REGISTRATION OF DESIGNS,

IN ORDER

TO SECURE COPYRIGHTS

ACCORDING TO THE STATUTE, 5 & 6 VIC. c. 100.

BY

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LINCOLN'S INN.

FROM THE "REPERTORY OF PATENT INVENTIONS," &c.

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REGISTRATION OF DESIGNS.

In many branches of our manufactures much money is annually expended in the designing and producing patterns, for which, formerly, no legal protection could be obtained; and it constantly happened that when a pattern was brought out in any department of manufacture, which was approved of by the public, other persons, engaged in the same trade, quickly copied the successful pattern; and, having paid nothing for the design, the copyist could bring the articles into the market at a reduced price, thereby depriving the original proprietor of all reward. Thus the enterprising and talented manufacturer of integrity had less chance of success than those in the same trade who, employing no skill or taste, were willing to depend on copying the productions of others. To meet this state of things an Act was passed in 1839, entitled "An Act to Secure to Proprietors of Designs for Articles of manufacture the Copyright of such Designs for a limited time."

This statute has been repealed by the statute 5 and 6 Victoria, cap. 100,* but all designs registered according to the former Act, are to remain in force as if it had not been repealed, and such is the case in respect to all copyrights under other Acts which are now repealed. The

* See p. 13.

new statute is made more comprehensive, and the periods for which protection is granted have been extended for all articles of manufacture, other than those made of metal, which are still for three years. It is important that the manufacturer should well understand, that the protection offered by this Act applies only to the shape, configuration, or ornament of any article of manufacture, and that the protection offered by this statute does not in any way relate to mechanical instruments, nor to machines, nor to processes of manufacture. The words of the third section of the Act are as follows:—

"And with regard to any new and original design (except for sculpture and other things within the provisions of the several Acts mentioned in the schedule C, to this Act annexed), whether such design be applicable to the ornamenting of any article of manufacture, or of any substance, artificial or natural, or partly artificial and partly natural, and that whether such design be so applicable for the pattern, or for the shape or configuration, or for the ornament thereof, or for any two or more of such purposes, and by whatever means such design may be so applicable, whether by printing, or by painting, or by embroidery, or by weaving, or by sewing, or by modelling, or by casting, or by embossing, or by engraving, or by staining, or by any other means whatsoever, manual, mechanical, or chemical, separate or combined; be it enacted, That the proprietor of every such design, not previously published either within the United Kingdom of Great Britain and Ireland, or elsewhere, shall have the sole right to apply the same to any articles of manufacture, or to any such substances as aforesaid, provided the same be done within the United Kingdom of Great Britain and Ireland, for the respective terms hereinafter mentioned, such respective terms to be computed from the time of such design being registered according to this Act."

Any new design applicable to the following classes of articles of manufacture, being registered according to the statute, will be protected for THREE YEARS:—

Articles in metal; articles in wood; articles in earthenware; articles in glass; paper-hangings; carpets; shawls (patterns not printed); woven fabrics, furnitures (patterns printed).

Any new design applicable to the following classes of

articles of manufacture, being registered according to the statute, are to be protected for NINE CALENDAR MONTHS:—

Shawls (patterns printed); yarn, thread or warp (printed); woven fabrics, not furnitures (patterns printed).

Any new design applicable to the following classes of articles of manufacture, being registered according to the statute, will be protected for TWELVE CALENDAR MONTHS:—

Woven fabrics (patterns not printed); lace, and all other articles.

In order to obtain protection for a design intended for any article of manufacture, it must be registered according to the statute; and care must be observed, first, that no publication by sale of articles produced according thereto be made before registration; second, that after the registration, every article manufactured according to the design must be marked or labelled with the name of the registered proprietor, and the number and date of the register.

The words of the fourth section are as follows:—

"Provided always, and be it enacted, that no person shall be entitled to the benefit of this Act, with regard to any design in respect to the application thereof to ornamenting any article of manufacture, or any such substance, unless such design have before publication thereof been registered according to this Act, and unless at the time of such registration such design have been registered in respect of the application thereof to some or one of the articles of manufacture or substances comprised in the above-mentioned classes, by specifying the number of the class in respect of which such registration is made, and unless the name of such person shall be registered, according to this Act, as a proprietor of such design, and unless after publication of such design every such article of manufacture, or such substance to which the same shall be so applied, published by him, hath thereon, if the article of manufacture be a woven fabric for printing, at one end thereof, or, if of any other kind or such substance as aforesaid, at the end or edge thereof, or other convenient place thereon, the letters 'R^{d},' together with such number or letter, or number and letter, and in such form as shall correspond with the date of the registration of such design according to the registry of designs in that

behalf; and such marks may be put on any such article of manufacture or such substance, either by making the same in or on the material itself of which such article or such substance shall consist, or by attaching thereto a label containing such marks."

The person registering a design according to the statute may be the author, if the work has not been produced for another, for a valuable consideration; in which latter case the person for whom the design has been produced may register as the proprietor; and any person purchasing a new design may register the same, and thus become the registered proprietor of such design.

The statute thus states who the proper person is to register a design:—

"And be it enacted, that the author of any such new and original design shall be considered the proprietor thereof, unless he have executed the work on behalf of another person for a good or a valuable consideration, in which case such person shall be considered the proprietor, and shall be entitled to be registered in the place of the author; and every person acquiring, for a good or a valuable consideration, a new and original design, or the right to apply the same to ornamenting any one or more articles of manufacture, or any one or more such substances as aforesaid, either exclusively of any other person or otherwise; and also every person upon whom the property in such design or such right to the application thereof shall devolve, shall be considered the proprietor of the design in the respect in which the same may have been so acquired, and to that extent, but not otherwise."

The object and intention of this Act of Parliament have been very much misunderstood; and it has been supposed by many that new inventions of a mechanical nature, such as weighing-machines, lamps, and machines of various kinds, may be secured for a short period; and, in fact, that this statute offers the same protection as a patent, and for the same class of cases, excepting as to the length of time. This is entirely erroneous; for it may be broadly stated, that an invention, for which a patent may be secured, can in no way be protected under the Registration Act; and, on the other hand, the invention of a design which can be protected under the Regis-

tration Act cannot be made the subject of a patent. The intention of the Registration Act is to secure to the author or proprietor of any new design, applicable to a manufactured article, the exclusive right in the making and selling of that article of manufacture, when made according to the configuration or contour or with the ornament proposed by the new design: whilst a patent secures to the inventor the exclusive right of any manner of new manufacture, whether the invention be for a new machine, or an improvement of a machine, or a new or improved process for producing known manufactures. We will suppose a case, which will make the distinction most clear. In registering any new design for a table-lamp, all that could be secured under such registration would be, some peculiarity of form in the stem or oil vessel, or in the glass shade, or some ornament applied thereto—no new mode of supplying oil to the wick, nor any new mode of raising the wick, nor any new apparatus for supplying air to support combustion, could become the subject matter of a registration. The simple configuration, or contour, or ornament of the lamp, or some particular part of the lamp, would be the only subject for registration; and any person might without infringing the registration make the same description of lamp, all parts acting mechanically in the same manner to produce the same end, so long as the outer configurations were not imitated. A patent, on the contrary, can scarcely ever be said to depend on shape; and supposing a patent be taken for any improved construction of lamp, such, for instance, as an improved means of raising the oil from the stem or pillar of a table-lamp, the patent will be equally infringed, whether the external figure or design be retained or not, so long as the means of raising the oil are preserved. Pursuing this error, many persons have registered weighing as well as other machines, which have for their object peculiar modes of working, without reference to the figure or shape of the whole or of the parts. A case may be given. When the Post-office regulations were first made, several weighing-machines were registered, amongst others were some in which the beam had a suitable scale or apparatus at one end for holding letters, the other end being provided with means of successively raising additional weights, and by the number of weights raised the weight of the letter was indicated; this

registration could simply secure the design of the stem and beam and weights, when all were kept in the same figure or configuration: any other person might have made the same weighing machine, by simply changing the shape of the stem or the beam or the weights; thus supposing in the registered design the fulcrum of the beam were supported by an Ionic column, and another person were to substitute a Corinthian column, the registered machine would not be infringed, though, for all practical purposes, the machine would be the same; it will, therefore, become very clear, that inventions which depend for their value on modes of action, and not on their external figure or ornament, are not proper subjects for registration, but for patents: and it is important that manufacturers should well understand this distinction; for there is no recalling a registration after it is once made, the act of registration is a publication, and no valid patent could afterwards be secured. The intention of the Registration Act is, to give protection to persons who introduce new designs into the market; and for this purpose the Act is very valuable. Heretofore, a manufacturer, bringing out a new pattern of stove, or fender, or coffee-pot, or urn, or lamp, or table, or candlestick, or tray, or bell-pull, or handles for doors, or new form of button, or for a new form of decanter, or other glass vessel, &c., was in no way protected; on the contrary, a pattern of any article of manufacture which became a favourite with the public, and which ought to have produced considerable profit to the party bringing it out, quickly became copied; and often such party, in place of profit, suffered a loss. In all such cases, the manufacturer may now protect himself by registration. At the same time, considerable care is requisite in the manner of registering a design according to the statute: in some cases the whole article may be of a new design; in other cases, only part of the article will be according to a new design; and it will be evident, that the simple showing of the article complete will not for both cases be a correct registration. This may be made more clear to the reader by again supposing the case to be a new design for the stem of a table-lamp; in such a case, if the whole table-lamp were to be shown and registered, without any statement of that portion to which the registration was intended to apply, the registration would in fact be

for the whole lamp, stem, oil-vessel, and glass-shade, and a change of figure being given to either of the parts, would take it out of the registration; but if the registration pointed out or specified correctly the extent of the pattern proposed to be secured, the alteration of other of the parts shown would not enable another person legally to use the new pattern or design of the part pointed out. Again, supposing the case to be a new design for a fender, and that the registration showed that the fender was supported by balls, if the registration did not define that it was the front surface of the fender, without reference to the means of supporting it, which was intended to be secured by the registration, another person placing the feet of an animal, or other device, as the supports, might not be considered to infringe the registration. In fact, it is clear, that in order to protect a new design for a manufacture, the nature of that design and its extent should be made clear to the public on the face of the document which is registered, in a somewhat similar manner to the specification of a patent. How, otherwise, is the public to know the precise point to which a registration lays claim, any more than if a patentee describes generally a machine or a process partly new and partly old. If the public, on reading the specification fairly, cannot ascertain what is new from what is old, the patent is bad. Is it not natural then to suppose, that a person making a registration, if he mix up old matter of design with new matter of design, (and without which in many cases he cannot show the new design correctly,) and does not point out what constitutes the new portion of design claimed under the registration, that he will be visited with a similar legal construction, and that he will lose the intended protection? The better way, in making registrations of designs under the statute, is, simply to show by drawings, and, if necessary, to describe only so much of any article of manufacture as relates to the novel design or pattern; but where other parts, and parts which may be varied, are considered necessary to be shown, then great care is requisite in pointing out to what extent the registration is intended to extend.

The sixth section of the Act relates to the sale and transfer of registrations, for the particulars of which see the statute itself in the appendix.

There are two classes of persons who may infringe a

registered article. *First*, any person who makes the same for sale, and *Secondly*, any person who sells or offers for sale an article similar to one protected by a registration. It will be found on reading the seventh section of the statute, that a person who only sells or offers for sale, and does not make the article, cannot be convicted of infringement of the registration, unless previously served with notice or otherwise informed of the registration. The words of the section are as follows:

"And for preventing the piracy of registered designs, be it enacted, that during the existence of any such right to the entire or partial use of any such design, no person shall either do or cause to be done any of the following acts with regard to any articles of manufacture, or substances, in respect of which the copyright of such design shall be in force, without the license or consent in writing of the registered proprietor thereof; (that is to say)

"No person shall apply any such design, or any fraudulent imitation thereof for the purpose of sale, to the ornamenting of any article of manufacture, or any substance, artificial or natural, or partly artificial and partly natural:

"No person shall publish, sell, or expose for sale, any article of manufacture, or any substance, to which such design, or any fraudulent imitation thereof, shall have been so applied, after having received, either verbally or in writing, or otherwise from any source other than the proprietor of such design, knowledge that his consent has not been given to such application, or after having been served with or had left at his premises a written notice signed by such proprietor or his agent to the same effect."

In cases of infringement of any registered design, the proprietor may recover a penalty for every offence of a sum of not less than 5*l.*, and not exceeding 30*l.*; and such penalties may be recovered by action in any of the superior courts of law, or by summoning the offending party before two justices of the peace acting for the county, riding, division, city, or borough, where the offending party resides; and such justices, on hearing the case as directed by the Act, may award the damages.

The words of the eighth section of the statute are as follows:—

"And be it enacted, that if any person commit any

such act, he shall for every offence forfeit a sum not less than five pounds, and not exceeding thirty pounds, to the proprietor of such design in respect of whose right such offence has been committed; and such proprietor may recover such penalty as follows:—

"In *England*, either by an action of debt, or on the case against the party offending, or by summary proceeding before two justices having jurisdiction where the party offending resides; and if such proprietor proceed by such summary proceeding, any justice of the peace acting for the county, riding, division, city, or borough, where the party offending resides, and not being concerned either in the sale or manufacture of the article of manufacture, or in the design to which such summary proceeding relates, may issue a summons requiring such party to appear on a day and at a time and place to be named in such summons, such time not being less than eight days from the date thereof; and every such summons shall be served on the party offending, either in person or at his usual place of abode; and either upon the appearance, or upon the default to appear of the party offending, any two or more of such justices may proceed to the hearing of the complaint, and upon proof of the offence, either by the confession of the party offending, or upon the oath or affirmation, of one or more credible witnesses, which such justices are hereby authorized to administer, may convict the offender in a penalty of not less than five pounds, or more than thirty pounds, as aforesaid, for each offence, as to such justices doth seem fit; but the aggregate amount of penalties for offences in respect of any one design committed by any one person, up to the time at which any of the proceedings herein mentioned shall be instituted, shall not exceed the sum of one hundred pounds; and if the amount of such penalty or of such penalties, and the costs attending the conviction, so assessed by such justices, be not forthwith paid, the amount of the penalty or of the penalties, and of the costs, together with the costs of the distress and sale, shall be levied by distress and sale of the goods and chattels of the offender, wherever the same happen to be in England; and the justices before whom the party has been convicted, or, on proof of the conviction, any two justices acting for any county, riding, division, city, or borough in England, where goods and chattels of the

person offending happen to be, may grant a warrant for such distress and sale; and the overplus, if any, shall be returned to the owner of the goods and chattels, on demand; and every information and conviction which shall be respectively laid or made in such summary proceeding before two justices under this Act may be drawn or made out in the following forms respectively, or to the effect thereof, *mutatis mutandis*, as the case may require:—

Form of Information.

"'Be it remembered, that on the at in the county of *A. B.* of in the county of [or *C. D.* of in the county of at the instance and on the behalf of *A. B.* of in the county of] cometh before us and two of Her Majesty's justices of the peace in and for the county of , and giveth us to understand that the said *A. B.*, before and at the time when the offence hereinafter mentioned was committed, was the proprietor of a new and original design for [*here describe the design*], and that within twelve calendar months last past, to wit, on the at in the county of *E. F.* of in the county of did [*here describe the offence*], contrary to the form of the Act passed in the year of the reign of her present Majesty, intituled "An Act to consolidate and amend the Laws relating to the copyright of Designs for ornamenting Articles of Manufacture."'

Form of Conviction.

"'Be it remembered, that on the day of in the year of our Lord at in the county of *E. F.* in the county aforesaid is convicted before us and two of Her Majesty's justices of the peace for the said county, for that he the said *E. F.* on the day of in the year at in the county of did [*here describe the offence*] contrary to the form of the statute in that case made and provided; and we the said justices do adjudge that the said *E. F.* for his offence aforesaid hath forfeited the sum of to the said *A. B.*'

"In *Scotland*, by action before the Court of Session in ordinary form, or by summary action before the sheriff of the county where the offence may be committed or the offender resides, who, upon proof of the offence or offences, either by confession of the party offending, or by the oath or affirmation of one or more credible witnesses, shall convict the offender and find him liable in the penalty or penalties aforesaid, as also in expenses; and it shall be lawful for the sheriff in pronouncing such judgment for the penalty or penalties and costs, to insert in such judgment a warrant, in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding: provided always, that it shall be lawful to the sheriff, in the event of his dismissing the action and assoilzieing the defender, to find the complainer liable in expenses; and any judgment so to be pronounced by the sheriff in such summary application shall be final and conclusive, and not subject to review by advocation, suspension, reduction, or otherwise.

"In *Ireland*, either by action in a superior court of law at Dublin, or by civil bill in the Civil Bill Court of the county or place where the offence was committed."

Lincoln's Inn, May 3, 1843.

ACT REFERRED TO IN THE FOREGOING.

5 & 6 VICTORIA.

CAP. C.—*An Act to consolidate and amend the Laws relating to the Copyright of Designs for ornamenting Articles of Manufacture.*

WHEREAS by the several Acts mentioned in the Schedule (A.) to this Act annexed, there was granted, in respect of the woven fabrics therein mentioned, the sole right to use any new and original pattern for printing the same during the period of three calendar months: and whereas by the Act mentioned in the Schedule (B.) to this Act annexed, there was granted, in respect of all articles, except lace, and except the articles within the meaning of the Acts hereinbefore referred to, the sole right of using any new and original design, for certain purposes, during the respective periods therein mentioned; but forasmuch as the protection afforded by the said Acts in respect of the application of designs to certain articles of manufacture is insufficient, it is expedient to extend the same, but upon the conditions herein-after expressed; now, for that purpose, and for the purpose of consolidating the provisions of the said Acts, be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of

the same, that this Act shall come into operation on the first day of September, one thousand eight hundred and forty-two, and that thereupon all the said Acts mentioned in the said Schedules (A.) and (B.) to this Act annexed shall be and they are hereby repealed.

II. Provided always, and be it enacted, that notwithstanding such repeal of the said Acts, every copyright in force under the same shall continue in force till the expiration of such copyright; and with regard to all offences or injuries committed against any such copyright before this Act shall come into operation, every penalty imposed and every remedy given by the said Acts, in relation to any such offence or injury, shall be applicable as if such Acts had not been repealed; but with regard to such offences or injuries committed against any such copyright after this Act shall come into operation, every penalty imposed and every remedy given by this Act in relation to any such offence or injury shall be applicable as if such copyright had been conferred by this Act.

III. And with regard to any new and original design (except for sculpture and other things within the provisions of the several Acts mentioned in the schedule (C.) to this Act annexed), whether such design be applicable to the ornamenting of any article of manufacture, or of any substance, artificial or natural, or partly artificial and partly natural, and that whether such design be so applicable for the pattern, or for the shape or configuration, or for the ornament thereof, or for any two or more of such purposes, and by whatever means such design may be so applicable, whether by printing, or by painting, or by embroidery, or by weaving, or by sewing, or by modelling, or by casting, or by embossing, or by engraving, or by staining, or by any other means whatsoever, manual, mechanical, or chemical, separate or combined; be it enacted, that the proprietor of every such design, not previously published either within the United Kingdom of Great Britain and Ireland, or elsewhere, shall have the sole right to apply the same to any articles of manufacture, or to any such substances as aforesaid, provided the same be done within the United Kingdom of Great Britain and Ireland, for the respective terms hereinafter mentioned, such respective terms to be computed from the time of such design being registered according to this Act; (that is to say,)

In respect of the application of any such design to ornamenting any article of manufacture contained in the first, second, third, fourth, fifth, sixth, eighth, or eleventh of the classes following, for the term of three years:

In respect of the application of any such design to ornamenting any article of manufacture contained in the seventh, ninth, or tenth of the classes following, for the term of nine calendar months:

In respect of the application of any such design to ornamenting any article of manufacture or substance contained in the twelfth or thirteenth of the classes following, for the term of twelve calendar months:

Class 1.—Articles of manufacture composed wholly or chiefly of any metal or mixed metals:

Class 2.—Articles of manufacture composed wholly or chiefly of wood:

Class 3.—Articles of manufacture composed wholly or chiefly of glass:

Class 4.—Articles of manufacture composed wholly or chiefly of earthenware:

Class 5.—Paper hangings:
Class 6.—Carpets:
Class 7.—Shawls, if the design be applied solely by printing, or by any other process by which colours are or may hereafter be produced upon tissue or textile fabrics:
Class 8.—Shawls not comprised in class 7:
Class 9.—Yarn, thread, or warp, if the design be applied by printing, or by any other process by which colours are or may hereafter be produced:
Class 10.—Woven fabrics, composed of linen, cotton, wool, silk, or hair, or of any two or more of such materials, if the design be applied by printing, or by any other process by which colours are or may hereafter be produced upon tissue or textile fabrics; excepting the articles included in class 11:
Class 11.—Woven fabrics, composed of linen, cotton, wool, silk, or hair, or of any two or more of such materials, if the design be applied by printing, or by any other process by which colours are or may hereafter be produced upon tissue or textile fabrics, such woven fabrics being or coming within the description technically called furnitures, and the repeat of the design whereof shall be more than twelve inches by eight inches:
Class 12.—Woven fabrics, not comprised in any preceding class:
Class 13.—Lace, and any article of manufacture or substance not comprised in any preceding class.

IV. Provided always, and be it enacted, that no person shall be entitled to the benefit of this Act, with regard to any design in respect of the application thereof to ornamenting any article of manufacture, or any such substance, unless such design have before publication thereof been registered according to this Act, and unless at the time of such registration such design have been registered in respect of the application thereof to some or one of the articles of manufacture or substances comprised in the above-mentioned classes, by specifying the number of the class in respect of which such registration is made, and unless the name of such person shall be registered according to this Act as a proprietor of such design, and unless after publication of such design every such article of manufacture, or such substance to which the same shall be so applied, published by him, hath thereon, if the article of manufacture be a woven fabric for printing, at one end thereof, or, if of any other kind or such substance as aforesaid, at the end or edge thereof, or other convenient place thereon, the letters "Rd," together with such number or letter, or number and letter, and in such form as shall correspond with the date of the registration of such design according to the registry of designs in that behalf; and such marks may be put on any such article of manufacture or such substance, either by making the same in or on the material itself of which such article or such substance shall consist, or by attaching thereto a label containing such marks.

V. And be it enacted, that the author of any such new and original design shall be considered the proprietor thereof, unless he have executed the work on behalf of another person for a good or a valuable consideration, in which case such person shall be considered the proprietor, and shall be entitled to be registered in the place of the author; and every person acquiring for a good or a valuable consideration a new and original design, or the right to apply the same to ornamenting any one or more articles of manufacture, or any one or more such substances

as aforesaid, either exclusively of any other person or otherwise, and also every person upon whom the property in such design or such right to the application thereof shall devolve, shall be considered the proprietor of the design in the respect in which the same may have been so acquired, and to that extent, but not otherwise.

VI. And be it enacted, that every person purchasing or otherwise acquiring the right to the entire or partial use of any such design may enter his title in the register hereby provided, and any writing purporting to be a transfer of such design, and signed by the proprietor thereof, shall operate as an effectual transfer; and the registrar shall, on request, and the production of such writing, or in the case of acquiring such right by any other mode than that of purchase, on the production of any evidence to the satisfaction of the registrar, insert the name of the new proprietor in the register; and the following may be the form of such transfer, and of such request to the registrar :—

Form of Transfer, and authority to register.

'I *A. B.*, author [*or* proprietor] of design, No. having transferred my right thereto, [*or, if such transfer be partial,*] so far as regards the ornamenting of [*describe the articles of manufacture or substances, or the locality with respect to which the right is transferred,*] to *B. C.* of do hereby authorize you to insert his name on the register of designs accordingly.'

Form of request to register.

'I *B. C.*, the person mentioned in the above transfer, do request you to register my name and property in the said design as entitled [*if to the entire use*] to the entire use of such design, [*or, if to the partial use,*] to the partial use of such design, so far as regards the application thereof [*describe the articles of manufacture, or the locality in relation to which the right is transferred*].'

But if such request to register be made by any person to whom any such design shall devolve otherwise than by transfer, such request may be in the following form :—

'I *C. D.*, in whom is vested by [*state bankruptcy or otherwise*] the design, No. [*or if such devolution be of a partial right,* so far as regards the application thereof] to [*describe the articles of manufacture or substance, or the locality in relation to which the right has devolved*].'

VII. And for preventing the piracy of registered designs, be it enacted, that during the existence of any such right to the entire or partial use of any such design no person shall either do or cause to be done any of the following acts with regard to any articles of manufacture, or substances, in respect of which the copyright of such design shall be in force, without the license or consent in writing of the registered proprietor thereof; (that is to say,)

No person shall apply any such design, or any fraudulent imitation thereof for the purpose of sale, to the ornamenting of any article of manufacture, or any substance, artificial or natural, or partly artificial and partly natural:

No person shall publish, sell, or expose for sale any article of manu-

facture, or any substance, to which such design, or any fraudulent imitation thereof, shall have been so applied, after having received, either verbally or in writing, or otherwise from any source other than the proprietor of such design, knowledge that his consent has not been given to such application, or after having been served with or had left at his premises a written notice signed by such proprietor or his agent to the same effect.

VIII. And be it enacted, that if any person commit any such act, he shall for every offence forfeit a sum not less than five pounds and not exceeding thirty pounds to the proprietor of the design in respect of whose right such offence has been committed; and such proprietor may recover such penalty as follows:—

In *England*, either by an action of debt or on the case against the party offending, or by summary proceeding before two justices having jurisdiction where the party offending resides; and if such proprietor proceed by such summary proceeding, any justice of the peace acting for the county, riding, division, city, or borough, where the party offending resides, and not being concerned either in the sale or manufacture of the article of manufacture, or in the design to which such summary proceeding relates, may issue a summons requiring such party to appear on a day and at a time and place to be named in such summons, such time not being less than eight days from the date thereof; and every such summons shall be served on the party offending, either in person or at his usual place of abode; and either upon the appearance or upon the default to appear of the party offending, any two or more of such justices may proceed to the hearing of the complaint, and upon proof of the offence, either by the confession of the party offending, or upon the oath or affirmation of one or more credible witnesses, which such justices are hereby authorized to administer, may convict the offender in a penalty of not less than five pounds or more than thirty pounds, as aforesaid, for each offence, as to such justices doth seem fit; but the aggregate amount of penalties for offences in respect of any one design committed by any one person, up to the time at which any of the proceedings herein mentioned shall be instituted, shall not exceed the sum of one hundred pounds; and if the amount of such penalty or of such penalties, and the costs attending the conviction, so assessed by such justices, be not forthwith paid, the amount of the penalty or of the penalties, and of the costs, together with the costs of the distress and sale, shall be levied by distress and sale of the goods and chattels of the offender, wherever the same happen to be in *England*; and the justices before whom the party has been convicted, or, on proof of the conviction, any two justices acting for any county, riding, division, city, or borough in *England*, where goods and chattels of the person offending happen to be, may grant a warrant for such distress and sale; and the overplus, if any, shall be returned to the owner of the goods and chattels, on demand: and every information and conviction which shall be respectively laid or made in such summary proceeding before two justices under this act may be drawn or made out in the following forms respectively, or to the effect thereof, *mutatis mutandis*, as the case may require:—

Form of Information.

'Be it remembered, that on the at
'in the county of *A. B.* of in the county
'of [*or C. D.* of in the county of
' at the instance and on the behalf of *A. B.* of in
'the county of] cometh before us and
' two of Her Majesty's justices of the peace in and
'for the county of , and giveth us to understand that
'the said *A. B.*, before and at the time when the offence hereinafter mentioned was committed, was the proprietor of a new and original design for [*here describe the design*], and that within twelve calendar months last past, to wit, on the at
' in the county of *E. F.* of
'in the county of did [*here describe the offence*],
'contrary to the form of the act passed in the year
'of the reign of Her present Majesty, intituled, "*An Act to consolidate and amend the Laws relating to the Copyright of Designs for ornamenting Articles of Manufacture.*"'

Form of Conviction.

'Be it remembered, that on the day of
'in the year of our Lord at in the
'county of *E. F.* of in the county aforesaid is convicted before us and two of
'Her Majesty's justices of the peace for the said county, for that he
'the said *E. F.* on the day of in the year
'at in the county of did [*here describe*
'*the offence*] contrary to the form of the statute in that case made
'and provided; and we the said justices do adjudge that the said
'*E. F.* for his offence aforesaid hath forfeited the sum of
'to the said *A. B.*'

In *Scotland*, by action before the Court of Session in ordinary form, or by summary action before the sheriff of the county where the offence may be committed or the offender resides, who, upon proof of the offence or offences, either by confession of the party offending or by the oath or affirmation of one or more credible witnesses, shall convict the offender and find him liable in the penalty or penalties aforesaid, as also in expenses; and it shall be lawful for the sheriff, in pronouncing such judgment for the penalty or penalties and costs, to insert in such judgment a warrant, in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding: provided always, that it shall be lawful to the sheriff, in the event of his dismissing the action and assoilzieing the defender, to find the complainer liable in expenses; and any judgment so to be pronounced by the sheriff in such summary application shall be final and conclusive, and not subject to review by advocation, suspension, reduction, or otherwise:

In *Ireland*, either by action in a superior court of law at *Dublin* or by civil bill in the Civil Bill Court of the county or place where the offence was committed.

IX. Provided always, and be it enacted, that notwithstanding the remedies hereby given for the recovery of any such penalty as aforesaid,

it shall be lawful for the proprietor in respect of whose right such penalty shall have been incurred (if he shall elect to do so) to bring such action as he may be entitled to for the recovery of any damages which he shall have sustained, either by the application of any such design or of a fraudulent imitation thereof, for the purpose of sale, to any articles of manufacture or substances, or by the publication, sale, or exposure to sale, as aforesaid, by any person, of any article or substance to which such design or any fraudulent imitation thereof shall have been so applied, such person knowing that the proprietor of such design had not given his consent to such application.

X. And be it enacted, that in any suit in equity which may be instituted by the proprietor of any design or the person lawfully entitled thereto, relative to such design, if it shall appear to the satisfaction of the judge having cognizance of such suit that the design has been registered in the name of a person not being the proprietor or lawfully entitled thereto, it shall be competent for such judge, in his discretion, by a decree or order in such suit to direct either that such registration be cancelled (in which case the same shall thenceforth be wholly void), or that the name of the proprietor of such design, or other person lawfully entitled thereto, be substituted in the register for the name of such wrongful proprietor or claimant, in like manner as hereinbefore directed in case of the transfer of a design, and to make such order respecting the costs of such cancellation or substitution, and of all proceedings to procure and effect the same, as he shall think fit; and the registrar is hereby authorized and required, upon being served with an official copy of such decree or order, and upon payment of the proper fee, to comply with the tenour of such decree or order, and either cancel such registration or substitute such new name, as the case may be.

XI. And be it enacted, that unless a design applied to ornamenting any article of manufacture or any such substance as aforesaid, be so registered as aforesaid, and unless such design so registered shall have been applied to the ornamenting such article or substance within the United Kingdom of *Great Britain* and *Ireland*, and also after the copyright of such design in relation to such article or substance shall have expired, it shall be unlawful to put on any such article or such substance, in the manner hereinbefore required with respect to articles or substances whereto shall be applied a registered design, the marks herein-before required to be so applied, or any marks corresponding therewith or similar thereto; and if any person shall so unlawfully apply any such marks, or shall publish, sell, or expose for sale any article of manufacture, or any substance with any such marks so unlawfully applied, knowing that any such marks have been unlawfully applied, he shall forfeit for every such offence a sum not exceeding five pounds, which may be recovered by any person proceeding for the same by any of the ways hereinbefore directed with respect to penalties for pirating any such design.

XII. And be it enacted, that no action or other proceeding for any offence or injury under this Act shall be brought after the expiration of twelve calendar months from the commission of the offence; and in every such action or other proceeding of the party who shall prevail shall recover his full costs of suit or of such other proceeding.

XIII. And be it enacted, that in the case of any summary proceeding before any two justices in *England*, such justices are hereby authorized to award payment of costs to the party prevailing, and to grant a warrant for enforcing payment thereof against the summoning party if

unsuccessful, in the like manner as is hereinbefore provided for recovering any penalty with costs against any offender under this Act.

XIV. And for the purpose of registering designs for articles of manufacture, in order to obtain the protection of this Act, be it enacted, that the Lords of the Committee of Privy Council for the consideration of all matters of trade and plantations may appoint a person to be a registrar of designs for ornamenting articles of manufacture, and, if the Lords of the said Committee see fit, a deputy registrar, clerks, and other necessary officers and servants; and such registrar, deputy registrar, clerks, officers, and servants, shall hold their offices during the pleasure of the Lords of the said Committee; and the Commissioners of the Treasury may from time to time fix the salary or remuneration of such registrar, deputy registrar, clerks, officers, and servants; and, subject to the provisions of this Act, the Lords of the said Committee may make rules for regulating the execution of the duties of the office of the said registrar; and such registrar shall have a seal of office.

XV. And be it enacted, that the said registrar shall not register any design in respect of any application thereof to ornamenting any articles of manufacture or substances, unless he be furnished, in respect of each such application, with two copies, drawings, or prints of such design, accompanied with the name of every person who shall claim to be proprietor, or of the style or title of the firm under which such proprietor may be trading, with his place of abode or place of carrying on his business, or other place of address, and the number of the class in respect of which such registration is made; and the registrar shall register all such copies, drawings, or prints, from time to time successively, as they are received by him for that purpose; and on every such copy, drawing, or print he shall affix a number corresponding to such succession; and he shall retain one copy, drawing, or print, which he shall file in his office, and the other he shall return to the person by whom the same has been forwarded to him; and in order to give ready access to the copies of designs so registered, he shall class such copies of designs, and keep a proper index of each class.

XVI. And be it enacted, that upon every copy, drawing, or print of an original design so returned to the person registering, as aforesaid, or attached thereto, and upon every copy, drawing, or print thereof received for the purpose of such registration, or of the transfer of such design being certified thereon, or attached thereto, the registrar shall certify under his hand that the design has been so registered, the date of such registration, and the name of the registered proprietor or the style or title of the firm under which such proprietor may be trading, with his place of abode or place of carrying on his business, or other place of address, and also the number of such design, together with such number or letter, or number and letter, and in such form as shall be employed by him to denote or correspond with the date of such registration; and such certificate made on every such original design, or on such copy thereof, and purporting to be signed by the registrar or deputy registrar, and purporting to have the seal of office of such registrar affixed thereto, shall, in the absence of evidence to the contrary, be sufficient proof, as follows,

Of the design, and of the name of the proprietor therein mentioned, having been duly registered; and

Of the commencement of the period of registry; and

Of the person named therein as proprietor being the proprietor; and

Of the originality of the design; and

Of the provisions of this Act, and of any rule under which the certificate appears to be made, having been complied with:

And any such writing purporting to be such certificate shall, in the absence of evidence to the contrary, be received as evidence, without proof of the handwriting of the signature thereto, or of the seal of office affixed thereto, or of the person signing the same being the registrar or deputy registrar.

XVII. And be it enacted, that every person shall be at liberty to inspect any design whereof the copyright shall have expired, paying only such fee as shall be appointed by virtue of this Act, in that behalf; but with regard to designs whereof the copyright shall not have expired, no such design shall be open to inspection, except by a proprietor of such design or by any person authorized by him in writing, or by any person specially authorized by the registrar, and then only in the presence of such registrar or in the presence of some person holding an appointment under this Act, and not so as to take a copy of any such design or of any part thereof, nor without paying for every such inspection such fee as aforesaid: provided always, that it shall be lawful for the said registrar to give to any person applying to him, and producing a particular design, together with the registration mark thereof, or producing such registration mark only, a certificate stating whether of such design there be any copyright existing, and if there be, in respect to what particular article of manufacture or substance such copyright exists, and the term of such copyright, and the date of registration, and also the name and address of the registered proprietor thereof.

XVIII. And be it enacted, that the Commissioners of the Treasury shall from time to time fix fees to be paid for the services to be performed by the registrar, as they shall deem requisite, to defray the expenses of the said office, and the salaries or other remuneration of the said registrar, and of any other persons employed under him, with the sanction of the Commissioners of the Treasury, in the execution of this Act; and the balance, if any, shall be carried to the Consolidated Fund of the United Kingdom, and be paid accordingly into the receipt of Her Majesty's Exchequer at Westminster; and the Commissioners of the Treasury may regulate the manner in which such fees are to be received, and in which they are to be kept, and in which they are to be accounted for, and they may also remit or dispense with the payment of such fees in any cases where they may think it expedient so to do: provided always, that the fee for registering a design to be applied to any woven fabric, mentioned or comprised in classes 7, 9, or 10, shall not exceed the sum of one shilling; that the fee for registering a design to be applied to a paper-hanging shall not exceed the sum of ten shillings; and that the fee to be received by the registrar for giving a certificate relative to the existence or expiration of any copyright in any design printed on any woven fabric, yarn, thread, or warp, or printed, embossed, or worked on any paper-hanging, to any person exhibiting a piece end of a registered pattern, with the registration mark thereon, shall not exceed the sum of two shillings and sixpence.

XIX. And be it enacted, that if either the registrar or any person employed under him either demand or receive any gratuity or reward, whether in money or otherwise, except the salary or remuneration authorized by the Commissioners of the Treasury, he shall forfeit for every such offence fifty pounds to any person suing for the same by

action of debt in the Court of Exchequer at Westminster; and he shall also be liable to be suspended or dismissed from his office, and rendered incapable of holding any situation in the said office, as the Commissioners of the Treasury see fit.

XX. And for the interpretation of this Act, be it enacted, that the following terms and expressions, so far as they are not repugnant to the context of this Act, shall be construed as follows; (that is to say,) the expression "Commissioners of the Treasury" shall mean the Lord High Treasurer for the time being, or the Commissioners of Her Majesty's Treasury for the time being, or any three or more of them; and the singular number shall include the plural as well as the singular number; and the masculine gender shall include the feminine gender as well as the masculine gender.

XXI. And be it enacted, that this Act may be amended or repealed by any Act to be passed in the present Session of Parliament.

Schedules referred to by the foregoing Act.

SCHEDULE (A.)

DATE OF ACTS.	TITLE.
27 Geo. 3. c. 38. (1787.)	An Act for the encouragement of the arts of designing and printing linens, cottons, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors for a limited time.
29 Geo. 3. c. 19. (1789.)	An Act for continuing an Act for the encouragement of the arts of designing and printing linens, cottons, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors for a limited time.
34 Geo. 3. c. 23. (1794.)	An Act for amending and making perpetual an Act for the encouragement of the arts of designing and printing linens, cottons, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors for a limited time.
2 Vict. c. 13. (1839.)	An Act for extending the copyright of designs for calico printing to designs for printing other woven fabrics.

SCHEDULE (B.)

2 Vict. c. 17. (1839.)	An Act to secure to proprietors of designs for articles of manufacture the copyright of such designs for a limited time.

SCHEDULE (C.)

38 Geo. 3. c. 71. (1798.)	An Act for encouraging the art of making new models and casts of busts and other things therein mentioned.
54 Geo. 3. c. 56. (1814.)	An Act to amend and render more effectual an Act for encouraging the art of making new models and casts of busts and other things therein mentioned, and for giving further encouragement to such arts.

Table of Fees, &c.

CLASS.	ARTICLE.	COPYRIGHT.	FEES. £.	s.	d.
1.	Articles in metal	3 years	3	0	0
2.	Articles in wood	3 „	1	0	0
3.	Articles in earthenware	3 „	1	0	0
4.	Articles in glass	3 „	1	0	0
5.	Paper hangings	3 „	0	10	0
6.	Carpets	3 „	1	0	0
7.	Shawls (patterns printed)	9 months	0	1	0
8.	Shawls (patterns not printed)	3 years	1	0	0
9.	Yarn, thread or warp (printed)	9 months	0	1	0
10.	Woven fabrics, not furnitures (patterns printed)	9 „	0	1	0
11.	Woven fabrics, furnitures (patterns printed)	3 years	0	5	0
12.	Woven fabrics (patterns not printed)	12 months	0	5	0
13.	Lace and all other articles	12 „	0	5	0
	Certifying design same as registration fee, but for class 1		1	0	0
	Cancellation or substitution		1	0	0
	Search		0	2	6
	Inspection of designs of which the copyright has expired, each class		0	1	0

ALEXANDER MACINTOSH,
PRINTER,
GREAT NEW STREET, LONDON.

ADDRESS.

THE main object of this publication is to give a regular abstract of all Specifications of Patents of Inventions enrolled. Hitherto, this most important desideratum has been but very partially attended to, whereby the nature of many patented Inventions is totally unknown, particularly such as have only been worked in private, or are altogether dormant; and manufacturers frequently find, after great outlay of capital, that they have been infringing upon some Patentee's right, entirely from ignorance of its existence. To remedy this evil is the object of the present work; which will contain copious Abstracts of every Specification, in the order in which they are enrolled during each month, commencing from the 1st August, thus affording the means of immediate information and ready reference,—the necessity and importance of which will be evident to every Inventor and intending Patentee. In addition to this, the "RECORD" will contain

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Lists of all new Patents granted during each month, also Law Reports of Patent Cases, and Scientific Notices.

It is therefore confidently hoped that a publication embodying so much valuable information will meet with the support of the great body of Inventors; the price, moreover, being such as to place it within the reach of the most humble mechanic.

ALEXANDER PRINCE.

OFFICE FOR PATENTS OF INVENTIONS,

14, Lincoln's-Inn Fields.

30th September, 1842.

JUL 12 1927

The Record

OF

PATENT INVENTIONS.

No. I.

SPECIFICATION enrolled 1st August, 1842, of a PATENT granted 2nd February, 1842, to HENRY FOWLER BROADWOOD, of No. 33, Great Pulteney Street, Golden Square, in the county of Middlesex, for "*an improvement in that part of a piano-forte, harpsichord, or other the like instrument, commonly called the name board.*"

THIS improvement consists in that part of the piano-forte commonly called the name board, and which forms the back part of the key board, being divided into two parts, in the direction of its length. The upper part contains the maker's name and address; the lower part is fixed by means of a centre pin in each end, in such a manner as to revolve, thereby presenting either surface of such board to view. One of these surfaces may be made plain, so as to correspond with the upper part of the board; the other surface, which constitutes the improvement, is engraved with a gamut, or scale, extending throughout its whole length, and showing the names of all the notes. Below this scale, and on the lower edge of the board, is

shewn a continuation of all the black and white keys, so as to present, at one view, to the eye of the student, a complete scale and gamut, with the name of each key and note. The inventor states that this will be found a very useful improvement in school-room piano-fortes.

SPECIFICATION enrolled 3rd August, 1842, of a PATENT granted 8th February, 1842, to ADDERLEY WILLCOCKS SLEIGH, K.T.S., of Manchester, in the county of Lancashire, captain in Her Most Faithful Majesty's service, for "*a certain method, or certain methods, of effecting and forming sheltered floating harbours of safety, by the employment of certain buoyant sea barriers applicable thereto; and which said improvements are also applicable to, and useful for, the formation of breakwaters, floating bridges, light-houses, and beacons, the protection of pier-heads or embankments, and for other similar purposes.*"

THE invention consists in the construction and adaptation of sloping or oblique platforms, mounted upon, or supported by, floating hollow vessels or caissons, by which the platforms are always maintained in sloping or oblique positions, and are enabled to rise and fall with the tide. These sloping platforms and floating vessels, when constructed, are to be so arranged as to form sea and wind barriers, for sheltering ships and other vessels, and also pier-heads, bridges, and other structures requiring such shelter, from the ordinary destructive effects of heavy seas and gales of wind.

A transverse section is shown of a floating breakwater constructed on the patentee's system. The hollow vessel or caisson is represented as made of ribs of timber, strongly planked on the outside, and made perfectly water-tight and buoyant; but it may be constructed of sheet iron or other suitable material. This caisson is made in the form of an oblong longitudinal wedge, the back part is rounded like the side of a vessel, and the bottom, or that part immersed in the water, is made perfectly flat, whilst the surface or deck rises at an acute angle from the extreme edge of the bottom, forming an inclined plane, which extends in a longitudinal direction the whole length of the structure. Through the centre of this caisson, and above its whole length, extends a strong timber beam or keel, which will be the centre of motion, on which the caisson floats. The top, bottom, and sides are supported by internal stays or bracings, abutting against the timber beam or keel. The whole structure is surmounted by a sloping platform, which is firmly secured to it by wooden or iron bracings or stays. Strong rings are attached for moving it securely in any desired place. The lower end of this platform is immersed in water, and its face or inclined plane rises at an angle of about 30 degrees (in imitation of the slope of a supposed beach) to a considerable distance beyond the top of the caisson or vessel, thereby offering a modified resistance to the violence of the winds and waves, by which means their destructive effects will be much lessened, and the water behind will be sheltered from the action of the tempest. These floating breakwaters may be made of any dimensions; and in order to form a sea and wind barrier or harbour of refuge, a suitable number may be moored side by side, either in a straight or curved line, as may be required, and be connected together by universal ball and socket

joints placed at the ends of the keel or beam, by which they will be allowed to roll upon their centres of gravity, or yield temporarily in any other way to the violence of the winds or waves.

The drawings also show the manner of arranging these sea barriers or floating breakwaters, connected together as above described, for the purpose of forming a harbour of refuge, and also the manner of mooring them to the bottom of the sea, by means of chains and cables attached at one end to the rings before stated, and at the other end to anchors fixed to the ground under water. Instead of the peculiar shaped caisson or floating vessel above described, a floating frame work, supported by a number of barrels or other hollow wooden or iron vessels may be used, and the sloping platform or inclined plane may be attached or connected thereon, or the inclined platform may be supported by a raft. The floating supports may even be dispensed with altogether, by connecting the platform at one end, by means of chains, cables, or in any other suitable manner, to the bottom of the sea, so that the upper edge of the platform may rise from the water in an inclined direction.

The inventor wishes it to be perfectly understood, that he does not intend to confine himself to the methods above described, of constructing and floating his improved sea and wind barrier; but he claims, as his invention, the employment, as breakwaters, of portable sloping platforms or inclined planes, partially immersed in the water, in whatever manner, or of whatsoever materials such inclined planes may be constructed, or in whatever way they may be floated or buoyed up, in or on the water, and held in the required situations, when such portable and buoyant inclined planes are employed for the purposes or objects above stated.

SPECIFICATION enrolled 6th August, 1842, of a PATENT granted 15th February, 1842, to GEORGE HADEN, of Trowbridge, in the county of Wilts, engineer, for "*certain improvements in apparatus for warming and ventilating buildings.*"

THESE improvements consist in the application, to the external sides of stoves, grates, and other warming apparatus, of certain metallic plates, or zig-zag pieces, which being cast on to, or otherwise fixed to, the sides of the stove, or grate, increase the extent and effect of the heating surfaces, and also cause currents of air to pass with considerable rapidity in close contact with these heated surfaces, by which means the air becomes warmed, and such warmed air may then be conducted to any apartment that may require to have its temperature raised.

The method employed by the inventor of obtaining an increased extent of heating surface, is, by casting or affixing with hard solder, on the sides of rectangular stoves, a number of plates at right angles to the plane upon which they are affixed, and which may form either right or curved lines. These plates, which are represented in the drawing of a zig-zag form, may be of any breadth, from one to twelve inches, according to the size of the stoves, and may also be arranged in any direction, or at any angle, with reference to the sides of the stoves. The sides and top of the stove being furnished with any number of these plates, and arranged in any convenient manner, such stove is then provided with an external casing of any suitable material, which is made to touch the outer edges of the projecting plates, thereby forming, between the case and

the stove, a number of zig-zag channels, through which atmospheric air is conducted from below, through apertures made for that purpose. Metals being good conductors of heat, the projecting plates thus connected to the sides of the stoves become heated by the fire within, and the air being obliged to pass in narrow streams between these plates, acquires a considerable degree of heat, and on arriving at the top, may be conducted, through a pipe or flue, to other apartments, or may be allowed to pass at once into the room containing the apparatus. This stove may also be employed for diffusing heat, produced from hot water, or from steam or gas, which is effected by the application of a narrow water chamber surrounding the fire place, with the projecting plates affixed to the outer part, as before described. The inventor prefers such plates to be cast on the stoves, so as to form component parts thereof. Pure atmospheric air may be supplied to the apparatus, by means of pipes or flues leading from the outside of the building, and, by thus causing a constant draught, ventilate the apartments.

The patentee states that one of the principal advantages to be derived from this invention is the increased extent of heating surface obtained by the application of the projecting plates, whereby a small stove may be made to give out as much or more heat than one of larger dimensions, having plain sides, as at present made.

Claim.—The application of projecting plates, or pieces placed in zig-zag ranges, and at any angles on the sides or surfaces of stoves, or grates, or other apparatus for diffusing heat by radiation and rapid circulation of the atmospheric air.

SPECIFICATION enrolled 8th August, 1842, of a PATENT granted 8th February, 1842, to WILLIAM NEWTON, of Chancery Lane, in the county of Middlesex, civil engineer, for "*certain improved apparatus, to be adapted to lace-making machinery, for the production of a novel description of elastic fabric from silk, cotton, woollen, linen, and other fibrous materials.*" Being a communication from a foreigner residing abroad.

THIS improved apparatus consists in certain mechanism to be applied to lace-machinery, for producing a novel description of elastic fabric, by the introduction of threads of cotton or silk into the net lace, for the purpose of filling up the meshes and other open parts.

This apparatus, as stated in the Specification, will admit of several modifications, which will be necessary in order to apply it to different machines. The first description of this improvement shows the apparatus applied to a French machine, and consists of certain mechanical arrangements for communicating motion to a shuttle, whereby the silk or other material in the shuttle, intended to constitute the weft of the fabric, is carried across the machine whilst the presser is up, and being held in tension, in a proper situation to be acted upon by the evolutions of a lace-machine, becomes woven into the fabric, thereby closing the interstices and other open work, and forming a body to lace resembling a satin ground.

The construction of this apparatus, as applied to lace-machinery of the ordinary construction used in England, is as follows:—On the left hand end of the cranked-formed shaft of a common warp lace-machine, is affixed a bevil wheel which takes into and drives another wheel affixed on the end of a transverse shaft, communicating

motion at its opposite end in the same manner (by bevilled wheels) to the "main shaft;" upon this shaft, and near the centre of the machine, are two cams, which impart motion to two levers, moving upon an axis affixed to each frame end, and extending to or near the centre of the machine; the ends of these levers are connected together by a band passing over a pulley affixed on the end of a transverse shaft placed above the machine; thus, by the action of the cams, a reciprocating rotary motion will be given to the said transverse shaft by the vibration of the levers. On the opposite end of this shaft is another pulley of larger diameter, communicating motion, by means of a band, to a small pulley affixed at the left hand end of the machine, on the axis of which is a second pulley, corresponding with, and equal in diameter to, a pulley affixed at the opposite end of the machine: over these two last mentioned pulleys passes an endless band, to which is attached the weft carrier, which is supplied from a bobbin affixed in any convenient manner above the machine. In place of this weft carrier, which in the present case moves upon a bar with a dovetailed slide, the inventor sometimes uses a shuttle. It will be seen, when we compare the driving pulleys with the driven, that, the to and fro motion of this weft carrier, by the action of the aforesaid levers, will be very rapid.

The weft thread being thrown along the machine, immediately after the lops have been put upon the needles, the presser bar comes down upon the beards of the needles, and the sinkers rise and come forward to force the work over the beards and heads of the needles in the usual manner; the sinkers then descend, and falling back, the nibs of the sinkers take the work, together with the weft threads, on to the shafts of the needles, when the machine laps again, and thereby incorporates the weft threads into

the work, and have the effect of filling up the meshes and other interstices of the lace.

The claim is for the application of carriers or shuttles, actuated by bands, as described, or by other mechanical agents, for conducting across the machine, longitudinally, weft thread or threads, independently of the ordinary carrying parts of such machine; by means of which, such independent weft thread or threads may be placed so as to be incorporated or worked into the meshes, or interstices of the lace, during the ordinary evolutions of the machine, by which the fabric is produced.

SPECIFICATION enrolled 8th August, 1842, of a PATENT granted 8th February, 1842, to CHARLES HANCOCK, of Grosvenor Place, in the county of Middlesex, artist, for "*certain improvements in printing cotton, silk, woollen, and other stuffs.*"

THESE improvements relate to printing such fabrics without the application of a mordant or sizes, for the purpose of preparing such goods previous to printing, also in printing them partly with oil colours and partly with water colours, or dischargeable resists. For this purpose, the patentee mixes linseed oil, or nut oil, or other oil of a drying nature, with burnt Turkey umber, in the proportion of one gallon of oil to one pound of umber, and boils the mixture over a slow fire. This boiling is continued until the mixture gives indication of having parted, or nearly so, with most of its evaporative constituents. Care must be taken to draw the fire, before any depositions of carbon take place, as they would have a discolouring effect. The substance thus prepared will resemble and have the consistence of dissolved India rubber, and will

be found to flow freely by the application of gentle heat or pressure, and will not soil on being brought into contact with textile fabrics, or paper. When it is desirable to have the medium of a more drying nature, or of a more adhesive quality, a little white vitriol, litharge, sugar of lead, or other dryer, may be added: the mixture may also be thinned down with oil of turpentine, if required. In order to combine the composition or medium above mentioned with any of the pigments or other matters suitable for the printing of cotton, silk, woollen, or other fabrics, the combination is to be effected in a vessel heated by steam, such as are employed by colour manufacturers. When the colours are to be applied to the stuffs, it may be done without the stuffs undergoing previous preparation with mordants, sizes, oils, or otherwise, by means of cylindrical printing machines or plates. If the preparation be previously thinned with oil of turpentine, the colour may be applied in a cold state; if otherwise, the application of heat to the trough, as also to the cylinder or plate, will be necessary, which may be effected by steam in the usual manner. Should any smell be imparted to the stuffs by the use of turpentine, it may be removed by exposing them to the air. In some cases, instead of the figures being printed in oil, or oils, the inventor makes use of water colours which can be discharged, the oil being used for the ground only.

The claim is to the printing of cotton, silk, woollen, or other stuffs, with oil or oil colours, prepared or compounded, and without any previous preparation of the stuffs by mordant, sizes, or oils; also the printing of stuffs with oils, compounded in the manner described, however differently applied; together with the printing of stuffs, partly with oil colours and partly with water colours, termed by the inventor "dischargeable resists."

SPECIFICATION enrolled 8th August, 1842, of a PATENT granted 8th February, 1842, to BENJAMIN BIRAM, of Wentworth, in the county of York, colliery viewer, for "*certain improvements in the construction and application of rotary engines.*"

THE first part of these improvements consists in giving a better form to the vanes or floats of rotary machines, which are moved by currents of air or water, or some other fluid acting against such vanes or floats. The inventor has ascertained, by numerous experiments, that there is a certain curved form which may be given to floats or vanes, that is, a gradual reduction in the angles of obliquity, in which case a greater amount of useful effect will be obtained, the theory of which the inventor has illustrated by a number of geometrical problems.

The claim is for the employment of that class of rotary engines which are moved by the action of wind or water, or other fluids with surfaces of a curvilinear form, or with an obliquity gradually decreasing from the axles, such surfaces being of a peculiar form.

The second improvement consists in the application of rotary engines or wheels, with vanes or floats affixed at angles determined and set forth in the Specification, for the purpose of registering the velocities of bodies propelled through water. For this purpose, the patentee employs a wheel of the above description, on the side of a vessel, which is affixed on one end of a horizontal shaft; the other end, which passes through the ship's side, imparts motion, by means of a worm, to a train of multiplying wheels; the circumference of the wheel to be acted upon is made to form some integral part of a mile, and the floats are placed at such angles that the wheel will make one revolution, or a number of revolutions, in the same time that the vessel takes in going a certain distance.

By this arrangement, the number of revolutions are to indicate the speed of the vessel, which may be shown by an index hand connected with the train of wheel-work, as will be understood.

Claim is for the application of a rotary engine, or wheel, as described, for registering the velocities of bodies propelled through water or wind.

The third improvement relates to such rotary wheels, when employed as propellers of vessels, and which are caused to act upon the water by the means of an engine, or other motive power. For this purpose, the paddle wheels, which are placed at the stern, are partly enclosed at their sides by means of plates, riveted, or bolted, to the rings composing the wheel. And from repeated experiments, the inventor states, that paddle wheels constructed on his improved plan, with angular floats, such angles at their extremity not being less than 45 degrees, and gradually decreasing until they meet the axle, will be equal in propelling power, to paddles with double the amount of area of floats, of the ordinary construction; and in consequence of the oblique manner in which the paddles enter and leave the water, that tremulous motion so much complained of will entirely be obviated. He also employs these paddles, or rotary machines, for the purpose of ventilating mines and other places.

The claim is for the employment of such rotary wheels, or engines, as derive their motion from some motive power, having vanes or floats with angular surfaces, of the form described, and presenting, at their extremity, angles of not less than 45 degrees to their planes of motion, and enclosed more or less at the sides, or round their peripheries, according to the purposes to which they are to be applied.

SPECIFICATION enrolled 9th August, 1842, of a PATENT granted 9th February, 1842, to FREDERIC HARLOW, of Rotherhithe, in the county of Surrey, carpenter, for "*improvements in paving or covering roads, and other surfaces, and in machinery for cutting the materials to be used for these purposes.*"

THE first improvement consists in forming grooves or lateral openings in the blocks, into which is inserted a tongue, so as to project past the surface of the block for the purpose of being inserted into the next row of blocks, thereby connecting the blocks together in such a manner as to prevent the block, separately, from sinking below the surface of the road. The tongues may be inserted in one or more lengths, and are made to project or extend beyond the surface of the outer blocks forming the road into grooves made in the gutter blocks, such blocks being connected in the same manner by a tongue between them, and in a longitudinal direction of the road. The drawing also shows the footpath from the kerb stones covered in the same manner, with this exception, that the tongues, which are in a transverse situation, are made of strong sheet-iron.

The claim is for the mode of applying tongues and grooves to combine and sustain blocks of wood used for paving roads.

The second part of these improvements relates to certain apparatus for cutting such grooves, and also the angular nicks in the surfaces of blocks for the better footing of horses and other animals, and consists of a horizontal shaft affixed in a frame, and provided with two discs or plates of metal, to which is affixed, by means of bolts, a

series of cutters of the breadth and shape required for forming the grooves and angular nicks. These cutters, which are caused to revolve, project above the surface of the frame or bench, which is provided with a guide for the purpose of cutting the grooves an equal distance from the upper or lower surface of the blocks, in order that they may coincide with each other. It will be seen that the joints of such blocks may either be angular or vertical.

The claim is for a mode of combining rotary cutters, with suitable surfaces, for forming grooves to receive tongues, and also for forming the grooves or nicks in the upper surfaces of blocks used for wood pavement.

SPECIFICATION enrolled 9th August, 1842, of a PATENT granted 9th February, 1842, to ISHAM BAGGS, of King's Square, in the county of Middlesex, chemist, for "*improvements in obtaining motive power by means of carbonic acid; and also by a peculiar application of heated air.*"

THE Specification gives a description of certain apparatus for evolving and absorbing carbonic acid gas, after it has been used for moving the piston of an engine. The solutions employed by the patentee for generating carbonic acid, in the form of gas, are the super sulphate of ammonia, and carbonate of ammonia, which are contained in two separate vessels; these matters are constantly introduced in proper quantities into another vessel, by means of pipes, whereby the carbonic acid contained in the carbonate of ammonia becomes evolved, which may be seen by the application of a safety valve, or pressure gauge, applied to the generator. The gas evolved from

the combination of the two liquors, which are introduced by means of pumps worked by the engine, passes off by means of a pipe affixed to the upper part of the generator —this pipe, which, has a coil, is made to pass through a second vessel for the purpose of cooling the gas; the gas is subsequently heated in passing through the upper part of the vessel to the cylinder of an engine, having a suitable arrangement of valves for opening the parts, for the induction and eduction of the carbonic acid gas. This gas passes from the eduction way of the cylinder, by means of a pipe dipping into the liquor contained in the before mentioned vessel, through which the coil of pipe passes, which is partly filled with a solution of ammonia, and answers the purpose of a condensing medium by absorbing the carbonic acid, and consequently reducing the pressure of such gas on the eduction side of the piston. This vessel is also provided with a pipe in its upper surface, which dips into a second vessel containing a solution of ammonia, for the purpose of more completely absorbing the gas, which may remain in the upper part of the first vessel. These vessels are also provided with tubular connections to the first mentioned vessel, containing the carbonate of ammonia, into which the vessels are occasionally emptied, as they become charged with the liquor.

The ammonia for supplying the separate vessels is obtained by submitting sulphate of ammonia to heat in a vessel, provided with a tube connected with the first vessel, for the purpose of supplying it with the super sulphate of ammonia.

The inventor makes no claim to any of the above processes when separately considered, the object of the inventor being to combine the three processes together; *videlicet*, the evolving and absorbing of carbonic acid gas,

together with submitting sulphate of ammonia to heat, for the purpose of obtaining the said gas, to be applied to the piston of a suitable engine, so that the power of the gas may be exerted on the piston before the gas is absorbed, as above described, such gas being evolved and used as a motive power, and then absorbed; and the matters used for evolving and absorbing such gas are used over and over again.

The patentee has, by a disclaimer entered with the clerk of the patents, 9th August, 1842, disclaimed the following words, in the title of his patent, "and also by a peculiar application of heated air."

SPECIFICATION enrolled 10th August, 1842, of a PATENT granted 10th February, 1842, to CHRISTOPHER NICKELS, of York Road, Lambeth, in the county of Surrey, gentleman, for "*improvements in the manufacture of plaited fabrics.*"

THESE improvements consist in the application of two warp beams, with the threads of the warp divided into portions of one inch, or one inch and a half wide, so as to form alternate stripes of plain and plaited fabric in the manufacture of tabbies, twills, and other descriptions of goods. The inventor effects his improvements by weighting one warp beam more than the other, or by any other method whereby the warp beam forming the plaits will be caused to unwind at a greater speed than that which forms the plain part of the fabric: by this arrangement, the fabric may be plaited, so as to form various figures, according to the number of warp beams employed, and the taking up of the ends forming the warp, as will be well understood.

The claim is for the mode of weaving plaited fabrics, by dividing the warp into sets or parts, and causing the separate sets or parts to be delivered at different speeds in the weaving.

SPECIFICATION enrolled 10th August, 1842, of a PATENT granted 10th February, 1842, to WILLIAM BROOK ADDISON, of Bradford, in the county of York, manufacturer, for "*certain improvements in machinery for spinning worsted and woollen yarn.*"

IN common throstles, or spinning frames, used in the manufacture of worsted yarn, it is customary, in the process of spinning, to give an uniform perpendicular traversing motion to the whole length of the bobbin. In place of this uniform motion, the inventor has introduced a copping motion, whereby the cop is formed in the throstle, or spinning frame. By this arrangement, the machine usually employed in forming the cop is not required. On one end of the tin roller, which gives motion to the spindles, is affixed a pulley, which drives, by means of a band, another pulley placed above it, having a pinion, taking into a large wheel fixed on a shaft; this shaft communicates motion, by means of a worm fixed thereon, to a horizontal shaft, placed near the end of the frame: as the traverse or copping motion is the same for each side of the frame, it will be necessary to give a description of one side only. On one end of this horizontal shaft, which extends from side to side of the frame, is a heart wheel, acting upon a spring bar, one end of which is affixed to the frame, the other passes through a slot in the frame end, and carries a pulley at its extremity. Over this pulley passes a chain, one end of which is fastened to the periphery of a pulley, receiving its motion

from a worm affixed on the horizontal shaft; the other end is fastened to an inclined lever, moving on a stud, the lower end of which gives motion to the traverse rail. When the machine is set to work, the heart wheel imparts a reciprocating motion to the spring bar—this motion, by means of the chain, tends to draw the inclined lever into a vertical position—the lower end being connected with the traverse rail, depresses it, together with the bobbin, which is, for this purpose, without flanges; by this motion, the yarn will be wound on a portion of the bobbin, from its base upwards, in the same manner as in the first formation of the cop in the process of spinning, and will be continued as the heart wheel revolves, thereby causing the bar to reciprocate or move up and down through the slot: such motion would therefore only have the effect of winding the yarn on the bobbin a certain portion of its length; but this traversing motion is further obtained by means of the chain winding on the periphery of the pulley, which receives its motion, as before stated, from the horizontal shaft, by means of a worm, thereby raising the inclined lever and depressing the bobbin; and which combined motions, acting simultaneously, have the effect of forming the cop. There are other arrangements of mechanism by means of which the machine is stopped when the bobbin is full, and the pulley, on which the chain is wound, disconnected; and by placing a weight at the upper end of the inclined lever, the pulley, together with the lever, are brought into their original position, ready for commencing another cop.

The claim is for the mode of forming cops of worsted or woollen yarn, suitable for the shuttle, by causing the cops to be built up progressively, as above stated, as the yarn is spun in a throstle, or other spinning machine acting in a similar manner to the throstle.

SPECIFICATION enrolled 10th August, 1842, of a PATENT granted 13th June, 1842, to WILLIAM COTTON, of Leytonstone, in the county of Essex, esquire, for "*an improved weighing machine.*"

THIS machine is principally for the purpose of weighing coin and blanks, and also for separating the light coin from such as are of weight. The blanks, or pieces of coin for this purpose, are placed in a hopper of tubular form, which stands in a vertical position upon a plate forming the upper part of the machine. Underneath this plate is the beam, which supports at each end a pendant wire, moving freely upon a fulcrum; one of these wires supports the weight, and the other has a round plate or disc affixed to its upper end, and placed above the beam, for receiving the pieces of coin to be weighed. These pieces of coin are forced from the hopper, in a horizontal direction, on to the plate, by means of a sliding bar, moved by an eccentric; this plate is provided with two openings in its edge, to receive the ends of two flat hammers placed at right angles to each other, and acted upon by means of cranks affixed on a horizontal shaft: one of the hammers is placed about one-tenth of an inch above the other, which is the distance allowed for the vibration of the beam. Thus, by turning the handle of the machine, motion is communicated by means of wheels to two horizontal shafts, upon which are affixed eccentrics, &c., for effecting the various movements of the machine, the first of which is to force the piece of coin from the hopper to the scale. This being done, a pair of nippers, which have hitherto held the pendant wire with the scale attached, become released. If the piece of coin be of proper weight, the beam remains in a horizontal position, and the lowest hammer strikes against its edge, and forces the piece of

coin from the scale into an inclined channel provided for its reception; if on the other hand, the coin should be light, the scale will be elevated by means of the counterpoise at the opposite end of the beam; and the hammer which would have struck a heavier piece of coin, passes under the edge of the lighter coin, which is struck off by the other hammer, and driven in a direction at right angles to the first, into a smilar channel, which conducts it into a separate receptacle: thus the weighing and separating of the coin is effected by the rotary motion of the handle. The whole of the mechanism may be enclosed in a case in such a manner that nothing is to be seen but the pieces of coin in the hopper; and when those pieces come out from the openings in the end of the case, they are weighed and assorted.

The claim is for the employment of machinery, or mechanical means, for supplying the balance from a hopper, or other receptacle, with one piece of coin or blank at a time, and for removing such pieces from the balance and separating the light from the heavy coin.

SPECIFICATION enrolled 13th August, 1842, of a PATENT granted 14th February, 1842, to GEORGE JARNAM, of Leeds, in the county of York, flax and cotton spinner; ROBERT COOK, of Heathersage, in the county of Derby, heckle and needle manufacturer; and JOSHUA WORDSWORTH, of Leeds, aforesaid, machine maker, for "*certain improvements in machinery for spinning flax.*"

THE drawing shows an elevation and transverse section of a machine for spinning flax, hemp, and tow; and consists in certain arrangements of drawing apparatus for flax

spinning machinery, whereby the drawing out or extension of the roving for yarns is performed by two or more sets of holding and drawing rollers, and not by a progressive series of drawing rollers as in cotton spinning machinery.

The arrangement will admit of several modifications, but, as described in the Specification, consists of three bottom and four top rollers, applied to a spinning frame or throstle, which are supported by stands affixed to the roller beam. The front and back roller have each one top roller pressing on their peripheries, and the middle roller two; which three last mentioned rollers, with their stands, remain stationary, as also the front pair of rollers; but the back or first pair have their axes mounted upon a stand having a slide and screw, by which means they are capable of being moved further from or nearer to the middle or second row of rollers, so as to increase or diminish the length of the reach or draft of the fibres, as may be required; the top rollers are weighted by saddle bars, having nicks on the upper side thereof, with lever bolts for adjusting the pressure between the first and second series of rollers, by placing the lever bolt in any of the aforesaid nicks. The opposite ends of these lever bolts are connected by joints to a swivel piece, which is also connected to the short arm of a bent lever; to the long arm is suspended a weight for the purpose of weighting the four top rollers,—motion being communicated from one set of rollers to another by pinions, or change wheels, affixed on their ends. The rovings, which are wound on a spool or bobbin, pass through a trough containing water, and from thence through guides to the first pair of rollers, through which they are conducted to the second series or three rollers, which revolve at a greater speed than the first pair, in consequence of

which, they (the first pair) will become partial holders or retainers, and the fibres will be drawn out; such fibres then pass from the middle series, or three rollers, (which have all the same speed) and are drawn through the third pair or front rollers, and are further elongated, owing to the speed of the front rollers being greater than the preceding or middle series, which will also become partial holders or retainers to the front rollers; the fibres thus drawn out pass to the flyer and are wound on the bobbin. The patentees have employed a disc of metal, with a bevilled edge above the bobbin, for the purpose of keeping the fibres of the thread from the edge of the bobbin,—the application of which they believe to be entirely new.

The patentees claim the introduction of a distinct retaining roller, or rollers, after the first reach of the drawing apparatus, instead of continuing uninterruptedly the process of progressive drawing, as by the old system of drawing rollers.

SPECIFICATION enrolled 13th August, 1842, of a PATENT granted 15th February, 1842, to JAMES ANDREW, junior, of Manchester, in the county of Lancashire, manufacturer, for "*certain improvements in the method or process of preparing or dressing yarns or warps for weaving.*"

THIS improvement consists in the mode of preparing or dressing yarns or warps for weaving, by substituting an article of commerce well known in cotton manufacture, called "farina," which is prepared from potatoes and other vegetable matters. This article the patentee uses in the place of wheaten flour, which is now commonly employed

for the purpose of stiffening warps; and when in a fit state for use, called "sough" or "sow." It appears from the Specification, that farina has been tried as a stiffening medium for warps, but without success; in all probability, from having been mixed up in too large quantities, and been allowed to stand, whereby the farina loses its stiffening property. The method employed by the patentee, which constitutes the only feature or claim in the invention, is as follows:—

Instead of mixing farina in large quantities, and allowing it to stand so long that it loses its glutinous and stiffening quality, he causes it to be mixed in small portions when in a flour or pulverized state; each dresser mixing his own in a pail or bucket, and using it immediately in the dressing machine, whilst in a hot state; the vessel or trough for containing it in the machine should be lined with brass; he also states that he has found, from practice, that the use of farina, in the manner described in the manufacture of cloth, will alone be found to effect a saving of 70 per cent. in the cost of stiffening matters, besides the subsequent advantage arising from the superiority of the threads, and the facility of weaving, and other advantages which the cloth possesses. It also dispenses with a portion of hand labour, such as steepers, carriers, sough-makers, together with room and unnecessary apparatus, as it requires simply to be mixed in small quantities and to be instantly used, in order to preserve the peculiar stiffening quality it possesses.

SPECIFICATION enrolled 15th August, 1842, of a PATENT granted 15th February, 1842, to JOHN OSBALDESTON, of Blackburn, in the county of Lancashire, metal heald maker, for "*certain improvements in looms for weaving.*"

THESE improvements are twelve in number.

The first improvement consists in a mode of applying to the slay or lathe of a loom certain springs for the purpose of regulating the beat up. These springs are affixed to the back of each slay-sword in a vertical position, and may extend the whole length of the sword; the arrangement being, to affix the spring at its lower end to any part of the sword, thereby increasing or reducing the tension as may be required; the slay moves freely from front to back of the loom, so that the strength of the beat up of the weft will be governed by the springs.

The claim is for the mode of applying springs, as described, to the slay of a loom.

The second improvement consists in the application of springs to the connecting rods for the purpose (as above described) of giving elasticity to the beat up. One of the parts of such connecting rods is made to slide within the other: these parts have lateral openings, or slots, with two pins passing through them, for the purpose of keeping such parts in a right line, and also to allow them to slide freely in the direction of their length. These parts are acted upon by a spring placed between them, for the purpose of keeping them extended. The action of the beat against the cloth, owing to the flexibility of the spring, causes the connecting rods to be shortened.

Claim.—The application of springs to connecting rods, in order to give elasticity to the beat up.

The third improvement consists in the application of two horizontal levers, moving on vertical pins, affixed to the upper edge of each frame side, and underneath the shuttle box. These levers have each an inclined plane at one end, and are connected together by a rod extending across the loom, whereby the action of one lever will be governed by that of the other. Within the shuttle box are "bulges," having projecting fingers, which act on the inclined plane at the end of each lever: by this arrangement, if the shuttle be not thrown across into the box, such bulges will not be acted upon, and the front part of the lever will be brought against the frame, and thus prevent the beat up.

Claim.—The mode of stopping the beat up of a loom, when the shuttle is not thrown across into the shuttle box.

The fourth improvement consists in certain arrangements for stopping the loom, when the weft is not properly supplied. The method adopted by the inventor is, by affixing to the spring, which is connected with and moves the strap-guider, a horizontal projecting pin, which is actuated, in certain cases, by the slay. The upper end of this spring, when on the fast pulley, fits into a notch. In the event of the weft not being properly supplied, the movement of the slay will not be checked by the weft, and the slay will therefore strike against the projecting pin, and cause the spring to be forced from the notch in a lateral direction, and by that means the strap to be moved on to the loose pulley.

Claim.—The mode of stopping the loom, by combining the spring with the fork, and striking such spring with the slay, as described.

The fifth improvement relates to a mode of winding up the work on the cloth roller, technically called "the taking up motion." On the axis of the cloth roller, at one end, is affixed a double ratchet wheel, actuated by two vertical

levers, with wedge-like ends entering the teeth, or openings of each wheel at the underside. The lower parts of these levers are bent at right angles, and extend along the frame side, to a wheel having crank pins: this wheel receives its motion from a driving wheel affixed on the crank shaft. The motion is effected by the action of the pins on the ends of the levers, (which are weighted,) the vibration of which causes their opposite ends to enter the teeth of the ratchet wheel, and to impart a rotary motion to the cloth roller.

Claim.—The mode of taking up the cloth, by the application of the wheels and other parts described, for giving motion to the same.

The sixth improvement is a new mode of giving off the warp from the warp beam. An endless chain of teeth passes, at its upper end, over a roller affixed to a spring bar, and at its lower end, over a roller with a weight suspended to it. This endless chain of teeth also passes over and takes into a cog wheel affixed on the axis of the warp beam. The resistance, caused by the friction of the interior surface of the chain, together with the weight, will have the effect of giving off the warp with a regular tension.

The claim is for the application of an endless chain of teeth to the warp beam, for the purpose above described.

The seventh improvement consists in certain mechanical arrangements, for producing an effect similar to that above described (that is, of giving off the warp) by the application of two levers, and a double ratchet wheel affixed on the axis of the warp beam. These levers, which take into the teeth of the ratchet wheel, are successively acted upon by a wheel similar to that used in the taking up motion applied to the cloth roller,—with this difference, that the action of these levers is to retard the motion of the warp beam.

The inventor claims the mode of regulating the giving off of the warp, by means of a wheel and apparatus for moving the same.

The eighth improvement consists in the application of grooved rollers, for giving off the warp. These rollers are placed one above the other; the bottom roller having a wheel on its axis, taking into and receiving its motion from the crank shaft; the warp, in passing from the beam, is pressed, and held between the fluted rollers: by their evolutions, the giving off of the warp, as stated by the inventor, will be better regulated.

The claim is for the application of grooved rollers, for giving off the warp.

The ninth improvement relates to a mode of working the treadles of looms, by the application of a cog wheel having a number of pins or studs projecting from its sides. This wheel receives its motion from a driving wheel affixed on the axis of the main shaft; for which the inventor claims—a mode of applying a wheel, as above described, for giving motion to the treadles.

The tenth improvement relates to the construction of temples, and giving motion thereto. The construction of this apparatus consists of a small shaft (fixed in a frame) having two eccentric parts, which open and close two chaps. On one end of the shaft is a ratchet wheel, which is actuated, at every movement of the slay, by a rod: the motion of this shaft causes the chaps to be closed, and to take hold of the cloth, while at the same time they are moved by certain mechanical arrangements, endwise and sidewise. The chaps, when not acted upon by the eccentric shaft, are kept open by means of weights attached to their upper part, and will remain open when moving towards the cloth, and closed in the manner above described.

Claim.—A mode of giving motion to temples, in addition to opening and closing them.

The eleventh improvement is a peculiar arrangement of revolving temples, and consists of two spiked wheels; the spikes in the one wheel are fixed, while those in the other wheel are so placed as to slide with the cloth after they have taken it thereon; each of these sliding spikes is placed on a strong stem which slides through the boss of the wheel. This boss has a number of slots, through which the spikes protrude, and in which they slide, and by means of a roller acting against the stems, the spikes will successively approach the cloth, and having penetrated it, will move outwards: an inclined plane on the opposite end of the boss causes the spikes to be withdrawn.

Claim.—The mode of constructing revolving temples, by giving motion to the points.

The twelfth, and last, improvement relates to a mode of stopping the loom by means of the shuttle when the yarn sticks in the shed. The interior of the shuttle, which has a portion of its upper and lower edge removed, is provided with a lever extending in a right line past the lower opening in the edge of the shuttle, and is then bent upwards and extended in a line with its upper edge and past the opening. In the event of the warp sticking in the shed, such portions will act upon the lever which will cut the shute, and thus bring into action certain machinery for stopping the loom when the weft is not properly supplied.

Claim.—The application of certain apparatus to be acted on by the yarn sticking in the shed as above described.

SPECIFICATION enrolled 15th August, 1842, for a PATENT granted 15th February, 1842, to ALEXANDER ROUSSEAU, of the Strand, in the county of Middlesex, manufacturer, for "*certain improvements in fire-arms.*" Being a communication.

THESE improvements consist in applying to fire-arms an apparatus containing a number of detonating caps, which will be simultaneously brought on the nipple of the gun, or other fire-arm, by the act of drawing back the hammer, in cocking the gun. By this arrangement, the gun may be repeatedly discharged, according to the number of caps contained in the apparatus, which is about fifty for a single barrelled gun.

The following is a description of the apparatus—On the inside of each hammer of a double barrelled gun, is affixed a tube about two inches long, provided with a projecting stud at one end, fitting into the upper plate of the lock. These tubes have a lateral motion, and are acted upon by a double spring placed underneath the upper plate of the lock in such a manner as to force the tubes outwards as the hammer is being drawn back in the act of cocking the gun; in which position, their ends (which are bent downwards), are brought in juxtaposition with the nipple, upon which the caps are placed. When the piece is discharged, the side of the hammer, in falling, comes in contact with a projection formed on the side of such tube, and moves it to its former position, and allows the hammer to strike the nipple. The chambers or tubes containing the caps are passed through holes made in the gun stock, and communicate at their ends with the moveable tubes; the end of the stock is provided with a plate, which can be removed

for the purpose of withdrawing the tubes, in order to supply them with caps; the interior of each of these tubes, at the bottom end, is provided with a spiral spring, which is compressed within the tubes; and the same being filled with caps, are placed within the gun stock; the action of the spiral spring forcing the caps into the moveable tube, which is a continuation of the chamber; a small projecting plate screwed to the lock near the opening of the moveable tube, prevents the caps from passing through when not required; by drawing back the hammer, as before stated, the moveable tube, by the action of the spring, causes its opening to be brought opposite the nipple, and past the projecting plate, and allows a cap to pass from the tube, and to be deposited on the nipple—the tube being replaced by the action of the hammer when the piece is discharged. The hammer of this gun has a portion of its side cut away for the purpose of facilitating the removal of such portions of the cap as may be left after the discharge of the gun.

SPECIFICATION enrolled 15th August, 1842, of a PATENT granted 15th February, 1842, to JOHN LEWTHWAITE, of East Street, Manchester Square, in the county of Middlesex, engineer, for "*improvements in steam engines and boilers.*"

THE first improvement relates to a new method of working the valves of steam engines. In place of the slide valve, the inventor introduces a rotary one, having six openings in its face, and which is, in form, similar to a ventilator. A piece is cast, or otherwise affixed, on the side of the cylinder, and provided with a plain smooth face and with

suitable openings for the induction and eduction of steam. This valve, which is made to fit the face perfectly tight, is affixed on the end of a shaft, and caused to revolve, thereby forming alternate communications with the induction and eduction ports of the cylinder. The shaft is geared to the main shaft of the engine, in such a manner as to receive a constant rotary motion, the speed being one-third of a revolution of such shaft, for one revolution of the crank shaft; the gearing being so arranged as to admit of the valve being reversed when required—the valve is enclosed in a hemispherical cover, having a steam-tight opening, through which the shaft passes.

Claim.—The mode of constructing and applying rotary slides or valves to reciprocating steam cylinders.

The second improvement relates to steam boilers. This steam boiler is of a quadrangular form, the four sides consisting of narrow water spaces or chambers, securely stayed by means of bolts; through the front part an opening is formed for the fire doors, and through the back part are formed holes, through which the products of combustion pass into the chimney. This chimney is composed of two tubes or parts; the interior tube, which is eccentric with the exterior, is provided with a fan, having vanes moving upon axes situated at the lower end thereof, so as to incline in either direction; the object of which is to cause a draft, in whichever direction the axis of the fan may be caused to revolve. The space made by the interior tube being situated in the chimney, is for the escape of steam from the cylinder. The interior of the boiler consists of a series of narrow water spaces, extending from front to back of the boiler, and from the fireplace in a vertical direction to the steam chamber, which is separated from the action of the fire by a horizontal plate, at the upper part of the water spaces, or chambers. A

number of plates in the form of brackets are placed between the spaces, such plates being perforated with holes to allow the heat to encompass the whole exterior of the water chambers. The tubular connections from one to the other, and which form one of the novelties of the invention, consist of a number of hollow screws, with right and left handed threads, perforated in the middle with a number of holes; these screws being passed through the plates forming the water spaces, are of such length as to project past the surface, and are so placed as to coincide with each other; a nut being screwed on the ends of such tubular bolts having right and left handed threads, holds the water chambers together, and also forms tubular connections from one to the other. The connections for steam are formed in the same manner, observing that larger perforations will be necessary; these water chambers are further held together by a number of bolts passing through strong cast iron plates at each end of the series of water chambers, so as to hold them firmly together.

The claim is for the mode of combining water spaces in the construction of steam boilers by means of hollow screws and nuts; also for the application of the plate for separating the heat of the furnace from the steam chamber, together with the mode of constructiug a revolving apparatus with moveable vanes, so as to incline in either direction, and to act in whichever way the axis is driven.

SPECIFICATION enrolled 15th August, 1842, of a PATENT granted 15th February, 1842, to THOMAS RUSSELL CRAMPTON, late of Lisson Grove, but now of Southwark Square, in the borough of Southwark, in the county of Surrey, engineer; and JOHN COOPE HADDAN, late of Moorgate Street, in the city of London, but now of Liverpool Street, St. Pancras, in the county of Middlesex, civil engineer, for "*improvements in steam engines and railway carriages.*"

THE first of these improvements is an improved method, or improved methods, of reversing and varying, or altering, the cut off of the steam, by varying the position or inclination of the eccentric rod, to the cylinders of locomotive, stationary, and marine steam engines. The handle for shutting off and reversing the steam, in such engines, is bent at its lower part at right angles, and forms a lifting arm, the end of which is connected by a link to the end of the eccentric rod, in such a manner, that by moving the handle, the end of the eccentric rod will be raised or lowered in a slot made in a curved lever which moves on an axis at its centre, and at which place the slot is made wider; to the upper part of this slotted lever is attached the valve rod. The handle, which is in a vertical position, is furnished with a segment, having notches in it to indicate its position. When the engine is out of gear, the handle will be in a vertical position, and in the centre of the segment; and the eccentric will be worked backwards and forwards in the widest part of the grooved lever, without causing the same to vibrate; but when the handle is shifted to the first notch in the segment, the end

of the eccentric rod is forced upwards and into the narrow part of the groove, at which place the rod forms an angle of about 21 degrees with the line of the eccentric rod. The motion of the eccentric rod will now impart a reciprocating action to the grooved lever, and also to the valve rod and slide valve. When the eccentric rod makes an angle of 21 degrees, as described, the slide valve is arranged with a lap of about one inch, so as to cut off the steam at about seven-eighths of the stroke of the piston. By moving the handle back in the opposite direction, the end of the eccentric rod will be forced into the opposite end of the slotted lever, and the action of the slide reversed.

The second improvement is an improved method of altering the lead of admission, by giving various inclinations to the valve rods of locomotive and other engines. This is a modification of the foregoing, with the application of an additional lever, for the purpose of raising the end of the valve rod in the slot of the projecting arm or lever; whereby its radius will be increased, and cause a longer traverse of the slide valve, and thereby give a greater lead of admission to the steam through the openings into the cylinder.

The third improvement is in cutting off and varying the lead of admission (without increasing or diminishing the traverse of the slide valve), by varying the inclination of the eccentric rods of locomotive steam engines. On the end of the valve rod which works through a guide, is affixed, at right angles, a double fork, having "gab ends;" this double fork has a narrow groove, forming a portion of a circle, and is made to branch out at each extremity of the curvilinear groove, thereby forming the "gab ends;" the ends of the two eccentric rods are connected together by links; the opposite end of such links being

affixed by means of a stud passing through them to the end of the lifting arm of the handle; by forcing the handle on the segment in one direction, the lifting arm, or lever, will be depressed, and carry with it the end of the forward eccentric rod to the bottom of the groove. When in this position, the slide valve is so arranged as to cut off at about three-fourths of the stroke, and give *no* lead of admission. By shifting the handle in a contrary direction to the centre of the segment, the end of the connecting rod will leave the groove, and be equidistant with the other rod, from the centre of the double fork. The ends of the connecting rods, when in this position, are moving in the widened part, or "gab ends;" consequently, no action is produced on the double fork, and the engine is out of gear. By forcing the handle still further in the same direction, the end of the lower, or backward rod, will be raised into the bottom of the groove, and the action of the engine will be reversed.

The fourth improvement is in diminishing the friction of slide valves: the back of the valve is turned out for the reception of a ring of brass, or other metal, which is expanded and kept tight by means of a steel spring acting against a bar and wedge fitted into an opening in the ring; the upper edge works at right angles against the slide box cover, which is planed true, and forms an angle with the face of the slide; this ring is kept up and in contact with the inclined cover, by the application of a spring attached to the top of the slide valve, and presses against a plate affixed to the underside of the ring, which plate serves as a covering for the opening of the ring. By this arrangement, the motion of the slide valve will cause the ring to be depressed by the action of the inclined cover; and on its return, the spring will force the ring up again. By this contrivance, the steam will be

prevented from acting on the back of the valve, and the friction on the face of the slide will be diminished in proportion to the area of the ring from which the pressure of the steam is removed.

The fifth improvement is a mode of regulating or altering the admission of steam into the passage from the slide valve box to the inside of the cylinder of locomotive and other engines, independently of the action of the slide valves; and consists in the application of two regulators, or throttle valves, placed in two extra steam passages leading into the ordinary passages. These regulators, which are in the form of a cock, and placed on the outside of the ordinary passages, with openings communicating therewith, are connected together by levers, so as to be worked together; which may be done by the governor, or the man attending the engine. The action of the slide valve only permits the steam to enter through the extra passages, while it escapes through the ordinary passages in the usual way: the quantity of steam admitted can therefore be regulated by the engineer moving the lever which is connected to the two throttle valves.

The sixth improvement is an improved method of using steam expansively in steam engines, by increasing the size of the cylinders, and by applying a regulator or throttle valve to each cylinder; for this purpose, the patentees apply to the back of the valve box, or cover, an extra valve or slide, which communicates with the engine driver. In order to obtain a saving in the consumption of steam used expansively in cylinders, (each having a regulator or throttle valve,) the contents of the cylinders must be increased as compared with the size of the two cylinders worked by one regulator only. The regulator may be applied to the steam pipe of each cylinder, provided the admission of steam to one cylinder is quite independent,

and not influenced by the admission of steam into the other.

The seventh improvement relates to a mode of lowering the centre of gravity of locomotive engines. For this purpose, the leading and trailing wheels are placed at each end of the boiler, in order to admit of its being lowered; the axles of the driving wheels being placed above the boiler, which is so constructed as to allow such axle to be placed as short a distance as possible above the upper tubes leading from the fire box. This arrangement of boiler and wheels will, of course, require the cylinders to be placed outside. There are other modifications shown, whereby the centre of gravity is lowered by placing the driving and leading wheels beyond the ends of the boiler.

The eighth improvement relates to tubular boilers; and consists in lowering the position of the tubes; and also in the application of a bridge across the fire box. This bridge, which is placed in the fire box in a transverse direction, is filled with water from the boiler; the object being to prevent the fuel from filling up or choking the lower tubes leading from the fire box.

The ninth improvement consists in the application to locomotive steam engines and railway carriages, of cylindrical wheels, with outside flanches, fitted to axles, which will allow each wheel to run independent of the other. The drawings show a section of a compound axle, which consists of an axle fixed to one of the wheels, and revolving within a tubular axle, upon which is keyed the other wheel; for which axle, a patent was granted to one Edmund Taylor, on the 11th May, 1841. "Any other description of axle which will allow one wheel to travel at a different speed to the other, may be substituted for the one shown."

The tenth improvement relates to a mode of affording additional security to locomotive engines, by the applica-

tion thereto of extra safety wheels or sledges; for this purpose, smaller wheels are placed underneath the boiler, either with or without springs, the object being to take the weight of the engine should either of the leading or driving wheels break; in which case sledges may be substituted.

The eleventh improvement is the application to railway carriages of springs formed by levers, acting upon, and twisting bars of steel. Two iron levers, about two feet long; are firmly fixed, in an inclined position, on the ends of two steel bars, about 1¼in. diameter and 18in. long; these bars are fastened at their opposite ends in a strong iron cross bar, affixed to the framing of the carriage; the ends upon which the levers are affixed move freely in plates bolted to the side of the carriage frame; the opposite ends of the inclined levers rest upon the top of the brass bearings of the axles: consequently, any depression of the carriage, or raising of the wheels, will elevate the ends of the inclined levers, and cause the steel bars to twist; on the wheels being restored to their original position, the bars, from their flexibility, will immediately untwist. This novel application of a steel bar, or bars, as a substitute for springs, is also applied to the draw bar and buffer in the following manner: the draw bar is formed in two parts, which work through the end and cross timbers, and are each furnished with a draw hook at one end, the other end being cottered into a cradle. When the bar is pulled, the cradle will move the end of a vertical lever, which is affixed on the end of a steel bar, as described, and cause it to twist. When the draw bar is moved in an opposite direction, it will move the end of a second lever in the same manner. The same effect can be obtained by the application of one bar, affixed at both ends, with the lever in the middle; in this case the bar will be twisted

backward and forward. The shock of one carriage buffing against another is lessened by the following means: the buffers are fixed on the upper ends of inclined levers, the lower ends being firmly secured by keys, or any other means, to steel bars, in the manner before described; the levers of each carriage being kept in a right line with each other, by means of a cross bar, or stay, extending from one to the other. When the carriages, by sudden concussion, are brought against each other, the buffers, coming in contact, cause the levers upon which they are affixed to approach a vertical position, thereby twisting the steel bars upon which they are keyed.

The twelfth improvement consists in the application to railway carriages and locomotive steam engines of wheels with felloes of wood, papier machée, or other suitable material, tightened by a bevilled ring or circular wedge.

The tyre being placed over the wood felloe, which is round the centre, or boss, of the wheel, is tightened by an annular wedge, having a flanch corresponding with the flanch on the periphery of the boss; the wedge being forced between the boss and the wood felloe, and secured by bolts passing through the flanches—the wedge, when required, may be withdrawn, and packing introduced.

The thirteenth and last improvement consists in the application to railway carriages and locomotive steam engines, of wheels formed with wooden felloes, simultaneously compressed by being forced through a conical ring, or by an improved arrangement of screws, or by hydraulic presses. The wood, or other material forming the felloe, together with the boss, or ring, is forced, by pressure, through a conical ring, into the tyre of the wheel; the taper of this ring being about three-quarters of an inch to a foot, and its smallest internal diameter equal to the interior diameter of the tyre, this apparatus

being placed upon the tyre, the application of hydraulic pressure to the upper surface causes the felloe to be compressed, and at the same time to be placed within the tyre. There is another method shown, whereby the wood felloe is compressed, by placing it, together with the boss, on a strong plate of iron, fitted up with six slides, each of which is furnished with strong screws.

The inventors claim the several improvements above enumerated and described, and their use, either separately, or when connected with each other; but make no claim to such old and well-known means as may have been incidentally mentioned or referred to.

SPECIFICATION enrolled 15th August, 1842, of a PATENT granted 15th February, 1842, to ROBERT WORNUM, of Store Street, Bedford Square, in the county of Middlesex, piano-forte-maker, for "*improvements in the action of piano-fortes.*"

THE first improvement relates to the application of a spring to the hammer-but, the peculiarity of which improvement is to cause the spring to move upon an axis; the spring is affixed at one end to the hammer-but of a piano-forte having a downward stroke, and is then turned round, so as to form a coil; the other end is brought back in a line parallel with the hammer-but, and is bent at its extremity so as to form a hook. To this hooked end of the spring is fastened a piece of leather, or other flexible material, which passes through a mortice formed in the hammer, and is affixed to the rail. The effect of this arrangement is, that the hammer is instantly drawn from the springs, without producing any prejudicial effect upon the touch

of the key. There are several modifications wherein the same result is obtained.

The claim is for a mode of applying a spring to return the hammer of a piano-forte action, wherein such spring moves upon an axis.

The second improvement relates to a vertical lever mounted upon an axis at its lower end, and having a projecting piece or arm affixed to it at right angles, which is acted upon by the key. At the opposite side is another projecting arm, to which is affixed, by means of a centre pin, the "*hopper*," which extends and gives motion to the hammer, both of which are in a nearly horizontal position—the hammer in this case is also provided with a spring, which is applied in a similar manner to the preceding. Through the upper part of the vertical lever a wire passes in a horizontal direction; the opposite end being fixed to a block moving upon an axis, to which is attached a vertical wire extending to the strings, having the damper affixed to its end: consequently, when the key is acted upon so as to give motion to the hammer, the horizontal wire will be pushed in a direction of its length, and by its action on the block, the damper wire will be raised from the strings.

The patentee claims the mode of actuating the hammer of a piano-forte action, where the hammer strikes downwards.

The third improvement relates to a mode of connecting the damper to the hammer-but, in upright piano-fortes. The damper in this case is in a vertical position, and moves upon a centre near its lower end: below the centre is a spring, having a tendency to press the damper against the strings; the damper above its axis is connected by a piece of leather to the under part of the block, which holds the hammer. When the hammer is struck against

the strings, the tension of the leather, owing to the block moving upon an axis, draws the damper from the strings. There is also another method of working the damper, by affixing a vertical wire near the end of the key, and attaching the upper end to the damper, so that as the key is depressed the damper is withdrawn—the hammer in this case is also provided with a spring, which is affixed to the hammer-rail.

Claim is for a method of connecting the damper with the hammer-but.

SPECIFICATION enrolled 17th August, 1842, of a PATENT granted 21st February, 1842, to DANIEL GREENFIELD, the elder, of Birmingham, in the county of Warwick, brass-founder, for "*an improvement in the manufacture of hollow metal knobs, for the handles of door and other locks.*"

THE essential character of this improvement consists in applying to hollow metal knobs, for doors and other locks, an internal lining of sheet or rolled iron, in order to give greater support and firmness to the metal which constitutes the external surface.

The first process in carrying out the said improvement is, to prepare a hollow lining of iron for the ball part of the knob. For this purpose, a disc of sheet or rolled iron, of suitable dimensions for the knob intended, is to be cut out, by a fly press and suitable tools of the kind; this disc of metal, which is to be well annealed, is then placed in suitable dies and submitted to the action of a fly press, to render it concave or in form resembling a shallow saucer. It is then placed in another pair of dies resembling the former, but somewhat deeper, and again submitted to

a similar pressure; and in like manner, it is rendered more and more concave until it has assumed the form of a deep cup—this process being the same as is practised in manufacturing the ball part of brass knobs without iron, but on account of the latter being less ductile it requires to undergo a greater number of operations, and it will also be necessary to anneal it from time to time, to prevent fracture. A thin piece of brass, German silver, or other metal, intended for the external surface of the knob, is cut out, of suitable size, and placed in dies, and submitted to the operations before described, until it assumes the form of the iron cup, but so much larger, that the convexity of the latter will be equal to the concavity of the former. The iron cup, having its border edge clipped so as to remove any superfluous metal, is then placed within the brass or other metal cup, and the two corresponding cups together are forced through a circular hole formed in a piece of steel, whereby the sides of the two cups will be contracted into a cylindrical form, and the brass or other metal cup, by this last operation, will be caused to adhere firmly to the iron one. The border edge of the compound cup thus formed is to be cut with shears, so as to bring the edges of the two metals to an exact correspondence, and thus form a true border edge to the compound cup. The compound cup is then to be closed in, or so contracted at the border edge around the mouth and sides adjacent thereto, as to be of suitable size to receive the large part of the neck of the knob, the mode of closing in being the same as is practised in the manufacture of hollow metal knobs from brass plate,—viz. by a pair of closing tools and a fly press. The operation of closing and gathering in of the border edge being performed, it may in some cases be found necessary to cut the edge, which may not be quite true. This is done by

taking the ball part of the knob in the hand, and holding it against a countersink, which may be fixed in the revolving spindle of a lathe, which operation will have the effect of cutting the edge true and smooth, and also of a proper bevilled shape: but if the operation of cutting the border edge of the compound cup is truly performed with the shears, it will not be necessary to use the countersink, as the edge will retain its shape during the operation of the closing in of the knob. For preparing the neck part of the knob, the lining for such neck may be made of iron, cast into the intended shape, with a square hole through the centre, and a groove or nick round each end for the purpose of fastening the several parts which constitute the exterior surface. To prepare brass or other metal for this external surface, a piece of brass, or other metal corresponding with that used for the ball, is cut out of a square shape; after which it goes through the operation of stamping between dies,—the last pair being of the same shape as the larger part of the neck or surface which it is intended to cover. A hole is then punched through the centre of the piece of metal, so as to pass over and fit tight upon the neck part; this piece of metal is then forced over the neck part by suitable tools, so as to make it apply closely to the enlarged part of the neck,—the border edge of this piece being previously cut of such length as to leave a space between the end of the said casting and the edge of the metal piece, sufficient to allow the edge of the ball to pass between such parts into the groove.

The next process is to cover the plane part or surface of the neck; which is effected by cutting from a piece of brass, or other metal tubing, a hoop, or ferule, which is to be forced over the neck so as to apply the end of such hoop closely to the surface of the former piece, which covers the enlarged part of the neck. This ferule is of such

length as to leave the end of the casting uncovered, which, as has before been stated, has a nick, or groove, similar to that on the opposite end; upon this groove a collar of brass, or other metal, is to be cast; which is effected by placing the neck part in a mould of sand, with a pattern upon it, so as to leave (when drawn) a cavity in the sand of sufficient size for the collar or shoulder intended: when this process is completed, the three parts forming the external surface of the neck will be firmly affixed to the iron casting or lining.

The two parts being thus prepared (viz.), the ball and the neck part, such parts are then to be put together; which is effected by a pair of mounting tools. The neck part of the knob being placed in a die, with its enlarged part resting in a concavity in the upper surface of the die; the ball part is then placed over it; in which position, that part which is adjacent to the mouth will find a resting place in the concavity of the aforesaid die, and the border edge of the ball, will be opposite the groove formed in the neck part; into which it is forced by the action of a suitable concave tool, together with a fly press; thereby causing the mouth of the ball to be further contracted, so as to interlock its edge firmly into the groove; whereby the two parts become united firmly together, and in a fit state for the finishing process, such as dressing and burnishing the exterior surface, which is done in a lathe in the usual manner. The patentee states that the tools employed in the process before described, are of the ordinary kind, and such as are well known; and he does not make any claim in respect of such tools, nor in the mode of using the same. But the patentee declares that the new invention, (whereof the exclusive use is granted to him by the aforesaid letters patent), consists in the improvement hereinbefore described, and employed in manufacturing hollow metal knobs for the

handles of door and other locks; the essential character of such improvement being, that of forming and applying an interior lining of stamped iron plate to the hollow part of the knob, and (in case it is preferred) an interior lining of cast iron to the neck part of the knob, in order, by means of such stamped iron, and such cast iron (if the latter be used), to give support to the brass, German silver, or other metal whereof the exterior surface of such knobs is, or may be composed.

SPECIFICATION enrolled 21st August, 1842, of a PATENT granted 21st February, 1842, to MOSES POOLE, of Lincoln's-Inn, in the county of Middlesex, gentleman, for "*improvements in treating, refining, and purifying oils, and other similar substances.*" Being a communication by a foreigner residing abroad.

The following is a description of the operation:—The oil to be operated upon is allowed to remain in one place until the congealed parts have become melted, and the grosser parts deposited; these parts are then separated; and an alkaline solution, composed of from four to eight per cent. of soda or potash, according to the quality of the oil, is then added; and the whole well agitated and stirred up together for about an hour, by any of the well-known means. The inventor states that this solution may be rendered caustic by the addition of a certain quantity of lime. The oil, after being well stirred up together, is to be put into another vessel and allowed to stand for from twenty-four to thirty-six hours; at the end of which time a scum will appear on the surface, which scum is to be removed, and the oil will then be in a fit state for the next process. The inventor remarks, that if the oil is very impure, it will be necessary to subject it a second

time to the above process. The oil, after being thoroughly purified, is again to be well agitated, and about ten per cent. of water, containing from four to five per cent. of sulphuric acid is then added. This solution is to be heated to about 100 or 120 degrees Fahrenheit, and the whole is to be stirred up together for about a quarter of an hour; after which the oil is allowed to stand for about forty-eight hours, when it will be in a fit state for filtering or refining, which may be effected by any of the well-known means; the oil will then be in a fit state for use. The quantity of oil which the patentee prefers to operate upon, is about fifty gallons at one time. The temperature of the room during the operations above described, should not be less than from 70 to 80 degrees Fahrenheit.

The claim is for the mode of purifying animal and vegetable oils, and such like substances, by subjecting them to alkaline and acid solutions, as above described.

SPECIFICATION enrolled 22nd August, 1842, of a PATENT granted 7th March, 1842, to WILLIAM NEWTON, of Chancery Lane, for "*an improved machine or apparatus for weighing various kinds of articles or goods.*" Being a communication.

THIS invention, which is a communication from Major André Weschniakoff, of the royal engineers of Russia, consists of certain improvements in a weighing machine, for which a former patent was granted to the patentee on behalf of the said André Weschniakoff, and dated at Westminster, the 12th September, 1839, the Specification of which was duly enrolled in Her Majesty's High Court of Chancery, on or before the 19th March, 1840, as re-

quired. In order that the present Specification may be more clearly understood, a description of the principal features of the former invention is given, as follows: The scale or plate upon which the goods to be weighed were placed, was suspended by a chain or cord attached to, and passed over, or round, a pulley; this pulley was mounted on, and firmly fixed to an axle, formed at its two extremities like wedges, or knife-edges, on which it rocked or oscillated; this pulley had also at its lower side a pendant arm, or lever, to the extremity of which an adjustable weight was attached, which, when raised, described the segment of a circle, as the pulley was drawn round on its axis by the weight of the goods placed in the scale. To the same axle as the pulley just described, was affixed the needle, or index, which, as the axle turned, pointed out on a graduated quadrant, indicator, or face-plate, the weight of any body placed in the scale. The graduations or divisions on the indicator gradually increased from the point zero; and the method of correctly setting off these divisions was fully explained. Having thus briefly described the nature of the former invention, we will point out the various improvements of the present machine, which is stated by the inventor to weigh more accurately, and to a greater extent. To the ceiling, beam, or roof, of a warehouse, in which a machine intended for heavy goods is to be used, is bolted a cross-head, having two ears or projections, from which the machine is suspended, by bolts passing through corresponding ears formed on the upper side of a metal entablature, to the underside of which are bolted metal bearings, having pieces of steel, of a wedge-like form, or knife-edges, on which the horizontal shaft or axle of the machine rocks or oscillates; at each end of this shaft, a cavity, or recess, is made by cutting away, in a longitudinal direction, about

one-third of the substance of the shaft, for the purpose of receiving the knife-edges; this shaft is maintained in its proper position by brackets, or projections, bolted on each side of the bearings, which prevent it from being displaced by any sudden concussion. In place of suspending the scale by means of a cord, or chain, as before stated, the improvement in this part consists in the application of a curved lever, which is formed on, or connected to a collar, having a hole therein to receive the shaft, and upon which it is firmly keyed. The outer end of this curved lever is provided with a knife-edge, from which is suspended a pendant frame, whose lower end is terminated by a swing joint; a pin passes through this joint, and supports a vertical rod, having at its lower end four hooks, from which is suspended the scale board. The pendant, or vibrating weight, which in the former construction was connected to the pulley, is connected to the lower end of a lever, the upper end of which is terminated by a collar, through which the axle passes, and upon which it is affixed. The needle, or pointer, is also connected to the axle in the same manner. The graduated plate is fastened by screws to a pendant open frame-work; and in order that the machine may weigh with accuracy, it is necessary that this open frame-work should hang in a perfectly vertical position; which is effected by turning the handle of a screw either to right or left, as may be required; the amount of alteration being shown by a level affixed to the lower part of the frame, and also a plumb line. The respective positions which the needle and weighted lever occupy on the axle, are regulated at first when making and setting the balance, and are afterwards maintained in their proper places by two bridle pieces, which connect their lower parts together; thus by placing a weight on the scale which is suspended from the curved lever, or arm, projecting from

the axle, the needle will move on the graduated scale, and thus give the amount of weight required. The graduations of the indicator, on the old construction, increased in size the farther they receded from the point zero; but in the present construction, by the peculiar arrangement of the mechanism, and other parts of the machine, the divisions are made to diminish, the farther they recede from the point zero. A further alteration in the graduations may be made, by elongating and elevating the curved lever, so as to raise the knife-edge thereof (when in a quiescent state), to an angle of 30 degrees from a horizontal line drawn through the centre of the axle. The inventor states, "when this alteration of parts is made, the divisions on the indicator will be symmetrical." There is also another method shown of connecting the needle to the lever, by forming the same with a projecting arm, to which the needle is fixed, and carried over the plate or indicator. The patentee lays no claim under this patent to such parts of the machine as have been described under the former patent, above mentioned; nor to any of those parts which are not new; but what he claims is, the arrangement of parts as shown and described, or any modification thereof, when employed for, or constituting a machine for weighing goods or merchandize.

SPECIFICATION enrolled 23rd August, 1842, of a PATENT granted 25th February, 1842, to WILLIAM NEWTON, of Chancery Lane, in the county of Middlesex, civil engineer, for "*certain improvements in regulating the flow of air and gaseous fluids.*" Being a communication.

THIS invention consists of a peculiar construction of appa-

ratus, in which, upon the slightest increase of pressure from the air or gas, which passes through the apparatus, the flow of the said air or gas is restricted in a novel manner until the extra pressure has ceased.

The working parts of this improved apparatus, whereby the supply or flow of air or gas to the burner is regulated, are contained within a cylindrical metal casing, which is provided with a moveable lid or cover. An annular moveable bell-shaped vessel is placed in the interior of the metal casing, covering an aperture by which the gas or air enters the bell-shaped vessel, and through which its flow or passage is regulated by means of the conical end of a hollow tube, which is suspended from the inside of the bell-shaped vessel by means of a metal rod or chain. The aperture for the admission of gas or air into the bell-shaped vessel is formed at the upper circular end of a metal cylinder, which is supported by an annular chamber or gallery, and when once in its proper situation, it remains stationary, and is prevented from moving laterally, or out of its position, by small blocks. The apparatus is supplied with water from above by removing the lid or cover, and its level is ascertained inside by means of a glass tube outside. All the different parts of the apparatus to be filled with water, are made to communicate with each other, the water passing from the upper or annular parts to the bottom of the outside casing, through holes made for that purpose; and at which place there is a screw-tap, which can be taken out when the vessel requires emptying. The bell-shaped vessel is suspended by chains from the ends of levers, and the weight of the vessel, together with the hollow tube, is counterbalanced by weights at the opposite end of the levers. Gas or air flows into the apparatus from a supply pipe, and passes up one annular passage into the upper part of the bell-shaped vessel,

whence it passes down another annular passage, and finally escapes from the apparatus through a pipe. If the pressure of the air or gas which enter into the apparatus is too great for the consumption, then it presses on the surface of water, and against the interior, or domed part of the bell-shaped vessel, thereby causing the latter to rise and draw the conical end of the hollow tube up into the aperture, and contract the same, and not allow so great a quantity of gas to pass through. When, by the issue of gas from the apparatus, the equilibrium or proper pressure is restored, the vessel sinks again, and allows the conical end of the tube to descend also from the aperture, and permit the gas to enter.

The patentee claims, first, the peculiar arrangement of apparatus herein shown and described, or any modification thereof; and, secondly, any apparatus for regulating the flow of air or gas, in which such regulation is effected by means of a conical plug, or the conical end of a tube, either hollow or solid, rising into the aperture through which the gas passes: thereby closing or partially closing the same, and preventing the air or gas from passing, as above described.

SPECIFICATION enrolled 28th August, 1842, of a PATENT granted 25th February, 1842, to JOHN BIRKBY, of Upper Rawfolds, in the county of York, card manufacturer, for "*improvements in the manufacture of wire cards.*"

THESE improvements consist, first, in the application of paper board, formed of several thicknesses of paper, as a substitute for leather, in the manufacture of fillets, and

sheet cards; and, secondly in the mode of manufacturing, or constructing, the backs of wire cards, by the application of a thin plate of metal, when combined with paper, leather, or woven, or hard felted fabrics, to the back thereof.

In the construction of this description of card, the inventor prefers a thin plate of iron, tinned, which is to be glued or cemented to a paper board back, this plate forming the upper surface; the two surfaces are then covered with a woven cotton fabric, which is cemented on the surface of the metal plate and paper board back, the object of which is to keep the whole together. In the process of pricking such substance, for the reception of the dents or teeth, the operation is similar to that of leather,—with this exception, the prickers have a guide, which moves on the surface of the plate, and also at the back, through which the prickers move, and which acts as a stay, thereby preventing them from bending when passing through the metal and other substances of which the back is formed. As the prickers are being withdrawn, the guide will press against the back of the paper, and prevent its surface from being injured by the adhesion of the prickers, and will also move with, and at the same time, as the prickers. The patentee remarks, "Although I prefer to use paper at the back of the metal plate, yet I do not confine myself thereto, as leather may be used, or a series of layers of cotton, or other woven or felted fabrics, pasted or cemented together;"—the object being to obtain the advantage of retaining the whole of the teeth regular, by the application of a thin plate of metal placed in front of the fillet or sheet constituting the back of the card. He also states that paper may be used without the application of a metal plate,—in which case, he generally makes use of that description of paper board used by pressers in finishing goods.

The claim is,—first, a mode of manufacturing wire cards

with a paper back, as the fillet or sheet in which the teeth or dents are received; secondly, the forming of wire cards with thin sheets of metal, combined with paper board, or with woven or hard felted fabrics, or with leather at the back, as the sheet or fillet for receiving the teeth.

The third part of these improvements relates to giving to the crowns of the dents, or teeth, of wire cards, an additional bearing. In the present formation of wire cards, it is well known that the crown of such card forms a right line from one tooth to the other, and the bearing of such teeth depends upon the thickness of the wire employed. The mode of extending such bearing is by leaving a sufficient length of wire, and bending the crown backwards and forwards in a zig-zag form, thus presenting to the surface of the cylinder or roller upon which they are affixed, an extended bearing; or, the teeth of such cards may be bent in the stem at a short distance from the crown, at right angles, to the lower part of the stem,—in which case, the bearing of the crown will be brought underneath the inclined part of the teeth. The practicability of carrying such improvements into effect will be readily seen by those acquainted with card machines.

Claim.—The extending the bearing surfaces of the crowns of wire teeth, or wire cards, as described.

SPECIFICATION enrolled 25th August, 1842, of a PATENT granted 25th February, 1842, to WILLIAM SAUNDERS, of Brighton, in the county of Sussex, gentleman, for "*improvements in apparatus employed in roasting and baking animal food.*"

THE improvements, which are the subject of this patent, consist, firstly, in a new mode of basting meat. At

the back of the hastner is a weight descending through a vertical pipe, and giving motion by means of a chain, passing over a pulley at the top, to a number of wheels connected to, and driving a horizontal shaft placed underneath the dripping-pan; on the end of this shaft is a bevil wheel, which takes into and drives another wheel fixed on the axis of the spit; the intermediate part of this shaft is provided with a crank, having a connecting rod which works a pump. The fatty matter flows from the dripping-pan into the vessel containing the pump, from which place it is pumped into a perforated dish placed above the meat.

The patentee claims the mode of basting meat, by causing the basting liquid to be raised or forced up by mechanical means, so as to be distributed over the meat when roasting.

Secondly.—The drawings of this part of the invention have reference to a rectangular kitchen range, to be placed in the centre of a room. A plan of this range shows the square divided into nine compartments, the four corners consisting of a number of ovens placed one above the other, and which may be used for various purposes, and the spaces between for four dripping-pans, with the fire in the centre, having four sides. The pans, which are made to run upon wheels, can be drawn out at pleasure, and are provided with pumps, as described; with this difference, that they are driven, together with the spits, by a smoke-jack, placed in the chimney, having a vertical spindle, upon which are two pinions giving motion to four wheels for driving the four spits, together with the fat pumps.

Claim is for a mode of constructing a range for the centre of a kitchen, so as to make use of every side of the fire for roasting.

The third improvement relates to a range with the fire projecting into the room, and is covered with a plate

which forms a hot-hearth. The fire place is provided with a check-plate, moved by a winch, affixed on the end of a shaft, having a pinion taking into a rack, for increasing or diminishing the space occupied by the fire; behind the fire-place, and above it, is placed an oven; in a line with which, and on one side is a second hot-hearth, with two ovens below it. The smoke and hot air which pass from the fire are conducted through spaces formed by placing the ovens and other baking apparatus apart from each other. The inventor states that the fire in this case may be constructed with three heating surfaces, by removing the boiler, which occupies one side, together with the side-plate opposite, and substituting bars in their place.

The next arrangement shows the space made by the fire projecting into the room, filled up with ovens and other heating apparatus.

The claim respecting the first part of these improvements, is for the fire projecting into the room, and the general arrangement shown.

Second, the filling up of the space above the hot-hearths with ovens, and the arrangement described.

SPECIFICATION enrolled 22nd August, 1842, of a PATENT granted 25th February, 1842, to OSBORNE REYNOLDS, of Belfast, Ireland, clerk, for "*certain improvements in covering streets and roads, and other ways with wood, and also in the means of enabling horses and other animals to pass over such roads, and other slippery surfaces with greater safety than heretofore.*"

THE first part of the invention relates to various improvements upon a former patent granted to Mr. Rey-

nolds on the 27th of April, 1841, for "improvements in paving streets, roads, and ways;" and secondly, in the application of bars, ribs, or projections to the shoes of horses and other animals, to prevent them from slipping, by giving them a firmer hold of the pavement.

In order to form a firm, compact, and cheap pavement, the ground is, in the first place, levelled and rammed hard, and also covered with sand, if desirable. Upon this prepared surface are laid boards, planks, beams, laths, or slips of wood, either in close contact or with spaces between them; and upon the planks or boards so arranged are placed the blocks. The form preferred by the patentee are parallelopipedons or other figures, such as may be formed by one cut, either oblique or perpendicular to the grain of the wood, from a plank of any breadth, and of any thickness, not exceeding four inches; or blocks similarly formed from round or unhewn timber, may be used. If desirable, a second or even a third layer of boards may be placed on the first, imbedded wholly or partially in cement, and nailed or otherwise fastened together. Between the blocks, which are in contact with each other, may be interspersed a few grains of gravel or other hard substance, not smaller than spheres whose diameter is one-twentieth of an inch, so that these grains may be partially imbedded in each of the two adjacent sides, and thereby strengthen their mutual support.

To make the pavement water-tight, the blocks are surrounded with cement; and to unite the whole compactly together, the blocks are secured to the foundation planks, or to each other, or both, by nailing or pinning each block to the mass already formed. This method of fastening the blocks together, is stated by the patentee to be obviously different from any of the methods hitherto employed of securing a number together by pegs, pins, or

dowels. The surface of such pavement is made rough by scattering upon it, by hand or otherwise, gravel or broken stone, screened, so as to contain neither dust nor sand of any size less than that above described: such gravel may be scattered in any quantity not exceeding four pounds avoirdupoise to the square yard. This operation is repeated often enough to keep the surface constantly rough; this repetition, combined with the use of grains of a proper size, alone produces the whole effect desired, without the accumulation of mud or dust, which always accompanies the use of gravel as hitherto employed for this purpose. In order to prevent animals from slipping, the under-side of the shoe is provided with a number of bars or projections, beginning at the toe with three curvilinear projections, at the termination of which, a number of transverse or oblique bars, or projections, are continued to the caulk, resembling in form the teeth of a rack.

The inventor claims.—First, the method herein described of using boards for a foundation of wood pavement; also the use of blocks of the form described, together with the modes described of strengthening the whole by means of hard grains of gravel, and nails of iron, or pins of wood; and further, the method described of roughening the surface continually by gravel or broken stone.

Secondly, an improved method of constructing the shoes of horses and other animals, whereby they are prevented from slipping, as above described.

SPECIFICATION enrolled 26th August, 1842, of a PATENT granted 26th February, 1842, to SAMUEL MORAND, of Manchester, merchant, for "*improvements in machinery, or apparatus for stretching fabrics.*"

THE improvements, as described in the Specification, con-

sist, first, in the peculiar construction of an endless chain, with a continuous row of stretching pins, for holding the selvage of the fabric to be stretched; secondly, in a mode of cleansing the said stretching pins, by means of revolving brushes; and, thirdly, in a mode of affixing or pressing the fabric on to the stretching pins. The continuous row of stretching pins, attached to the chains, is formed by inserting between the links of the chain, which are of a peculiar form, a plate, provided with a groove in its upper surface. This plate receives a piece of brass equal in length to one of the links, containing a number of pins, so affixed as to incline a little from the perpendicular, for the purpose of holding the selvage more securely. These plates, which are affixed to the links by a pin passing through them, form an endless chain of teeth, and drive certain apparatus hereafter described.

The machine consists of two horizontal chains of the construction described. These chains pass through guides, and over pullies at each end of the frame, and can, by means of two shafts, having at each end a right and left handed screw, and upon which the guides are affixed, be set at any distance required, according to the breadth of the fabric, before and after the stretching process. Above each chain, at that end of the machine where the fabric is introduced, is a wheel, having teeth corresponding with, and taking into, the spaces formed by the back part of the plates containing the stretching pins: these plates, by their movement, have the same effect as a rack driving a pinion. Upon the face of this wheel is affixed a pulley, with its periphery covered with bristles in the same manner as a brush. This apparatus, which is fixed in a frame with the bristles pressing on the points of the pins, will, as the edge of the fabric passes between such parts, cause it to be affixed on the pins, and the motion of the machine will carry the fabric forward. The chains at each end of the

machine are parallel to each other; but on setting the machine to work, they are at that end at which the fabric is introduced, set to the width of the fabric before it is stretched; but at the other end, they are set to the width at which the fabric is intended to be stretched. When the machine is set to work, such fabric will be progressively introduced, and will be carried endwise by the stretching pins, which move for a short distance parallel to each other; but having arrived at a certain point, the chains will gradually diverge from each other to the width required, and then again move parallel to the end of the machine, which is effected by guides moving upon one or more hinged joints, acted upon by right and left handed screws. The cleansing apparatus is as follows:—Underneath the chains is affixed a wheel, having teeth corresponding with the openings in the chain, in the manner before stated, and which gives motion to two circular brushes, revolving in opposite directions, and fixed in such a manner as to brush across the pieces of brass containing the pins.

The inventor claims.—First, the mode of combining the parts of the chain, as described; secondly, the cleansing of the stretching pins, by brushes; thirdly, and lastly, the mode of pressing the fabric on to the stretching pins.

SPECIFICATION enrolled 26th August, 1842, of a PATENT granted 26th February, 1842, to BENJAMIN GILLOTT, of Great Saffron Hill, in the county of Middlesex, cutler, for "*improvements in heating and ventilating.*"

THIS heating and ventilating apparatus, so far as regards the fireplace, is constructed in the same manner as an ordinary hot air stove: over which is placed a boiler,

made of copper, iron, earthenware, or glass, and containing a number of tubes surrounded by water; over the boiler, which may be placed in any position, is placed a cover, with a small opening for supplying it with water.

A fan, or blowing machine, of the ordinary construction, is placed with the opening of the box containing it, opposite the open spaces formed by the tubes in the boiler. The air thus heated, is forced, or driven by the action of the fan, to any room or apartment requiring to have its temperature raised; "such air, by passing through boiling water, is more particularly intended for respiration, though applicable to all purposes requiring heat of a moderate temperature." In cases where heat only is required, independent of its quality, the air is forced through a box having a number of plates, which are heated by the stove, or a number of metal tubes instead of the boiler, whereby greater heat will be obtained. The drawing also shows the case containing the fan, made double, with the fire placed underneath it, whereby the air contained in the space formed by the two parts of the case becomes heated, and passes off to the neck of the case containing the fan, and is afterwards forced, or driven, in the manner above described.

The claim is for a mode of heating or ventilating apartments, &c., by forcing air through a heating medium, by means of a fan or blower, as described.

SPECIFICATION enrolled 27th August, 1842, of a PATENT granted 1st March, 1842, to THOMAS SMITH, of Northampton, in the county of Northampton, plumber, for "*an improvement or improvements in water closets.*"

THE principal feature in this invention consists in the ap-

plication to water closets of a secondary service pipe. This pipe is connected with, and forms a branch at that part of the principal service pipe, where the bend takes place previous to entering the basin, and terminates at the back part of the trap. When the valve is opened, which may be effected by any of the well-known means, the water passing through the principal service pipe carries the soil into the trap, from whence it is forced by the stream of water from the secondary service pipe, into the delivery pipe, the trap by this means being more effectually cleansed. This latter service pipe may, if required, be connected to the cistern so as to be acted on at, or nearly at, the same time as the principal service pipe. The trap is represented in the drawing of a curved form, with the opening to the delivery pipe placed somewhat higher than the bottom of the trap: which arrangement of parts (as stated by the patentee) allows the apparatus to stand on the floor, without having to cut away so much of the boards, which is necessary in fixing water closets of the ordinary construction. For the purpose of removing any obstruction which may have accidentally got into the trap, the upper part, between the delivery pipe and the trap, is provided with a lid, which can be removed for that purpose.

The claim is for the manufacturing of water closets, constructed with a secondary service pipe, and trap of the description represented in the drawing, whether the said service pipe is connected with the cistern; or, whether the trap is of the form represented in the drawing, or of any other suitable form.

The SPECIFICATION of the PATENT granted 15th February, 1842, to CHARLES THOMAS HOLCOMBE, of Bankside, Southwark, iron merchant, for "*certain improvements in the manufacture of fuel, and in obtaining products in such manufacture,*" due 15th August last, has not been enrolled in that month.

N°. 1.

Bysner's Improvements on Lamps.

Fig. 6.

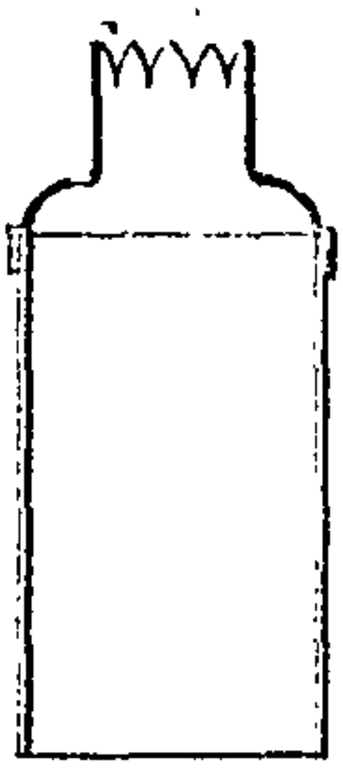


Fig. 5.

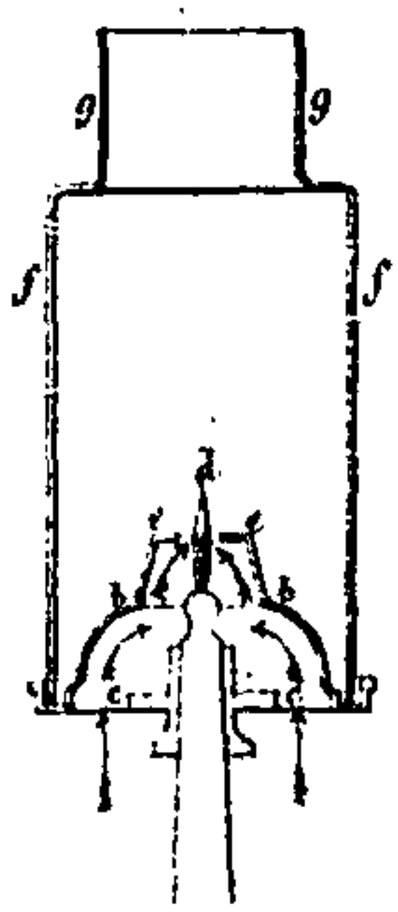


Fig. 4.

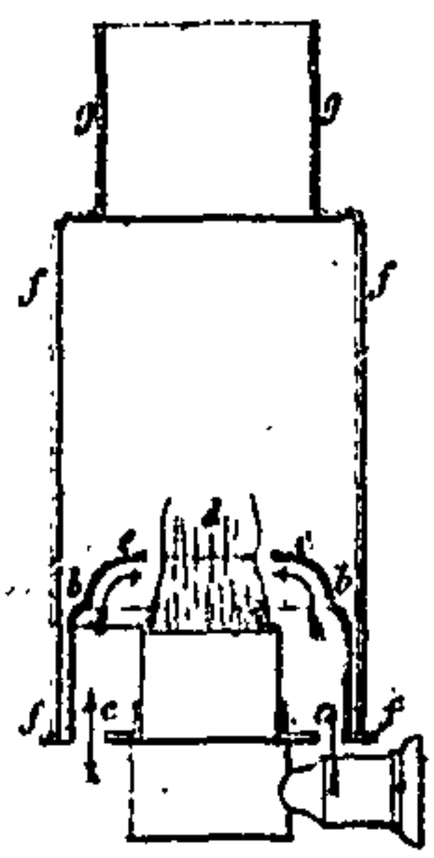


Fig. 7

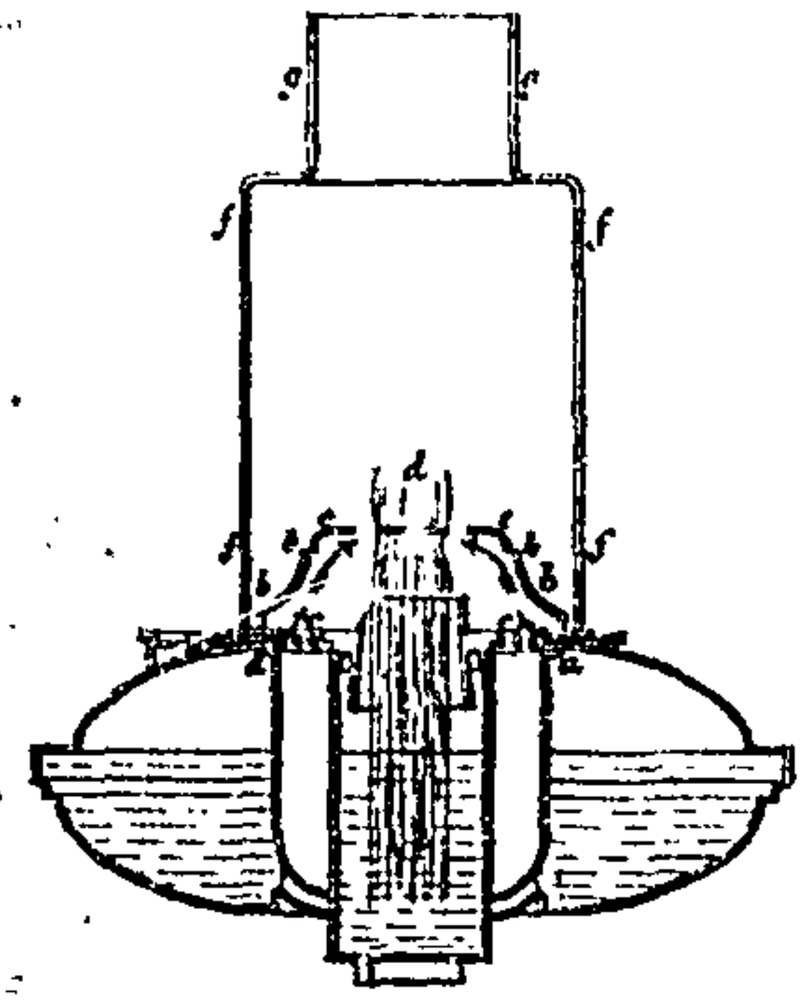


Fig. 1.

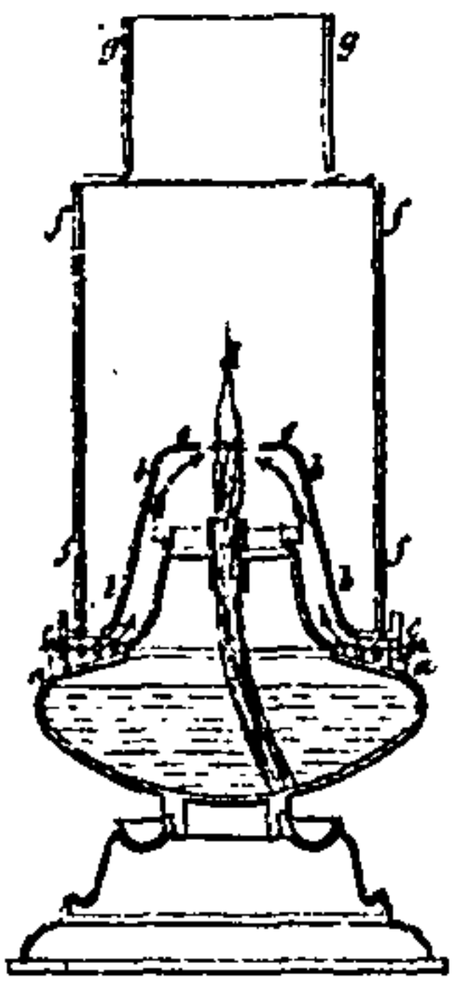
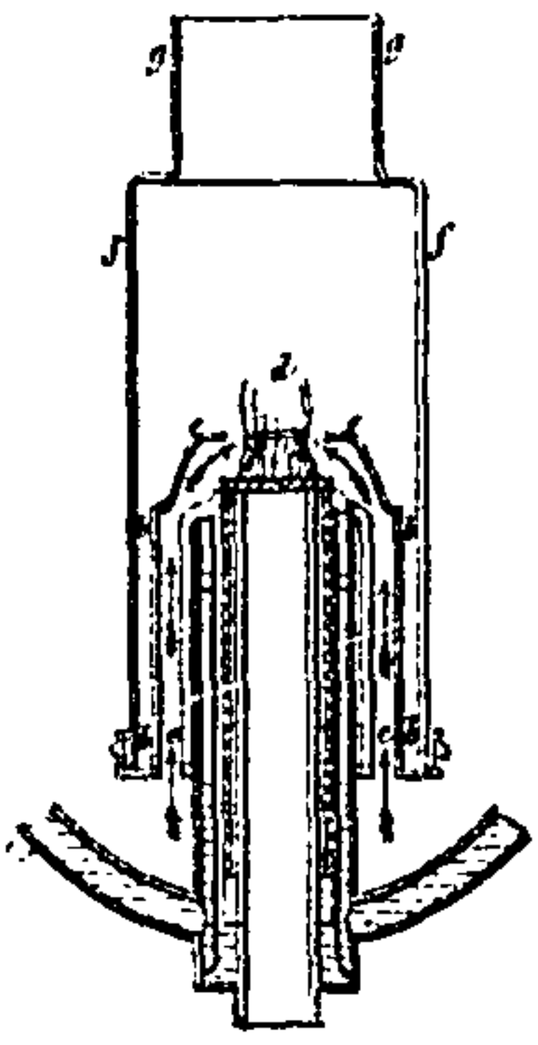


Fig. 3.



Law Reports on Patent Cases.

BYNNER'S PATENT.

LETTERS PATENT granted to JEREMIAH BYNNER, of Birmingham, lamp manufacturer, 9th December, 1837, for "*improvements on lamps.*"

ON the 9th of June, 1838, in pursuance of the proviso in the said letters patent, to that effect contained, the said Jeremiah Bynner did cause a particular description of the nature of his invention, and in what manner the same was to be performed, to be enrolled in Her Majesty's High Court of Chancery. The specification is as follows: "My invention relates to a mode of supplying air to the flames of lamps (whereby I am enabled to obtain greater length and steadiness of flame, and brilliancy of light from such flames), and consists in the application of certain deflecting surfaces in combination with peculiarly constructed chimneys, whereby currents of air are caused to act upon the flames at a position above the point of ignition; and such currents of air are so deflected as to have a tendency to impinge on the flames, and would, if only applied to one side of the flames, cause them to be blown down towards a horizontal position; but currents of air being deflected on to the flames of lamps, according to the invention, all round, or on all sides, a steadiness of flame and brilliancy of light is produced, not attainable by other modes of supplying the air thereto: and it is important to call particular attention to the circumstance of the currents of air (so deflected), and having a tendency to cross the flame at all points, being deflected, or striking above the point of ignition, because it is important that the flame should be formed below the point at which the currents of air strike or act.

Figure 1 represents the section of a lamp having a common

pipe wick burner, the construction of which is well understood (a), is a projecting ring round the upper surface, on which the deflectors rest, and are supported; (b) is the deflector, and consists of a conical metal surface, having a number of small holes (cc) for the passage of air from below the point of ignition upwards, and at the upper part there is an opening (d) for the flame to pass through; and it will be evident on the rush of air through at (cc), the currents of air will be guided by the deflector (b), and on the arrival of the currents upwards to the parts (eee) they will have obtained considerable velocity, and they will strike against the parts at (ee) and be bended and deflected therefrom in a direction across the flame (ff);—(gg) is the chimney, the lower portion being of a large diameter, and of greater length than the upper part (gg), and it is important that the chimney should be of such a figure in order to produce the fullest effect. Figure 2 represents part of the section of a lamp having a flat wick burner. Figure 3 is a section of part of a lamp having an argand burner. Figure 4 is an argand burner for burning gas, and figure 5 is a gas burner having a jet flame. In each of these figures the same letters indicate similar parts, and respectively show my invention as applied to those classes of burners for lamps. Figure 6 shews a glass chimney with a metal top, in order to produce a central current above the flame, in place of having the chimney wholly of glass; and it will be seen that there are no openings to admit air to the chimney, excepting that which comes through the deflector at (ee): and I would remark, that although the deflectors may be employed in combination with ordinary chimnies of glass, I prefer the using of chimnies as shown and described. (*See Drawing annexed.*)

I would remark that I do not make any claim to the various parts of lamps shown, nor do I confine myself to the precise figures or shapes thereof, as the same may be varied according to taste. And I would have it understood that I am aware that various modes of supplying and regulating air to the burners of lamps have been before resorted to. I do not, therefore, claim any mode for accomplishing that object other than where the cur-

rents of air are obtained at a point below the point of ignition, as at (cc), and conducted up, and deflected off, in a direction to cross the flame on all sides, and all around, at a point above the point of ignition, as above described.

And I also claim the combining deflectors as above explained, with chimnies of the construction shown and described.

In witness, &c.

THE QUEEN *v.* BYNNER.

This was a *scire facias* to repeal the preceding letters patent; and the writ, after reciting the grant of the letters patent, further recites: "AND WHEREAS we are given to understand that our said grant was and is contrary to law, and was and is prejudicial to our subjects in general; and also that the said supposed invention, at the time of the granting of the said letters patent, was not a new invention as to the public use and exercise thereof in that part of our United Kingdom of Great Britain and Ireland called England: *And further*, that the said pretended invention of the said Jeremiah Bynner was not invented and found out by the said Jeremiah Bynner, as in the said letters patent mentioned: *And further*, that the said Jeremiah Bynner was not nor is the first and true inventor of the said pretended invention of the said Jeremiah Bynner, as in the said letters patent mentioned: *And further*, that the said invention was before and at the time of the granting of the said letters patent, used by others in that part of our United Kingdom of Great Britain and Ireland called England, to wit, at Westminster: *And further*, that a part of the said supposed invention, pretended to be attained unto by the said Jeremiah Bynner, was before and at the time of the granting of the said letters patent, used by others in that part of our United Kingdom of Great Britain and Ireland called England, to wit, at Westminster aforesaid: *And further*, that the said supposed invention was not a manufacture within the intent and meaning of the Statute, made and passed in the twenty-first year of the reign of the late King James the First, intituled, "*An Act con-*

cerning Monopolies and Dispensations with the Penal Laws, and the forfeitures thereof." AND MOREOVER, that, although the said Jeremiah Bynner did cause a certain instrument in writing under his hand and seal, bearing date the 22nd day of February, in the year of our Lord 1838, to be enrolled in our High Court of Chancery at Westminster aforesaid, within six calendar months next and immediately after the date of the said letters patent, to wit, on the 9th day of June in the year last aforesaid, thereby pretending, in compliance with the said last-mentioned proviso, particularly to describe and ascertain the nature of the said invention, and the manner in which the same was to be performed, as by the said instrument in writing so enrolled in our High Court of Chancery, at Westminster, appears. Yet the said Jeremiah Bynner hath not in and by the said instrument in writing, so enrolled as aforesaid, or by any other instrument in writing, under his hand and seal, enrolled in our said High Court of Chancery, within the six calendar months next and immediately after the date of the said letters patent, particularly described and ascertained the nature of his said invention, and in what manner the same is to be performed, according to the true intent and meaning of the said proviso in that behalf in the said letters patent contained, but hath wholly neglected so to do, contrary to the form and effect of the said letters patent, and of the said last-mentioned proviso in that behalf contained: *By means of which said several premises*, the said letters patent so as aforesaid granted to the said Jeremiah Bynner, are and ought to be void, and of no force and effect in law." *And* the said writ then calls upon the said Jeremiah Bynner to shew cause why the said letters patent so granted to him as aforesaid, and the enrolment of the same, for the reasons aforesaid, ought not to be cancelled, vacated, and disallowed, and those letters patent restored into Her Majesty's said Chancery, there to be cancelled.

The defendant pleaded:—

1. That the said letters patent so granted to him as aforesaid, and the enrolment of the same by reason of anything in the said writ of *scire facias* alleged, ought not to be cancelled,

vacated, and disallowed, nor those letters patent restored into Her said Majesty's Chancery, there to be cancelled; because that Her Majesty's said grant was not nor is contrary to law, and was not nor is prejudicial to Her said Majesty's subjects in general.

2. That the said invention at the time of granting the said letters patent was a new invention, as to the public use and exercise thereof.

3. That the said invention was invented and found out by him, the said Jeremiah Bynner, as in the said letters patent mentioned.

4. That the said Jeremiah Bynner is the first and true inventor of the said invention, as in the said letters patent also mentioned.

5. That the said invention was not, before or at the time of the granting of the said letters patent and grant, used by others in that part of the United Kingdom called England.

6. That no part of the said invention was before, or at the time of the granting of the said letters patent, used by others in that part of the United Kingdom called England.

7. That the said invention was a manufacture within the intent and meaning of the said statute of 21st James I.

8. That he did by the said instrument in writing, under his hand and seal, so as aforesaid enrolled, particularly describe and ascertain the nature of his said invention, and in what manner the same was to be performed, according to the true intent and meaning of the proviso in that behalf in the said letters patent contained.

Issue having been joined on these traverses, the case came on for trial in the Court of Queen's Bench, at Westminster Hall, the 4th of July, 1842, before Mr. Justice Coleridge, and a special jury.

The Solicitor General, Mr. Fitzroy Kelly, Q.C., Mr. Hindmarch, and Mr. Hugh Hill, appeared as counsel on behalf of the Crown.

The Attorney-General, Mr. M. D. Hill, Q.C., Mr. Crompton, and Mr. Webster, conducted the case for the Defendants.

The following are the particulars of objections filed with the Declaration, and relied upon on the part of the prosecution :—

That the said invention, at the time of the granting of the said letters patent, was not a new invention as to the public use and exercise.

That the said Jeremiah Bynner was not the first and true inventor of the said alleged invention in the said letters patent mentioned.

That the said supposed invention was not, and is not, a manufacture within the intent and meaning of the said statute of 21st James I.

That the Specification of the said patent does not particularly and sufficiently describe and ascertain the nature of the said invention, and in what manner the same was or is to be performed, but is false, fraudulent, ambiguous, obscure, insufficient, repugnant, defective, and calculated to deceive.

That the said Specification is obscure, insufficient, defective, and calculated to deceive in this, that although the said Specification refers to certain drawings, yet it does not state, nor can it be inferred therefrom, that the relative proportions of the several parts of the said alleged invention are shown in the said drawings, or any of them, or whether deflectors or chimnies of the forms and proportions indicated by the said drawings are the best or only ones that can be advantageously adopted, or whether deflectors and chimnies, the several parts of which bear a different ratio to each other than those to be deduced from the said drawings, or some of them, may not be employed with equal benefit—that experiments are necessary to determine the relative proportions of the several parts of the deflector and chimney, so as to produce the greatest effect—that a person constructing a lamp according to the proportions indicated by the said drawings, would not construct so useful an article as if he were to make use of other proportions.

That by the said Specification, the said supposed invention is alleged to consist in the application of certain deflecting surfaces in combination with peculiarly constructed chimnies,

thereby meaning that the said peculiarly constructed chimnies were and are an essential part of the said alleged invention. Whereas, in truth, and in fact, the said peculiarly constructed chimnies were not, nor are they essential or even advantageous.

That, although by the Specification it is alleged to be essential that the currents of air should be deflected on the flame at a point above the point of ignition, yet, the said Specification is insufficient, obscure, and defective in this, that the said Specification does not give or suggest any mode of determining the point or distance above the point at which the flame is formed, at which the currents of air ought to be so deflected on the flame, which it was material to do; that if the Specification is to be understood as implying that such point or distance is immaterial, then the said Specification is false, and calculated to deceive; but if the Specification is to be understood as implying that the said point or distance is material, then it ought to give some rule or data by which the same might be ascertained.

That the said Specification falsely alleges that it is important that the chimney should be of the figure therein stated, in order to produce the fullest effect. Whereas, in truth, and in fact, chimnies of the figure in the said Specification mentioned, are not necessary to produce the fullest effect.

That the said Specification is also false, and calculated to deceive, in thisi to wit, that it is alleged in the said Specification that it is important that the chimney should be of the figure therein mentioned, in order to produce the fullest effect; whereas, in truth, and in fact, chimnies of the figure in the said Specification described, will not produce the fullest effect, but, on the contrary, much less effect than chimnies of other and different figures and shapes.

That the Specification is ambiguous, uncertain, insufficient, and calculated to deceive in this, that in the Specification it is said, that although the deflectors may be employed in combination with the ordinary chimnies of glass, the Patentee prefers using chimnies of other and different figures and shapes as shown and described, by which words the Patentee seems to imply, and a

person reading the Specification would be led to suppose, that chimnies of the form in the Specification described were not a material part of the said alleged invention; whereas the said alleged invention is in another part of the Specification said to consist in the application of "deflectors in combination with the peculiar constructed chimnies," thereby implying that the same were, and are, a material part of the said alleged invention.

That a lamp constructed according to the directions given in the said Specification, and in the drawings thereunto annexed, would not be of any use or advantage.

That in stating the invention to be applicable to gas burners, the Specification is defective, for no advantage is derived from the application of such contrivances as are described in Figures 4 and 5 to the consumption of gas.

That the said Specification does not contain sufficient information to satisfy the requirements of the proviso in the said letters patent.

Mr. *Hugh Hill* having opened the pleadings—

The *Solicitor-General* then addressed the jury on the part of the Crown: he began by stating that these proceedings were instituted in order to repeal a patent granted to one Jeremiah Bynner, for "improvements on lamps," upon the following grounds: 1st. That the invention was not new:—2ndly. That Mr. Bynner was not the inventor; and, 3rdly. That he had not complied with the proviso contained in the patent as to specifying, and that his Specification was obscure, inaccurate, insufficient, and delusive. Before entering upon the question of novelty, he would make a few preliminary observations. He begged the jury to bear in mind that Bynner was the nominal Patentee only; that the parties most interested, and the real defendants in this case (being the assignees of Bynner's patent) were Messrs. Smith and Sons, of Birmingham, in whose service Bynner was employed as a workman. The learned counsel then proceeded to make some remarks on the law of patents. He cited the Statute of Monopolies, 21st James I., and explained the origin of that statute, and stated that patents were granted to inventors upon certain con-

ditions, one of which was that the invention should be new, and not have been used or known before;—that if it should be discovered that the patent, at the time of granting, was not new, and had been used and known before, that then the patent was invalid. That another condition of the patent was, that the patentee should enroll in the High Court of Chancery, within a certain period, a true and accurate description of the nature of his invention, and of the manner in which the same was to be performed, in such terms that a person of ordinary skill in the business might be enabled to make it therefrom. That the object the legislature had in view in imposing this latter condition was, that after the patentee had reaped the advantage of his invention during the term of his patent, the public might, after the expiration thereof, be benefited by it; and, by means of the Specification so enrolled, be enabled to manufacture the same articles as the patentee, and without his assistance. That the lamps manufactured under Bynner's patent were not new in principle; such lamps were well known and used before. That the prejudice resulting from a patent being granted for an old article was very great, as it not only restricted the right of the public, but also prevented improvements. The learned gentleman then read the Specification, and particularly pointed out to the jury, that Mr. Bynner claimed all those modes of supplying air to the flame of lamps, where "the currents of air obtained at a point below the points of ignition are conducted up and deflected off by a conical metal surface, so as to impinge on the flame at a point above the point of ignition, no air being admitted to the chimney excepting through the centre aperture of the deflector." He should prove that identically the same construction of lamp had been patented in 1828 by Messrs. Upton and Roberts, and applied to all kinds of pipe and flat wick lamps; and that lamps under this patent had been extensively manufactured by Messrs. Smith and Sons, of Birmingham, by Mr. Guise, Mr. Hetherington, and others in London; and most extensively, as applied to flat wick lamps, by Messrs. John and Charles Ratcliff, of Bir-

mingham ;—that the same invention, as applied to argand lamps, had been patented in 1812 by one Simpson, of Birmingham ; and that lamps under this patent had been manufactured under the name of "the economic lamp," by Messrs. Palmer, and by Messrs. Wright and Salt, of Birmingham ; and by Mr. John Milner, and others, in London. That Mr. Bynner could not be the inventor, for he received instructions to manufacture the pipe wick deflecting lamps from the patentees, Messrs. Upton and Roberts, and that his employers, Messrs. H. and R. Smith, first as licencees, and afterwards as assignees of this patent right, manufactured and sold many hundreds of these lamps, and were fully aware of the application of the same invention to flat-wick lamps, the right to manufacture which latter was assigned to Messrs. J. and C. Ratcliff, of Birmingham, by Messrs. Upton and Roberts. That the Specification was inaccurate, in stating that deflectors could be advantageously applied to gas lamps ; insufficient, in not stating the proper height at which the deflectors should be placed, and in not describing the proper size of the aperture through which the flame passed ; and delusive, in stating that a peculiar shaped chimney therein described was essential to produce the fullest effect, and that the deflectors could be advantageously employed with ordinary chimnies of glass.

The learned gentleman, in the course of his address, exhibited various models of the different inventions alluded to, and explained them to the jury. He then proceeded to call evidence to prove the prior use of lamps, resembling, in all respects, the lamps claimed by Mr. Bynner as his invention.

Mr. A. Rawlingson produced copies of Bynner's patent and specification—also of Upton and Roberts', and of Simpson's.

Mr. George Upton, examined by Mr. Kelly, stated that he was a lamp dealer in George Street, Hanover Square, and in Basinghall Street; that he had been in the trade above thirty years, and in partnership with Mr. Roberts, who is since deceased ; that he had seen Mr. Bynner's Specification, and a lamp made according to it ; that he was well acquainted with the principle of applying air to the flame of lamps, and had made many experiments on

the subject; that the principle of admitting air below the point of combustion was very old, as was also the principle of deflecting the current of air against the flame above the point of combustion; that in the year 1828 he and Roberts took out a patent for improvements in lamps, but confined themselves to flat wick and pipe wick lamps; that he has known such lamps to have been sold in considerable numbers before the date of Bynner's patent. Mr. Upton further stated, that in 1832 he and Mr. Roberts having had their attention called to the construction of safety lamps, they adopted that principle in the solid wick lamps under their patent. Two specimens were put into the witness's hands, which he stated had been made by himself and Roberts, and that hundreds had been manufactured and sold before the date of Bynner's patent; that in them the current of air was obtained below the point of ignition, and was conducted up and deflected off by a conical metal surface, and caused to impinge on the flame at a point above the point of ignition; but that no air was admitted to the chimney except through the aperture in the deflector. [One of the patent lamps was handed to the witness, which he stated was identically the same in principle.] That he had frequently given directions to Bynner thereon: he was Smith's foreman. Miller's lamp, Hetherington's lamp, and Guise's lamp, were then shown to Mr. Upton, and he stated that the principle of obtaining the air below the point of ignition and of impinging on the flame above was the same in all; that he had sold a portion of the patent to Messrs. Ratcliff: their lamp produced the same effects, except that it had holes in it, which made the air to impinge with less force, and it kept the glass cooler; that he had applied his invention to gas, and had made some of his lamps with "regulators," and some without,—the use of which was to proportion the quantity of air admitted; that he had given evidence before a Parliamentary Committee in 1835 on the subject of these lamps. Mr. Upton lastly stated, that Cox's lamp (Skelton's) and Bynner's were the same in prin-

[To be continued.]

List of New Patents.

PATENTS GRANTED IN ENGLAND IN THE MONTH OF AUGUST, 1842.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

John Stephen Woolrich, of Birmingham, chemist, for "improvements in coating with metal the surface of articles formed of metal or metallic alloys." Sealed August 1.

Alfred John Phipps, of Blackfriars-road, gentleman, for "improvements in paving streets, roads, and ways." Sealed August 1.

Joseph Whitworth, of Manchester, engineer, for "improvements in machinery or apparatus for cleaning roads, and which machinery is also applicable to other similar purposes." Sealed August 2.

John Dry, of Beverley, agricultural implement maker, for "improvements in thrashing machines." Sealed August 2.

Samuel Carson, of Covent Garden, gentleman, for "improvements in purifying and preserving animal substances," Sealed August 3.

Archibald Turner, of Leicester, manufacturer, for "improvements in the manufacture of muffs, tippets, ruffs, mantillas, cloaks, shawls, capes, pelerines, boas, cuffs, slippers, and shoes." Sealed August 3.

John Lee, of Bermondsey, gentleman, for "improvements in wheels and axle-trees to be used on railways, and in machinery for stopping on, or preventing such carriages from running off railways, which improvements may also be applied to other carriages and machinery." Sealed August 3.

Charles Henri Perrin, of Lombard-street, London, for "improvements in the construction of certain parts of mechanism used in watches and chronometers, which improvements are also applicable to some kinds of clocks." Sealed August 8.

David Napier, of Millwall, engineer, for "improvements in steam engines and steam boilers." Sealed August 9.

Thomas Walker, of Birmingham, stove maker, for "improvements in stoves." Sealed August 9.

Richard Ford Sturges, of Birmingham, manufacturer, for "an improvement in the manufacture of Britannia metal and plated wares." Sealed August 10.

Dominic Frick Albert, of Cadishead, Doctor of Laws, manufacturing chemist, for "a new combination of materials for the purpose of manufacturing a manuring powder." Sealed August 10.

Moses Poole, of Lincoln's Inn, gentleman, for "improvements in paving or covering roads and other ways." Sealed August 11.

Joseph Betteley, of the Brunswick Anchor Works, Liverpool, chain cable manufacturer, for "improvements in windlasses and machinery for moving weights." Sealed August 11.

John Thomas Betts, of Smithfield Bars, gentleman, for "improvements in covering and stoppering the necks of bottles." A communication. Sealed August 11.

George Roberts, of Liverpool-road, miner, for "improvements in the construction of lamps." Sealed August 15.

William Raybould, of Clerkenwell, brass founder, for "a new or improved soldering iron." Sealed August 18.

George John Newbery, of Cripplegate-buildings, artist, for "improvements in producing damask and other surfaces on leather and other fibrous substances and fabrics." Sealed August 18.

NATHAN DEFRIES, of Fitzroy-square, engineer, and NATHANIEL FORTESCUE TAYLOR, of Mile-end, engineer, for "improvements in meters for gas and other fluids." Sealed August 18.

WILLIAM RIDOWAY, of Stafford, earthenware manufacturer, for "a new method of conveying and distributing heat in ovens used by manufacturers of china and earthenware, and brick, tile, and quarry makers." Sealed August 18.

GOLDSWORTHY GURNEY, of Great George-street, gentleman, for "improvements in apparatus for producing, regulating, and dispersing light and heat." Sealed August 18.

RICHARD ELSE, of Gray's Inn, Esq., for "improvements in machinery or apparatus for forcing and raising water and other fluids." Sealed August 18.

THOMAS HENDRY, of Glasgow, mechanic, for "improvements in machinery for preparing and combing wool, and other fibrous materials." Sealed August 25.

DAVID REDMUND, of City-road, engineer, for "improvements in hinges or apparatus applicable to suspending or closing doors and gates, and other purposes." Sealed August 25.

CHARLES FREDERICK GUITARD, of Birchin-lane, notary public, for "certain improvements in the construction of railways." Sealed August 31.

CHARLES THATCHER, of Midsomer Norton, Somerset, brewer, and THOMAS THATCHER, of Kilmersdon, in the said county, builder, for "certain improvements in drags or breaks to be applied to the wheels of carriages generally." Sealed August 31.

PATENTS GRANTED IN ENGLAND UP TO SEPTEMBER, 22, 1842, INCLUSIVE.

ROBERT HAZARD, of Clifton, near Bristol, for "improvements in ventilating carriages and cabins of steam-boats." Sealed September 3.

WILLIAM ROCHE, of Prince's-end, Stafford, mechanic and engineer, for "improvements in the manufacture of mineral colours." Sealed September 3.

WILLIAM WARBURTON, of Oxford-street, gentleman, for "improvements in the construction of carriages, and apparatus for retarding the progress of the same." Sealed September 8.

JOHN WORDSWORTH ROBSON, of Jamaica-terrace, Commercial-road, engineer, for "certain improvements in machinery and apparatus for raising, forcing, conveying, and drawing off liquids." Sealed September 8.

JAMES INSOLE, of Birmingham, saddlers' ironmonger, for "improvements in the manufacture of brushes." Sealed September 8.

JOSEPH HENRY TUCK, of Francis-place, New North-road, engineer, for "certain improvements in machinery or apparatus for making or manufacturing candles." Sealed September 8.

WILLIAM EDWARD NEWTON, of Chancery-lane, civil engineer, for "improvements in machinery or apparatus for making or manufacturing screws, screw-blanks, and rivets." Being a communication. Sealed September 8.

HERBERT GEORGE JAMES, of Great Tower-street, merchant, for "certain improvements in machines or apparatus for weighing various kinds of articles or goods." Being a communication from abroad. Sealed September 8.

WILLIAM FOTHERGILL COOKE, of Coptball-buildings, Esq., for "improvements in apparatus for transmitting electricity between distant places, which improvements can be applied, amongst other purposes, to apparatus for giving signals and sounding alarums at distant places by means of electric currents." Sealed September 8.

THOMAS THIRLWALL, of Low Felling, Durham, engine builder, for "certain improvements in lubricating the piston-rods of steam engines, and of other machinery." Sealed September 8.

WILLIAM CROFTS, of New Radford, Nottingham, lace-machine maker, for "improvements in the manufacture of figured or ornamental lace." Sealed September 8.

THOMAS MARSDEN, of Salford, Lancaster, machine maker, and SOLOMON ROBINSON, of the same place, flax dresser, for "improvements in machinery for dressing or hackling flax and hemp." Sealed September 8.

JAMES WAKE, JUN., of Goole, York, coal factor, for "certain improvements in propelling vessels." Sealed September 9.

JOHN ROLT, of Great Cumberland-place, Colonel in Her Majesty's army, for "certain improvements in saddles." Sealed September 15.

FREDERICK BOWLES, of Moorgate-street, London, for "a new method by machinery of preparing flour from all kinds of grain and potatoes, for making starch, bread, biscuits, and pastry." Being a communication from abroad. Sealed September 15.

CHRISTOPHER NICKELS, of York-road, Lambeth, gentleman, and CALEB BEDELLS, of Leicester, manufacturer, for "improvements in fabrics produced by lace machinery." Sealed September 15.

WILLIAM HENRY JAMES, of Martin's-lane, London, civil engineer, for "certain improvements in railways and carriage-ways, railway and other carriages, and in the mode of propelling the said carriages, parts of which improvements are applicable to the reduction of friction in other machines." Sealed September 16.

JOHN SANDERS, *WILLIAM WILLIAMS*, SAMUEL LAWRENCE TAYLOR, *and* WILLIAM ATMSTRONG, all of Bedford, agricultural implement makers, and EVAN WILLIAM DAVID, of Cardiff, for "improvements in machinery for ploughing, harrowing, and raking land, and for cutting food for animals." Sealed September 22.

PATRICK STEAD, of Halesworth, Suffolk, maltster, for "improvements in the manufacture of malt." Sealed September 22.

JOHN JUCKES, of Putney, gentleman, for "improvements in furnaces." Sealed September 22.

PATENTS GRANTED FOR SCOTLAND, FROM AUGUST 1, TO SEPTEMBER 26, 1842.

JOHN WOODCOCK, of Manchester, in the county of Lancaster, millwright, for "certain improvements in the construction of steam engines." Sealed August 1.

ALEXANDER JOHNSTON, of Hillhouse, in the county of Edinburgh, Esq., for "certain improvements on carriages, which may also be applied to ships, boats, and various other purposes, where locomotion is required." Sealed August 2.

JULIUS SEYBELL, of Golden-square, Westminster, in the county of Middlesex, manufacturing chemist, for "certain improvements in the manufacture of sulphate of soda and chlorine." Sealed August 11.

BENJAMIN BIRAM, of Wentworth, in the county of York, colliery viewer, for "certain improvements in the construction and application of rotary engines." Sealed August 11.

JOHN ANTHONY TIELENS, of Fenchurch-street, in the city of London, merchant, for "improvements in machinery or apparatus for knitting," being a communication from abroad. Sealed August 22.

JOB CUTLER, of Lady-pool-lane, in the borough of Birmingham, gentleman, for "improvements in the construction of tubular flues for steam boilers, and in the manufacture of tubes for such, and other purposes." Sealed August 23.

HENRY BARCLAY, of Bedford-row, in the county of Middlesex, dentist, for "a composition, or compositions, applicable as tools or instruments for cutting, grinding, or polishing glass, porcelain, stones, metals, and other hard substances." Sealed August 25.

WILLIAM EDWARD NEWTON, of 66, Chancery-lane, in the county of Middlesex, civil engineer, for "improvements in machinery or apparatus for making or manufacturing screws, screw-blanks, and rivets." Being a communication from abroad. Sealed August 31.

EUGENE DE VARROC, of Bryanston-street, Portman-square, in the county of Middlesex, gentleman, for "an apparatus to be applied to chimneys to prevent their taking fire, and for rendering sweeping of chimneys unnecessary." Sealed September 1.

THOMAS MARSDEN, of Salford, in the county of Lancaster, machine maker, and SOLOMON ROBINSON, of the same place, flax dresser, for "improvements in machinery for dressing or hackling flax and hemp." Sealed September 1.

SAMUEL MORAND, of Manchester, merchant, for "improvements in machinery or apparatus for stretching fabrics." Sealed September 1.

WILLIAM HENRY KEMPTON, of South-street, Pentonville, in the county of Middlesex, gentleman, for "improvements in the manufacture of candles." Sealed September 2.

JOHN GEORGE HUGHES, of No. 158, Strand, in the county of Middlesex, general agent, for "a new application of telegraphic signals, and the mode of applying the same." Sealed September 2.

JOSEPH WHITWORTH, of Manchester, in the county of Lancaster, engineer, for "certain improvements in machinery or apparatus for cleaning roads, and which machinery is also applicable to other similar purposes." Sealed September 2.

JOHN THOMAS BETTS, of Smithfield-bars, in the City of London, gentleman, for "improvements in covering and stoppering the necks of bottles and other vessels," being a communication from abroad. Sealed September 8.

ISHAM BAGGS, of Wharton-street, in the county of Middlesex, chemist, for "improvements in obtaining motive power by means of carbonic acid." Sealed September 8.

CHARLES WILLIAM FIRCHILD, Wesley-park, in the parish of Northfield, in the county of Worcester, farmer, for "an improved propelling apparatus for marine and other purposes." Sealed September 26.

PATENTS GRANTED, IN IRELAND, FROM AUGUST 6, TO SEPTEMBER 13, 1842.

ROBERT WARRINGTON, of South Lambeth, in the county of Surrey, gentleman, for "improvements in the operations of tanning." Sealed September 3.

JAMES WARREN, for "an improved machine for making screws." Sealed September 3.

THOMAS CUTHBERT COCKSON and GEORGE BALL, of the city of Dublin, merchants, for certain improved machines which facilitate the drying of malt, corn, and seeds; also the bolting, dressing, and separating of flour, meal, and all other substances requiring to be sifted." Sealed September 5.

WILLIAM HANDCOCK, the younger, of Amwell-street, in the county of Middlesex, gentleman, for "certain improvements in combs and brushes." Sealed September 5.

HENRY CLARKE, of Drogheda, in the county of Louth, linen merchant, for "improvements in machinery for lapping and folding all descriptions of fabrics, whether woven by hand or power." Sealed September 13.

WILLIAM NEWTON, 66, Chancery-lane, in the county of Middlesex, civil engineer, for "certain improved machinery for excavating and dredging earthy and stony matters, in the construction of railroads, canals, cleaning of rivers, harbours, and redeeming of marshy and alluvial soils; also for boring rocks, indurated clay, and other earthy matters, for the purpose of blasting and removing the same; the whole to be worked by steam or other power." Communicated by a foreigner. Sealed September 13.

LIST OF EXPIRED PATENTS IN AUGUST, 1842.

JOSEPH CLISILD DANIEL, of Lumphey, Stoke, Wiltshire, clothier, for "improvements applicable to the manufacturing and preparing of woollen cloth." Sealed August 5, 1828.

JOHN LANE HIGGINS, of Oxford-street, London, gentleman, for "improvements on wheel carriages." Sealed August 11, 1828.

WILLIAM MENECKE, of Park-place, Peckham, Surrey, gentleman, for "improvements in preparing materials for and in the making or manufacturing bricks." Sealed August 11, 1828.

LEWIS ROPER FITZMAURICE, of Jamaica-place, Commercial-road, master in the Royal Navy, for "improvements on ship and other pumps, which improvements are also applicable, by certain alterations, to turning lathes and other purposes." Sealed August 11, 1828.

WILLIAM GRISENTHWAITE, of Nottingham, Esquire, for "a new process of making sulphate of magnesia, commonly called Epsom salts." Sealed August 11, 1828.

HENRY MAXWELL, of No. 99, Pall-mall, London, spur maker, for an "improvement in spring spur sockets." Sealed August 13, 1828.

THOMAS STIRLING, of the Commercial-road, Lambeth, Surrey, for "improvements on filtering apparatus." Sealed August 16, 1828.

BENJAMIN MATTHEW PAYNE, of the Strand, London, scale maker, for "improvements on weighing machines." Sealed August 18, 1828.

EDWARD BARNARD, of Nailsworth, Gloucestershire, clothier, for "improvements in weaving and preparing cloth." Sealed August 19, 1828.

PHILIP FOXWELL, clothier, WILLIAM CLARK, cloth dresser, and BENJAMIN CLARK, cloth dresser, all of Dye-house-mill, in the parish of Minchinhampton, Gloucestershire, for "improvements on machinery for shearing, cropping, or cutting, and finishing woollen and other cloths, and cassameres." Sealed August 19, 1828.

WILLIAM SHARP, of Manchester, spinner, for "improvements in machines for spinning or roving of cloth, silk, wool, or other fibrous substances." Sealed August 19, 1828.

GEORGE STRATTON, of Frederick-place, Hampstead-road, in the county of middlesex, gentleman, for an "improvement iu warming and ventilating churches, hot-houses, and all other buildings; which improvements may be applied to other purposes." Sealed August 28, 1828.

The Record

OF

PATENT INVENTIONS.

No. II.

SPECIFICATION enrolled 1st September, 1842, of a PATENT granted 1st March, 1842, to MARC LA RIVIERE, of London Fields, in the parish of Hackney, in the county of Middlesex, gentleman, for "*certain improvements in the machinery for figure weaving.*"

THESE improvements consist in a machine, or apparatus, for setting off the figures of designs, and transferring the same, or indicial points of the same, to a number of punches, which perforate in succession the cards employed in figure weaving.

This machine or apparatus consists, firstly, of a rectangular wood framing, in the front of which, and near the top, are two brackets supporting a warp frame; this frame, which can be removed at pleasure for the purpose of having the figure or design set upon it, consists of a perforated board, through which are passed the warp ends, which extend in a vertical direction, and are passed through a similar board at or near the feet of the operator, and held in their places by knots tied to their ends, which press on the under side of the board, and prevent them

from being withdrawn: the upper ends of these warp threads, after passing through the lower part of the warp frame, as described, are hooked on, or tied to, an equal number of vertical leads, or pieces of metal, which are separated, or kept apart, by longitudinal bars of wood placed between each row, the two outside bars being of metal: these bars have a number of transverse tightening screws passed through them; and by turning their nuts, the leads will be tightened, or bound together, and will maintain their vertical position, so as to support the ends of the vertical warp threads. The upper ends of these leads have eyelet holes, through which an equal number of vertical leads, having hooks at their lower ends, are passed; these leads are also fixed in a frame, and can be acted upon by screws in the same manner as those already described; to the upper ends of these leads is attached another set of warp threads, which pass for a short distance in a vertical direction, and through a perforated board fixed in an angular position. From this board the ends are carried in a horizontal direction to the opposite side of the frame, and through a similar perforated board, from whence they proceed down the back side of the frame in a vertical position, where they are fastened to the ends of an equal number of solid metal rods, each having at its lower end a helical spring, to the end of which is fastened another set of warp ends, which pass through another angular perforated board, from which they extend in a sloping direction to the punching machine.

This punching machine consists of a screw similar to a fly-press; a strong cast-iron frame, containing the punches, is attached to the end of this screw, and moves in a vertical position between the cross-head of the machine and the bed plate upon which the cards to be punched are drawn. The upper part of this frame has a perforated

angular plate, similar to those described, through which the warp ends last mentioned, pass; and are finally attached to the punches. By this arrangement it will be seen that by pulling out the ends of the warps in the front of the warp frame, the punches so connected will be raised, the helical springs before described being for the purpose of keeping the ends at a proper tension; and in order to separate those punches which are raised from those left down, a comb is inserted between two horizontal plates through which the punches move, each punch having, a short distance from the upper end, a portion of its two sides cut away, sufficient to allow that part to pass between the teeth of the comb; consequently, if all the punches be down, and the comb inserted, it will embrace such parts of the punches, and prevent them from returning; and, if at this time a card be placed on the plate under the punches, and the screw turned round, such card will be perforated with holes equal in number to the punches; again, suppose a number of holes was required to be punched in a card: by elevating those punches that were not required, and inserting the comb, such punches would rest upon the comb, and consequently not be brought into action, and the card would be punched as required.

The mode of placing the cards on the bed plate is as follows: each side of the punching machine is provided with a square roller, and the cards are stitched together so as to form a chain of cards, the first card being placed ready for punching on the plate; the next, or next but one, succeeding, will rest upon one square of the revolving bar, which has at each end (to correspond with the holes in the cards), a conical pin; the cards, after being punched, pass over another bar at the opposite side of the machine; thus by the action of such bars, the cards will be successively brought under the punches.

Let us suppose the first card to be placed on the bed plate, and all the punches down, and the moveable warp frame described, to have its figure or design set on it by cross threads or sheds in the usual way; for which purpose, it may be sent to the artist: the warp frame being put in its place, and the punches all in readiness to act on the series of cards, the workman then proceeds to read off, as it is technically called, the figures or designs, by drawing together by the two ends such cross threads of the shute in succession, and passing between each lash of the warp thus separated from the rest, a tightening bar; this bar, when passed between the lash, is held by the ends of two levers, moving on axes, at each side of the frame, and connected together in front by a cross bar; by pulling this cross bar down, the opposite ends of the levers will be elevated, and the lash so separated will be pressed out; thus raising the punches attached to the end of each thread, and leaving down in each instance those punches which are required to be left down; the card is then punched by turning the screw, and the operation repeated. When it is required to take a number of copies of the cards, the inventor combines the punching machine with an ordinary jacquard machine. The claims are as follows: 1st, the general arrangement and combination of the setting and transferring apparatus as represented; 2nd, the moveable warp frame in which the figure or pattern is set; 3rd, the punching machine in its general arrangements and construction of parts; 4th, the forms of the punch as represented, whether applied to the improved punching machine, or to any other; 5th, the use of the comb of the form represented, or of any other analogous form to separate the punches which are raised from those which are left down, whether applied to the said punching machine or to any other; 6th, the combination of the setting

and transferring apparatus, with the punching apparatus, for the purpose of transferring the figure or design to the cards; 7th, the combination of the punching apparatus with an ordinary jacquard or recutting machine, in the manner described, for the multiplication of copies of such cards.

SPECIFICATION enrolled 3rd September, 1842, of a PATENT granted 3rd March, 1842, to GEORGE CARTER HASELER, of Birmingham, jeweller and toy maker, "*for improvements in the tops of scent bottles.*"

THESE improved tops of scent bottles can be made of any shape, and ornamented as fancy or taste may direct. The ornamented parts have a number of perforations, in order to allow the scent to pass through; a lid, or valve, acted on by a spring, is made to fit tight on the end of the bottle neck, and is attached to one end of a lever moving upon an axis, or fulcrum; and the other end projecting beyond the side of the cover. By pressing the finger on this part of the lever, the valve will be raised, and the scent will escape from the bottle, and through the perforations in the cover; when the finger is released, the action of the spring will cause the valve to return to its place. There is also another method shown, wherein the same effect is obtained, by substituting a rotary sliding valve in place of the one above described; and it consists of two perforated plates, or discs, similar to a ventilator, one of which is fixed, and the other moves upon an axis; the two plates are held in close contact by a spiral spring pressing on the bottom plate, to which a projecting pin is attached, passing through the side of the cover; therefore, by moving this pin in a lateral direction, the communication to the bottle can be opened and closed at pleasure.

The patentee claims, 1st, the combination or use of an open top or cover, with a lifting valve, as applied to scent bottles; and 2nd, the combining a sliding valve with an open top or cover, as applied to scent bottles.

SPECIFICATION enrolled 3rd September, 1842, of a PATENT granted 4th March, 1842, to EDWARD SLAUGHTER, of Bristol, engineer, for "*improvements in the construction of iron wheels for railway and other carriages.*"

IN constructing a wheel of four feet diameter, the inventor prefers to use eight spokes; these spokes are made of malleable iron, with a dovetailed projection on one side; the other side may be made flat, or of a curvilinear form, by bending the iron thus prepared, when hot, round a cast-iron block of any suitable form, and of such width that the spokes will collectively serve as an inner framing to the wheel. The spokes shown in the drawings are of a curvilinear form, each end of the spoke from the nave of the wheel, diverging from each other (about half their length) to the required width, and then approaching each other, leaving at the top a sufficient length for the bearing which is to be inserted into the tire, as hereinafter explained. The tire, or outer ring of the wheel, is also formed of malleable iron, with a dovetailed recess in its inner circumference, corresponding with the dovetailed projection on the spokes; or the form of these dovetails may be reversed, viz., the projection may be made on the inner circumference of the wheel, and the recess in the spoke. When the outer ring, or tire, has been welded so as to form a perfect hoop, a space is taken out on the face side of the wheel, at that part where the weld was taken,

sufficient to allow the end of the spokes to pass between, and be inserted into the dovetailed recess; the tire is then made hot, and one of the spokes introduced through the space made in the face into the dovetailed groove, and passed on the breadth of itself; another spoke is then introduced in like manner, and passed round in an opposite direction, until the curved part of such spoke comes in contact with the first; the whole of the spokes being introduced, a segment of iron is then fitted into the space through which the spokes were introduced, and being firmly secured by set screws, will have the effect of holding the last spoke in the framing of the wheel. After the operation of putting in the spokes, the wheel is perfected by placing it on an iron table of sufficient dimensions, and securing it by clamps and bolts; after which the nave is to be cast on the ends of the spokes, care being taken to have the spokes from the end to that part where they come in contact with each other, sufficiently curved to allow for the contraction of the iron.

Claim is for the forming of a wheel for railway and common roads, with an outer ring having a dovetailed groove, or recess, and spokes having a corresponding projection, or *vice versâ*, so that the wheels shall be held together by means of dovetails to the spokes and rings, as described.

SPECIFICATION enrolled 3rd September, 1842, of a PATENT granted 4th March, 1842, to JAMES CLEMENTS, of Liverpool, for "*improvements in composition for ornamenting glass and picture frames, and articles for interior and other decorations; also for the manufacture of toys and other fancy articles.*"

THE following novel improvement relates to the applica-

tion of paste produced from potatoes, mixed with woody or fibrous matter, for forming ornaments for glass and picture frames, and other articles.

The mode of preparing this composition is as follows. The potatoes are to be cooked as if intended for the table, either by boiling, roasting, or steaming; and when so prepared, are to be pressed, and mixed with some pulverized article, such as fine saw dust, turf, or waste bark from tan pits, ground very fine, or any powder of a similar nature, which can be had at a small cost. The whole being worked into a paste, by rolling or beating, it is then fit for use, and may be cast in moulds commonly used for ornaments of that description, and applied in the same manner.

The patentee does not confine himself to the above named articles, as other matters mixed with the pulp of potatoes would have the same effect; the object being to apply the pulp, or paste, of potatoes, in combination with a suitable pulverized material, in order to make a composition for the purposes above described.

SPECIFICATION enrolled 3rd September, 1842, of a PATENT granted 4th March, 1842, to WILLIAM PALMER, of Sutton Street, Clerkenwell, in the county of Middlesex, manufacturer, for "*improvements in the construction of candle lamps.*"

THE first of these improvements relates to the construction of carriage lamps, with a distinct or separate tube to contain the candle. "It has," says the patentee, "been customary to make the tube of a carriage lamp to form a part of such lamp; and the mode of cleansing that part

of the lamp from such matter as the candle is composed of, is attended with some inconvenience. To obviate this, the tube is introduced into the lamp from below upwards; by which arrangement, the operation of placing the candle within the lamp, together with the cleansing of that part of the lamp, will be greatly facilitated." The tube of this improved lamp is provided with a spring in the ordinary manner, for keeping up the candle; and also with a nozzle, which may be screwed on, or otherwise fastened to the tube. This tube has two collars, equal in diameter to the interior diameter of another tube fixed in the lamp, and into which the candle holder slides; one of these collars, which is placed immediately below the nozzle, has two slots, one of which is cut through the collar, and the other only partially, so as to form a notch. The upper interior part of the large tube is provided with a small stud, or projection; so that when the tube or candle holder is to be inserted, the slot being brought opposite the projecting stud, the collar of such tube will be allowed to pass such projection, and on turning the tube so as to bring the notch opposite the stud, and drawing the tube back a little, the same will be held in its proper place; and, when required, such tubes can be taken out, for the purpose of cleansing from oil or other fatty matters.

The claim is for the mode of constructing candle lamps for carriages, by employing tubes for receiving the candle, which are separate from the other parts of the lamp.

The second part of these improvements relates to a mode of applying air to candle lamps, for the purpose of supporting combustion; and consists in the application of a cone, which surrounds the upper part of the tube and the nozzle. The apex of this cone the inventor prefers to be on a level with the upper part or edge of the nozzle; and the space between the cone and such part to be $\frac{3}{16}$ of

an inch; although the position of the cone, and also the distance from the nozzle, may be altered without materially altering the effect of the light. This last improvement is shown in the drawings as applied to the carriage lamp before mentioned, and also to a lantern and table lamp; in each case the lower edge, or base of the cone, is made with a projecting flanch, upon which the glass chimney rests, and by which it is supported. The air for supporting combustion is admitted through holes made in any convenient part of the vessel, so as to allow it to enter the lower part of the cone.

The claim is for the mode of introducing air to candle lamps, as described.

SPECIFICATION enrolled 3rd September, 1842, of a PATENT granted 4th March, 1842, to WILLIAM PALMER, of Sutton Street, Clerkenwell, in the county of Middlesex, manufacturer, for "*improvements in vessels for making infusions or decoctions, and for culinary purposes; and in apparatus for measuring or supplying from vessels.*"

THE first part of these improvements relates to the construction of vessels for making infusions or decoctions of coffee and other matter, and consists in dividing the vessel by a plate, having a small hole in its centre. The principal feature or novelty is, in making the hole of such diameter as to allow the fluid contained in the upper part of the vessel to pass through in any given time which may be found sufficient to make or prepare the coffee, or other matter contained in the upper vessel. About $\frac{1}{4}$ of an inch above the division plate is a strainer, upon which the coffee or other matter is placed; this part of the vessel is

then filled with boiling water, which immediately begins to flow through the strainer, and through the small aperture, into the lower part of the vessel; the size of this aperture being such as to allow the decoction to pass through in the time required for making such decoction. The lower part of the vessel is provided with a spout in the usual way for pouring the liquor off. There is another modification of this improved coffee-pot given, which differs from the one above described, in this particular—that the hole in the division plate is made larger, the flow of the liquor being regulated by placing the strainer in close contact with the plate; in which case the filtering medium will be contracted to the size of the hole; but by raising the filter, which has a handle attached to it, the whole area of the filter will be brought into action; and in consequence of the hole in the plate being larger, the contents will pass into the lower vessel in much less time.

Claim.—The mode of making vessels for obtaining infusions and decoctions as described; where the time allowed the material to be soaked, is regulated by a small hole. Also the mode of regulating the speed of filtering when making infusions, by combining the filtering surface, which can be raised, with a small hole as described.

The second part relates to an improvement in vessels for cooking, and consists in the application of a vessel similar to those above described, for cooking eggs. The eggs are placed in a small basket in the upper part of the vessel, and such part is then filled with boiling water; the time of running through of the water, as in the former case, being regulated according to the time required for cooking the eggs.

Claim.—Is the mode of constructing apparatus for cooking, by regulating the time of the operation by a small hole, as described.

Third.—This part relates to an apparatus for measuring dry granulated matters, such as tea and coffee. This apparatus consists of a horizontal cylinder, fixed on the lid of the canister or other vessel containing the granulated matter; this cylinder is provided with an opening at its upper side, which can be covered with a lid; and also with an opening at its lower side leading into the vessel. Within this cylinder is placed a smaller cylinder, with but one opening in its side, and turning upon an axis. When it is required to measure a quantity of coffee, or other matter, the opening of the interior cylinder is to be turned opposite that opening in the outer cylinder leading into the vessel, and the vessel inverted, whereby the interior cylinder will be filled with coffee; in this position the interior cylinder is to be turned half-way round, and the coffee contained in the small cylinder will be allowed to escape through the opening in the outer cylinder. In the construction of the measure described, the patentee makes the cylinders of such diameter, that when put together a space will be left between them; for which he claims the mode of constructing two cylinders with a space between them, for measuring granulated matters, as described.

SPECIFICATION enrolled 3rd September, 1842, of a PATENT granted 7th July, 1842, to WILLIAM RICHARD, the elder, of Burley Mills, in the parish of Leeds, in the county of York, manufacturer, for "*an improved method of preventing or consuming smoke, and economising fuel in steam engine furnaces.*"

THIS invention relates to a peculiar mode of admitting and regulating a current of atmospheric air, which passes

through an air chamber, and meets, at right angles, the hot air and other vapours, as they pass from the fire. At the back part of the ash pit is an aperture which conducts the current of air through a number of holes formed in the brick-work at the back of the bridge; this aperture is provided with a door, which regulates the flow of air in the following manner:—At the front of the brick-work of the boiler is fixed a cylindrical vessel about 18 inches deep, and 8 inches in diameter, half filled with oil, water, or other fluid; a similar vessel, of less diameter, is suspended by a chain inside the first one, in an inverted position; the top of this vessel is provided with a valve, opening outwards, and also with a stop cock; the chain, by which it is suspended, passes over a pulley, and is attached at its opposite end to a lever connected with the fire doors, and also with the door leading to the air chamber, in such a manner, that, on opening the fire door, it will press against a projecting arm and actuate the levers so as to open, at the same time, the air chamber door, and also depress the suspended vessel; the air escaping from such vessel by means of the valve, a counterbalance weight is attached to one of the levers, so as to draw up the suspended vessel; the speed, or time of rising, being regulated by the stop cock which admits the air. The action of the apparatus is as follows: when the furnace door is opened for the purpose of feeding with coal, the suspended vessel will be depressed, and the air chamber door also opened; the coal being thrown on the fire, and the door closed, atmospheric air will be allowed to pass through the air chamber; but the door, or aperture, will be gradually closed as the vessel rises in the fluid, the time, as before stated, being regulated by partially opening the stop cock, so as to allow a certain quantity of air to flow into the vessel, and thus close the aperture, or door, of the air chamber, by the time the coals are consumed;

therefore, every time the furnace doors are opened for supplying the fire with coal, the door of the air chamber is opened for the supply of atmospheric air, and the time taken in closing such aperture can be prolonged or shortened as circumstances may require, in the manner above described.

The claims are, first, the mode of regulating or cutting off the supply of atmospheric air admitted into the furnace or air chamber; secondly, the mode of increasing or diminishing the supply of atmospheric air admitted into the furnace or air chamber; thirdly, the mode of diminishing the supply of atmospheric air gradually as the quantity of smoke from the furnace diminishes; fourthly, the mode of prolonging or shortening the supply of atmospheric air admitted into the furnace, air chamber, or flues, according as the quality of coal used, or other circumstances may require; fifthly, the mode of opening the air flue door, or doors, by opening the furnace door; sixthly, the use and application of the apparatus above described, separately or combined.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to THOMAS HEDLEY, of the town and borough of Newcastle-upon-Tyne, gentleman; and CUTHBERT RODHAM, of Gateshead, in the county of Durham, millwright, for "*an apparatus for purifying the smoke, gases, and noxious vapours arising from certain fires, stoves, and furnaces.*"

THIS improvement relates to a mode of constructing an apparatus for purifying, by washing the smoke, and other vapours arising from stoves, and other furnaces that emit

smoke greatly charged with unconsumed carbon, chemical minerals, or other metallic matters of a noxious and injurious character. By this new apparatus, smoke and vapours of a highly impure nature, are effectually purified, and the draught improved; and the deposit of matter and solid particles, when separated from the water employed in purifying such smoke, will be of value.

This apparatus consists of six vertical flues, three of which are ascending, and three descending; over the top of each of the descending flues is fixed a water box, with a perforated bottom; these boxes are connected with a horizontal main which supplies them with water. At the bottom of these descending flues are lateral openings, through which the water passes into a cistern; its level being somewhat higher than the lateral openings, so as to form a bottom to the flues, and prevent the vapours passing through such opening. The smoke from the furnace passes through an inclined flue, and up the first ascending flue, over an arch of narrow span, from the spring of which commences the passage leading to the descending flue, which is in an inclined or sloping direction; the smoke, in passing down this passage into the descending flue, is met by a stream or shower of water from the perforated box, and is thus carried to the bottom of the flue; it then passes into the next ascending flue, and in the same manner to the next descending flue, when it is again met with a stream or shower of water; and so on to the third, when the smoke will be effectually purified, and the draught, by the action of the water carrying the smoke down the descending flue, will be improved. In order to prevent any smoke escaping down the sides of the flue without being washed, a number of bevilled projections of slate, or other material, are placed round the descending flues, at intervals of about one yard and a half. The pa-

tentees also sometimes place a jet of water in a slanting position, in the inclined flue, previous to entering the first ascending flue; and they also introduce a jet of steam into the lower part of the ascending flues if required.

The claim is a mode of constructing an apparatus for purifying vapours, gases, and smoke, arising from certain fires; and by combining two or more ascending flues with descending flues, by inclined or sloping passages at their upper ends; and with streams or showers of water to fall down the descending flues.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to THOMAS HENRY RUSSELL, of Wednesbury, iron tube manufacturer, and CORNELIUS WHITEHOUSE, of the same place, for "*improvements in the manufacture of welded iron tubes.*"

THESE improvements relate to manufacturing welded iron tubes by internal pressure, when passing through suitable external dies, in the process of welding the joint or seam. The scalp of the tube being formed in the usual manner, is to be heated to a moderate welding heat, and drawn through a pair of tongs, or dies, with a bell-shaped mouth; the upper part of these dies have a recess, so that when the scalp of the tube is being drawn through, one edge will enter the recess so as to project above the other, which latter will touch the inner surface of the projecting edge, and thus prepare the parts for a lap joint, ready for welding. A cylindrical bar, or rod, is then introduced into the scalp, or partly formed tube, which is then placed into the fire and heated to a welding heat; and then, by means of a

draw bench, the tube, together with the bar, or rod, is drawn through another pair of dies of an oval shape; after which, and when at a welding heat, it is drawn through three pair of dies, of the same form, in succession, the direction of the pressure, or force applied, being altered from the direct, or centre line, to a line passed through the centre from each edge of the lap; by which process the tube will become perfectly welded; and in this state the bar, or rod, inside, will be held fast; but on passing the tube through another pair of dies, which are cylindrical, the tube will be brought to its proper shape or form, and the bar will become loose, and can be withdrawn. The patentees prefer the description of dies represented in the drawing, and which are in the shape of tongs, on account of their cheapness, and the facility with which they can be removed from the tube for the purpose of cooling them, which will be necessary during the process of welding. In place of the bar, or rod, for the internal support, the inventors employ a strong iron tube, which they prefer not to be cooled after being withdrawn from the tube under process of manufacture, but merely straightened, ready for inserting into another scalp. The patentees also state, that they do not confine themselves to the use of dies in the form of tongs, as grooved rollers, or other dies may be employed; they therefore do not claim the use of such dies when uncombined with the use of an internal support; neither do they claim the use of an internal support when using external pressure in welding iron tubes, unless the instrument for giving internal support be such as to pass through the hole, or dies used in offering internal support from end to end of the joint or seam; neither do they confine themselves to the precise details set forth, provided the peculiar mode of applying internal support, combined with external pressure, for

welding wrought iron tubes, be retained, together with the application of a rod, or bar, which is much smaller in diameter than the interior of the tube to be welded, and made to give internal support to the joint of the tube, when being welded by external pressure; and whereby such bar, or rod, is caused to pass under pressure with the tube, and is released by the subsequent shaping of the tube, as above described.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to HENRY BARRON RODWAY, of Birmingham, in the county of Warwick, wine merchant, "*for improvements in the manufacture of horse shoes.*"

THESE improvements consist in making bar iron for the manufacture of horse shoes, with a curvilinear groove throughout the length of the bar: this groove, which is, when the shoes are manufactured, on the underside, should not be less than $\frac{3}{8}$ of an inch wide, and the bar containing such groove should be at least $\frac{3}{4}$ of an inch wide; but such bars will, of course, vary in dimensions according to the size of the shoe to be made; the groove, in all cases, occupies about two-thirds of the breadth of the bar, and the curvilinear form is given to it in the usual manner by rolling. The thickness of the bar at that part which is to form the outer edge of the shoe, is greater than that of the edge forming the inner circle of the shoe. The bar so made can be manufactured into horse shoes, in the usual manner; the heels may be formed by what is called jumping, or knocking up the ends of such pieces as have been cut off of the length required; and the ends, after the shoe is bent, can be turned down, as will be understood by the

smith; the toes may also be steeled, if required. In order to form the heels solid, the inventor purposes to roll the iron between rollers, with intervals, or spaces, cut out of the projection formed on the roller for making the groove; so that in the bar there will be solid parts left, at proper distances, to be cut off, for the length of a shoe; which parts (as will be understood), will only require bending, in order to form the heel.

Claim.—The mode of manufacturing horse shoes, by making and employing bar iron, rolled with a groove therein, at least $\frac{3}{8}$ of an inch wide, and in a bar of at least $\frac{3}{4}$ of an inch wide, as described.

SPECIFICATION enrolled 7th September, 1842, for a PATENT granted 7th March, 1842, to JOHN GREEN, JUN., of Newtown, in the county of Worcester, farmer, for "*certain improvements in machinery, or apparatus, for cutting or reducing turnips, mangel wurzel, carrots, and other roots, for food for horned cattle, horses, and other animals.*"

THESE improvements consist, first, in constructing a machine for reducing or grinding into a pulp and small pieces, turnips and other vegetable matters used as food for cattle; and secondly, in combining this machine with other well-known machinery for cutting the said roots into slices; which combination of parts shall form one machine, and perform two operations. The first part of this compound machine consists of a cylinder, having its periphery for about one-third of the circumference, deflected; that is, such part of the circumference, (extending nearly across the cylinder), gradually approaches the axis, in the same man-

ner as a scroll, to such extent that the termination of the deflected part will be about $\frac{2}{8}$ of an inch from the upper edge, or periphery; thus forming an opening into the interior of the cylinder, which has its end open. The periphery, or projecting edge, is provided with a knife the length of the opening, and also with a number of knives placed at right angles to it, so as to divide the opening into a number of openings. Upon the axis of this cylinder is a fly wheel, with a handle for giving motion to the machine; there is also a large mitre, or bevil wheel taking into, and driving a smaller wheel, placed underneath the aforesaid shaft, and keyed on the axis of a vertical shaft, which gives motion to the second part of the machine. Upon the axis of the vertical shaft is a cone which revolves with it, and also within a cylinder; the periphery of this cone contains a number of rows of projecting pins, or studs, each row from the apex of the cone diminishing in length, and increasing in number; that is, the projecting pins in the bottom row are made shorter than those in the top row, and are also much closer together. The cylinder within which the cone revolves, is also provided with projecting studs, and arranged in the same manner; this cylinder, it will be observed, remains stationary; on the periphery of the revolving conical drum are affixed about eight knives, which pass between the projecting pins in the cylinder, for the purpose of clearing out the turnips and other vegetable matter. The lower part of the cylinder is provided with three lateral openings, each having a lid, or iron door, moving upon an axis, or hinge, at the upper end; the distance of these doors from the cylinder is regulated by a screw, and their object is to reduce (by turning the screw and partially closing the openings) the matter to be operated upon into a fine pulp, or smaller pieces, and *vice versâ*, by opening such doors. The turnips, &c., intended to be

ground, are placed in a hopper above the revolving cylinder, and are cut into slices and small pieces by the aforesaid knives, some of which pieces pass through the openings, and into the interior of the cylinder, and others are carried down with the cylinder past the cutting edge; but all of which drop into the lower part of this machine; that is, between the cylinder and revolving conical drum, where they undergo the operation of grinding and reducing into a pulp and small pieces, and finally escape from the opening at the bottom, formed by the interior of the cylinder and exterior of the cone, into a suitable receptacle provided for the purpose.

Claim.—First, the combination of machinery described, as forming a reducing or grinding apparatus; and also the combination of mechanical parts for reducing or grinding previously cut pieces of vegetable matter into pulp and small pieces, and whereby such roots are operated upon by surfaces, part of which are moveable, and part of which are stationary; such surfaces having spikes, or studs, or any other similar projections which will produce the like effect; and secondly, the combination of such reducing or grinding apparatus, with other such machinery as has been described to have been previously used for cutting the roots into slices or strips.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to JOHN BODMER, of Manchester, engineer, for "*certain improvements in machinery, or apparatus, for cleaning, carding, roving, and spinning cotton, and other fibrous substances.*"

THESE improvements in machinery, or apparatus, for clean-

ing, carding, roving, and spinning cotton, and other fibrous substances, apply principally to such machines as have been fully detailed and described in the Specifications of Mr. Bodmer's former patents, but more particularly in the one granted on the 22nd of October, 1838.

The first part of these improvements consists in a mode of collecting the cotton from a beater of 36 inches, more or less, in lengths, into a wire cloth, which forms it into a narrow lap of 5 inches, more or less, as may be required. The drawings show a plan of a blower, in which the cotton is drawn by a current of air produced by a fan, through a pipe, or flue, and is collected in the usual manner upon the surface of a narrow wire cloth, from which it passes to an endless belt, and from thence to the delivery rollers, and press rollers of a lap machine.

Claim.—The forming of one single narrow lap of 5 inches, more or less, in width, from the produce of a beater and feeding apparatus, of the usual or any convenient width; and the arrangement of the different parts by which this effect is produced. The inventor also claims his improved lap machine as applied to the said blower.

The improvements in the lap machine consist in the application of a doffing knife and mechanism, by which it is worked. Instead of tearing the lap and laying it over an empty bobbin by hand, as described in the former Specification, the same in this case is performed by a self-acting doffing knife, which enters between the full bobbin and the empty one, at the very moment the latter takes its position upon the lap roller.

Claim is the mode of cutting the sliver, or lap, of a lap machine, by a self-acting tool, or knife, instead of separating it with the hand, and also the mechanism by which this is accomplished.

The next part relates to a mode of clearing or stripping

flats, or top cards; and in this part of the drawing is also shown the adaptation of a main cylinder clearer. The apparatus for stripping top cards consists of a crank motion, connected with the doffer, in such proportion as to perform one revolution in about four minutes; a connecting rod, affixed to this crank motion, actuates certain mechanical arrangements, whereby the end, or what we may term, for the sake of perspicuity, No. 1 flat, is lifted up; the crank motion still advancing, the flat is brought over a roller, and the cotton is stripped off the cards of the flat; the crank motion has now performed half a revolution, and the connecting rod of the crank, with other mechanical arrangement, in performing the other half revolution, brings the flat No. 1, which is still elevated, over the flats Nos. 2, 3, 4, &c., until it arrives immediately over the flat No. 8; the seven remaining flats are then caused to advance, so as to leave a space for the one suspended; and on the crank motion completing the revolution, the flat is deposited in the place which No. 8 occupied.

The claim is for the arrangement of mechanism by which the flats, or top cards, are shifted and stripped, and which the inventor considers a material improvement upon that described in his former patent.

The improved main cylinder clearer consists of a tube upon which a number of narrow brushes are fixed. The periphery of these brushes revolve from 10 to 20 per cent., more or less, as may be required, quicker than the periphery of the main cylinder of the carding engine, the wires of which are slightly touched, or nearly so, by the brushes, just enough to enable them to remove the cotton and dirt from the teeth of the main cylinder; in the very narrow space in which the brushes act, at one time, the cotton and dirt removed from the main cylinder are deposited on the teeth of a licker-in, and carried past the feeding knife, at

which place the dirt will drop on the floor, and the cotton will be carried forward, and again be taken up by the main cylinder. The clearer is also shown as being placed under the doffer, in front of the carding engine; in which case, a small clearing roller, covered with cards, is placed underneath the clearer, to receive what is stripped off the cylinder, which is afterwards taken up again from the roller, the dirt falling on the floor.

The claim is for a number of narrow brushes instead of one; and the mechanism by which the motions of the same are produced; and also the construction of a double inside wheel and clearing cylinder, with the mode of fixing the brushes.

This apparatus is also made applicable for grinding the cylinders, by placing on the tube brass rings instead of brushes, which are to be painted and then covered with emery, in the usual manner; or a number of segments may be employed in place of the rings, for the purpose of grinding the wire, card of cylinders, flats, &c.

The patentee claims the mechanism described in the drawings.

With respect to narrow laps, and the manner of feeding them, explained in the Specification, the object of the arrangement is to correct the inequality arising from the irregular spreading of the cotton at the lap machine, by reducing the width of the cotton, say to one-seventh; the velocity of the wire cloth being increased seven times, so that the carding engine will be fed by seven narrow laps placed side by side; thus extending any irregularity over seven times the length, and taking the chance also of compensation from the irregularities of the other six parts.

The improved lap machine is also shown applied to the drawing frame, and the manner of winding single ends, or any number of ends, separately from the drawing frame,

upon the bobbins or rollers, whether twisted or untwisted, is also shown; for which the patentee claims the mechanism of the machine, for the purpose of winding separate slivers, or rovings, coming from drawing frames, or other machinery, or only from coils or spools; and also the dofling knife applied to this machine.

The Specification in this part gives a description of an improved twist coil frame, of which the principal feature or novelty is the change of the direction of the roving, which in this instance forms the coil from below; for which he claims, the mode of forming coils with the sliver or roving coming from below, and the mechanism by which this is effected. The patentee also claims a spherical contact cone, for the purpose of varying the speeds of contact discs, used in coil and roving frames; and also the spherical contact cone, whether applied on one side of the disc or on both sides; and the mechanism by which the cones are acted upon.

For the purpose of feeding the spinning machines in a more economical manner, a number of rovings are wound from the coils upon a barrel, or bobbin, on the lap machine; the laps from this machine being placed behind the spinning frame. The inventor also applies the improved disc motion to a double coil frame applied to carding engines.

Claim.—The arrangement of the double coil frame, and the differential reversing screw for moving the friction pulley, or spherical cone, and the mechanism by which the guide tube is shifted from one coil to the other, and reversed. For certain improvements in a copping motion applied to spinning frames, the inventor claims the mechanism of the copping motion described. Another of these improvements consists in banding the spindles. Claim.—The mode of driving the spindles, as described.

The last improvement relates to an improved flyer, made of buffalo hide; after being cut out of a proper form, it is softened in water, and bent in a mould. The drawings also show a plan and elevation of a flyer, made of two pieces of whalebone, round which a wire is bent and secured by thread or silk, linen or cotton, or other suitable material, not only for the purpose of securing the whalebone, but also to prevent the same from rubbing against an iron or steel guide plate, which the patentee considers an improvement upon the box described in the Specification of his former patent.

Claim.—Is for an improved fly plate and flyer, as described.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to JAMES READMAN, of Islington, gentleman, for "*a certain improvement, or certain improvements in the barometer.*"

THESE improvements consist in applying an index, to be acted upon by the rising and falling of a balance; and also in employing a steelyard balance to indicate or register the barometrical pressure, as will be hereafter described, by which arrangement the following defects which exist in barometers of the ordinary construction, are said by the inventor to be entirely removed.

1st, the difficulty of ascertaining the proper allowance to be made for the expansive effect of changes in the temperature on the barometric column; 2ndly, the smallness of the range; and 3rdly, the disturbing influence of alterations in the level of the mercury in the cistern.

The inventor states that the pressure of the barometric column of mercury, added to the atmospheric pressure on the surface of the mercury in the cistern, is equal to the

atmospheric pressure on the exterior of the cistern; in which case it follows, that if a cistern with its contents be placed upon a spring or adjustable balance, the depression caused in the balance will be in proportion to the weight of the cistern and its contents, independently of the barometric column, on account of the weight of that column being counterbalanced by the atmospheric pressure on the exterior bottom of the cistern; but as the mercury in the cistern is the source whence the barometric column is derived, and as the quantity in the cistern is increased or diminished according to the height of that column, it follows also, that as the barometric column is caused to rise or fall by variations in the weight of the atmosphere, so the weight of the cistern will be increased or diminished, and the spring or balance on which it presses be to the same extent raised or lowered; and that by ascertaining how many inches, or parts of inches, are contained within the extreme range of the barometric column, and what the weight of so many inches, or parts of inches, of mercury is, and to what extent the addition of such weight to the cistern will cause the spring or balance to be depressed, the inventor, from these data, constructs an index, which being connected to the balance, shows on inspection the smallest changes in the height of the column. The construction of the barometer is as follows:—At the bottom of the frame is affixed a cylindrical vessel, containing mercury; and within this vessel, and floating on the mercury, is another cylindrical vessel or cistern, concentric with the first, into which the barometric tube is placed; it will be seen, that the weight of mercury in the floating cistern will be increased or diminished according to the height of the column, and such vessel will be raised or lowered. The object of the invention is, therefore, to register the alterations of this floating cistern; which the

patentee effects, by placing on the top a brass collar, having a flange made to project on the outer vessel; on each side of the upper part of this flange are fixed vertical rods, which are connected together at the top by a cross bar, in the centre of which is affixed, in a vertical position, a rack, which takes into, and drives a wheel, having on its axis a pointer, or index; the vertical position of this cistern, and other apparatus, is maintained by anti-friction rollers on each side, and an anti-friction roller also behind the rack. Thus by applying a fixed scale to the side of the tube of an instrument of the above construction, very minute changes in atmospheric pressure might be rendered perceptible; for besides the actual lengthening and shortening of the column by changes of pressure, such a scale would indicate the rise and fall of the cistern, the amount of which would be added to the column. In order to render this instrument portable, the flange can be lowered on to the edge of the exterior vessel, so as to form a lid, and the tube can be released from its fastenings and pressed to the bottom of the cistern; a cork or other soft substance is placed there for it to rest upon; there is also a conical plug made to slide on the tube, which can be lowered so as to stop up the opening formed by the brass collar through which the tube passes.

In order to apply the steelyard balances, the cistern, which is placed within another vessel, in the same manner as the preceding, is provided with a brass collar round its upper edge; the steelyard balance is mounted upon an axis, fixed in the framing; the short arm of the steelyard is made semi-circular, so as to encompass the ring of the cistern, which is attached to the end of the short arm by centre pins; the long arm is provided with a sliding weight and graduated scale, in the usual manner; and in order to ascertain the height of the column, the

lever is brought to a horizontal position, which is determined by a projecting stud, placed over the arm of the lever; the sliding weight is then moved towards the fulcrum, and the height of the column is thus ascertained. The adaption of this plan to the barometer, says the patentee, will not interfere with the ordinary scale, which may be retained with it. There is also a recess formed in the frame to receive the steelyard, when not required to be used.

The last part of these improvements relates to a self-acting apparatus, for registering the indications of a barometer, constructed in the manner hereinbefore described. For this purpose, the inventor places at the back of the cistern a circular plate of metal, covered in front with photogenic paper, of the same size as the dial plate, and makes the centres of the two plates to coincide exactly betwixt the circumference of the dial plate, and the graduated circle on the face of it; a border or margin is left of about an inch and a half in breadth, and across the margin, directly over or under the centre of the plate, he makes a narrow slit; behind the plate, and before the slit, is placed a slip of metal, attached to the cistern balance, the bottom of which, when the mercurial balance is at its highest point, is on a level with the upper end of the slit; therefore the rising and falling of the cistern increases or diminishes the line of light admitted on the photogenic paper; and by causing the registering plate to revolve by a weight, or other means, a circular border is formed on the photogenic paper, the outer edge of which represents correctly the fluctuations of the atmospheric pressure; but as the process only answers for the day time, the inventor proposes to cause the plate to revolve as aforesaid, and to have the point of a black lead pencil acted on in such a manner by a spring, as to trace the

lines on the disc or plate, by which arrangement the fluctuations will be taken during the night.

Claim.—First, the placing of the cistern of a barometer on a spring, or other suitable balance, by the elevation or depression of which balance, the neight of the barometer is ascertained, as well as the range of the cistern; secondly, the placing the cistern of the barometer on mercury contained in a cylinder, which mercury serves the purpose of a spring or other balance; thirdly, the application of the steelyard balance to ascertain the height of the barometric column; fourthly, the application of photography in the manner before described, for registering the indications of barometers.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to JOHN DUNCAN, of Great George Street, in the city of Westminster, gentleman, for "*improvements in machinery for excavating soil.*" Being a communication.

THIS invention may be divided into two parts, and consists, first, in certain arrangements and combinations of machinery, whereby earthy matter may be cut away, or excavated, for the purpose of constructing or forming railways, canals, harbours, and other similar works; and secondly, in certain variations in the arrangement of some parts of the machinery, whereby such invention may be applied to dredging or deepening rivers.

The apparatus, as applied to land excavations, consists, first, of a strong rectangular frame of wood, or other material, mounted upon wheels, which are supported, together

with the machine, on a temporary railroad; at one end of this frame is a strong crane, consisting of a vertical shaft or pillar, with the jib supported in the ordinary manner by diagonal stays, or arms; to the end of the chain tackle is suspended a scoop, shovel, or scraper, made of strong boiler plate iron, and consisting of two sides, end, and bottom, the edge of which latter is provided with four or more projecting points, or cutters, and between these, and at their roots, is a steel edge well tempered, so as to resist stone, or other hard substance with which it may come in contact; the chain tackle is attached to the sides of the shovel, and passes over a pulley at the end of the jib, and over another pulley fixed on the top of the pillar or support of the crane, and from thence to the barrel, upon which it is made to coil; the periphery of the last mentioned pulley is formed with indentations to receive the links of the chain, for the purpose of giving motion to the pulley, which has on its axis a bevil wheel, taking into, and driving a similar wheel, upon the end of an inclined shaft, which shaft actuates certain machinery, fixed to, and supported by, the diagonal arms of the crane. This machinery consists of a barrel, with other appurtenances, round which is passed a chain, with its ends attached to the opposite ends of a beam or arm, which is also fixed to the shovel or scraper. The crane is capable of being moved round, so as to turn the scoop, when elevated, either to the right or left, in a horizontal direction; for this purpose, a "horse shoe pulley," having a groove in its periphery, is affixed to the upper part of the crane; a chain, attached at each end to a transverse bar, passes round this pulley, and over certain horizontal and vertical guide pullies, to a barrel, in such a manner that, by reversing the motion of the barrel, the jib of the crane can be turned either to the right or left. A steam engine is erected at one end of the rectan-

gular frame, or platform, for the purpose of giving motion to the various parts of the apparatus. When commencing operation, the shovel, or scraper, is suspended by the chain tackle, in a nearly vertical position, with the steel points towards the ground; by releasing the clicks, or catches, of the chain barrel, and applying the break, the shovel will be lowered, and force itself, by its own weight, into the ground; then by communicating motion to the chain barrel, the tackle will be raised, and by means of the indented grooved pulley, motion will be given to the shaft, which actuates the machinery on the diagonal arms, which in its turn will force forward the shovel into the ground; at the same time that this motion is going forward, the shovel, or scraper, is being raised or lifted up by the tackle, by which means the shovel has a double motion—a thrusting forward motion, and a lifting motion. When the shovel has become filled, and attained its proper altitude, these motions stop; and the shovel being prevented from returning by the clicks or catches, the other barrel is thrown into gear by means of a coupling or clutch box, and the crane turned round so as to bring the shovel over the cart, or other place of deposit, and by certain arrangements it is turned up so as to empty itself; in which position it is again ready for another operation.

The second improvement relates to a similar arrangement of parts, with some variations, to be fixed in a vessel, and applied to dredging and deepening rivers. The mode of turning round the crane when applied to this purpose, is by fixing on the lower part of the pillar, or axis, a large bevil wheel, which is below deck; a small bevil wheel, keyed on the end of a shaft, takes into and drives the first in either direction. The whole of the apparatus in this part is also driven by a steam engine.

What the patentee claims as his invention is, such con-

struction and arrangement of parts, as will effect the object of digging, taking up, and removing in the manner described, (that is to say) by means of a pendulous scoop attached to a crane or elevated beam, capable of turning horizontally such scoop, and its appendages being worked in the manner before stated; by chains and toothed gear, actuated by a steam engine.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to FRANCIS KANE, of Cumberland Street, in the county of Middlesex, for "*improvements in the construction of fastenings for the posts of bedsteads, and other frames.*"

THE bedstead is put together, so far as regards the joints, in the usual manner, but the method of fastening, or holding such joints, is different, which part constitutes the improvements. The mode of holding such joints or parts together on the old construction, is by two screws, or bed bolts, passing at right angles to each other, through the post, and into the ends of the framing, or bed-sides; but by the patentee's improved method, the bed-sides and ends have a hole bored in them, about one and a half inch, or two inches from the end, in the inside of the bed framing; after the parts have been put together, viz., one bed-side and end together with the bed-post; the two ends of an iron clamp, with a hole in the middle, are inserted into the two holes made in the bed-side and end, and a bed bolt passes through the hole in the middle of the iron clamp, and into a hole formed at the interior corner of the bed-post, at the bottom of which is a nut; thus, by screwing

up this bolt, the ends of the clamp will be brought towards the bed-post, and being inserted into the holes aforesaid, will bind the side end and post together. The inventor prefers to let a plate into the wood, having a hole to receive the ends of the clamp, which will prevent the wood giving way.

The claim is the mode of combining the parts together, as described, with a suitable nut for the screw, when fastening the parts of bedsteads to the rails or framing; and also when fastening the parts of other framings, where three parts are combined together, in a manner similar to that above described.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to Sir FRANCIS DESANGES, of Upper Seymour Street, Portman Square, Knight; and ANGUISH HONOR AUGUSTUS DURANT, of Long Castle, Shropshire, esquire, for "*improvements in apparatus for sweeping and cleaning chimneys or flues, and extinguishing fires therein, which they intend to call 'Ramoneur.'*"

THESE improvements for sweeping and cleaning chimnies, and also for extinguishing fires therein, consist, first, in a mode of constructing the joints of the rod for moving the cleansing apparatus. On one end of each of the rods to be joined together, are portions of a tube, the outer ends of which respectively form an universal joint, having concave and convex parts fitting into each other; through the centre of the concave part is a hole leading into the tubular part, which is provided with a spiral spring, connected by a hook, or pin joint, to the ball, or convex joint,

in such a manner, that the tension of the spring may always have a tendency to keep the rods in a straight line; the upper part of this joint is connected to the rod by a link and two pin joints, the object of which is to allow the rod to be folded up when stowing it away; this part of the joint is held in a straight line by a sliding tube, which extends from that part forming the joint on to the rod, and is held by a catch, or stop, when the rod is in use; just below the bend, or joint of the rod, is a ring having two projecting arms, or axes, at right angles to the rod, and upon which are two pullies of a conical form, for the purpose of assisting the rod over the uneven parts of the flue or chimney.

Claim.—The mode of constructing an universal joint, as described; also the mode of constructing the folding joints, as described.

The second improvement relates to another mode of constructing a joint, which the patentees term a flexible joint. For this purpose, the two ends of the rod are connected together by a flat link, twisted in the middle, so that one end of the flat part is at right angles to the other; this link is fastened to each end of a portion of the rod by pin joints, and the joint of the rod so connected is covered with a spiral spring, having an external covering of leather, or other flexible material, bound firmly round it; which is stated by the patentees to be sufficient, when the parts of the rod are bent so as to form angles with each other, to draw them into a straight line.

Claim.—The mode of constructing the flexible joint to parts of a rod used for moving apparatus for sweeping and cleansing chimnies.

The third improvement consists in a mode of applying arms and rollers, and of constructing the joints of such arms. Above the brushes, when in a position for entering the flue

or chimney, are three arms, provided with pullies, or rollers, at their extremities; two of these arms branch out or extend from the middle arm, which is in a vertical position, and only about half the length of the other two; which two have also joints, acted upon by the spiral springs in a similar manner to those first described, with this exception, that the joint is not universal. These arms are intended to guide the brush through the bended parts of the flue or chimney into which it is introduced; the jointed arms, with their rollers, when approaching such parts, give way, and thus facilitate the introduction of the apparatus into the flue. For the purpose of assisting the brushes to pass over sharp corners in the flue, there are two iron guides screwed on the face, or that part of the brushes containing the bristles, and extending in a sloping direction above and below the head of the brush, and terminating in projecting arms, having a nick, through which the aforesaid guides pass, and are held by a pin passing through them; these guides have a slot at their ends, through which the pin passes, to allow the brushes, as will be hereafter described, to contract; the ends of these guides below the brush or brushes, are also provided with rollers or pullies, for the purpose before described.

Claim.—The mode of applying arms and rollers, also a mode of constructing joints of such arms when used therewith, or for combining the parts of the rod, for the purpose of moving the apparatus for the sweeping and cleansing of flues.

The fourth improvement relates to expandiug brushes. The brushes for a rectangular flue are fewer in number, each brush has two tubes, one at each end, fixed to its back part; these tubes slide into other tubes; at the opposite ends of which, two other tubes, supporting a similar brush, are inserted; and in the inside of this com-

bination of sliding tubes is placed a spiral spring, which extends through the centre or connecting tube, to the bottom or ends of the tubes supporting the brush heads. It will be seen by this arrangement, that the two brushes so affixed, will, by the action of the spiral spring, be held in an extended position; and that upon any pressure being applied by passing through a contracted opening, the brushes will give way. The other two brushes for completing the rectangle are fixed in the same manner, by tubes being placed across the others, and the brushes inserted in the same manner. These tubes have a slot and a stop, to prevent them from getting out of their place. There is also another description of this brush given, whereby the same effect is obtained, and which is shewn, applied to a circular brush.

Claim.—The modes of constructing brushes for sweeping, whereby they are caused to act by means of coiled springs, as described.

The fifth improvement relates to brushes with moveable arms. The ends of the arms, in this case, move upon a joint, and are acted upon by a spring, in a similar manner to the joints of the rods; by this arrangement, the brush, in passing through contracted openings, will bend and give way to such parts.

Claim.—The mode of constructing an apparatus for sweeping chimnies, as described.

The sixth improvement relates to an apparatus for extinguishing fires in chimnies; and consists in a combination of tubes and springs, in the same manner as those described with regard to the expanding brush in the fourth improvement, with this exception, that in the place of brushes, solid plates of iron are used. This apparatus, says the patentee, introduced into a chimney with a suitable instrument, will effectually stop the draught, by the

expanding plates closing up the aperture, and thus extinguish the fire.

Claim.—The mode of constructing an apparatus for extinguishing fires in chimnies and flues, as described.

SPECIFICATION enrolled 7th September, 1842, of a PATENT granted 7th March, 1842, to ROBERT FRAMPTON, of Cleveland Street, Fitzroy Square, in the county of Middlesex, coachmaker, for "*improvements in the construction of hinges.*"

THESE improvements relate to such hinges as require the doors or flaps upon which they are fixed to be covered, though they may be used for connecting flaps of doors that do not require covering. The plates of these hinges have each projecting ears, or lugs, between which the two ends of a bent lever or link are placed, and are connected together by pins passing through them, upon which the curved lever or connecting link moves. In fixing this description of hinge to certain flaps which require to be opened, the plates of the hinge are sunk level with the face of the flap, which can be covered if required, so that no appearance of hinge is seen; and the flaps, when opened, can be brought back to back. There are two other modifications of this hinge shown in the Specification, wherein the mode of connecting the plates is the same, viz., by connecting links, the form of which differs somewhat from the first, one of them having projections at each end of the link, so as to allow the door or flap to open at, or nearly at, right angles.

The inventor claims the mode of combining the parts described, and shown in the Specification, into a hinge; and also the mode of combining the parts described with a hinge.

SPECIFICATION enrolled 8th September, 1842, of a PATENT granted 8th March, 1842, to WILLIAM CATFORD, of Chard, in the county of Somerset, mechanic, for "*certain improvements in machinery for making or manufacturing lace or other netted fabrics.*"

THESE improvements consist, first, in certain peculiar adaptations of the principle of the jacquard, for the purpose of working, longitudinally, the guide bars of lace machinery, by means of which a great variety of figures can be introduced into the fabric of the lace.

This apparatus is shown in the drawings as being affixed to the left hand end of the machine. Near the end of the main shaft, which in this machine requires to be elongated, are two cams, which impart motion to two rectangular frames moving in a vertical position in slides. These frames carry, at their upper end, a square barrel or roller, turning upon an axis; each of which is provided with an endless chain composed of a number of plates, jointed together in such a manner as to form a chain of plates: each of these plates is perforated with a number of holes, into which are screwed, or otherwise fixed, studs or projecting pins of different heights. These plates and projecting pins, when elevated by the cams, come in contact with the underside of right angle levers moving on an axis, the opposite or vertical ends of which are connected to the ends of the horizontal guide bars of the ordinary lace making machine. Therefore, as the main shaft revolves, the barrels, or square rollers with the plates containing projecting studs resting on the top side or square of the roller, will be brought alternately against the respective cranked levers, which will be raised by the projecting studs: after the plates have lifted up the levers, so as to move the guides,

they fall by their own weight. It will be necessary, in forming the pattern, to give motion to the barrels, so as to bring the different plates, in succession, under the ends of the levers; for this purpose, a third cam is keyed on the main shaft, which also gives motion to a rectangular frame supporting a vertical rod, having on its upper end a rack, taking into and giving a reciprocating motion to a wheel. On the axis of each of the square rollers is fixed a wheel, which, as the frame falls, drops into gear with the reciprocating wheel, and moves the barrel one-fourth of a turn, or revolution, and thus brings on another plate,—and in like manner with the other barrel. By this arrangement of parts, the plates will be brought, in succession, under the horizontal arms of the right angled levers, and will be raised, and the vertical arms will be drawn, and thereby shog, longitudinally, certain of the guide bars, and give such movements to the warp threads as are required for making patterns in lace fabrics. The object of making the studs of different heights is to move the guide bars different distances, according to the pattern of lace required to be produced, as will be understood.

The second improvement consists in adopting similar contrivances, in connection with certain levers and cams, for the purpose of working, both longitudinally and transversely, extra bars, upon which are fixed a series of bent pins or hooks, called stump points, so as to be introduced between the warp threads; by means of which, the situations of such threads are shifted during the ordinary operations of the machine, for producing different patterns or figures in the fabric. The object in introducing these stump points between the warp threads, is, that when so introduced, a shogging or longitudinal movement given to the bars upon which they are fixed, by means of the jacquard, will cause the points to draw certain of the warp

threads sideways, or out of their perpendicular position, and thereby effect such alterations in the course or direction of the threads as will produce patterns or ornaments in the lace fabric.

The third improvement consists in the peculiar adaptation of the jacquard apparatus, or principle, to lace machinery, for moving transversely the situations of the guides carrying the warp threads, their longitudinal or shogging movement being effected either by cam wheels, as usual, or by the application of the jacquard apparatus. The jacquard, in this part of the invention, is shown as applied to the back part of the machine; and in place of the metal plates with projecting pins, the patentee employs cards perforated in the same manner as the ordinary cards used in figure weaving. The square roller over which they pass, as in the foregoing, moves in a vertical position, by means of cams fixed on an auxiliary shaft; by this means, the cards are forced against the ends of a number of vertical pins of different lengths: those pins which are not to be acted upon, pass through the holes or perforations in the card.

The claims are—1st, the peculiar construction of endless series of plates of metal, or other suitable material, connected together by joints, each plate having a series of studs of different lengths or elevations, for the purposes hereinbefore described; 2ndly, the application, or adaptation, of double jacquard barrels to lace machines, which barrels are for bringing successive plates or cards into operation at the end or other suitable part of the machine; 3rdly, the giving alternate action to such barrels, by means of racks, as described; 4thly, the means of giving sliding movements, through the agency of jacquard series, directly to levers connected to the longitudinal bars, and also to levers by which the stump points are worked; 5thly, vibrat-

ing the guides to and fro, transversely, between the series of stump points, by means of the jacquard apparatus; and also the several parts of the improvements, in connection with lace machinery.

SPECIFICATION enrolled 10th September, 1842, of a PATENT granted 10th March, 1842, to HENRY SMITH, of Liverpool, engineer, for "*improvements in the construction of wheels and breaks for carriages.*"

THESE improvements relate, in the first place, to the construction of railway wheels with cast-iron centres, wood felloes, and wrought iron tires, combined with steel, so as to present a steel face to the line of rail; and secondly, to a mode of connecting together all the breaks of railway carriages of a train in such a manner, that they may all be acted upon when desired by the man attending the engine. The nave of the wheel, together with the spokes and ring, are made of cast-iron, and in one casting. A screw-bolt is passed through the tire and middle of each of the pieces forming the wood felloe, and also through the cast-iron ring, in which place they are held by nuts. A portion of each corner of the pieces of the wood felloe is cut away, so as to form at the corners adjacent to the cast-iron ring, a triangular cavity or recess, into which is introduced an inverted V (Λ), or triangular piece of iron, whose exterior surface is caused to press against the corners of the parts forming the wood felloe, by a corresponding triangular wedge, forced by means of a screw, between the aforesaid wedge piece and the periphery of the ring; thus causing the wedge piece, together with two of the parts forming the felloe, to be forced outwards, in a direction from the centre of the wheel, against the interior surface of the tire.

There is also another mode of holding the tire by a similar application of the V wedge pieces; in which case, such wedge piece is divided in two parts, by a line drawn from the centre of the wheel, and is therefore caused, by the force applied to the triangular wedge, to separate, each part acting simultaneously on the parts of the wood felloe. The underside, or base of the triangular wedge, is provided with a square hole, which receives the head of a screw-bolt; the screw part of these bolts passes, or is received into, a cylindrical recess or hole formed in the spokes of the wheel; thus by screwing down a nut of each bolt, which rests on the edge of the hole, the bolt will be forced outward, and thus cause the wedge pieces, together with the wood felloes, to separate, and press against the interior surface of the tire; for which the inventor claims, first, the mode of separating the parts of the wood felloes of railway wheels, by means of wedges forced outwards in radial lines in a direction from the centre of the wheel; and, secondly, the mode of separating the parts of the wood felloes, by means of two wedge pieces being caused to separate by a wedge, as described.

The next part of these improvements relates to a mode of applying steel to railway tires, so as to present a steel face to the line of rail. The bars for forming the tire are rolled with a groove throughout their length, into which is to be inserted a steel bar with bevilled edges. The form of the tire, previous to introducing the steel, is somewhat hollow, or concave, on the opposite side to the groove, that is, in a transverse direction, so as to make the groove sufficiently wide to receive the steel, which is then to be placed in the groove; the tire, together with the steel bar, is then passed through other rollers, with grooves suitable for giving it a proper shape; during which process, the edges of the groove become pressed over the

bevilled edges of the steel bar, and the two parts firmly united or bound together.

The claim is for the mode of applying steel to railway tires, whereby the sides of the groove formed therein are pressed over bevilled edges introduced into such groove.

Lastly, a mode of connecting breaks. Under each carriage, and between the leading and driving wheels, is a transverse shaft, having at its end an arm, firmly keyed thereon; to each end of this arm, which is in a vertical position, is attached, by pin joints, two connecting rods, connected at their opposite ends to breaks, having a socket, sliding on a horizontal bar, which is in a line with the centre of the wheels. There is another vertical arm, or lever, keyed on to the horizontal shaft, about the middle; to the end of this arm is attached, by a pin joint, another connecting rod, extending to the end of the carriage, and fixed by a stud to a segment of a wheel moving upon an axis bolted to the cross timbers, or framing of the carriage; by this arrangement it will be observed, that on imparting a backward and forward motion to the segment, the transverse shaft will, by means of the aforesaid connecting rod, have a reciprocating motion, and the breaks will be brought into action; or, otherwise, by reversing the movement of the segment, which is effected in the following manner:—A line of shafts extends the whole length of the train, coupled together by socket-joints, each carriage having a shaft working on bearings bolted to the underside of the framing, which shafts have at one end a socket for receiving the next; through these sockets are slots, with a key passing through them for the purpose of coupling the same and giving the shafts a little play longitudinally; each of these shafts has a worm-wheel taking into and giving motion to the segmental wheel; thus, by

giving motion to the line of shafts, the breaks of each carriage will be acted upon simultaneously. On one end of this line of shafts is a bevilled friction wheel, which can be alternately acted upon by two similar friction wheels, between which the former is placed; the latter are keyed on to each end of a hollow axle, through which passes one of the axles of the tender, or the axle of that particular carriage which is intended to give motion to the breaks: the hollow axle is caused to revolve by a fixed key in the axle of the tender, or other particular carriage, upon which the hollow axle moves in a lateral direction so as to bring either of the bevilled friction wheels into action, by means of a lever communicating with the engine driver; it will therefore be seen by this arrangement of parts, that on moving the lever in one direction, the line of shafts will be acted upon by the friction wheel, and give motion to the segments, and bring all the breaks into action; and by moving the lever in an opposite direction, the motion of the shafts will be reversed, and the breaks withdrawn from the wheels.

There is another method shown, whereby the breaks of a train are acted upon simultaneously, by means of a friction chain passing over a pulley fixed on the axis of the tender; the friction chain is brought into action, or close contact with the periphery of the pulley, by means of a lever; the opposite end of the chain is connected by a pin-joint to the end of a line of rods connected with the breaks of each carriage; these rods are also connected to each other at the ends of the carriage, by a combination of levers, which allow the carriages to approach each other without affecting the breaks; on moving the handle of the lever, the friction chain will be brought to bear on the pulley, and the line of rods will be pulled in a direction of their length, and thus bring into action all the breaks.

The mode of connecting this line of rods to the breaks is such, that each break can be acted upon separately and independently of the rest.

Claim.—The mode of working the breaks by putting them into action by means of one of the axles of the wheels of a locomotive engine, or of the tender, whereby the engineer may, when required, cause the breaks to act on the wheels of the railway carriages of a train.

SPECIFICATION enrolled 10th September, 1842, of a PATENT granted 10th March, 1842, to RICHARD BEARD, of Earl Street, Blackfriars, in the city of London, gentleman, for "*improvements in the means of obtaining likenesses and representations of nature.* Being a communication.

THE invention relates to certain modes of colouring pictures produced by the daguerreotype; whereby likenesses and representations of nature will be obtained in a more finished style than from the simple process of Daguerre. This improvement consists in the deposition of certain colours on the different parts of the picture in succession, the outline of each colour being regulated by a screen or pattern. After the picture is prepared, it is placed in a rectangular frame with a projecting edge of about $\frac{1}{20}$ of an inch, a piece of glass or mica is placed on the frame, so as to completely cover the picture; a tracing is then made on the glass with a little colouring matter corresponding with the part of the picture which it is intended to colour. A light rectangular frame, covered with tracing paper, is to rest accurately upon the original frame, which is to be placed upon the glass, and the original tracing copied on the tracing paper; the paper between the lines

so traced is then cut out with any convenient instrument. By this means, when the glass, which previously covered the picture, is removed, it will be found, on applying the tracing paper screen, that all parts of the picture which are cut out between the lines of the tracing, and exposed, are ready to receive the colour. A number of patterns or screens of different parts of the picture being prepared in the same manner, each having a part or parts cut out, are to be used in succession for the picture to be coloured, each screen allowing the colour to be deposited at those parts where the screen is cut away.

In preparing the colours, the dry colours such as are employed in the arts, are to be ground to an impalpable powder with a weak solution of gum arabic, starch, or other adhesive matter. When gum arabic is used, the patentee employs about thirty grains to one quart of water; after the operation of grinding with the above solution, the colours are then to be dried in a stove, the temperature of which must be less than 212° Fahrenheit. The colours are then to be sifted through fine sieves and kept from moisture. A number of boxes are then provided, the base of which should be somewhat larger than the frame of the picture; a small quantity of colouring matter, about fifty grains, is placed in each of these boxes, which are then ready for use: a dust is then made in the box by rubbing the inside of the box with a large fine brush, and when the colouring particles are held as it were in suspension in the box, the picture, together with the screen, is inserted, and such particles are allowed to settle on the frame, which is afterwards taken out and the colour removed from the shaded parts with a pair of small bellows, and by breathing on the picture, the colour will attach itself with sufficient firmness as not to be easily removed, such colours being prepared with gum as before described for that purpose.

By the above it will be seen that the colours are used singly, and in succession, over the different parts of the picture, the form and extent of the deposition being regulated by patterns traced from the picture.

Another mode of colouring such pictures is by using transparent water with gum, and in place of actually putting such colour on the surface of the picture, it is laid on the glass. The glass for this purpose is placed over the picture, and a tracing taken from the picture in the manner before described; the glass is then removed, and the colour laid on the underside or opposite side to which the tracing was taken by an artist, with small hair pencils; the glass is afterwards placed in its exact position with the picture, and as close to it as possible without coming in contact, in which position, it will be observed, that the picture is seen through the colours, which produces an effect similar to that of a coloured picture.

Another mode is by laying the colours, prepared as above, on to the picture, in a dry or pulverized state, with small brushes, which is done by dotting; and by breathing on the picture, the colours will adhere in the manner described.

SPECIFICATION enrolled 10th September, 1842, of a PATENT granted 10th March, 1842, to WILLIAM EDWARD NEWTON, of Chancery Lane, civil engineer, for "*certain improvements in boilers, furnaces, and steam engines.*" Being a communication.

THIS invention consists in the peculiar construction of the parts of a steam boiler for generating steam, whereby the heat given out from the fire is said to be more effectually applied than in boilers of the ordinary construction; and also a perfect circulation of fluid is kept up.

This improved apparatus for generating steam consists of a cylindrical vessel, which the patentee calls the reservoir, and one, two, or more conical tubes called boilers; these conical tubes may be made of boiler plate iron, and elongated at the end with copper; such elongated part being fixed to the iron tube by means of a bolt passing up the interior, and fixed in such manner as to draw the two parts together. The end of the copper tube consists of a hemispherical cup, brazed so as to form the bottom of the boiler;—one or more of these tubes are rivetted or otherwise affixed to the underside of the reservoir. This reservoir is to be built round with brickwork, when it is required to be stationary; if otherwise, it should be inclosed in a case, and the space between filled with water. The conical tubes are therefore suspended from the underside of the reservoir in the flue, with their ends in contact with the fire. A communication is made between the two vessels by means of pipes passing from the reservoir nearly to the bottom of the conical boiler for the supply of water, from the reservoir to the boiler; there is also another pipe, which passes from the upper part of the boiler or conical tube, through the water in the reservoir for the escape of steam from the boiler—over the top of this tube is a cap. Therefore, by the application of heat from the furnace to the ends of the conical tubes or boilers, and also the exterior surface of such tubes being exposed to the action of the hot air passing up the flue, the steam generated, in escaping from the boiler by means of the aforesaid pipe into the reservoir, will be directed downwards by means of the cap placed above the end of the tube on to the surface of the water, and by its elastic force will cause the water to descend through the pipe and supply the place of that portion which has been evaporated; by this means a continual circulation is kept up, and the bottom of the

boiler protected from burning; but, if by accident or inattention of the engine driver, the boiler should become empty, the brazing will melt and the hemispherical cap will be blown out and the fire extinguished.

Claim.—The peculiar construction of a boiler or apparatus for generating steam by combining a reservoir for containing water and steam, with one or more vertical tubes, arranged in any convenient manner so as to expose an extensive surface to the action of the fire, such vertical tubes being supplied internally by a pipe or pipes, for the purpose of injecting water from the reservoir on to the bottom of the vertical tubes, thereby keeping up a continuous flow or circulation of water through the boiler, and preventing it from becoming injured by the action of the fire.

SPECIFICATION enrolled 13th September, 1842, of a PATENT granted 21st March, 1842, to EDWIN WARD TRENT, of Old Ford, Bow, in the county of Middlesex, rope maker, for "*an improved mode of preparing oakum and other fibrous substances for caulking ships and other vessels.*"

THESE improvements consist in preparing new or picked oakum, or other fibrous substances to be used as oakum, for caulking ships and other vessels, by forming them into even and soft rovings or slivers of suitable dimensions for caulking. This is stated by the inventor to be a great improvement over the present mode of rolling the oakum on the thigh and knee of the caulker, whilst in the act of caulking.

The mode of preparing oakum composed of new hemp, hemp, tow, or of old or second-hand ropes, or rope yarns, picked in the ordinary manner, is stated by the patentee

to be as follows:—If new hemp is used and the fibres are found to be too long, they are, in the first place, passed through a breaking machine to reduce their length (in order that they may not clog or hinder the working of the carding machine); the fibres are then passed through an ordinary carding machine, which delivers them in continuous bands or slivers of sufficient thickness for caulking purposes. When the fibrous substances have never been tarred, a number of slivers, produced as aforesaid, are spun or formed into a stout strand or haul of yarn, of sufficient thickness to pass properly through a rope nipper, and this strand is afterwards tarred by passing it through tar, tar and tallow, tar and oil, or other suitable mixture, kept at or nearly at, a boiling heat, so as to render the oakum impervious to moisture, the operation being similar to that of tarring yarns for making ropes. After the yarns or haul of yarns have been tarred, they must be separated into the original slivers and hung up to dry; while they are drying they are to be opened out to prevent them from adhering too closely together. With regard to ordinary picked oakum, or what is called second-hand oakum, the same process may be followed in preparing it into slivers of uniform size and substance for the caulker.

Claim is for the preparing of oakum, whether from new hemp, or from old second-hand stuffs, or from ordinary picked oakum, or any other suitable fibrous substances, to be used for caulking ships and other vessels, by passing them through suitable machinery, and then forming them into even and soft rovings or slivers of uniform size throughout their length. For fibrous substances which have never been tarred before, the patentee further claims the tarring and opening process, when applied to such substances and for the purposes aforesaid.

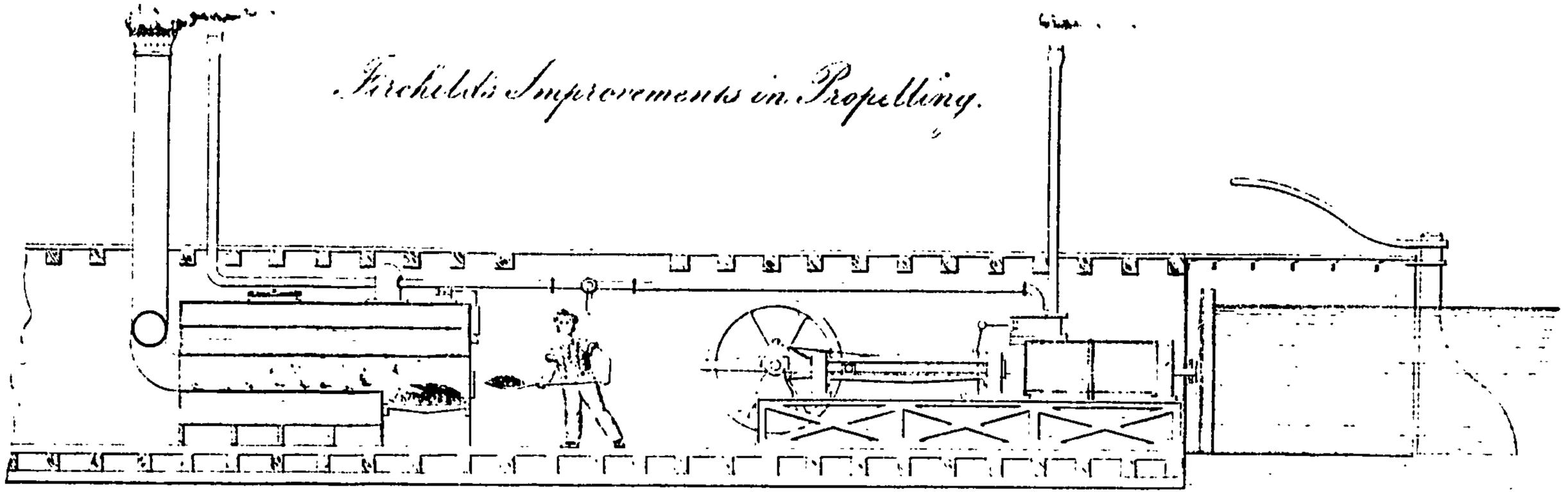
SPECIFICATION enrolled 14th September, 1842, of a PATENT granted 14th March, 1842, to CHARLES WILLIAM FIRCHILD, of Wesley Park, in the county of Worcester, farmer, for "*an improved propelling apparatus for marine and other purposes.*"

THIS improvement relates to the application of two square pistons to act upon water admitted into chambers in which they move, for the purpose of propelling the vessel, and consists of a pair of engines with a boiler or boilers, and other apparatus for working the same.

The cylinders of the engine are horizontal, and are fixed at the stern of the vessel; the pistons are continued through the bottom or opposite ends to which the crank shaft is situated, and are also continued through the stern of the vessel; upon this latter end of each of the pistons is fixed a square piston, working in a square box or chamber, open at the end. These pistons are made to fit tight by packing on the two sides and bottom, so as to prevent water from getting behind, the top of the chamber being open, or so as not to touch the pistons. Thus, on setting the engine to work, the pistons will alternately move backwards and forwards in the chambers, which have been stated to be open at the outer ends, and thus act or press against the body of water admitted at each stroke.—*(See the Drawing.)*

Claim.—The improved propelling of pistons acting upon water admitted into chambers at the stern of the boat or vessel.

Archibald's Improvements in Propelling.



SPECIFICATION enrolled 14th September, 1842, of a PATENT granted 14th March, 1842, to REUBEN PARTRIDGE, of Cowper Street, Finsbury, in the county of Middlesex, engineer, for "*certain improvements in machinery or apparatus for splitting and shaping wood into splints, for the manufacture of matches and other similar forms.*"

THESE improvements in machinery, or apparatus, for splitting and shaping wood into splints, for the manufacture of matches and other similar forms, consist in the employment of a perforated metal plate, through which blocks of wood are to be passed by means of pressure, the perforations in such plates being so shaped and situate as to cause the block of wood, when pressed against its face, to be divided or split into a multitude of small rods or splints; and these splints protrude through the perforations of the plate in regular formed rods, either of a cylindrical, square, polygonal, or other figure, according to the shapes or dimensions of the perforations in the plate.

The drawing represents the plan and section of one of these plates, having a multitude of circular holes pierced through it. The forms of the perforations are cylindrical throughout, except at their openings on the face, where they are slightly countersunk, for the purpose of presenting sharp cutting edges to the wood when pressed upon it, and in order to afford more easy entrance. The size of the perforations in the plate must depend upon that of the required splints or matches to be produced; but it is to be observed, that they must be as close together as possible, allowing sufficient substance of metal to afford strength and resistance to the pressure when the wood is forced through. The reason why the apertures must be so closely contiguous is, that there may be as small a space of

surface or blank between the holes as possible, in order that resistance to the passage of the wood may be avoided, and that indeed the whole area of the block of wood may be compressed, laterally, into the countersunk openings, and forced through the cylindrical perforations. Though it is intended generally to split the wood, and form the splints into cylindrical rods, yet the patentee does not confine himself to that form, as the perforations in the plate may be made of any other figure, and thereby enable splints of other forms to be produced by forcing wood through them. The plate shewn in the drawing has a steel face, strengthened by a bell-metal back. The patentee does not limit himself to any particular kind of metal, or compounds or combinations of metals, nor to any precise dimensions; but that which is shewn in the drawing being about three inches wide, by six inches long, and nearly an inch thick, he has found to answer the purpose: this plate may be employed in connexion with any suitable pressing apparatus. The mode which has been found to answer is, by fixing the back of the plate against a firm resisting block, having an aperture equal to the area of the perforations in the plate, and then placing the end of the piece or pieces of wood, in the direction of the grain, against the face of the plate, within the area of the perforated parts. A plunger or lever, or any other suitable mechanical agent, being then applied to the back or reverse end of the piece of wood, it may be forced through the perforations in the plate, being first split as it advances, by the cutting edges of the holes, and afterwards compressed and driven through the perforations in the plate, and coming out on the opposite side or back of the plate in the form of a multitude of distinct splints, according to the shapes and dimensions of the perforations.

SPECIFICATION enrolled 15th September, 1842, of a PATENT granted 15th March, 1842, to ALFRED GREEN, of Sheffield, in the county of York, surgical instrument maker, for "*improvements in trusses, or surgical bandages.*"

THESE improvements consist in a mode of constructing trusses, whereby they are rendered more compact, and also made to sit more closely on the part affected, and are not liable to shift after being properly applied.

This improved truss consists of a concave plate of metal, with the convex side padded, the concave side being covered with a stout piece of leather; to this side is fixed a vertical ogee steel spring, attached at its upper end to the body-belt, by an eyelet. The ogee spring, when the truss is put on, sinks into the concavity of the plate, and thus renders the plate less bulky. The spring is connected to the plate by an eyelet; but it is also shown connected to the plate by a strap or loop, made of leather or other suitable material, through which the spring, which is also covered with leather, passes; by this arrangement, the plate can be slided on the spring, so as to raise or lower it as may be required.

The patentee claims, first, the mode of constructing trusses, or bandages, with a perpendicular spring and steel plate; secondly, the mode of fastening the perpendicular spring to the body-belt of trusses and other surgical bandages; thirdly, the mode of fastening or connecting the various parts of trusses and other surgical bandages, by means of eyelet-holes instead of buttons, studs, and other means heretofore used; fourthly, the mode of connecting the perpendicular spring to the pad, or cushion, by a loop or slide of leather or other suitable material, by means of which the pad, or cushion, may be raised or lowered as may be required.

SPECIFICATION enrolled 17th September, 1842, of a PATENT granted 19th May, 1842, to WILLIAM BRUNTON, of Neath, in the county of Glamorgan, engineer, for "*an improved method, or means, of dressing and separating metals or minerals from other substances.*"

THE first part of the invention relates to a novel mode of separating the various qualities of ores, by letting them fall by their own gravity through water; and in proportion to their weight, and the time they are in descending, the metallic particles will be conducted into separate vessels provided for their reception. The apparatus for this purpose consists in a cylindrical tank, either constructed to stand on the ground, or excavated, and from ten to twenty feet deep; another vessel, concentric with this tank, extends to within a few feet of the bottom, through which the mineral ore is precipitated; a shaft passes down the centre of this chamber, carrying at its lower end, and just below the bottom of the chamber, a board, at an angle of about 60 degrees, which conducts the ore into a number of inclined radial troughs, and from thence into tubs or buckets; these are six in number, and are, for the sake of perspicuity, designated Nos. 1, 2, 3, &c. By turning a handle fixed on the upper part of the shaft, the inclined table can be brought successively opposite the troughs leading into any of the aforesaid buckets which are placed round the bottom of the tank, and which can, by means of chains, be drawn up between the tank and concentric chamber. The lid, or cover, of the concentric chamber, is constructed of two parts, and consists, first, of a circular board, about three inches thick, with radial slots cut through, about six inches wide at the outer circumference; underneath this board is a corresponding piece of wood, perforated in the same manner, and moving upon an axis, both of which

are covered with sheet copper; therefore, by bringing the solid parts of the bottom revolving cover opposite the perforated parts, in the top, such parts will form boxes, or cavities, for containing the ore; and by turning the bottom cover so as to bring its opening opposite the top cover, the mineral contained in the cavities will simultaneously pass through, and drop on the inclined board, and be conducted by one of the inclined troughs into a tub or bucket. The ore, previous to going through the process of separation, is to be passed through sieves, having holes not larger than $\frac{3}{8}$ of an inch in diameter; the tank, and also the precipitation chamber, being filled with water so as to cover the lids, which are about two inches below the surface. The ore, being placed in the radial cavities, is precipitated into the water, and those particles which descend through the water in the first 10 seconds, are conducted into No. 1 tub, or bucket, and those which fall through from 10 to 20 seconds, are conducted into No. 2, and from 20 to 30 seconds, into No. 3, &c.; the operator stands on the cover of the cylindrical tank, and by the aid of a stop watch, or pendulum, sees the time to move the handle; which time can be varied according to circumstances. There is another mode of effecting the same by a different arrangement of inclined troughs, and also of giving motion to the handle, by weights; and in the application of what the inventor terms a chronometric barrel; for which he claims, the free precipitation of the ores or materials in water, and the separation of them according to the time of their falling, as described.

Secondly—For the purpose of separating ores and materials containing metals or minerals, into classes of the same bulk, the patentee constructs a series of square or oblong sieves, fixed one above another, and about $1\frac{1}{2}$ inch apart, and varying in length, and also in the meshes, the

top sieve being the longest and coarsest; the whole of these sieves are contained in a cistern, and immersed in water, the metals, or minerals, being placed on the series of sieves, a vertical, and also a horizontal motion is given to them, by which contrivance the water, when the sieves are being lowered, will pass through the reticulate work, and the lighter parts of the ore will be, as it were, suspended: at this moment the sieves move backward, in a direction of their length, and the particles will be carried, or caused to approach the end of each sieve, where they fall off, and are received into separate compartments provided for their reception.

Claim is the mode of discharging the classified ores, or materials, from the respective sieves into separate compartments by the motions described, in conjunction with the action of the water.

Thirdly—for the purpose of separating ores and minerals by washing, the inventor employs a square or oblong cistern, filled with water, in which is an oblong table, supported in an inclined position by four chains. This table is provided with longitudinal grooves, down which the mineral passes; it has also deep grooves for receiving the earthy matter, which is conducted into a separate receptacle; a percutient motion is given to the table, for the purpose of agitating and driving the minerals forward. The principal novelty in this apparatus is to drive, by means of a paddle wheel, a stream across the table, which is conducted from the wheel race, and through a trough across the table, the velocity of which can be regulated by the motion of the wheel; and what the inventor claims as new, with respect to the washing machine, is, the application of the cross stream of water.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to SYDNEY JESSOP, of Sheffield, in the county of York, merchant and steel manufacturer, for "*an improved mode of preparing wrought iron intended for wheel tires, rails, and certain other articles.*"

AFTER the iron has been prepared, or manufactured into the shape intended for wheel tires, rails, &c., it is placed in a furnace for the purpose of carbonizing, or hardening it. For this purpose the inventor uses a furnace of the ordinary construction; and in piling up, or placing the tires or rails in the furnace, a layer of charcoal, or other carbonizing fuel, is laid between those surfaces only which are intended to be hardened; in hardening the rims after being formed into a hoop for the wheel, they are piled one upon another, and the charcoal placed between the outer surface and the sides of the oven; by which arrangement the interior surface will be protected from the action of the fuel. After the process of hardening, the rims are placed between two iron rollers fixed in a frame, the top roller having a groove to receive the tire, which is to be submitted to the pressure of the rollers, for the purpose of laying the blisters and uneven parts which are raised by the hardening process.

Claim is for the preparing of such wrought iron as is intended for wheel tires, rails, tram-plates, "switches," &c., in a carbonizing furnace, in such manner as to expose what are intended to be their wearing surfaces only to the process of carbonization, and protecting their other surface therefrom by the arrangement of position and fuel; and afterwards rolling, hammering, swaging, or otherwise consolidating the metal so as to make it hard, compact, and even.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to ZACHARIAH PARKES, of Birmingham, in the county of Warwick, manufacturer, for "*certain improvements in apparatus for grinding and dressing wheat and other grain.*"

THESE improvements relate to apparatus for grinding wheat and other grain, and consist in the application and combination of a "steel mill," denominated a domestic mill, with a dressing apparatus, by which the various products of grain are separated. The steel mill employed for this purpose is of the ordinary construction, consisting of a conical barrel, revolving within a cylinder, the surfaces of which are cut so as to form teeth, and are case-hardened; on the axis of the revolving barrel is a fly wheel, with a handle fixed to one of its arms for giving motion to the machine. Underneath the steel mill is the dressing apparatus, which consists of a reticulate cylinder fixed in an inclined position; this cylinder is composed of an iron frame, covered with wire gauze, in three lengths, and of different degrees of fineness; below this cylinder is the drawer, divided into compartments, each division board or plate being placed opposite the joinings of the wire gauze; within this cylinder is a shaft, carrying three brushes, placed equidistant from each other, and extending nearly the length of the cylinder, and fixed at such a distance from the axis as to press lightly on the interior surface of the cylinder; motion is given to these brushes by a band working in a nick in the periphery of the fly wheel, and passing round a pulley fixed on the end of the shaft. Motion being given to the machine, and the hopper, which is placed above the steel mill, being supplied with

grain, such grain, in passing through the mill, will be reduced to powder, and pass through a channel or passage to the upper end of the inclined cylinder, and the revolving brushes will carry the same round, and cause the particles to move in a gentle stream towards the lower part of the cylinder. Such particles as pass through the meshes into the first compartment, if wheat be used, will be fine flour; and the particles which fall into the next compartment constitute second flour; and the pollard, or sharps, will pass through the meshes into the third compartment; the bran passes through a hole in the end of the cylinder, and is conducted into a fourth compartment.

The inventor claims, first, the construction of a domestic mill, by combining a steel mill with a dressing apparatus; and secondly, the general arrangement of parts of the domestic mill described, whether such mill consists of a steel mill combined with a dressing apparatus, or of any other kind of mill combined with a dressing apparatus.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to WILLIAM PALMER, of Sutton Street, Clerkenwell, in the county of Middlesex, for "*improvements in the manufacture and preparation of pills, and some other articles of a medicinal and remedial nature.*"

THIS invention consists, first, in a mode of covering pills, by cementing them between two pieces of thin paper, or other suitable material, the covering of which is effected by two hollow hemispheres. In order to cover the surface of pills, the inventor takes a piece of paper and pastes the surface; the pills are then put upon it, at convenient distances from each other, and a second piece of paper,

pasted in the same manner, is laid on the top; the pills, together with the paper, are then placed upon a small machine, composed of a rectangular frame with a plate in the middle, having a hollow hemisphere, above which is an instrument in a vertical position, moving in a guide, and having a corresponding cavity in its end. The apparatus has also a number of little rollers the whole length of the frame, over which the pills and paper are drawn, and successively brought under the hemispherical cavities; and by pressing the sliding instrument down as the pills are brought underneath, the paper will be pressed on their surface so as to cover them; after the paper is dry, the superfluous part is cut off, by putting them separately in an instrument similar to that for pressing on the paper, but having a cutting edge; the pills are then rolled between the hands or a board, to lay the edges of the paper.

Claim.—The mode of covering pills, by pasting or cementing two surfaces of paper, or suitable material, as above described.

The second part of these improvements relates to the employment of charcoal as the principal ingredient in lozenges, pills, and other remedial articles.

In making lozenges, the patentee uses one-half charcoal and one-half sugar. The charcoal should be as fine as possible, and also fresh; and a little benzoin, or other water, may be mixed with it to flavour it.

The charcoal pills are to be made, by mixing large quantities of charcoal with any other matter that may be required or deemed best, and formed into pills in the usual way. The use of it, in all cases, is to purify the breath.

Claim.—The application of charcoal in the making of pills and lozenges.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to ROBERT HAZARD, of Clifton, in the county of Somerset, confectioner, for

"certain improvements in apparatus for heating public and private buildings."

THIS improved apparatus consists of a fire-proof, or hot air chamber, with a number of iron pipes, or flues, communicating with a furnace, or fire-box, at one end of the chamber, and passing backwards and forwards one row above another—the top row or series leading into the chimney; the fire-box is made of iron, lined with fire-brick; the smoke and hot air pass from the fire-box, and through the series of tubes, or flues, each series being provided with a lid, or cover, at the end, which can be removed for cleaning the same. The fresh air is admitted by a passage leading from outside the building to the bottom of the air chamber; and in passing through the chambers containing the series of iron tubes, becomes heated, and escapes through an aperture at the top into such rooms as require heating.

The inventor states, that by these improvements, a building of any size may be effectually warmed by a mild and genial heat, (without the intervention of steam, or hot water), passing through tubes, in order to obtain a large radiating surface, at a low temperature; and that he is also enabled to burn the coals at a slow combustion, so that attention to the fire is not required more than once in six or twelve hours.

Claim is the mode of arranging a series of metal flues in connection with a furnace, such flues having common openings for cleansing the same.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to WILLIAM BROCKEDON, of Queen Square, in the county of Middlesex, gentleman, for "*improvements in manufacturing fibrous materials for the cores of stoppers to be coated with india rubber, and used for stopping bottles and other vessels.*"

THIS improvement relates to a mode of manufacturing stoppers, used as a substitute for corks, in corking bottles and other vessels, by preparing a fibrous core, and afterwards coating it with india rubber. The mode hitherto practised by the inventor has been to provide a number of coarse threads of wool, and lay them in a straight line; these threads were tied at one end, and twisted at the other, so as to form a rope, which was afterwards put into a fulling mill, and beaten until the fibres were felted into a rope sufficiently strong for the purpose required; this rope, after being dried, was coated with a sheet of india rubber, and cut into lengths for stoppers; after which, the ends were covered in the same manner; or such stoppers might be covered with a solution of india rubber. The present improvements consist in preparing the cores from fibrous materials: for this purpose, he takes a sufficient number of threads, rovings, or slivers of cotton, or wool, or other fibrous substance, to form the core, of the size required, and instead of felting them, as in the former patent, they are drawn through a frame, and bound together so as to form a core, in the following manner: The threads, or slivers, in the form of strands, are passed through two holes, or bosses, one end of which is caused to revolve by means of a wheel, or pulley, being keyed upon it, and carrying with it a stud, upon which is a bobbin of binding thread; thus as the two strands are being drawn

through, the wheels are caused to revolve; by this means, the separate strands are bound with the thread; the strands pas. after being lapped, through a similar boss, upon which is the driving pulley of the machine, where they are both bound together so as to form a core, which is afterwards covered with india rubber in the manner described; it will be seen that three or more strands can, by this process, be formed into a core.

Claim is the mode of preparing fibrous cores, to be covered with india rubber, by drawing the several strands, or collection of threads, rovings, or slivers, of which they are composed, through a series of holes, and binding the strands separately, and afterwards binding them together, as described.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to JOHN DENT, of No. 82, Strand, and No. 33, Cockspur Street, in the county of Middlesex, chronometer maker, for "*certain improvements in chronometers and other time keepers.*"

THE inventor states that the rates of the best constructed chronometers show a losing rate at the two extremes of temperature, which defect he attributes to the compensation weights of the balance of an ordinary chronometer not sufficiently approaching the centre of motion on an increase of temperature, and thereby causing the rate to be a losing one; and on the other hand, they are brought out too far from the centre of motion by a decrease of temperature. To obviate this defect, the patentee constructs what he terms a primary compensation, in combination with a secondary compensation, whereby the

distance of the weights from the centre of motion is increased or diminished, according as the temperature is greater or less; there are two modifications of this improvement shown; the compensation pieces in both cases being composed of brass and steel. The first is the peculiar arrangement and construction of the primary and secondary pieces, which are in two parts. The second modification gives a description of a continuous secondary compensation, formed of one piece, or compound bar, curved in such a manner as to answer the purpose of the two; for which the patentee claims, the combination of a primary compensation, with a continuous secondary compensation, in all forms and positions which shall augment the distance between the centre of gravity of the compensation weights, and the junction of the primary compensation pieces with the bar, by an increase of temperature, and which shall diminish that distance by a decrease, as described.

There is another application of the secondary compensation pieces, which are erected on the two ends of a diameter-compensation-bar. The compensation pieces, as well as the diameter-bar, are composed of brass and steel; the former are bent in the form of a staple; one of these compensation pieces, or staples, is fixed by its end to a block at the end of the diameter bar, the bow or bent part approaching the axis of the diameter-bar; on the opposite, or upper end of the staple, is another block, to which is affixed a second staple, with its bow or bent part in an opposite direction; and upon its opposite end is fixed a vertical pillar, supporting a weight, which can be raised or lowered by a screw on the pillar. The opposite end of the diameter-bar is provided in like manner with a weight and compensation pieces; thus by an increase of heat, a curvature upwards takes place in the diameter-

compensation-bar, and the weights are simultaneously raised, and depressed by the decrease of temperature.

The claim for this part is, the application of secondary compensation pieces, erected upon the ends of a diameter-compensation-bar, whereby the compensation weights are raised by means of heat, from the points of junction with the ends of the compensation bar, and depressed by cold, and thus the weights will be simultaneously raised or lowered; and by the secondary compensation, they move quicker, and over a greater space, towards the centre of motion, which the patentee states could not be effected by the curvature of the diameter-bar alone.

The second part consists in the introduction of a remontoire escapement into chronometers, or other portable timekeepers; the remontoire spring being wound up at regular intervals by the main spring through the train of wheels, gives an invariable impulse to the balance by means of the impulse escape wheel; in order to accomplish this, the inventor introduces a second escape wheel, which he terms the train escape wheel, and which revolves concentrically with the impulse escape wheel.

There is also a mode of locking the escape wheels by one locking spring, for which the patentee claims the simultaneous locking of two escape wheels by one locking spring, in a chronometer or other portable timekeeper; and also for the same purpose, the combination of parts of a duplex escapement, in conjunction with the ordinary detached escapement.

And lastly, in a chronometer or other portable timekeeper, the arrangement of the impulse escape wheel, in which there is no lateral pressure on the pivots beyond the pressure of the remontoire spring, which is connected with the two escape wheels.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to JOHN HAUGHTON, of Liverpool, in the county of Lancashire, M.A., for "*improvements in the method of affixing certain labels.*"

THIS invention is an improvement on a former patent granted to the said JOHN HAUGHTON, 19th June, 1841, and consists in giving a certain motion to a machine, whereby the label is damped, and by applying a certain pressure becomes fixed on the letter, which is not required to be damped, as in the former patent.

This apparatus consists of a rectangular box, divided into two compartments, one of which is equal in size to the penny stamps used for letters and is provided with a round pin, moving in a collar, or guide, and having at its end a square piston made of hard wood, and covered with india rubber about $\frac{1}{16}$ of an inch thick; this piston is also made to fit the inside of the rectangular compartment. The bottom of this box is provided with a slide, equal to the area of both compartments; that part of the slide which is under the labels, is about one-eighth of an inch thick; the remaining part which is considerably thinner, carries a damp sponge, projecting a little above the surface of the thickest part of the slide, so as to press slightly on the labels, which are put in the box with the gummed side downwards. The letters to be stamped are placed on a sort of table of the apparatus, which is held in the left hand, in an inverted position; the slide being withdrawn, the sponge is brought over the surface of the gummed side of the label, and on pressing on the

end of the pin connected with the piston, the stamp is affixed on the letter; the letter being withdrawn, and the slide replaced, the apparatus can then be turned up again ready for another operation.

The inventor states that he does not limit himself to any particular mechanical means of carrying out this improvement, it being manifest that the same may be effected in a variety of ways; but what he claims is, the improved principle of the operation developed in this machine.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to MARK FREEMAN, of Sutton Common, in the county of Surrey, gentleman, for "*improvements in the construction of inkstands.*"

THE first description of inkstand consists of a rectangular vessel, divided into two compartments, but of unequal depths. The deepest vessel is provided with a loose cover, for introducing a float made of cork, covered with coachmakers's japan paint, or sealing-wax, and made to fit the sides of the vessel; the dipping cup is fixed to the front part of this vessel, and is above the cover of the other vessel, which forms the second compartment; this cover is provided with a screw-lid, or top, for supplying the vessel with ink; and the lid, or cover, of the dipping cup, has a projecting finger, which passes through the sides of the deeper vessel, and takes into a rack, formed of pins, in the cork float. This float is also made with a groove cut in its side, leading to the dipping cup. In order to put the inkstand in operation, the screw-cover is removed and the ink poured in, and allowed to flow into the adjoining compartment through an aperture made at the

bottom of the division plate; by these means the float will be raised until the surface of the fluid is at the same level in both vessels. The air-tight screw-cover is then put on, and it will be seen, that on raising the lid of the dipping cup, the float, by means of the projecting finger, will be depressed, and the ink will, consequently, be forced up the groove into the dipping cup; and on shutting the lid, the float will rise, and the ink will return into the vessel.

Claim.—The mode of constructing inkstands, by combining two compartments opening into each other, with a float in one compartment, and a dipping cup, which may open into either compartment.

The second description of inkstand consists of a cylindrical vessel, formed of two compartments, provided with a cover, upon which is fixed the dipping cup, with a tube leading into the vessel, and which can be removed for supplying the vessel with ink. The second compartment consists of a tube, or cylinder, concentric with, and projecting above the other, and having an aperture at the bottom, so as to connect the two compartments. A plunger is fitted into the concentric tube, or cylinder, with a screw attached to it, passing through the cover of the cylinder; by turning the screw in one direction, the plunger will be forced down, and cause the ink to ascend into the dipping cup. As the ink is used, and the plunger descends to the bottom, it will be necessary to raise the plunger, and also to take off the air-tight cover, to admit air, when the ink will again flow into the concentric vessel, or compartment; the cover may then be screwed on again, which will prevent the ink from flowing back into the compartment; but, by the action of the plunger, it will be forced into the dipping cup.

Claim.—The mode of constructing inkstands by combining two compartments, opening into each other; one

of which has a plunger working within it; and either compartment having a dipping cup applied thereto.

The third improvement consists of a similar arrangement of parts, and is also applied to the first description of inkstands, by which arrangement it is not necessary to take off the cover to admit air; in this case, the plunger is not made to fit the sides of the vessel tight, and is also allowed to pass the hole which connects the two compartments; for which the patentee claims, the mode of arranging a communicating hole between the two compartments of an inkstand, in one of which a plunger or float works, so that the lower part of the float may pass below the hole.

The fourth improvement relates to a mode of connecting the ink vessel and the dipping cup, by means of a syphon. A tube, having a screw cut on one end, passes through a female screw formed in the cover of the vessel containing the supply of ink; this tube, which forms a part of the handle of the inkstand, rises in a vertical direction, with a bend at the top, and is brought down below the cover of the ink vessel to the dipping cup; the vessel being supplied with ink, and the syphon filled, which may be done by inserting a long tube, having a funnel at the top, into the dipping cup, the ink will flow through the syphon into the dipping cup, the height of which is regulated by turning round the ink vessel on the screw, which will cause such vessel to be raised or lowered, as may be required; and will have the effect of filling, or emptying, the dipping cup. It will be seen that the tube and dipping cup may be made to move, and the ink vessel remain stationary.

Claim.—The mode of constructing inkstands, by combining a dipping cup with an ink vessel, by means of a syphon, in such a manner that the positions of the vessel and of the dipping cup may be varied.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to JOHN CLAY, of Cottingham, in the county of York, gentleman, and FREDERICK ROSENBERG, of Sculcoates, in the county of York, gentleman, for "*improvements in arranging and setting up types for printing.*"

THESE improvements consist of two parts; first, in a peculiar combination of mechanism for arranging types, commonly called "*distributing*," so that they are arranged for the second operation. The several letters of any "*composition*," after they have been used for printing, are separated and arranged according to their several characters, in distinct columns, ready for inserting into the rack of the second composing, or setting-up, machine. The peculiar construction of this machine constitutes the second part of the improvement: the several types are first arranged, and then selected and formed into words, lines, and sentences.

Firstly.—The distributing machine consists of a frame supporting a grooved plate, into which the several letters or characters are deposited in rows or columns; at one end of these grooves, and in a transverse direction, is affixed a sliding carriage, which moves from one end of the series of grooves to the other; in front of the machine, and just below the sliding carriage, is a row of keys marked with the letters A, B, C, &c., corresponding with an equal number of vertical channels; these channels are covered in front by a face-plate, but so as to leave an open space at the bottom of each channel, which receives a cam or eccentric, mounted on a shaft fixed in suitable bearings, in front of the face-plate, and receiving a rapid rotary motion from some first mover; thus, as the types are dropped down the vertical channels, they are forced for-

ward by the revolving cams into the grooved plate. It will be seen by this arrangement, that the channels might be placed in an inclined positic and the types fed into the same by hand, when by the motion of the shaft they would be forced into the respective grooves of the grooved plate. At the left-hand end of the machine is supported by a bracket, in a horizontal position, the galley containing a page of type, to be assorted or arranged; at the end of the galley is a slot, to allow one line of the page to pass through at a time; which is effected by a vertical slide, covered at its lower edge with soft leather, so as not to injure the type. The page of type being pressed up against the end of the galley, and over the slot, by lowering the vertical slide a line of the page is forced through the slot into a groove of the sliding carriage, and is pressed against the front or end of this groove by an endless chain, worked by a convolute spring contained in a case; the arrangement being such, that on lifting up the vertical slide for the purpose of forcing through a line of type, the convolute spring is wound up ready to act on the same. Supposing a line of type to be in the groove of the sliding carriage, the operator moves the carriage to the right, and commences reading off the letters contained in the line; and supposing F to be the first letter, he places a finger of the left hand under the key marked F, and elevates the same; on moving the sliding carriage back, it is arrested by the elevated key, which acts upon a bent lever, and actuates a slide that pushes out the first or end letter of the line—a recess of sufficient width for the thickness of the type being made by an indented bar elevating a spring, which moves another slide forming the recess; the type thus forced out from the line, is allowed to drop into the vertical channel, and is forced, as before stated, into the corresponding channel of

the grooved plate, the operation being the same for the other letters of the remaining part of the line.

The patentees claim, first, the peculiar arrangement of mechanism, constituting a machine for "*distributing*" the types, commonly called arranging; secondly, the use of the grooved plates in which the type are arranged in rows or columns; thirdly, the mode of lowering the types, line by line, from the galley into the travelling carriage; fourthly, the use of the travelling carriage, by means of which each type is consecutively brought over the proper opening, or vertical channel, through which it descends to the grooved plate; fifthly, the indented rib, and those parts which form a recess of the proper width to suit the type, and into which the type is pushed; sixthly, the use of the bent levers or keys, whereby the sliding carriage is stopped over the proper aperture, or vertical channel, and which keys at the same time act upon a lever, which by means of a slide or pusher of the carriage, forces out the last type of the line into a recess, formed of a proper width by the indented rib acting upon a spring lever; seventhly, the method of forcing the types along the grooves by means of cams or eccentrics; eighthly, the method described in which the sliding carriage and keys are dispensed with, and the types deposited by hand.

Secondly.—The composing or setting-up machine consists of two sets of keys, arranged one above the other, and actuated and mounted upon an axis, in a similar manner to those of a piano-forte; these keys actuate by means of a connecting rod, a T-formed lever, which moves a slide at the bottom end of a rack-frame, in which the columns of type are arranged; this frame is supported by two plates, fixed on their edge in a vertical position; between these plates, at the upper edge, is a longitudinal bar of wood or metal, having a groove. Below the key-board

of the machine is a transverse shaft, having a wheel keyed thereon, round which is passed an endless band, conducted by guide pullies at each end of the machine, through the longitudinal groove, on each side of which are arranged the columns of type, as before stated, in the rack-frame; therefore, on pressing the finger on one of the keys, in the lower line or set, the T-formed lever will be acted upon, so as to press its slide against the lowest type of that column against which it is opposite, and force it out into the longitudinal groove; and presuming that motion has been given to the shaft, such type will be carried forward towards the left-hand end of the machine, and into a receiver; on pressing the finger on one of the keys of the upper line, a type will in the same manner be forced from a corresponding column on the opposite side of the groove. The receiver into which they are carried by the endless chain, consists of a vertical slide, upon which the types are consecutively laid; above this slide is fixed an endless chain, cam, or eccentric, for the purpose of forcing or lowering the slide every time it receives a type, until a line is completed, which can be seen by a dial-plate connected with the slide, and graduated with inches and parts of inches. When the line is completed, and the slide lowered to the bottom, by pressing on the end of a lever near the hand of the operator, the types are forced from the slide into a frame, or composing-stick, mounted upon an axis at the lower end, and capable of being turned down in an horizontal position, in which position it is immediately above the galley, which can, by an assistant compositor, be raised; and on removing a slide, which forms the bottom of the composing-stick, the line is lowered into the galley: the assistant, during the time another line is being composed, corrects that which has just been placed in the galley.

Claims.—First, the general arrangement of mechanism described; secondly, the peculiar mode of pushing out one single type from a column in the rack frame, as described, so as to force out the type on to the endless chain which runs in the longitudinal groove at the back of the column of type, and on which the type is carried to the receiver; thirdly, the construction of the rack frame, in which columns of type are arranged on both sides of the channel or groove; fourthly, the mode in which the types are forced down in the line after they are brought to the receiver, by an endless belt, or by a cam or eccentric; fifthly, the manner in which the line of types is lowered from the receiver into the galley, and the manner in which the galley is mounted in the machine.

SPECIFICATION enrolled 21st September, 1842, of a PATENT granted 21st March, 1842, to WILLIAM HANCOCK, junior, of Amwell Street, in the county of Middlesex, gentleman, for "*certain improvements in combs and brushes.*"

THE first improvement consists in making curry-combs, used in grooming horses, with flexible stocks or backs, instead of stiff and unyielding backs, as heretofore. This is effected by applying to the back of a wire card, such as is used for carding machines, two or three coats of a solution of caoutchouc, or other strong flexible cement; a piece of leather, felt, or thin veneer of wood, is to be prepared in the same manner, and when in an adhesive or sticky state, the two surfaces are to be firmly pressed together. When the cement is set, there is inserted, for greater security, a number of small pins round the edges, or the

edges are to be sewn together with strong thread or wire; for which the patentee claims, the making of that description of combs called curry-combs, with flexible backs.

The improvements in brushes relate, first, to that class of brushes employed in dry brushing, as hair brushes, clothes brushes, horse brushes, and machine brushes; and secondly, to brushes employed for painting, colouring, varnishing, whitewashing, &c.

With respect to the dry brushes, the improvement consists principally in making them with flexible backs, the same as those of the curry-combs, and in making brushes of a curvilinear form. The bristles, or hairs, are fixed in a flexible back, which is then attached to a solid back of the form required. When the whole of the back is to be made flexible, the mode of proceeding is similar to that above described for curry-combs, only that when it is desirable to give such brushes as much springiness as possible, a thin piece of horn, metal, or whalebone, is introduced between the two pieces forming the back.

In making brushes of a circular form, commonly called wheel brushes, the solid disc should have a groove cut round its periphery for the reception of the flexible back, which may be composed of canvass, felt, leather, or other firm but yielding substance, to which the bristles or hairs are attached by the usual method of drawing.

If of a cylindrical form, the solid cylinder should have a spiral groove cut on its external surface, with such distances between the threads, that when the flexible belt of bristles is wound round it, the whole surface of the cylinder may be covered with the bristles or hairs; the flexible backs may be secured in the grooves by nails, pins, screws, or cement. It is sometimes of importance to be able to expand brushes, or parts of brushes; for this purpose, the patentee attaches to the under piece of a flexible backed

brush, a piece or pieces of sheet caoutchouc, or of cotton varnished with caoutchouc, and unites the edges of such piece or pieces to the flexible back, so as to form an air tight space or spaces. These spaces are connected with a tube, or tubes, leading to a screw plug in the handle of the brush, in such a manner that the brush, or parts of the brush, can be inflated as may be required. In order to protect those brushes which are employed by hatters, and occasionally in water, from being loosened, the patentee attaches to the under side of the flexible back, previous to drawing the hairs or bristles, a piece of india rubber waterproof cloth, by means of a solution of caoutchouc. The drawings show a flexible backed brush containing the bristles or hairs, attached to the two ends of a solid curvilinear back, in such a manner as to leave a space between the solid and the flexible back; so that when the face of the brush is pressed against anything, the yielding takes place upwards, towards the solid arched back of the wood.

For the above description of brushes, the patentee claims the making of such description of brushes as are chiefly used for dry brushing, with flexible backs.

The improvements in constructing brushes employed for painting, colouring, varnishing, and whitewashing, consist in a method of affixing the bristles or hairs more firmly to the handle, so as not to give way when exposed to wet, and variations in the temperature. For this purpose the patentee inserts a knot of hairs or bristles into a cylinder, or round socket of tin; and then passes through the centre of the bristles, and through an orifice in the centre of the socket, a taper ferule of tin, so that the bristles or hairs are compressed between the exterior surface of the ferule and the interior surface of the socket; the socket and ferule should then be secured by soldering at the orifice in the

socket. A taper handle of wood or metal, which is made to fit the ferule, can be inserted, and detached when the brush is not in use. The knot of bristles, besides being compressed between the socket and ferule, can be imbedded or set in pitch, or other suitable cement.

There is also a drawing of a flat brush, such as is employed for whitewashing, made with a metal stock or foundation. For this description of brushes the inventor claims, the making of them with metal stocks or foundations, and handles such as hereinbefore described; or with metal stocks or foundations combined with wooden handles; or with metal handles combined with wooden stocks, and whether the stock consists of a socket and ferule connected together, or a metal ferule only.

SPECIFICATION enrolled 23rd September, 1842, of a PATENT granted 23rd March, 1842, to MOSES SPERRY BEACH, of Norfolk Street, Strand, printer, for "*improvements in machinery used for printing with type, and in the construction of type for printing.*" Being a communication.

THE principal feature of this machine consists in the application of four cylinders, two of which are called the type cylinders, the other two the impression cylinders, and are covered with a quantity of cloth or blanketing, in order to obtain a good impression from the type cylinder.

These cylinders are supported by a suitable frame, and arranged one above the other in such a manner that the paper will be printed on both sides, each type cylinder being provided with a trough and a set of inking rollers. The paper is wound on a roller in a damp state; this

roller is supported on bearings at one end of the machine, the paper is drawn from it in an inclined direction by the first pair of cylinders, the type cylinder being above, and the impression cylinder below it, which therefore prints the paper on the top side; the paper is then carried in a horizontal position to the next pair of cylinders, in which the type cylinder is below and the impression cylinder above, so as to print the paper on the under side. The paper then passes on to the end of the machine and to the folders, and between a pair of vertical rollers, one of which has a knife in its periphery, which meets the edge of a stationary knife, and the paper is cut into sheets.

The types are formed with a small projection on one side, and a recess or indent on the other; so that on setting up the type the projection of one will be received by the indent of the other; they are also made on two edges a little taper, so as to suit the curve of the cylinder on which they are to be set up. It will be seen that the types cannot be used for cylinders of different diameters, as the two sides of each type, when placed on the cylinder, must form radial lines. In composing or setting up, the types are placed in a curvilinear composing stick, and arranged in a column round a cylinder, from which they are to be lifted and placed on the type cylinder. For this purpose the patentee employs "a gab," which consists of a cylinder of brass, whose internal diameter is equal to the external diameter of the cylinder of type; the periphery of this brass cylinder is provided with four vertical springs bent at their ends, so as, when compressed, to project under the bottom edge of the cylinder. When one column of type has been arranged as before stated, the cylinder is placed over it, and on sliding a ring over the brass cylinder, the springs will be forced underneath its edge and under the type, so that on raising the cylinder the column of

type will be raised with it, and may then be placed on the type cylinder; a circular ring, provided with an indent on one side and projection on the other, may then be placed on the type, so as to form the column line. It will be seen, that in book printing, spaces and broad rings may be introduced, so as to form the margin.

Another part of these improvements relates to the construction of a proof press, and consists of a frame supporting a quadrant of type; on each side of the frame is a lever moving on an axis; these two levers are joined together at the opposite end from the axis, so as to form a frame which supports a roller or cylinder, so arranged, that on moving the frame from one side of the press to the other, the cylinder is carried over, and presses on to the quadrant of type. In taking a proof from the type in this machine it is only necessary to place the paper on the type, and pass the handle of the moveable frame from one side of the press to the other. This apparatus may be used as a proof press or otherwise.

In order to damp and pack the paper previous to printing, it is placed in a machine, in which the paper passes from one roller, and is rolled on to a second, which is in contact with a damp cylinder, covered with blanketing or cloth, and as the roll increases in diameter the damping cylinder, together with the trough containing water with which it is connected, recedes; the trough runs upon four wheels and has a band passing over a pulley, to which is attached a weight; by this means the damping roller is pressed against the roll of paper, so as to pack it as it is wound on the roller ready for the printing machine.

Claim.—First, the peculiar form or shape of the type with indents and projections as described, and its combination with the taper on the sides corresponding with the top and bottom of the letter; secondly, the construc-

tion of the type having the taper in the sides corresponding with the tops and bottoms of the letters, either with or without the indent and projection; thirdly, the mode of securing the type to the cylinder by means of the indents and projections in combination with the circular column, rules and rings; fourthly, the mode of folding and cutting the paper; fifthly, the mode of constructing the hand press for obtaining proofs or otherwise; sixthly, the mode of constructing a machine for placing the column or ring of type upon the type cylinder; seventhly, the method of constructing the machine for damping and packing the paper previous to printing.

SPECIFICATION enrolled 28th September, 1842, of a PATENT granted the 15th of April, 1842, to CHARLES FARINA, late of Leicester Square, in the county of Middlesex, but now of No. 83, Upper East Smithfield, in the county of Middlesex, chemist, for "*a new method of making soap, candles, and sealing wax.*"

THE first of these improvements consists in a method of producing lees; secondly, in a new combination of animal and vegetable matter to be introduced into soap, and a new method of discharging the colour and smell therefrom, and also from grease, oil, or resin; and thirdly, in a new method of making candles and sealing wax.

For producing the lees, the inventor takes those alkalies commonly used for making soap, and throws them gradually into boiling water, which is to be continually stirred, to prevent the alkali from adhering to the bottom of the pan, the water being kept boiling till the alkali is

dissolved; the lees are then removed from the vessel and thrown into an iron "back" charged with salt and lime, to obtain the caustic properties of the lime, and will then become caustic lees, and may be used in the soap copper of any required strength. The patentee states that when the lees prepared in this manner are spent, they are run through a filter, to separate any impurities contained in them, and are afterwards run into another "back" containing fresh lime; and so soon as they have passed through the lime, they are drawn off in the usual way and put into another vessel, and alkali thrown in, until the required strength of lees is obtained, and the colour discharged, by filtering with animal charcoal obtained from calcined bones.

Secondly.—The manner of combining animal and vegetable matter with soap, and the mode of discharging the colour and smell therefrom, and also from grease and resin, is as follows: the patentee first takes bones in a rough state, or hoofs, horns, and other refuse animal matter, and purifies them in lime water; they are then washed in clean water, after which they are boiled until all the fat is obtained, which is to be run off, whilst in a liquid state, into another vessel heated by steam or fire, and boiled with a portion of alumina and animal charcoal, and then run off through a filter into a soap copper; lees are then added, and soap made in the usual way. The same process is made use of for discolouring and purifying all kinds of grease, resin, and oils.

The bones or animal charcoal, after the fat is extracted as above, are taken out and dried, and when in a sufficiently dry state, are ground into a fine powder, and boiled in water until all the gelatine or glutinous matter is obtained. This glutinous matter is taken off, and the remaining portion of bones boiled in fresh water, acidu-

lated with muriatic or sulphuric acid sufficient to destroy the remaining portion of bones, or phosphorus of the bone, that is left; the liquid is strained through a filter, and added to the first extract obtained; the whole is then purified in the same way as the fat, grease, or oil, and introduced into the soap copper, as before. If a great degree of whiteness is required, the soap copper is charged with about one-third of lime water, and then filled with grease, oil, or other material of which the soap is to be made, such material having first been purified. The mixture is then to be gradually boiled, and chloride of lime introduced: after boiling three or four hours the water is pumped away, and then lees are added, and the soap finished as before directed.

With respect to the vegetable matters, the patentee takes potatoes or other vegetable substances, which are to be cleansed if required, and afterwards put into a wooden vat, and boiled until reduced to a jelly, and then strained to separate the husk. The husks may also be prepared by grinding them in a mill, and then boiling them in water acidulated, which is afterwards to be neutralized, by introducing soda or other alkalies: the substance thus obtained is put into the copper, and mixed with soap made in the usual way.

The inventor mixes from 20 to 25 per cent. of this composition with the quantity of grease, oil, or tallow used: after the combination of these materials with soap, resin is to be added in such proportion as the soap may require.

For making candles or sealing wax, gelatine is obtained from any of the above animal substances, and boiled with alumina and ivory black, or animal charcoal, and then filtered, to which is added an equal quantity of purified resin. The filtered galatine is boiled with tallow or wax, until it becomes of the consistency required, and the

candles or sealing wax are made in the usual way. The alumina referred to in the foregoing process is produced by a combination of lime and soda, the caustic property of the soda neutralizing the acetic property of the lime; the lime is to be dissolved, and an equal quantity, by weight, of soda added.

In the foregoing process, the patentee uses 10 per cent. of the different purifying and discolouring properties to the quantity of other material made use of.

Claim.—A new method of manufacturing soap, candles, and sealing-wax, and the new way of preparing lees, together with the combination contained in the description.

SPECIFICATION enrolled 30th September, 1842, of a PATENT granted 31st March, 1842, to JULIUS SEYBEL, of Golden Square, Westminster, manufacturing chemist, for "*improvements in the manufacture of sulphate of soda and chlorine.*"

THESE improvements relate, first, to the manufacture of sulphate of soda, by decomposing common salt with sulphuric acid; and secondly, to a method of manufacturing chlorine, by employing the vapours of muriatic acid to act on manganese immersed in water; such vapours being conducted below, and permitted to escape upwards, through the water and manganese.

The apparatus employed for the above purpose consists, first, of a vessel or retort, made or lined with lead, and provided at the top with a man-hole, for the purpose of charging it with salt; two pipes are attached to the upper part of this vessel, one leading into the chimney, and the other into a vessel containing sulphuric acid of the specific

gravity of 1.71, and each pipe is provided with a valve. This retort is placed in an iron vessel containing oil, or other suitable material, to act as a heating medium, and having also a false bottom, perforated, so as to allow the heating medium to come in contact with the retort. The vessel is to be heated by a fire, or furnace, having a flue, provided with a damper to regulate the heat, which is required to be at a temperature of from 300° to 330° Fahrenheit. In order to effect the process of decomposition, the retort is to be charged with 20 cwt. of common salt; the man-hole lid being fixed, 30 cwt. of sulphuric acid of 1.71 are poured in; during the time that the acid is being poured in, the valve leading to the chimney should be open, but closed so soon as the operation is finished; the muriatic gas evolved by the decomposition of the salt, then passes through another pipe placed in the upper part of this vessel, to a second vessel, or retort, for making the chlorine. This retort is lined with fire-brick, or tiles, so as to resist, as much as possible, the action of the acid; the pipe from the first retort passes through the top of the second retort, and through the mixture contained in it, to the bottom; this part of the pipe which passes through the mixture is made of earthenware, and terminates in a perforated pipe in the form of a ring, passing round the bottom of the vessel; a vertical shaft, also protected from the action of the acid, passes through a stuffing box, having at its lower end an agitator. This vessel is charged with about 7 cwt. of ground manganese, and from 11 to 12 cwt. of water. The temperature of the heating medium being gradually raised to 300° Fahrenheit, is kept at that temperature until the charge is nearly worked off, which will be in about fifteen hours, the temperature being then got up to 330° Fahrenheit. By this arrangement it will be seen, that the muriatic acid gas formed by the decomposition of the

salt, passes, on shutting the valve leading to the chimney, through the pipe which conducts it to the bottom of the second retort, and through the water and manganese, and forms the chlorine, which passes through a pipe in the upper part of this vessel, to another retort containing water with about 10 lbs. of manganese; and also through another similar retort, from which it may be received and formed into chlorides, as will be understood. The sulphate of soda thus obtained is drawn, or run into, and finished in an ordinary reverberatory furnace, adding and mixing therewith from 9 to 10 cwt. of common salt.

The claims are, first, the mode of manufacturing sulphate of soda, by decomposing common salt by sulphuric acid, in close vessels or retorts, made or lined with lead, and heated as described; secondly, the mode of manufacturing chlorine by means of the vapours, or gases, of muriatic acid introduced below water in which manganese is immersed; thirdly, the stirring, or agitating, of manganese with water, when acted upon by the vapours or gas of muriatic acid, in the manufacturing of chlorine.

SPECIFICATION enrolled 30th September, 1842, of a PATENT granted 31st March, 1842, to JOSEPH CLISILD DANIELL, of Tiverton Mills, near Bath, clothier, for "*improvements in making and preparing food for cattle.*"

THE first part of these improvements relates to a mode of preparing and treating certain substances to be used as food for cattle, designated ligneous matter, (because such matter is of the nature of wood) as oak, sycamore, hazel, brushwood, hedgewood, brambles, furze, heath, or any

other fibrous matter possessing the same qualities as those above stated.

The mode of preparing such ligneous substances, is by cutting them up into small pieces, and passing them through certain machinery for grinding them to a powder. A description of a machine suitable for this purpose was described in a former Specification of Mr. Daniell's. The ground wood thus obtained, is further reduced or pulverized, by passing it through a mill, similar to a coffee mill, or a mill used for grinding malt, but much stronger; after which it is further reduced, and the grosser part separated by grinding it betwixt stones, and by other processes similar to those used in preparing flour. It will be necessary to have the wood in a dry state, which may be effected by placing it in a kiln, or oven; and wood which has a bitter taste will be improved by this process.

The second part of these improvements consists in a mode of treating and preparing grass, either common grass or lucerne, green clover or green vetches, or straw of any description, or halm, or hay, such as may be used as food for cattle. In preparing straw or halm with grass, the former is to be used in a dry state, with about double its quantity of grass newly cut, previous to making it into hay. The grass, when free from external moisture, is to be mixed with the straw, or halm, and put into a vat or tank, surrounded by steam, when by the application of heat, the straw will be impregnated with the moisture from the grass. The heat having been applied about twenty-four hours, a current of atmospheric air is made to pass through the grass and straw, by means of an air pump, which is to be worked from six to eight hours, and thus any moisture that may remain will be expelled. If after having been removed from the tank, the hay and grass are not sufficiently dry, they may be exposed to the sun or

the wind, when they will, after being well mixed together, be ready for the stack. The inventor states that old hay may be very much improved by the foregoing process.

The manner in which the powdered wood is to be used for feeding cattle, is (for horses) by mixing half a peck of ground wood, or ligneous matter, together with a bushel of chaff and a pint of corn or barley meal; the mixture may be moistened by sprinkling it with water, or steaming it in the usual way, or the ligneous matter may, previously to mixing it with the chaff, be moistened with a solution of eight ounces of soda dissolved in one gallon of water to each bushel of powdered wood, or ligneous matter. For horned cattle or sheep, about half a peck of ground wood mixed with a bushel of chaff; and the same, after being moistened as before stated, may be used alone, or mixed with grains, potatoes, turnips, carrots, or mangel wurzel, in which case a greater quantity of ground wood may be used.

Claim.—First, the mode of making and preparing food for cattle, by pulverizing ligneous matter, and applying the same to feed cattle; secondly, the mode of treating all kinds of grass and straw, or halm, or grass and hay, in a vat, or tank, when preparing the same for food for cattle.

A DISCLAIMER has been entered on the 5th September, 1842, with the Clerk of the Patents, in the PATENT granted the 28th May, 1840, to DANIEL GOOCH, of Paddington Green, in the county of Middlesex, engineer, for "*certain improvements in wheels and locomotive engines to be used on railways,*" whereby the patentee disclaims the following words in the title of his Patent, "*and locomotive engines.*"

SPECIFICATION of the PATENT granted 31st March, 1842, to WILLIAM LIVERSIDGE TRIPPETT, of Charlton-upon-Medlock, Lancaster, agent, for "*improvements in looms for weaving by hand or by power,*" due 30th September last, has not been enrolled during that month.

BYNNER'S PATENT.

[*Continued from page 75.*]

ciple, and that the chimney which he and Roberts first used was the same as Bynner's.

Cross-examined by the Attorney-General.—The witness stated that he had been a bankrupt in 1829—30. He was then an oil and colourman. That the principle of getting the air below the point of combustion was very old; that Roberts was joint patentee with him, and that part of the patent was sold to Messrs. Ratcliff, who were to pay 1*s.* 6*d.* for a certain term per label, and 1*s.* for the remainder—that was the flat wick lamp: this occurred about nine or twelve months before Bynner's Patent was sealed. He sold the remainder to Messrs. Smith three months before Bynner's Patent was sealed—the consideration which they were to give, was that they should cancel an account of about £120. though he thought that he owed them nothing. In the lamp (No. 1 safety) put into witness' hands, the wire was for raising the wick and knocking off the crust. The wick should be placed about $\frac{1}{8}$ of an inch below the cap. That the wick in the one produced by the Attorney-General, was too high, and it would spoil the effect—the pricker should be out of the way of the wick. That the lamp which he had exhibited in court (No. 1.) was made for mining purposes—it was a flat wick lamp. [Guise's and Bynner's lamps were then shewn to the witness, who stated that they were the same in principle.] Mr. Upton admitted that he and his son were defendants in an action brought by Messrs. Smith for an infringement of Bynner's Patent. That he had advised the present proceedings, and had pressed Mr. Smith, of Finch Lane, as far as he could, to institute them,

but he did not know who the sureties were; that the *scire facias* was tested on 31st January, and the declaration filed on 15th April.

Re-examined by Mr. Kelly.—Stated that the lamps under his Patent were made, some with round and some with flat wicks; that the principle of admitting the air below the point of ignition and of deflecting it above, was old; and the use of metal cones in argand lamps was also old. Roberts had shewed him one so constructed, a long time since. That his failure was in the oil trade and other speculations; that a very great change took place in the price of oils; sperm oil rose in price in 1837—8—9—40, almost to a prohibitory price, whilst southern oil fell: that this caused men to exert themselves to devise means to burn the cheaper oils, and that circumstance had caused the great demand for their lamps.

By the Attorney-General.—That the price of oils began to rise in 1834—5, but that it rose more in 1836; and began to get very high in 1837.

Mr. Guise examined by Mr. Hindmarch.—Stated that he was a gas fitter and lamp manufacturer residing in Margaret Street, Spa Fields; that he was in the employ of Mr. Meadows in 1829—30: that he knew Upton's Patent, and had made many of his pipe wick and flat wick lamps; that Mr. Meadows was employed by Mr. Upton to make them, and that witness made them under Mr. Upton and Mr. Roberts' direction: that he had never read the defendant Bynner's Specification, nor seen any of his lamps until within the few last days. A lamp called Meadows' lamp was then shewn to the witness, who stated that he had made about five or six dozen of them in the early part of 1830, and none since; that in 1830 he was principally engaged in making oil lamps, the top of the cap of which was placed between $\frac{1}{3}$ or $\frac{5}{8}$ths of an inch above the top of the wick holder. Mr. Guise then further stated, that he made for his own use a similar lamp, but of a smaller size, the top of the cap of which was above the bottom part of the flame. The lamp itself was produced (Guise's) to witness, who said that it was the lamp which he had made for

himself; that Upton and Roberts procured the lamps with the caps from Meadows; that in 1830 he had made some safety lamps with caps; [two patterns of such lamps were exhibited to the jury]; that he is quite certain that the top of the wick was below the level orifice of the cone; that in 1832 he had made a great many cones for gas argand burners, some with regulators, some without, all of which were sold.

Cross-examined by Mr. M. D. Hill.—The witness stated, that after 1832 he chiefly made gas cones, and left off making oil lamps; that in the lamp which he made for himself, the top of the wick holder was but $\frac{3}{8}$ths of an inch below the level of the orifice of the cap at the centre, and $\frac{1}{8}$th at the sides; had used it on various occasions, but not for the last eight years, as the glass was unfortunately broken; that the holes in the lamp holder were made to admit air between a globe glass and the chimney; the lamp was first used with a globe glass and chimney, until the globe glass was broken; that he had cut off the outer edge, but was obliged to leave part of the holes.

Re-examined by Mr. Hindmarch.—That he had made the outer holes in his own lamp, in order to admit a draught of air between the chimney and the globe; but that the lamps which he made for Upton and Roberts had holes in the gallery between the chimney and the cap, by way of experiment.

Mr. George Roberts examined by Mr. Hugh Hill.—Stated that he was the son of the late Mr. Roberts, the late partner of Mr. Upton, and that he was well acquainted with safety lamps; that he had bought several from Messrs. Smith and Son, and had sold many for his father and Mr. Upton previous to Bynner's Patent, and that Jeremiah Bynner was at that time in Messrs. Smith's service; that he recollects well his father making deflective argand lamps, and that the one which he now produces was one made by him and used as an experimental lamp; that not many of these argands were made, perhaps a few dozens, they had glass chimnies with metal tops; that the metal top was shorter and not so wide as the glass; that the safety lamps were all made with cones.

Cross-examined.—Stated that the wick in Upton's lamp (No. 1.) was placed the wrong way; that Upton and Roberts employed Messrs. Smith; but he cannot say whether the tin lamp is in the same condition as those his father sold; witness has not carried on business since his father's death in 1840; Messrs. Ratcliff manufactured for them; that they carried on their trade in Bilston, and his father and Mr. Upton had a shop in London; that his father and himself never had any lamps from Messrs. Ratcliff with Messrs. Smith's or Bynner's private mark on them.

Re-examined.—That in the lamp produced, and those which his father sold, the only difference was that the orifice in the one produced was larger; that in all those which his father sold the top of the cap was higher than the top of the wick. The witness also stated that the names of the parties to whom he had sold safety lamps were Messrs. Charles and Walter, Dudley Corbyn, Hull Colliery; Mr. Francis Downing, Agent to Lord Dudley and Ward; Mr. Best, the Manager of the Staffordshire Works of the British Iron Company; and Mr. Samuel Banks, of Bilston.

Mr. Hetherington examined.—Stated that he was in the lamp trade formerly in Everett Street, but now in the Quadrant, and had been in the trade 25 years; that in the year 1827 he used to make lamps for Upton and Roberts, but has not since; that he then made three or four dozen of one sort, and may be one dozen of another; that the air in these lamps was admitted below the point of ignition, and conveyed to the top of the cotton by a cone or metal cap. [A model was then produced.] That the air struck the cotton at the point it was ignited, and struck the flame at the top of the cotton below the cap; that he should call the top of the wick the point of ignition; that the caps which he made in 1826 and 1827, were $\frac{5}{8}$ths of an inch above the top of the wick; they were sold. Mr. Hetherington further stated, that he knew Bynner's Specification, and that the principle therein claimed was the same as in the lamps made by him. Miller's lamp was also the same.

[*To be continued.*]

List of New Patents.

PATENTS GRANTED IN ENGLAND, FROM SEPTEMBER 29 TO OCTOBER 27, 1842.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

EDWARD BELL, of the College of Civil Engineers, Putney, professor of practical mechanics, for "improvements in applying heat in the manufacture of artificial fuel, which improvements are applicable to the preparation of asphalt, and for other purposes." Sealed September 29.

SAMUEL HENSON, of New City Chambers, Bishopsgate-street, engineer, for "certain improvements in locomotive apparatus, and in machinery for conveying letters, goods, and passengers, from place to place through the air, part of which improvements are applicable to locomotive, and other machinery to be used on water or on land." Sealed September 29.

WILLIAM SMITH, of Grosvenor-street, Camberwell, gentleman, for "improvements in treating certain animal matters, to obtain products applicable to the manufacture of candles, and other purposes." Sealed September 29.

JOHN RAND, of Howland-street, Fitzroy-square, artist, for "improvements in making and closing metallic collapsable vessels." Sealed September 29.

JAMES HYDE, of Duckenfield, Cheshire, machine-maker, and JOHN HYDE, of the same place, cotton-spinner and manufacturer, for "a certain improvement or improvements in the machinery used for preparing cotton, wool, silk, flax, and similar fibrous materials for spinning." Sealed September 29.

JOHN RIDSDALE, of Leeds, for "improvements in preparing fibrous materials for weaving, and in sizing warps." Sealed September 29.

JOHN FRY WILKEY, of Mount Vernon, Exeter, commission agent, for "improvements in carriages." Sealed September 29.

JOHN GEORGE SHIPLEY, of Bruton-street, Berkeley-square, saddler, for "certain improvements in saddles." Sealed October 6.

JOHN OLIVER YORK, of Upper Coleshill-street, Eaton-square, for "improvements in the manufacture of axles for railway wheels." Sealed October 8.

WILTON GEORGE TURNER, of Gateshead, Durham, doctor in philosophy, for "improvements in the manufacture of alum." Sealed October 8.

CLAUDE EDWARD DEUTSCHE, of Fricour's Hotel, St. Martin's-lane, gentleman, for "improvements in combining materials to be used for cementing purposes, and for preventing the passage of fluids, and also for forming or constructing articles from such compositions of materials." Sealed October 8.

SAMUEL DOTCHIN, of Myrtle-street, Hoxton, jeweller, for "improvements in paving, or covering, and constructing roads, ways, and other surfaces. Being a communication from his son lately deceased. Sealed October 13.

WILLIAM EDWARD NEWTON, of Chancery-lane, for "certain improvements in the manufacture of artificial fuel." Being a communication. Sealed October 13.

CHARLES THOMAS HOLCOMBE, of Valentines, near Ilford, Essex, Esquire, for "an improved mode of using certain materials as fuel; also an apparatus or method for collecting the smoke or soot arising from the combustion of such fuel; which apparatus or method is applicable to collecting the smoke or soot arising from the ordinary combustion of fuel, and also the application of the products arising from the combustion of the first mentioned materials, as a manure, and for other useful purposes." Sealed October 13.

ROBERT WILLIAM SIEVIER, of Henrietta-street, Cavendish-square, gentleman, for "certain improvements in looms for weaving, and in the mode or method of producing plain or figured goods or fabrics." Sealed October 13.

PETER KAGENBUSCH, of Lyth, in the county of York, dyer, for "certain improvements in the treatment of the alum rock, or schist, and in the manufacture and application of the products derived therefrom." Sealed October 13.

HENRY BROWN, of Selkirk, manufacturer, and THOMAS WALKER, of the same place, manufacturer, for "improvements on woollen carding engines." Sealed October 13.

THOMAS SEVILLE, of Royton, Lancaster, cotton spinner, for "certain improvements in machinery used in the preparing and spinning of cotton, flax, and other fibrous substances." Sealed October 20.

JAMES PALMER BUDD, of Ystalyfera Iron Works, Swansea, merchant, for "improvements in the manufacture of iron." Sealed October 20.

WILLIAM LONGMAID, of Plymouth, accountant, for "improvements in treating ores and other minerals, and in obtaining various products therefrom, certain parts of which improvements are applicable to the manufacture of alkali." Sealed October 20.

JAMES STATHAM, of West-street, St. Giles's, Venetian lock maker, for "improvements in the construction of locks for Venetian blinds used in carriages." Sealed October 20.

GILBERT CLAUDE ALZARD, of Tichborne-street, gentleman, for "certain improvements in bread, biscuits, macaroni, vermicelli, and pastry, and the mode of making the same." Sealed October 20.

GEORGE HAZELDINE, of Lant-street, Southwark, coach manufacturer, for "certain improvements in omnibuses." Sealed October 27.

JAMES GARDNER, of Banbury, ironmonger, for "improvements in cutting hay, straw, and other vegetable matters for the food of animals." Sealed October 27.

JOHN MULLINS, of Battersea, surgeon, for "improvements in making oxides of metals in separating silver and other metals from their compounds, with other metals, and in making white lead, sugar of lead, and other salts of lead, and salts of other metals." Sealed October 27.

ROWLAND WILLIAMS, of Manchester, fustian shearer, for "certain improvements in machinery, or apparatus for raising, shearing, and finishing velvets, or other piled goods by power." Sealed October 27.

PATENTS GRANTED FOR SCOTLAND, FROM SEPTEMBER 26 TO OCTOBER 25, 1842.

EDWIN WARD TRENT, of Old Ford, Bow, in the county of Middlesex, rope maker, for "an improved mode of preparing oakum and other fibrous substances for caulking ships and other vessels." Sealed September 29.

PETER KAGENBUSCH, of Welter on Rhur, in Westphalia, in the Kingdom of Prussia, dyer, now residing in the parish of Lyth, in the county of York, in England, for "certain improvements in the treatment of the alum rock or schist, and in the manufacture and application of the products derived therefrom." Sealed September 29.

HENRY BEWLEY, of Dublin, in the county of the City of Dublin, licentiate apothecary and chymist, for "an improved chalybeate water." Sealed October 4.

ALFRED JEFFREY, of Lloyd's-street, Pentonville, in the county of Middlesex, gentleman, for "a new method of preparing masts, spars, and other wood for ship building, and other purposes." Sealed October 18.

CLAUDE EDWARD DEUTSCHE, of Fricour's Hotel, St. Martin's-lane, in the county of Middlesex, gentleman, for "improvements in combining materials to be used for cementing purposes, and for the preventing the passage of fluids; and also for forming articles from such composition of materials." Communicated by a Foreigner. Sealed October 18.

JOHN RIDSDALE, of Leeds, in the county of York, for "improvements in preparing fibrous materials for weaving and in sizing warps." Sealed October 20.

SAMUEL CARSON, of York-street, Covent-garden, in the county of Middlesex, gentleman, for "improvements in purifying and preserving animal substances." Sealed October 20.

HENRY BROWN, of Selkirk, manufacturer, and THOMAS WALKER, of the same place, manufacturer, for "improvements on woollen carding machines." Sealed October 20.

ALPHONSE DE TROISBRIOUX, of Great Russell-street, Bloomsbury, in the county of Middlesex, gentleman, for "improvements in lithographic and other printing presses." Communicated by a Foreigner. Sealed October 20.

PATENTS GRANTED IN IRELAND IN OCTOBER 1842.

WILLIAM HENRY KEMPTON, of South-street, Pentonville, in the county of Middlesex, gentleman, for "improvements in the manufacture of candles." Sealed October 6.

ALEXANDER JOHNSTON, of Hill-house, in the county of Edinburgh, Esq., for "certain improvements on carriages, which may also be applied to ships, boats, and various other purposes where locomotion is required." Sealed October 6.

CHARLES AUGUSTUS PRELLER, of 16, Eastcheap, in the City of London, merchant, for "improvements in machinery for preparing, combing, and drawing wool and goats' hair. Sealed October 6.

WILLIAM GEEVES, of Old Cavendish-street, in the county of Middlesex, gentleman, for "improvements in machinery for cutting cork." Sealed October 6.

WILLIAM BAKER, of Grosvenor-street, Grosvenor-square, in the county of Middlesex, surgeon, for "certain improvements in the manufacture of boots and shoes." Sealed October 8.

THOMAS BANKS, of Manchester, in the county of Lancaster, engineer, for "certain improvements in the construction of wheels, and tires of wheels, to be employed upon railways." Sealed October 14.

JOHN ANTHONY TIELENS, of Fenchurch-street, in the City of London, merchant, for "improvements in machinery or apparatus for knitting." Communicated by a foreigner. Sealed October 14.

EUGENE DE VARROC, of Bryanstone-street, Portman-square, in the county of Middlesex, gentleman, for "apparatus to be applied to chimnies, to prevent them taking fire, and for rendering sweeping of chimnies unnecessary." Sealed October 14.

WILLIAM REVELL VIOERS, of Russell-square, in the county of Middlesex, Esq., for "a mode of keeping the air, in confined places, in a pure or respirable state to enable persons to remain or work under water, and in other places, without a constant supply of fresh atmospheric air." Sealed October 14.

THOMAS MARSDEN, of Salford, in the county of Lancaster, machine maker, and SOLOMON ROBINSON, of the same place, flax dresser, for "improvements in machinery for dressing or hackling flax and hemp." Sealed October 15.

THOMAS BELL, of St. Anstell, in the county of Cornwall, mine agent, for "improvements in the manufacture of copper." Sealed October 15.

JULIUS SEYBEL, of 11, Golden-square, Westminster, in the county of Middlesex, manufacturing chemist, for "certain improvements in the manufacture of sulphate of soda and chlorine." Sealed October 15.

ISHAM BAGGS, of Wharton-street, in the county of Middlesex, chemist, for "improvements in obtaining motive power by means of carbonic acid." Sealed October 15.

JAMES WHITELAW, of Glasgow, in the county of Lanark, engineer, and JAMES STIRRAT, of Paisley, in the county of Renfrew, manufacturer, for "improvements in rotary machines to be worked by water." Sealed October 19.

The Record

OF

PATENT INVENTIONS.

No. III.

SPECIFICATION enrolled 5th October, 1842, of a PATENT granted 6th April, 1842, to JOHN BEVAN, of No. 15, Whitehead's Grove, Chelsea, in the county of Middlesex, gentleman, for "*an improved mode of expelling the air from certain cases or vessels for the preservation of various articles of food.*"

THE nature of this invention consists in expelling the air from cases intended for preserving animal and vegetable matter, by connecting such cases with a vacuum chamber on the one hand, and with a vessel containing gelatine on the other, in such a manner, that by opening a communication to the vacuum chamber, the air from the vessel will pass into the exhauster, and the space be subsequently filled by the gelatine. The patentee remarks that the mode hitherto practised has been to subject such cases to a high temperature; and that a patent was obtained for the use of a bath, in which by chemical mixtures, a heat of 280° Fahrenheit was considered necessary to expel the air; but in the present improvement the temperature is not required to be higher than 120°, and by this arrangement

the inventor is enabled to cook the matter to be preserved in an almost perfect vacuum.

The vessel containing the matter is to be placed in a bath, and is connected by tubes, provided with stop cocks, with the vacuum chamber, which consists of an hemispherical vessel provided with pipes and stop cocks for the induction and eduction of steam; and also with the vessel containing the gelatine, which is placed in a warm bath for the purpose of keeping it in a fluid state. The substance to be preserved being inclosed in an air-tight vessel, and the same being placed in a bath at the temperature of 120° Fahrenheit; by turning the cock which opens the communication to the vacuum chamber, the air in the vessel becomes exceedingly rarified; and the inventor states that the temperature of 120° or thereabouts is sufficient to cook and throw off the fixed air contained in the animal or vegetable matter inclosed therein. Having maintained this temperature for a short time (say about fifteen minutes) for a fowl, the communication is opened to the vessel containing the gelatine which is allowed to run into the vessel containing the animal or vegetable matter, and expels any remaining portion of rarified air that may be left in the vessel: the tubes being hermetically closed, the case is then submitted for a few minutes to the action of boiling water, according to its size; if for a fowl, about thirty minutes—the vessel is then allowed to cool, when the process is complete. Claim is, the use of an exhauster or vacuum chamber for expelling the air in cases employed for the preservation of animal and vegetable matter to be used as articles of food; and where the articles will admit, the introduction of gelatine or other like substance into the said cases as described.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 6th April, 1842, to JAMES SMITH, of Deanston, in the Parish of Kilmadock, and county of Perth, cotton spinner, and JAMES BUCHANAN, of the city of Glasgow, merchant, for "*certain improvements applicable to the preparing and spinning of cotton, wool, flax, hemp, and other fibrous substances.*"

THE first part of these improvements relates to a mode of heckling or combing wool, flax, hemp, and other fibrous substances, by attaching the "parcels" of wool or such like substances to the periphery of a revolving cylinder, by the motion of which the fibres are thrown out upon the comb or heckle, which is so affixed as to give way upon any extra pull or stress of the fibres.

This machine or apparatus consists of a cylinder having three groves or cavities, equidistant from each other, cut across its periphery, which receive plates with suitable projections for holding one end of the tress "or parcel" of wool to be combed. The drawing shows three tresses or "parcels" attached to one plate. On imparting a rotary motion to the cylinder, the fibres of the wool will be thrown by the centrifugal force, so as to form a tangent to the cylinder, and upon the comb which is placed below the centre of the cylinder with its teeth in an inclined position; but in order that such parcels of wool may come in contact with the comb gradually, beginning with the end of the parcels of fibres, such fibres are inclosed between the periphery of the cylinder and a concentric case attached to and revolving with the cylinder; this case revolves round, or partly round, the periphery of the cylinder, which is effected in the following manner:—

On the end of the cylinder shaft is a wheel which takes into and drives a similar wheel keyed on the end of a stud, passing through the frame side in a suitable bearing; at the opposite end of this stud is another wheel which takes into and gives motion to a wheel keyed on a bush working loosely on the cylinder shaft; at the opposite end of this bush is a bevil wheel which drives a radial shaft revolving with the cylinder, on the opposite end of which is another bevil wheel taking into and driving a bevil wheel keyed on the end of a transverse shaft passing through the arm or arms of the cylinder; and on the opposite end of this shaft is a spur wheel gearing into and driving a large wheel to which are attached the concentric cases; by this contrivance, the motion of the shaft upon which the cylinder is fixed communicates a rotary motion to the radial and transverse shaft, and thus drives (at the same time as they are carried round with the cylinder) the concentric cases partly round the cylinder: it will be seen that this motion of the cases, "between which and the periphery of the cylinder the 'parcels' of wool are placed," will, as the cylinder revolves, cause the ends of the fibres to be gradually liberated and come in contact with the comb, beginning at the point or end of the fibres, and gradually receding until the whole length of the fibres is liberated so as to come in contact with the comb or heckle. For the purpose of gathering the fibres into the space occupied by the comb, a trough or case with bevilled sides and open in front is fixed in a slanting position in front of the cylinder, so that when the fibres are thrown from the cylinder they are collected by the bevilled sides of the trough, the position of which also prevents them from entering the teeth of the comb further than is required. The comb is also held by radial rods, and is provided with a spring underneath its back,

so as to alter the inclination of the teeth upon any extra pull or stress of the fibres.

Claim is for the fixing to a revolving cylinder portions of flax, hemp, wool, or other fibrous substance, so that the centrifugal force arising from the motion of the cylinder shall throw the end of the parcel of fibres beyond the line of the periphery of the cylinder, and upon the heckle placed to receive them; and also the gradual exposure of the different lengths of the fibres which are being heckled or combed, to the action of the heckle. He also claims the attachment of the heckles in their working position in such a manner as to yield to any extra pull, yet having the power to retain their position so soon as the extra strain is removed.

The second improvement relates to a peculiar arrangement of mechanism whereby the sliver as it flows from the delivery rollers of a carding engine, drawing frame, or slubbing frame, is deposited in parallel rows or layers. This apparatus is shown in the drawing as attached to one side of a compound carding engine, and consists of a can or receiver in the form of an oblong square, mounted upon a joint or axis at the lower end, so as to allow of an oscillating motion being given to it by fixing on the end of one of the doffer shafts a heart wheel, which communicates a slow oscillating movement to a pendent arm or lever, moving upon an axis at its upper end, the opposite end being attached by means of a connecting rod to the oscillating can or receiver; thus as the fibres are stripped from the two doffers in a sheet, they pass through the delivery rollers, and from thence (in the form of a sliver) over a guide roller and between another pair of rollers to the can or receiver, which at every revolution of the doffers moves backwards and forwards over a space equal to the length of the sliver delivered from the doffer; the rollers through which the sliver last passes, and which are just above the

can or receiver, also serve to press the sliver down as it is laid in parallel rows one above the other, as just described. The application of this apparatus to the drawing frames differs somewhat from the preceding in this respect, that on account of the slivers being much narrower and more than one single row of the sliver being required to be deposited, a lateral motion is given to the can or receiver, so as to deposit the sliver in three parallel rows or layers, side by side.

Claim.—The depositing slivers, slubbings, or rovings in cans or suitable receivers, in regular successive parallel layers as they flow from the carding engine, drawing frame, slubbing frame, or tube frame, such slivers being compressed by the flowing rollers; also the oscillating and reciprocating movement of the receivers, and in conjunction with a transverse movement when more than single rows of slivers are to be deposited.

The third improvement relates to the application to drawing and other frames, of a self-stopping apparatus, which is acted upon when any of the slivers have been broken or terminated. The slivers in passing from the cans or receivers are conducted over a guide roller placed at some distance from the receiving rollers of the frame, and below the slivers is fixed in a vertical position a lever, moving on an axis and supporting at its upper end a plate having a number of teeth similar to a comb; therefore when one of the slivers breaks or terminates, the end of such sliver will fall from the guide roller and on to the teeth of the comb, which will, by the motion of the sliver, be drawn towards the frame, and the opposite end of the lever to which the comb is attached will act upon a catch or detent, so as to release the strap guider, which is forced by means of a spring on to the loose pulley: a counterbalance weight affixed to a bent arm of the comb-formed lever, draws it to its original position. It will be seen that

this toothed or comb plate may extend from one end of a machine to the other so as to be acted upon by any of the slivers.

The claim is for the self-stopping of drawing frames, slubbing frames, or roving frames when any of the slivers shall have been broken or terminated by the dropping of the end or terminating of the sliver upon what the patentee calls "a toothed palm," in the manner described.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 6th April, 1842, to JOHN READ, of Regent Street, in the county of Middlesex, machinist; HENRY RUTLAND, of Hurst Green in the county of Sussex, farmer, and CHARLES WOODS, of Fore Street, Cripplegate, in the county of Middlesex, commercial traveller, for "*improvements in the construction and make of driving reins, harness, bridles, and reins, and in bridles and reins for riding.*"

THIS invention relates to the mode of constructing or making reins and bridles in such manner that they are capable of acting on two powers of leverage of the same bit, or of two bits used at the same time, whereby the horse will, under ordinary circumstances, be governed by the lesser power, or leverage of the bit; but when that is not sufficient, the greater power or leverage is brought into action, and answers the purpose of double reins.

This improved bridle or rein consists of a single strap to hold by, but is made at each end, that is to say, on each side of the horse's neck, to branch out into two parts, thus forming four ends to the bridle, two of which are attached

to the bit, so as to obtain sufficient leverage under ordinary circumstances; the other two are attached lower down or near the end of the bit, so as to obtain greater leverage; the former are made elastic by inclosing a spiral spring in a case; the latter hang loosely below the flexible reins. Thus by pulling at the rein, the lesser power or leverage will be acted upon, and will answer the purpose of an ordinary rein, but when not sufficient to control the horse, the spring will give way, and the other ends which are attached to the greater leverage will be brought into use, and produce the effect of a double rein.

Claim.—The mode of constructing and making driving reins, harness, bridles, and reins, and bridles and reins for riding, by forming thereon two means of attaching each end thereof, the one to be attached to a more powerful part of the leverage, and the other to a less power of leverage, of a bit, or to separate bits; the attachment to the lesser power of the bit being through an elastic medium in order that the same may yield, to allow of the greater power being brought into use.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 6th April, 1842, to JEAN GEORGE SUE CLARKE, of Euston Grove, in the county of Middlesex, engineer, for "*improvements in supplying and regulating air to furnaces of locomotive engines.*"

THIS invention relates to certain apparatus for heating and regulating the supply of atmospheric air to the furnace of locomotive engines. The chamber through which the air passes consists of two compartments, made of plate iron, and placed below the fire bars; the arrangement

being such, that by turning a handle which imparts motion to a screw placed near the engine driver, the apparatus, which is supported by a hinge joint at one end, can be lowered, for the purpose of clearing away the ashes. The air is admitted through an aperture at one end of the chamber, which is provided with a lid or cover, moving upon a hinge joint, and actuated by a combination of levers, so as to enlarge or contract the opening for the admission of air, which passes through the upper compartment, and in contact with the surfaces of such compartment which have become heated by the fire; the air in a heated state then passes to the lower compartment, and is conducted in a lateral direction to the ash-pit, for the purpose of supplying the fire.

Claim.—First, the mode of supplying heated air to the furnace of locomotive engines, by applying an apparatus below the fire bars; secondly, the mode of regulating the supply of air to such apparatus, as described.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 15th April, 1842, to JOHN LAMB, of Kidderminster, in the county of Worcester, machinist, for "*certain improvements in engines to be worked by steam, air, gas, or vapour; which improvements are also applicable to pumps for raising or forcing water, air, or other fluids.*"

THIS invention of improvements in engines to be worked by steam, air, gas, or vapours, applicable also to pumps for raising or forcing water, air, or other fluids, relates to that description of engine commonly called and known by the name of rotary engines, and consist of one cylinder

working in a peculiar manner inside another, so as to impart a rotary motion to the main or driving shaft.

The outer case or cylinder of this engine is firmly fixed to a foundation plate by screw bolts, and is in form similar to a gas meter; the main or driving shaft, which is in a horizontal position, has its end enlarged: this enlarged end passes through an opening in the centre of the outer cylinder or case, and is surrounded by a collar or ring, concentric with the cylindrical case, and forms part and parcel of such case: thus leaving between the periphery of the collar and the interior surface of the cylindrical case, an annular space, which is divided by a vertical steam stop, that is to say, a vertical plate, which slides into two dove-tailed grooves, one of which is formed in the periphery of the collar, (at the top side of the circle) and the other in the inner surface of the case; this vertical steam stop is somewhat narrower than the depth of the cylinder, but is equal to the length of the collar which surrounds the enlarged part of the shaft, and on each side of this steam stop there is an aperture for the induction and eduction of steam. The inner or revolving cylinder has but one end; and when inserted into the annular space, (for which purpose it will be observed, that there must be a transverse slot cut across its periphery, to receive the vertical steam stop) the edge of which is ground, forms a steam tight junction against the back or end of the cylindrical case; and the end of the collar and shaft also fits tight against the bottom or end of the cylinder; and the internal and external diameter of the inner or revolving cylinder is such, that it respectively binds or fits tight against the periphery of the collar and the interior of the large cylinder or case; that is to say, the periphery of the interior or revolving cylinder, forms a steam tight junction with the interior of the outer cylinder or case; and the

interior of the inner or revolving cylinder also forms a steam tight junction with the periphery of the collar.

There is a certain arrangement of a compound or double wedge, acted upon by two wedge pieces, connected together by a right and left hand-screw, by turning which, the parts just referred to are brought to bear against each other. Suppose a pin or axis to be passed through the centre of the end of this eccentric cylinder, and into the end of the enlarged part of the driving shaft; this pin, it will be seen, is on one side of the centre of the shaft, and will therefore form a crank axis to the main shaft, and by a peculiar motion of this cylinder, a rotary motion will be imparted to the crank. The operation of the engine is as follows :—

It will first be necessary to state, that the interior cylinder does not revolve upon its own axis, its motion round the interior of the case being like that of the planetary wheel in the sun and planet motion. Presuming the end of the outer cylinder to be firmly bolted on, and the centre or axis of the revolving cylinder to be at or near the top centre, on admitting steam through one of the apertures formed at each side of the vertical steam stop, the interior cylinder, which is open at that end, will be filled with steam, and its elastic force will be exerted on the stationary steam stop, and on one half of the interior of the cylinder, the steam being prevented entering its other half by its close contact with the collar; the elastic force, therefore, will cause the cylinder to recede; a space will then be formed between the outside of this cylinder and the interior of the case, and the steam will act on its periphery: when it has arrived at the bottom centre, having made half a revolution, the communication with the inside will be cut off by the edge of the cylinder having passed below the induction passage, and the force of the steam will be

exerted on the periphery alone, and will cause it to recede still further, when a communication with the inside of the cylinder, by its motion upwards, will be gradually opened with the eduction passage, for the escape of steam which is on the opposite side of the vertical steam stop; and at the same time that this communication is being opened, steam is again entering the interior of the cylinder on the opposite side to the steam stop; and in this manner the eccentric cylinder is carried round by the elastic force of the steam admitted inside, and also between the spaces formed by the periphery of the said cylinder and the interior surface of the cylindrical case, and imparts a rotary motion in the manner described, to the main shaft.

Note.—The pin or axis of the revolving cylinder enters the compound or double wedge, the object of which has previously been described. There is also a radial slot in the cylinder, into which works a metal piece, mounted on an axis at its upper end, and fixed to the stationary steam stop; this piece vibrates as the cylinder moves round, and is for the purpose of guiding the revolving cylinder on its own axis. The patentee also shows the application of a slide valve box, of the ordinary construction, by which means the motion of the engine can be reversed.

The drawings show a modification of the engine above described, suitably arranged for working expansively; (that is to say) the steam having exerted its elastic power in the engine, as above described, passes therefrom to other chambers, constituting another engine of enlarged capacity, and from thence to any ordinary condensing apparatus. The inventor remarks, with respect to the engine above described, that no alteration or arrangement of parts will be positively necessary when the apparatus is to be applied for the purpose of forcing air, as in the blast engine, or for pumping water or other fluids, the

induction passage being in communication with the fluid to be pumped or forced, and the eduction passage in connection with the receptacle into which the fluid is to pass; for which the patentee claims, first, the construction of an engine to be worked by steam, air, gas, or vapours, consisting in the operation of the eccentric cylinder or cylinders, in combination with the stationary stop or stops; such cylinder or cylinders being capable of turning on their own axes, and performing the motion above described; secondly, the like arrangement of apparatus for the purpose of raising or forcing water, air, or other fluids.

SPECIFICATION enrolled 7th October, 1842, of a PATENT granted 7th April, 1842, to THOMAS CLIVE, of Birmingham, iron founder, for "*certain improvements in the construction of candlesticks.*"

THESE improvements consist, first, in the construction of a new apparatus, or "push up," for raising the candle in the socket of a candlestick; and secondly, in the combination of this new push up with an elastic holder, for holding the candle securely in the candlestick, for which (in part) a patent was granted to JAMES BARLOW, of Birmingham, on the 25th of April, 1839.

This new apparatus or "push up," consists simply of a disc, which forms a base for the candle to rest upon, and has a vertical rack attached to its under side; a transverse shaft passes through the cylindrical part of the candlestick, having a pinion fixed upon it, which takes into the teeth of the rack: by turning round a knob fixed on the end of the shaft, and projecting from the side of the candlestick,

the push up will be raised or lowered as may be required. It will be evident that this push up can be effected with a rack and pinion in a variety of ways, of which several are shewn in the drawings.

The elastic holder, which is to be rivetted or otherwise affixed to the upper part of the push up, consists of a thin plate of metal cut out in the form of a star, the points or ends being turned upwards so as to approach each other; and on inserting a candle, the same will be held by the ends of the plate pressing against the side of the candle.

The patentee claims as his invention, any push up in which a rack and pinion are used, of whatever form and however placed; and also the methods described in the Specification of giving motion to the rack and pinion.

SPECIFICATION enrolled 7th October, 1842, of a PATENT granted 7th April, 1842, to JOHN ANTHONY TIELENS, of Fenchurch Street, in the city of London, merchant, for "*improvements in machinery or apparatus for knitting*." Being a communication.

THIS machine, which is of a cylindrical form, is to be suspended from the roof or ceiling by a vertical shaft, and consists principally of four circular plates, placed one above the other, to which the minor parts of the machine are connected. The first or upper plate, together with the vertical shaft, remains stationary, and is termed the "support plate," having certain other parts of the machine or apparatus attached to it. The second, which is called the needle plate, has arranged round its circumference a number of needles, affixed so as to form radial lines; this plate works loosely on the shaft, and receives

a rotary motion by means of a pair of bevil wheels, one of which is fixed to and revolves with the plate; and the other is keyed on the end of a transverse shaft, having at its opposite end a handle. The third plate, which is connected by means of vertical bolts and revolves with the second, is provided with a number of radial slots cut through it, near its circumference, and is called the "comb plate;" this plate is for the purpose of supporting in a vertical position a number of jacks or sinkers, which work through the slots of the plate and between the needles. The fourth plate also remains fixed to the vertical shaft, and is provided with a circular projection, having undulations or inclined planes in its edge, which cause the sinkers to move up and down in a vertical direction, their position being maintained by the slots in the comb plate; from the circumstance of these sinkers (which are carried round by the two revolving plates) moving with their lower end on the undulated projector, which cause them to rise and fall, this plate is termed the railway plate. These sinkers have also an outward motion, which is effected by certain cams, suspended by bolts from the upper or support plate, so as to press against their back or inner circular edge, thus causing them, as they are carried round, to move outwards; and, for the purpose of forcing them back to their original position, two helical springs are bound round, or caused to encircle the whole series of sinkers. From the above description, it will be observed, that on giving a rotary motion to the machine, the sinkers or jacks will, besides having a rotary motion, be caused to move up and down between the needles, "which revolve with them," and also backwards and forwards between such needles.

The threads for forming the work enter the machine by four trumpets, or conical tubes, and are conducted under

the hooks or notches of the sinkers, and laid along the needles; during the motion of the sinkers, and when descending one of the inclined planes of the railway plate, the front notch of the sinkers taking hold of the thread which is drawn so as to form a loop hanging between the needles, and at the same time these sinkers are pressed forward between the needles by coming in contact with one of the cams placed behind them, by which means the loop is brought towards the end of the needles and under the beard or back of such needle; when the sinker comes in contact with the opposite incline of the railway plate, it will be raised, and having at this time passed the highest part of the cam, it will, by means of the helical springs, or a suitable projection, be forced back: during the upward or rising motion, the sinker will be raised out of the loop, but on being pressed back as aforesaid, another part of the sinker takes hold of the work, and draws it from under the beard or beak of the needle, which is then closed by being brought under the edge of a circular revolving presser plate; at this moment, the sinker comes in contact with another cam, which gradually forces it outwards, and forces the work over the beard of the needle, which has before been stated to be closed by the circular pressure plate, and in this manner the loops are formed; and the sinker ultimately presses the loop of the work over the end of the needle, and over a loop which has just been formed, and which loop remains at the end of the needle until another by the next two needles is made; and when the work is thrown over, the sinkers are pressed back to their original position by the helical springs.

The claims are, first, the peculiar arrangement of mechanism, or combination of parts, for performing the operation of knitting or producing looped work; secondly, the arrangement and construction of the needles, which

are placed radially round a circular plate or disc, and the application of such plate for the production of knitted or looped fabrics; thirdly, the construction of the comb plate, railway plate, and sinkers; fourthly, the peculiar arrangement and combination of the circular disc and wheel for closing the beak of the needles, &c.; and also the peculiar mode of fixing and removing the needles employed in knitting by machinery.

SPECIFICATION enrolled 8th October, 1842, of a PATENT granted 8th April, 1842, to MARC CARLOTTI, of No. 3, Little Argyll Street, Regent Street, in the county of Middlesex, gentleman, for "*certain improvements in the construction and manufacture of boots, half boots, shoes, clogs, and galoches.*"

THIS invention consists, first, in the introduction and concealment of wooden soles between the outer leather sole and lining of boots, half boots, shoes, clogs, and galoches, and has for its object the better protection of the foot from damp, and combines both lightness and economy of wear and tear, and at the same time dispenses with the necessity, or nearly so, of sewing the sole and the vamp, and the various pieces of the sole together, and presents the appearance of leather; and, secondly, in an improved construction and arrangement in the manufacture of clogs and galoches, having for its object the superseding of ancle straps, buckles, or any other fastening across the instep or ancle, and enabling the wearer to introduce and remove his foot, and to fasten on the clogs or galoches, or loosen them without the application of his hands or the necessity of stooping.

The improvement in this part of the invention consists in the employment of a sole of wood either in one or two parts, that is to say, a toe and heel piece; if the latter be used, the two parts or pieces are to be joined together, or connected by an intermediate piece of leather which is to be nailed to the corresponding ends of the two pieces; the vamp, if for boots or shoes, or the toe and heel pieces, if for clogs or galoches, are then adjusted round the circumference of the wooden sole; and when the toe and heel piece are connected by means of a piece of leather in the manner described, the corresponding edge of the vamp and such connecting pieces are to be stitched together. A piece of leather from one-inch to one-and-a-half inch wide, according to the thickness of the wooden sole, is then to be nailed round the sole, or if in parts round the toe and heel piece, the edge of such piece of leather being level with the bottom edge of the wooden sole, so that the other part of the leather may cover a portion of the vamp; and upon the piece of leather thus attached is nailed a thin piece or ribbon of metal; the leather is then turned down, and drawn tightly over the lower edge of the sole and nailed to the underside, so as to give the edge of the wood the appearance of leather; the leather sole is afterwards nailed on to the sole prepared in the manner just described.

The improved arrangement and construction of clogs and galoches consists, firstly, in the use of one or several springs placed one over another; these springs are placed in a recess formed along the inner or upper surface of the sole of the clog or galoche, that is to say, of such as have a divided tread, the springs being held at each end by two metal plates, beneath which they play freely in a longitudinal direction; and, secondly, in the application of a thin metal half circle, which is introduced within the project-

ing heel of the clog or galoche, which half circle is fastened by each end to the sides of the projecting heel by means of two pins or rivets upon which it works; to the centre of the lower part of this half circle is fixed a small curved spring, the arrangement being such that when the foot is introduced into the clog, the half circle will be pressed upwards against the heel of the boot or shoe. There are other modifications of the application of this half circular piece for the purpose of holding the clog firmly to the foot; and in order to remove these clogs or galoches from the feet, it is only necessary to press with the toe of the other foot upon a little stud or projecting piece attached to the curved spring.

The patentee in conclusion says, "I do not claim as any part of this said invention so much in the above description as relates to the employment or use of wooden soles or of vamps for boots, half boots, shoes, or galoches, or toe and heel pieces for clogs, or as relates to the construction, employment, or use of the springs or studs, or knobs fixed to the heels of clogs or galoches themselves when furnished only with the springs, but I do claim all else that is hereinbefore described, and that, whether the same is employed together or separately, having the same object."

SPECIFICATION enrolled 13th October, 1842, of a PATENT granted 13th April, 1842, to WILLIAM FALCONER, of Clapham Common, gentleman, for "*improvements in apparatus for attaching buttons and fasteners to gloves and parts of garments.*"

THE first part of these improvements relates to certain fasteners for gloves, and consists, first, of two small square

plates, attached together so as to form a hinged joint by means of two small projecting studs rivetted to two corners of the bottom plate; these studs pass through openings or holes in the upper plate, which allow the two plates a little play, and to separate; the bottom plate has also a screw in its centre which passes loosely through a hole in the other plate, and by screwing on the button, which is provided with a female screw passing through the centre or shank, the two clamps or plates will be bound together, so that on placing the edge of the glove between the two plates, the inner surfaces of which are roughed, the button will be held securely, and can be removed to any part of the glove, so as to make it when buttoned fit tight to the wrist of the wearer. The second part also relates to certain fasteners for gloves, and consists of a button made at the shank with an extended surface in the form of a disc, in the centre of which there is a female screw, which receives a screw having a flat round head: for this description of button, a hole is required to be made through that part of the glove to which the button is to be fixed, in order to allow the screw to pass through into the button; by this arrangement it will be seen that such part of the glove is held between the two discs of metal. This mode of affixing buttons to parts of garments is also shown as applied to a covered button; in both cases the inner surfaces of the discs are made rough by forming points or projections thereon, for which the patentee claims, firstly, the mode of fastening buttons or fasteners to gloves and parts of garments by means of the button pressing together two clamping surfaces; and secondly, the mode of attaching buttons to gloves and other parts of garments by forming "roughings," points, or projections at the stems or shanks, or to discs or enlargements formed on or fixed to the ends of the stems or

shanks of buttons, there being a disc fixed to one end of the male screw which enters the stem or shank of the button, which disc is suitably prepared for holding the material to which it is affixed between the two surfaces.

The third improvement relates to fastenings for trowsers' straps; for this purpose the patentee provides a narrow plate of metal about two inches long, having a button projecting from one side, and in the middle of the plate, which is also made rough, or provided with projections at its lower edge, so as to prevent it, after being introduced into the seam, from moving out of its place. In the seam at the bottom of the trowsers' leg, and in the inside, is made a hole similar to a button hole, sufficiently large to admit the narrow plate of metal, together with the projecting button; the plate, after being pushed through along the seam, is then drawn half way back until the projecting button comes opposite the hole; it is then drawn through so as to serve as a button for the purpose of fastening the strap; the plate may be bent a little, so as to suit the curvilinear form of the trowsers, and it will be seen that the plate applied in the manner described can be easily removed from trowsers which require washing, and the plate extending on each side of the button will have the effect of drawing the trowsers equally straight, as if more buttons were used. There is another application of this principle, wherein the plate with the button is attached to a piece of leather, and such piece of leather, together with the plate, is stitched to the trowsers; and also where plates are used having a cavity in their edge, for the purpose of receiving the button stitched to the ends of the trowsers' straps, for which the patentee claims the mode of attaching buttons or fasteners by means of plates in the manner described, whether the straps referred to are applied or not.

SPECIFICATION enrolled 15th October, 1842, of a PATENT granted 15th April, 1842, to THOMAS RICHARDS, of Liverpool, in the county of Lancaster, bookbinder, for "*certain improvements in the art of bookbinding, and also in the machinery or apparatus to be employed therein.*"

THESE improvements consist in the application of machinery for the purpose of sewing, weaving or binding a number of sheets of paper together, so as to form a book, and also in a peculiar arrangement of machinery, consisting of a table sliding to and fro on the edge of the frame, in order to supply the sheets of paper separately into the machine; and also in certain needle bars or holders for presenting the needles with the threads for stitching the sheets as they are consecutively delivered to the machine, and, by certain arrangements of mechanism, a series of holding fingers or pincers advances and takes hold of the needles and draws them through the sheet of paper, and afterwards returns them to their respective holders.

The sheets intended to be bound together by this process are to be folded, and introduced into the machine singly, that is to say, they are not folded one within another, nor are several sheets stitched through at one and the same time; but the single sheets are prepared for the machine by introducing a piece of gummed thread between the fold, and nearly the whole length of the fold, the two ends of the gummed thread being passed through the sheet within a short distance from the top and bottom of such sheet.

The machine consists of three longitudinal shafts, which give motion by means of cams, eccentrics, &c., to the

several parts of the machine, the principal features of which are the horizontal sliding table upon which the sheets of paper are placed; and a series of needle holders, which have also a horizontal movement, and a longitudinal bar, which moves by means of two eccentrics in vertical V grooves cut in the frame sides; this bar is provided with a series of holding fingers or pincers composed of a number of vertical steel springs attached to the bar; in front of these springs is a bar having one portion of its circumference flat; the object of which is, that when such part is turned towards the series of springs, such springs will not be acted upon, but on turning the round side towards the springs, such springs will then be pressed against the lower edge of the bar upon which they are affixed, so as to form a series of pincers or holders for drawing through the needles, after which certain arms or levers take the sheet having the threads passed through it, and place it upon a table which is below the sliding table. Motion being communicated to the machine by means of a treadle, in the same manner as a foot lathe, or by any other means, a sheet of paper, folded in the manner described, is placed on the sliding table, which moves in a horizontal direction towards the needle holders, which support the needles, together with their threads in a vertical position; the table having arrived at a certain point, the needle holders advance, so as to be brought underneath the folded edge of the paper; at this moment a longitudinal bar takes hold of the edge of the paper and presses it upon the points of the needles, when, by means of the two eccentrics, the longitudinal bar, with its series of finger holders is lowered over the points of the needles, the flat sided bar being partly turned round, the series of springs will be compressed in the manner described, and thus hold the needles, which are by the upward motion of the

slide drawn through the sheet of paper, which is afterwards taken hold of by means of a pair of levers or arms, and drawn over the suspended threads and placed on a horizontal table, and in this manner the sheets are stitched and laid one upon another. It must be here observed, that there are two sets of needles and needle holders to this machine, each set of needle holders advancing to stitch through every alternate sheet; it is by this arrangement, that what the patentee terms "weaving" the sheets together, is formed, and constitutes one of the principal features of the invention. For the sake of illustrating this part more clearly, suppose one set (called the first set) of needles to be threaded with black thread, and the other or second set with white thread. On setting the machine to work, the first set advances and stitches the paper in the manner before described; the needle holders, after the needles have been returned to them, recede, and on the next sheet advancing, by means of the table, the second set of needles, or those with white thread, advances to stitch the second sheet, which is carried away in the manner described and laid upon the first; the next sheet brought by the table is stitched with the first set of needles, having the black thread, and in this manner they advance to stitch every other sheet, the threads passing over the folded edge of the intermediate sheets, thus forming, with the cross or gummed threads which are within the fold, a complete woven fabric; the vertical or needle threads constituting what may be termed the warp, and the cross or gummed threads the weft. When the sheets have accumulated in sufficient number to form a book, they are ready to be submitted to the subsequent operation of boarding and finishing, the threads being left long enough to form a substitute for the end papers commonly employed to secure the boards to the back of the book.

The patentee does not confine himself to the mechanical arrangements, as others may be substituted without deviating from the object of the invention.

SPECIFICATION enrolled 15th October, 1842, of a PATENT granted 15th April, 1842, to ALFRED JEFFERY, of Lloyd's Street, Pentonville, gentleman, for "*a new method of preparing masts, spars, and other wood, for ship building and other purposes.*"

THESE improvements consist in a new mode of preparing masts, spars and other wood for ship building, and also for other purposes, by the application of a glue, which is insoluble in water, and more elastic than the ordinary prepared glue, and is called by the patentee "Jeffery's marine glue," and which is made with a preparation of caoutchouc: such glue may also be made without the application of caoutchouc. When the glue is made with caoutchouc, the patentee prepares a solution of what he calls "my" or "Jeffery's crude naphtha caoutchouc solution," and which consists of caoutchouc of the best quality, dissolved in coal naphtha, commonly called crude naphtha, in the proportion of one pound of caoutchouc to four gallons of the crude naphtha; the caoutchouc is to be cut into shreds or strands, and the mixture occasionally stirred, which will take from ten to twelve days in dissolving. In making this improved marine glue with caoutchouc, the patentee takes one part by weight of the crude naphtha caoutchouc solution, and two parts by weight of gum lac or shell lac, preferring the latter; this mixture is put into an iron pan, having a tap at the bottom, and heat applied either by hot water, steam or

fire, and by frequent stirring, the compound becomes amalgamated; it is afterwards to be drawn off by means of the tap, on to a slab and allowed to cool, after which it may be cut into pieces ready for use.

To make marine glue without caoutchouc, the patentee mixes one part by weight of coal naphtha, called crude or rough naphtha, and two parts by weight of gum lac, or shell lac, (preferring the latter) and proceeds to mix them in the manner before stated with respect to making glue with the crude naphtha caoutchouc solution.

The patentee adds, that the proportion mentioned for making the marine glue for ship building and other purposes may be varied; for instance, a larger proportion of lac may be used to produce greater hardness in the glue, and where the material to be prepared is to be exposed to greater atmospheric action: or a larger proportion of caoutchouc solution may be used, (when the glue is made with caoutchouc) to give it greater elasticity.

To prepare the glue for use, it is to be put in an iron vessel and heated by fire to about 250° Fahrenheit; the melted glue is then to be laid over the surfaces with a brush, care being taken that they are perfectly dry; the two surfaces are then placed together and pressure applied in the usual way; it will be found that the temperature of the glue, after being laid on the surface, will decrease quickly, in which case irons heated to about 140° Fahrenheit may be applied, and the joining cramped in the ordinary manner.

The patentee claims as his invention the use or application in preparing masts, spars, and other wood for ship building and other purposes, of glue insoluble in water and more elastic than glue in ordinary.

SPECIFICATION enrolled 17th October, 1842, of a PATENT granted 18th August, 1842, to WILLIAM RAYBOULD, of St. James's Walk, Clerkenwell, in the county of Middlesex, brass-founder, for "*a new or improved soldering iron.*"

IN the ordinary mode of making soldering irons the copper head is fastened to the shank by means of rivets, and the handle by which the workman holds the tool is fixed and stationary: so that a great number of tools of different lengths and sizes are required for different descriptions of work.

These improvements consist, first, in affixing the copper head of a soldering iron to the shank, so as to be easily removed: for this purpose the shank is made in the same form as in the ordinary construction, with this difference, that the patentee employs screws to fasten the copper head thereto, in place of rivets as heretofore, the object of which is to facilitate the removal of the head when required; and secondly, in place of boring the hole only partly through the handle, and fixing the same stationary to the shank, the patentee bores the hole wholly through the handle, and lines it with iron or other metal, so that it may slide freely on the shank. In order to fix it in any required place, a thumb screw is passed through the hoop of the handle, which, on being tightened up, binds against the shank; and by this arrangement the length of the soldering iron can be altered as may be required.

The claim for these improvements is the method or methods of readily fastening and unfastening the copper head to and from the shank of the soldering iron, in the manner described, or any other mechanical means which may be adapted to the purpose.

SPECIFICATION enrolled 21st October, 1842, of a PATENT granted 21st April, 1842, to KENT KINGDON, of Exeter, in the county of Devon, cabinet maker, for "*certain improvements in impressing and embossing patterns on silk, cotton, and woven or felted fabrics.*"

THESE improvements consist, first, in producing, by means of flock, a raised or embossed pattern on any unprepared surface of woollen, cotton, and other fabrics; and secondly, in the use and application of a solution of india rubber, which renders more perfect and durable the raised or embossed part produced by the flock; and thirdly, in the employment of a solution of india rubber spread over the surface of linen, wool, silk, or cotton; which solution, by preventing absorption, admits of a gold size being spread on the surface, and thereby enables the cloth to be gilt or bronzed. The cloth prepared in the above manner is to be embossed by passing it between cylinders in the ordinary manner. In order to produce embossed surfaces on cloth, the patentee takes, for instance, a piece of woollen damask quite plain, and impresses thereon, by means of a wooden or other block, the pattern required, with a solution of india rubber. When this is dry, he prints flocking varnish over the india rubber with the same or a similar block, and afterwards dusts the flock on the varnish; and when dry, the flock, by adhering to the varnish, forms the pattern required. If the ground is intended to be gilt or bronzed, the patentee takes a piece of thin calico and covers it entirely with a solution of india rubber; after it is dry, he spreads over it a coat of gold size made in the usual way, which may either be gilt or bronzed, and the embossing produced by passing the gilt

or bronzed cloth between engraved surfaces; and if it is wished to form a pattern in flock, he proceeds in the manner before described: for which the inventor claims, first, the use of flock for the purpose of forming embossed or raised figures or patterns on unprepared surfaces of woollen, cotton, and other fabrics; and secondly, the application of india rubber to the surfaces of linen, woollen, silk, and other fabrics, which, by preventing the absorption, enables either the flocking varnish or the gold size to be applied so that the surface can be bronzed or gilt and embossed in the usual way, and afterwards flocked if required.

SPECIFICATION enrolled 21st October, 1842, of a PATENT granted 21st April, 1842, to WILLIAM NOEL, of Jermyn Street, St. James's, in the city of Westminster, boot and shoe maker, for "*certain improvements in the manufacture of boots and shoes.*"

THESE improvements consist in giving greater elasticity or flexibility to boots and shoes, by the application of metallic springs between the in-sole and out-sole, so that during the action of walking the foot will have greater freedom and easiness of motion; and further, the insertion of shank pieces, for the purpose of giving greater stiffness to the "waist," is rendered wholly unnecessary. The description of spring used for this purpose is a well tempered piece of steel, slightly curved, and covered with paint to protect it from rust; and in manufacturing a boot or shoe according to this invention, the patentee says, "I take the sole down, from the joints backward to the heel, quite thin, leaving the leather all its substance to be placed under the heel; the spring is then fastened at one

end to the back part of the sole under the heel by means of pins or rivets, and the other end of the spring, which extends half way between the heel and toe of the boot or shoe, is left loose; the spring thus fastened at one end is allowed some play between the in-sole and out-sole, it being one essential feature of the invention that the spring shall be fixed at one end, so that the play before referred to may take place." Although the inventor prefers to fix the spring in the manner described, yet such spring may be fastened by pins or rivets in the middle, so as to leave it at liberty at both ends: for which he claims, the improvements in the manufacture of boots and shoes by the use and application of metallic springs, in the manner described.

SPECIFICATION enrolled 21st October, 1842, of a PATENT granted 21st April, 1842, to ALPHONSE DE TROISBRIOUX, of Great Russell Street, Bloomsbury, gentleman, for "*improvements in lithographic and other printing presses.*"

THIS invention consists in the construction of a press, and in the peculiar arrangement and combination of parts and apparatus connected therewith, for the purpose of obtaining impressions from cylinders of stone and other suitable materials; as for instance, a metal cylinder, or a cylinder covered with metallic plates, the pattern or device being drawn and arranged on the surface of the cylinder by any of the known methods. The patentee then proceeds to describe the construction of a press, and the arrangement of parts which has been found to answer extremely well.

Plate.—Fig. 1, represents a front elevation of a double

Fig. 1.

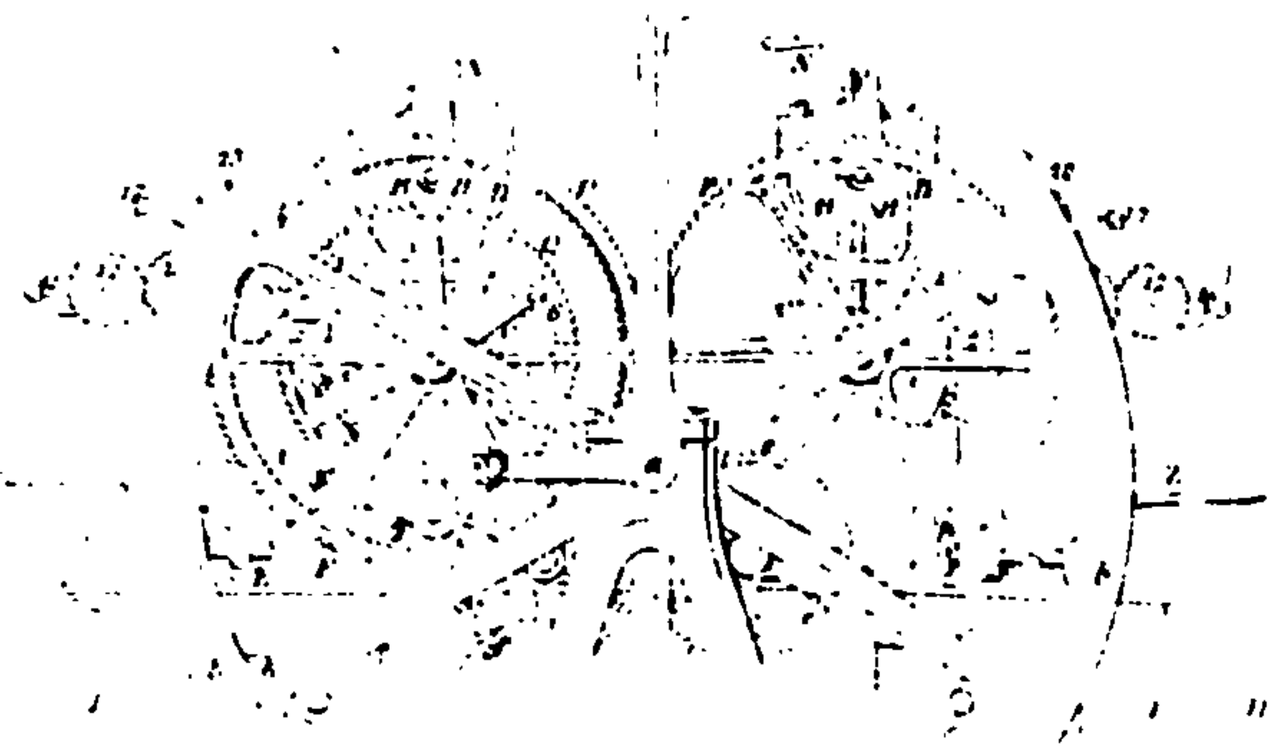


Fig. 5.

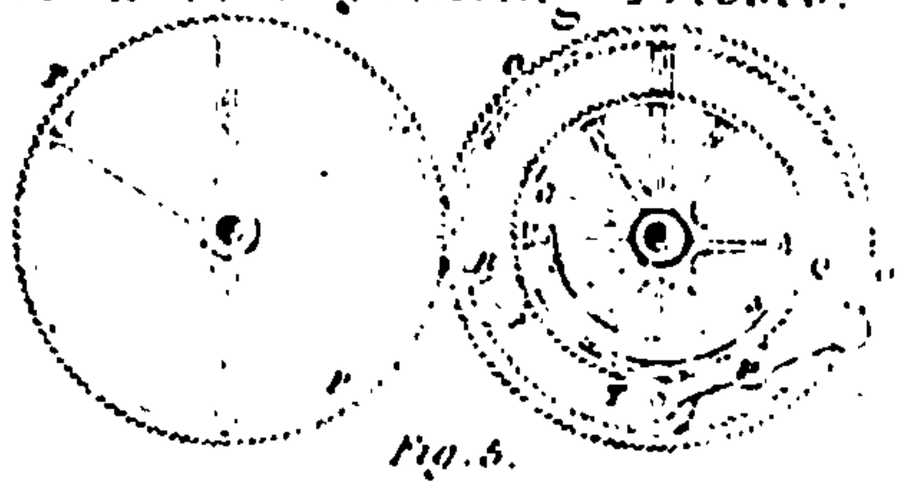


Fig 6.

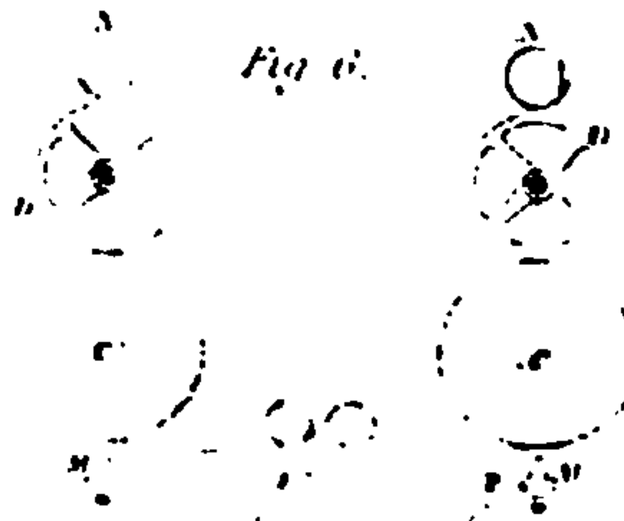


Fig 3

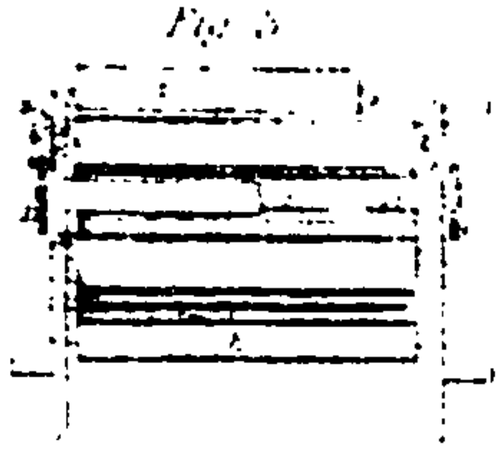


Fig 1

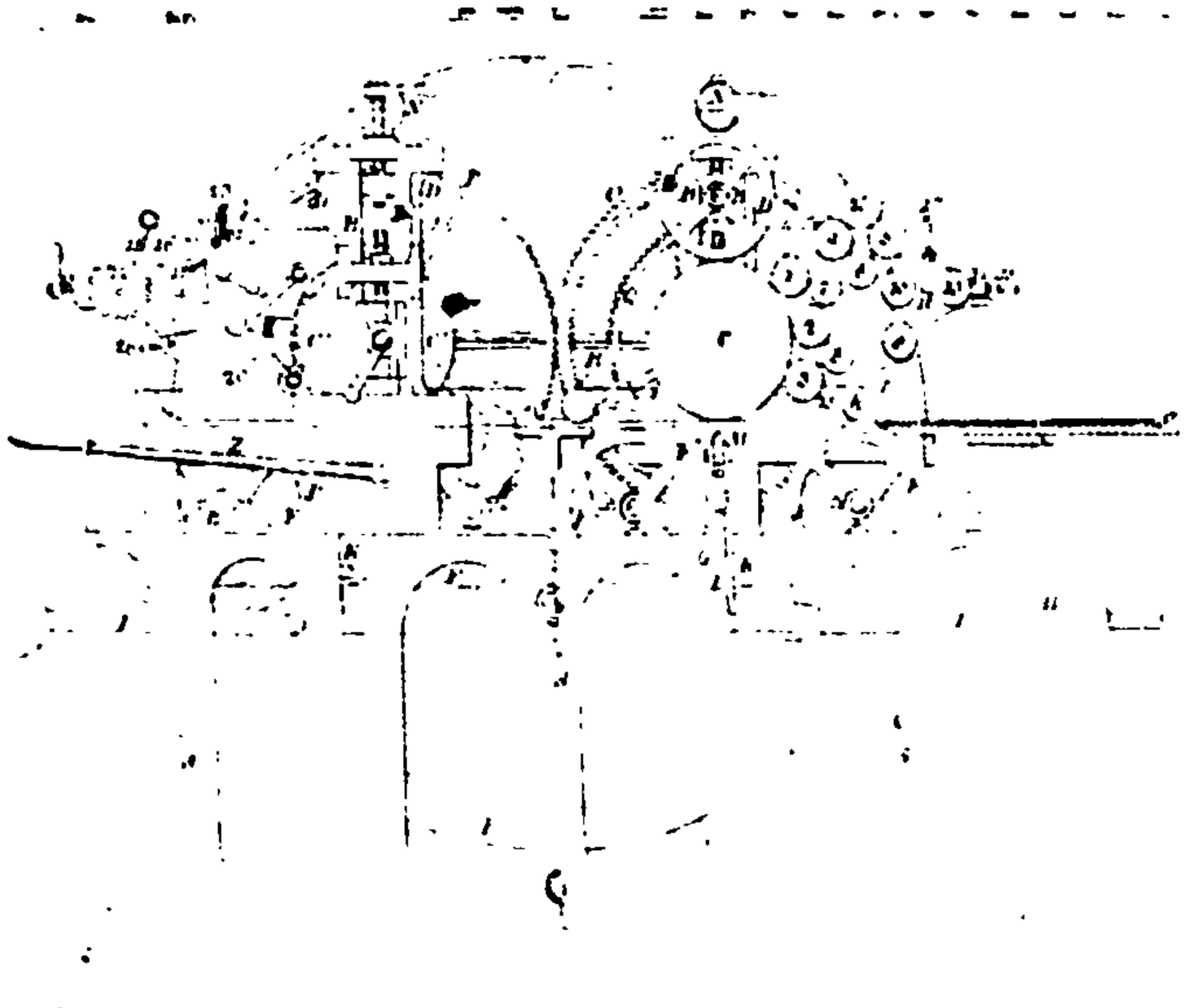
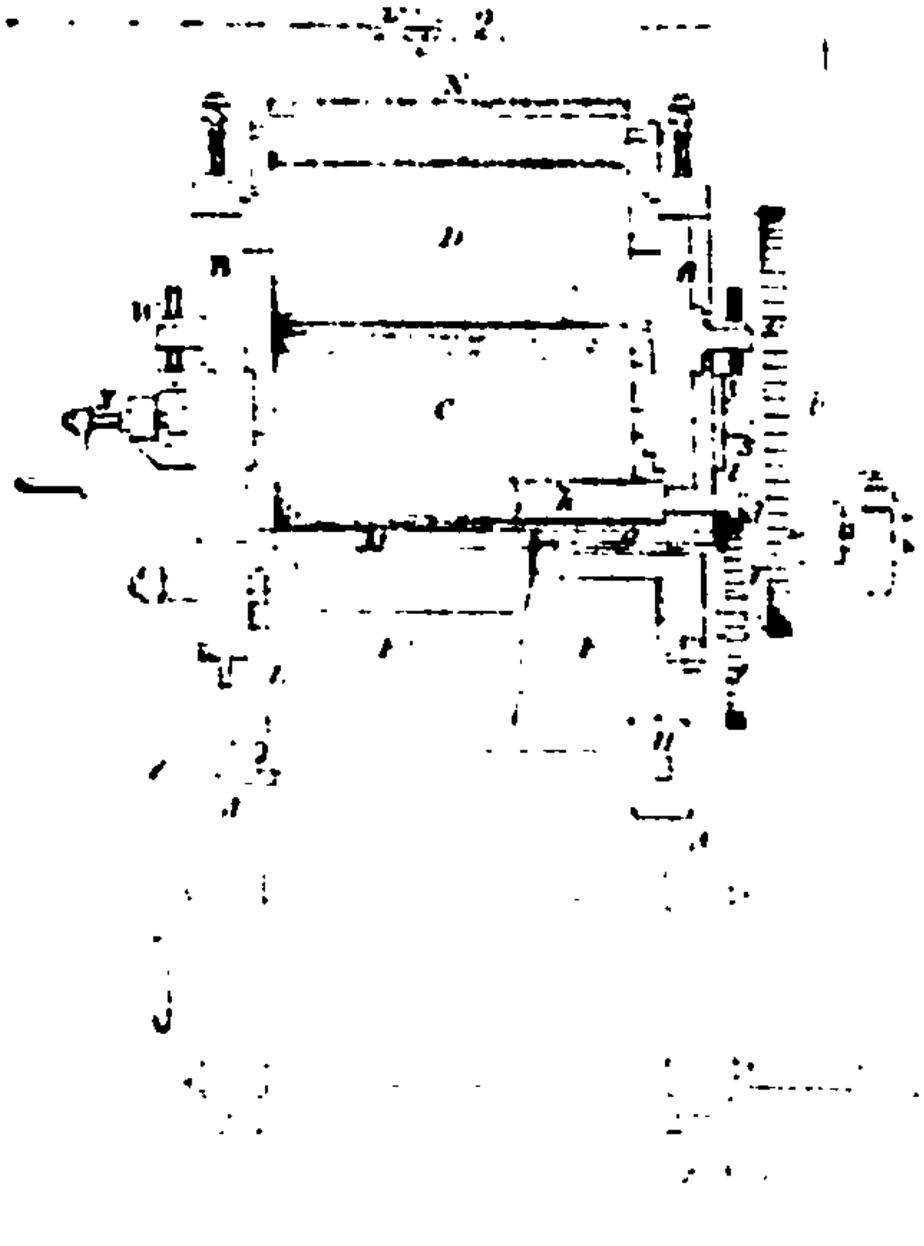


Fig 2.



acting lithographic printing press, one half thereof being in section.

Fig. 2, an end view of the same.

Fig. 3, an end view of the inking apparatus.

Fig. 4, a back elevation of the driving gear.

Fig. 5, a detached elevation of the regulator.

Fig. 6, a detached longitudinal section, taken through the several cylinders, by which the course of the sheet of paper is clearly represented, together with the relative position of the cylinder.

A A, the frame of cast iron, at the upper part of which standards B B are securely bolted, slots being formed therein for carrying the stone cylinders C C*, and damper cylinders D D; E E, plummer blocks or bearings, for supporting the hollow cast iron cylinders F F; around these cylinders an endless band or skin G passes, and turns continuously therewith, the same being kept in contact by pressure from the adjustable weight H, placed upon one end of the lever I, the other end thereof pressing against the tension roller K; L, a jointed link, one end of which is connected to the aforesaid lever, and the other end to the scraper M, which extends across the whole breadth of the skin or band; this scraper forms an important feature in these improvements, as the correctness and clearness of the print depends entirely upon the proper working of the same. The band which has hitherto been used is of calves skin, and the part of the scraper in contact with the band is made of hard wood, as ebony, placed between two plates of metal, as seen in Fig. 6. When the pressure is applied to the scraper, the skin or band G will be brought into close contact with the stone cylinders C C*, and as the band advances, the friction between the surfaces of the band and stone cylinders, which are kept in forced contact, will cause the stone cylinders to revolve upon

their fixed axes; motion will then be imparted to the damper cylinders D D, which are in contact with the stone cylinders, and from thence to the metal cylinders N N, which are in contact with the damper cylinders. The metal cylinders N N contain water, and have small perforations in the direction of their length, through which the water passes, an arrangement being provided for regulating the quantity of water supplied to the damper cylinders D D. The damper cylinders are covered with a woollen cloth, which absorbs the water, and distributes the same uniformly upon the stone cylinders. 1, 2, 3, three inking rollers, around which an endless band or skin passes, and is kept in contact with the surface of the stone cylinder, which revolving, imparts motion thereto, the endless band or skin passing over a series of rollers 4, 5, 6, 7, 8, 9, and communicating with a roller 10. Upon the axis of this roller, a toothed wheel 11 is keyed, taking into a corresponding wheel 12 fixed upon the axis of the roller 13; this roller is in direct communication with the trough 14, containing the printing ink. To regulate the quantity supplied to this roller, adjusting screws 15, 15 are caused to act against the back of the trough, by the withdrawing or advancing of which, the quantity of ink is regulated. 16, a forked lever, the upper extremity of which is mounted upon studs 17, 17 situated at each side of the frame; 18, a small roller, having its axis supported by the lower extremities of the vibrating levers 19 situated at each side of the framing 20, the upper extremities of which are secured upon the rods 17, 17. It will be seen upon referring to the drawing, that the furnishing roller 18 is about one-fourth of the diameter of the rollers 10 and 13, for the purpose of disposing readily of the ink; and as the supply thereof is only required at intervals, this roller 18 is caused to rock or vibrate by pins 21 and 22 suitably

placed against the inner surface of the toothed wheels 11 and 12; and it will appear evident, that upon motion being imparted to these wheels, the pins fixed thereto will be brought into contact successively with the prongs of the forked lever 16, when the necessary rocking or vibrating motion will be produced. 23, a roller, which takes its bearing upon the rollers 4, 5, being for the purpose of uniformly distributing the ink upon the skin or band; this is effected by pins being fixed against the outer surface of the toothed wheels 11, 12, pieces of cord being attached thereto, pass over pullies 24, 24, and are made fast to the ends of the roller 23; whence as the wheels 11, 11 revolve, the pins which actuate the roller being placed in opposite directions, and at opposite sides of the machine, will have the effect of sliding the same across the surfaces of the rollers (and skin) 4 and 5, and uniformly distributing the ink thereon, a knife 25 being situated at the underside of the skin or band for removing the superfluous ink. 26, a screw, having a lever attached thereto, for causing tension of the skin or band when necessary—the roller 2 having a similar arrangement for the same purpose. *a*, the main driving shaft, upon which is keyed the fly wheel *b*, for equalizing the motion of the machine; upon one end of this shaft a winch *c* is fixed; power being applied thereto, imparts motion to a pinion *d* fixed upon the other end of the driving shaft; this pinion takes into a spur wheel *e* keyed upon the axis of the hollow cylinder F*, and gearing into a corresponding wheel *f*, imparts motion thereto.

The operations of the machine are as follows:—The paper being placed upon the table *g* in a fit state for printing, the roller *h* being previously raised, (by an arrangement hereafter described) the workman introduces the sheet of paper, when by the depression of this roller,

which is provided with endless tapes, *i i*, passed around a portion of each extremity thereof, the paper is firmly held and advanced (in the direction of the arrows) by the endless skin or band G, motion being imparted thereto as hereinbefore described, when by the pressure of the lever I, the scraper will be brought into close contact with the underside of the band, by which the paper will be firmly held, and uniformly pressed against the stone cylinder, causing the same to revolve, and consequently taking the impression therefrom. This being done, the sheet is then conducted in the direction of the arrows until it is brought into contact with the stone cylinder C*, when the pressure being applied to the scraper M, the verso is obtained; but in order that the sheet may come right for the verso, spur wheels O P connected to the stone cylinders at *a*, are employed, which being of corresponding diameters, ensure a perfectly uniform and similar motion of the stone cylinders, which are likewise of corresponding diameters. To regulate the band which conducts the paper to be printed, a spur wheel Q is employed; this wheel revolves loosely upon the same axis as that upon which the spur wheel O is keyed, and is driven by a pinion R, which receives motion from the wheel O, as represented by the drawing. S, a cam, fixed to the arms of the wheel Q; this cam is caused to act against a friction roller T, situated at one end of the vibrating lever U, having its fulcrum at V, the other end of which carries the axis of the receiving roller *h*; it will appear evident, that as the wheel Q revolves, the cam will act successively upon the friction roller T, by the raising and depressing of which the necessary motion is obtained. In order that the stone cylinders may be used as their diameters become reduced, the same may be lowered by means of the screws and nuts W W*, a screw X being situated at the end of the fixed axis, around

which the cylinders revolve, screws Y being employed for adjusting the damper cylinders. The machine, as represented in the drawing, and as above described, is a double printing press, that is, both sides of the paper or substance to be printed receive the impression during the passage of the said paper or substance through the press; but it is evident that the machine may also be used as a single press, that is, one cylinder only being printed from.

The arrangement above described may be applied to printing several colours, either from the same or different cylinders, without departing from the principles of the above invention, of communicating motion to the printing cylinder by the forced contact of a band in motion, and of imparting motion from the printing cylinder to the other parts of the apparatus. The arrangements hereinbefore described are adapted more particularly for printing from the surface of the cylinder, but the several arrangements and principle of the said improvements will also serve as a press for printing from engraved cylinders, the damper cylinder being removed, and the well known apparatus for washing and cleaning the cylinder, according to the process of calico and other printing, being supplied.

The patentee states, that he is aware of stone cylinders, with axes passing through them, having been attempted to be used before for the purposes of lithography, but such attempts have, he believes, failed: he does not therefore claim the exclusive use of stone cylinders for lithography, in whatever manner the same may be applied; nor does he claim the exclusive use of any of the several parts hereinbefore described, except when such several parts shall be employed for the purposes of the said invention, as above described and hereinafter more particularly mentioned; but he claims—firstly, the exclusive use, for the

purpose of lithographic printing, of a cylinder of stone, moveable on pivots, and receiving and communicating motion as above described; secondly, the exclusive use of the apparatus, or general combination and arrangement of parts herein described, for the purposes of printing; thirdly, the exclusive use, for the purpose of printing, of the arrangement herein described, whereby the printing cylinder receives its motion from contact with the surfaces to be printed; fourthly, the exclusive use of the arrangements herein described, whereby the printing cylinder is made to receive and communicate motion to the apparatus for transferring the ink or colouring matter to the printing cylinder.

SPECIFICATION enrolled 25th October, 1842, of a PATENT granted 26th April, 1842, to SEPTIMUS COCKING, of Birmingham, in the county of Warwick, draughtsman, for "*certain improvements in the production of light, by the burning of oil, tallow, and wax, and in the apparatus for regulating and extinguishing the same.*" Being partly a communication.

THIS invention, in the first place, relates to certain improvements in lamps, whereby the arrangement of tubes for raising and lowering the wick of an argand lamp is such, that the surface of the oil is brought nearer the top of the wick, whereas in lamps of the ordinary construction, the revolving tube, which is supported by projecting wires resting upon the end of an external tube, is shorter than the tube which is surrounded by the wick; in consequence of which the surface of the oil is not brought so near the top of the wick as in the improved lamp; and in

place of attaching the gallery or glass holder to the projecting wires, by turning which the wick is raised or lowered, it is, in this arrangement, quite distinct.

In this improved lamp the wick holder is raised, as in the ordinary argand lamp, by means of two tubes having a spiral and vertical groove, between which the wick is placed. In place of attaching projecting wires for supporting the revolving tube, to which the gallery in the ordinary construction is affixed, the end of the tube is turned back so as to form a flange, which rests upon the end of the outer tube; to the edge of this flange is attached, by soldering or other means, a short tube of sufficient calibre to pass over the external tube, upon the end of which the revolving tube is supported, in the manner described; by turning round the short tube the wick will be raised or lowered, as may be required, for the purpose of regulating the flame; the two tubes between which the wick is placed and the oil conducted, are both of the same height. The glass chimney for this lamp is enlarged at the lower end, by being made conical, and the gallery for holding the same is supported from the tubes which supply the lamp with oil, by two projecting arms, which being in the same plane as the tubes, cast no additional shadow.

Claim, is for the arrangement of gallery and revolver for an argand lamp, by which the surface of the oil is brought nearer the top of the wick than in lamps of ordinary construction; and also for the mode of supporting the glass holder on the tubes through which the oil is conducted to the burner, by which means the bottom part of the glass is kept cool.

Another improvement is for defending the flame from currents of air: for this purpose, the glass chimney is surrounded by a conical glass tube, and both rest on the same

gallery; the annular space in the gallery, formed by the two glasses, is perforated with a number of holes; the air for supplying the flame enters at the top of the conical glass, between it and the glass chimney, and is conducted through the holes in the annular space to the flame, and owing to its circuitous passage, the flame will be protected from sudden currents of air.

Claim.—The arrangement of two glasses for defending the flame from sudden currents of air.

For the purpose of supplying lamps having solid wicks with oil, the patentee constructs the wick holder of two parts. If that part of the lamp which contains the tube for holding the wick is made of a disc of metal a quarter of an inch thick, such piece is dished out, and a hole drilled through the centre of its bottom for holding the tube for the wick, which, when inserted, forms an annular space or cup between the tube and the edge or side of the piece of metal, into which the oil is poured, there being holes made round the exterior of the tube in order that the oil may pass into the lamp; when the lamp is filled, a corresponding piece of metal, with a hole through the centre to allow the tube to pass through, is fitted, by means of a screw cut on its periphery, into the annular space, so as to form a cover or top to that part which contains the tube. Another mode is, by forming two such pieces, fitting one within the other, and having holes made through them similar to a ventilator; so that by turning one piece partially round, the holes in each piece are brought to coincide, and to form openings into the lamp through which the oil can be poured; and by turning the top piece back again, the holes will be closed: the object being, to supply the lamp with oil without the necessity of having an additional hole for that purpose.

Claim.—The mode of introducing oil into lamps having

solid wicks, without the necessity of removing the wick, or having an additional hole in the lamp for that purpose.

The next improvement is, for the peculiar arrangement of a lamp, consisting of three compartments one above another, and having a similar arrangement of glasses to those already described.

This lamp can be made of any form that fancy or taste may suggest. The first or bottom compartment, which is within the base of the lamp, consists of a vessel, having its sides made of india rubber or other flexible material, which can be attached to the upper part of the said vessel and also to the projecting edge of the bottom, by overlapping such parts with the india rubber or other flexible material, and binding the same with cord: the bottom part of this vessel is acted upon by a spiral spring, placed underneath in such a manner as to force it into the upper part of the vessel, and by so doing, expels the air therefrom, which passes from this vessel through a tube into the upper vessel containing the oil. The middle vessel is for the purpose of receiving the oil which overflows from the wick, which is conducted by a tube passing through the vessel containing the oil.

In order to supply this vessel with oil, it will be necessary in the first place to inflate or fill the lower vessel with air, which is done by taking hold of a ring and drawing the bottom of the vessel downwards, where it will be held in that position by a spring catch on each side of the vessel; a plug is then removed from the upper vessel, which is to be filled with oil; the plug being replaced, and the spring catches which hold the bottom of the lower vessel being released, the air contained therein will be compressed, and such pressure will be transmitted through the tube to the surface of the oil, which will be forced up a tube and through a chamber to the wick. In order to

regulate the supply to the wick, a number of discs, of woollen or other cloth, having a small spring between them for the purpose of keeping them apart, are compressed by means of a screw, and forced against an aperture in the chamber through which the oil passes to the wick.

It will therefore be seen, that the object of the lower vessel is to force the oil (by compressing the air in the vessel) up the tube to the wick, the quantity of which is regulated by the cloth discs, in the manner described.

Claim.—The general arrangement of the lamp described.

The last improvements in lamps relate to certain improvements in the fountain lamp. The fountain consists of a cylindrical vessel, moving upon its axis, and having an aperture in its periphery, which is covered by a projecting curvilinear tongue, placed inside the vessel, and when it is required to supply the vessel with oil, it is only necessary to turn it upon its axis till the aperture comes to the top side, when the oil can be poured in; on moving it back to its proper position, the oil will flow from the vessel as it is consumed by the wick. There is another modification of this fountain, which is applied to the argand lamp; in which case the vessel moves upon a hinge joint, which is to be thrown back for the purpose of filling the fountain; and in order to render the oil less liable to fall out when turning the vessel up to its proper position, the patentee employs two projecting tongues or plates, one projecting over the other; for which the patentee claims, the construction of a fountain lamp, having an aperture with a projecting piece as described, whether such fountain be removable from that part of the lamp to which the burner is attached, or connected thereto by a hinge joint or a central axis.

The next part of these improvements relates to certain improvements in candlesticks, by introducing into the

socket a moveable tube, which can be brought to the top of such socket by means of a projecting stud or push up, when it is required to place a smaller candle in the stick, and whereby the same can be lowered when it is required to introduce a candle which is large enough to fit the socket itself. The drawings show a mode of raising a candle in the socket by the application of a tube having a spiral slot cut through it; this tube is connected with the flange or top of the candlestick, and the plate or disc of metal upon which the candle rests moves with the tube; there is also a vertical slot cut through the socket of the candlestick; a stud projects from the moveable part upon which the candle rests, and passes through the spiral slot in the revolving tube, and also through the vertical slot in the socket of the candlestick; it will therefore be seen, that on turning round the collar or flange connected to the top of the rotary tube, that the candle will be raised or lowered in the socket, as may be required; and it will also be seen that the spiral slot may be in the socket and the vertical slot in the rotary tube.

The patentee claims, first, the introduction of moveable tubes within the sockets of candlesticks, so as to render them capable of raising and lowering candles of different sizes; and secondly, the raising and lowering of candles in the sticks, whether the support for the candle is raised or lowered by the stud fixed upon it, working in a spiral slot in the inner tube and a vertical slot in the outer tube, or *vice versâ*.

The patentee in the next place describes an apparatus for supporting candles of different sizes in a vertical position; for this purpose, the projecting flange or top part of the candlestick is formed of two parts, one of which contains a spring made in the form of an ellipsis or oval, having two projecting arms fixed to it in the direction of

its shorter axis, with their ends somewhat hollow or in the form of segments; it will be seen, that on compressing the elliptical spring in the direction of its longer axis, that its shorter axis will be enlarged, and will therefore increase the space between the two projecting pieces, and on introducing the candle between them and removing the pressure, the shorter axis of the spring will collapse and the candle will be held between the two projecting pieces in a vertical position. The other part consists of a plate which fits on the top of that part which contains the spring, so as to cover or inclose the spring; this plate has on each side a piece of metal, which, when in its place, presses on the outside of the spring, and by turning the same partly round, the plates will have the effect of compressing the spring in the manner described. There is another arrangement given, wherein the elliptical spring is acted upon in a direction of its longer axis by means of a screw.

Claim is for the mode of supporting candles in a vertical position by means of arms fixed on an elliptical spring in a direction of its shorter axis, whether the compression of the spring be effected in the manner described or by any other means.

Improvements in snuffers.—The first relates to a novel construction of snuffers, which may be called a vertical cylindrical snuffer; it consists of a cylinder divided about the middle into two compartments, the upper of which contains mechanism for opening and closing the door, and the bottom compartment forms a receptacle for the snuff; a portion of the side of this lower compartment works upon a hinge-joint so as to form a door; to the top and bottom edge of this door is rivetted a piece of curved steel to fit the inner circle of the door; the bottom or lower projecting piece of steel forms, as the door closes, a cutting

edge against the bottom of the compartment. The method of using these snuffers is by taking hold of a handle which is attached to the side of the cylinder, and by pressing with the thumb or finger upon a vertical pin, which passes through the centre of the top of the cylinder, a piece of metal in the form of a wedge acts against the projection fixed to the top part of the door and forces it open; after opening to a certain extent the door is released, and is suddenly drawn to by the action of a spring. There is another modification of this snuffer, the principle of which is the same, the only difference being in the arrangement of mechanism, in which case the thumb-plate, in place of being in the centre of the cylinder, is on one side, but in both cases the thumb-plate is returned to its original position by means of a spiral spring.

The patentee also introduces certain improvements in the common snuffers, which consist, first, in the application of a scraper, actuated by certain arrangements of mechanism, so that when the snuffers are closed the scraper will fall upon the cutting edge, and when in the act of opening them, the cutting edge is drawn under the edge of the scraper, which effectually cleans such edge, and also prevents any of the snuff falling from the snuffers. The second improvement is in the application of a spring for the purpose of pressing the two cutting edges of the snuffers together. There is also an instrument for taking off, in one piece or annular ring, the hard carbonaceous deposit from the wick of an argand lamp, which consists of two small cylinders connected together by a tube, and provided with a handle for the purpose of holding the instrument; the top cylinder contains a spiral spring which acts upon a piston or piece of strong wire passing through the top cylinder through the tube to the bottom cylinder, and having at its end a round piece or disc of

metal; this lower cylinder also contains a number of vertical springs arranged in a conical form; to the bottom end of these springs, or apex of the cone, there is attached (to each spring) a horizontal projecting point similar to a pin point: thus, when the piece of wire is pressed down by means of a thumb-plate, the disc of metal presses out the lower ends of the springs and forces the projecting points through holes formed in the side of the cylinder; it will be seen that, on inserting the end of this instrument (which is made below the projecting points in the form of a cone) into the tube, which is surrounded by the wick, and applying the thumb to the thumb-plate, that the points will be forced through the wick, and on raising the instrument the carbonaceous substance will be removed. The last improvement relates to extinguishers, and consists in the application of two, three, or more tubes sliding one within another, in the same manner as the tubes of a telescope, for the purpose of lengthening the extinguisher when used for extinguishing candle lamps.

The patentee claims, first, the construction of a vertical cylindrical snuffer, in which the door is opened by the depression of a projection or thumb-plate at the top or side of the cylinder in which the door is closed, by the action of a spring; secondly, the introduction of scrapers in the boxes of snuffers, for the purpose of removing the snuff from the cutting edge of a snuffer and preventing it from falling out on the re-opening of the snuffers, and also the use of a spring for forcing together the cutting edge of snuffers; thirdly, the instrument for removing the hard carbonaceous deposit from the wicks of argand lamps; and lastly, the employment of sliding tubes for the purpose of lengthening or shortening extinguishers.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to OTTO ROTTON, of Gracechurch Street, in the city of London, doctor of medicine, for "*certain improvements in machinery or apparatus for spinning cotton, wool, silk, and other fibrous substances.*" Being a communication.

THIS invention of improvements in apparatus for spinning cotton, wool, silk, and other fibrous substances, consists in the peculiar arrangement or combination of machinery, constituting what is commonly called a throstle, the novelty of which is in ranging the bobbins, spindles, or flyers in a circular form, in place of having them in right lines as heretofore; which arrangement or disposition of parts allows of the peculiar mode of driving the bobbins, spindle, and flyers, by means of a friction wheel having a bevilled edge; thus dispensing with the assistance of bands and riggers.

This throstle frame consists of a circular rail constituting the spindle rail, supported by suitable feet or pedestals, the continuation of which above the spindle rail supports the roller beam, which is of a polygonal form. The spindles for this machine differ somewhat from those generally used, in this respect, that the lower end of each spindle passes through a boss formed on the under side of the spindle rail, in which they remain stationary by means of a set screw passing through the said boss which binds against the spindle. The upper part of this spindle is formed with a tubular cavity, which receives another spindle, screwed at its upper end for the purpose of holding the flyer, which is to be screwed upon it; just below the screwed part of this spindle is a collar which rests upon

the tubular edge or end of the outer spindle; by this arrangement the inner spindle supporting the flyer can be made to revolve within the tubular part of the outer spindle, which, as before stated, remains quiescent. One of the principal novelties of this invention is the manner of communicating motion to the bobbins, which revolve and slide up and down on the outer spindle, and is effected in the following manner. In the centre of this circular machine is a vertical shaft, about the middle of which is fixed, by means of a key or binding screw, a horizontal bevilled edge friction wheel, upon which the lower ends of the bobbins, when on the spindles, rest. The bobbins are similar in shape to those in ordinary use, with the exception of the lower end, which is in form like an inverted frustum of a cone, the bevil of which corresponds with the bevil of the horizontal wheel upon which they (the bobbins) rest; it will be seen that on giving motion to the horizontal wheel, which is keyed on the vertical shaft, that the bobbins will be caused to revolve upon the spindles by the friction of contact. The rollers and roller stands are arranged in pairs and disposed in a polygonal form, in order to accommodate them to the circular form and arrangement of the bobbins and flyers upon the circular plate or spindle rail, and the ends of each corresponding pair of rollers, which project beyond the sides of the stands, are formed with teeth similar to bevil wheels, and the teeth of the rollers in the first box or set take into and drive those of the second, and in like manner with the remainder; so that on giving motion to the first box or end rollers, motion will be communicated to the whole series. The creel for holding the rovings is supported by pillars within the circular or polygonal range of the drawing rollers.

The main or driving shaft is in a horizontal position, supported by suitable bearings underneath the spindle

rail; on the outer end is a loose and a fast pulley in the usual manner, and on the other end is a bevil wheel taking into and driving a similar bevil wheel upon the vertical shaft; this shaft is provided with a fixed key, so that it may slide through the wheel for the purpose of raising and lowering the bobbins, as will be hereafter described. Motion is communicated to the series of rollers by a similar pair of bevil wheels at the upper end of the vertical shaft, one of such wheels being keyed on the end of a horizontal radial shaft, which imparts motion to a number of wheels at its extreme end, and through them to the series of rollers.

From the foregoing it will be observed, that on giving motion to the main or driving shaft, by means of a band from any first mover, the central vertical shaft upon which is fixed the horizontal bevilled edge wheel will be driven by the aforesaid bevil wheels, and rotary motion will be given to the bobbins which are ranged round and in contact with the bevilled edge wheel, and the rollers will be drawn by the pairs of bevil wheels and radial shaft in the manner before described. The copping or traverse motion is effected as follows: the bottom end of the vertical shaft rests in a foot step fixed on the end of a lever, which moves on a fulcrum; this lever is caused to vibrate or move up and down by an arrangement of wheels and a heart wheel, by which means the vertical shaft, besides having a rotary motion, will be caused to rise and fall with the end of the vibrating lever, and thus elevate and depress the bobbins which rest upon the horizontal bevilled edge wheel. The patentee here only describes the mode of driving the bobbins by this novel method, as he states that it will be obvious to any practical man, that such can be applied to the flyers and also to two sets of bobbins when required.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to WILLIAM WOOD, of Wilton, in the county of Wilts, carpet manufacturer, for "*a new mode of weaving carpeting and other figured fabrics.*"

THIS invention of a new mode of weaving carpeting and other figured fabrics consists in weaving two pieces in one loom at the same time, by certain arrangement of parts in the loom, whereby the two pieces are woven face to face. For this purpose the inventor employs two separate linen warps, and into or on to which is woven the pattern from a worsted or other warp placed between the two linen warps; and by the evolutions of the loom, the pattern is alternately bound to the bottom linen warp, and then to the top linen warp; by this arrangement it will be seen that the two warps are bound together by the pattern of worsted working up and down from one linen warp to the other, the worsted warp being secured to the linen ground by means of linen shoots of weft obtained from shuttles. The pattern of the worsted warp is raised by a jacquard apparatus and bound into the upper linen warp, and the remaining portion of the worsted warp is bound into the under linen warp by every shoot of the weft; the fabric thus produced is afterwards divided or cut asunder by means of a knife or some other cutting instrument.

The upper warp beam is fixed to the upright frame at the back of the loom with a guide roller just below it, and the lower warp beam is fixed in the same manner with a guide roller above it; the distances of these two linen warp beams from each other are such that the threads passing from them and over the guide rollers to the healds, form two inclined planes, the worsted warp passing between

them in a horizontal position; in front of the slay, which is provided with two shuttles, there is a guide bar extending across the loom, and having a longitudinal slot through which the whole of the warp threads pass; this slot is capable, by means of screws, of being made wider or narrower for the purpose of regulating the length of the vertical threads which constitute the pattern in the double fabric, and also (when the fabric is divided) the length of the pile; this guide bar works to and fro similar to the slay, so as to pass over the edge of the woven part of the fabric at every motion of the slay, in order to allow the slay to beat up the weft; and in front of this guide bar, or between the guide bar and breast beam, is the cutting apparatus. This consists of a thin knife working in a longitudinal slit or groove cut in the edge of a piece of wood bevilled off in the form of a wedge at the top and bottom side; at that edge where the knife passes through, it moves rapidly to and fro in a direction of its length by means of bands passing over a large pulley fixed on the end of a horizontal shaft, which is actuated by the motion of the first heald, in such manner that, as the fabric is woven, it is divided by the knife into two pieces, which pass over the breast beam and are wound on to two separate cloth beams in front of the loom in the ordinary manner.

The patentee claims as his invention, the manufacture hereinbefore described of carpets and other fabrics having a pile on their surface by the use of an upper and under ground warp, the pattern of the said carpeting and other fabrics being bound into the upper warp and under ground warp alternately, and afterwards cut asunder. The patentee disclaims the mode of weaving hereinbefore described, except when the same shall be applied to carpeting and other figured fabrics.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to JOSEPH MEGE, of Keppel Street, Russell Square, in the county of Middlesex, for "*improvements in making and constructing trowsers.*"

THIS invention relates to trowsers principally intended for soldiers, and consists in constructing them in such a manner, that they may be opened behind when required, and closed again by means of one hand of the wearer; the object being to arrange the parts of the trowsers so as to avoid the necessity of the soldier displacing his accoutrements, or even laying down his musket, or releasing his trowsers from the braces.

The mode of constructing the hinder part according to this invention, is by straps or bands, which are placed between the lining and the cloth, and brought to the front part, where they are attached by buttons or other suitable fastenings. It will be necessary in constructing these trowsers, that the hinder part should be fuller than that of trowsers of the ordinary construction, in order that the part where the opening is may be concealed; and in place of the parts being sewed together between the legs, such parts are sufficiently full so as to allow of their being buttoned in front; and the trowsers, when the soldier is not on march, may be laced up behind. In place of sewing together the two parts forming the back part of the trowsers, one side is made with a flap so as to lap over the other; to the edge of this flap is attached a strap, which passes between the outer cloth and the lining, and through a sort of button hole made at the side of the trowsers; a second strap is attached to the other edge of the back part of the trowsers, and passes through a slit made in the aforesaid flap, and also between the lining and cloth, in

the same manner as that before described. It will be seen that on tightening the straps, the parts of the opening will be drawn so as to overlap each other; the straps, which are of sufficient length to admit of the back part opening, are fastened (when such part is closed) by a button at each side of the trowsers, or other convenient means; and "in order to open the part behind, the lower front button, which is closed, is to be unbuttoned, and the straps or bands are to be released, when the hind parts to which the straps are attached, on the soldier bending the person in the act of 'squatting,'" will be opened, and will be kept in that position without the necessity of the wearer holding them apart; and when it is required to close the back of the trowsers, it is only necessary again to fasten the lower button in front, and to draw the ends of the straps and fasten them at the sides in the manner described. The mode of fastening them in front is by buttons in the ordinary manner.

Claim is for the mode of constructing trowsers as herein described, by having an opening behind, combined with the means of closing and opening the parts closed, as described.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to HENRY ROBINSON PALMER, of Great George Street, Westminster, civil engineer, for "*an improvement or improvements in the construction of roofs and other parts of buildings; and also for the application of corrugated plates or sheets of metal to certain purposes, for which such sheets or plates have not heretofore been used.*"

THIS invention may be divided into two parts; the first

of which relates to certain improvements upon a former Patent granted to the said Henry Robinson Palmer, bearing date 28th April, 1829, in which Mr. Palmer claimed the use and application of fluted, indented, or corrugated metallic sheets or plates, for the purpose of constructing roofs and other parts of buildings, and consists in certain methods of forming or constructing the joints of corrugated iron, and of connecting iron or other metal sheets or plates for the purpose herein described; the joints being made in such a manner, that the strength of the roof or joints thereof may not depend on the strength of any bolts or rivets employed in forming or connecting such plates or sheets together.

In order to effect this, several methods are shown which differ somewhat from each other, yet are all constructed upon the same principle, viz., the ends of the metal sheets or plates are made to abut so as to support each other; for this purpose, one end of each plate is jumped up or bent in such a manner, that when the next plate is joined to it, the part bent shall lap over the end of the second plate, and allow the ends of the two plates to abut against each other, precisely in the same manner as the socket joint of two cast iron pipes, presuming such part or joint to be opened out so as to form a plane surface; these two plates are held by a projecting piece fixed to the end of the straight plate, the bent plate having a corresponding slot to receive it when the plates are joined together. This projecting piece or pieces serve to support or bind the ends of the two plates together transversely; the longitudinal or side joinings are made by means of a bar of iron, having a groove cut in each edge to receive the plates joined in the manner described. There is another method of joining the ends of the plates together, by cutting corresponding slots in each plate,

so as to receive a piece of iron having a groove cut all round its edge, which, when inserted, and the two plates put together, forms a fastening or support to the plates.

The patentee makes no claim to the use of the corrugated plates for the purposes described, except when the plates are made to abut against and to support each other; but what he claims is, the use and application of corrugated metal plates for the above purposes, when the said plates are made to abut against and to support each other in the manner described.

The second part of these improvements relates to the use of such corrugated plates for the purpose of building, or constructing arches and bridges. For this purpose, the patentee employs corrugated plates of cast iron, bent so as to form the circle of the arch; these plates have flanges all around them, perforated with holes to receive the bolts; the end or abutting flanges connect the plates longitudinally by means of the bolts, and the side flanges connect them transversely together in the same manner, the side flanges of the outside plate or plates being bolted to the spandrill or ribs of the bridge. It will be observed, that the use and application of corrugated plates in the construction of bridges, depend entirely upon the plates abutting together in the manner described.

Claim is, the construction of the arch by corrugated plates of metal abutting against or upon, and supporting each other as described.

The last improvement is in the application of corrugated plates to the construction of wheels. For this purpose, a disc is formed of such iron, which, when the wheel is constructed, answers the purpose of arms or spokes; for which the patentee claims, the application of corrugated iron to the construction of wheels.

SPECIFICATION enrolled 25th October, 1842, of a PATENT granted 26th April, 1842, to RAOUL ARMAND JOSEPH JEAN, COMTE DE LA CHATRE, Chevalier de la Légion d'Honneur, of Leicester Square, in the county of Middlesex; RICHARD TAPPIN CLARIDGE, of Weymouth Street, in the county of Middlesex, gentleman; and RICHARD HODGSON, of Salisbury Street, Strand, in the county of Middlesex, gentleman, for "*improvements in preparing of fabrics to be used in covering roofs, floors, and other surfaces.*" Being a communication.

THIS composition, which the patentees call "oropholithe," is made by mixing together linseed oil, litharge, or white lead, dry powdered whiting, and dry sand, in the following proportions by weight, that is to say, of linseed oil eight parts, litharge or white lead four parts, dry powdered whiting nine parts, and dry sand 36 parts. In order to amalgamate these ingredients, the oil and white lead, or litharge, are to be thoroughly mixed together in a convenient vessel, after which the dry powdered whiting is to be added, and well mixed with the previous mixture; the sand is then to be added, and also thoroughly mixed with the compound above described. Although the patentees find this mode of adding and mixing the substances herein described to be the most convenient, such peculiar mode is not essential, the only object being to mix the substances of which the "oropholithe" is composed thoroughly together. When it is desired to make the composition of a particularly white colour, it will be necessary to use boiled linseed oil; and in all cases where light colour is not

required, the patentees prefer to use the red litharge; they also prefer the sand to be that usually called "white sand," or "silver sand;" in lieu of which, the same proportion of yellow sand, or brick or tile, ground to a fine powder and perfectly dry, may be used. The "oropholithe" can be made of any shade required, by adding colouring matter; but this it appears destroys, in some degree, its tenacity. In covering surfaces, the composition is laid on about $\frac{1}{16}$ of an inch thick: and in covering fabrics intended for covering roofs, the fabrics are stretched on a frame or table, (a description of which apparatus is given in the Specification) and the fabric covered on both sides, so that the composition sinks or penetrates through the interstices of the fabrics, and the two surfaces of the "oropholithe" meet and join together with the fabric between them; or the same, when colouring matter is used, may be laid on so as to represent various devices or patterns.

The patentees do not claim any of the instruments described or mentioned to be used in applying the said composition called "oropholithe," but what they claim is, the making the said composition called "oropholithe," in whichever mode hereinbefore described, and with whichever of the substances mentioned as being capable of being used in the composition thereof, the same may be composed of, and whether combined or not with colouring matter; and the covering one or both surfaces of fabrics to be used in covering roofs and floors, and other surfaces with the said composition.

SPECIFICATION enrolled 28th October, 1842, of a PATENT granted 28th April, 1842, to JOHN VARLEY, of Colne, in the county of Lancaster, engineer; and EDMONSON VARLEY, of the same place, cotton manufacturer, for "*certain improvements in steam engines.*"

THIS invention consists in the application of certain arrangements of mechanism to be substituted in place of the ordinary eccentric for working the D or other slide valves of a steam engine. The object of this improvement is to enable the steam employed in working steam engines to be worked expansively and compressively, and thus to economize the consumption of fuel; and also to effect an increase of power, by the application of certain arrangement of parts, which shall cause the steam to be admitted into the cylinder and cut off at any required angle of the crank shaft during its revolution.

The arrangement of the eccentric rod, for effecting these improvements, is the same as those in ordinary use, the only difference being in the application of a tappet, bolted to the periphery of the crank shaft, in place of the ordinary eccentric; and also in forming the ring, which is generally made of two semicircular pieces of brass or other metal, with two projections or cams, that is, one cam in each half circular piece, against the face or surface of which the periphery of the tappet at each half revolution acts; the eccentric rod is attached to the ring by means of nuts in the ordinary manner, or the two semicircular pieces, or ring, may be made with two horizontal projecting pieces, which may work in two standards; and to the end of one of these projecting pieces, which pass through the standards in which they slide, may be attached the eccentric

rod for working the valves. By this arrangement, as the crank shaft revolves, the first rise or lift of the tappet will act against the surface of the cam, which will cause the eccentric rod to move so as to cut off the steam at the quarter stroke, (or any other given point,) and as the tappet continues its revolution, the second or extreme rise of the tappet will force the eccentric rod still further, and open the valve port to the full extent for the admission of steam; the completion of the stroke will cause the double tappet to act upon the other surface or cam, and consequently reverse the action of the valves: by this arrangement, the valves receive a double or interrupted movement instead of the ordinary progressive motion produced by the eccentric, that is to say, owing to the peculiar form of the tappet, there are two separate movements for opening the slide valve ports into the cylinder, and also two for closing the same at each revolution of the crank shaft; the first stroke of the tappet closes the induction port, shuts off the steam, and causes that which is contained in the cylinder to work expansively, leaving the eduction port partially open until the piston has moved a little further, when the eduction port is closed and the uncondensed steam which remains in the cylinder becomes compressed therein, nearly to the extremity of the stroke of the piston, until the second stroke of the tappet opens the contrary eduction port, at which time the compressed steam and the newly admitted steam meet together, and form a counterbalance and reaction in the return-stroke of the piston, the eduction port being opened a little previous to the induction port. It will be observed that these two strokes of the tappet take place in one half revolution of the crank shaft, and are again repeated in the other half revolution, admitting and cutting off the steam at any required angle of the crank,

in each entire revolution. This double tappet may, if preferred, be made in two parts, for the purpose of regulating any adjustment in the striking part.

The patentees claim the substitution and employment of a double tappet or tumbler, in connection with the internal cam and eccentric, or valve rod, in place of the ordinary eccentric motion for the purpose of working the *D* or slide valves, in order that engines so constructed may be enabled to work the steam expansively and compressively.

SPECIFICATION enrolled 28th October, 1842, of a PATENT granted 28th April, 1842, to WILLIAM LOSH, of Newcastle-upon-Tyne, esquire, for "*improvements in the construction of wheels for carriages and locomotive engines intended to be employed on railways.*"

THESE improvements consist in certain modes of securing the iron tire of wheels upon the ring or felloe by the elongation of the iron bars employed in making the wrought-iron spokes, either with or without the intervention of wood, felt, rope, or such like flexible material between the same; by which method the patentee avoids the necessity of heating the tire for the purpose of securing it by contraction; and also in certain modes of fixing a cast-iron tire upon a straight or curved malleable iron spoke; and, lastly, in a method of forming the malleable iron spokes of wheels.

The drawing represents a wheel produced by bending bars of iron in such a manner that the two ends of each bar are made fast in the nave in the usual manner, whereby such bar produces two spokes, the middle por-

tion of each forming part of the ring or felloe, and the whole producing nearly a complete ring or felloe, so as to give he requisite support or bearing to the tire when applied to the wheel; the usual mode of fixing the tire upon these wheels is by shrinking.

The principle employed by the inventor is that of producing firm attachment between the felloe and the tire, by diminishing the size of the tire until it firmly grasps the felloe; but it is obvious that the same effect will be accomplished by increasing the size of the felloe when placed within the tire. The mode of carrying this principle into effect is as follows:—

For the purpose of securing the iron tire upon a wheel constructed as in the foregoing, that is to say, having malleable iron arms or spokes bent in such a manner that the middle part thereof shall form a portion or segment of a circle, and that a number of such arms shall collectively form, or nearly so, a complete circle. The arms so formed, when fixed into the nave of the wheel, are placed at such distances from one another that the corners or bent parts formed by the ends of the segments, and the arms, are about two inches apart, and between such parts two blocks of iron formed so as to fit the recess made by the bent parts of the arms are then introduced between them; these blocks have each a groove cut in them, so as to form, when put together, a key-way, into which is to be driven a key; by so doing, the two blocks will be separated, and each piece of iron forming the two arms will be forced towards each other, and the circular part, it will be seen, will be forced outward against the interior of the tire, and will have the effect of securing it firmly upon the circular ends of the arms, which may either have wood or other flexible material between such parts, or

otherwise, and afterwards pinned or rivetted to the tire in the usual manner.

There is another mode of effecting this by bending the pieces of iron, when single arms are employed, so that the part bent will form a portion of a circle with its end resting upon the end of the next arm or spoke; the segments of the spokes or arms bent in this peculiar manner, are forced out against the interior of the tire in the same manner as those above described.

Another mode of fixing the tire upon wheels having spokes constructed of the form described in the first improvement, is, by placing upon the periphery or circular part of the spokes a strong hoop, in such a manner that one edge of the spokes shall project beyond the face of the hoop, which is composed of several parts, so as to be capable, by means of keys or bolts, or both, of being drawn together, and thereby contract or reduce its diameter; this hoop being put on the circular part of the spokes, and the keys and bolts tightened up, the spokes, owing to their peculiar form, will spring or give way with the hoop. The tire having been made of a proper size, is then placed on to that circular part of the spokes which projects above the face of the hoop, and the hoop removed; the tire is then, by means of suitable pressure, forced on to the spokes, which, by their elasticity or tendency to spring outward, press against the interior surface of this tire so as to hold it securely in its place.

Claim for this part of the invention is, first, the method of fixing the tire, whether of cast or of malleable iron, upon the felloes of wheels by iron keys employed so as to enlarge the circumference of the felloe, and thus produce the necessary pressure against the tire; secondly, the mode of fixing the tire, whether of cast or of malle-

able iron, upon the felloes of wheels by powerfully compressing the felloes, and in this state fixing them within the tire.

For the purpose of fixing the cast iron tire upon straight or curved arms, the tire is cast with certain lugs or projections; these projections are two in number, and form a dovetailed recess for each spoke; and the bottom of these recesses the patentee prefers to be made of a curvilinear or circular form, which circle should be struck with a radius much less than that of the wheel, the object of which will be hereafter explained.

Suppose, for instance, that two straight arms, having their outer ends bent back (similar to a Y, presuming the lower part to be double) so as to fit the dovetailed form of the recess formed by the projections; if these straight arms were to be separated at the bottom end, the upper ends, which are turned back as described, would approach each other, and in this manner they are inserted into the tire, and their length is such that the ends of the arms touch the bottom of the recesses; it will therefore be seen that on forcibly separating them, which is done by means of a key driven between them, the ends of the arms will be forced along the curvilinear part or bottom of each recess which gradually approaches the centre of the wheel. The effect of this will be, that the end of each arm will press against the bottom of each recess in a direction from the centre of the wheel, and finally be brought to bear against the dovetailed sides of the recess, and thus hold the tire securely.

The last improvement is for the forming a compound spoke by introducing a number of spokes or pieces of iron bent in the same form as those first described, which may be placed, when the wheel is in a horizontal position, either directly above each other, or with the joints of the

different layers intersecting each other, and which are fastened in the nave of the wheel in the usual manner.

Claims are—The mode of fixing the cast iron tires upon straight or curved malleable iron arms by wedging, in the manner described; also the making of malleable iron arms in several pieces placed against each other, and secured in the nave as usual, so as to form a compound spoke in place of having the same formed of one piece; by which is secured a firm junction and great flexibility in the form or felloe, and less liability to fail when exposed to sudden shocks. The patentee also claims the placing of these separate pieces of each compound spoke, either directly above each other when the wheel is placed in a horizontal position, or with the joints of the different layers intersecting each other.

SPECIFICATION enrolled 28th October, 1842, of a PATENT granted 28th April, 1842, to JOHN HENRY PAPE, of Grosvenor Street, Bond Street, in the county of Middlesex, piano-forte maker, for "*improvements in carriages and in the construction of wheels.*"

THE inventor in the first place describes an improved axle, which consists of an axle revolving within a metal tube; this tube Mr. Pape prefers to make of two or three thicknesses of iron, in order to obtain greater strength. There are two pieces of brass which fit into the ends of the tube through which the axle passes, and which form bearings for the same; in order to prevent any lateral movement, the axle is made with a collar at each end, which bears against the inner surfaces or ends of the two pieces of brass; on each end of the tube which contains the axle,

there is a socket, one end of which is made to fit on the tube and is secured to it; the other receives the nave of the wheel, which has a groove cut round its periphery to receive the points of pins or screws which pass through the periphery of the socket; the wheel is further secured by having bolts fixed to the spokes and at right angles to them; these bolts are bent at right angles at the end so as to form a hook, and project over the edge of a collar formed on the periphery of the socket, thus preventing the possibility of the wheel disengaging itself. Should the axis break, it will be seen, that if such were to occur, the nave of the wheel would still revolve within the socket, and be held there by the aforesaid pins and hook or bolts. The drawings also show another support for the wheel, placed outside, having a similar contrivance for holding the nave; when this support is employed, the hooks may be dispensed with. There is also a number of rings within the tube for preventing the vibration of the shaft or axis; the tube also forms a reservoir for the oil, which is ladled up at every revolution of the axle by a projection or scoop fixed to each collar of the axle.

Claim.—The arrangement of an axis revolving within a tube, in place of the axletree commonly used, which contrivance renders the fracture of the axis by strong vibration or concussion scarcely possible; and should it even occur, the tube would, by means of the contrivance above described, answer the purpose of an axletree, enabling the carriage to proceed on its journey without interruption.

The next improvement is for a contrivance for stopping all kinds of carriages when the moving power is removed. This is effected by placing inside the tube of an axle constructed as in the foregoing, two brass steps or other metal

bearings; these two metal bearings are drawn together so as to bind tight on the shaft by means of a screw, which passes through the tube and binds on the top bearing; this screw is acted upon by a spring connected to the draw-bar or hook of the carriage, in such a manner, that on applying power to move the carriage the action of the spring will be removed from the screw; but immediately the moving power ceases to act, the spring, by an arrangement of levers, will move the screw partly round, and cause the two bearings to be drawn together, and the friction applied in the manner described.

Claim.—The contrivance described, which being in connection with the moving power, applies friction to a revolving part of the carriage the moment the moving power ceases. The patentee also claims the use of tubes for shafts and framing of carriages.

The Specification, in the next place, shows several modifications of the application of a coiled or convolute spring as applied to carriages, in place of the ordinary spring now in use, for which the inventor claims the use of coiled springs, as shown in the drawings, for the purpose of giving elasticity to carriages.

Improvements in wheels for carriages.—The spokes of these wheels are made of tubes, and contain a spiral spring; a bar of iron, made to fit the bore of these tubes, rests with its end upon the spring, the opposite end being divided and turned back in opposite directions so as to form a coiled spring, the termination of which is fixed to the tire of the wheel, which is made of a flat bar of iron, having its two edges bent at right angles to the periphery of the wheel, so as to form two internal flanges, the breadth and thickness of which will depend upon the strength of the wheel required; it will therefore be seen that the periphery of the wheel is supported entirely upon springs.

The periphery is then covered with plates, which the patentee prefers to make of some alloy, such as zinc and lead, which will be found to make very little noise, and when worn out may be recast; these plates are fixed to the periphery of the wheel by means of bolts, having first placed a layer of some flexible material round the wheel; or the periphery may be covered with wood.

Claim.—Construction of the wheel described.

The last improvement is for the peculiar construction of a carriage having from four to seven seats; the principal advantages of its arrangement is, that the whole weight of the carriage rests upon two wheels, as is usual in cabriolets, and which is said to diminish very much the labour of the horses; another advantage is, that the carriage is very low, and the door is placed at the side behind the wheels, which renders it much more convenient to get in and out.

Behind or underneath this carriage is placed an additional small wheel, similar to a castor, which is for the purpose of maintaining the equilibrium, as in a four-wheeled carriage.

The SPECIFICATION of the PATENT granted 13th April, 1842, to JOHN BYRON DAWES, of Trafalgar Square, Charing Cross, in the county of Middlesex, for "*a certain improved composition or compositions, to be employed in the preparation of glass or other media of light,*" due 13th October last, has not been enrolled during that month.

BYNNER'S PATENT.

[*Continued from page* 173.]

Cross-examined.—That the solar lamp was a new name, but the lamp was old in principle; that the price of oil was the cause of the great demand for lamps. Witness further stated, that he had purchased solar lamps from Messrs. Ratcliff's, marked "patent solar;" and that he did not know but that they were Messrs. Smith's until those gentlemen complained; and that since then he had not sold any unless made by Messrs. Smith, as he could not afford to contest a patent.

Mr. G. A. Miller, examined by Mr. Kelly.—Was a lamp manufacturer, carrying on business under the firm of Miller and Sons, Piccadilly, and had manufactured a great many chamber lamps in the year 1824, known as Miller's chamber lamp; that he first constructed them with a large chimney, but that in 1832 he introduced a cone; the air was admitted below the point of ignition, and was conducted to the flame by the cone, and struck it above the point of ignition; that he had sold about six dozen, and then introduced a change in the manner of getting the air above the point of ignition. Mr. Kelly here read Bynner's Specification, when the witness declared that the principle mentioned in it was not new; and on Bynner's lamp being shown to him, he stated that it was the same in principle as his, but that in Bynner's the cone was higher.

Cross-examined.—That the size of the aperture in the cone was larger, and the height at which it was placed less than in Bynner's lamp; that the top of the wick was above the cone; and that if the wick were placed below, the beneficial action of the deflector would be lost, and the flame become smoky, as if no cone at all were used.

Mr. A. Stockwell, foreman to Mr. Miller, corroborated the whole of Mr. Miller's evidence.

Mr. Wm. Tye, examined by Mr. Hugh Hill.—That he was bookkeeper to Mr. Ratcliff, of Birmingham; that the flat wick lamps, and Argand lamps, were sold by them before 1837; and he produced a list of persons to whom such lamps had been forwarded.

Cross-examined.—That he saw Bynner's lamp in the morning; that "patent solar lamp" was put on Ratcliff's lamp; the licences were granted by Messrs. Smith, but that he did not know where Messrs. Ratcliff got the cone from; there was a great increase in the demand for common oil lamps; and the demand for solar lamps was very great.

Mr. John Milner, examined by Sir W. Follett.—Was formerly a lamp manufacturer in London, but since retired in Dublin. That the models shown to him were made by himself; that air was admitted below the combustion, and carried up and thrown upon the flame by the cone; no other air was admitted but what was within the cone. Sir W. Follett then read Bynner's Specification, when the witness said that his lamp was precisely the same in principle; that he had made the Argand lamps for Messrs. Sivewright's lottery office, in the Haymarket, with metal cone deflectors, and that they were used until superseded by gas. Mr. Milner also produced various specimens of old cones, and explained their action: and also stated that he had made flat-wick lamps the same in principle as Bynner's; and also Argand gas cones; and that he used the ordinary French chimney.

Cross-examined.—That the lamp produced was one of the original ones he had made in London; that he had given some suggestions to Messrs. Upton and Roberts as to the cone, and the safety part of their lamps.

Mr. Thomas Clutton Salt, examined.—Stated that he had been a lamp manufacturer in Birmingham for a considerable number of years; had seen the solar lamp; it was not new in principle; in 1816 he had purchased Palmer's patent, (really Simpson's) and had made and sold lamps under it; that the air in them was admitted below, and deflected upon the flame by a cone above; Palmer's lamp was specified chiefly for oil, and was used in shops until superseded by gas. Witness further stated, that he had sent word to Messrs. Smith, that he did not admit their patent, and that he would sell deflectors to them or their Attorney to bring into Court; that Messrs. Smith said that he mistook the point of their patent, and told him that if he sawed off one-half of their deflector, the effect would be, that the flame would be deflected in somewhat a horizontal direction; that his answer was, that he had never made the experiment; that he tried with Palmer's lamp by cutting off one-half of the deflector, and that the same effect was produced; that he made peace with Messrs. Smith, upon terms of having labels at half price.

Cross-examined.—That he paid sixpence per label; did not remember when he first heard of the solar lamp, but considered it a great improvement on the Argand lamp, and on every lamp to which it could be applied; that all persons who made Palmer's lamp, varied the elevation and contraction to their taste; and that he considered Messrs. Smith's elevation and contraction the best; that he had a partner, whose name was Wright; that they made experiments and differed; that he complained that the cone was made so high that it buried the light; and that his partner complained that the cone was so low that it smothered the light.

Re-examined.—That there was nothing in Bynner's Specification indicating the height or contraction; it was what Messrs. Smith had adopted in practice, and that a manufacturer must learn the elevation and contraction by experiments.

Mr. Thomas Blakeway and Mr. Taylor, proved that the principle of Simpson's patent was the same as Bynner's; and that they had made and sold many of Palmer's lamps before 1837.

Mr. Robert Douglass, examined.—Stated that he was a large lamp manufacturer in Piccadilly; and that he was well acquainted with the solar lamp; that the Argand deflecting lamps, as first introduced by Messrs. Smith, did not succeed, principally in consequence of a thin ordinary sperm oil cotton wick being employed; and that he suggested the use of the thick wick of unbleached Smyrna cotton, to which in a great measure it was owing that he tried the peculiar chimnies, stated by the patentee to be essential to produce the effect here required, but that for Argand lamps they entirely failed; and that he introduced the use of a totally different chimney, which he showed to Messrs. Smith, and which they had since adopted.

Professor Cumming examined.—Stated that he was Professor of Chemistry in the University of Cambridge; that he had lectured on light and heat there; that the point of ignition was absurd, as applying the point to the surface of a flame, and ambiguous if it meant the commencement of ignition, and as not stating what was ignited. That there was nothing in Bynner's Specification to show the limits or extent of contraction or elevation of the cone, and that no explanation was given of the point of ignition; that he had heard part of the evidence given. Various models were then shown to the witness. (Milner's). That lamp was constructed on the same principle as Bynner's; the air came in below, and would be deflected above the highest point of ignition. (Upton's and Miller's.) These were constructed on the same principle; that they differed merely in degree, and that the principle was common to both. (Hetherington's) was the same in principle. (Guise's flat-wick and small-wick). The form of the cone was the same. (Ratcliff's.) The only difference in this lamp was that the air was admitted through a circle of holes near the top of the cone. (Palmer's) (Simpson's) was the same; that the principle in all was the same, viz., the curve of the upper cone; the difference was one of degree; the principle was the same, it deflected the air. (Roberts.') This was also the same, but admitted of an adjustment, so that it might impinge at any height above the flame.

Mr. George Soames gave a list of the different prices of sperm oil and common oil, from before 1830 to 1841.

Mr. Maugham stated that he was a chemist at the Polytechnic Institution; and that he had made experiments with gas lamps and Bynner's cone; that the loss was nearly 15 per cent.

This closed the case on the part of the Crown.

The Attorney-General then addressed the Jury for the Defendant.—The learned gentleman began by stating that the proceedings were founded in fraud and supported by perjury; but that he would not condescend to particularise either the one or the other; that the whole question was where the air was deflected; and that the question as to the height of the cone was one of degree; upon that he joined issue. In order to refute the evidence of the prosecution, he would call most respectable witnesses—professors, and persons in the lamp trade; Mr. Greensill of the Strand; eight or ten witnesses in the trade in London, and five or six from Birmingham. That the impinging of the air against the flame above the point of ignition was peculiar

to Bynner's lamp. That the patentee made two claims; he claimed both the deflector and the chimney; that no lamp had been produced which was the same as Bynner's; none which was not a fraud. In Bynner's drawing, the blue part of the flame was shown, and the air impinged above, and that there was nothing in Simpson's drawing like Bynner's. That all the witnesses on the part of the prosecution were interested, being lamp makers, particularly Mr. Upton, against whom an action was pending. That if the Jury had any doubt on their minds, Mr. Bynner was entitled to the benefit of it. The learned gentleman concluded his lengthened address by saying, "I ask you to give a verdict, not for the Defendant, but according to the evidence, for the party entitled to it, without reference to the speeches of counsel. I make these observations with great anxiety, because I hear that there never was a *scire facias* in which the patent did not fail."

Professor Cowper examined by Mr. M. D. Hill.—Stated that he was a lecturer on manufactures, &c. at King's College, and inventor of the improved printing machine, and was conversant with specifications; and had read Bynner's; that the patentee's objects were, greater length and steadiness of flame and brilliancy of light; that by "point of ignition" was meant where the thing was ignited; and that the words "formed below the point at which the currents of air strike or act," showed that the flame ought to be perfect where the air struck. Did not consider the flame formed until above the blue part of the flame. That there would be no difficulty in constructing the articles mentioned in Bynner's Specification. [Lamp Patent No. 1. was then put into witness's hands,] when he stated that in that lamp (purchased of Miller) the wick was above the deflector, but in that produced the day before, the wick was one-eighth of an inch below the deflector, and that neither of these lamps were the same as Bynner's; that he considered the deflecting power injured by the largeness of the aperture, but not practically destroyed; that in Miller's lamp the deflector was so constructed that the air had a tendency to impinge on the flame, but that if one half was cut away, it would cause the flame to be blown down in a horizontal direction. (Guise's small lamp.) In this lamp the air would not be deflected equally all round, as at the end it was straight; but it would not make a long unsteady flame. (Ratcliff's universal lamp.) That this lamp had holes in the deflector, which were inconsistent with the patentee's object, and which would have the effect, as far as they went, of destroying the power of the deflector, and of shortening the flame. (Palmer's lamp.) The effect of the button was to spread out the flame and render a globe glass necessary. (Upton's lamp.) That if a workman made the lamp No. 4. in Upton's Specification, the blue flame would come above the deflector; if made by Bynner's Specification, the deflector would be higher; that Upton's safety lamp was different from Bynner's; the deflector was not so high, and the orifice was larger. (Hetherington's lamp.) That the aperture at the ends was on a level with the top of the wick, and the fish-mouthed cap was not at all within Defendant's patent. That the same observation applied to Milner's green lamp only in a smaller degree, the top of the wick being nearly on a level with the top of the deflector; that the holes in the gallery would keep the

glass cool, and that there could be no current of air if the holes were not within the glass. That Milner's argand was not at all within the Defendant's patent, the orifice was too wide. (Roberts' tin lamp.) That in that lamp the orifice was obviously too large to produce the effect of the patent lamp; that he had no doubt none of the lamps produced the same effect as Bynner's, and that the specification and drawings would enable a workman to make a solar lamp whether he drew a general conclusion or not.

Cross-examined by the Solicitor-General.—Had been sometimes a witness in patent causes; that using the word "principle" as meaning deflection, he should say that all the lamps exhibited to him were on the same principle as Bynner's, but varying in their construction, and consequently varying in effect; that they were almost every one formed upon the principle of admitting the air below the point of ignition; that some were formed on the principle of deflecting the air above the point of ignition; some partly so, and some not. That he was of opinion that none of the lamps produced were within the Defendant's patent; they were not constructed in the same manner as the patent lamps. [Ratcliff's universal lamp was then put into witness's hands,] when he stated in answer to the learned Counsel's questions, that the air was admitted below the point of ignition, and was deflected above, but that he thought that the holes round the cone would operate injuriously, as they prevented the air deflecting against the flame; that he had only formed his opinion because the lamp departed from the construction of the patent lamp, and from the absence of holes in the latter; that he did not know that any person could say that the lamp would not burn as well without making an experiment. [A glass (oxydator) was shown to witness.] That the holes in the top of the cone or ring prevented it being within the patent, but that he could not tell whether these holes would operate injuriously or beneficially. That from the Defendant's Specification the air should strike above the point of ignition; from the drawings, above the blue flame, and also at a certain distance above where the flame was formed; that he had measured the distance between the top of the wick and the top of the cap; in figure 3 it was five-sixteenths of an inch; that if it were one-quarter of an inch, it would come within Defendant's patent; any thing that deflected the air above the blue flame would also be within the patent. [A lighted lamp was put into witness's hand.] That the blue flame in that was not above one-sixteenth of an inch; the blue flame in gas was higher; and that he did not expect accuracy in the drawings. (Miller's lamp.) That in this lamp the air was admitted below the point of ignition; there was a deflector, by means of which the air was deflected above the point of ignition; that his objection to that lamp was that the orifice was too wide, and that if he saw a lamp varying from Bynner's he did not think it so good. If the aperture were narrowed, it would be the same as Bynner's.

To the Judge.—That the only difference between the patent lamp and Miller's was, that the patent lamp was an improvement upon Miller's, in narrowing the aperture of the deflector; that in every other respect they were similar.

[Guise's small lamp shown to witness.]—That the air was admitted below the point of ignition; and that if the corners were not so low the air would be

deflected above all round; that the difference between this lamp and Bynner's was, that Bynner's had a differently formed aperture. (Guise's flat wick.) Air was also admitted below the point of ignition; and if the top of the cap was one-half or five-eighths of an inch above the top of the wick holder, the air would be deflected above the point of ignition all round; and that if half of this cone were cut off, it would have the effect of blowing the flame to almost a horizontal position, if not quite; that he would not say that it was a defect, if it were described in a specification without noticing the corners. (Palmer's lamp.) That the only difference was the button, and also that the area was greater in Palmer's than in Bynner's; that in Upton and Roberts' Specification the air was admitted below, and deflected above the point of ignition. [Hetherington's cone was put into witness's hands.] He stated that it was constructed as mentioned in Upton and Roberts' Specification, except that the aperture was larger; that the air would be deflected above the point of ignition in the centre, but not at the sides; that he could not tell the accurate measurement from Upton and Roberts' Drawings. (Upton's lamp, No. 2, Newcastle.) That the difference with Bynner's was one of degree. (Milner's green lamp.) That the difference in that was in the air being admitted in the glass; that if the glass fitted close to the cone, it would remove the defect of admitting the air; that the cone was but three-eighths of an inch above the wick holder, and was not high enough to produce the effect of the solar lamp, and that it would be an improvement to have it higher; that in Miller's copper lamp, and Roberts' tin lamp, the orifices were too large, but that if they were smaller, they would resemble Bynner's lamp; that the distance from the edge of the deflector to the wick holder was only three-eighths of an inch; and at that distance the air would have some effect.

Re-examined.—That the conditions in Bynner's Specification were, first, getting the air below the point of ignition: secondly, having it deflected above the point of ignition where the flame was formed; and, thirdly, having the same distances and measurement as shewn in the drawings; that in no one of the lamps shewn were all the conditions observed; that it was all a question of degree, and that some of the lamps were deficient in orifices, and some in height.

Mr. Thomas Greensill, examined.—That he was a lamp manufacturer in the Strand, and had been in the trade forty years; that he knew the solar lamp well; and that it was quite new, and was the greatest improvement since Argand's invention; that it had a great sale; it was simple, economical, and produced the greatest light; that the lamp trade was always good; but that the solar lamp trebled the sale, and helped to meet the inconvenience resulting from the high price of oil.

Cross-examined.—That the sale increased two or three years ago—was greatest last year; that it effected a great saving by burning common oil, on account of the high price of sperm oil; a thicker wick was used for it.

Mr. William Dunn proved the same thing as the former witness.

Richard Willis, examined.—Stated that he was a partner in the house of Perry & Co., in Bond Street; that they had a large trade, and supplied

Buckingham Palace; that he had been in the trade for fifteen years, and remembers the solar lamp being brought out; that it was three or four years since he first saw it; it was quite new to him; the flame was bright, long, and steady; that each of these requisites was very important, and that none of the lamps shown would produce the length, steadiness, and brilliancy of light that the patent lamp did; that it was about four years before the solar lamp came out that Ratcliff brought his lamp to him, but he did not think it worth his notice; that he had not seen Upton's lamp until within the few last weeks; that Ratcliff's lamp was never taken up by the trade; and that he had turned it out at once.

Cross-examined.—That the lamp then shown to him (the brass one) was of the same construction as the one Ratcliff had shown him; that it was substantially according to Upton's patent, except the holes at the top of the cone; that in the Argand lamps he had sold, he had never sold the peculiar chimney described by the patentee.

Mr. Thomas Finn, Mr. John Blakeway, Mr. John Warner, Jun., Mr. Parkinson, and Mr. Thomas Abbott, severally stated that they considered the solar lamp a very excelle t one, and different from any they had ever seen before.

Mr. Muntz, exami ed.—Stated that he carried on trade in Birmingham, and that his offices were fitted up with gas; that Mr. Smith supplied the gas burners.

Mr. Newby, examined.—Stated that he had been a lamp maker for thirty years, and worked for Mr. Messenger of Birmingham; that he remembered the first time he saw the solar lamp, about three years ago; that it had astonished him; that he would have no difficulty in making the lamp from the drawing; that he had made two dozen lamps for Mr. Upton about twelve years ago; the wick was a little under the deflector, and the flame was not so good as Defendant's—not so long.

Cross-examined.—That Mr. Upton's lamps had caps; but could not swear that the caps were made at his manufactory at Birmingham; that he had seen one of the lamps alight which Upton had brought, but none that he had made; recollected the caps; this object was to deflect the air on the flame; that he did not think the air was deflected on the flame, the top of the wick was so near the top of the cap.

Re-examined.—That in drawing his hand over the deflector, it would touch the top of the wick; that he thought the tin lamp was made to have the deflector put down to the bottom; and that there was a wire in the centre of the lamp for a button.

Mr. Pearce and Mr. Samuel Messenger severally gave evidence as to the novelty of Bynner's lamp, and as to its extensive sale.

Professor William Thomas Brande, examined.—Was a professor at the Royal Institution; had read Bynner's Specification, and considered the invention a contrivance for driving the air on the flame so as to produce the maximum of light in a flame properly adapted for the lamp; that the great length, steadiness, and brilliancy of flame, arose from the combination mentioned in the Specification; that he presumed that the air should be struck on the flame

when it became white, and assumed the character of a perfect flame; and that the drawing accorded with that; it was right on chemical principles that the air should strike there, as he conceived that the flame would then be enabled to consume a greater quantity of carbon, and to give a greater quantity of light; and if the air did not strike there, the flame would be smoky, and would not give so much light; smoke was carbon unconsumed; and the point of ignition, the place where the flame was first generated in contact with the oil; popularly speaking, it was the top of the wick; that Bynner's lamp produced a very brilliant light, by the quantity of carbon thrown down by the air, and almost at the same moment consumed—on that the brilliancy deponded. It was important that the upper part of the glass should be smaller than the lower part; that the current of air was increased, and descending currents were excluded, and by the narrow chimney the heat was better kept up. [Some experiments were then made by the learned Professor with Upton's and Bynner's pipe wick, and Argand lamp.] That it appeared that the aperture was very little larger than the wick; it was important that it should be so; that in Milner's, if the deflector was intended for an Argand lamp, the aperture was much too large. [Further experiments were then tried with Milner's deflector and Bynner's.] That he had never seen another lamp which produced such a light as Bynner's; that he had attended to the various lamps produced, and to the examination of the witnesses upon them; but that he had not seen any of the lamps in which all the directions as to Bynner's lamps were observed.

Cross-examined by the Solicitor General.—That he had attended as a witness in patent causes; he collected from the Specification that the air ought to impinge above the blue flame, that is to say, at a certain point above the point of ignition; he considered there was a difference between the term "point of ignition," and the term "point where the flame begins to be formed into a perfect flame;" that one expression conveyed one idea to the mind, and the other another. [A chimney, shaped like a peculiar patented chimney, was then tried on the Argand lamp, which burnt with a brilliant light.] That the chimney tried was not according to the patent; it was higher than the chimney shown in drawing No. 1. [Several other chimnies were afterwards tried, but they failed.] He had seen a straight chimney used within the last twenty years, and had used it himself. [A common French glass tried.] This was better than the straight glass. [Deflector taken off and oxydator tried.] This was better than the deflector with the French chimney.

Re-examined.—That by pinching in the glass it made a deflector; he considered a straight chimney an ordinary chimney; and that the invention might be used with the ordinary chimney, but not so well as with the patent chimney.

Professor Daniell, examined.—That he was professor of chemistry at King's College, and had given much attention to lamps; had never seen a lamp so perfect as Bynner's; that its excellence consisted in increase of flame, steadiness, and brightness of light; that all these advantages resulted from the construction pointed out in the patent; and that the steadiness was the effect of contracting the glass.

Cross-examined.—Admitted that the principle on which Bynner's lamp was

constructed, was precisely the same as Simpson's, Upton's, Ratcliff's and other lamps produced; and that the only difference in practice was one of degree; the contraction of the cone being greater than that ordinarily employed in some of the old lamps.

Professor Philipps, examined.—That he was the curator of the Museum of Economic Geology, and a lecturer for many years on chemistry, and had attended to the subject of combustion. Had never seen any lamp, including those brought by the prosecutors, comparable to Bynner's, and considered the parts specified to produce the excellence of those lamps; that he had looked at Upton's Specification, but not minutely; that his lamps had the wick near the deflector, and that the flame would not be struck at the point where it began to become a perfect flame; that was essential to Bynner's lamp, and that he attributed incandescence to that impinging on the flame; had seen various glasses and deflectors used; but that none produced the effect that Bynner's did, and that no lamp combined all the parts of Bynner's Specification. In Miller's lamp there could not be the impinging on the flame to produce the effect of Bynner's. In Roberts' lamp the orifice was too large to produce the proper effect, and that a sufficient quantity of air could not come up between the two caps; and that the aperture was comparatively greater than Bynner's in proportion to the size of the wick. That all the lamps produced were on the same principle as Bynner's, but not properly carried out.

Cross-examined.—Could not say whether the distance of the top of the deflector from the wick was the same in gas and oil lamps; nor whether there was any difference in the distance at which the flame was formed in oil and gas lamps; that he could not say if in Miller's lamp the air was admitted below the point of ignition, nor whether it would impinge on the flame above the point of ignition; that in Upton's safety lamp the air was deflected above the point of iguition, and slightly over the wick, and was constructed on the same principle as Bynner's, but not carried out to the same degree.

Re-examined.—That in Upton's lamp the air did not impinge at the same point as Bynner's, but a little above the wick; that in Miller's there was not room between the top of the wick and deflector for the air to impinge, that there might be a sufficient current, but not to produce a good effect.

This closed the case for the Defendants.

The Solicitor-General then replied:—and after referring to the attack the Attorney-General had thought proper to make upon the parties concerned in the prosecution, and vindicating them from the charges of fraud and perjury, which were as unfounded in fact as unsupported by even a shadow of evidence, he directed the attention of the Jury, first, to the evidence for the prosecution, which he stated was as fair and conclusive as it was uncontradicted, and next, to the evidence for the defence, which, had it stood alone, he declared must have insured a verdict for the Crown. The learned gentleman then remarked, that although generally there existed a very proper desire on the part of the Court and the Jury to support *bonâ fide* patentees, and protect them from the consequences of any unintentional error, that such feeling ought not to be allowed in the present case; for from the evidence for the prosecution it was

impossible to doubt that Mr. Bynner had appropriated the invention of another person, and imposed upon the Crown in declaring sincerely and solemnly that he was the inventor thereof, and that the same had never, to his knowledge or belief, been practised within this realm; whereas, in fact, he was taught the very invention by Mr. Upton, and manufactured these lamps for his employers, the Messrs. Smith, who were licencees of Upton's patent right. The learned gentleman then directed the attention of the Jury to the leading cases of patent law, particularly to the case of Carpenter *v.* Smith, and contended that the evidence before the Court entitled the Crown to a verdict upon all the issues except the seventh; and on behalf of the prosecution he submitted that as this issue was immaterial, and no evidence had been produced to support it, a verdict might very properly be given for the Defendant; but with respect to the remaining issues, all of which were material, he, with confidence, claimed their verdict for the Crown.

Mr. Justice Coleridge then summed up the case at great length.—This was a proceeding by *scire facias* to repeal a patent; the grounds of repeal were that the invention was not new or useful, and that there was not sufficient specification. The declaration stated many such objections, and the pleas denied them; issues were joined which the Jury would have to determine; that there were substantially but two or three questions raised; the utility was admitted, but notwithstanding utility, the facts must be found according to law. The first issue raised the question whether the patent was contrary to law. Two, 3, 4, 5, and 6, whether Bynner's invention was new in December, 1837, and whether Bynner was the first inventor.

7.—Whether or not a manufacture. There was no evidence on either side, but this issue ought to be found for Defendant.

8.—Sufficiency of Specification.

First.—Was the invention new in December, 1837?

Secondly.—Was Bynner the inventor?

Thirdly.—Was Specification sufficient?

Questions 1 and 2 depended in part, and to a great extent, on the nature of the invention in the Specification, it was therefore necessary to consider that first. The Specification must describe the nature of the invention accurately and honestly, and so clearly, that a workman might understand the same, and it must so state, that a party might understand what the party claimed, and next in what manner his invention was to be performed, in such terms, that a person of ordinary skill in the business might make it as well as the patentee. It should be on the face of the Specification what the patentee did, and in what manner he did it. If patentee referred to drawings, they were to be taken as part of the Specification; but if the drawings were not upon a scale, they could not be looked upon as giving the same degree of assistance as if more accurately drawn. Every Specification might be bad in two ways; first, unintelligible; or, secondly, though intelligible, yet if applied to the evidence, it did not describe accurately the invention. The Specification was tolerably clear, so far as it went. The title was "Improvements on Lamps." The Solicitor-General took a distinction founded in law between an improvement and an

entirely new discovery. If the invention was merely an improvement, and claimed as an absolutely new discovery, the patent was void. Bynner's invention consisted in the application of certain deflecting surfaces in combination with peculiarly constructed chimnies; it did not specify where the narrower part of the chimney was to be. It should seem from the words that it was important that the air should strike above the point where the flame was formed; the air must strike above where the perfect flame was formed, but no particular point or distance was mentioned, and the drawings could not be relied on as showing any precise point.

Another matter was as to the use of these chimnies; *read the words* "it is important that the chimney should be of such a figure, in order to produce the fullest effect;" *read also* as to ordinary chimnies. Bynner claimed the combination of the deflectors with peculiarly constructed chimnies; also the use of ordinary chimnies.

The Jury will have to say—

First.—Whether any particular point of deflection was necessary?

Secondly.—Whether a particular size of orifice was necessary?

If the air must impinge at a precise point, or the orifice vary in proportion, the Specification was bad.

The Jury will also have to say—

First.—Whether chimnies of the peculiar form mentioned in the Specification were necessary to produce the fullest effect?

Secondly.—Whether ordinary chimnies would do to produce the same beneficial effect?

Next as to novelty. It was alleged by the prosecution, that there was no novelty as to principle. The Defendants alleged that it all depended on degree or nicety, and that it was a new lamp. The Jury will have to determine whether it was but an improved application of instruments known before, or whether it was a new discovery.

The witnesses on the part of the Crown consist of persons biassed as being in the trade, and proprietors of expired patents, and scientific persons.

First.—As to Specification and peculiar chimney, the learned Judge read the evidence of Douglass, Willis, Pearce, Messenger, and Brande, and commented on it, and left it to the Jury to say—

Whether the fullest effect was produced by the use of the peculiar chimney?

Or, whether it would, in a substantial degree, be produced at all by the ordinary chimney?

Next, as to whether any particular point at which the air should strike, or whether any precise size of orifice was necessary?

Read evidence of Salt, Cumming, Cowper, and Brande.

The Specification did not state at what precise point of the perfect flame the air should strike; the Specification showed the lowest point, but not the highest; and did not show the precise point where the flame began.

Next as to novelty.

Was the Defendant the inventor of a mode of deflecting air on the flame above the point of ignition, or that mode, that is, that principle having been

before discovered, had he only made some practical improvement upon it? If only the latter, the Defendant claimed too much.

In considering the evidence, it ought to be borne in mind, that the witnesses spoke with the knowledge of 1842.

The learned Judge then read Upton and Roberts' Specification, and Cowper and Newby's evidence as to it.

It became a very nice point whether the use had been such as to render the invention not new.

The learned Judge then recapitulated all the lamps that had been produced, and commented upon the evidence given by the witnesses in reference to them.

Professor Cumming made it altogether a question of degree, but that there was identity of principle.

The Defendant called manufacturers to prove the great utility, as well as the novelty of the invention. The learned Judge stated the names and evidence, and commented thereon.

All the manufacturers said might be perfectly true, yet if the invention was in any thing like public use before Bynner's patent, the patent could not be supported.

The points for the consideration of the Jury would be,

First.—Whether upon evidence, a precise point of the flame was necessary to be impinged on?

Secondly.—Whether a precise size of orifice was necessary?

Thirdly.—Whether the fullest effect would be produced by chimnies of the peculiar construction.

Fourthly.—Whether the effect would be produced at all substantially by ordinary chimnies, understanding thereby a straight chimney, like that produced in evidence.

Fifthly.—Had Mr. Bynner invented, in truth, a new mode of applying air to lamps, or that mode having been discovered before, had he only made some practical improvement?

The Jury found as follows:—

We find, for the Crown: we find unanimously, that,

First.—A precise point is necessary; and that such point is not set forth in the Specification and drawings.

Secondly.—We also consider the precise size of orifice to be necessary; and that such is not set forth in the Specification and drawings.

Thirdly.—We find that the peculiar chimney does not produce the fullest effect.

Fourthly.—We find an ordinary or cylindrical chimney of no substantial advantage.

Fifthly.—We find that the invention is not new; it is but a practical improvement of a matter previously known.

Verdict for the Crown upon the first, second, third, fourth, fifth, sixth, and eighth issues; for the Defendant on the seventh issue.

COURT OF QUEEN'S BENCH.—4th November, 1842.

THE QUEEN *v.* BYNNER.

In this case (reported above) the Attorney-General applied to the Court for a rule to shew cause why the verdict should not be set aside and a new trial had.

The Court, at the earnest entreaty of the learned counsel, took time to consider their judgment, which has not yet been given.

COURT OF QUEEN'S BENCH.—6th November, 1842.

THE QUEEN *v.* WALTON.

In this case a *scire facias* had been issued for the purpose of trying the validity of a patent the defendant had obtained for certain improvements in wire cards, used in carding cotton, wool, &c. The invention consists in the application and adaptation of India rubber through which to set the teeth of card, instead of leather, before used, whereby superior elasticity and uniformity are obtained. The issues set up on the part of the Crown were, that the invention was not new as to public use, that it was not found out by the defendant, that it was not a new manufacture, that the Specification was insufficient, and that it was useless for some of the purposes stated in the Specification. The trial took place before Lord Denman, in the sittings after Trinity term, and the Jury found a verdict for the Crown.

Sir Thomas Wilde now moved for a rule *nisi* for a new trial, on the ground that the verdict was against evidence. The validity of the patent had been tried twice before, in actions brought by the patentee for infringements of his patent, in both of which he had received verdicts. On the trial it was contended that the invention did not essentially differ from the inventions of Mr. Macintosh and Mr. Hancock, in neither of which did elasticity constitute any feature of their invention; whereas in Mr. Walton's, it constituted the main characteristic of his invention.

Lord Denman thought it a very fit case for further inquiry; and the Court, after hearing the learned counsel at great length, granted the rule.

List of New Patents.

PATENTS GRANTED BY THE FRENCH GOVERNMENT DURING THE SECOND QUARTER OF 1842.

AYGALENQ-BLANQUET, of Arras, for "a new machine for making bricks."

CHEVALIER, 140, Rue-montmartre, for "a portative stove."

CHUARD, 25, Rue-d'enfer, for "an instrument, called Gazoscope, for detecting detonations of the atmosphere in mines and in rooms where gas is used, so as to guard against explosions."

COLMAN, at M. Truffaut's, 8, Rue-favart, for "improvements in the manufacture of starch."

DELAROCHE, 40, Rue-du-bac, for "a new steam boiler for culinary purposes."

FOULQUIE, 4, Rue-Caumartin, for "an instrument to chop meat, vegetables, &c."

MLLE. GALY-CAZALAT, 23, Rue-folie-mericourt, for "a new tea or coffee pot which acts by steam."

GUEUDET, 47, Rue-du-ponceau, for "a machine for the manufacture of matches."

GUIBAL, of Vigan (Gard) for "a new veneering instrument."

HADDAN, at M. Duret, 4, Rue-vide-Gousset, for "improvements in the construction of railway carriages, axles, wheels, &c."

[*To be continued.*]

PATENTS GRANTED IN ENGLAND, FROM NOVEMBER 2nd TO NOVEMBER 17th, 1842.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

MATTHEW GREGSON, of Toxteth-park, Liverpool, esquire, for "improvements applicable to the sawing or cutting of veneers." Being a communication. Sealed November 2.

JOSEPH EDWARDS, of Bloomsbury-square, clerk, for "an improved razor-strop, or instrument for sharpening certain cutting edges, and an improved material for covering the same, which material is also applicable to other purposes." Sealed November 2.

SIR JOHN SCOTT LILLIE, of Chelsea, for "certain improvements in roads." Sealed November 2.

PIERRE PELLETAN, of Bedford-square, esquire, for "improvements in the production of light." Sealed November 2.

JAMES BULLOUGH, of Blackburn, overlooker, for "certain improvements in the construction of looms for weaving." Being a communication. Sealed November 3.

RICHARD BEVAN, of Liverpool, wine merchant, for "certain arrangements connected with the circulation of steam employed in pipes or tubes for producing heat, and the application of such arrangements to various purposes." Sealed November 5.

JOHN ROTHWELL, of Great Bolton, grocer, for "a certain composition and preparation to promote the ignition and combustion of coke, coal, and other combustible substances, in stoves, furnaces, and grates." Sealed November 5.

WILLIAM COLEY JONES, of Vauxhall-walk, Lambeth, practical chemist, for "improvements in treating or operating upon a certain unctuous substance, in order to obtain products therefrom for the manufacture of candles, and other purposes." Sealed November 8.

PIERRE FREDERICK INGOLD, of Buckingham-place, Hanover-square, watch-maker, for "improvements in machinery for making parts of watches and other time-keepers." Sealed November 8.

ARTHUR HARVIE, of Wilmington-square, gentleman, for "improvements in the process of vinous fermentation." Being a communication. Sealed November 8.

THOMAS WRIGLEY, of Bridge-hall, Bury, Lancaster, paper manufacturer, for "certain improvements in machinery for manufacturing paper." Sealed November 8.

JOHN MITCHELL, of Birmingham, steel pen-manufacturer, for "a certain improvement in the manufacture of metallic pens, and a certain improvement in the manufacture of pen holders." Sealed November 8.

JOHN SPINES, the younger, of John-street, Bedford-row, gentleman, for "an improved apparatus for giving elasticity to certain parts of railway and other carriages requiring the same." Sealed November 8.

HENRIK ZANDER, of North-street, Sloane-street, engineer, for "certain improvements in steam-engine boilers and furnaces, and in the methods of feeding and working the same; as also in the machinery for applying steam power to propelling purposes." Sealed November 8.

JOHN BARNES, of Church, Lancashire, manufacturing chemist, and JOHN MERCER, of Oakenshaw, Lancashire, calico printer, for "certain improvements in the manufacture of articles used in printing and dyeing cotton, silk, woollen, and other fabrics." Sealed November 10.

CHARLES ROWLEY and JAMES TURNER, of Birmingham, button manufacturers, for "improvements in the manufacture of perforated metal buttons." Sealed November 15.

ANDRE EUSTACHE GRATIEN AUGUSTE MAURRAS, of Cornhill, gentleman, for "certain improvements in the process and apparatus for filtering water and other liquids." Being partly a communication. Sealed November 15.

CHARLES SMITH, of Newcastle-street, Strand, for "improvements in the manufacture and application of bricks, tiles, and other plastic articles or surfaces, and for cements or compositions to be used with, in, and about the same, for building and other useful purposes." Sealed November 17.

PATENTS GRANTED IN IRELAND IN NOVEMBER, 1842.

JOSEPH WHITWORTH, of Manchester, in the county of Lancaster, engineer, for "certain improvements in machinery or apparatus for cleaning roads, and which machinery is also applicable to other similar purposes." Sealed November 1.

CLAUDE EDWARD DEUTSCHE, of Fricour's Hotel, Saint Martin's Lane, in the county of Middlesex, gentleman, for "improvements in combining materials to be used for cementing purposes, and for the preventing the passage of fluids, and also for forming articles from such composition of materials." Being a communication. Sealed November 7.

JOHN COX, of Gougie Mills, near Edinburgh, tanner and glue manufacturer, for "improvements in the processes of tanning and leather dressing."

JAMES PILBROW, of Tottenham Green, in the county of Middlesex, engineer, for "certain improvements in the application of steam, air, and other vapours, and gaseous agents, to the production of motive power, and in the machinery by which the same is effected." Sealed November 18.

The Record

OF

PATENT INVENTIONS.

No. IV.

SPECIFICATION enrolled 3rd November, 1842, of a PATENT granted 3rd May, 1842, to JOHN ROBINSON, of Watney Street, Commercial Road East, in the county of Middlesex, engineer, for "*improvements in windlasses and capstans.*"

THE first improvement relates to windlasses, and consists in the application and use of two barrels, with guide rollers or pullies between them; one of the barrels is of the ordinary description, the other is about half the length; on the axis of each barrel is a cog wheel, with an intermediate wheel between them; and on the same axis as the intermediate wheel is a number of guide pullies. The cable, in passing from the barrel of one windlass to the other, passes over the guide pullies. The object of this arrangement, is that the cable may be continuously wound, without stopping to move it on the surface of the barrels.

Claim.—The mode of connecting two barrels, having guiding surfaces or pullies between them.

The second improvement consists in another method of effecting the same object, namely, avoiding the necessity of stopping from time to time, for the purpose of moving

the cable on the barrel of a windlass; in this case, the barrel, at that part where the cable is wound on, is made conical, and with a number of bits, or projecting surfaces, around the periphery of the conical part; these surfaces extend in a direction of the length of the cone, and also across its axis somewhat in a spiral form, which causes the coils of the cable to slip down as they are wound on the barrel.

Claim.—The mode of applying a series of inclined planes or bits, in a direction across the axis of the barrel of the windlass.

The third improvement consists in the application of a guide plate for facilitating the giving out of the cable. This plate is fixed in a vertical position, and moves upon an axis at its lower end, and consists of a rectangular or oblong plate of iron, standing at right angles to the axis of the windlass, and having a portion of one edge removed, so as to embrace the barrel. When it is required to run the cable out, it is placed between the said plate and a guide pulley.

Claim.—The mode of applying a guide plate to give out the cable.

The fourth improvement relates to that description of windlass having a motion similar to a pumping action; and consists in making the cross-head with four sockets in place of two, as in those of the ordinary construction. By this arrangement it will be seen, that four bars can be employed in working the cross-head, in place of having only two.

Claim.—The construction of a cross-head for working the barrels of windlasses, whereby four bars may be used in giving motion to the cross-head.

The fifth improvement is an improved method of giving motion to windlass barrels. The barrel, in this case, is

made with an enlarged part or collar; a band or strap passes round the periphery of this collar, which is attached at one end, by means of a link, to two plates. These plates are connected together, and are placed at each side of the collar, which is made with a circular projection on each side; and within these projections the plates, which have concentric projections formed on one edge, fit; a horizontal lever works between and upon an axis carried by the plates; one end of this lever is joined to a connecting rod, which passes from the cross-head; and the other end is connected by a link to the opposite end of the strap or band which passes round the periphery of the collar. By this contrivance, when the end of the horizontal lever is lifted by means of the connecting rod, the opposite end will be depressed, together with the link, and the end of the metal strap which passes round the collar, and is attached at its opposite end to the bottom edge of the two plates, will be drawn so as to embrace the periphery of the collar tightly; and on further raising the end of the lever, the barrel of the windlass will be caused to move partly round; and on depressing the end of the said lever, the band will be released and slip on the periphery of the collar, so as to be ready for the next rise or lift of the lever.

Claim is the mode of giving motion to windlass barrels, by employing a band or strap with the plates and other parts connected therewith.

The sixth improvement relates to another mode of giving motion to windlass barrels by forming the surface of the collar into teeth, and in the application of a plate of iron in the form of a segment of a circle. This plate is placed between the end of a lever similar to that above described, and the toothed surface; in this case, the end of the lever is formed so that whenever its opposite end is raised, the

lever will nip against the back of the plate, and thus bind or press it tight against the toothed surface; and on further raising the lever, the barrel will be forced partly round. This arrangement also admits of a pall or catch being fixed to the top part of the two plates supporting the lever (as before described), and taking into the teeth of the surface, which is formed like a ratchet wheel.

Claim.—The forming the surface into teeth, and using a plate between such surface and the nipping lever.

The seventh improvement.—This arrangement shows the application of a plate between the nipping lever and a plane surface, which is embraced by a hoop fixed to the plates which carry the lever; and also a mode of applying a friction band for retarding or giving motion to windlass barrels. This friction band passes round a collar or enlarged part of the windlass barrel; to one of its ends is firmly attached a projecting piece, which forms a radial line to the circle made by the band; to the other end of the band is connected, by a pin joint, a piece of iron having a socket in its outer end; the middle of this latter piece, which moves upon a pin joint, and the outer end of the former, are connected together by a link; consequently, if a handspike be inserted into the socket, and the same be depressed, the two ends of the strap or metal band will be drawn together by the connecting li...; and on raising the handspike, the metal band will be slackened, and will slip round the surface upon which it is placed, ready to take another hold.

The eighth improvement shows the application of a second barrel to a windlass, which is grooved for the purpose of keeping the cable straight; and also the application of an apparatus for holding the cable, in order to release the windlass when the ship is riding at anchor. The frame of this apparatus is fixed a-head of the wind-

lass, and consists of a series of levers which move a block of iron having a concave or grooved surface, with suitable projections, for holding the cable, which passes underneath it. By raising or depressing the block, the cable will be held or released, as may be required.

Claim.—The mode of applying a second barrel to windlasses, when one of the barrels is grooved; also the mode of constructing a stopper for the purpose above described.

The ninth improvement relates to a mode of employing two barrels to capstans. A cog wheel is fixed on the axis of each of the barrels, which are connected together by an intermediate wheel keyed on the axis of a vertical shaft, placed between the barrels; on the upper end of this shaft, is fixed the head of the capstan, which can be removed when less power is required, and placed on the end of one of the barrels. The cable is guided from one barrel to the other by means of guide pullies.

Claim.—The mode of constructing capstans with two barrels, when guide pullies or rollers are used between them.

The tenth improvement relates to a mode of lowering, and thereby releasing, the nipping apparatus hereinbefore described. For this purpose, the frame or bearing which supports the axis of the cross-head is capable, by an arrangement of levers, of being lowered, and with it the connecting rods which actuate the levers, and thus release the nipping apparatus when it is required to give out cable: and in order to raise the palls from the teeth of the pall wheel, a semicircular piece of iron, connected with the frame, partly embraces the surface of the wheel; at one end of this semicircular piece there is a socket to receive a handspike, for the purpose of moving it round the said surface; on doing which, the opposite end will be forced between the surface of the wheel and the ends,

or underneath the palls, and thereby force them out of the wheel.

Claim.—The mode of putting the nipping parts out of action, by lowering the cross-head; and also the mode of putting out the palls by means of the plate, as described.

The eleventh improvement consists in a mode of working a windlass on the main-deck by means of the top-gallant capstan. Underneath the top-gallant forecastle deck is fixed a horizontal shaft, having two forked ends; the forks of one end are connected with and work the cross-head of the windlass, and those of the other end (and which are provided with anti-friction pullies) rest upon the top side of a horizontal tappet wheel, keyed on the lower end of the axis of a capstan barrel, which passes through the deck: by this contrivance, when motion is imparted to the capstan, the projections on the face of this tappet wheel, as it revolves, first raise one forked arm of the horizontal shaft, and then the other, alternately; and thus impart a reciprocating movement to the cross-head, or other suitable driving tackle of the windlass.

Claim.—The mode of giving motion to a windlass, by means of connecting the cross-head, or other apparatus (which works suitable driving tackle of the windlass,) with the working of a capstan.

The twelfth improvement relates to the application of two eccentrics for working the barrel of a windlass, in place of the cross-head; the eccentrics are fixed on a horizontal shaft, on the end of which is a winch for giving a rotary motion to the same; the connecting rods, in place of being connected with the cross-head, are attached to rectangular frames, within which the eccentrics work.

Claim.—The mode of giving motion to a windlass barrel by means of eccentrics working the connecting rods, which actuate the parts for driving the barrel of a windlass.

The thirteenth improvement relates to a mode of applying power to capstans. This improved capstan consists of a vertical shaft, which remains stationary; upon this shaft is a tube which works loosely; and upon this tube, in the same manner works the barrel of the capstan; a plate of iron is bolted to the bottom end of the barrel, having a projecting rim of a cylindrical form, so as to cover the wheel-work inclosed within, the lower end or periphery of which forms a ratchet wheel, which receives palls or catches fixed upon a plate below the first. This plate is precisely of the same form as that described, with this difference, that the projecting rim or cylindrical part forms an internal wheel. To the upper end of the tube which passes through the barrel is fixed the head of the capstan; and to its lower end is keyed a pinion, which gives motion, by means of an intermediate wheel (the axis of which is carried by the barrel of the windlass), to the internal wheel, or bottom plate. It will be seen, that on giving motion to the tube working on the fixed shaft, that motion will be imparted by the intermediate wheel to the internal wheel which forms part and parcel of the plate; and that, by means of the catches fixed upon this plate, and taking into the pall wheel formed on the upper plate, motion will also be given to the barrel. The capstan head may, when less power is required, be fixed to the barrel of the windlass, in place of the tube; the two plates being locked together, motion will be communicated to the whole. There is another modification of the capstan, the principle of which is the same.

Claim is the mode of applying power to a capstan, as described.

SPECIFICATION enrolled 3rd November, 1842, of a PATENT granted 3rd May, 1842, to JOHN RAILTON, of Blackburn, in the county of Lancaster, machine maker, for "*certain improvements in machinery or apparatus for weaving.*"

THE first improvement relates to certain arrangements of mechanism for stopping the loom when the weft is not properly supplied, or the shuttle not thrown into the shuttle box: for this purpose a horizontal arm supports at its end a double lever or forked piece; at one end of the reed are two wires, or more coarse dents of a reed or wires, between which the forked piece passes when not intersected by the weft thread; but at every pick, so long as the weft is thrown across, the forked piece is kept in a vertical position or nearly so by the intersection of the thread between such piece and the coarse dents of the reed; when the weft breaks, the end of the forked piece passes through the wires and falls down, when it comes in contact with the end of a bent lever, which forces forward the fork and the arm upon which it is fixed, and actuates at its opposite end the knocking-off lever, and thus stops the loom. With respect to this stopping apparatus, the inventor only claims the arrangement of levers shown for stopping the working of a loom.

The second improvement is for self-acting temples. This arrangement consists in the application of two or more round bars or rollers, extending across the cloth; one or both of which are fluted, commencing at the middle, and continued to each end, and similar to a right and left hand screw, and also in a direction of their length, so as to present a surface of fine points. The drawings show

the application of one roller fluted as above, and the other plain, with the cloth passing over the former and under the latter; which arrangement the patentee prefers. A roller fluted in the manner described is substituted in place of the ordinary breast beam.

Claim.—The novel and peculiar construction of temples above described, and the mode of their application to looms in general.

The third improvement consists in an improved elastic connecting link, to be used in place of the ordinary connecting rod, between the crank shaft and the slay. This connecting rod is constructed of two parts, and when put together, one part, which is of a cylindrical form, fits into and slides within the other, and the two parts so connected are acted upon by a spiral spring which keeps them extended: by this arrangement, the crank and crank shaft are less liable to break from any accident which may occur to the loom, in consequence of the parts giving way.

Claim.—The making the connecting links, used between the slay and crank in power looms, elastic or yielding, whether the springs employed be helical or elliptical, or of any other form.

The fourth improvement is for certain arrangements of mechanism for the purpose of effecting the recoil of the warp-beam, in order to bring back the cloth any number of picks, in case the loom should make a few picks without weft. This is effected as follows: a small lever is attached to the common clicks or catches of a taking-up wheel, and by lifting up this lever when it is required, the taking-up motion will be released and the weighted warp roller recoil, and will pull back the warp and cloth until a catch lever falls upon the taking-up wheel of the cloth roller and stops the recoil or running back of the

warp beam. The upper part of this catch lever is made with a slot sliding upon a stud, and in the top of the slot is a set screw, which regulates the running back of the cloth roller.

Claim.—The peculiar arrangement for effecting and regulating the recoil of the warp beam.

SPECIFICATION enrolled 7th November, 1842, of a PATENT granted 9th May, 1842, to JAMES PRINCE WALKER, of Manchester, in the county of Lancaster, coal merchant, for "*certain improvements in the manufacture of candles, candlesticks, or candleholders, and in the apparatus connected therewith.*"

THE improvements in candles consist in making them of an oval, circular, or other form, and with three separate wicks, which run through the candle parallel to each other. The light produced from these candles is stated to be much more intense than those of the ordinary construction, and the combined flame of the three wicks to be similar to a "bat's-wing." In making these candles, the wicks are placed in a mould of a circular or oval form, a little distance apart, and the operation of filling the moulds is conducted in the same manner as for ordinary mould candles. For dips, the candles, after being partly made, are placed together in lots of two or three, according to the number of wicks intended for each candle, and are then finished by dipping in the usual way.

The candlesticks referred to consist, first, of a candlestick having three separate tubes for holding three candles, which are represented as being less in diameter than those of the ordinary construction. These tubes have

each a rod passing through them at their lower end, for the purpose of raising the candles, which may be effected by a stud passing through the socket of the candlestick. Another improvement in candlesticks consists in making them oval to suit the form of candle described; and in order to make them hold candles of different sizes, a sliding piece of metal is inserted in a horizontal recess formed in the upper part of the socket and actuated by a screw, by turning which the candle is forced against the opposite side of the socket: this arrangement of a sliding piece is also shown applied to a candlestick having a circular socket, in which case the sliding piece is forced against the side of the candle by means of a spiral spring in place of a screw.

For candleholders, the patentee bends a piece of metal (by preference steel) in the form of a U, which is to be considerably reduced in breadth at that part where the bend takes place, so as to form a spring for holding the candle; another of these pieces, formed in the same manner, is attached to the first by rivetting the two bent parts together thus , the only difference being that the two pieces are thrown at right angles to each other; the lower piece fits in the socket of the candlestick, and the upper piece receives the candle: and owing to the flexibility of the spring, the former will accommodate itself to sockets of different sizes, and the latter will in the same manner answer for candles of different sizes.

For the purpose of snuffing candles made with three wicks as hereinbefore described, the inventor constructs snuffers with their cutting edge of a convex or curvilinear form, so that the middle wick may be cut off or snuffed shorter than the two outside wicks, by which means a less quantity of smoke is made than if the wicks were all snuffed of the same length.

Claim is for the manufacture of candles with three or more wicks; and also the exclusive use, for the purpose of such manufacture, of the moulds and parts hereinbefore described; also the several improvements in candlesticks or candleholders, and the parts connected therewith for the purpose hereinbefore described.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to GEORGE HAWE, of Manchester, in the county of Lancaster, gentleman, for "*certain improvements in machinery or apparatus for sweeping and cleansing chimnies and flues.*"

THE first part of these improvements relates to a mode of sweeping chimnies and flues by means of a chain, or wire rope, traversing up and down the chimney or flue with a brush attached to it; and secondly, in a mode of rendering the chain suspended in the flue a nonconducting medium for the electric fluid; and thirdly, in a mode of sweeping or cleansing chimnies, by sudden concussion or disturbing of the air therein.

In carrying out the first improvement, the patentee fixes to the fire-place a frame, having two barrels or windlasses, round which are coiled the two ends of a chain, or wire rope, passing up the chimney and over a pulley fixed at the top. At the several angles or corners of the chimney are placed bars of iron, for the purpose of keeping the chain at a proper distance from the sides of the chimney. When it is required to sweep the chimney, a sufficient length of chain is wound on one of the barrels, if the machine or apparatus be previously fixed to the fire-place, and the brush is attached to the chain at or near to the

apparatus, when by turning a handle or winch fixed on the axis of the other barrel, the brush will be drawn by the ascending chain up the chimney to the top, and over the pulley, and by the descending chain down the chimney to the bottom; and by placing the handle on the other windlass, the operation can be repeated until the whole of the soot is removed.

For the purpose of preventing the rope or chain, when not in use, from conducting the electric fluid, two pieces of glass, having grooves cut round them in two directions, are introduced into the chain or wire rope, so as to disconnect the metallic parts of the chain by the interposition of the said pieces of glass.

The apparatus for removing the soot by a sudden concussion or disturbance of the air, consists of a cylinder, made of sheet iron or other material, open at both ends, and having a piston fitting therein, which is rendered air-tight by packing in the ordinary manner. A fire board is fitted into the fire-place, having a hole large enough to receive the end of the cylinder into which it is fitted, together with the fire-board in the fire-place, sufficiently air-tight for the purpose required; to the end of the piston rod is fixed a vertical spring, having a horizontal projecting arm, acted upon by a tappet mounted on a shaft, having a handle or winch at each end, and supported by a suitable frame resting upon the floor of the room. By turning the handle or handles of the tappet shaft, the piston will be gradually forced into the cylinder, until the tappet has made one revolution, when the end of the projecting arm will be released, and the piston being suddenly withdrawn by the spring, will form in the cylinder a partial vacuum; and the air, in rushing down the chimney to supply the place, removes, by its sudden concussion, the soot from the sides of the chimney, which falls into the

fire-place: this operation may be continued until the whole of the soot is removed.

The patentee, in conclusion, says, that he does not claim the use and application of a chain and windlass, in the manner herein described, when separately considered, as he remarks that such have before been used; but what he claims is, first, the employment and use of windlasses, in connection with such chain or rope, as the means or instrument of motion by which the brush is made to travel up and down the chimney or flue; secondly, the contrivance herein described for interrupting the continuity of the chain or rope, as a conductor of electric fluid, by the interposition of pieces of glass, or other bodies being nonconductors of electric fluid; and thirdly, the contrivance for removing soot from chimnies or flues by the sudden disturbance of the air therein, by means of the apparatus hereinbefore described, or any other similar apparatus for producing a similar effect on the air in the chimney or flue.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to THOMAS EDGE, of Great Peter Street, in the city of Westminster, gas apparatus manufacturer, for "*certain improvements in apparatus for measuring gas water and other fluids.*"

THE first part of this invention consists in improvements in the ordinary water gas meter, by means of which a more correct registration is obtained; and also whereby the action of the meter is stopped with greater certainty, when the water sinks below the proper level by evaporation or other causes. It is well known that when the

water, in ordinary meters, gets below its proper level, the ingress of gas is prevented by means of a valve connected with a float; but this part of the apparatus, according to the present construction, is subject to become corroded, and its action thereby stopped. To obviate this, the patentee fixes the valve on the end of a horizontal lever, moving upon a pin joint at its opposite end; and the mode of raising or lowering this valve is by a spherical float, having a vertical rod attached to it, and connected at its extreme end to the lever; so that as the water becomes raised or depressed by the action of the gas thereon, or by evaporation, the float will be acted upon, the vertical motion of the same being preserved by a weight attached to the lower part of the spherical float. A shield, or piece of metal, is placed over the valve, in such a position as to entirely prevent the deposition of any matter from the inlet pipe, and also to protect it against injury or alteration.

The second improvement is for compensating for either an increase or decrease of water in a gas meter. The axis of the drum gives motion by means of a worm and worm wheel to a vertical shaft; at the upper end of this shaft is a drum in the form of a frustum of a cone; this cone imparts motion, by means of a band, to another cone placed in an inverted position upon another vertical shaft, which gives motion to the series of wheels, or registering apparatus. The band for communicating motion to the second shaft is actuated by a guide connected to a float, in such manner, that as the level of the water varies, the band will be moved up or down on the peripheries of the two cones, and thereby accelerate or diminish the speed of the second cone; for instance, if it be supposed that the registering of the meter varies 10 per cent., by an increase or decrease of one inch in the level of the water,

then the larger and smaller extremities of the frustums of the cones should vary about one-twentieth in diameter; by which means the different situations of the band would communicate such rotary motion to the counting machine as would indicate the quantity of gas passed through, presuming the cones to be previously adjusted.

The second improvement consists in constructing a station meter for gas works, whereby the total quantity of gas consumed and issuing from the gasometer or holder may be ascertained, and its pressure regulated. There are several modifications of this improvement; one of which consists of a gas holder, placed in a tank in the ordinary manner. The gas enters through a pipe, as usual; into which pipe is suspended, from the centre of the top of the gas holder, a parabolic cone; the top part of the inlet pipe being contracted, so that when the holder is raised by the gas to its highest altitude, the parabolic cone forms a valve, and closes the aperture, which has gradually been contracted during its ascent. On the top of the gas holder is fixed a vertical rack, which takes into and drives a wheel supported by a suitable framing, and having fixed at one end of its axis a lever or arm, which carries a weight capable of being adjusted, that is, of being moved to any part of the said arm, for the purpose of regulating the pressure on the gas holder. This frame also supports, in an elevated position, a common-going clock, having a vertical spindle connected with it; upon this spindle is a drum, covered with a sheet of paper, graduated vertically round its periphery into twelve compartments, answering for the twelve hours of the night, and also into horizontal compartments corresponding to the altitude of the gas holder; the upper end of the rack carries a pencil, with its point in contact with the periphery of the drum; and as the gas holder rises or falls,

the point of the pencil marks its altitude; and the rotation of the drum, actuated by the clock, shows the time and extent of opening the aperture or valve, and consequently, the quantity of gas which has passed at any time during its action, as ascertained and known by previous experiments. Another modification of a station meter is shown, in which the quantity of gas passed through is ascertained by the measurement of a fractional part of the volume only, by which the whole quantity is inferred.

The third improvement consists in the peculiar arrangement of parts constituting a meter for measuring water and other fluids. This apparatus consists of a rectangular vessel, divided into two compartments; the water is admitted by a pipe, through the bottom of one compartment, into one of three passages; these passages are alternately opened and closed by a valve in the form of a fan, having its face dished out similar to a D valve of a steam engine, so as to form a communication with the two passages at one and the same time. A spherical ball or float is supported in this compartment, by a lever on a horizontal shaft; to which shaft is attached a pendulous arm, actuating at every vibration, by means of a tappet wheel, the slide valve. Suppose the passage to this compartment to be open, and the water from the inlet pipe passing through into the vessel; while the vessel is filling, the float will be elevated, and the pendulous arm (when the vessel is sufficiently full), will have moved the valve so as to close the communication, and open that which leads into the other compartment; the water, in passing from one vessel to the other, will allow the float to descend, and the valve will again be moved for the purpose of refilling the vessel, and at the same time open a communication between the other compartment and the outlet pipe, in the same manner as the steam from a high-pressure engine passes from

the cylinder to the eduction port. The quantity of water the vessel contains being ascertained, the number of vibrations or times the float rises and falls is shown by a registering apparatus.

The fourth improvement relates to an improved method of constructing the counting apparatus of meters, whereby the quantity of gas, or other fluid, that passes through the compartment, may be more easily ascertained. For this improved counting apparatus, the inventor employs ratchet wheels in place of the ordinary cog wheels. Motion is communicated from the drum, by means of a vertical shaft and worm wheels, to a horizontal shaft placed in the box of the counting apparatus; upon the axis of this shaft is a peculiar formed tappet wheel, which at every revolution raises the end of a lever moving upon a pin joint, at its extreme end; this lever is provided with a click or pall, which at every vibration of the lever, or revolution of the tappet wheel, takes into one tooth of the first ratchet wheel; and by the action of a spring on the top side of the lever, the ratchet wheel is forced forward one tooth as the tappet wheel recedes; it will, therefore, be seen, that every revolution of the tappet wheel causes the first ratchet wheel to move one tooth; a projecting pin is fixed in the side of this wheel, which at every revolution enters and moves the second ratchet one tooth, and the second wheel in the same manner; and by means of a projecting pin moves the third ratchet wheel. Supposing that each of these ratchet wheels to have ten teeth, and the tappet wheel to make one revolution for every 100 feet of gas passed through the meter, then the first wheel, being moved one tooth, would indicate 100 feet; and one revolution 1000 feet—which would be indicated by the next wheel moving one tooth; and one revolution of this wheel would indicate 10,000—which would be shown or

Thos. Waterhouse's Patent.

Fig. 1.

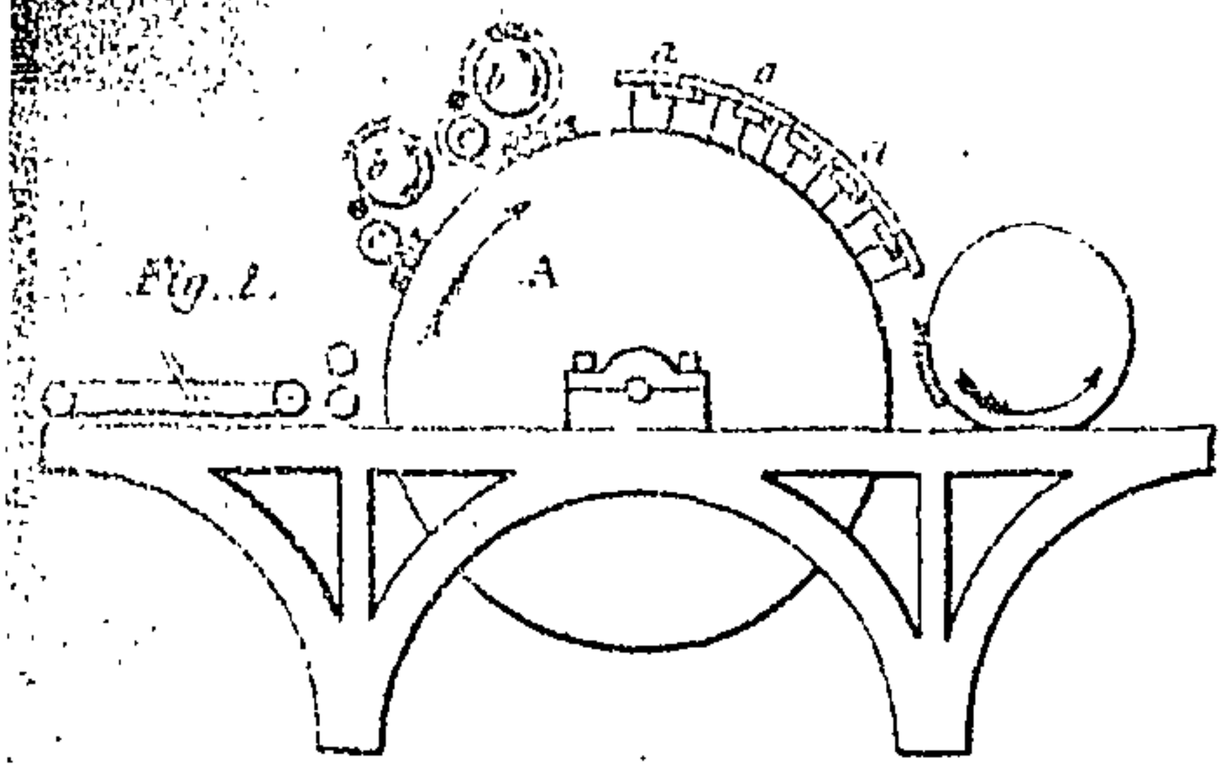


Fig. 2.

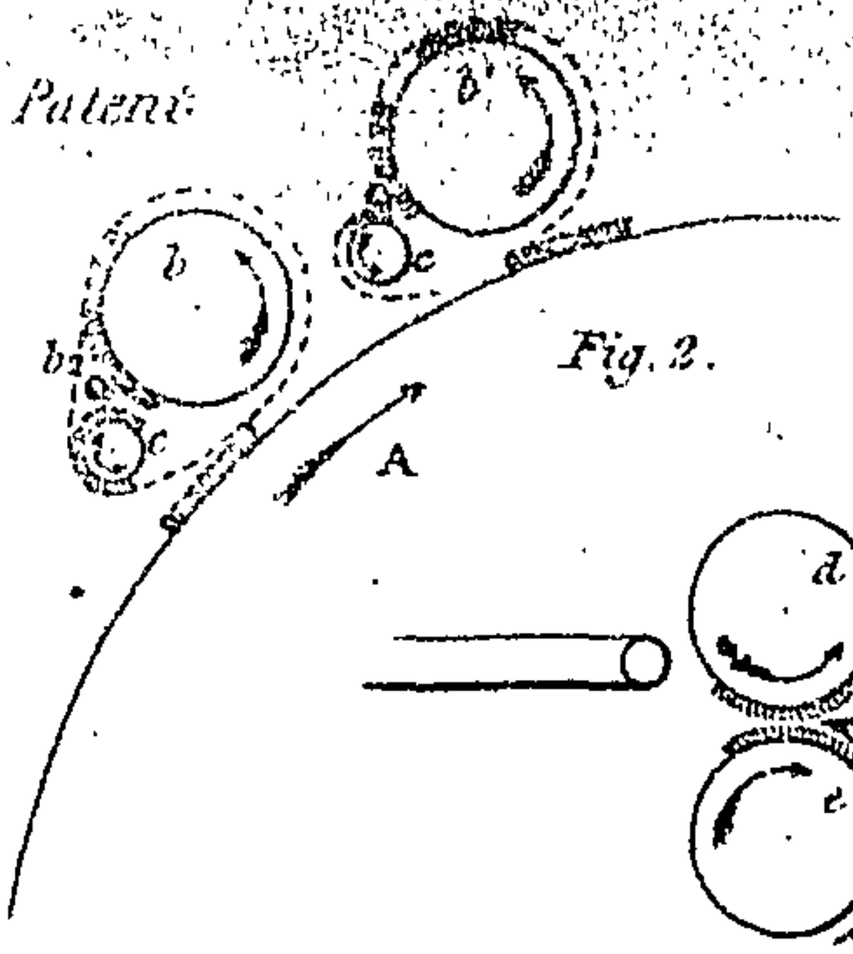


Fig. 3.

Sam.l Hall's Patent.

Fig. 1.

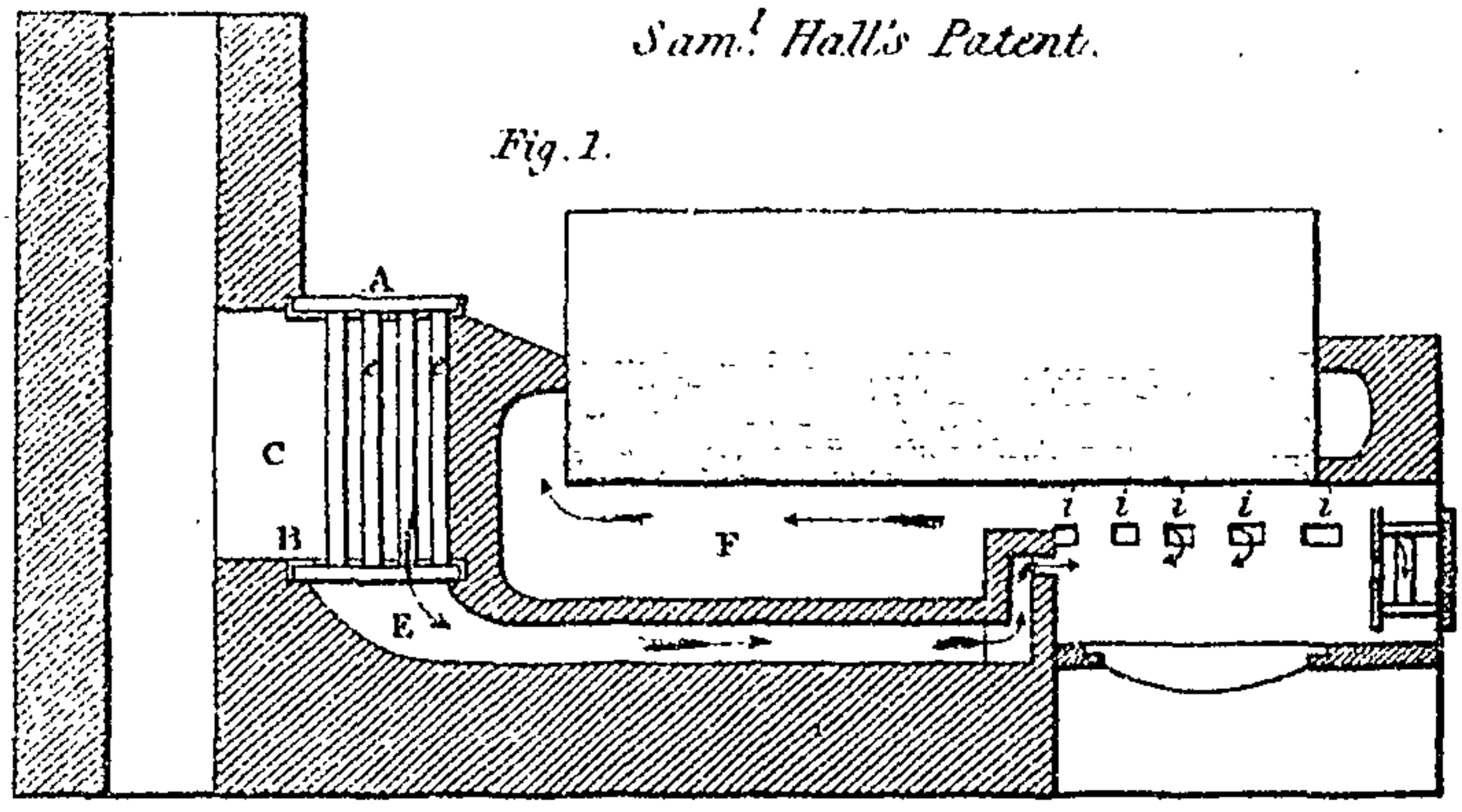
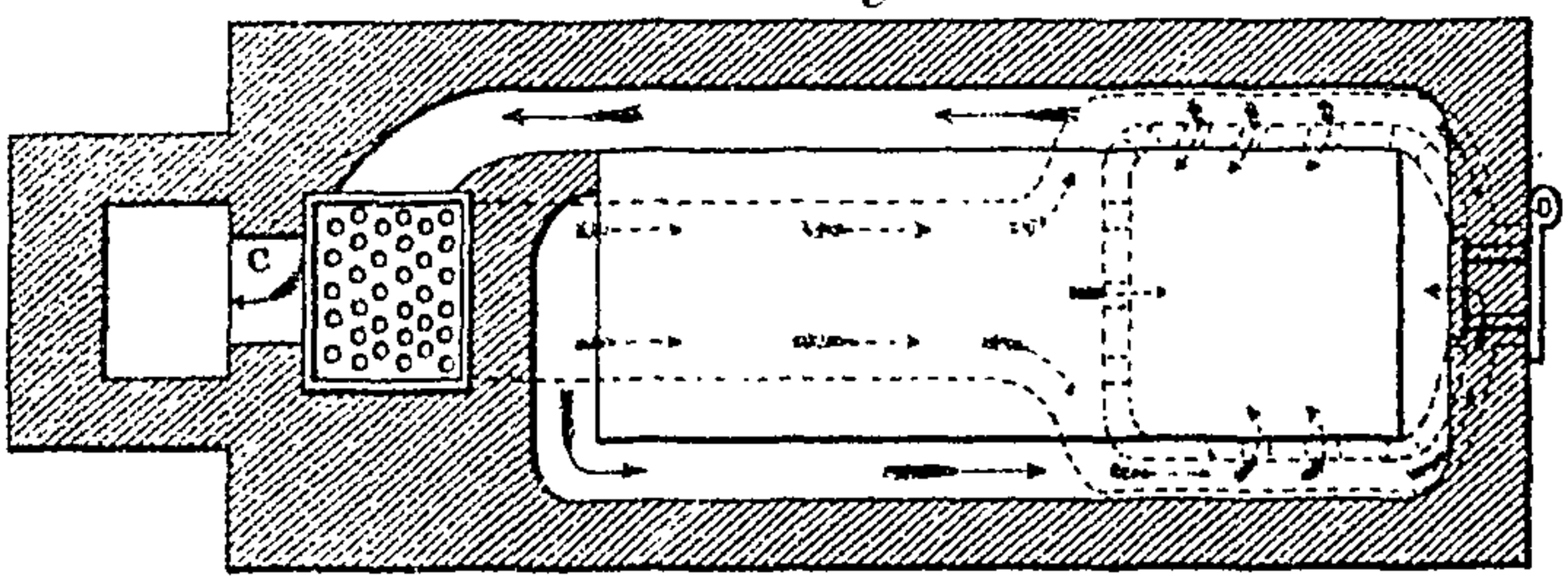
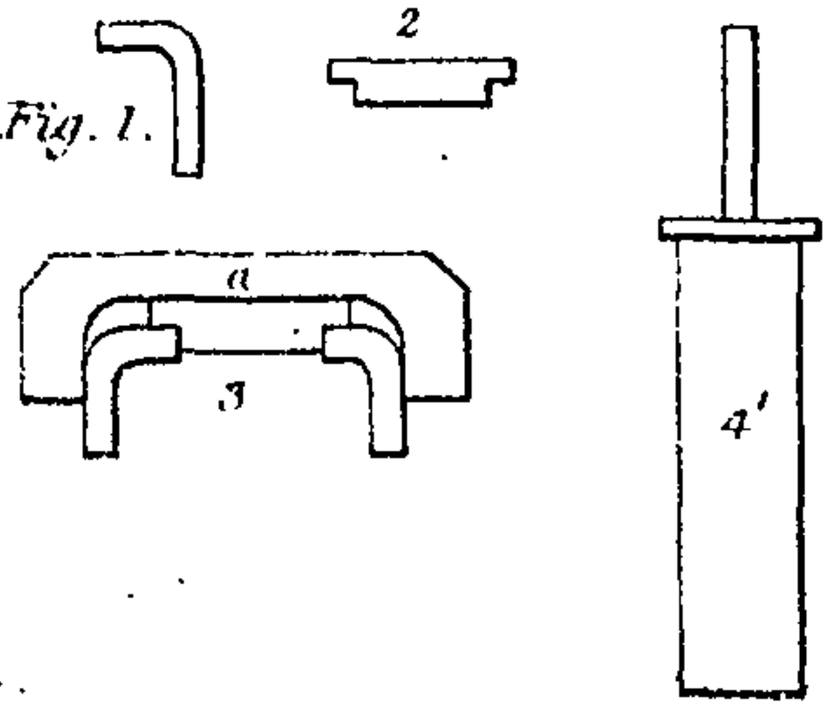


Fig. 2.

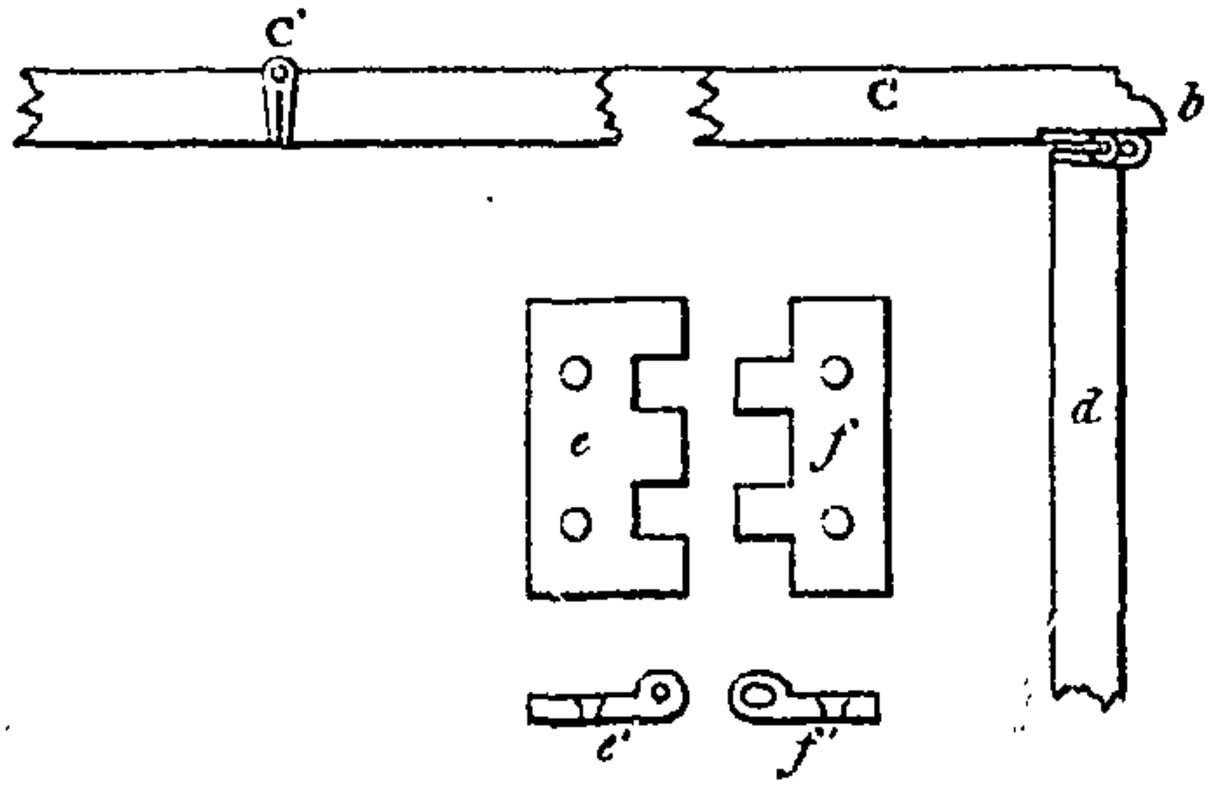


James Boydell's Patent.

Fig. 1.



James Stewart's Patent.



indicated by the third wheel moving one tooth in like manner. Another modification of this counting apparatus is shown, the principle of which is the same, the novelty being in the application of ratchet instead of cog wheels.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to SAMUEL HALL, of Basford, in the county of Nottingham, civil engineer, for "*improvements in the combustion of fuel and smoke.*" (With a Drawing.)

THIS invention is for certain improvements and additions upon former patents granted to the said Samuel Hall, dated 24th June, 1836, 30th July, 1838, and 14th January, 1841.

The first improvement consists in a peculiar arrangement of flues, for the introduction of atmospheric air to the furnace of an ordinary waggon boiler of a stationary engine. Fig. 1, in the accompanying drawing, is an elevation, and Fig. 2 a plan of this improvement applied to a waggon boiler of a stationary engine. A B are two perforated plates, connected together by a number of vertical tubes, *e e*; these plates are fixed in the brickwork, in such manner, that the tubes pass through the flue C, leading to the chimney, as will be seen by the plan. The air for supplying the fire passes through the vertical tubes, and along the flue E, which is made underneath the main flame flue F, until it arrives at the bridge; at which place it branches off to the right and left, terminating at each side of the fire door; thus allowing the air to pass all round the fire and through the holes I I I, made in the brickwork at each side of the fire, and also at the bridge. There are also holes made in the guard. An arrangement of tubes

or apparatus for supplying air, which may either be previously heated or otherwise, on every side of the furnace, is also shown applied to pans for brewing, bleaching, dyeing, &c., and also to bakers' ovens.

The patentee showed, in a former Specification, a mode of conducting air to furnaces of marine boilers; in which case the tubes passed through the water spaces, and were secured by a double nut. The improvement in this part consists in a mode of fastening the tubes; which is effected by driving conical ferules in the ends of the tubes, in the same manner as the tubes in locomotive boilers are fixed.

Claim.—First, the peculiar mode of taking air, for effecting the combustion of smoke, from the atmosphere, and conducting it underneath the main flame flue or passage from the fire-place, which passes underneath the bottom of the steam engine boiler, in combination with the introduction of such atmospheric air at the bridge of the fire-place; secondly, the mode of taking atmospheric air as described, in combination with its introduction either in the front or sides of the fire-place, or both, or all round it; thirdly, the mode of taking air as described, in combination with the previous heating of the air, together with the introduction of air all round the fires of bleachers, brewers, dyers, and other similar pans, or as nearly all round as may be convenient; fourthly, an improved method of fixing the pipes for supplying air to furnaces of marine and other similar boilers. The patentee also claims the combination of the feeders for supplying the fire with fuel, and known by the name of "Stanley's feeders," with each of the methods described, with respect to the present Specification, of supplying air to furnaces; and also in those of the former patents, to which furnaces such feeders are applicable.

In order to effect a more rapid combustion in the furnaces of locomotive engines, the inventor constructs the

fire-box with a number of tubes or holes, for the admission of atmospheric air to the carbonaceous part of the flame as well as to the volatile parts; for this purpose, some of the tubes of the boiler are elongated, so as to pass through the smoke box, for the purpose of admitting air to the back part of the fire as well as to both sides. The inventor also introduces, in the centre of the fire box, an apparatus consisting of a vertical tube connected with the boiler. This tube, at the lower end, is enlarged, so as to form an oval or annular water space; the air from the ash pit passes up the centre of this space, and through lateral openings, to the carbonaceous part of the flame.

Claim.—The use of one or more tubes placed round and near the bottom of the fire, to effect the combustion of the carbonaceous parts of the fire, in the same way as the tubes above effect the combustion of the volatile inflammable parts of the fire; also the employment of the apparatus within the furnace, to give a still further supply of air to the furnace.

As the above arrangement will not have the effect of causing a draught when the engines are stopped, the inventor introduces a pipe, which proceeds from the front of the engine, or steam chamber, to the chimney, in order to create a draught; this pipe is provided with a stop-cock, and can be connected to a pipe leading from any other boiler, for the purpose of getting up the fire and steam in the first instance. The same effect may be produced by inserting a pipe down the chimney which proceeds from some other boiler, and which can be removed when required.

Claim.—The means of causing a draught of air through the fire when the engines are stopped; and also the introduction of a jet of steam into the chimney from any other boiler, for the purpose above described.

There are some improvements in the smoke box; the first of which is the introduction of a bent tube, which proceeds from the force pump; this tube is perforated with a number of small holes, through which a jet or jets of water can be forced, for the purpose of cooling and quenching any fire that may remain therein. Another is for the application of a bent plate, so as to form a lining; this plate is to be perforated with a number of small holes, the aggregate amount of area of which should exceed that of the chimney; the object of this plate, or perforated lining, is for the purpose of preventing any sparks passing up the chimney. And lastly, for constructing the chimney with a casing, between which and the chimney a portion of the water from the tender is passed, in order to heat it previous to entering the boiler.

Claim.—The use of a jet of water within the smoke box at pleasure, for the purpose of keeping it cool, and also for quenching the sparks that may remain therein. The means of supplying a portion of water to the boilers of locomotive engines, by passing it through a casing round the chimney.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to JACOB WILSON, of Welbeck Street, Cavendish Square, in the county of Middlesex, upholsterer, for "*certain improvements in bedsteads.*"

THE nature of this invention consists in constructing bedsteads in such a manner that the tester may be raised or lowered at pleasure for the purpose of fastening, cleaning, adjusting, or removing the furniture, whereby the trouble and inconvenience attending the use of steps for the pur-

pose are avoided. The frame of this improved bedstead differs from the ordinary one in this particular, that the posts are to be made from 3 ft. 9 in. to 4 ft. 6 in. high, or any other convenient height, with a head and foot board, to each of which is fixed a box extending from the top of the foot and head board to the floor, and about 14 inches wide; a screw, having a handle on the top, passes down the centre of the box and through a nut or cross-piece made to fit in the interior of the box, which can be raised or lowered by turning the handle of the screw; to each end of this nut is affixed a vertical rod, which passes through the end of the box and supports one end of the tester; it will be seen, that by turning the handles of the apparatus described, fixed at the foot and head of the bed, the rods will descend in the boxes, and the tester will be raised or lowered as may be desired.

Claim is for the construction of bedsteads in the manner described, whereby the tester can be raised or lowered by mechanical means to any extent, whether the means employed be the same as those described or not.

SPECIFICATION enrolled 10th November, 1842, of a PATENT granted 9th May, 1842, to JOSEPH WARREN, of Heybridge, in the county of Essex, agricultural implement maker, for "*certain improvements in ploughs.*"

THE first improvement consists in regulating the depth to which the ploughshare enters the ground, and also the height or elevation of the beam to suit the line of draught; the former is effected by a wedge, which enters at the back part of the ploughshare in such manner as to depress the point in the same proportion as the back part is elevated; the mode of forming the wedge is by a screw

made of a conical form near the head, upon which part rests one end of a bell-cranked lever, attached at its opposite end to the front part of the mould board; so that as the screw is forced forward for the purpose of depressing the point of the ploughshare, the mould board will be depressed in the same proportion by the bell-cranked lever. The beam is attached to the frame of the plough by two bolts, the holes through which they pass being made about twice the length of the thickness of bolt, so as to admit of the beam being raised or lowered at pleasure; the beam is further secured by a regulating screw, which is attached to the frame of the plough, and passes in a vertical direction through the beam.

Claim.—The regulating the depth of the shares and mould boards of ploughs, by means of a wedge-screw and crank, in the manner described; also the raising and lowering of the beam by means of shifting bolts and a regulating screw.

The second improvement is merely a modification of some of the parts of the foregoing.

The third improvement is for a mode of depressing the point of the ploughshare by raising the frame of the plough: for this purpose the sole of the plough is attached to the front part of the frame by a pin joint, and to the after part by a vertical screw-bolt; by turning which, the frame is raised from the sole, and the share depressed in the same proportion.

Claim.—The mode of depressing the shares of ploughs in the manner set forth; also the several modes described of raising the height and inclination of the beams and depth of mould boards and shares of ploughs; and also the peculiar form of a plough described, in which the beam is connected to the top part of the frame, and such part of the frame to the handle by means of "shifting bolts" and regulating screws, similar to those described.

The fourth improvement consists in giving the ploughshare intended for tilling stony land, a more elongated and pointed form than those of ordinary construction.

The fifth improvement cousists in giving the mould boards of a double-breasted plough a peculiar form or curve, so as to present an outline continually diverging outwards from the base to the upper extremity.

Claim.—The making of double-breasted ploughs with mould board of the peculiar form represented.

The sixth and last improvement relates to a plough for making drains, and consists of a frame mounted upon two wheels, supporting the plough between them. To the frame of the plough are affixed two vertical racks, actuated by pinions keyed on two horizontal shafts supported by the frame. These shafts are each provided with a handle; by this contrivance, if the handles be turned simultaneously, the plough will be raised or lowered, as may be required; if only one handle be turned, the inclination of the plough will be altered in such manner as to raise or depress at pleasure the ploughshare.

Claim.—The general arrangement of parts, of which the wheel plough for cutting drains consists.

SPECIFICATION enrolled 10th November, 1842, of a PATENT granted 26th May, 1842, to PETER KAGENBUSCH, late of the parish of Whitby, and now of Sandsend, in the parish of Lyth, in the county of York, for "*an improvement in the dyeing of wool, woollen cloths, cotton, silk, and other fabrics and materials.*"

THE nature of this invention consists in the use and application of the residual mother liquors from alum works, from which is obtained a certain product, to be employed as a mordant in dyeing and also for fixing colours.

The inventor takes any convenient quantity of the residual mother liquors from the alum works, that is, rough alum, or alum for rocking, and from which the Epsom salts have been taken in one or more crops; and he also takes the residual mother liquor of that manufacture in which muriate of potassa or sulphates have been employed, but preferring the liquor of the alum from the natural rock. To this residual mother liquor, when heated to boiling, common salt or brine is to be added, in sufficient quantity to neutralise the sulphuric acid contained in the mother liquor: the quantity of salt to be added depends entirely upon the quantity of acid existing in the mother liquor. The salted liquor thus obtained is ready for use, as a mordant for dyeing all colours but red; but if not found to be sufficiently strong, the strength may be increased by continued boiling and evaporation. For the purpose of transport, the patentee prefers to boil it so that the salt will, when left to cool, readily crystallize. The mordant thus obtained should be protected from the atmosphere; and when required for use, it is to be dissolved in water, and more or less of the mordant used according to the depth of shade required.

Claim is, the improvement in dyeing, by the use and application of the residual mother liquors of the alum works, and of the product obtained therefrom, as a mordant.

SPECIFICATION enrolled 11th November, 1842, of a PATENT granted 11th May, 1842, to JOHN MELVILLE, of Upper Harley Street, in the county of Middlesex, esquire, for "*certain improvements in propelling vessels.*"

THE following improvements in propelling are chiefly

intended for the service of sailing vessels, in which steam power is occasionally employed as an auxiliary; and consist, first, in a peculiar manner of attaching the float boards or paddles to the arms of the wheel, in order that the float may enter and leave the water at a curve of small resistance. The ends of each pair of arms of a wheel are connected together by a shaft parallel to the main axis; and to each of these shafts, which work loosely in the ends of the arms, is suspended a float board or paddle, in such a manner that the area of the board on each side of the shaft shall be nearly equal; consequently, when the float is immersed in water, its action will be in a direct line to the line of motion, and the float, in consequence of being made heavier on one half than the other, so as to preponderate, will keep in a vertical position so long as it remains immersed; but immediately on leaving the water, the action of the water against the board will cause it to vibrate, owing to the axis upon which it is fixed working loosely in the arms of the wheel, the amount of vibration being regulated by a chain attached to the edge of the float and the wheel, or by any other convenient stop which will allow the float to vibrate in an arc of about 90 degrees, which the inventor states to have found, from practice, to be attended with good effect.

Claim.—Floats or boards suspended upon an axis or spindle, and vibrating in arcs, the extent of which is regulated by chains or other suitable stops.

Secondly, in constructing a paddle wheel in such a manner that some of the arms can be turned upon the shaft, so as to assume a position nearly parallel to the other arms, and the whole laid nearly in a horizontal position, whereby the floats are prevented from retarding the vessel's progress, when their action is not required. In order to effect this, a number of bosses are employed, to which are bolted

the arms of the wheel; the two outside bosses are keyed fast to the shaft; but such bosses as are between them are so affixed to the outside bosses or shaft as to be readily released and turn upon the axis of the shaft, by means of which the arms can be brought parallel or nearly so to each other.

Claim.—A paddle wheel with moveable arms, as described.

The third, and last improvement, consists in employing one pair only of floats or paddles, that is, one on each side of the vessel; for this purpose, the arms on each side of the vessel may be fixed to the shaft, or the arms on one side of the vessel may be keyed to the shaft, and those on the other side may be connected to the shaft by a clutch or other convenient means, so that they can be turned on the axis at pleasure, parallel or at right angles to each other; in which latter case the arms will act on the water alternately.

Claim.—The employment of a pair of arms or levers on each side of the vessel, arranged in the manner described.

SPECIFICATION enrolled 12th November, 1842, of a PATENT granted 12th May, 1842, to JOHN BROWN, of Brighton, in the county of Sussex, esquire, for "*improvements in the manufacture of mud boots and overalls.*"

THE improvement consists in making the legs of mud boots and overalls in two parts, that is, open in front and behind. Each side or half of the leg is supported or kept in its position by a vertical spring, having a swivel joint about the middle or half way up the leg of the boot, the object of the hinge or swivel joint being to facilitate the

movement of the leg when walking. In some cases, the vertical springs have frames riveted or otherwise affixed to them, for the purpose of keeping the two sides of a proper shape; the spring has at all times a tendency to close the two sides of the boot or overall, so as to cover the leg; at the same time the boot may be readily removed, by opening or separating the sides.

Claim.—The making of mud boots and overalls, each with two sides capable of separating, and which are caused to close together by means of springs.

SPECIFICATION enrolled 17th November, 1842, of a PATENT granted 17th May, 1842, to THOMAS WILLIAMS, of Bangor, in the county of Carnarvon, smith, for "*an improved churn.*"

THERE are four modifications of this improved churn; the first consists in the application of a vertical shaft fixed in the centre of the churn. Upon the axis of this shaft are fixed, at right angles to each other, four vanes or beaters, and to the inside of the churn are affixed four abutments or projections; on the top of the vertical shaft is a bevil wheel, taking into a similar bevil wheel fixed on a horizontal shaft, to one end of which is attached a handle, and to the other a fly wheel; motion being given to the last mentioned shaft, a rotary motion will be imparted to the vertical shaft, which will, by means of the vanes, beat the milk against the projections.

In the second modification the arrangement of parts is similar, excepting that there are two beaters, one above the other, and at right angles to each other, with a sliding piece between them, against which the milk is beaten.

The third description of churn is of a rectangular form, and has a horizontal shaft fixed to the top part of the frame, to which is suspended, inside the churn, a vertical board or beater. On the end of the shaft is a bent lever, having at one end a weight, and at the other a rope; by pulling which an oscillating motion is given to the shaft, to which is attached the board, by means of which the milk will be beaten against the ends of the vessel.

The fourth modification consists in the use and application of an Archimedean screw, which raises the milk from the bottom of the churn and pours it upon a perforated breaker, on which the butter is deposited, the residue of the milk being allowed to pass through.

Claim.—The improved churn of any of the peculiar forms represented.

SPECIFICATION enrolled 18th November, 1842, of a PATENT granted 23rd May, 1842, to SIR JAMES MURRAY, of Merrion Square, Dublin, knight and doctor of medicine, for "*an improved method of combining various materials, in a manner not hitherto in use, for the purpose of manure.*"

THE main object of this invention or improvement is to produce a compound, such that when mixed in by ploughing, harrowing, raking, digging, or otherwise, with soil, earth, mould, or any ordinary compost, it shall cause to be generated or evolved within such soil, earth, mould, or compost, carbonic acid and useful salts, so as to augment the supply of nutriment for vegetables, and improve the quality of crops generally. This is effected by drying up and solidifying the common mineral acids, which in their

ordinary state, as articles of sale, are not well adapted for purposes of manure, and also phosphoric acid, by mixing them with dry, porous, and absorbent matters, vegetable, animal, or mineral, such as bran, sawdust, dust of malt, husks of seeds, brewers' or distillers' grains, ground rags, pulverized rape or linseed cakes, the refuse of flax, leaves, bark, dry tan, siliceous sands, peat or other sandy mould, dry dust, earth, or clay, fine sifted cinders, ashes, and the like; in which form they may be more conveniently and advantageously combined with alkaline substances; and so combined, may be worked into the ground in a dry state, the chemical action by which the carbonic acid is evolved, and the salts generated, taking place subsequently, and in the most advantageous manner, in the soil itself, when excited by the moisture then present in it, or which may afterwards fall upon it in rain or dew. The acids which the patentee finds most suitable are, first, the phosphoric acid; second, the nitric, or common aquafortis of the shops; third, the hydrochloric or muriatic acid; fourth, the sulphuric acid; and he uses the following processes, whereby, as will be seen, different compounds are produced, but all with this common property, that they are acids, fixed in a solid state, by mechanical mixture with, or absorption into, porous or powdery matters. Thus, first, the patentee mixes any suitable quantity of the mineral apatite, or asparagus stone, or native phosphate, or phosphorite of lime, or fossil bone earth, with an equal weight of common or cheapest sulphuric acid, or any other of the above-mentioned acids. This paste or mixture is well agitated in an earthen vessel during two or three days, and is then ultimately incorporated with one, two, or more of the absorbent substances above enumerated, in sufficient quantity to convert this acidulous phosphoric mixture into a compost, called "phosphoric compound or

powder." In this process, although the phosphoric acid and the super-phosphate of lime thus produced from the mineral phosphate of lime or apatite are specified, which phosphoric acid and phosphate are well adapted to the compound, and are now first applied to such purpose, yet the process is not restricted to the use of this mineral phosphate, inasmuch as any phosphoric acid, and super-phosphate of lime, however obtained, will equally answer the purpose. Secondly, the patentee mixes any suitable quantity of nitric acid or aquafortis with such a quantity of one or more of the absorbent substances already mentioned, as is found sufficient to incorporate the entire mixture into a dry or powdery compost; this compound, when intended to be used for manure, is again mixed intimately with an equal weight of powdered alabaster, or gypsum, or sulphate of lime, whereby the acid fumes are more confined and held in; and the manuring properties are aided when these various substances are well and thoroughly incorporated by stirring and mixing them upon a suitable floor, or in proper vessels. The mixture so obtained is put into casks or earthen jars, from which the air is carefully excluded. This compound, called by the patentee "acidulous nitric powder," is well adapted for producing carbonic acid and the useful class of nitrates within soils, when introduced together with alkaline or earthy carbonates in the manner hereafter shown. Thirdly, the patentee mixes any suitable quantity of hydrochloric or muriatic acid, with such quantity of one or more of the already mentioned porous substances as is found sufficient for incorporating the whole mixture into a dry or powdery compound for agricultural purposes; to this is added an equal weight of powdered alabaster or gypsum, and the whole is intimately mixed together; the resulting mixture is then put into casks, or stone vessels, and secured from

the air; and to this compound the patentee has given the name of "acidulous muriatic powder." Fourthly, any suitable quantity of sulphuric acid is mixed with such quantity of one or more of the most appropriate of the absorbent substances already mentioned, as is sufficient to form a dry powdery compost as before; to this, when intended for agricultural purposes, an equal weight of dry and powdered acidulous sulphate of soda is added, and the same weight of dry and pulverised acidulous sulphate of potass; these, when well mixed and incorporated together, form another compound, which is put into casks or vessels, and called "acidulous vitriolated powder." Each of the acids above mentioned, the inventor has found to require for mixture, about one-half its weight of one or more of the light absorbent porous substances above mentioned; more, however, should be added when necessary, to secure a perfectly dry and pulverisable combination; the nitric acid, or common aquafortis of the shops, being frequently unequal in strength, it has been found convenient to reduce it to a uniform specific gravity of about 1.200. When compounded with alabaster or gypsum, as described in the second process, the compound should be kept separate; the sulphuric acid employed should be diluted with water to a strength of about 1.600; any one or more of the above mentioned acidulous powdery compounds may be used either together or separate, in carrying out the principal object of this invention, as explained in the commencement; and in making the selection, regard must be had to the nature and quality of the lands to which the compost is to be applied, and the kind of crops proposed to be obtained. Thus, phosphates, nitrates, muriates, or sulphates, all or any as may be desired, or be found advantageous, may be generated within the soils by the chemical union of the several acid powdery compounds respectively,

with a sufficient quantity of alkaline matter, either already existing in the ground, or artificially introduced into it for the purpose; but the patentee has found it peculiarly advantageous to conjoin two or more of the before mentioned acid compounds, or all of them together, taking equal quantities of each into one general mixture, which he calls "consolidated acid compound;" and which combination, whether of all or any two or more, constitutes a fifth species of the acid compound, which the patentee claims as one part of his invention.

The next part of the invention proceeds to specify the alkaline substances with which, for the purpose of manure, these compounds are to be mixed. The substances which may be beneficially employed for this purpose are supercarbonates, carbonates, and even subcarbonates of soda, potass, and ammonia; and also earthy carbonates of lime, as lime stone, marble, chalk, calcareous marl, coral, coraline, or shells, or the carbonate of lime remaining after the purification of coal gas, and also magnesian carbonate, such as the mineral called dolomite, or any of them. In order to secure abundance and variety of alkaline matter, (for as the saline constituents of plants are numerous, a variety of alkalies as well as of acids is beneficial), the method which the patentee uses is the following: he takes 1 cwt. powdered sesqui-carbonate of ammonia; 1 cwt. sesqui-carbonate, or bi-carbonate of soda; 1 cwt. powdered dolomite; 1 cwt. of carbonate of lime, coral, or coraline; and 1 cwt. bi-carbonate of potass: all these he mixes well with 1 cwt. of silicate of potass or soda. The powder so obtained the patentee calls his "alkaline mixture;" but he does not claim either the ingredients or the combination as any part of the invention; he only states and describes it as part of the process whereby the general result is effected. For obtaining the silicate, seven parts

of powdered hornblende, nap, or felspar are mixed with three parts of black soda ash, obtained from salt, or with twenty parts of kelp, are fused together for four hours, or until the silicate is formed, in a furnace or kiln; the alkaline mixture so obtained is mixed in equal quantities with either or any of the four acidulous powders, or with the same consolidated acid compound severally above described; this resulting mixture the patentee calls his "fertilizing compost or powder," and he claims it as another and distinct part of his invention. The fertilizing compost is to be put up in casks and kept dry till used. It is to be ploughed, harrowed, or raked into mould or soils; and it may be introduced into subsoils to improve their quality, or may be mingled with clay, earth, or other compost heaps or pits for manure. For wet lands, it is useful to dry the various materials above mentioned, in such manner and at such temperature as are used for drying grain for grinding; and in such lands, in order to retard the too sudden escape of the fixed air, through rain or floods, and to retard and prolong the chemical action, the acid or acids, and the alkaline or alkalies above mentioned, are separately mixed with one-third their bulk of cohesive or gelatinous substances, such as coal or gas tar, liquid pitch, and animal size or jelly, in order to retard and prolong the action of the above manures. On the contrary, for parched land, it is beneficial to make up and use the series of acids or alkalies, or any of them, in a less dried state; and in that state to keep them separate until wanted, and then to mix them together at the time of introducing them into soils and composts, so that their action may sooner commence, by being confined in a moist state within the mould or earth. Another highly beneficial mode of using them is the following: by being briskly agitated or rolled in strong casks, with twenty-four times their bulk of water

or stable liquids, they will impregnate such fluids with fixed air, which may then be applied, by irrigation or sprinkling, to the fertilizing of lands, pastures, meadows, or gardens.

The patentee, after thus describing his invention, states, he would have it understood that he does not claim to have discovered any of the above named mineral acids or alkaline ingredients; but he claims as one part of his invention, the acid powdery compound (five several kinds of which he has above enumerated and described), whereby the hitherto liquid acids are rendered solid and portable, and thereby capable of being brought advantageously and conveniently into combination with alkalies and alkaline earths. And he also claims as a further part of his invention, the combination of the acid powdery compound with an alkaline mixture, and the compost and manure thence resulting. And as he is aware that other combinations of acids and alkalies may be used, differing in some degree both as to the ingredients and the proportions, from those herein described, but capable of producing similar effects, he does not restrict his invention, or any part of it, to the particular mineral acids, or the particular alkaline substances before enumerated, or the exact number or proportion of the specified ingredients; but he claims as his invention, the compound resulting from the mixture of a mineral acid or acids with a porous powdery substance, so as to mechanically solidify the acid or acids, or absorb it or them into the powder; and also the combination of such compound with alkaline or earthy carbonates, for the evolving of carbonic acid within the soil, and about the roots of vegetables; and for generating salts upon and within the ground itself, instead of spreading such salts in crystals or powder over the surface of land as heretofore.

SPECIFICATION enrolled 22nd November, 1842, of a PATENT granted 23rd May, 1842, to JOSEPH GIBSON, of Birmingham, in the county of Warwick, manufacturer, for "*certain improvements in axle-trees and axle-tree boxes.*"

To prevent any lateral motion of the axle-tree, that part of the axle technically termed the coned part works in a cylindrical nut of bell-metal, turned or dished out at one end to receive a collar formed on the axle-tree; a left-hand screw is cut on the periphery of the nut, and made to fit the axle-tree box; this nut is kept in close contact with the collar of the axle-tree by a six-square nut, which fits on the coned part of the axle-tree, and binds against the end of the bell-metal nut; consequently, when the axle-tree box is screwed upon the bell-metal nut, so as to bring the end of the box against a collar formed upon the nut, any lateral motion of the axle will be prevented, in consequence of the bell-metal nut in which the axle revolves being securely held between the collar of the said axle, and the six-square nut screwed upon the coned part.

In order to lubricate the parts of the axle, a longitudinal groove is cut on the top side the whole length of the cylindrical part of the axle-tree, and communicates at the end with a vertical hole drilled through the collar; a similar hole is also drilled through the collar of the bell-metal nut; so that by turning round the box, and bringing the two holes opposite each other, oil may be poured in, which will run along the groove on the top side of the axle-tree and into the oil cup at the opposite end of the axle-tree box.

At each end of the bell-metal nut, that is, between such nut and the six-square nut, and also the collar of the axle-

tree, there is a leather washer, and, in order to prevent such nuts from working loose, a radial hole is drilled through the middle of every square of the six-square nut, for the purpose of inserting (when the nut is screwed up) a pin, the point of which enters the groove on the top side of the axle-tree, thus preventing it from turning back. With respect to the bell-metal nut, a recess is formed in its collar which receives a bolt, acted upon by a spring, so as to force it out of the recess in a lateral direction, and against the end of the axle-tree box, which is made with a number of cavities, in the same manner as a pall wheel; consequently, as the boss is screwed upon th nut, and when nearly up to the shoulder or collar of the same, the bolt will be forced into the recess; but every time one of the cavities of the axle-tree box comes opposite the bolt, such bolt will be forced, by means of the spring, out of the recess, and into the cavity of the axle-tree box, and thus prevent the box from turning back, precisely in the same manner as the pall holds a pall wheel.

Claims.—First, the melitod of preventing the lateral motion of an axle-tree box upon an axle-tree, by means of a screw collar or nut upon the coned part of the axle-tree.

Secondly.—The method of lubricating the moving parts of an axle-tree and axle-tree box.

Thirdly.—The mode of screwing the axle-tree box on the axle-tree, as described.

SPECIFICATION enrolled 22nd November, 1842, of a PATENT granted 23rd May, 1842, to BENJAMIN COOK, junior, of Birmingham, in the county of Warwick, brass-founder, for "*improvements in the construction of bedsteads, both of metal and wood.*"

THESE improvements consist in coating or covering the

shafts and posts, or other parts of the framing of bedsteads with paper, pasteboard, papier-mâché, or other similar composition, or attaching to such framing figures or devices of similar material, and afterwards ornamenting the external surface of the same, by painting, japanning, gilding, silvering, &c. In order to carry this into effect, the patentee takes the parts of the bed previously fitted and jointed together, and covers them by any of the well-known means with the material above-mentioned.

Claim.—For the invention of decorating bedsteads with suitable ornaments and materials, as above stated.

SPECIFICATION enrolled 22nd November, 1842, of a PATENT granted 24th May, 1842, to JOSEPH DUCE, the younger, of Wolverhampton, in the county of Strafford, lock manufacturer, for "*an improved lock and key to be used therewith, and an improved slide bolt for the said lock, applicable also to other purposes.*"

ONE of the peculiarities of this lock consists in the tumbler having a lateral movement in place of a lifting or vertical movement; the tumbler is made, as in the usual way, of a thin piece of metal, supported at one end, in a horizontal position, by a stud; a projection is formed on the upper edge of the tumbler, which prevents the bolt from shooting, in consequence of a projecting stud, which is riveted to the tail part of the bolt, coming in contact with the projection of the tumbler; on the underside of this projecting stud, which stands at right angles to the tail of the bolt, and slides upon the upper edge of the tumbler, a transverse slot is cut through, so as to receive,

when the tumbler is forced a little on one side, its projection, and thereby allow the boit to shoot. This lateral movement of the tumbler is effected by the key, which is made with an inclined plane or surface; thus, when the key is partly turned round, such part of the key comes in contact with the side of the tumbler, and forces it on one side, so as to bring the edge of the projecting piece opposite the slot in the projecting stud of the bolt, and thereby allow the bolt to shoot. A modification of this principle is shown applied to the latch lock, in which case the tumbler is dispensed with, and the tail part of the bolt is made to move from side to side; in doing which, the tail end of the bolt, which has a small hole through it, is lifted off the end of a projecting stud, fixed in a moveable piece actuated by the handle of the lock; so that when the key is applied to shoot the bolt, the tail end is forced sideways, which liberates it from the projecting pin, and when the bolt is shot, the handle has no control over it, until the key is applied for moving it back, so as to bring the small hole opposite the projecting stud, in which position it drops on to the stud, and by turning the handle of the lock, the bolt will be acted upon.

Claim.—The improved lock having a tumbler as described, *videlicet*, with a motion to be given by the key from side to side, instead of up and down, as usual; also, the key with inclined surfaces or planes to be used with the said lock.

The Specification gives a description of an improved bolt for the said lock, and applicable to other purposes, such as window fasteners, &c. The projecting part of the bolt, which slides in a slot made in the upper or under edge of a lock, rests upon the edge of an inclined piece of metal, one end of which moves upon a centre pin, and the other is bent down at right angles, so that when the

metal piece is depressed, by means of the projecting piece of the slide moving along its edge, such piece will be depressed, and the end will be forced into a notch made in the edge of the bolt of the lock, and thus prevent it from moving.

The last improvement consists in constructing door handles, so that the spindle can be screwed into the knob, whereby the spindle will be shortened to suit different thicknesses of doors.

Claim.—The slide bolt, which has a projection acting against an inclined plane in the manner described.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to JOHN BENNET LAWES, of Rothamstead, in the county of Hertford, gentleman, for "*certain improvements in manures.*"

THESE improvements in manures are as follows, and consist in decomposing bones, bone dust, bone ash, and other phosphoritic substances, previous to using them for manure, by mixing with the bones, bone ash, bone dust, or with apatite or phosphorite, or with any other substance containing phosphoric acid, a quantity of sulphuric acid, sufficient to set free as much phosphoric acid as will hold in solution the undecomposed phosphate of lime; whereby the free phosphoric acid is enabled to unite itself with the various alkaline earths contained in the soil, and the undecomposed phosphate of lime is left in a greater state of division than can be obtained by mechanical means.

The second improvement relates to manures applicable to soils which are deficient in any particular alkali, as potash, soda, magnesia, or ammonia. For such soils the

patentee makes use of manure compounded of a mixture of phosphoric acid with the particular alkali required, as potash, soda, magnesia, or ammonia.

The third improvement relates to soils of which silica forms an essential component part, and from which a crop of wheat or other plant is intended to be raised. For this purpose, manure composed of a combination of silica, such as ground flint, sand, or glass, with either of the alkalies, as potash, or soda, is used.

The claims are, first, the combination, for the purposes of manure, of bones, bone ash, or bone dust, or apatite or phosphates, or other substances containing phosphoric acid, with sulphuric acid; secondly, the combination, for the purposes of manure, of phosphoric acid with either of the alkalies, as potash, soda, or ammonia, or with any of the alkaline earths, as magnesia or alumina; thirdly, the combination, for the purposes of manure, of silica with the several alkalies, as above mentioned.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to JOHN BISHOP, of Poland Street, in the city of Westminster, in the county of Middlesex, jeweller, for "*a new or improved construction of break apparatus applicable to railway carriages.*"

THESE improvements consist of a complicated arrangement of mechanism, for the purpose of putting all the breaks of a train of carriages into action. To one of the links of the drag chain, which the inventor states should be from forty to sixty feet or more in length, is attached the end of a small chain, passing over certain guide rollers, and

attached at its extreme end to a loop, which embraces a vertical shaft, and is connected at its opposite end by a pin joint to a horizontal bar. Upon the main axle of the carriage is a worm, taking into and driving a wheel fixed on the end of the vertical shaft; a clutch box is fixed upon this shaft, which, when the drag chain is slackened so as to allow the loop or end of the horizontal connecting bar to fall upon it, drops into gear, and puts the whole of the breaks into action; the arrangement being such, that when the drag chain is slackened, previous to the engine starting, all the breaks will be in action; but when the engine is set to work, and the chain is drawn tight, the short chains lift the end of the horizontal bar, and the breaks are then inactive. By this arrangement, if the engine should get off the rails, these self-acting breaks, by means of the chains being slackened, will all be brought into action. There are also certain arrangements shewn, by which the breaksman can put one or all of the breaks on at the same time.

There are three modifications of these improvements; the breaks in the third, in place of being applied to the wheels, are brought in contact, by means of an arrangement of levers and a vertical bar, with the rails.

Claim.—First, is the use of an endless screw on the main axle, in connection with a toothed wheel and clutch box on the vertical shaft; secondly, the mode of putting the break parts into gear, by means of a horizontal connecting bar with a loop falling when the drag chain slackens; thirdly, the means of limiting the amount of friction in the break, with the necessary apparatus connected therewith.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to JAMES PILBROW, of Tottenham, in the county of Middlesex, engineer, for "*certain improvements in steam engines.*"

THESE improvements in steam engines are stated by Mr. Pilbrow to consist in a new discovery in the properties of steam, by which he has ascertained the proper effect of force due to its expansive velocity, viz., that the whole available power and extreme duty from expansion may be obtained from the simple expansive velocity of the steam, when applied in the peculiar manner hereafter described, as well in locomotive as in other high-pressure and condensing engines; also in the engine and parts by which such discovery is made available for propulsion and general purposes, and in the laws or rules by which the best velocities of this engine are ascertained to give the maximum effect; which improvements combined, form a steam engine characterized by the inventor, to distinguish its principle from that of others, as "the in-jet reaction rotatory engine;" also in two methods of connecting the same with the machinery to be moved, one of which the patentee calls "the roller and wheel connection," and the other "the bevilled groove and spherical tongue connection," which is to be used where more than ordinary adhesion or contact is required between the moving parts.

It occurred to the inventor in the course of a series of experiments, which were commenced upon the most simple form of engine, namely, the one invented by Hero, that a current of steam from an orifice loses almost entirely that power of lateral expansion which it possesses when cut off and allowed to expand from a state of comparative rest. The steam engine as invented by Hero, it

is well known, consists of a hollow axle, having two arms, through which the steam or hot air passes, and is afterwards allowed to escape through orifices, which causes the engine to revolve by the force of unbalanced pressure; but if a flat plate be attached to the arm so as to be immediately above the orifice, the steam will impinge thereon, and its course will be changed, and the arms will become stationary, shewing that the force of impingement equals that of unbalanced pressure; if, however, the orifice be covered with a cavity instead of a flat plate, that is to say, a hollow vessel attached to the arm or arms, at such an angle that the in-jet of steam can be returned by its reaction clear of the arm without impinging on the same, the arm will revolve in an opposite direction with greater power than that with which it revolved previous to the cavity being put on; shewing that the cavity not only received the same amount of impingement as the flat plate received, which was equal to the unbalanced pressure, but by this peculiar in-jet and re-issue of the steam, its whole velocity was arrested, and the cavity thus acquired another power of equal amount; from this formula, *videlicet*, that the expansibility of steam issuing from an orifice is not in a lateral direction, but in a line of its motion, and the invariable law that motion is power—power in proportion to its velocity—the patentee constructs a steam engine, or steam wheel, into which the steam is injected, and returned again on the wheel so as to be used over and over again. The construction is as follows, and consists of a wheel enclosed in a case, having a number of cavities around its circumference, similar to the buckets of a water wheel (but of a peculiar form); the case which encloses it should be made sufficiently strong to resist the pressure of the atmosphere, and of such dimensions as to leave about half an inch between

the said case and the periphery of the wheel; a number of orifices are made in the case, through which the steam is conducted by pipes leading from a circular valve box, placed at such an angle as will produce the greatest amount of useful effect upon the cavities of the wheel; there are also a number of cavities formed in the case, into which the steam enters after impinging on the wheel, and from which it is thrown back again on to the wheel. The wheel is made double, or with two sets of cavities inclining in opposite directions; and the valve box, which is of a circular form, has ten holes, five of which lead to the cavities on one side of the wheel, and five to those of the other side, for the purpose of reversing its motion. These ten holes are covered with two-thirds of an annular plate or valve, mounted upon an axis; by turning which, 1, 2, 3, 4, or all the holes leading to either side of the wheel can be opened, and when the engine is in a state of rest the whole of the holes are covered; and by increasing the number of holes and emission pipes round the periphery of the wheel, almost any amount of power is stated to be obtained, from 100 progressively to 1000 horses, without increasing the size of the wheel, by merely applying a greater number of jets of steam; and in condensing engines, the increase of weight would not amount to more than ten tons for the largest.

The mode of applying the engine to locomotives is as follows: The case of the steam wheel is fixed in the smoke box; upon the flange of the driving wheel, which in this case is made somewhat thicker, and flat in the periphery, rests a small roller, the frame being so constructed that this roller, which is attached to the frame, supports the engine; consequently, the weight of the engine, in place of being supported by the axle of the driving wheels, is supported by the wheel itself, and the frictional power

of contact or adhesion between the roller and the wheel will be equal to that of the wheel to the rail; upon the end of this roller is a crank, which is attached, by means of a connecting link, to a crank fixed on the axis of the steam wheel; the object of the link is to allow for the vibration of the springs, and to prevent the wheel from sudden jerks; thus motion is communicated from the steam wheel by means of the cranks to the rollers, and from the rollers to the driving wheels, by the friction of contact, which the inventor calls "the roller and wheel connection." The proportions of this engine, as shewn in the drawings, are intended for a locomotive boiler, which evaporates, at 60 lbs. pressure per square inch, sixty cubic feet of water in one hour; and for such steam wheel, the patentee prefers the periphery to revolve at the rate of 34,830 feet per minute, which will give, at the above pressure, the net actual power of 153 horses. Presuming the driving wheels to be four feet in diameter, and the rollers about three in diameter, and the steam wheel to revolve at about 35,000 feet per minute, the locomotive will be propelled at the rate of about thirty miles per hour. There is a table given in the Specification, shewing the best velocity of the steam wheel to obtain the maximum effect in horses power.

The "bevilled groove and spherical tongue connection", where greater adhesion is required, consists in making two bevilled grooves or nicks in the periphery of the roller, into which two projections formed on the periphery of the wheel, and made completely spherical on their edge, work; or in making a groove in the periphery of the driving wheels, bevilled on each side, so as to get narrower as it approaches the bottom, and sufficiently wide to receive the spherical edges of the rail. It will be seen that the adhesion of the wheel to the rail on this

principle, will be increased as the angle formed by the two bevilled sides is more acute; and the same might be beneficially employed in assisting locomotive engines up inclines.

Another improvement, for increasing the adhesion between the wheels and the rail, and also lessening the obstruction of the air upon the engine, is by applying a curvilinear guard or shield, fixed in front of the engine, at an angle of forty-five degrees; by this arrangement, one-half of the total amount of resistance caused by the impingement of the air upon the curved plate will be thrown in a vertical direction, and the other half will have the effect of adding to the weight, or pressing the engine to the rail.

The steam wheel is also shown applied to steam navigation, and having an improved rotary condenser, which consists of a cylindrical vessel, having an eccentric shaft working within it, and extending the whole of its length, and forming a steam tight junction between the ends of the vessel. There are two longitudinal openings in the side of the vessel, one for the induction of steam and hot water from the condenser, and the other for the eduction which leads to the hot well; between these openings there is a spring, which extends the whole length, and bears upon the periphery of the eccentric, so as to form an air and water-tight joint between the two apertures; thus as the eccentric shaft revolves within the cylindrical case, a space will be formed between the induction part and the periphery of the eccentric, which will be filled with water; and as it revolves, the water will move round with the eccentric, and finally escape through the aperture leading to the hot well.

The inventor claims the exclusive use of the invention described, namely, an engine or wheel, with cavities in the

circumference, and the use of two or more jets of steam; also the double row of cavities for reversing the wheel, together with the roller and wheel connection; and the bevilled groove and spherical tongue connection; and the general arrangement and application of such engines to steam navigation.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to THOMAS MIDDLETON, of Leman Street, in the Borough of Southwark, and county of Surrey, engineer, for "*an improved method of preparing vegetable gelatine or size for paper, and also an improved mode of applying the same in the manufacture of paper.*" Being a communication.

INSTEAD of dissolving the resin in potash lye by the action of a strong fire, so as to obtain a brown lye product, which is afterwards put into a cylinder, and the potass neutralized by alum, in order that the alum may act upon the size; the patentee proceeds in the following manner:—

Into a vessel heated by steam is put (say) 50 lbs. of pulverised resin and 100 lbs. of water, together with a proper quantity of soda or potassa, "and if the lye, when cold, marks 100 on Baume's areometer, the proportions will be correct;" when the potassa or soda lye is in a boiling state, the pulverised resin must be gradually added, and the whole stirred well together for five or ten minutes; if the resin continues brittle, it will be necessary to stir the mixture a little longer, in order to make the alkaline lye act upon and soften it; the bath is then allowed to cool, and the alkaline lye is to be drawn off, and the re-

sinous product will be found at the bottom of the boiler. This compound, which is somewhat of the character of white resinous soap, only requires to be dissolved in order to make it into size of the proper strength for mixing with paper pulp; this is effected with boiling water in the proportion of eight pounds of water to one of the resinous product, after which a proper quantity of alum is to be added; the size thus prepared will contain only the proper quantity of potassa, and is ready to be mixed with the pulp in the ordinary or following manner; which latter constitutes the second improvement, and consists in introducing the size into a separate reservoir, from which it flows through a cock provided with a regulator, by means of which the pulp can be sized to any required degree.

At one end of the pulp-vat is fixed a cylindrical vessel, having a spherical float, the rod of which passes through the top, and is connected with a cock leading to the vessel containing the size. By this arrangement the size in the cylindrical vessel is always kept at the same level; there is another cock fixed to the bottom of this vessel provided with an index hand moving over an index plate, by means of which the quantity of size which flows through can be regulated; the size flowing from the vessel in the manner described, falls into a trough through which the pulp runs into a vessel containing a wheel or beater mounted upon a horizontal shaft; this beater is provided with a number of teeth or radial projections, and immediately below it there is also a number of projections against which the pulp is beaten by the revolving wheel, and the size thoroughly incorporated with the pulp previous to entering the paper-making machine. The advantages of this mode of applying size to paper is, that the pulp is brought from a reservoir in an unsized state, and

sized to any required degree with great exactness before it enters the paper-making machine.

The Claims are—First, the producing a paper size, by causing the resin or other equivalent ingredient to absorb as much alkali as required, then drawing off the superfluous alkali, and treating the product with alum or other suitable material, whereby the size is obtained with just the proper proportion required; and—

Secondly—Sizing the pulp with the improved or other size in a separate vessel, into which the size and pulp are brought separately and mixed in any proportions which may be regulated, and from which vessel the paper pulp flows into the paper-making machine.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to WILLIAM TUDOR MABLEY, of Henrietta Street, Covent Garden, in the county of Middlesex, mechanical draughtsman, for "*improvements in machinery or apparatus for making nails.*" Being a communication.

THIS invention consists, first, in certain improvements in making that class of nails commonly known as "cut nails," by a peculiar combination of mechanical parts and motions forming a cut nail machine; the novelty of which is in the application of two heading tools, placed one at each side of the machine, and coming alternately against the ends of the strips of metal as they are cut off by the machine. By this arrangement, the operation of turning the strips of metal is avoided.

The machine consists of a beam, which is caused to

vibrate by means of a connecting rod attached to a crank shaft, and provided with a cutter in the usual manner; the strip of metal, which is equal in breadth to the length of the nail required to be cut, is placed upon a horizontal table or slide, and forced up to the cutters by meaus of a weight attached to a band or chain, the opposite end of which is connected to a slide which forces the strip of metal against the cutters. The outer end of the table upon which the strip of metal is placed, moves upon a centre or stud, the opposite end being connected to a series of levers; and is caused by means of an eccentric to move to and fro, in order to present first one corner of the end of the strip of metal to the cutters, and then the other, so as to cut off, at each stroke or vibration of the beam, a piece of metal of the size of the nail required. Underneath the beam is a slide having a groove cut throughout its whole length, into which is inserted a nipper; there are also two other similar grooves which receive the holding dies, and are regulated at the end by a key or wedge passing through a vertical slot in the slide, and acted upon by a screw. The slide containing the nipper and holding dies is actuated by the beam in such manner that, as the nails are cut off, they are securely held by the nipper and dies during the operation of heading, which is effected by two powerful levers or beams fixed in a vertical position, and moving upon an axis at each side of the frame; these levers are joined together at the bottom end by a connecting link, so that the upper end of each beam, as the nails are cut off, strikes alternately against the heading dies, which are so arranged as to be adjusted at pleasure.

Claim.—The employment of two heading apparatus for the purpose of performing the operation of heading first on one side and then on the other, of a nail-making machine; also, the means by which the heading dies are

held adjusted and removed at pleasure; together with the mode of applying the nipper, such mode allowing it to be withdrawn through the groove which extends throughout the whole length of the slide.

The second improvement consists in a peculiar method of cutting plates of metal into what are commonly called "bills" and "brads" for shoemakers' and joiners' use. This object is effected by a machine with two cutters fixed in frames moving in vertical slides; these cutters are acted upon alternately by means of a crank shaft and connecting rods, the principal novelty in this machine being in the cutters, and consisting in making one pair (that is, the moveable and fixed cutter) grooved, so as to present to the plate under operation a serrated edge, and the other pair of cutters plain. The piece of metal is placed upon a slide which moves alternately from one cutter to the other. Supposing the end of the piece of metal under operation to be plain, it is first presented to the serrated cutter, which severs from the end a number of triangular pieces, which form the bills or brads intended; the end of the plate, having these pieces cut out, presents the appearance of a number of triangular projections, similar to the teeth of a saw, each projection being equal to one of the pieces cut out. The slide now moves on to the plain cutters which cut off the number of projections, and also form "bills or brads," equal to those cut out by the grooved cutters; the end of the metal plate, which is now plain, is again presented to the grooved cutters, and so on, until the whole plate is cut up, which is done without any waste.

Claim.—The production of those nails commonly called "bills and brads," by means of grooved or serrated and plain cutters, alternately, in whatsoever manner the said cutters

are caused to act upon the plate of metal so as to produce the said bills and brads.

Thirdly.—This part consists in certain methods of feeding cut-nail machines of the ordinary construction, whereby the constant attendance of the workman is rendered unnecessary.

This apparatus, fixed in front of the nail-machine, consists of a frame supporting on an axis at its upper end a pendulous bar, which is caused to vibrate by means of a connecting rod at every movement of the beam or cutters; the bottom end of this pendulous bar is made hollow and receives a plunger, the end of which works in grooves made in the periphery of a horizontal cylinder; two of these grooves are of a spiral form, and two straight, and extend the length of the cylinder, and are so constructed that the ends of the straight grooves join those of the spiral grooves; these latter are made at one end with a step, or, in other words, are cut deeper than the spiral groove; at the end of this cylinder are two inclined planes, each of which extends half way round the cylinder; these inclined planes work against similar inclined planes joined to a nut, through which, and also through the cylinder, a horizontal screw passes; this screw has a slot or groove cut in its periphery extending the whole length, into which works a key affixed to the interior of the cylinder; to the end of this screw is attached, by a socket joint, a pair of clams for holding the strip of metal plate to be cut into nails. The action of the apparatus is as follows: Suppose the moveable cutter to be descending, the end of the pendulous bar will move along one of the straight grooves of the cylinder, and on arriving at the end thereof, the plunger will drop down the step, and will then be in the end of one of the spiral grooves; when, by the ascent of the

beam, the pendulous bar will move in an opposite direction and along the spiral groove, which will cause the cylinder to make half a revolution, and thereby turn the screw, together with the plate, the same having advanced sufficiently for the width of a nail to be cut off the end of the said plate by the next motion of the cutter: during this half revolution, the inclined planes of the cylinder have been acting against those of the nut, and the former have caused the latter to recede, drawing with them the screw, and also the plate under operation, the object of this motion being to clear the end of the plate from the cutter during its ascent; thus, when the inclined planes have arrived in such position that the projection of one has passed that of the other, the screw, together with the plate, is forced forward and underneath the cutter, by means of a spring acting against the nut, and in this manner the operation is continued until the whole of the plate is cut into nails.

There is another modification of this apparatus in which the half turn of the plate is obtained by the connecting rod giving motion by means of a ratchet wheel to a pair of bevil wheels, the plate in this case being forced up by means of a fusee or barrel containing a convolute spring.

Claim.—The feeding of nail-cutting machines by means of a revolving and longitudinal travelling screw; also the method of turning over the strip of metal by means of a grooved cylinder, together with the application of inclined planes abutting against other inclined planes upon the box of the screw for the purpose of drawing back the sheet of metal when the cutter is ascending; also, the mode of turning round the sheet of metal by means of a ratchet wheel and bevilled wheels, and also the mode of introducing the metal to the cutter by the application of a fusee or other barrel operated upon by a spring.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to FREDERICK GOOS, of Manchester, in the county of Lancaster, jacquard machine maker, for "*certain improvements in the jacquard machine or apparatus to be used or employed in looms for weaving.*"

BY these improvements, the operations of the jacquard apparatus are stated to be performed in a more perfect and efficient manner, and the several working parts rendered less liable to derangement,

The first improvement consists in the application of a press board, which forces the card against the needles. In front of the front board through which the ends of the needles pass, is placed the press board, which consists of a flat board, having the requisite number of perforations to receive the points of the needles; this press board moves to and fro in slides, in the same manner and for the same purpose as the cylinder in the ordinary jacquard machine; the cylinder in this machine is removed from its original position and placed above the press board, and is made solid in place of being indented or perforated; as its application in this case is merely to present the cards which pass (after leaving the cylinder) between the front board, or points of the needles, and the press board; and in order to ensure greater accuracy, two pins are fixed in the front board to receive the cards, in the same manner as those pins on the cylinder; thus, as the cards are presented, the press board forces them against the points of the needles; and those which come in contact with the card, press the hooks from off the "griff" or grate in the ordinary manner; the card, as the press board returns, is forced over the points of the needles by two bars passing

through the front board. These bars have round plates or discs at the end, and are actuated by spiral springs.

Another improvement is in reversing the position of the holdfasts upon the "lantern," and also in the application of an independent lantern outside the framing, having a flange to guide the latches, which are in one piece instead of two.

Another improvement is in having the cylinder guide frame open at the end; and also in making the bottom part adjustable by bolts, whereby the cards are more easily got in and out.

Another important feature in this invention is, in making the tail end of the hooks to extend above the top row of needles; and in placing between such tail end and the wire hook a horizontal wire. By this arrangement, when the needle is forcing the hook from off the "griff," and consequently out of its perpendicular position, the tail end of the hook comes in contact with the horizontal wire, and acts as a spring; whereby the spring box, or series of helical springs for acting upon the needles, is entirely dispensed with. Again, the guides at the bottom end of the hooks in this improvement are made of thin plate or sheet iron, perforated with a number of slots, to receive the ends of the hooks; and are attached to the bottom end of the rack or griff, which is worked by a number of studs or circular teeth in place of the ordinary cog teeth.

A further improvement in the jacquard machine consists in the application of a disc, having studs or circular teeth for working into the rack of the griff, instead of a toothed segment as heretofore; and also in employing an improved mode of fastening the segment plate to the links.

Claim.—The improvement as described and set forth, viz., the press board, the holdfasts, the bottom plate and wires, also the tail end of the hooks extending above the

top needles, and the springs for pushing the cards off the needles or front board; the placing the cylinder slide or carriage inside the guide rails, instead of outside; the circular teeth for working in the rack upon the griff; and the improved stud for fastening the links.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to WILLIAM GEEVES, of Old Cavendish Street, in the county of Middlesex, gentleman, for "*improvements in machinery for cutting cork.*"

THE first part of these improvements consists in certain apparatus for cutting cork of a cylindrical form for the stoppers of bottles. This machine is similar to a foot lathe, having a fast headstock with a revolving spindle, which receives its motion from a wheel on the crank shaft. The spindle, which is made hollow, has a tubular cutter fixed on its end, for the purpose of cutting the cork, which is inserted, by means of a hopper or trough, between the cutter and a horizontal square bar or "ram," which works to and fro by means of a connecting rod, actuated by an eccentric keyed on to a transverse shaft at the opposite end of the machine. One side of the slide, within which the ram moves, works upon a vertical pin; so that every time the connecting rod advances to push the end of the ram towards the cutter, it presses outward one end of the moveable part of the slide; and the opposite end being to the same extent forced inwards, holds the square piece of cork steady between it and the opposite part of the slide, during the time the end of the ram is pushing

it between such holding surfaces against the end of the tubular cutter; the holding surfaces are also a little bevilled at the end, so as to allow the waste part of the cork to shell off, and also to prevent it binding against the sides of the cutter. At the top side of the cutter is an oil brush, and at the other side a fine Turkey stone, both of which are brought against the cutter every time the ram is drawn back, for the purpose of lubricating and sharpening the same. Motion being given to the machine by means of a treadle, the corks, as they drop in between the end of the ram (which has a piece of cork attached to it to prevent the cutter being injured), and the tubular cutter will be forced against the same and cut into a cylindrical form; the corks, as they are cut, passing through the hollow spindle and out at the opposite end.

The second improvement consists in cutting discs of cork for wadding for fire arms, and other purposes. This is effected by two horizontal circular knives or cutters, which receive a rotary motion by means of a band; above the revolving cutters is a sliding table, which moves to and fro, similar to the ram above described. On each side of the horizontal circular knives are two vertical tubes or hoppers, into which the cylindrical pieces of cork are placed. Motion being imparted to the machine, the table upon which the vertical hoppers are fixed moves to and fro, so as to bring the cylindrical pieces of cork, as they fall by their own weight, below the bottom end of the tube, alternately against the edge of the circular revolving knives; the discs, which at the commencement of cutting rested upon a plate, are brought by the time the knives pass through them over a vertical tube, through which they fall and are received into baskets.

Claim.—First, the mode of constructing and applying a tubular cutter, in such a manner, that the corks as they

are cut are forced through the tubular cutter; also the mode of lubricating and sharpening a tubular cutter used in cutting corks; and the holding a piece of cork, when cut by a tubular cutter, in such manner, that the cork may protrude beyond the holding surfaces as the cut is made into the piece of cork; then allowing the external surface of cork to shell off and not bind on the outer surface of the tubular cutter which may be used.

Secondly, the mode of cutting circular discs of cork, by means of the tubes acting with suitable cutters.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to JAMES BOYDELL, junior, of the Oak Farm Works, near Dudley, in the county of Stafford, iron master, for "*improvements in the manufacture of keel-plates for vessels, iron gates, gate-posts, fencing, and gratings.*" (With a drawing.)

THE first improvement relates to an improved mode of manufacturing keel-plates for vessels, which the patentee effects by rolling in place of hammering, as heretofore, and consists in bending two plates, by means of rolling, into the form seen at fig. 1, in the accompanying drawing; and also one plate of the form shown at 2, which subsequently forms the bottom of the keel-plate. These three plates, which the inventor prefers to be from seven to nine feet long, are placed together, as seen at 3, and held in such position by wood cramps *a*, and then placed in a suitable furnace, and heated to a welding heat; the wood cramps will be burnt away, but the metal will have run sufficiently to hold the plates together, for the purpose of

withdrawing them from the furnace, and placing them between suitable rollers, whereby the joinings will become firmly welded together. The keel-plate may also be formed of flat plates, by subjecting them to three more rollers of different sizes.

Claim.—The mode of forming keel-plates for vessels, by rolling iron into the proper form, as described.

Secondly, in a mode of making gates, grates, and fencings, such as hurdles. In forming a gate or grate, the bars of iron are cut to the proper length, and placed one over the other in the form required. The parts of the bars, where they intersect each other, are lapped with wire, so as to hold the separate parts together till they are placed in a suitable furnace, for the purpose of heating them to a welding heat; when they are withdrawn, and the welding effected by running them between a pair of rollers.

Claim.—The mode of making gates, fencings, and grates, by welding bars, as described.

Thirdly, in a method of forming feet on iron posts, for gates and other purposes. Fig. 4', represents a cylindrical vessel of sheet iron, into which is fixed, in a perpendicular position, the piece of iron intended for the gate post, which is then to be filled with the scoriæ as they run from the cupola of an iron furnace, whereby the semi-fluid matter becomes firmly fixed to the piece of iron, and forms a foot for inserting in the ground.

Claim.—The mode of applying feet to iron posts, for gates and for fences, by means of the scoriæ from a furnace, as described.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to JAMES STEWART, of Osnaburgh Street, Regent's Park, piano-forte maker, for "*improvements in hinges for piano-fortes, and other purposes.*" (With a drawing.)

THIS invention consists in forming the bearings of the pins or axis of the flaps of hinges, which are to be used for connecting the parts of a piano-forte, or for other purposes, so that the shutting or closing of such parts will not be deranged by the contraction or shrinking of the wood. The improvement consists simply in making the holes through which the pin or axis passes, in one of the flaps of an oval or oblong form, and in the other flap of a cylindrical form, so as to fit the pin; in all other respects the hinge is the same as those of ordinary construction, the object of the invention being to apply one pair of these improved hinges to the cover of a piano-forte, or for other purposes, so that the oblong hole through which the axis passes in one of the flaps may give way, or move upon the axis or pin, and compensate for any contraction or shrinkage of the part to which they may be attached. The application of this improvement will be seen, reference being had to the drawing. *e*, *f*, fig. 1, plan of an improved hinge; *e'*, *f'*, edge view; *b*, fig. 2, represents the hinge, applied to a lid or cover *c* of a piano-forte; the hinge at *c'* may be of the ordinary construction.

Claim.—The mode of constructing a hinge, by forming the bearing for the pins or axis in such a manner as to allow of the flaps moving to and from each other, by the sliding of the axis or pins in their bearing.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to THOMAS WATERHOUSE, of Edgely, in the county of Chester, manufacturer, for "*a certain improvement or improvements in the machinery for carding cotton, wool, flax, silk, and similar fibrous materials.*" (With a drawing.)

THESE improvements consist in the application of certain rods or straight-edges to that class of carding engines in which top rollers and clearers are employed, either in connection with or without top cards or flats; whereby the fibres in the process of carding are retained in the top roller by the rod or straight-edge, and subjected to the action of combing or carding.

Fig. 1, in the accompanying drawing, shows the improvement as applied to a carding engine of ordinary construction, and in connection with top cards or flats *a, a, a*. Fig. 2, is an enlarged view of the parts; A, portion of a cylinder; *b, b'*, the top revolving cards or rollers, and *c, c*, the clearers; the bar or straight-edge is shown in section between the rollers and clearers, and extends the whole length of the rollers, and is supported at each end by the framing. Presuming the engine to be at work, the cylinder and rollers moving in the direction of the arrows, the fibres of cotton or other substance will pass from the cylinder to the roller *b*, and (previous to the application of this improvement) from thence in a direction of the dotted lines b^2, to the clearer *c*, and be delivered to the cylinder in nearly the same state as they left it; but by the application of the bar or straight-edge, the fibres are retained by the roller *b'*, and carried down between the bar, (shown by dotted lines) and are then taken by the clearer, which strips them off the roller, and draws them underneath the bar, and afterwards delivers them to the

cylinder. By this arrangement, the fibres are subjected more or less to an action similar to combing, according to the thickness and form of the bar, a transverse section of which is shown in the drawing as being circular; but a flat bar having a circular edge, or a bar of a wedge-like form, may be employed, the edge varying according to the length of the fibres or staple.

The next improvement consists in the introduction of a bar or straight-edge between the ordinary licker-in and the dirt roller, by means of which the cotton will be more effectually cleaned from moats and dirt. *d*, fig. 3, is the licker-in; *e*, the dirt roller, having the bar or straight-edge between them, and in close contact with the dirt roller, which moves with a slow motion, and has always a tendency to strip the licker-in; but by the application of the bar, the fibres are re-taken and delivered to the cylinder. In this case the bar is made to cover that side of the dirt roller nearest the cylinder, in order to prevent the dirt or moats getting into the same. The patentee states, that carding engines having the above improvements applied, will turn out from 30 to 50 per cent. more work than the ordinary machine.

Claim.—The application of a bar or straight-edge between the clearer and the card roller; also between the licker-in and the dirt roller.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 25th May, 1842, to JAMES POTTER, of Manchester, manufacturer, for "*certain improvements in spinning cotton, flax, and other fibrous substances.*"

THE motion of the carriage in self-acting mules, when spin-

ning numbers below fifty, is continued throughout the whole length of the draught with one speed or unvaried movement, and in like manner with the rotary motion of the spindles; but in spinning fine counts, or numbers above fifty, it is desirable to reduce the speed of the carriage when the drawing rollers cease to revolve, and at the same time to increase the rotary motion of the spindles. The reduced speed of the carriage is commonly called the "after draught," and the increased velocity of the spindles, the "double speed;" these two important movements for spinning fine yarn form part of these improvements.

There are other improvements in certain motions, all of which are shown as being applied to that description of self-acting mule for which a patent was granted to Mr. Potter, on the 21st of December, 1838.

The outward motion of the carriage is effected in the following manner: motion is communicated by a bevil wheel on the front roller to an inclined shaft, which, (by means of a bevil wheel at its opposite end,) imparts motion by a series of wheels to two pinions revolving at different speeds; these two pinions are supported by a vibrating lever having three arms, two of which carry the studs upon which the pinions revolve; the third, which is in a vertical position, is actuated by a horizontal connecting rod; by moving this rod, the pinions will alternately be thrown in and out of gear with a spur wheel, which takes into and drives a horizontal rack attached to the underside of the carriage; suppose the carriage at the commencement of the draught, and the same to be coming out, (which is effected by one of the pinions driving the spur wheel, which latter, as described, gears into the teeth of the rack); the carriage having arrived at a certain part of the draught, such part being the commencement of the "after draught," comes in contact with an inclined plane

or lever, the motion of which is transmitted through a series of levers to the connecting rod, which causes the three-armed lever to vibrate, and thus throw out of gear that pinion which has hitherto driven the spur wheel, and put the other into gear, which latter revolving at a less speed than the former, imparts a slower motion to the carriage to the end of the draught, at which time both pinions are thrown out of gear with the wheel so as to leave such wheel free to revolve by the motion of the carriage going in. It must be observed, that the same arrangement of levers which actuates the pinions for the commencement of the "after-draught" also stops the motion of the drawing rollers.

In order to effect the "double speed," the face of the spur wheel which drives the carriage is made with a projecting flange or ring, the greater part of which is concentric with the wheel. This flange has two openings provided with guides or loose pieces, moving freely upon a stud; one of such pieces, as the wheel revolves, will fall down, so as to open or close such opening according to the position of the wheel. On the interior of this flange works a roller or pulley affixed to the end of a weighted lever moving upon a fulcrum; a vertical connecting rod is attached to this lever, the upper end of which is connected by a pin joint to a bell crank, the vibration of which, upon a horizontal shaft, connects and disconnects an arrangement of wheels connected with the rim, for the purpose of varying the rotary motion of the spindles.

The effect of this arrangement is as follows: as the spur wheel revolves, in driving out the carriage, the roller or pulley of the lever will pass over that opening in the flange which has been closed by the loose piece of metal, and on to the next opening, at which place the after-draught commences, and the pulley drops through and throws

into gear, by means of the connecting rod and bell crank, the "double speed," which continues during the "after-draught," the pulley of the lever working on the periphery of the flange, which pulley, by the reverted motion of the wheel, comes in contact with an inclined plane, and is forced through the opening over which it passed and into the interior of the projecting flange, ready for the commencement of the succeeding stretch.

For the purpose of restraining the impetus of the carriage when going in, the patentee employs a grooved pulley affixed to the carriage, round which a band passes, extending in a horizontal direction, and attached at each end to the framing; when the carriage is going in, the grooved pulley is prevented from revolving by means of a ratchet wheel and click, and therefore offers a resistance to the motion of the carriage, owing to the friction of the band on the periphery of the pulley, but on the carriage coming out, the grooved pulley is permitted to revolve.

The putting down of the faller wire is effected as described in the former Specification, but the governing or guiding its position as the winding-on proceeds, is dependent on an inclined plane or shaper, which is well known and in common use, the peculiar form of which is shown in the drawings; the only additional improvement in this part of the invention is a small lever connected to the under faller, by weighting which the tension of the ends of yarn can be regulated, and when the carriage arrives near the roller beam, the lever is lifted by an inclined plane, and the under faller removed preparatory to the succeeding stretch.

The backing off movement remains the same as in the former Specification; also the going in of the carriage, with the exception of a scroll or pulley, which varies the speed of the going in of the carriage. The winding-on

movement in the former patent was effected by a conical drum, which, in these improvements, is entirely removed; and on the same shaft as that upon which the cone was, is placed an expanding or contracting pulley consisting of three discs of metal, the first of which has a number of radial slots, into each of which works a slide, having a projecting stud; the second has an equal number of slots of a curvilinear form, which receive the ends of the projecting studs: this plate or disc which works loosely upon the shaft is placed between the first and third, which two latter are fixed to the shaft by means of keys; thus, by turning round the middle plate, having the curvilinear slots, the studs and slides will be increased or diminished in diameter, or in other words, will be caused to move from, or approach the axis or shaft. The chain, which was, in the former Specification, wound round the conical drum, is in this improvement supported by or wound round the projecting studs, which, at the commencement of the cop, are at their largest diameter; but as the spinning proceeds, gradually decrease, by an arrangement of mechanism attached to the face of the third plate. Another improvement which is added to the winding-on movement, consists in giving a small rotation to the spindles after they have arrived up to the front roller, and when the faller wires are moving out of the way for the succeeding stretch.

The inventor claims as follows:—First, the combination of machinery by which the "double speed" required for fine spinning is effected; secondly, the mechanical arrangements by which the coming out of the carriage is effected; thirdly, the application of a spiral pulley in conjunction with a crank for effecting the bringing in of the carriage; fourthly, the application of a new mechanical movement in the self-acting mule for preventing

snarles at the time the faller wires are removed for the commencement of the succeeding stretch by giving a small rotation to the spindles, and thus taking up the yarn; fifthly, the improved winding-on motion, as set forth in the Specification; sixthly, the application of a spring for increasing or diminishing the tension of the yarn during the winding-on, likewise the grooved break pulley attached underneath the carriage for restraining its impetus when going in.

SPECIFICATION enrolled 28th November, 1842, of a PATENT granted 28th May, 1842, to WILLIAM [illegible]NG, of Queen Street, in the city of London, lamp maker, for "*improvements in lamps and candlesticks.*"

THE principal features of these improvements, the Specification of which is accompanied with six sheets of drawings, are as follows:

The first improvement relates to the construction of lamps, with parts so arranged, that an argand or ring burner is produced, by combining a series of wicks together in such manner as to have air passed up the interior of the lamp. These improvements are shown in the first case, as being applied to a reading lamp; and consist of an oil vessel, adjustable by means of a set screw to any part of a vertical standard; the vessel containing the wick is attached to the oil vessel by means of a tube, which supplies the former with oil. The principal novelty in this lamp is the burner, which is composed of a number of tubes, the form of which, when put together, is somewhat hemispherical, with lateral openings between the tubes for the passage of air to supply the interior of the

flame, which may be composed of any number of wicks arranged in the manner described. In order to regulate the quantity of wick exposed to the flame, a hoop or ferule is made to fit the inner circle formed by the wick, and a flat ring to fit the external part; this hoop and ring are connected together, and supported by three or more arms, affixed at their lower end to a ring, made to slide upon the periphery of the tube, supporting the series of tubes containing the wicks; thus by raising or lowering the apparatus, the hoop and ring, between which the wicks pass, will regulate the quantity of such wicks exposed to the action of the flame.

The next improvement shows a similar arrangement of three tubes, which are applied to a table lamp; in which case there is an apparatus for raising the three wicks at one time, in place of raising them singly, as in the foregoing improvement.

The fourth part of the invention consists in a mode of raising the cylindrical wicks of argand lamps between two tubes, by a spiral action, without the necessity of turning the wicks between such tubes. The wicks in this case are pressed against the periphery of the interior tube, by serrated plates, acted upon by a spring; there are two projections attached to the back of these plates, which pass through vertical slots, made on each side of the exterior tube, and into two spiral slots of a third tube, which encloses the other two; thus by turning the former, the wick, which is held by the serrated plates, and pressed against the interior tube, will be caused to ascend or descend between the said tubes, as may be required.

The fifth improvement relates to lamps for burning naphtha or turpentine spirit. This lamp is similar to that described in the first improvement; in which case the air is introduced into the interior of the flame, between the

separate parts of which the ring of wicks is composed; and in order to prevent the heat from descending to the spirit, a cylindrical block of wood, or other non-conducting substance, is inserted in the tube which supports the ring of wicks, round which piece of wood is tied a piece of cotton, which is in contact with the lower part of the wicks, and conducts the spirit to the same; there is also an apparatus similar to that described, for regulating the flame.

The sixth part relates to lamps for consuming tallow. In this case two wicks are employed for forming the argand wick, and are so arranged, that the air for supplying the interior of the flame passes between the separate wicks, as before described. A cylindrical piece of tallow (or a candle may be employed) is placed into the stem of the lamp, and is forced, by means of a spring, against a convex cover, screwed on the top of the stick, after the candle is inserted; this cover, which is in the centre, and just below the flame, is perforated with three or four holes, and becomes heated, and the melted tallow, which is pressed against the under side, flows through the holes and into a vessel for the purpose of supplying the wicks. If a candle is not used, it will be necessary to place between the end of the cylindrical piece of tallow and the perforated plate a piece of cotton, which will prevent the melted tallow from running down the sides of the piece of tallow, and into the tubular socket which contains it; but if a candle be used, the wick will answer the same purpose, and will accumulate underneath the perforated cover as the candle melts away.

The seventh part relates to candlesticks, and to modes of supporting candles on suitable surfaces applied to the upper part of candlesticks, whereby candles of various sizes may be supported in a vertical position, and such

candles consumed to the end when once set up. For this purpose the upper part of the candlestick is formed with two projections, having horizontal set screws passing through them, the ends of which are attached to the lower ends of two vertical levers, with semi-circular pieces at their upper ends to embrace the candle; thus by turning the two screws, the candle, which rests upon a concave dish, will be held by such pieces pressing against its sides. There are several modifications of this mode of applying screws to support candles upon candlesticks.

The eighth improvement has for its object precisely the same end as that last described, but the same result is obtained without lever holders, which is effected by the application of screws passing through standards, and bending against the sides of the candles; but in place of screws, wedge pieces may be employed so as to penetrate the sides of the candle as it is forced down between the standards, and various sizes of candles set up, the surface on which the candle rests acting as a "save-all," which constitutes the peculiarity of the invention.

The inventor claims, first, the mode of constructing lamps, whereby a series of wicks are used to produce a ring of flame, and in such manner that the air passing into the interior of the flame passes between the wicks; secondly, the application of the apparatus, which being raised or lowered, governs the height of the series of wicks which are offered to the flame; thirdly, the mode of constructing and applying the wick holder to lamps where separate wicks are used to produce a ring flame; fourthly, the mode of raising the wick or cotton of an argand lamp by a spiral action, so that the wick passes up vertically between two tubes, without the wick turning between such tubes; fifthly, the mode of constructing spirit lamps, whereby a series of wicks are used to produce

a ring flame, and in such manner, that the air to support the interior of the flame passes between the separate wicks; and also the mode of applying the apparatus described, for regulating the quantity of the wick which shall be presented to the flame, together with the mode of applying wood or other non-conductor of heat, for the purpose of preventing the heat from descending to the spirit, as described; sixthly, the mode of applying burners to lamps for burning tallow, whereby the air for the interior of the flame passes between the separate wicks; and also the mode of applying tallow to the vessel, by means of a candle or cylinder of tallow forced up towards the burner, as described; seventhly, the mode of holding candles in candlesticks by means of lever holders, as described; eighthly, the mode of holding candles on candlesticks, so that the candle may be securely held by standards, and completely consumed without having to be removed from sockets of candlesticks and placed in "save-alls," as heretofore.

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to PHILIP JACOB KEYSER, of Gracechurch Street, in the city of London, manufacturer, for "*improvements in the construction of lamps.*"

THIS improved lamp consists, first, of a cylindrical vessel, having a half-round tube soldered, or otherwise affixed, to the outside, the lower end of such tube communicating with the lower part of the vessel, and the upper part with a tube leading to the burner; in the interior of the cylindrical vessel there is a weight, which the inventor prefers to be in the form of an egg, the upper end having a disc

of metal attached, upon which is placed a disc of leather, that binds against the sides of the vessel, and is firmly secured thereon by another disc of metal placed on the top and affixed by means of screws. This weight is suspended from the upper part of the vessel by means of a chain passing over a pulley, the axis of which is made so that a key can be applied for the purpose of drawing up the weight. The object of this weight is to force the oil from the cylindrical vessel up the external tube, and to the burners of the lamp.

Claim.—The mode of forcing the oil up an external tube to be consumed.

Secondly, in the application of a regulator to the burner; and consists of a small tube about one inch high, the lower part of which is thicker than the upper part, and fits closely into the inner part of the burner; the upper part is notched to retain the wick, and the lower part has also several notches sufficiently deep to retain the oil, which rises to keep the lamp properly supplied.

Claim.—The regulator which is placed in the burner, and which serves at the same time as a wick holder.

There are also two other modifications of this lamp having a weight applied in the manner described; in one of which the oil vessel is placed above the burners, as in chandeliers; in which case, the descent of the weight forms a vacuum in the upper part of the vessel, into which the oil which overflows or drops from the burners (and which is received in a vessel below the lamp), is forced through a pipe communicating with the said vessel and that in which the vacuum is formed, the object of which is not clearly shown.

Claim.—The forming a vacuum in the reservoir to receive the oil which drops from the burners that are lower than the reservoir.

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to HENRY WILKINSON, of Pall Mall, in the county of Middlesex, gun maker, for "*improvements in unloading shipping, especially those vessels called colliers.*"

THIS invention consists simply in the application of steam power in the place of manual labour; which the inventor effects by constructing a portable engine, so as to take up the least possible room, and just large enough to lift the heaviest weight required. This engine is to be bolted to the deck, and provided with the necessary tackle for raising such weights. The Specification gives a description of an engine suitable for this purpose; which consists of a horizontal cylindrical boiler, having the cylinder attached to one side; and upon the fly wheel shaft, which is at one end of the boiler, is placed a crane barrel, which can be put into gear, with a lever acting upon a clutch box. Although the inventor describes the engine suitable for the purpose, yet he does not claim any part thereof, "the object of the invention being to apply steam engines of small power in combination with vessels, for the purpose of loading and unloading such vessels."

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to RICHARD WATSON, junior, of Cloth Fair, within the city of London, gas fitter, for "*improvements in draining land, embankments and cuttings of railways, and other engineering work.*"

THE first part of these improvements relates to the construction of tubes for the purposes hereafter described;

and consists in making the tubes, which may either be of iron or other composition, such as is employed for tiles, with a number of holes or perforations, which are to be wider on the inside than the outside of the tube, that is, the perforations are made gradually to increase in size from the outside to the inside of the tube, such holes being either circular or in the form of a slot.

The second part relates to the application of such tubes for the purpose of draining embankments, cuttings of railways, and other works, by first boring a hole or holes in the embankments to be drained, and then inserting the perforated tubes, which will have the effect of draining and consolidating the parts to which they are applied. The drawings show the application of the tubes to various parts of engineering work, such as tunnels and embankments, where masonry and brickwork are employed; the number of tubes employed, and the various inclinations at which they are laid, will of course depend upon the land to be drained, and the judgment of the engineer.

The third improvement relates to boring holes in brickwork or masonry; and consists of a drill or bit of a tubular form, having at the bottom end a number of inclined teeth, and at the upper end (which is formed with a screw for attaching it to the boring rods or bars), a lid or cover, which can be removed; the object of this cover is to prevent the cylinder of brick, or other substance, which passes up the tubular part of the bit, from clogging or fastening the boring instrument in the hole.

The inventor claims, first, the mode of constructing perforated drain tubes and tiles with holes or openings enlarging from the outside inwards; secondly, the mode of draining embankments, cuttings of railways, and other engineering work, by applying perforated tubes from the face of an embankment, or of an open or other cutting as described, and whether faced with a wall of masonry

or not; thirdly, the apparatus described for boring holes in brickwork or masonry, for draining cuttings and embankments of railway and other engineering work, which are faced or not with brickwork or masonry.

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to LOUIS NICOLAS DE MECKENHEIM, of the Kingdom of Austria, but now of London, engineer, for "*improvements in the manufacture of iron.*"

THIS invention consists, first, in utilising for various heating purposes the superabundant gases evolved by the blast and other furnaces; which superabundant gases are suffered, in the present mode of manufacturing iron, to escape into the air; and by this new system a great saving of fuel is stated to be effected; secondly, in a new mode of constructing the several furnaces used in the manufacture of cast or pig iron, and malleable iron; and in a new method of manufacturing such iron, whereby a great saving of fuel is also stated to be effected.

The inventor first describes his mode of collecting and employing the gases evolved by blast and other furnaces as follows: In order to collect the gases evolved from the blast furnace, several passages are formed in its circumference. These passages must be sufficiently large and considerably inclined, and should be below the range of the vapour, and generally from ten to fifteen feet below the charging place or tunnel head. The conducting passages in the furnace must be lined with fire brick, and each of them separately closed by a cast iron plate, having two holes in it; to one of which is fitted the receiver for

collecting the gases; the other is used for clearing the passage into the furnace, and must be kept hermetically closed, so that no air may penetrate from the exterior. The mouth of the furnace is kept shut, and the gases are forced into the conducting pipes by the compression produced by the blowing engine, added to the pressure of the superincumbent mass of materials, as well as by the effect of their expansion. When these means are not found sufficient, it may then be necessary to employ a fan or ventilator. The gases, after flowing through the passages formed in the brickwork of the furnace, pass into receivers, and are from thence forced by means of the fan, either into the blast furnace itself, from which they are taken, or into the adjoining furnace. There are several methods shown in the drawing of collecting these gases; and the inventor states, that these gases may be employed for heating the steam engine boiler, or the kiln for washing the ore, &c. &c., and for all other purposes where heat is required. The mode of constructing the improved furnaces is as follows: A certain number of furnaces are to be placed against each other with a feeding furnace between each, and behind either a fan or ventilator to collect the gases, or a draught chimney. An apparatus, with regulating valves, determines the force of the current, and the quantity of atmospheric air to be admitted, not only under the hearths but also into the furnaces, by regulating the quantity necessary for the complete combustion of the gases, and distributing it as each furnace may require.

The improvements in manufacturing iron consist in employing the superabundant gases collected as above described, conjointly with coke, as in the present method, for the purpose of producing cast or pig iron. But in making malleable iron, the patentee employs exclusively the gases which he obtains by distillation or otherwise,

without the addition o ny other fuel whatever, whether such iron is made fro n cast or pig iron, or whether the ore is at once converted into malleable iron without passing through the intermediate state of cast or pig iron, as in the "Catalan" method.

A DISCLAIMER has been entered on the 8th November, 1842, with the Clerk of the Patents, in the matter of the PATENT granted 13th April, 1840, to THOMAS YOUNG, of Queen Street, in the city of London, merchant, for "*improvements in lamps.*"

The patentee, after reciting that his invention related, first, to the method of regulating the supply of oil to the burners of fountain lamps by means of a float; secondly, to a mode of using bags, or flexible vessels, to contain the oil in fountain lamps, together with the means of causing the oil to be expressed from such bags or flexible vessels; thirdly, to a mode of applying a perforated plate at a position above the point of combustion of the wicks of lamps, and thereby obtaining a more favourable application of the air to the flame of lamps; fourthly, to a mode of improving the combustion and consequent flame of lamps, by applying a coil of wire round the flame thereof; then goes on to say, that, having discovered that three of his improvements, viz., the first, second, and fourth, were comparatively useless, but that the third improvement had proved to be of great value, he disclaims all that part of his Specification and Drawing having reference to such first, second, and fourth above mentioned improvements; as also the *s* in the title; so that the Patent will now be for "*an improvement in lamps;*" and will consist in "a mode of applying a perforated plate at a position above the point of combustion of the wicks of lamps, and thereby obtaining a more favourable application of the air to the flame of lamps."

A DISCLAIMER has been entered on the 17th November, 1842, with the Clerk of the Patents, in the matter of the PATENT granted 8th September, 1841, to NATHANIEL CARD, of Man-

chester, in the county of Lancaster, candle-wick maker, for his invention of "*certain improvements in the manufacture of wicks for candle lamps, and other similar purposes, and in the apparatus connected therewith.*"

The patentee states, that since the taking out of the said Letters Patent, and since the enrolment of his SPECIFICATION, he has discovered that his invention cannot be applied beneficially to manufacturing wicks for lamps; and he therefore disclaims the words, "*lamps and other similar purposes,*" in the title of his Specification; and also all those parts of his Specification which relate to manufacturing wicks for lamps. The title of the said Patent will now read as follows, "*Certain improvements in the manufacture of wicks for candles, and in the apparatus connected therewith.*"

The SPECIFICATION of the PATENT granted 7th May, 1842, to GODFREY WETZLAR, of Myddleton Square, Clerkenwell, for "*improvements in rendering fabrics waterproof,*" (being a communication), due 7th November last, has not been enrolled during that month.

The SPECIFICATION of the PATENT granted 9th May, 1842, to WILLIAM SANDERSON, of Aldermanbury, London, silk manufacturer, for "*improvements in weaving fabrics to be used for covering buttons,*" due 9th November last, has not been enrolled during that month.

The SPECIFICATION of the PATENT granted 31st May, 1842, to HENRY PHILLIPS, of Exeter, chemist, for "*improvements in purifying gas for the purposes of light,*" due 30th November last, has not been enrolled during that month.

Law Reports on Patent Cases.

JUDICIAL COMMITTEE of the PRIVY COUNCIL.— 8th December, 1842.

SIMISTER'S PATENT.

(Present—*Lord Campbell, Mr. Justice Erskine, the Judge of the Prerogative Court, and the Judge of the Admiralty Court.)*

Mr. M. D. Hill and Mr. Webster appeared in support of the petition, which was opposed by the Solicitor-General and Mr. Cowling on the part of the staymakers.

This was an application under Lord Brougham's Act for the renewal of a patent granted on the 18th of December, 1829, to Mr. James Simister, of Birmingham, staymaker, for "an invention of improvements in weaving, preparing, or manufacturing a cloth or fabric, and the application thereof to the making of stays and other articles of dress, which improvements are also applicable to other purposes." The petition stated, that before this invention the cloth used for stays (satcen) was woven according to the usual and well-known methods of weaving, and stays were made by placing two surfaces of such cloth together, and sewing or stitching by the hand in such manner as to leave the requisite spaces for the introduction of the whalebone, steel, wood, cotton, or other article or material with which stays were filled; and that in stays so made the work was not performed with so much regularity, the stays in the process of making became soiled, and they did not fit so easily or pleasantly to the wearer. The petitioner, after bestowing much labour and expense in devising means to obviate these defects, had succeeded in discovering a method of weaving whereby the cloth or fabric might be formed into stays, consisting of two surfaces united together in a proper manner, the requisite open spaces to be filled with whalebone, so being

left or made at the time the cloth was woven, and the method so discovered was applicable to other articles of dress, such as braces, purses, bags, or reticules, &c.

The extension of the term of the patent was moved for on the ground of the invention being of public utility, and on account of the expense the applicant had been put to in perfecting it, and in law proceedings.

Several witnesses were heard in support of the application, which was opposed by

The Solicitor General, on the ground that the described fabric was not a new invention, and because the applicant had failed to prove that the invention (if it were one) was of public utility, or that he had not derived that emolument from it to which he was fairly entitled.

After a short deliberation,

Lord Campbell said, that in this case their Lordships were of opinion that no sufficient case had been made out to entitle the applicant to a renewal of his patent.

ROLLS' COURT, Chancery Lane.—Wednesday, 21st December, 1842.

BAKER *v.* COLE.

Mr. Dixon, for the plaintiff, William Baker, moved *ex parte* for an injunction to restrain the defendant, Richard Cole, from using the trademark or name of "Impilia" upon the sole of any boots or shoes sold by him, or by his direction, and from selling any boots and shoes with that trademark or name thereon, or any boots or shoes made according to the plaintiff's patent. The plaintiff's affidavit stated that he had discovered a new and useful invention for an improvement in the manufacture of boots and shoes, for which, in January last, he had obtained a patent, and had, in July, enrolled his Specification. The invention was specified to be "the applying a piece or sole of matted or felted horse or other strong curled hair between the inner and outer sole of the boot or shoe." The plaintiff had designated the articles thus

made by the name of "Impilia," which name had become universally known as designating his boots, and never had been before so used; but he had caused it to be adopted as the trade-mark of the boots and shoes made according to his patent. He discovered, on the 17th instant, that the defendant was selling boots and shoes which he represented to be "Impilia" boots, &c., made according to the plaintiff's patent, excepting that instead of horse-hair there was wool placed between the soles. The defendant had sold to a man of the name of Wise a pair of these boots, with the word "Impilia" upon the outer sole.

Injunction granted.

VICE CHANCELLOR'S COURT.—Thursday, 22nd December, 1842.

(Before Sir J. K. Bruce.)

MUNTZ v. GRENFELL.

This was a motion on behalf of the plaintiff, Mr. Muntz, the member for Birmingham, to restrain the defendants, Edward Pascoe Grenfell and others, from using or continuing to use the alleged invention of the plaintiff for making metal plates for sheathing the bottoms of ships.

Mr. Wigram and Mr. Follett were for the plaintiff, and Mr. K. Parker and Mr. Hetherington for the defendants.

The facts appeared to be as follows:—That in October, 1832, letters patent for the term of fourteen years were granted to Mr. Muntz for this invention, and in September, 1833, the defendants, who were then copper-merchants, entered into partnership with him, and by the agreement it was stipulated that the letters patent should be vested in the plaintiff and defendants, jointly, for the then residue of the term; that the patent should be the joint property of the partners, and the profits, after deducting expenses and apportioning £2. a ton to the plaintiff for all metal made according to the patent, were to be divided, one

moiety for the plaintiff, and the other moiety among the defendants. Liberty was reserved to either party to put an end to the partnership by one month's notice. Upon the formation of the partnership the plaintiff explained to the defendants the mode of working his patent, and the sale of the articles so manufactured was managed by the latter. The bill stated, that by these means the defendants had become possessed of the good-will of the trade. In May, 1841, the defendants gave the plaintiff a month's notice, according to the stipulation of the arrangement, to put an end to the partnership, and on the 17th of June in that year the same ceased, and the plaintiff received notice from the defendants to give up the mills in which the partnership business had been theretofore carried on. It was insisted that the patent was vested in the plaintiff, but that the defendants continued to work, make, and expose for sale the composed metal as before; and for this reason the present application was made. He claimed the common right of a patentee, and that if the patent should, as the defendants alleged, be found invalid, he ought to be protected, considering the distinct contract that had been entered into between the parties; but, whether the patent was good or bad, the defendants were not at liberty now to question it. The counsel for the plaintiff said that Mr. Muntz was the party who had all the knowledge of the mode of working the patent, and that the defendants, having extracted from him that knowledge, and being intrusted with the management of the sale, had got the whole of the trade into their hands, by which, if not restrained, they would inflict irreparable injury on the plaintiff. Mr. Muntz was quite willing that his title should be tried at law, but in the mean time he insisted that his interests ought to be protected by a court of equity. The cases of "Bowman *v.* Taylor," 2 Adolphus and Ellis; "Hale *v.* Thompson;" "Pickford *v.* Skewer;" "Russell *v.* Cowley;" the case of "Oxford and Cambridge," in 6 Vesey; and "Hullett *v.* Haig," 2 Barnewall and Adolphus, 377, were cited.

Mr. Follett, in answer to a question from his Honour, said that the plaintiff was in a condition to prove that the patent had

been infringed by the defendants, without any admission on the part of the defendants; for that they had issued circulars to the trade, in which they stated, that as untrue reports had been propagated as to the legality of their continuing the manufacture of these plates, they would be willing to indemnify any persons who might suffer any damage by dealing with them.

For the defendants it was said, that the issue to be tried was whether or not the present was a valid patent—a point which the defendants negatived. In the *Repertory of Arts* they found, for the year 1804, a Specification of a patent of a Mr. Collins, precisely like that alleged to be the invention of the plaintiff.

His Honour.—Was the plaintiff ignorant of the invention of Collins?

Mr. K. Parker.—Mr. Muntz says, that he is the true and original inventor, and denies that his was the same as Collins's invention. The plaintiff's case is, that his metal is manufactured from "the best selected copper, an article of commerce not known at the time Collins obtained his patent." The patent of Collins consisted of "red, yellow, and white metals," all composed of copper and zinc in different proportions, and the defendants allege that the second, "the yellow metal," was exactly the same as that of the plaintiff's alleged invention.

His Honour.—As both compositions consist partly of copper, I wish to know whether such copper as was used in 1804 will do for the purposes of Mr. Muntz's patent?

Mr. Wigram.—My case is that only "the best selected copper" will do, and that that article was not known until within the last few years.

Mr. K. Parker proceeding, said, that the second ground on which the defendants relied was, that there had been no exclusive enjoyment under the patent, that is to say, uninterrupted enjoyment. The patent was never worked until September, 1837. The defendants paid Mr. Muntz 1,000*l.* for his invention; and therefore, if shortly after the agreement they had been aware of the invalidity of the patent, it would not have been consistent with their interest to state their opinion, at all events, until they

found other parties infringing the patent. So early, indeed, as 1837, the defendants wrote to the plaintiff, saying "the patent is all humbug." Before the dissolution of the partnership, a bill had been filed by the plaintiff and defendants against Messrs. Vivian, of Swansea, for an infringement of the patent, and Mr. Muntz had not then, as he might have done, tried his right at law. Infringements had also been proved to have been made by Lyon and Newton, and Mr. Freeman. The affidavit of Sears proved that "the best selected copper was smelted in exactly the same manner as the best cake or tithe copper, in the same furnace, at the same time, and by the same process, and that it was used, to his own knowledge, for many years before 1831." The defendants, therefore, insisted that the plaintiff was not entitled to the relief he prayed, but they were quite willing to account until the right could be decided at law.

Mr. Hetherington was heard on the same side.

His Honour.—The first question is whether for the limited purpose of the present interlocutory application, and as between these parties only, the patent is or is not to be taken to be valid? The utility of the process is not questioned, The Specification has not been strongly attacked, and it appears that there has been a conviction on the part of the defendants that the invention is the plaintiff's, and that the Specification is not insufficient. The main question is as to the originality of the alleged invention. Now, how does that stand on the evidence? The patent is dated the 22nd of October, 1832. Negociations took place during the following year between the plaintiff and defendants, for the purpose of working (as it is called) the patent in partnership together. That negotiation ripened into a contract on the 24th of September, 1835; by which the plaintiff and defendants agreed to carry on the business together for a term commensurate with the duration of the patent, subject to the notice for dissolution which has been mentioned. The articles of agreement, though not in precise terms, recite the validity of the patent, proceeding upon the notion that they were dealing with a valid patent. In 1835 the Specification of a former

expired patent was observed in a scientific publication, which was brought to the attention of the plaintiff and defendants as being likely to affect the validity of the patent in which they were jointly interested. On that occasion the plaintiff in substance offered the defendants to close his connection with them, if they were dissatisfied. This offer was refused, and the partnership went on as usual until May, 1842, when the parties, not being able to agree (why was not shown), notice of dissolution was given by the defendants to the plaintiff, in accordance with the articles of agreement. On the 17th of June, 1842, the partnership expired, the result of which was to revest the patent wholly in the plaintiff. Some time before this, Vivian was supposed to have infringed the patent, and a bill was filed against him in this Court by the present plaintiff, and the defendants jointly, as co-plaintiffs, and an injunction was moved for. That suit was conducted by the private solicitor of the present defendants, as I collect, and they used, as a main part of the materials on which they applied for the injunction, an affidavit made by Mr. Muntz, in which he swore precisely as to the originality of the patent. Under these circumstances, can I, for the present limited purposes, and as between the present parties, refuse to let this injunction go? If I were of opinion that I ought so to do, then the question of enjoyment or disturbance becomes of less importance than otherwise it would be. It appears that the plaintiff from the first has manufactured sheathing from his patented plan. He endeavoured to make his invention public for the purpose of selling it. It appears that there existed a strong impression in the trade against it; and as it would appear, from prejudice and ignorance of its real merits, for no one seemed to dispute that it was a meritorious invention. At first, therefore, it had no considerable sale; but in 1837 the patent appeared to be set actively at work, and was more known and taken up by the trade. Between 1838 and 1841 there was an attempt made to invade it by a party named Cutler, but he soon desisted. There are only three instances of infringement: one by Vivian, another by Lyon and Newton, and a third by

Freeman. Against this there is that species of enjoyment by the plaintiff which has taken place to the extent before mentioned, previously to the partnership, and a substantial, full, and complete enjoyment during 1838, 1839, and 1840. Considering, therefore, if the view I take be correct, as to the manner in which I have for the present purpose treated the question of the validity of the patent, I think I must consider the infringement as a slight disturbance. I shall, therefore, order the injunction as between the present parties, the plaintiff undertaking to abide by such order as the Court may think fit as to compensation, and undertaking immediately to bring his action to try the question of the validity of the patent; the trial to be in Middlesex; the plaintiff to commence within a week, unless prevented by the defendants, and to deliver the declaration in three weeks.

Scientific Notices, &c.

DESCRIPTION OF AN "ECHOMETER," OR PERCUSSION INSTRUMENT FOR INVESTIGATING DISEASES OF THE CHEST.

INVENTED BY C. J. B. ALDIS, M.D.,

Cantab, Fellow of the Royal College of Physicians, Physician to the London Dispensary, and Lecturer on Medicine at the Charlotte Street School.

Dr. Aldis's Echometer, which was registered Nov. 30, 1842, consists of a leathern plessimeter, with a steel stem and handle; the percussor is composed of steel, having a leathern face, and is attached by means of a joint to the stem of the plessimeter; the percussor is raised by pressure on the lever handle, having a spring underneath, which forcibly raises it when pressure is removed from the lever handle; on depressing the lever handle, it comes in contact with the top of a regulating screw, which can be raised higher or lower, according to the increase or diminution of sound required, which is a very great advantage for equalizing the force of the percussor, as well as the sound elicited; and it is remarkable that no instrument has been invented previously to the present one for fulfilling these intentions, since it is necessary, in comparing the opposite sides of the chest, to produce equal sounds.

We consider the echometer invented by Dr. Aldis for investigating the diseases of the chest, the greatest improvement in percussion since the discovery of the plessimeter by Piorry; and we strongly recommend it to the

notice of medical practitioners and students, much of whose time will be saved by using this instrument, instead of practising percussion in the ordinary way; for the operator, from the ingenious contrivance of its mechanism, cannot do otherwise than produce distinct and equal sounds.

The makers are Savigny & Co. of St. James's Street.

ROYAL POLYTECHNIC INSTITUTION.—Saturday, Dec. 17.

The Earl of Enniskillen, Sir M. A. Shee, Dr. Faraday, Professors Brande and Groves, with many other gentlemen distinguished in the scientific and literary world, attended at this Institution on this evening, by invitation of the directors, to witness some novel experiments with the colossal electrical machine. On this occasion the Leyden jars of the Royal and London Institutions were added to those of the Polytechnic, comprising in all 135, and presenting a chargeable surface of 200 square feet. The great machine offers a surface of 60 square feet, and was acted on by double rubbers, at a rate of 100 revolutions a minute, thus creating an electrical force of unequalled intensity. The chief experiments were those demonstrating the deflagration of the metals by electrical influence, and the appearances presented after this process were of the most unique and beautiful description.

INSTITUTION OF CIVIL ENGINEERS.

TELFORD AND WALKER PREMIUMS, 1842.

The council of the Institution of Civil Engineers have awarded the following Telford and Walker Premiums:—

A Telford Medal in silver, and a premium of books, suitably bound and inscribed, to Robert Thomas Atkinson, M. Inst. C. E., for his paper "On the sinking and tubbing, or coffering, of pits, as practised in the coal districts of the North of England."

A Telford Medal in silver to William Cotton, for his "Memoir of Captain Huddart."

A Telford Medal in silver to the Chevalier Frederik Willem Conrad, for his "History of the Canal of Katwyk (Holland), with an Account of the Principal Works upon it."

A Telford Medal in silver to James John Wilkinson, for his "Historical Account of the various kinds of Sheathing for Vessels."

A Telford Premium of Books, suitably bound and inscribed, to Thomas Casebourne, M. Inst. C. E., for his "Description and Drawings of part of the Works of the Ulster Canal."

A Telford Premium of Books, suitably bound and inscribed, to Thomas Girdwood Hardie, Assoc. Inst. C. E., for his "Description and Drawings of an Iron Work in South Wales."

A Walker Premium of Books, suitably bound and inscribed, to Charles Nixon, Assoc. Inst. C. E., for his "Description and Drawings of part of the Tunnels on the Great Western Railway."

A Walker Premium of Books, suitably bound and inscribed, to Alexander James Adie, for his "Description and Drawings of the Bridges on the Bolton and Preston Railway."

A Walker Premium of Books, suitably bound and inscribed, to John Brannis Birch, Grad. Inst. C. E., for his "Description and Drawings of the Bridge at Kingston-on-Thames."

A Walker Premium of Books, suitably bound and inscribed, to Robert Richardson, Grad. Inst. C. E., for his "Description and Drawings of part of the Works of the London Docks."

A Walker Premium of Books, suitably bound and inscribed, to James Combe, Assoc. Inst. C. E., for his "Description and Drawings of Messrs. Marshall's new Flax Mill, at Leeds."

A Walker Premium of Books, suitably bound and inscribed, to Charles Denroche, Grad. Inst. C. E., for his "Description and Drawings of the Apparatus used for compressing Gas, for the purposes of illumination, &c."

A Walker Premium of Books, suitably bound and inscribed, to Adrian Stephens, for his "Description of the Explosion of a Steam Boiler at the Penydarran Iron Works, South Wales."

A Walker Premium of Books, suitably bound and inscribed, to George Ellis, Grad. Inst. C. E., for the drawings illustrating the "Description, Specification, and Estimates of the Calder Viaduct, on the Wishaw and Coltness Railway; with the Series of Experiments on the Deflection of Trussed Timber Beams for that work, by John Macneill M. Inst. C. E."

A Walker Premium of Books, suitably bound and inscribed, to Thomas Chalmers, Grad. Inst. C. E., for the drawings illustrating the "Report on the Sinking of two experimental Brick Cylinders in an attempt to form a Tunnel across the River Thames, by John Isaac Hawkins, M. Inst. C. E."

The council take this opportunity of calling the attention to the importance of making the institution the depository of books, drawings, descriptions, and models of works and machinery; also of papers, reports, and pamphlets, which, though apparently of only local or temporary interest, would, when collected, be of great value to the profession.

TELFORD AND WALKER PREMIUMS.

SESSION, 1843.

The council invite communications on the following as well as other subjects for Telford and Walker Premiums:—

1.—The original cost, annual expense, and durability of timber bridges, compared with similar structures in stone, brick, or iron.

2.—A description of the Canal of the Helder (Holland), or of any foreign engineering works of a similar kind and importance.

3.—The modes of irrigation in use in Northern Italy; of drainage adopted in the Lowlands of the United Kingdom; or works of a similar nature in Holland, or in other countries.

4.—On any of the principal rivers of the United Kingdom (the Shannon) or of foreign countries, (the Po, Italy,) describing their physical characteristics, and the engineering works upon them.

5.—An account of the waste or increase of the land on any part of the coast of Great Britain, the nature of the soil, the direction of the tides, currents, rivers, estuaries, &c., with the means adopted for retarding or preventing the waste of the land.

6.—The various kinds of limes and cements employed in engineering works.

7.—The best and most economical mode of raising large stones or rocks from the beds of rivers and harbours.

8.—The conveyance of fluids in pipes, under pressure, and the circumstances which usually affect the velocity of their currents.

9.—The means of rendering large supplies of water available for the purpose of extinguishing fires, and the best application of manual power to the working of fire engines.

10.—The most advantageous method of employing the power of a stream of water, where the height of the fall is greater than can be employed to water wheels of the usual construction.

11.—The construction of large chimneys, as affecting their draught; with examples and drawings.

12.—On the ventilation of coal pits or mines, in Great Britain or in foreign countries.

13.—The relative merits of granite and wood pavements and macadamised roads, derived from actual experience.

14.—The smelting and manufacture of copper.

15.—The smelting and manufacture of iron, either with hot or cold blast, in Great Britain or in foreign countries.

16.—The comparative advantages of iron and wood, or of both materials combined, as employed in the construction of steam vessels; with drawings and descriptions.

17.—The sizes of steam vessels of all classes, whether river or sea-going, in comparison with their engine power; giving the principal dimensions of the engines and vessels, draught of water, tonnage, speed, consumption of fuel, &c.

18.—The various mechanism for propelling vessels, in actual or past use.

19.—The description of any meter in practical use for accurately registering the quantity of water for supplying steam boilers, or for other purposes.

20.—Deductions from direct experiment of the degree of condensation which is most favourable for the working of steam engines, as regards the production of mechanical power, stating the inconveniences resulting from the use of steam at a high pressure, and showing how such inconveniences may be remedied; with simple rules for indicating the proper temperature of the discharged water.

21.—The various modes adopted for moving earth in railway tunnels, cuttings, or embankments, with the cost thereof.

22.—On stone blocks and timber sleepers or sills, with or without continuous bearings, for railways.

23.—The results of experience as regards the consumption of power for a given effect, on railways having different widths of gauge; with the advantages attributable to any established width of gauge.

24.—On the forging of solid axles for locomotive engines and railway carriages, which are subjected to great strain, noticing particularly whether the iron used be of a cold-short or red-short quality; the relative strength of the two qualities, and whether the size of the crystals appears to influence the cohesive strength of the metal.

25.—The advantages of large and small hollow wrought iron shafts for machinery, axles for carriages, &c., the best mode of manufacturing them, and the formulæ for computing its strength.

26.—Memoirs and accounts of the works and inventions of any of the following engineers:—Sir Hugh Middleton, Arthur Woolf, Jonathan Hornblower, Richard Trevithick, and William Murdoch (of Soho).

Original papers, reports, or designs, of these or other eminent individuals, are peculiarly valuable for the library of the institution.

List of New Patents.

PATENTS GRANTED IN ENGLAND, FROM NOVEMBER 25th TO DECEMBER 22nd, 1842.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

Felix Napoleon Target, of Blackheath, gentleman, Leon Castelain, of Back-lane, Shadwell, chemist, and Adolphe Aubril, of Back-lane, aforesaid, artist, for "a new method of refining or manufacturing sugar." Sealed November 25.

James Smith, of Coventry, pattern drawer and card stamper, for "improvements in weaving ribbons and other ornamented fabrics." Sealed November 25.

Charles Heard Wild, of Birmingham, engineer, for "an improved mode of constructing floors for fire-proof buildings." Sealed November 25.

Isham Baggs, of Wharton-street, Middlesex, chemist, for "improvements in producing light." Sealed November 25.

Frederick Oldfield Ward, of St. Martin's-lane, gentleman, and Mark Freeman, of Sutton, Surrey, gentleman, for "improvements in candlesticks, apparatus, and instruments employed in the use of candles and rush-lights." Sealed November 25.

Pandia Theodore Ralli, of Finsbury-circus, wine merchant, for "improvements in the construction of railway and other carriages, and in apparatus connected therewith." Being a communication. Sealed November 25.

William Henry Fox Talbot, of Laycock-abbey, Wilts, esquire, for "improvements in coating or covering metals with other metals." Sealed November 25.

Thomas Mansell, of Birmingham, agent, for "certain improved machinery for cutting or shaping leather, paper, linen, lastings, silks, and other fabrics." Sealed December 3.

Ebenezer Timmis, of Birmingham, manufacturer, for "certain improvements in apparatus used for arresting the progress of, and extinguishing fires." Sealed December 3.

Edward Cobbold, of Melford, in the county of Suffolk, clerk, master of arts, for "certain improvements in instruments for writing or marking, part or parts of which improvements are applicable to brushes for water colour drawing." Sealed December 3.

John Stubbins, of Nottingham, hosier, for "improved combinations of machinery to be employed for manufacturing certain parts of articles in stocking or lace fabrics." Sealed December 3.

Don Pedro Pouchant, of Glasgow, civil engineer, for "a certain improvement or improvements in the construction of machinery for manufacturing sugar." Sealed December 3.

John Sealy, of Bridgewater, merchant, for "an improved tile." Sealed December 3; two months.

Charles Heard Wild, of Birmingham, engineer, for "an improved switch for railway purposes." Sealed December 3.

Thomas Howard, of Hyde, Chester, manufacturer, for "certain improvements in machinery for preparing and spinning cotton, wool, flax, silk, and similar fibrous materials." Sealed December 3.

William Hancock, Jun., of Amwell Street, gentleman, for "certain improvements in bands, straps, and cords for driving machinery and other mechanical purposes." Sealed December 5.

Frederick William Etheredge, of Frindsbury, gentleman, for "certain improvements in the manufacture of bricks, tiles, and other similar plastic substances." Sealed December 3.

William Henry Stuckey, of Guildford Street, esq., for "certain improvements in filtering water, and other fluids." Sealed December 3.

William Pope, of the Edgeware-road, ironmonger, for "an improved stove." Sealed December 6.

William Oxley English, of Kingston-upon-Hull, distiller, for "improvements in purifying spirits of turpentine, spirits of tar, and naptha." Being a communication. Sealed December 8.

William Coley Jones, of Vauxhall Terrace, practical chemist, and George Fergusson Wilson, of Vauxhall, gentleman, for "improvements in operating upon certain organic bodies or substances in order to obtain products or materials therefrom for the manufacture of candles and other purposes." Sealed December 8.

William Smith Harris and Septimus Hamel, both of Leicester, cotton-winders and co-partners, for "improvements in the manufacture of reels for reeling cotton and linen thread." Sealed December 8.

William Kempson, of the Borough of Leicester, manufacturer, for "improvements in the manufacture of muffs, cuffs, ruffs, tippets, mantillas, pellerines, dressing gowns, boots, shoes, slippers, coats, cloaks, shawls, stocks, cravats, capes, boas, caps, bonnets, and trimmings for parts of dress." Sealed December 8.

George Purt, of St. Mary-at-Hill, soda water manufacturer, and William Hale, of Woolwich, engineer, for "improvements in producing aerated liquors." Sealed December 8.

Richard Barber, of Leicester, reel manufacturer, for "improvements in the manufacture of boots, shoes, and clogs." Sealed December 8.

John George Bodmer, of Manchester, engineer, for "certain improvements in the manufacture of metallic hoops and tyres for wheels, and in the method of fixing the same for use; and also improvements in the machinery or apparatus to be employed therein." Sealed December 8.

William Edward Newton, of Chancery-lane, civil engineer, for "certain improvements in the construction and arrangement of axles and axle-trees for carriages, carts, and other vehicles used on rail or other roads." Being a communication. Sealed December 8.

William Lomas, of Manchester, worsted spinner, and Isaac Shimwell, of the same place, worsted spinner, for "certain improvements in the manufacture of fringes, cords, and other similar small wares, and also in the machinery or apparatus for producing the same." Sealed December 8.

John Grantham, of Liverpool, engineer, for "certain improvements in the construction and arrangements of the engines and their appendages for propelling vessels on water." Sealed December 8.

James Brown, of Soho, Birmingham, engineer, for "certain improvements in steam engines and steam-propelling machinery." Sealed December 8.

Benjamin Fothergill, of Manchester, machine maker, for "certain improvements in machines called mules and other machines for spinning cotton, wool, and other fibrous substances." Sealed December 8.

Percival Moses Parsons, of Waterloo-road, Surrey, civil engineer, for "certain improvements in steam engines and boilers, and in motive machinery connected therewith." Sealed December 8.

Charles Keene, of New Bond-street, hosier, for "improvements in the manufacture of hose, socks, drawers, gloves, mitts, caps, comforters, and cuffs." Sealed December 15.

William Palmer, of Sutton-street, Clerkenwell, manufacturer, for "improvements in the manufacture of candles." Sealed December 15.

Thomas Cardwell, of Bombay, in the East Indies, merchant, for "improvements in the construction of presses for compressing cotton and other articles." Sealed December 15.

Moses Poole, of Lincoln's-inn, gentleman, for "improvements in dressing mill-stones." Being a communication. Sealed December 15.

Charles Maurice Elizee Sautter, of Austin Friars, in the city of London, gentleman, for "improvements in the manufacture of sulphuric acid." Being a communication. Sealed December 15.

Guillaume Simon Richault, of the Sabloniere Hotel, Leicester-square, editor of music, for "improvements in apparatus for exercising the fingers of the human hand, in order to facilitate their use in the playing of the pianoforte and other instruments." Being a communication. Sealed December 15.

James Winchester, of Noel-street, hatter, for "certain improvements in steam boilers, and in the methods of applying steam or other power to locomotive purposes." Sealed December 15.

Edward Robert Rigby and Charles John Rigby, of Gracechurch-street, brush manufacturers, and co-partners, for "an improvement or improvements in the manufacture of certain articles in which bristles have been or are now used." Sealed December 21.

Gabriel Hippolyte Moreau, of Leicester-square, gentleman, for "certain improvements in steam generators." Sealed December 21.

Gabriel Hippolyte Moreau, of Leicester-square, gentleman, for "certain improvements in propelling vessels." Sealed December 21.

John Squire, of Ponghill, Cornwall, engineer, for "certain improvements in steam boilers or generators." Sealed December 21.

Tavernor John Miller, of Mill-bank-street, Westminster, oil merchant, for "improvements in apparatus for supporting a person in bed or when reclining." Sealed December 21.

William Bridges, of Birmingham, button tool maker, for "certain improvements in buttons." Sealed December 21.

Henry Purser Vaile, late of Fleet-street, gentleman, for "improvements in combining mechanical instruments for obtaining power." Sealed December 22.

Joseph Beaman, of Smethwick, Stafford, ironmaster, for "an improvement in the manufacture of malleable iron." Sealed December 22.

William Godfrey Kneller, of Wimbledon, chemist, for "improvements in the manufacture of soda in the evaporation of brine, and in the concentration and manufacture of sulphuric acid." Sealed December 22.

Robert Wilson, manager at the works of Messrs. Nasmyths, Gaskell & Co., at Patricross, near Manchester, engineer, for "certain improvements in locomotive and other steam engines." Sealed December 22.

James Morris, of Cateaton-street, London, merchant, for "improvements in locomotive and other steam engines." Sealed December 22.

PATENTS GRANTED FOR SCOTLAND, FROM OCTOBER 25th, TO DECEMBER 24th, 1842.

John Varley, of Colne, in the county of Lancaster, engineer, and Edmondson Varley, of the same place, cotton manufacturer, for "certain improvements in steam engines." Sealed October 26.

James Hyde, of Duckenfield, Cheshire, mechanic, and John Hyde, of the same place, cotton spinner and manufacturer, for "a certain improvement or improvements in the machinery used for preparing cotton, wool, silk, flax, and similar fibrous materials for spinning." Sealed November 3.

John Clay, of Cottingham, in the county of York, gentleman, and Frederick Rosendorg, of Sculcoates, in the county of York, gentleman, for "improvements in arranging and setting up types for printing." Sealed November 3.

James Pilbrow, of Tottenham Green, in the county of Middlesex, engineer, for "certain improvements in the application of steam, air, and other vapours and gaseous agents, to the production of motive power, and in the machinery by which the same is effected." Sealed November 7.

Francis Roubiliac Conder, of Highgate, in the county of Middlesex, civil engineer, for "improvements in the cutting and shaping of wood, and in the machinery for that purpose." Being a communication. Sealed November 9.

John Mitchell, of Birmingham, in the county of Warwick, steel pen manufacturer, for "a certain improvement in the manufacture of metallic pens, and a certain improvement in the manufacture of pen holders." Sealed November 11.

Henry Clarke, of Drogheda, in the county of Louth, in the kingdom of Ireland, linen merchant, for "improvements in machinery for lapping and folding all description of fabrics, whether woven by hand or power." Sealed November 17.

John Spinks, the younger, of John-street, Bedford-row, in the county of Middlesex, gentleman, for "an improved apparatus for giving elasticity to certain parts of railway and other carriages requiring the same." Being a communication. Sealed November 21.

Thomas Wrioley, of Bridge Hall Mills, Bury, Lancaster, paper manufacturer, for "certain improvements in machinery for manufacturing paper." Sealed November 28.

William Coley Jones, of Vauxhall-walk, in the parish of Lambeth, in the county of Surrey, chemist, for "improvements in treating or operating upon a certain unctuous substance, in order to obtain products therefrom for the manufacture of candles and other purposes." Sealed December 7.

Charles Maurice Elizee Sautter, of Austin Friars, in the city of London, gentleman, for "improvements in the manufacture of sulphuric acid." Being a communication. Sealed December 7.

Don Pedro Pouchant, of Glasgow, civil engineer, for "a certain improvement or improvements in the construction of machinery for manufacturing sugar." Sealed December 7.

Charles Heard Wild, of Birmingham, in the county of Warwick, engineer, for "an improved switch for railway purposes." Sealed December 7.

John Browne, of Charlotte-street, Portland-place, in the county of Middlesex, esquire, for "improvements in the manufacture of mud boots and overalls." Sealed December 7.

William Coley Jones, of Vauxhall-terrace, in the county of Surrey, practical chemist, and George Ferousson Wilson, of Vauxhall, in the same county, gentleman, for "improvements in operating upon certain organic bodies or substances, in order to obtain products or materials therefrom for the manufacture of candles, and other purposes." Sealed December 7.

William Losh, of Newcastle-on-Tyne, esquire, for "improvements in the construction of wheels for carriages and locomotive engines intended to be employed on railways." Sealed December 9.

Thomas Cardwell, of Bombay, in the East Indies, merchant, for "improvements in the construction of presses for compressing cotton and other articles." Sealed December 9.

Charles Augustus Preller, of Eastcheap, in the city of London, merchant, for "improvements in machinery for preparing, combing, and drawing wool and goats' hair." Being a communication. Sealed December 9.

THOMAS SEVILLE, of Royton, in the county of Lancaster, cotton spinner, for "certain improvements in machinery used in the preparing and spinning of cotton, flax, and other fibrous substances." Sealed September 9.

WILLIAM YOUNG, of Queen-street, in the city of London, lamp maker, for "improvements in lamps and candlesticks." Sealed December 12.

GEORGE EDMUND DONISTHORPE, of Bradford, in the county of York, top manufacturer, for "improvements in combing and drawing wool and certain descriptions of hair." Sealed December 12.

JOHN BISHOP, of Poland-street, in the county of Middlesex, jeweller, for "improvements in apparatus used for retarding carriages on railways, parts of which are applicable for portioning power, and improvements in steam cocks or plugs." Sealed December 12.

ISHAM BAGGS, of Wharton-street, in the county of Middlesex, chemist, for "improvements in the production of light." Sealed December 13.

GABRIEL HIPPOLYTE MOREAU, of Leicester-square, in the county of Middlesex, gentleman, for "certain improvements in steam generators." Sealed December 13.

JOHN GEORGE BODMER, of Manchester, in the county of Lancaster, engineer, for "certain improvements in the manufacture of metallic hoops and tires for wheels; and in the method of fixing the same for use; and also improvements in the machinery or apparatus to be employed therein." Sealed December 19.

WILLIAM LOMAS, of Manchester, in the county of Lancaster, worsted spinner, and ISAAC SLIMWELL, of the same place, worsted spinner, for "certain improvements in the manufacture of fringes, cords, and other similar small wares; and also in the machinery or apparatus for producing the same." Sealed December 21.

MOSES POOLE, of Lincoln's-inn, in the county of Middlesex, gentleman, for "improvements in dressing mill-stones." Being a communication. Sealed December 22.

WILLIAM PALMER, of Sutton-street, Clerkenwell, in the county of Middlesex, manufacturer, for "improvements in the manufacture of candles." Sealed December 22.

PATENTS GRANTED IN IRELAND FROM 25th NOVEMBER TO 25th DECEMBER, 1842.

JOHN MITCHELL, of Birmingham, in the county of Warwick, steel-pen manufacturer, for "a certain improvement in the manufacture of metallic pens, and a certain improvement in the manufacture of pen holders." Sealed December 5.

JOHN SPINKS, the younger, of John-street, Bedford-row, in the county of Middlesex, gentleman, for "an improved apparatus for giving elasticity to certain parts of railway and other carriages requiring the same." Being a communication. Sealed December 5.

MATTHEW GREGSON, of Toxteth Park, Liverpool, in the county of Lancaster, esquire, for "an improvement applicable to the sawing or cutting of veneers." Being a communication. Sealed December 10.

JOHN RIDSDALE, of Leeds, in the county of York, esquire, for "improvements in preparing fibrous materials for weaving and sizing warps." Sealed December 24.

JOHN BISHOP, of Poland-street, in the county of Middlesex, jeweller, for "improvements in apparatus used for retarding carriages on railways, parts of which are applicable for portioning power; and improvements in steam corks or plugs." Sealed December 24.

JOHN THOMAS BETTS, of Smithfield-bars, in the city of London, gentleman, for "improvements in covering and stopping the necks of bottles, jars, vases, and pots." Being a communication. Sealed December 24.

The Record

OF

PATENT INVENTIONS.

No. V.

Specification enrolled 1st December, 1842, of a Patent granted 1st June, 1842, to Henry Beaumont Leeson, of Greenwich, in the county of Kent, M.A., and Doctor of Medicine, for "*improvements in the art of depositing and manufacturing metals and metallic articles by electro-galvanic agency, and in the apparatus connected therewith.*"

The first part of this invention relates to improvements in the construction and arrangement of a galvanic battery, whereby the same can be better managed, and the quantity and intensity of the electric current regulated. This apparatus consists of a rectangular wooden trough, into which is placed a similar trough containing the porous cells, which fit into grooves cut on each side of the trough, and rest upon a ledge or flange formed at the bottom of the trough. This trough is open at the top and bottom, so as to allow a free communication of the electrolytic fluid or fluids with all the pairs of plates, which are suspended in the fluid from a piece of brass screwed to the side of the trough. Each piece of brass has three prongs or projecting bars, to which the plates are attached, and

each middle plate is suspended in one of the porous cells; the external oblong box or trough is provided with a conical plug, which can be taken out for the purpose of letting off the fluid. By this arrangement, the quantitative and intensity of the electric current can be increased or diminished, by merely raising or lowering the internal box which contains the plates and cells, so as to increase or diminish the depth to which the plates are immersed; or the electric current may be diminished by drawing the plug and thus allowing the liquid to run off, without at all deranging the apparatus.

The second improvement consists in the application of a galvanic battery for the purpose of amalgamating or coating the surface of zinc plates, and also in the application of the same for the purpose of cleaning copper and zinc plates which have been used in any battery.

The third improvement consists in the application of certain electrolytic fluids to be used in connection with nitric, muriatic, and sulphuric acid, for the purpose of exciting a galvanic current to be used in the deposition of metals; such, for instance, as the impure ammoniacal liquor, lime liquor after it has been used for the purpose of purifying coal gas, the impure alkaline sulphurets of potassium and sodium, the sulphurets of calcium, barium, and strontium produced from the sulphurets of lime, baryta, and strontia; and, lastly, in the use of sulphate of iron in connection with any of the above mentioned alkaline solutions, for the purposes described.

The fourth improvement relates to the mode of applying the galvanic current, in which is shown the maximum quantitative effect of batteries containing from four to eight pairs of plates, and also the quantity in cubic inches of gas produced per minute.

The fifth part of this invention relates to improvements

in the method of manufacturing works of art and other articles; and consists, first, in the application of an elastic mould to be employed for the purpose of obtaining casts: another part of these improvements relates to a method whereby silver may be deposited, and consists in using a strong solution of cyanide of silver and potassium, formed by dissolving from 10 to 20 ounces of pure salt in one gallon of distilled water, and adding thereto one ounce of cyanide of potassium, so that the latter salt may be slightly in excess.

The sixth improvement relates to a method whereby a smoother external surface may be obtained, and a greater amount of metal deposited in a given time; and consists in putting the object to be deposited upon in motion, which can be effected by an ordinary smoke-jack, or other mechanical means, or the electrolytic fluid may be put in motion by any known means.

The seventh improvement consists in the application of the electro-deposition of metals to the formation of parabolic and other reflecting surfaces and specula. In the first place, a mould is formed of the exact curve required, and silver, antimony, or other metal is deposited thereon, which is to be strengthened by a deposition of copper.

The eighth improvement relates to the deposition of metallic alloys: this is effected by connecting the article to be covered to the terminical cathode of two or more distinct batteries, according to the number of metals of which the alloy is to be composed, and placing the article to be covered in a solution composed of similar salts of the different metals to be deposited; and the cathode plate of each of the metals composing the alloy is to be placed in the solution, each of the plates being connected to the anode of one of the batteries.

The ninth improvement consists in the preparation of

metallic surfaces for electro-deposition, by first covering the same with a sliglit coating of metallic mercury, so as to produce greater adhesion of the metal afterwards deposited.

The tenth improvement relates to a mode of arranging the anode, or surface to be deposited upon, so as to assist in generating and maintaining a galvanic current; and consists in arranging the articles themselves in a series, as a portion of the battery, making the metals or articles to be deposited on anodes of the arrangement, and the cathodes by preference of the metal to be deposited; but zinc or other oxidizable metal may be employed.

The eleventh improvement consists in a method of depositing gold, silver, platinum, lead, zinc, tin, nickel, cobalt, and mercury, without the aid of a solution originally containing such metal; and consists in immersing the article to be deposited on in any fluid not containing such metals to be deposited, but capable of acting on or combining with the supply metal of which the deposit is to be formed.

The twelfth improvement relates to the electro-metallic deposition of metals, by the aid of a galvanic battery, as a means of manufacturing, extracting, or obtaining platinum and other metals from their respective ores.

The thirteenth improvement consists in forming or manufacturing platinum and other articles, and also in covering and coating other articles or surfaces therewith.

And lastly, this invention relates to the application of compounds of metal not heretofore proposed to be used for the purpose of furnishing an electrolytic solution to be employed in depositing the respective metals. Some of the compounds of metal mentioned in the Specification are cyanide of platinum and potassium, perchloride of platinum and barium, perchloride of platinum and potas-

sium, perbromide of platinum and sodium, sesquicyanide of platinum and ammonium, persulphocyanide of platinum, sulphomolybdate of platinum, hyposulphomolybdate of platinum dissolved in sulpharseniate of platinum, hyposulphomolybdate of gold, subsesquiarseniate of silver, sulphocyanhydrate of silver; with about two thousand others.

The patentee claims as follows :—First, the improved method of constructing a galvanic battery, without limit to any particular dimensions, and the particular mode of placing or constructing the metal bars connecting the cathode and anode poles, so that one plate can be readily removed or changed without disturbing the remainder; also the mode of separating and arranging the porous cells in one frame, so that the whole can at once be removed. Secondly, the application of a galvanic battery for the purpose of cleaning the copper and zinc plates used in any battery, and for the purpose of depositing mercury upon the zinc plates. Thirdly, the application of the electrolytic fluids mentioned, for the purpose of exciting an electric current to be used in the deposition of metal. Fourthly, the use of what the patentee terms the "intensity arrangement," for the purpose of obtaining a good metallic deposit, consisting in the use of a galvanic battery composed of more than ten pairs of plates. Fifthly, the method of manufacturing works of art and other articles in silver, by depositing the metals upon moulds of wax, plaster of paris, and other non-conducting surfaces, by using a strong solution of cyanide of silver and potassium, prepared in the manner described; also the use of elastic moulds for the purpose of producing casts to be employed for the purpose of electro-deposition, and also the peculiar method of obtaining a deposit on badly-conducting surfaces. Sixthly, the giving motion to the surface to be deposited upon, or to the electrolytic fluid in which such surface is

immersed, during the period of electro-deposition. Seventhly, the application of the electro-deposition of metals and metallic alloys to the formation of the reflecting surfaces of parabolic and other reflectors and specula. Eighthly, the methods of depositing metallic alloys, as described. Ninthly, the method of preparing metallic surfaces for electro-deposition, by previously covering the same with a slight coating of metallic mercury. Tenthly, the method of arranging the articles to be deposited upon, so as to assist in generating and maintaining the galvanic current. Eleventhly, the method of depositing metals by the aid of electrolytic solutions not originally containing such metals as component parts thereof, when in conjunction with a cathode of the metal to be deposited. Twelfthly, the use of electro-depositions, when employing the cathode herein mentioned, as a means of manufacturing platinum and other metals from their respective ores. Thirteenthly, the application of electro-deposition to the manufacture of vessels and other articles of platinum; also the method described of covering metal and other surfaces with platinum; and lastly, the application of the compounds of various metals set forth in the Specification as not having been heretofore used for the purpose of the deposition of such metals.

SPECIFICATION enrolled 1st December, 1842, of a PATENT granted 1st June, 1842, to WILLIAM HENRY KEMPTON, of South-Street, Pentonville, in the county of Middlesex, gentleman, for "*improvements in the manufacture of candles.*"

THIS invention relates to certain improvements in the manufacture of candles in which plaited wicks are employed, and consists in combining with or binding to the

side of a plaited wick a cord, bobbin, braid, string, or yarn, or other preparation of fabric. The plaits forming these wicks are similar to those in common use, but plaited not quite so hard; and are composed of three strands of soft cotton yarn, having several yarns in each strand, laid side by side and plaited in the ordinary manner. The cotton cord, which is to be bound on one side of the plaited strands, and which the inventor employs, consists of three strands of cotton yarn, each strand consisting of three yarns of cotton, the strands being twisted separately and then twisted together. It will be necessary to observe, that the cord, or other preparation of fibres twisted into a cord or yarn, should not be too strong for the wick; and also that, in affixing such cord to the plaited wick, it is placed on that side of the wick where the strands of which the plait is composed run upwards and from the centre outwards to the edges of the plait. By this arrangement, the wick will be controlled in its burning outwards, or separating, and the candle will burn more brilliantly and steadily, and not be so liable to gutter.

The inventor claims the application of plaited wicks combined with bobbin, braid, cord, or yarn, or other like preparation of fibres, whereby the plaited wick is regulated and controlled in its burning out of the flame.

SPECIFICATION enrolled 2nd December, 1842, of a PATENT granted 2nd June, 1842, to JAMES REED, of Bishop's Stortford, in the county of Hertford, statuary and mason, for "*improvements in tiles, slating, and the construction of water-tight joints, and in the covering and casing of buildings and other erections.*"

THESE improvements consist, first, in an improved form

and method of manufacturing by pressure, roofing, facing, paving, and other tiles, and in certain methods of ornamenting the same. The drawing shows several forms of tiles, each having an edge or rib projecting about three-eighths of an inch above the upper surface of the top part of the tile; and also a projecting edge or rib on the under side of the tile, each projection occupying about one-half of the circumference of the tile; so that when two or more tiles of the same pattern are placed together on the building, the projection on the under side of one tile shall overlap the raised part or projection of the tile below, in as nearly corresponding, or parallel, curved, or oblique lines as possible, according to the peculiar form or shape of the tile employed. The clay, after being prepared in a pug-mill, or otherwise, in the ordinary manner (care being taken to use as little water as possible, in order to prevent it from shrinking), is to be formed into plane slices, which are to be laid upon or between a pair of dies, and submitted to the action of a press, in order to give the proposed material for the tile the shape and impression required for one side. It is then submitted to the action of another pair of dies, in which can be cut or engraved crests, arms, or other devices, and which dies complete the form of the tile, which is afterwards dried in a closed house or shed; after which it is burnt in the ordinary manner. The drawings give a description of a machine for compressing and stamping the said tile; and consists of a pair of dies, the upper one being weighted or acted upon by some elastic power; and the lower die, which is capable of moving to and fro, for the purpose of placing the slices of clay upon it, is acted upon by a slide, which moves up and down in the framing by means of a connecting rod and a crank shaft; at every revolution of which the lower die is lifted up or forced against the upper die.

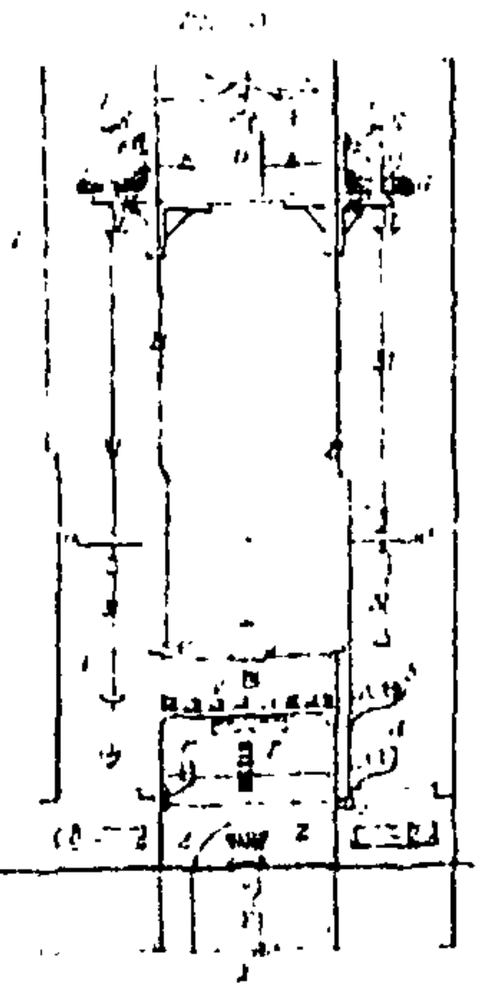
The second part of these improvements consists in an improved compressed composition of materials for manufacturing tiles, &c.; which composition is fit for use without subsequent burning, and consists in equal quantities of ground or pulverized bricks, tiles, or other earth, having been previously burnt, and newly slaked lime or other cement incorporated together with a sufficient quantity of water, which is to be first applied to the lime or cement in order to bring it to a creamy state; to which is to be added the pulverized material, and the whole well mixed together until sufficiently stiff to be worked. This composition is then to be placed into moulds and submitted to the action of a powerful press, which will have the effect of making the particles adhere more firmly; at the same time the composition can be formed into the peculiar form of tile required.

The third part of these improvements consists in a peculiar method of covering and casing buildings with slates, stones, and other slabs; also in laying, arranging, and fastening or securing the same, and rendering the joints water-tight. In covering roofs, the rafters or battens are laid at an angle of 45 degrees with the front walls, and the slates or other covering are of a diamond form, having the lateral corners cut off. These slates or coverings are nailed by their edges to the rafters, so as to overlap one another; and in order to secure the same against strong winds, the inventor employs an improved tie-bolt; and in order, also, to prevent the same from rattling, a piece of cord, such as a pitch band, is placed between those parts of the slates which overlap each other. The patentee also makes use of a disc of india rubber underneath the head of the tie-bolt, which prevents the wet from getting through the hole; and also applies strips or bands of caoutchouc, in an elastic state, between the slates or

slabs and the rafters or timbers employed in roofing and casing buildings.

The claims are as follow :—First, the peculiar form of roofing tiles, whereby the patentee obtains the overlapping joint in diagonal, oblique, and curved lines, by the application of reversed fillets or projections, as described. Secondly, the peculiar form of valley eaves and barging tiles. Thirdly, the forming of stone, slate, and other slabs for roofing and covering buildings, with reversed fillets. Fourthly, the peculiar form of facing tiles, with receding steps, fillets, bevilled or ornamented edges and shoulders; the outward edges of their surfaces fitting into or corresponding with the outward edges of other similar tiles in oblique and curved lines, as described. Fifthly, the manufacturing of tiles, mouldings, and facings, and other bricks and slabs, in a press, by stamping and pressing the same out of plane slices or surfaces of clay or other material; and in raising or depressing thereon crests, arms, and other devices. Sixthly, the use and application of pulverized brick, tile, or other burnt clay or material, mixed with lime or other cement, in the manufacturing of tiles, for the purpose and in the manner described, instead of being subjected to the fire in the ordinary manner. Seventhly, laying the rafters of buildings obliquely, for supporting and fixing thereto slates and other slabs in diagonal or oblique lines, without the use of battens; and, where battens are used, fixing the same in oblique directions, and slating upon them in a diagonal direction with square slates; and also the mode of fastening several slates or slabs by one and the same pin, as described. Lastly, the use and application of collars, bands, and strips of caoutchouc or india rubber, in an elastic state, for rendering the joints or parts to which it is applied, in roofing, covering, and casing buildings, water-tight.

Robbins' Improvements in Kitchen Ranges, and Apparatus for Cooking.





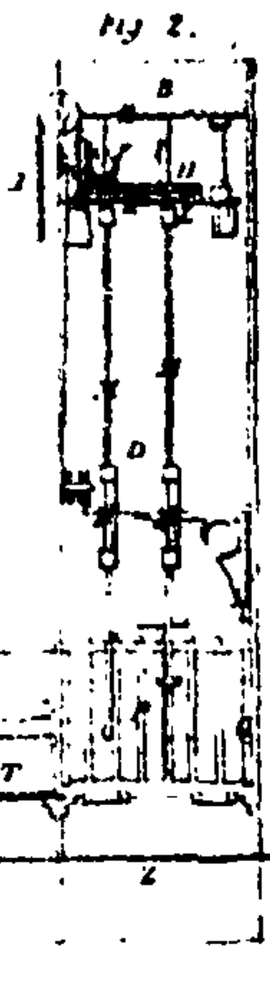


Fig 2.

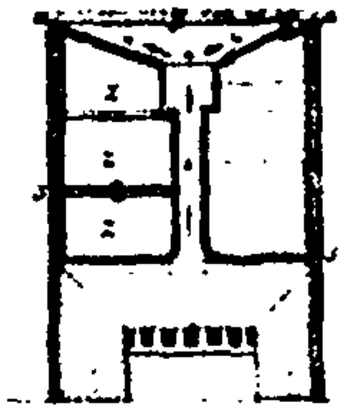


Fig 13

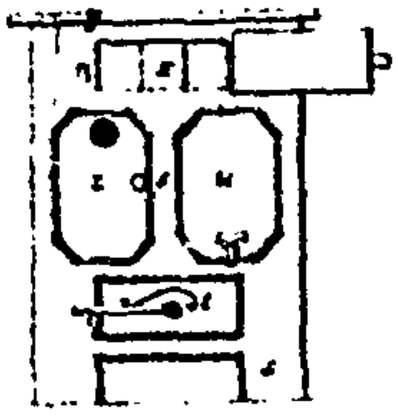


Fig. 12.

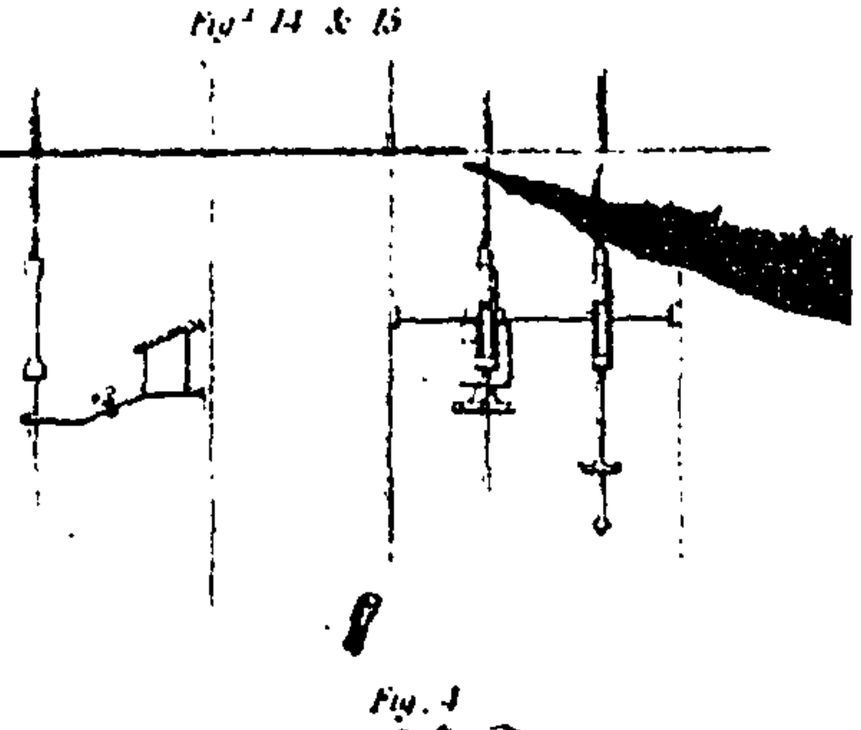


Fig 14 & 15

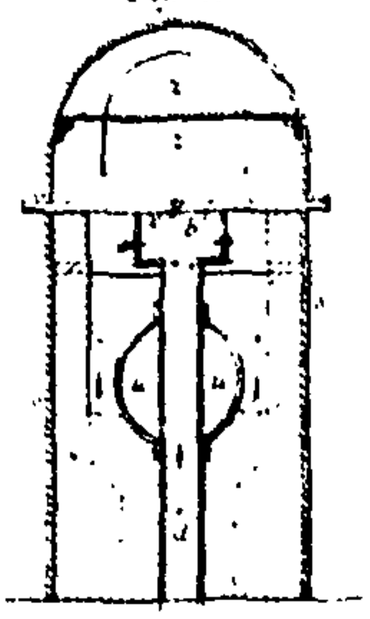


Fig 11

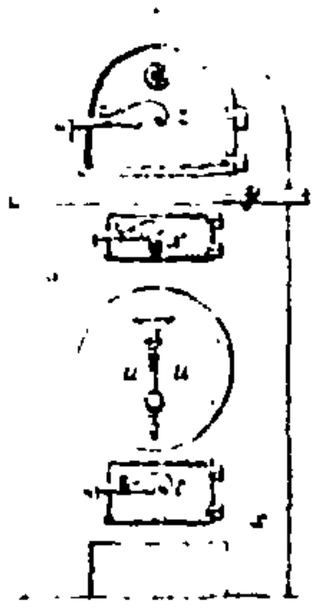


Fig 9

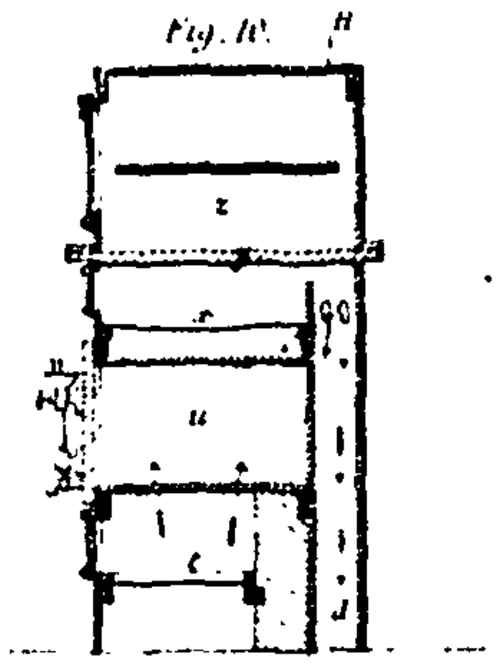


Fig. 10.

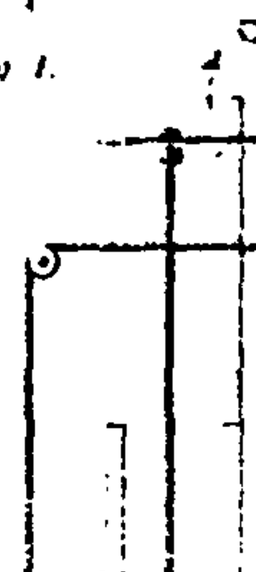


Fig. 3

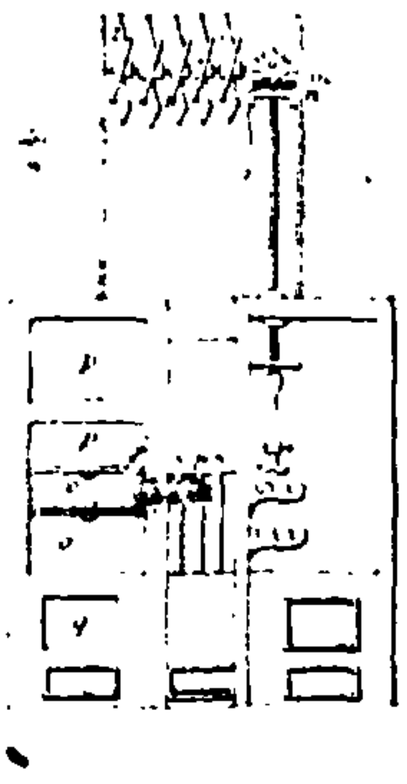


Fig 8

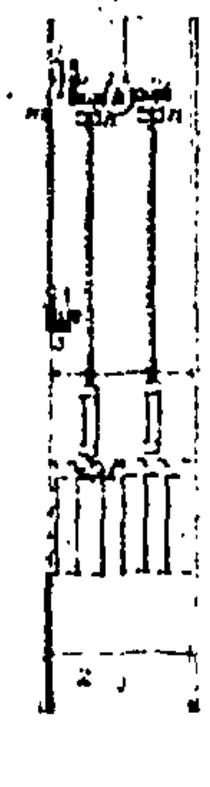


Fig 7

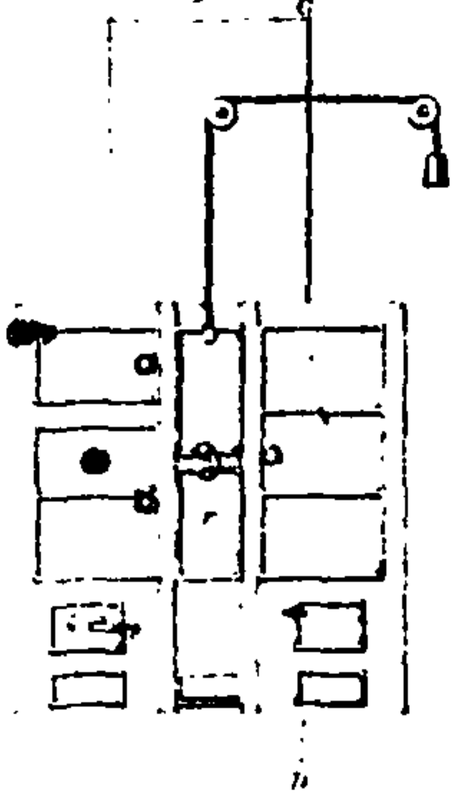


Fig 6

Fig 1.

SPECIFICATION enrolled 2nd December, 1842, of a PATENT granted 2nd June, 1842, to HENRY JUBBER, of Oxford, in the county of Oxford, confectioner, for "*certain improvements in kitchen ranges, and apparatus for cooking.*" (With a drawing.)

THIS invention relates to certain improvements in the construction of kitchen ranges, and apparatus for cooking, and consists in a novel and peculiar arrangement and combination of the parts connected therewith, whereby great economy in fuel is effected, and the process of cooking rendered less laborious to the attendant, and more effective than by the use of the apparatus hitherto employed for that purpose.

In plate 5, figure 1 represents a front elevation of an apparatus for cooking.

Figure 2, a vertical section of the same, taken through the line A B.

Figure 3, an elevation of the apparatus, a portion thereof being removed, in order to expose to view the internal mechanism, and also the general arrangement of the parts.

Figure 4, a detached view of an ordinary smoke-jack.

Figure 5, another arrangement of hot plate.

Figures 6, 7, 8, represent another arrangement of cooking apparatus, calculated for small establishments.

Figure 6, being a front elevation thereof.

Figure 7, a vertical section, taken through the line C D; and

Figure 8, an elevation, a portion of the front being removed to expose the internal arrangement of parts.

Figures 9, 10, 11, represent another arrangement and combination of parts, constituting an entire apparatus for

cooking; and figures 12, 13, a modification of the same.

Figure 9, being a front elevation thereof.

Figure 10, a vertical section, taken through the line E F.

Figure 11, a vertical section, taken through the line G H.

Figure 12, a front elevation.

Figure 13, a vertical section; and

Figures 14, 15, an arrangement for basting the meat.

In figures 1, 2, 3, 4, 5, A A represents a rectangular case or framing of metal, against one side of which vertical plates B B are firmly secured (by rivetting at the back) for carrying the mechanism employed to actuate the vertical and horizontal spits; the middle compartment C forming a metallic flue, at the upper part of which an ordinary smoke jack D is situated, (a detached view of the same being shown at figure 4) for imparting motion to the horizontal axis E, upon each end of which, mitre wheels F F are keyed, taking into corresponding wheels G G, motion being imparted from thence to spur wheels H H, which are likewise keyed upon vertical axes I I, situated in top and bottom plates K K, as represented by the drawing; L L, collars screwed upon or otherwise connected to the lower ends of the vertical axes; into these collars is inserted and made fast, one end of a fine wire rope M M, the other end being similarly secured in collars formed at the upper ends of the vertical spit carriers N N; O O, rack plates (see detached figure 5*) fixed to the sides B B, to enable the cook to place the spit at any required distance from the fire; P P, the grate, extending from back to front of the frame or casing A A, and furnished with a sliding cheek Q, worked by a rack and pinion R S; the arrangement and construction of this part of the invention forms an important feature in these improvements; the quantity of radiating surface of the fire exposed and available for the

purposes of cooking being considerably augmented by constructing the grate in such manner as that the three sides of the fire are beneficially employed, as represented by the drawing: T, a boiler, fixed to the front of the grate, and furnished with steam cocks, which may be used as required, the surplus steam passing off through an opening *x*, formed at the upper part of the boiler, as shown, and from thence through the fire or otherwise, as may be found most convenient; U, a hot plate, situated at the front of the framing A, heat being furnished to the same from the fire V, an opening W being made therefrom into the grate P; X, an air flue, situated in front of the hot plate; the air, which passes through a vertical perforated pipe Y, to supply the fires, is prevented from passing in any other direction than through the under side of the fire, by the hinged plates Z, situated at each side of the grate, the quantity of air admitted thereto being regulated by a damper *a*; *b b* slides for carrying dripping pans. Figure 5 shows another arrangement of hot plate, by which the necessity for a separate fire is dispensed with, and the heat from the water and steam contained in the boiler employed to effect the same; since, however, an open fire may occasionally be found necessary, provision is made for this purpose at *c*, a damper *d* being situated in the flue leading therefrom, which communicates with the main flue as represented.

The operation of the apparatus is as follows:—The fire being previously lighted in the grate P, and the spits charged with meat, motion will be imparted to the jack, by the ascent of rarified air, and from thence to the wire ropes or rods, to which the vertical spit carriers N N are attached; the horizontal spits receiving motion from a wire rope, passing over a rigger 1, fixed upon the axis *e*, and from thence over riggers 2, 3, 4, 5; and in order that

as much heat as possible may be rendered useful, sliding doors *f*, *g*, *h*, are employed, furnished with counterbalance weights, which it will only be found necessary to open when requiring to feed the fire, or notice the progress of cooking. It is obvious also, that instead of the peculiar arrangements hereinbefore described, of a boiler and hot plate in front of the fire, the boiler might be placed at the back, and the front of the fire used as an open fire, without departing from the principal features of the invention, namely, the rendering the fire at the two sides available for the purposes of cooking, as above described.

The patentee wishes it to be understood, that in this part of his invention he does not claim the exclusive use of any of the separate parts above mentioned and referred to, except so far as the same may be used in combination for the purposes of his said invention; one part of which he declares to consist in the construction of a kitchen range, or cooking apparatus, whereby the heat radiating from the fire exposed between the bars, on the two sides, may be rendered available for the purposes of cooking.

In figures 6, 7, 8, the drawings represent a more simple arrangement and construction of apparatus, possessing all the advantages of that above described; but being less in size is more portable, considerably less expensive, and better calculated for general domestic purposes. In place of the ordinary smoke-jack, shown at figure 4 (plate 5), the patentee employs a series of fans 1 1, mounted upon the horizontal axis *k k*. At one end of this axis a worm *l* is keyed, taking into worm wheels *m*, secured in their proper position by collars formed thereon, working in brackets *n n*. These worm wheels actuate the vertical spits, which are similar to those referred to above, with this difference, that by this arrangement only one set of spits is employed, an oven *o*, and hot plate *p*, and

hot closet *p'*, being substituted in the place of the second set. A set of horizontal spits may be employed in the apparatus, by the application of arrangements similar to those already described in the first part of this invention. In order that the heat arising from the fire may be made to act upon all sides of the meat, the oven is furnished with revolving shelves; *q*, a fire-place, having a flue communicating with the chimney, and furnished with a damper, by which a separate fire may be used when necessary, the apparatus being provided with doors similar to those used in the former apparatus, and being for the same purpose. As the front of the fire is not furnished with a boiler, a sliding door *r* is substituted, so that this part of the fire may be rendered available when required.

The patentee does not claim the exclusive use of any of the separate parts of the apparatus above mentioned, except when the same are used in combination for the purposes of his said invention; another part of which he declares to consist in the construction of a kitchen range, or cooking apparatus, whereby the heat radiating from the fire exposed between the bars, on one side, may be rendered available for the purposes of cooking.

In plate 5, figures 9, 10, 11, *s s* represents a rectangular casing, or box of metal, at one part of which a furnace *t t* is formed, the fire of which imparts heat to water contained in the cylindrical boiler *u*, which is provided with the necessary means of escape of steam, and drawing off the water when required; an arrangement being likewise made for ascertaining the quantity of water in the boiler, by the application of an ordinary water gauge *v*, at the top of which a funnel *w* and cock are fitted, for the purpose of filling the boiler; the whole being firmly fixed to the casing, as represented by the drawing. Immediately over the boiler *u* a second furnace *x* is situated, being for

the purpose of imparting heat to the hot plate *y*, and transmitting it from thence to an oven *z*, situated at the top of the hot plate, as represented by the drawing; this oven may be removed, when required, to use the hot plate. The patentee remarks, that from the portability of this oven it can, with a trifling modification, be adapted to any ordinary range or grate. The furnace *t t* is constructed with flues (the course of which is represented by the arrows' flight), and communicates with a descending flue *a'* by holes formed in the sides of the upper furnace *u* at **, an opening being made at *b'* communicating between the furnace *x* and descending flue. In figures 12 and 13, similar letters to those used in the foregoing figures are placed upon corresponding parts of the apparatus.

The patentee does not claim the exclusive use of any of the separate parts of the apparatus lastly above described, except when the same are used in combination for the purposes of his said invention; another part of which he declares to consist in the particular combination and arrangement of parts lastly above described, for the construction of an apparatus for cooking.

SPECIFICATION enrolled 3rd December, 1842, of a PATENT granted 4th June, 1842, to BENJAMIN AINGWORTH, of Birmingham, in the county of Warwick, gentleman, for "*certain improvements in the manufacture of glass, for the purpose of producing glass which may be used for the purposes to which plate glass and window glass are usually applied.*"

THESE improvements in the manufacture of glass consist in the application of machinery for the purpose of pro-

ducing plate glass, which machinery greatly facilitates the operation of casting glass into flat plates of uniform thickness. The ordinary mode of casting glass into flat plates is by pouring out the melted glass in a thin broad stream upon the upper surface of a large flat table of metal fixed in a horizontal position, and the melted glass is retained from spreading itself too wide by means of two metal rulers, which have been previously laid down lengthwise upon the surface of the table, along each of the sides thereof and parallel to those sides; the edges of the two rulers forming temporary raised borders, and the said edges being placed at such distance asunder as will suit the width of the plate glass intended to be cast. The thickness of the said rulers is equal to the thickness of the plate intended to be cast; and in order to retain the melted glass endways on the table, another ruler of like thickness is laid transversely across the width of the table, extending from one side ruler to the other; and in order to flatten down the melted glass evenly on the surface of the table, and to a uniform thickness, a heavy cylindrical roller of metal is used for rolling over the outpouring of the melted glass. For this purpose the roller is laid with its axis horizontally across the width of the table, the roller resting near to its ends with its circumference upon the said rulers, which bear the weight of the roller; the table, together with the two rulers, and also the roller, are all made hot, in preparation, for the operation of casting, in order to avoid chilling the glass too suddenly. Soon after the melted glass has been poured out on the surface of the table, the said roller is rolled by manual labour upon the surface of the glass and the two rulers, but without any guidance for moving the roller regularly upon such surface, so as to advance equally at each end of the roller, which operation depends entirely upon the

dexterity of the workmen, who give motion to the roller by holding the ends of the axis of the roller in their hands, and advance steadily over the surface of melted glass, in order to flatten it down upon the table. The melted glass is poured out from a square melting pot or cistern of a suitable rectangular form, for pouring out its contents in a broad thin stream upon the table; the cistern is suspended by chains, by means of a crane, the same being suspended upon pivots, so as to be convenient for tilting the cistern by means of handles; during all the time of the pouring out of the melted glass from the suspended cistern, the latter requires to be moved along by the workmen who tilt it, so that it may retreat over the surface of the table with a steady progress, in a direction of the length of the table. There is also a moveable cross ruler laid upon the table between the two side rulers, which cross ruler is moved by workmen, by means of a long handle, so as to withdraw the same as fast as the melted glass requires: all which motions are to be regulated by the skill of the several workmen. The tilting motion given to the cistern for the outpouring of the melted glass, and the retreating motion which is given to the same cistern, and to the moveable cross ruler for distributing the outpouring with uniformity of quantity along the length of the table, must be regulated, one motion to suit the other, so as to pour out the melted glass with the utmost attainable regularity of progression along the surface of the table, and also the rolling motion must be regulated to suit the consistence of the layer of melted glass, so that the roller will follow with regularity and in due time after the outpouring of the melted glass; all which regularity and steadiness of motion, and the requisite consort of the different motions, depend solely upon the manual dexterity and skill of the workmen employed.

The object of the patentee in mentioning these particulars is to point out in what department in the manufacture of glass it is that the said invention is to be applied, and also to show how the machinery employed in the operation differs from the usual apparatus and manipulations required for the purpose aforesaid. The machinery for this purpose is similar to that above described, but the same is applied and used in a different manner, that is to say, the table, instead of being fixed horizontally, is caused by suitable machinery to move horizontally backwards and forwards in a direction of its length with a true sliding motion; and the cylindrical roller, instead of being a mere loose roller, is mounted with its axis horizontally across the table, the two ends of its axis being sustained in bearings formed in fixed standards, which are bolted to the bed of the machine, upon which the table slides, such standards constituting part of the fixed framing whereon the moving table is sustained.

The table, it will be observed, works in a similar manner to the table of a planing machine; and at one end of the roller a spur wheel is fastened, which takes into and is driven by the teeth of a straight rack, which rack is fastened to one side of the table, the diameter of the roller being equal to the pitch line of the tooth of the wheel; by this arrangement, the motion of the surface of the table and that of the roller will be at one and the same speed, the roller being suspended in its bearings at such a height above the table as will leave space sufficient for the thickness of the plate of glass intended to be cast, the bearings of the roller being so arranged as to allow of the roller being raised or lowered according to the thickness of plate required. The requisite motion for moving the table backwards and forwards is shown in the Specification to be effected in a variety of ways; suffice it to say, that the

same may be effected either by manual labour or steam power.

In order to give heat to the table, so as not to chill the melted glass, a horizontal flue, which proceeds from a fire-place, passes along the under side of the table; this flue is covered with flat stones, the upper surface of which are placed as close to the table as they can be without touching the same; the flat stones becoming hot, transmit the requisite heat to the table. The fire-place and flue are contained within the fixed framing or bed of the machine; and, in order to give heat to the cylindrical roller, hot water may be caused to circulate through a coil of pipes, made to fill the interior of the roller, the said pipes being provided at each end with a swivel joint or stuffing boxes, so as to form water-tight junctions at each end of the axis of the roller; and, if required, the table may be heated by the same means, namely, the circulation of hot water through a series of pipes. The operation of casting glass into plate is as follows:—presuming the table and roller to be got up to a proper temperature, and the melted glass to be in the cistern, which is suspended over the table (the end of which table, at the commencement, is to be near the roller), and the pouring out of the melted glass from the cistern, which is performed in the usual manner by workmen tilting the cistern, and at the same time moving the cistern backwards, so as to deposit a broad thin sheet of glass over the surface of the table, the glass having acquired a proper consistency, then the machinery is put in motion, either by the strength of men turning the handles of the machine, or otherwise, which causes the table with the glass upon it to move with an even and steady motion, carrying the glass beneath the roller which flattens down the upper surface upon the surface of the table, thereby reducing the glass to an even thickness. When the table

has thus been moved all the length of its range, and the whole of the glass will have moved underneath the roller, the machinery is to be stopped, and the table and glass remain at rest until the glass is sufficiently stiff for the purpose of removing it to an annealing oven, which the inventor effects by causing the machine to run on wheels upon a railway with a travelling motion sideways with respect to such table, in order that the table may be transported from opposite one annealing oven to another, the several parts of the machinery being so arranged as to admit of the machine being removed in the manner described.

SPECIFICATION enrolled 3rd December, 1842, of a PATENT granted 4th June, 1842, to EDMUND TUCK, of the Haymarket, in the county of Middlesex, silversmith, for "*certain improvements in the covering or plating with silver various metals and metallic alloys.*"

THIS invention consists in the use and application of either of the two carbonates of ammonia, (viz., the sesqui-carbonate and the bi-carbonate,) as one of the ingredients in the mixtures or compounds employed for covering or plating with silver various metals and metallic alloys by the action of electricity. And it is found that by the use of the said carbonates, the silver so deposited and constituting such covering or plating, has not a crystalline character, and is firmly adherent to the surface of the metal.

Bi-carbonate of ammonia may be purchased of the manufacturing chemist, or may be prepared in various ways; among others is the following: take any quantity of the solid carbonate of ammonia of commerce (called sesqui-

carbonate of ammonia), reduce it to a coarse powder, and expose it to the air till it ceases to exhale or give off the pungent odour characteristic of that salt. This change will take place, under ordinary circumstances, in twenty-four hours, more or less, and the salt will have lost from forty to about fifty-two per cent. of its original weight, and will be found to have become bi-carbonate of ammonia; the composition of which is one equivalent (or by weight about 17 parts) of ammonia, two equivalents (or by weight about 44 parts) of carbonic acid, and one equivalent (or by weight about 9 parts) of water.

The material of the articles usually plated with silver is either copper or its alloys, and of these alloys, especially that which is commonly called German silver. This latter consists essentially of copper, nickel, and zinc; but the different manufacturers of this alloy do not use precisely the same proportions of the said ingredients, nor are these ingredients (especially the nickel) brought respectively to equal degrees of purity. Hence the process of plating German silver requires certain adjustments in the proportions of the substances used, and in certain variations in the manipulation, in order to secure in all cases the best result. But these adjustments and variations it is not possible to point out precisely, depending as they do on the varying quality of the alloy.

It has been already stated that bi-carbonate of ammonia is one of the ingredients in the mixture or compound which is employed by the patentee for plating. The other ingredient which the patentee employs is a salt of silver; and he finds it advantageous to vary the salt of silver according to the nature of the metal or alloy intended to be plated. For the common alloys of the so-called German silver, he uses the compound or mixture of a solution of bi-carbonate of ammonia with the sulphate of silver; for plating on

copper or on good German silver, he uses the compound or mixture of bi-carbonate of ammonia with the cyanide of silver; and he observes, that though the latter compound may be used to plate the common alloys of German silver, and the former compound to plate copper or good German silver, the use of these respective compounds, for such purposes, is not so advantageous, according to his experience, as those firstly mentioned. Both of these salts may be purchased of most manufacturing chemists, or may be made in the following way: to prepare the sulphate of silver, he takes a cold saturated solution of the salt called nitrate of silver, and adds gradually to it strong sulphuric acid, as long as any white precipitate comes down; he then washes the precipitate with small portions of cold distilled water, till the excess of acid is got rid of; he then dries the powder at a gentle heat: when it is fit for use. The sulphate of silver thus prepared is composed of one equivalent (by weight about 40 parts) of sulphuric acid, and one equivalent (by weight about 116 parts) of oxide of silver. The cyanide of silver may be made by putting any convenient quantity of the yellow salt called prussiate of potash, or ferro-prussiate of potash, or ferro-cyanide of potassium, into an earthen crucible, and exposing it to a low red heat for a quarter of an hour; the black mass thus produced is to be digested in warm distilled water, which when passed clear through a filter is a solution for the most part of cyanide of potassium; to this is to be added, gradually, a cold saturated solution of nitrate of silver, as long as a white or greyish white precipitate comes down: the precipitate, when washed in cold water and dried, is cyanide of silver, and consists of one equivalent (by weight about 108 parts) of silver, and one equivalent (by weight about 26 parts) of cyanogen. The way of preparing the plating mixture or compound, which

he has found to afford the best results, is to take one equivalent (that is 70 parts by weight) of bi-carbonate of ammonia, and one equivalent (that is 156 parts by weight) of sulphate of silver, or one equivalent (that is 134 parts by weight) of cyanide of silver. The bi-carbonate of ammonia is to be dissolved in distilled water, and the sulphate or cyanide of silver (whichever is made use of,) is then to be added, and the liquor is to be boiled till the salt of silver is entirely dissolved. The strength of the solution, that is the preparation of water, must be regulated by the strength of the galvanic battery made use of. The strongest solution used by the patentee for coating bad German silver, was composed of half an ounce of sulphate of silver, and 107 grains of bi-carbonate of ammonia, dissolved in one pint of water.

The kind of electricity whereby the plating mixtures above mentioned are made to deposit their silver on the metal or alloy to be plated, is that which is produced by means of a galvanic or voltaic battery; and of the various forms of such battery, which have been invented and published, the patentee prefers a modification of that commonly known by the name of Daniell's Constant Battery, of which a description is given in the 439th page of a book, intituled, "An Introduction to the Study of Chemical Philosophy, &c.," by J. F. Daniell, F.R.S. The modification of this battery which is employed, is a rectangular trough of seasoned wood, the cavity of which is divided longitudinally by a thin partition of porous wood into two cells, one of which is twice as wide as the other. The wide cell is again subdivided, by a longitudinal partition, into two equal cavities, which have free communication, because the partition does not quite touch the two ends of the trough. Of these two cavities, the outer is to be filled with crystals of sulphate of copper,

and the inner one with a solution of sulphate of copper and water; a plate of copper is also inserted in this cavity: the other cell is filled with water, and a plate of zinc is also put into it. Near the above mentioned trough or battery is placed another trough, having no partition, and containing the plating mixture or compound. The article to be plated, and a piece of zinc, are put into the plating mixture on opposite sides of the trough, the article to be plated being connected by means of a strip of copper with the zinc plate of the battery, and the piece of zinc being connected by a strip of copper with the copper-plate of the battery. The general proportion of the copper to the zinc surface of the battery, is as four of copper to one of zinc, but the proportion of copper must be increased when operating on those metals or alloys that have but a feeble affinity for silver. The article to be plated must first be made quite clear. The method which the patentee uses for this purpose, is to put it for two or three hours in a cold solution of common carbonate of potash and water, and then to wash it in cold water, and afterwards dip it in a pickle, which is a mixture of aqua-fortis and water, the proper strength of which depends on the nature of the metal or alloy of which the article is made. It is next to be washed and dried, and well rubbed with rottenstone on a rag or piece of leather. In operating on German silver, the quality of the alloy may be judged of by its appearance when taken out of the pickle, the best kinds having a perfectly white surface, the inferior kinds having a surface more or less dark coloured. Immediately before immersing the article in the plating liquid, it is dipped in a solution of common salt, in which a little gum has been dissolved. The strength of the battery must be such as to give a slow and even deposit of silver on the surface of the metal or alloy to be plated.

The usual time for obtaining a satisfactory deposit is three or four days; a perfect coating, indeed, is obtained in an hour, but the further length of time required depends on the intended thickness of the plating.

The patentee states that he does not claim the exclusive use of any of the several processes herein before described, except so far as any of them may be used in connexion with, or in aid of his said invention, which he declares to consist in the use of either of the two carbonates of ammonia, namely, the sesqui-carbonate, and the bicarbonate, as one of the ingredients in the mixtures or compounds employed for covering, or plating with silver, various metals and metallic alloys by the action of electricity.

SPECIFICATION enrolled 7th December, 1842, of a PATENT granted 7th June, 1842, to WILLIAM IRVING, of Regent Street, Lambeth, in the county of Surrey, engineer, for "*an improved corn drill, or machine for sowing all kinds of seed or grain.*"

THESE improvements consist in certain arrangements of mechanical parts in a drill, and in the application of discs for sowing the grain. Upon the main axle of the machine is a wheel, taking into and driving a wheel keyed upon a shaft extending across a frame, which drives by an arrangement of wheels a number of vertical shafts fixed in centre of the seed boxes, the bottom of which are covered with a plate of iron, having a circular recess which receives a disc of iron, or other metal keyed on the end of the vertical shaft; these discs have one or more holes through them, and there are also holes through the plate and bottom of the seed box leading to pipes

which conduct the seed or grain to the furrows; a small stiff brush is fixed over the last mentioned holes, which bears into the face of the disc. Motion is communicated to this part of the machine by means of a clutch box at each end of the shaft, which, by the application of a lever, throws the said shaft into gear with the wheels of the drilling machine, and, consequently imparts, by the arrangement of wheels, a rotary motion to the discs, the holes of which, (as they revolve) become filled with seed, and on arriving underneath the brushes, pass through the holes in the bottom of the seed box, and into the tube leading to the furrow; the object of the brushes is to brush from the surface of the plate, at that part where the hole is, the superfluous seeds, and also to prevent any more than what is contained in the hole to pass into the pipe. Motion is also communicated from the first driving wheel to two shafts fixed in a box containing manure; one of the shafts is provided with a number of arms for agitating the manure, and the other with a number of spoons for lifting or lading the same, and it is conveyed by pipes into the furrows simultaneously with the seeds.

The coulters of this machine are attached, by means of chains to a roller, fixed in plummer blocks at each side of the machine, by turning which the coulters can be raised from the ground, and, by turning the roller in an opposite direction, they can be depressed so as to cut the furrow deeper, which is effected by two chains passing round the roller in an opposite direction to those first mentioned, the extreme end of which is connected to two levers, or bars, affixed at their lower ends to a board resting upon the upper part of the coulters; thus, by turning the roller, the ends of the bars which stand above the same will be drawn downwards and so depress

them. The inventor claims the peculiar arrangement described, together with the application of the perforated plates or discs for dropping or sowing all kinds of seeds or grain, and their combination with wheels and pinions, or other mechanical contrivances, for the purpose of carrying out the principle herein described and set forth.

SPECIFICATION enrolled 7th December, 1842, of a PATENT granted 7th June, 1842, to JOHN WOODCOCK, of Manchester, in the county of Lancaster, millwright, for "*certain improvements in the construction of steam engines.*"

THE first part of this invention relates to certain improvements in the construction of rotary engines, either for stationary or locomotive purposes. This rotary engine consists of a cylindrical case within which revolves a cylinder having four longitudinal openings or recesses in its periphery, into which are fixed four sliding pistons. This cylinder is eccentric with the case, and turns upon its axis, which passes through the ends of the case, and also through stuffing boxes; these latter thus prevent the escape of steam from the interior of the case. Steam is admitted at one side, and near the lower part of the case; the force of which, acting upon one of the pistons, causes the interior cylinder to revolve, the steam escaping as the piston upon which it impinged passes the eduction port, which is on the opposite side; and in this manner the pistons are alternately acted upon, and rotary motion is obtained. The principal novelty or improvement in this engine, and what the inventor particularly claims, is the manner of connecting each opposite piston together by a

link or rod, having a mortice in the middle, through which the axis of the cylinder passes: by this arrangement, it will be observed, that the shaft is not weakened, as would be the case were the links to pass through mortices made in the shaft. Again, the passages through which the steam passes in and out of the cylindrical case, consist of a number of diagonal slots or openings, or the same may be of a curvilinear form, whereby the pistons will be subjected to less wear and tear.

The second part relates to certain improvements in slide valves for high pressure and condensing engines; and consists in making four ports or apertures in the chamber, two for the induction and two for the eduction; the former being made in proportion to the cylinder's diameter, and the latter somewhat larger, say as $1\frac{1}{3}$: 1, or any other proportion that may be required. The slide valve is so constructed as to open and shut all the four apertures; and is also provided with a fifth aperture, for the escape of steam into the exhaust pipe. The arrangement of this valve will admit of six apertures, should it be required, to make those of the eduction double the width of the induction; which would be effected by dividing the eduction at top and bottom of the cylinder into two, and placing the induction between them. In the slide valve, and between it and the cylinder facing, there are small spaces for the passage of steam, in order to reduce the friction, by relieving the valve from the external pressure of steam.

The third part relates to certain improvements in the arrangement of valves used for shutting off the steam between the boiler and the engine; and consists of a rectangular box, having a slide similar to a vertical sliding door; which slide is raised or lowered, for the purpose of opening and closing the communication, by an eccen-

tric fixed upon a shaft having a handle; the eccentric works in a broad slot or mortice made in the upper part of the slide; thus, by turning the handle the communication will be opened or closed as may be required.

SPECIFICATION enrolled 8th December, 1842, of a PATENT granted 8th June, 1842, to CHARLES SEARLE, of Bath, gentleman, for "*improved preparations of tea, coffee, cocoa, and milk.*"

THIS invention relates to preparing and solidifying milk, after the cream is removed, by evaporating the aqueous matter therefrom; and also to combining tea, coffee, and cocoa, with milk so prepared. Having taken the cream from the milk to be prepared, the milk is to be put in a vessel surrounded by a water bath, and about one-fourth part, by weight, of loaf sugar, is to be added. The aqueous matter is to be evaporated therefrom by the application of steam, at such temperature as not to injure the milk; which will be best effected in a closed vessel, from which the air is withdrawn, and a partial vacuum obtained; by which means the milk will be evaporated at a lower temperature, and a product of milk obtained in a perfectly pure and dry state, which can be preserved in bottles or jars. When the milk is to be combined with tea, coffee or cocoa, a strong extract of such matters is to be previously obtained by a carefully conducted evaporation of the concentrated aqueous infusion in vacuo, or by distillation; and the fluid extract thus obtained, added to the milk at an advanced stage of its preparation towards solidification, mixing therewith a suitable quantity of refined sugar, and continuing the evaporation at a low

temperature, in a glass, porcelain, or other suitable vessel, till the whole is converted into syrup, paste, candy, or powder; or by adding arrow-root, isinglas, Iceland moss, or other like matter, the substance will, by this latter addition, be rendered more nutritive, and may be converted into lozenges, and some essence of spice mixed with it to impart flavour, as may be desired.

SPECIFICATION enrolled 8th December, 1842, of a PATENT granted 9th June, 1842, to STEPHEN BENCRAFT, of Barnstaple, gentleman, for "*improvements in the construction of saddle-trees.*"

THIS invention relates to a mode of giving elasticity to the seats of saddles, by the application of metal springs, and consists in screwing a metal spring on to a plate fixed under the cantle of the saddle; underneath this spring are rivetted three arched springs, the ends of which rest on the sides of the saddle-tree, which part is covered with metal plates; by this arrangement, the springs receive the weight of the rider, and transmit the pressure to the saddle-tree, to which part the three springs are applied, and thus the weight of the rider will not press on the spine of the horse, but on the ribs, the spine being free and unencumbered, in addition to the rider having an easy and elastic seat.

The claim is for the mode of obtaining elastic seats to saddles, by applying metal springs to saddle-trees, as described.

SPECIFICATION enrolled 9th December, 1842, of a PATENT granted 9th June, 1842, to JAMES NASMYTH, of Patricroft, near Manchester, in the county of Lancaster, engineer, for "*certain improvements in machinery or apparatus for forging, stamping, and cutting iron and other substances.*" (With a drawing.)

THIS invention relates to certain improvements in the method of working tilt-hammers. As the action of such hammers is well known and understood, it will be unnecessary to dwell upon them, further than to state some of the objections which attend those of ordinary construction, and which objections or defects are entirely overcome by the application of these improvements. The mode hitherto practised of working such hammers is, by a wheel or revolving cylinder, having four or more projections on its circumference, which alternately raise the hammer, and allow it to fall by its own weight. It will be observed, that in hammers of this construction, when a large piece of iron is placed upon the anvil, the blow of the hammer is the lightest, owing to the thickness of the iron reducing the space through which the hammer falls, and is the heaviest when the piece of iron is worked down, the very reverse from what it ought to be; again, the face of the hammer and anvil are never parallel to each other, except when a certain thickness of iron is between them, which defect could not be obviated without having the opposite end of the hammer moveable, so as to rise or fall according to the thickness of iron under operation, which would be attended with great expense and inconvenience: these defects, it will be seen, do not exist in the novel mode of working the hammer, which is the subject of this patent.

The following is a description of the apparatus: figure 1, plate 6, is a front elevation, and figure 2 a transverse

Fig. 1.

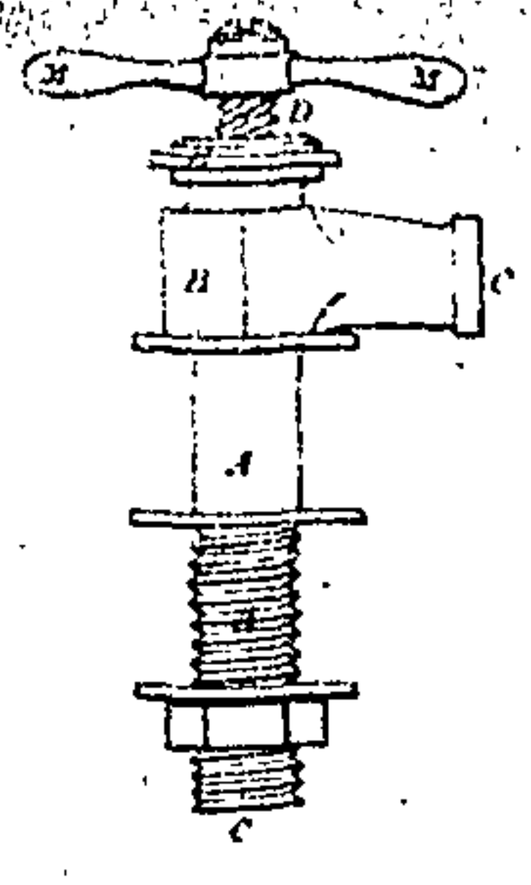


Fig. 2.

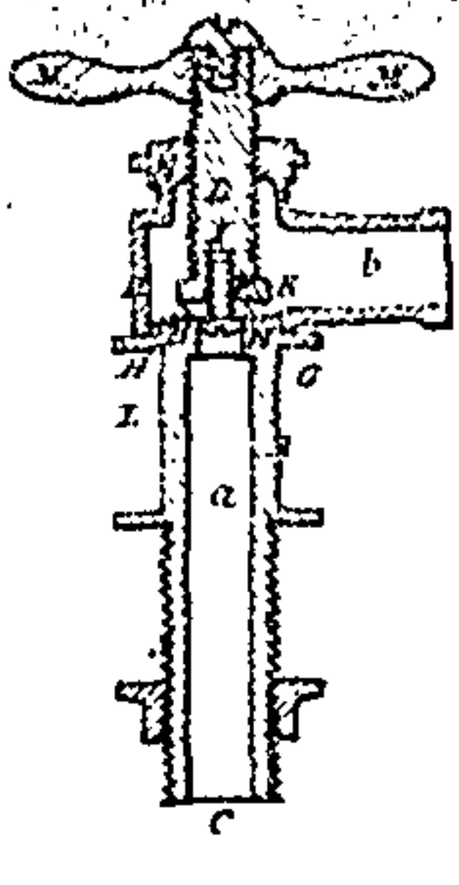


Fig. 3.

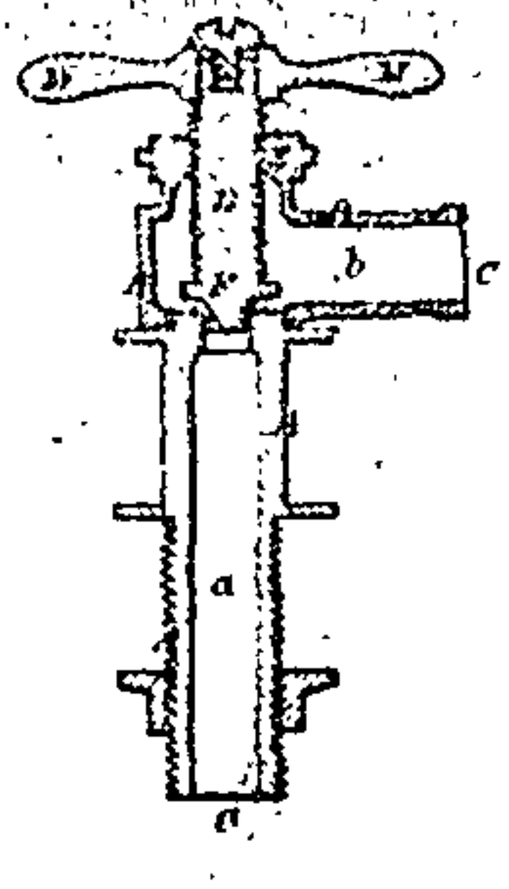


Fig. 5.

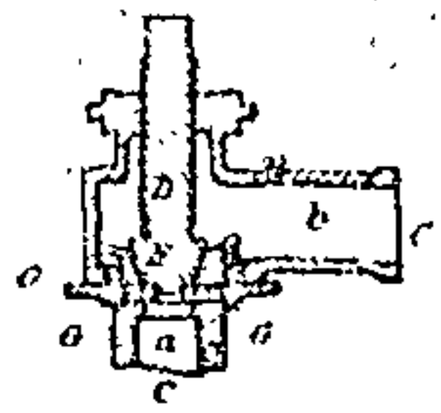


Fig. 4.



Nasmyth's Improvements in Tilt-hammers.

Fig. 2.

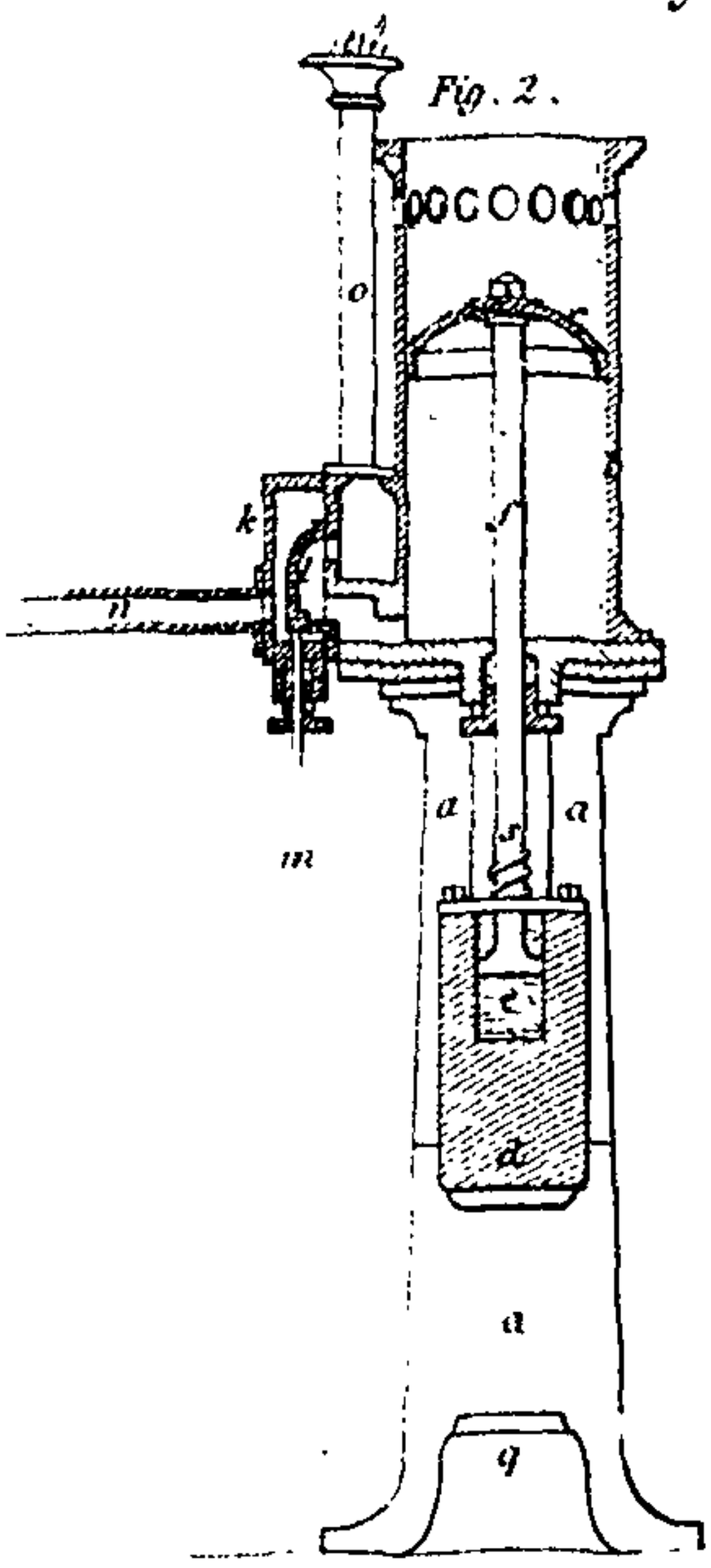
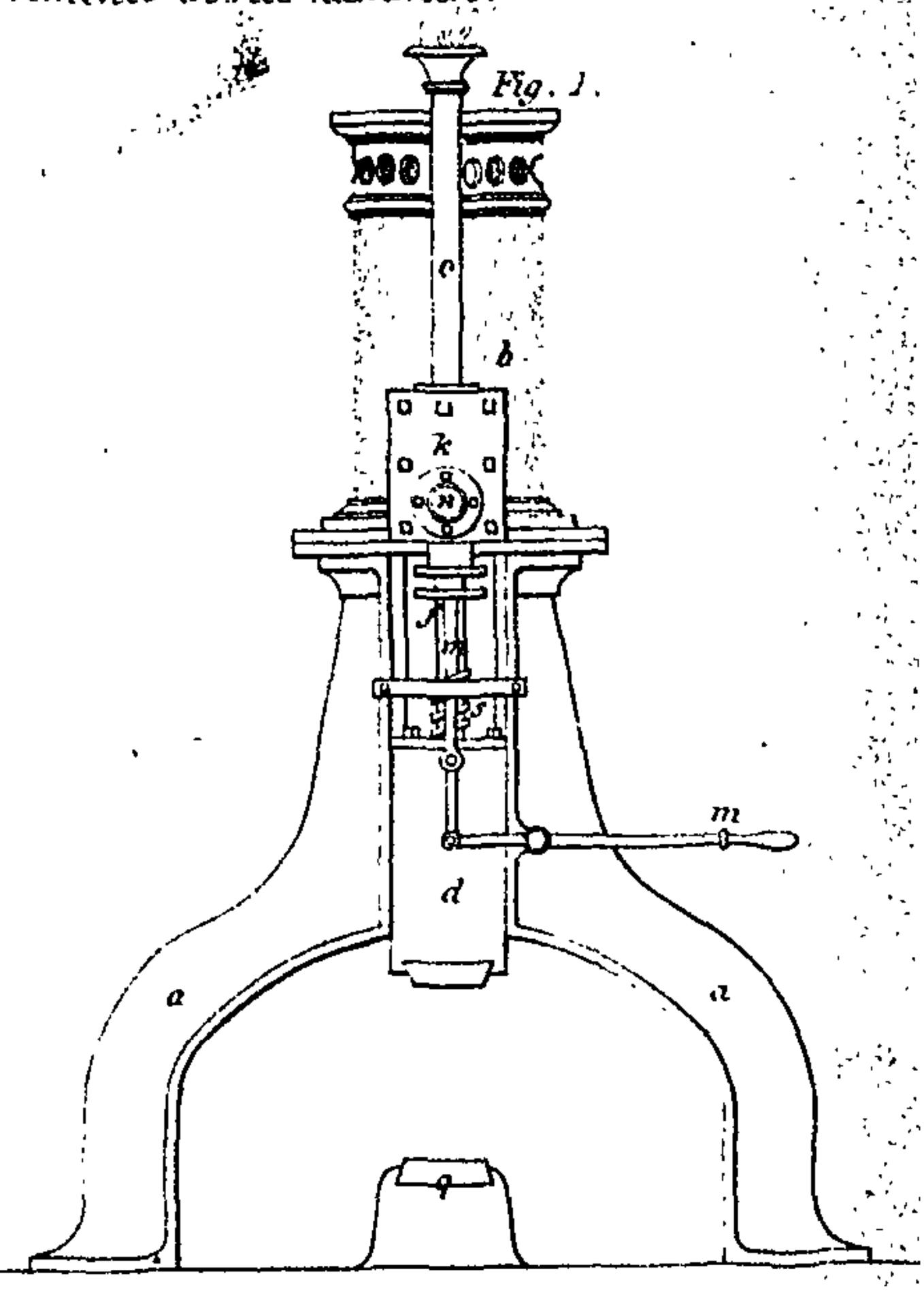


Fig. 1.



Williams's Improvements in Roofs.

Fig. 1.

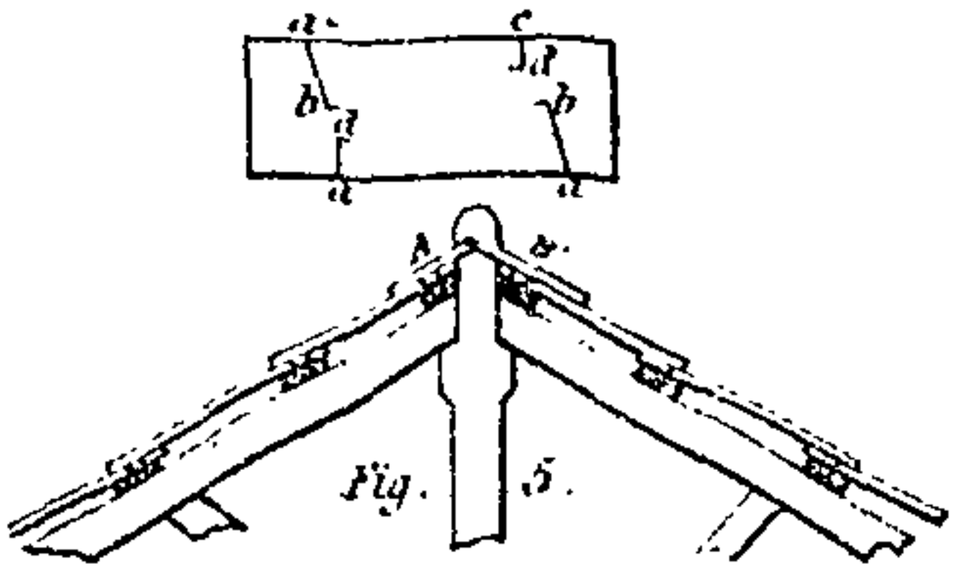


Fig. 2.

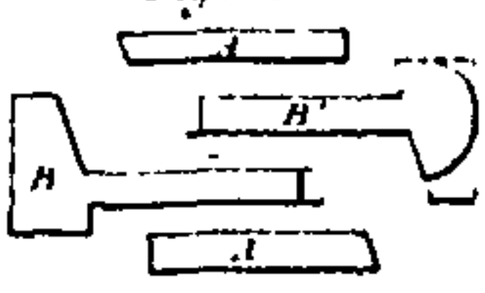
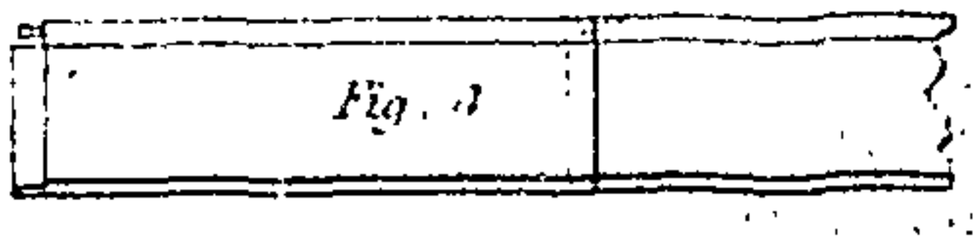


Fig. 3



Fig. 4



section of one of these improved tilt-hammers; *a a* is the frame, which supports in a vertical position the cylinder *b b*, having a piston *c*, the rod of which passes through a stuffing box at the lower part of the cylinder; *d* the hammer block, which moves in vertical slides of the frame, and is attached to the end of the piston rod *f*; *k* is a valve box, provided with a valve *l*, worked by a rod *m*, and lever *m'*; *o* the eduction pipe, through which the steam from the cylinder passes.

The operation of the apparatus is as follows:—steam being admitted through the pipe *p* to the valve box *k*, the handle of the lever *m'* is raised by an attendant, which raises the valve, and allows the steam from the valve box to pass into the cylinder, the elastic force of which, on the under side of the piston, causes the same to ascend, and thus raise the hammer block *d*; the lever *m'* being depressed, the valve closes the eduction port, and opens a communication between the cylinder and the pipe *o*; the steam escaping into the atmosphere, allows the hammer block to fall by its own weight upon the iron, which is placed upon the anvil *q*; by this arrangement, any quantity of steam can be admitted to the cylinder, so as to increase or diminish the strength of the blow of the hammer, by causing the same to fall through a greater or less space; and the face of the hammer and that of the anvil will always be in the same plane with each other. In place of having a man to work the valve, the same may be effected by stops or studs, fixed in the hammer block, and an arrangement of levers to move the valve as the block rises and falls. The piston is made very thin and light, and somewhat of an umbrella shape, so as to expand a little by the force of the steam, and thereby pack itself, and contract when the force of steam is removed on the descent of the piston; and in order to destroy as much as

possible the concussion caused by the fall of the piston, the end of the piston rod (as will be seen in the section) is formed with a collar, that fits into a hole made in the hammer block; and the same is packed above and below with some elastic material, such as cork or caoutchouc. There is also a strong spiral spring, lapping round the lower part of the piston rod, which causes the hammer block, when forced to the top, to rebound back; the top of the cylinder is perforated with a number of holes, which, when the piston is at its greatest height, allow the steam to pass from the cylinder.

The patentee in conclusion says, "I desire it to be particularly understood, that I do not claim the exclusive use of any of the several parts, and arrangement of parts, and machinery described, except when the said parts are used in connection with, and in furtherance of, my said invention, whereby the elastic force of steam is made directly applicable to raise the hammer or striking block, for forging, stamping, and cutting iron and other substances, as described."

SPECIFICATION enrolled 9th December, 1842, of a PATENT granted 9th June, 1842, to JOHN GEORGE HUGHES, of No. 158, Strand, in the county of Middlesex, general agent, for "*a new application of telegraphic signals, and the mode of applying the same.*"

THESE improvements consist in the application of telegraphic signals for the transmission of orders from one part of a dwelling to another; which are also applicable to the general working of vessels, and also for the management of engines on board of steam-vessels.

This telegraph consists simply of a disc dial plate, on the face of which are engraved or written the orders required to be transmitted—such, for instance, as coals, hot water, footman, &c. This plate is provided with an index hand affixed to the end of a shaft, upon which is a pulley. There are two of these apparatus: one fixed at the place where the orders are to be given, and the other at the place where they are to be received; a length of band or catgut, which is conducted through the different apartments by means of guide pullies, passes round each of the pullies, which are both of the same diameter; consequently, when the hand of the dial is moved round, so as to point to the particular order required to be given, the hand of the other dial will move in like manner, and the order required will be seen on looking at the dial plate: and in order to call attention to the same, a notched wheel is fixed on the axis of the latter instrument, which actuates a bell; so that the time the order is given will be noticed by the ringing of the same.

There is another modification of the mode of transmitting orders by telegraphic signals; in which case the communication is made by wires and bell cranks, similar to those employed in bell-hanging. Where the order is to be received is fixed an apparatus somewhat similar to those described, having a pulley on the axis of the index hand, round which passes one end of the wire. This instrument may be fixed in the engine-room of a steam-vessel, with the requisite orders written on the disc for the engineer; on each of the paddle boxes is fixed a tablet, equal in length to the circumference of the pulley, and having the same orders written on as those of the dial: thus, by drawing the end of the wire, to which is affixed a hand or pointer opposite the name of the order to be given, the opposite end of the wire being passed round the pulley,

will move the index hand in like manner. In this case, as in the former, a bell is employed; and the axis or shaft is also acted upon by a convolute spring, so as to keep the hand, when not in operation, always in the same position.

The inventor claims:—First, the application of telegraphic signals for the transmission of domestic orders from one part of a dwelling-house or building to another. Secondly, the application of similar signals for the transmission of orders for the management of vessels, from one part of a ship to another; and particularly the orders of the captain or pilot to the engineer of a steam-vessel. Thirdly, the mode of applying such signals, by means of corresponding tablets on which corresponding orders are written, one placed at the spot where the orders are to emanate, and the other at the spot where they are to be received; the communication between the tablets being made by means of cranks and pullies, as described.

SPECIFICATION enrolled 9th December, 1842, of a PATENT granted 9th June, 1842, to JAMES ANTHONY EMSLIE, late of the borough and county of Newcastle-upon-Tyne, but now of No. 5, Barge Yard, Bucklersbury, in the city of London, civil engineer, for "*certain improvements in pumps*."

THESE improvements relate to a method of raising, lifting, or forcing water and other fluids, whereby a great saving of power is stated to be obtained; which is effected by a new bucket, in pumps where buckets are employed. This bucket consists of four leaves, or valves, placed at an angle of about 45 degrees. To the end of the pump rod is attached a block of metal of any required shape; to the top side of which are fixed the inclined valves or leaves

by means of hinge joints, the upper ends of which rest against the sides of the pump barrel. By this arrangement, it will be observed that when the bucket descends, the valves will be forced by the water into a vertical position, or nearly so, and the water will pass between the sides of the barrel and the valves, which are prevented going too far back by projections formed thereon coming in contact with the pump rod; when, by the ascent of the bucket, the weight of water will cause the valves to fall against the sides of the barrel, and thus prevent the water returning: and the same will be lifted in the ordinary manner. When the lift is very great, the valves are supported by vertical screws or bolts passing through the block of metal, the ends of which come in contact with a lug or projection formed on the under side of each valve; by this means, the valves, in place of pressing against the sides of the barrel, during the upward stroke, are supported by the vertical bolts, whereby the friction against the sides of the barrel is entirely removed.

The claim for this part of the invention is the formation of buckets for pumps, whether made of metal or wood, in the form set forth, having any number of leaves or floats at any angle at which they may be set up, and the use thereof in all kinds of pumps for raising, lifting, or forcing water or other fluids.

The second part of this invention consists in certain arrangements for lifting water, by a series of lifts, a distance of 75 feet or thereabouts. In the construction of this apparatus the patentee proceeds as follows:—three lengths of pipe, each 25 feet, are placed in the well from which the water is to be raised; on the top of each length of pipe is fixed a water box, each box being provided with three valves, namely, one for the purpose of preventing the water returning from the box to the pipe; another,

which opens outward into a cistern into which the water passes from the box, and overflows into a reservoir, into which reservoir dips the end of the second 25 feet length of pipe, the top of which is provided with a box and reservoir the same as that just described; into this latter dips the end of the third length of pipe, which is also provided with a box the same as that described, with this difference, that the water, in place of being received into a reservoir, passes into a spout and is carried off. At the top of the shaft or well is an apparatus for exhausting the air from all the boxes, which consists of two cylinders (the cubical contents of each should not be less than the cubical contents of the three water boxes), with pistons connected to each end of a beam; to the bottom end of one of the cylinders is attached a pipe or air tube, passing down the well, and communicating with the top side of each of the water boxes. The third valve, which each box contains, is for the purpose of closing the aperture formed by the air tube as the water rises in each box: thus preventing the water passing into the air tube. The action is as follows: on the ascent of the piston in the air cylinder, which is caused by a vacuum being formed on the under side of the piston in the opposite (or steam) cylinder, the air in all the boxes will be acted upon and removed into the air tubes and cylinder, and water takes the place of the air removed from the boxes; the remaining portion of the stroke, or downward stroke of the piston, or the stroke for delivering the water, is caused by admitting steam under the piston in the steam cylinder, at about atmospheric pressure, which causes the piston to ascend and the piston in the air cylinder to descend, and restores to the surface of the water in the water boxes a pressure equal to that of the atmosphere: "the effect of which is owing to the tendency of the water to gravitate;" and the water contained in the

boxes will pass through the delivery valve and flow into the reservoir. The inventor states, that, in starting this apparatus, it will be first necessary, by means of an air-pump, to exhaust the air from all the water boxes, in order that the water may rise therein; the admission of steam under the piston causing the descent of the water in the boxes, and thereby obtaining the first portion of the stroke, when, by the condensation of steam, a vacuum is produced in the cylinder, and the ascent of the piston in the air cylinder forms the remaining portion of the stroke.

Claim is, the principle and general arrangement and adaptation of machinery described, and the peculiar application of the sources of its action; also the use or application of such power, or as many powers, as can be applied.

SPECIFICATION enrolled 9th December, 1842, of a PATENT granted 9th June, 1842, to JOSEPH CHATWIN, of Birmingham, in the county of Warwick, lamp-maker, for "*certain improvements in the construction of cocks.*" (With a drawing.)

THIS invention relates to certain improvements in the construction of cocks, and consists in a novel and peculiar arrangement and construction of parts connected therewith. In the construction of cocks employed for drawing off liquids, it is desirable that the material employed for effectually closing the way or aperture through which the liquid passes, should be such as to withstand the chemical action of liquids generally, and not subject to leakage when employed for the purpose of cutting off steam of great pressure. Various materials have been employed, and forms of construction of cocks adopted for these purposes, but have failed. In the arrangement and

construction of cocks hereinafter described, the patentee proposes to obtain the advantages, and to obviate the imperfections of cocks, as hitherto constructed and employed for the purposes above mentioned, by a peculiar construction and arrangement of the valves or valve seats thereof.

In plate 6, figure 1 is an elevation of a cock.

Figure 2, a longitudinal section of the same, showing the internal arrangement and construction of parts.

Figure 3, a longitudinal section of a cock, showing another arraugement of parts to be employed for effecting the same.

Figure 4, a detached view of one of the parts.

Figure 5, shows a longitudinal section of another arrangement of cock.

In figures 1, 2, 3, 5, A A the shank at one end of which a piece of metal B B is screwed and made tight; C C the way or opening for the flow of liquid, or the passage of steam; D D a valve stem, having a screw cut around it, and working in a screwed hole E, being for the purpose of withdrawing or advancing the valve F F; this valve is constructed in the following manner: G G a series of washers of cloth or other suitable material (hempen by preference) placed one upon the other, and firmly held together by forced contact from the screw H, which passes through the washers and works in a screwed hole I, formed in one end of the valve stem D: the washers being thus placed and secured between the shoulders K L, are subsequently cut to any convenient angle, the shoulders or bearings K L differing in their diameters so as to suit such angle; it will appear evident that upon turning the handle M fixed upon the valve stem D in one direction, the smaller part of the valve will be pressed against the edge N N of the way or opening C (this edge should be slightly rounded

off to prevent the cloth washers from being cut), whence the communication between *a* and *b* will be effectually cut off, and an air or steam-tight fastening established. Figure 3 shows another arrangement of valve, to be employed for similar purposes to the foregoing, similar letters of reference being placed upon corresponding parts; it will be seen, upon referring to the drawing, that the construction of this valve differs from the foregoing, by substituting yarn or string in the place of cloth, by passing the same around the lower part of the stem as shown at D* in the detached figure 4, the surface thereof being jagged, and constructed with a collar at its lower end to prevent the yarn or string from slipping. The arrangement of the parts represented at figure 5, differ from the foregoing arrangements, inasmuch as the valve, which in the foregoing figures is represented as being packed with cloth, string, or other suitable material, is, in this case, made of any solid material, and one end of the opening or way c constructed as follows: against that end of the shank upon which the piece B is fixed, a series of washers are placed, and maintained in that position by a screwed cap O, passing over and around a corresponding screw, formed upon a projecting part of the shank, as represented by the drawing, by tightening which the washers are firmly held; these washers have a circular opening made through them in the direction of the water or steam-way, for the purpose of admitting the solid valve F, which is forced against the edges of the cloth washers by a screw, as in the foregoing arrangements, the solid valve being constructed of a similar form to that which the valves packed, as aforesaid, assume when forced against the edge N (figure 2).

The patentee claims as his invention of improvements in the construction of cocks, the application of valves or

valve seats, so constructed and arranged that the edges of the cloth, or other suitable material, may be made to act so as to cut off the communication with the steam or water-way, as herein before particularly described and represented, with such immaterial variations of form and construction as experience may suggest.

SPECIFICATION enrolled 10th December, 1842, of a PATENT granted 11th June, 1842, to ARTHUR HOWE HOLDSWORTH, of Brook Hill, in the county of Devon, gentleman, for "*improvements in constructing certain parts of ships and vessels, in order to arrest the progress of fire, and for regulating temperature.*"

THESE improvements relate to the peculiar manner of constructing the bulk-heads, partitions, floors, ceilings, and other parts of a ship or vessel. The drawings show these improvements as applied to the construction of a magazine; and consist in forming the top, bottom, and sides of such chamber, of boiler-plate iron; the whole of the chamber so formed is enclosed in a case of the same metal, so as to leave a space of a few inches between the two; this space is to be filled with water, which is caused to circulate in the following manner: to the lower part of this double case, forming the magazine, is connected a pipe, which passes up and through the side of the vessel, below water-mark. There is also another pipe, which proceeds in like manner from the top of the double case or chamber, and passes through the opposite side of the vessel; and these pipes are provided with stop-cocks, to shut off the communication when required. The hatchway or door is also made double; and, besides being hung

with common hinges, has pipes in the form of hinges, provided with swivel joints, or stuffing boxes, so as to allow the door to open and shut; by these means, a communication for the circulation of water is established between the plates forming the door, and those forming the chamber. In order to ensure greater security, another iron door may be made to fit the hatchway behind the double door. The partitions forming the engine room are also shown as being constructed in the same manner; by means of which, the temperature of the engine room, and also of the apartments adjoining, is greatly reduced, and the same will also be protected from fire.

The inventor claims the mode of applying water spaces in hollow bulk-heads, partitions, floors, and ceilings, of metal, with means of obtaining the circulation of water therein, to various parts of ships and vessels, in order to reduce the temperature, and also to arrest the progress of fire, where such means are employed.

SPECIFICATION enrolled 13th December, 1842, of a PATENT granted 13th June, 1842, to DANIEL WILLIAMS, of Oxford, slater, for "*improvements in covering ridges and hips of the roofs of buildings.*" (With a drawing.)

THESE improvements, in covering ridges and hips of roofs, will be seen on reference to the drawings. In plate 6, figure 1 represents an end view of a block of slate, into which the inventor proposes to cut two inclined saw gates *a b*, *a b*, and also two other saw gates *c d*, *c d*; he then takes a splitting chisel, and after marking the end of the block, as seen by the dotted lines, splits it into four slates, the form of which will be seen in figure 2, A B, A B′; the slate B′ may, if desired, be rounded, although such rounding is not absolutely necessary; the bevil or inclination of the

saw gate *a b* should, in all cases, be suited to the inclination of the roof. Figure 3 shows the two slates A and B′ put together; and figure 4 represents a front view of the slates B′, the end being made to overlap each other; but they may be made with square joints; there are also holes drilled in the ends, into which are inserted pins, for the purpose of keeping them together. Figure 5 shows an end view of a roof, with the slates A B′ and flat slates applied thereto, the slates being secured in their places by means of screws or nails.

The patentee, in conclusion, remarks, "Although I have described the means of cutting a block of slate, so as to produce the parts A B with the least waste, yet I do not confine myself thereto; my invention consisting of forming slates into the forms A B, whereby the parts B may cover the ridge or hip of a roof, as described."

SPECIFICATION enrolled 13th December, 1842, of a PATENT granted 13th June, 1842, to THOMAS BANKS, of Manchester, in the county of Lancaster, engineer, for "*certain improvements in the construction of wheels and tires of wheels to be used upon railways.*"

THE first of these improvements relates to a method of constructing the nave or box of railway wheels whereby the wrought iron arms or spokes are more securely held. In order to carry out this part of the invention, the end of each arm or spoke is bent at right angles, the part so bent being made hollow to fit upon the periphery of a wrought iron ring, to which the arms are fastened. The arms, together with the ring, are then placed in a mould, and melted metal run about the ring and ends of the spokes, so as to form the nave or box. The inventor does not claim the exclusive use of running melted metal about

the ends of the spokes, except when the ends of such spokes are attached to a wrought iron ring, as described.

The second improvement consists in forming a groove, either dovetailed or otherwise, round the periphery of the tire, and inserting therein segments, or a hoop, or bar of steel iron or hard metal, either in one entire piece or in segments, placed end to end, so as to fill such groove. The groove which is shown in the drawing is dovetailed, and extends round the periphery of the wheel; the bar, hoop, or segments, are to be heated and placed in the groove, and hammered out, so as to increase the breadth of such bar or segments, and thereby fill the groove. A similar groove may be made in the flange, or the groove in question may be extended to that part of the flange which works against the rail.

The patentee says he does not claim the use of steel generally in tires for railway wheels, or the use of steel in such tires, when the iron and steel are welded together in the formation of a tire-bar, as such has before been employed, but he claims, as his invention, the improvement in the tires of wheels to be employed on railways, by inserting a hoop, bar, or segment of steel, or other hard metal, in a groove turned or formed entirely round the rim or tire of such wheels, as described.

SPECIFICATION enrolled 13th December, 1842, of a PATENT granted 13th June, 1842, to RICHARD GARRETT, of Leiston Works, near Saxmundham, in the county of Suffolk, agricultural implement maker, for "*improvements in the construction of horse hoes, scarifiers, drag rakes, and drills for cultivating land.*"

THE improvements in horse hoes consist, first, in suspend-

ing the guide bar which supports the levers, by means of chains passed over eccentric pullies, by turning which the hoes can be raised or lowered as may be required; the pullies to which the chains are attached are fixed on a horizontal shaft extending across the frame, having a handle at one end; the lower end of the chains are attached to a horizontal guide bar, having a number of slot plates or guides rivetted or otherwise affixed to the under side of the horizontal bar, through which slots the levers to which the hoes are affixed, pass; thus, by depressing the handle of the eccentric shaft the guide bar will be raised, and the levers resting on the bottom of each slot will be raised together with the hoes to any height required; and by reversing the motion of the handle, the levers, each of which is weighted, will depress the hoes so as to penetrate the ground to any depth required.

The second improvement consists in giving a lateral movement to the guide bars, by means of certain levers, and chains attached to each end of the guide bar, by which the hoes can, by the hands of the conductor, be guided in any particular course, independent of the direction pursued by the horse.

The third improvement relates to a mode of extending or contracting the distance apart of the running wheels of the drill machine, to suit the ridges of the land. Each of the wheels of the carriage works upon a stud fixed to the extremity of a bar of iron bent at right angles, which piece of iron is bolted to the under side of the axle tree; one of the bolts passes through a slot in one arm of the bent piece of iron, and through the axle tree, so that by slackening the bolts, the pieces of iron which support the wheels can be shifted further from or nearer to each other, so as to increase or diminish the distance apart.

The fourth improvement in drills relates to a mode of giving different inclinations to the cutting edges of the

hoes, so that they may be adapted to work in the land to the required depth, whether the ground be hard or soft; and lastly, to a mode of attaching and detaching blades of hoes, in order that they may be readily removed when required.

The improvements in scarifiers, intended to be employed in rendering the surface of the ground more uniform, consist in the means of raising or lowering the scarifying roller or rollers in the frame or carriage that supports them, in order that the roller or rollers may be made to cut more or less deep, and also to elevate the same entirely from the ground, when required. This apparatus runs upon ordinary wheels, capable of being raised or lowered by means of a screw, so that when the scarifier is intended to be used, the wheel, by means of the screws which pass through the frame side, can be raised from the ground, and the scarifying wheel or wheels rest upon the ground; and when not in use, the ordinary running wheels can be lowered so as to raise the scarifying wheel or wheels from the ground.

The improvements in drag rakes consist in a method of shifting the position of the tines, namely, placing them more or less erect, or at a greater or less angle with the surface of the ground. Each of the tines is attached to the end of a wooden beam or lever, capable of being raised or lowered at the opposite end to which the tines are fixed; by this arrangement, they can be fixed at any required angle; and in order to raise them entirely from the ground, each of the wooden beams is attached, by means of a chain, to a transverse beam, which latter is suspended by two chains, attached to the periphery of two eccentric pullies keyed on a shaft above the said beam and parallel with it; thus, by turning the shaft, the chains will be drawn up, and the tines will be raised from the ground,

so as to deposit the straw or other matter which may have accumulated on the points of the same.

The improvements in drills for cultivating land consist, first, in a mode of steering the carriage, independent of the course taken by the horse, for the purpose of causing it to pass over the required tracts, so that the rows of seeds may be placed parallel to each other in the successive courses of the drill; the body of the carriage is attached to the shafts, by means of a bent or curved piece of iron having a hole in the middle, through which passes a vertical stud or pin, which stud is fixed in the axle tree; by this arrangement, the body of the carriage is capable of moving partly round, independent of the shafts: this movement is effected by means of a horizontal shaft fixed in front of the carriage, having a pulley at each end, and over which pullies, in opposite directions, passes a chain, the end of such chain being fastened to the side shafts: thus, by giving motion to the said shaft, which is effected by a longitudinal shaft, a worm and worm wheel, and in consequence of the chains passing in opposite directions round the pullies, the body of the carriage or drill will be moved to the right or left, as may be required, which can be done with the greatest precision, by the attendant turning a handle fixed on the end of a longitudinal shaft, the opposite end having a worm taking into and driving a worm wheel keyed on to the horizontal shafts fixed in front of the carriage.

Secondly, an apparatus for agitating the manure in the box of the drill, in order that it may descend in an uniform quantity; on each end of the axis of a rotary agitator are fixed two eccentrics, which work a bar of iron having a number of projections, which bar passes through the upper part of the manure box.

Thirdly, an apparatus by means of which two kinds of

grain or seeds may be delivered at the same time through the respective tubes: for this purpose, the inventor puts the different kinds of seeds in separate compartments, with suitable apparatus for delivering the same.

Fourthly, the means of adapting rollers, upon a stationary axle, for forming and regulating the shape and height of the ridges, and lastly, a mode of guiding the coulters and spouts for enabling them to deposit the seeds accurately upon the middle of irregularly ploughed ridges, and consists in attaching the coulters and spouts to horizontal bars; these bars are made to swing upon vertical vibrating levers, worked by a crank, and are under the command of the attendant or conductor.

The mode of forming and regulating the shape and height of the ridges consists in the application of two concave rollers, shown applied to the front part of the drill, which are mounted and slide freely upon a horizontal shaft; these rollers act as a fore-carriage, and support part of the weight of the drill, and by freely sliding upon the axis, in lateral directions, will easily accommodate themselves to any irregularities in the furrows.

SPECIFICATION enrolled 13th December, 1842, of a PATENT granted 13th June, 1842, to WILLIAM MORRETT WILLIAMS, late of the Royal Military College, professor of mathematics, and now of Bedford Place, Commercial Road, in the hamlet of Mile End, Old Town, in the county of Middlesex, and of No. 163, Fenchurch Street, in the city of London, lock manufacturer, for "*certain improvements in the construction of locks and keys.*"

THESE improvements, as in all other patent locks, are

intended to render the lock more secure, and consequently less liable to be picked. The drawings show the improvements, in the first place, as being applied to a drawer lock. This lock is stated to be without a key-hole; the part where the key is applied for the purpose of locking and unlocking consists of a rectangular or oblong projection, standing from the face or front plate of the lock; there are three small round holes drilled through this projection, into which fit three stops, acted upon by a spring placed inside the lock, so as to cause the ends of the stops to stand flush with the face of the projecting piece; the inner ends of these stops are made flat, somewhat similar to a common key, each of which has one deep groove, nick or notch, cut in the end, and also two or more short notches, which the inventor calls false notches, the deep grooves being made at irregular distances with regard to each other: this part of the stops just described, moves or slides in a rack box, fixed inside the lock. The bolt of the lock is similar to those in common locks, except that one edge is made with a number of projecting teeth, which teeth, when the bolt is shot, pass through the deep grooves cut in the aforesaid stops; for this purpose, it will be observed, that the stops will require to be pushed forward or into the lock to an exact distance, in order to bring the deep grooves or nicks in a line with each other, and thereby allow the projections or teeth formed on the edge of the bolt to pass through them.

The key consists of a rectangular box made to receive the aforesaid projection; this part of the key is attached to the handle or bow by centre pins, so as to swivel round, and thereby present either end of the box for the purpose of locking and unlocking; one end, or one-half of the box, contains two projecting pins, of different lengths, and the other half contains three pins or projections. Suppose

the lock to be in a quiescent state, and it is required to shoot the bolt, or perform the act of locking, it is only necessary to apply that end of the box-key having two projecting pins to the rectangular projection on the front plate of the lock, and by pressing the key against the plate of the lock, the projecting pins enter two of the holes, and press upon the ends of the stops, so as to bring the long grooves, nicks or notches, in a line with each other, and allow the bolt, which is acted upon by a strong spring and driver, to pass through them; on removing the key, the stops will be forced, by means of a spring, to a level with the face of the projecting piece. When it is required to shoot the bolt in an opposite direction, or perform the act of unlocking, it will only be necessary to present the other end of the box-key having three projecting pins, when precisely the same result is obtained, except that the third projecting pin removes the driver and strong spring, and the bolt is forced back, or in an opposite direction, by a weaker spring.

There is another modification of this improved lock, in which the application of stops similar to those described are employed in the door lock; but in this case the stops slide into a circular rack-box, and are at equal distances around the circumference of the rack-box; the bolt is acted upon by a circular plate, having a projecting finger; the key in this case requires to be turned once round for the purpose of locking and unlocking. Another improvement is in the application of a circular rack-box, with sliding stops, to the plug of a tap or cock, for the purpose of retaining and drawing off liquor from butts and casks.

The patentee claims as his invention, the use and construction of a cylindrical rack-box, with its three stops, having false notches in each of them; and the said rack-box having a rotary motion, so as to enable the key to

turn quite round before it can be withdrawn from the lock after having performed the action of locking and unlocking; he also claims, as another part of his invention, the security produced by the use of three stops, having false notches therein, for the purpose of preventing the true ones being ascertained; and lastly, the use of the cylindrical rack-box when applied to a cock or tap, for the purpose of drawing off liquor from a cask or other vessel.

SPECIFICATION enrolled 13th December, 1842, of a PATENT granted 13th June, 1842, to ISAAC MOSS, of Macclesfield, in the county of Cheshire, silk trimming and button manufacturer, for "*improvements in the manufacture of covered buttons, ornaments, and fastenings of wearing apparel.*"

THIS invention relates, first, to a mode of making covered buttons, and consists in the application of a shell for the face of the button, which is to be covered with silk or other material. Within the shell is placed a "leek" button, consisting of a form or mould, covered by lapping thread or other material round it in the usual manner. The covered metal shell, with the "leek" button inclosed, is then submitted to the action of suitable dies, so as to turn the edge of the shell over the "leek" button; and the latter being covered with thread or other material, can be secured to the cloth.

The claim is, for the mode of making covered buttons, by employing a covered metal shell for the front of each button, the back of each button being composed of a leek button, formed by lapping thread on a form or mould.

The second improvement consists in the application of

woven wire cloth for the tuft or shank of the button: the woven wire cloth is inserted in a hole formed in the back, and secured in the ordinary manner. The wire cloth, which answers the purpose of a shank, may, if required, be previously covered, by cementing silk or other material upon it. Claim is, for the mode of constructing covered buttons, by employing woven wire cloth for the shank.

The third improvement consists in the application of a woven wire fabric for the purpose of covering buttons, the wire being previously lapped with some fibrous material. Claim is, the making of buttons of covered wire woven into a fabric, each button having a metal shell at the outer edge.

The fourth improvement consists in a method of constructing leek buttons: the improvement in this part is stated to be in forming the same with a metal edge. The leek button may be covered as the fancy or taste of the workman may suggest, and is then to be placed within a metal ring, and subjected to pressure between suitable dies, so as to press the ring flat upon the edge of the two surfaces of the button, and thereby present a metal border or edge. Claim is, the mode of constructing leek and such like covered buttons, by applying metal edges thereto.

The fifth improvement relates to the application of leather for the purpose of covering metal shells, the back collet of the button being made to lap over the edge of the front, and which latter is covered with leather. Claim is, the combining of a leather-covered surface with a metal shell in a die and pressure-made button.

The sixth improvement consists in making a covered button with a pasteboard or button-board back, having a hole in the centre, through which is passed the shank, the paper collet or back of the button being previously covered by winding cotton, silk, or other material thereon. Claim is,

the mode of making covered buttons by forming the back of each button with pasteboard or button-board, with a woven shank protruding through, together with the covering of the collet or back disc by winding fibrous material thereon.

The seventh improvement relates to a mode of ornamenting covered buttons, and consists in covering the button with an open woven fabric of wire, the wire being lapped previous to being manufactured into such open fabric; the front shell of the button, which is covered with the open woven fabric, is first covered with silk or some such material, which may either be of the same or a different colour to that of the material with which the wire is covered. Claim is, the mode of ornamenting covered buttons, by applying an open woven surface to the fronts of such buttons, when such open fabric is composed of covered wire, or covered yarn of fibrous materials.

The eighth improvement consists of another method of ornamenting buttons, by drilling or otherwise making a number of holes in the metal shell forming the front of the button, and then covering the same, by means of cement, with silk or other material, and placing inside the shell velvet or other suitable material, which, by the pressure of the back collet, presents a number of protuberances on the face or front of the button. Claim is, the mode of ornamenting covered buttons, by having the metal shell perforated with holes, and covered with silk or other fabric.

The ninth improvement relates to covering the forms, or wooden moulds, for tassels; and consists in covering or cementing on the same a woven fabric, in place of covering them in the manner hitherto practised. For this purpose the inventor provides a mould, consisting of a groove made of wood or metal, of the same form as the external

part of the mould for the tassel; into which the tassel, after the fabric has been cemented thereon, is rolled, so as to make the fabric adhere closely to all the parts of the mould. Claim is, the mode of covering forms or shapes for ornamental drops or tassels.

The tenth improvement consists in a mode of covering rings, by cementing a fabric upon a "shell ring," which is afterwards subjected to the action of suitable dies, in order to give it the form of a ring. Claim is, the mode of forming covered rings for furniture and other ornamental purposes.

The eleventh improvement consists in covering, by means of some adhesive matter, such as shellac dissolved in naphtha, the tags of stay laces with a woven fabric; and also in fixing tags of that description to the lace by means of the same adhesive matter; that is to say, employing such matter when putting the tag on the lace. Claim is, the mode of making tags, by covering the same with woven fabric, or with thread or such like materials and adhesive matter.

The twelfth improvement relates to a mode of constructing flexible eyes, or in constructing the eyes in such manner that their form is altered by the stress of the hook, and whereby the latter is more securely held. The sides of the eye are made to cross each other, and terminate in hooks, which, when the eye is drawn by the force of the hook, the said hook is held by that formed on the eye. Claim is, the mode of constructing eyes to be used with hooks.

The thirteenth improvement consists in a mode of bending wire for the purpose of forming a hook, in such a manner that two hooks will answer the purpose of a hook and eye. Claim is, the mode of constructing hooks to act as hooks and eyes for fastening parts of garments.

The fourteenth improvement consists of certain other

methods of constructing hooks and eyes for fastening parts of garments. Claim is, the combining the hook and eye, by bending wire into the forms described.

The fifteenth improvement relates to a mode of forming loops for vest bands.

The sixteenth improvement consists in the application of fringe for the purpose of ornamenting buttons, and in fixing the same, by means of a metal ring, round the edge of the button. Claim is, the mode of constructing covered buttons, by applying ornamental fringe or edging thereto; and lastly, the mode of forming hooks and eyes from wire which has been previously covered, by lapping or binding round the same some fibrous material.

SPECIFICATION enrolled 21st December, 1842, of a PATENT granted 21st June, 1842, to FREDERICK GYE, junior, of South Lambeth, in the county of Surrey, gentleman, for "*improvements in binding pamphlets, papers, and other documents.*"

THIS invention relates to the construction and application of a wire instrument, or instrument bent into suitable forms, for facilitating the binding of pamphlets, papers, and other documents, and consists of a piece of wire bent at each end, at right angles, and also in such a manner that between the parts which are at right angles there are two loop-holes. In order to fasten a number of papers with this instrument, the ends, which are made pointed, are pricked, or passed through the back of the sheets; after the whole of the sheets intended to be bound together have been passed on the ends of the instrument, the ends are folded down so as to hold the whole securely

together; and the same can be filed or hung up by means of the aforesaid loop-holes. When the papers are of great length, two of these wire instruments are to be employed. Another mode of fastening them is by forming two loop-holes on a piece of wire, and bending the same at the ends at right angles, in two directions, so as to allow of the points being passed through the whole of the sheets, that is to say, when the sheets are doubled; the ends of the wire after being passed through, are folded down so as to prevent them being withdrawn. Another instrument is also shown, somewhat similar to the last, but is intended to fasten the sheets by one corner, such for instance, as draft sheets, and legal documents. But in all cases the instrument consists of a piece of wire, pointed at each end, so as readily to penetrate the papers, and when passed through, the ends are folded down so as to hold or bind the papers together.

Claim is, the forming instruments, each of a piece of wire, for binding pamphlets, papers, and other documents, when the same are formed with loops, eyes, or openings, as described.

SPECIFICATION enrolled 21st December, 1842, of a PATENT granted 21st June, 1842, to HENRY HOUGH WATSON, of Bolton-le-Moors, in the county of Lancaster, consulting chemist, for "*certain improvements in bleaching, changing the colour of, and otherwise preparing, purifying, and refining tallow, and certain other organic substances, mixtures, compounds, and manufactures.*"

THE other organic substances alluded to in the title, besides tallow, are wax, and such other substances as are of a

greasy oleaginous nature, whether the same be compounds formed by mixing several such substances together.

The tallow or other substance to be operated upon, is first to be melted down in a leaden or other vessel capable of withstanding the action of the acid to be employed; to the melted tallow is added a compound, known to chemists by the name of "mineral chameleon," the same being constituted of manganesic or manganic acid and potash, soda, or other alkaline or earthy base; to this is added (observing to stir the same continually) sulphuric acid, diluted with from four to five times its bulk of water, or if preferred, the acid may be put in first; the temperature of the mixture is then to be kept up from 160° to 212° Fahrenheit, for about one hour, after which the heat is to be discontinued, and the mixture allowed to settle, when the tallow or other substance will be found to float on the surface; it is then to be taken off, when it will be fit to be used for the purpose for which it is afterwards intended. By this process, the tallow or other substance will be bleached or changed in colour, in a degree according to the mineral chameleon used. In place of mixing such mineral with the melted tallow or other substance under operation, and then adding the acid, the solution of mineral chameleon may first have as much of the diluted sulphuric or other acid mixed with it, for the saturation of the alkali contained therein, or as much as is required to make the mixture taste sour. This liquor, which will be of a purple or crimson colour, may then be mixed, and well agitated with melted tallow or other substance, which should be kept at a temperature of from 150° to 212° for about an hour, or until the desired whiteness or change of colour is obtained, which may be tested at intervals during the operation, by pouring a few drops upon a cold metallic substance, when the tallow will be observed to become

stiff, and the whiteness observable. If nitric, or any other powerful acid be used, it will be found necessary to make the vessel of some other material than lead, as such metal would be decomposed by the action of the acid. The vessel in which the operation is to be conducted, may be placed in a bath, and heated by steam or other means.

Instead of using the "mineral chameleon" for the purpose described, the tallow or other substance, may be bleached by means of a solution of red oxide, or of the deutoxide of manganese, or of a solution containing manganese, combined with more oxygen than is combined with it when in a state of protoxide. In order to carry this part of the invention into effect, a quantity of sulphuric acid is put into a leaden vessel, and diluted therein until its specific gravity is about 1.70; into which is to be sprinkled, by little at a time, the peroxide, or red oxide, or deutoxide, preferring the former, stirring the mixture all the time with a leaden rod. The liquor should then be allowed to stand for a few days, taking care to stir it occasionally, adding more water every day until the specific gravity is found to be 1.35. In preparing this liquor (which is of a crimson or claret colour), it will be found, that about 160 lbs. of peroxide of manganese, to about 500 lbs. of concentrated sulphuric acid, with the requisite quantity of water, will answer well; and that about 140 quarts of this liquor will bleach one ton of English tallow; the residual liquor (after the bleaching process) may be used in purifying and refining the fat as it comes from the butchers.

The inventor claims the application of "mineral chameleon," or compound of manganesic, or manganic acid, and potash or soda, or other alkaline or earthy base, to wax, tallow, and other greasy substances, in a melted state, by mixing the same therewith; and the previous or subse-

quent application of sulphuric acid (or other acid having a stronger affinity than the manganesic acid for the earthy base of the chameleon), to the said mixture, for the purpose of bleaching and changing the colour of tallow, and other like substances; also the application of a solution or mixture, formed by adding sulphuric, or other acid alluded to, to a solution of mineral chameleon, previously to either of them being added to the substance to be operated upon; also the application of a solution (made by the aid of acid) of red oxide, or deutoxide of manganese, or of a solution of manganese, combined with more oxygen than it is combined with when in a state of protoxide, to melted tallow, and such like substance, for the purpose of bleaching and changing the colour of the same; together with the application of the residuary liquor, after having been used for bleaching, as described, to unrendered tallow or fat, by heating and mixing the same therewith, for the purpose of purifying and refining the tallow or fat, without being confined to the exact proportions of substances and chemical ingredients, nor yet to the particular method herein described.

SPECIFICATION enrolled 21st December, 1842, of a PATENT granted 21st June, 1842, to JOHN DICKSON, of Brook Street, Holborn, in the county of Middlesex, engineer, for "*improvements in rotary engines and boilers; in stopping railway carriages; and in machinery for propelling vessels; part of which improvements are applicable to propelling air and gases.*"

THE first part of this invention relates to certain improvements in propelling; and consists in the application of

two wheels fixed to the side of the vessel. Round the periphery of each of the wheels is a groove, into which works an endless chain, carrying a number of flat discs of metal or wood; these circular floats, when immersed in the water, and passing from one wheel to the other (which wheels have transverse openings in the periphery, for the purpose of receiving the floats, and also the part to which they are affixed), are drawn through a horizontal cylinder, supported from the side framings by means of straps and bolts, so as to be immersed a few inches below the water line; the internal diameter of the cylinders being such, that the floats may pass through without touching the sides thereof. The inventor states that this machine will be applicable to many purposes besides that of propelling vessels; such as raising water above its level to any given height, or draining fens or marshes, instead of the common fen or marsh wheels, by placing the machine at a suitable angle. It is also stated to be applicable to propelling gas or air in any direction.

Another improvement in propelling consists in making a paddle wheel, with its periphery composed of a number of semi-cylindrical cavities or buckets, extending across the wheel in the same manner as ordinary floats, each cavity or bucket having two ends; so that by the motion of the wheel the water will not recede or pass off in a lateral direction as in the flat float. The inventor states that a vessel fitted up with paddles of this description, will be propelled through the water with greater force than if fitted with paddle wheels of the ordinary construction.

The rotary engine consists of a horizontal cylinder, through which is passed a shaft mounted in suitable bearings; the form of the shaft inside the cylinder is that of a cam, whose point or outer edge forms a steam-tight junction with the cylinder. There are two flat metal slides,

one on each side of the cylinder, which are kept, by means of a cord and a weight, in contact with the cam, shaft, or piston of the engine. The two slides, it will be observed, alternately form abutments for the steam to act against; and as the piston or cam revolves, these plates or abutments will be caused to slide in and out of the cylinder. Steam being admitted through a four-way cock, passes along a horizontal passage to the interior of the cylinder; where its elastic force is exerted upon one of the sliding abutments, and one side of the cam or piston; which causes the latter to recede until it passes the next slide, where it is acted upon in a similar manner, the steam being allowed to escape from the opposite piston through the eduction port.

Another modification of this engine, which is stated to be applicable to the purposes of propelling gases, vapours, or fluids of any kind; such as blowing furnaces, or driving air into mines, or *vice versâ;* also in purifying gas, by bringing it from the retort, and forcing it through lime purifiers and condensers. In this machine, the form of the shaft within the cylinder is that of a double cam extending across the diameter of the cylinder, and touching each side. Above the piston, and at each end of the cylinder, there is a vertical groove, into which works a metal slide, its own weight causing it to be in contact with the cam (which should form an air-tight joint), and which latter causes it (the slide) to move up and down in the said grooves, and into a recess in the upper part of the cylinder. In the upper part of the cylinder there are two apertures formed on each side of the metal slide, through which the gas, air, or other fluid, is received and delivered by the rotary motion of the piston. The same apparatus is described as answering the purpose of an air pump, for receiving air and hot water from the condensers

of steam engines; in which case, there are two other apertures, or foot valves, leading into the cylinder, placed one on each side near the bottom, and opening inwards; the two openings at the top, which are provided with valves opening outward, lead to the hot well; thus, by giving a rotary motion to the piston, the air and hot water from the condensers will pass through the foot valves into the cylinder, and will be delivered by the piston into the hot well which is above the cylinder.

The improvements in boilers consist of a vertical cylindrical boiler with a double case, leaving a water space between the two of from three to four inches; concentric with the interior case is another cylindrical boiler, having a number of vertical tubes or passages for hot air and vapours; it is also provided at the top and bottom with suitable communications to the double case; in the annular space formed by the two, and at a short distance from the bottom, is a frame which supports the grate bars; to the under side of the frame is attached a cog wheel which takes into and is driven by a pinion, motion being communicated to the axis of the latter by means of a winch or handle, by turning which it will be seen that the frame, together with the grate bars, will be caused to revolve, so as to bring any part of the fire which may have been lighted on the annular grate, opposite the furnace door. Presuming the fire to be lighted on the grate in the annular space, the volatile inflammable parts of the fire which fill the space, pass in a vertical direction to the top and down the aforesaid tubes which extend below the fire bars, and from thence to the flue, which also forms a part of the boiler, it (the flue) being constructed of a double case having a communication with the boiler, and is attached to one side thereof, which makes the external part of the boiler of an elliptical form. Another modification

of the principle is shown as being applied to horizontal boilers.

With respect to that part of the title which alludes to "stopping railway carriages," there is no mention made of it in any part of the Specification.

The patentee claims the whole arrangement of the several parts described.

SPECIFICATION enrolled 21st December, 1842, of a PATENT granted 21st June, 1842, to JOSEPH BUNNETT, of Deptford, in the county of Kent, engineer, for "*certain improvements in pavements for streets, roads, and other surfaces, and in machinery for producing and repairing the same.*"

THE first part of these improvements consists in a new form of wooden blocks for pavement, whereby each block is connected to and supported by those blocks which are in contact with it, without the use of pins, keys, dowels, or tenons. The form of this improved block may be described as follows: take a square block of wood, and from the upper surface, at one edge, make an inclined saw-cut half way through the block; then from the side of the block, and parallel with its upper and lower surfaces, make another cut, extending into the block (as if dividing it in two), so as to separate from one side of the block a piece in the form of a wedge. By this means, an indent will be formed on one side of the block, into which a suitable projection formed on the side of the block, which is to be joined to it, fits and rests; so that one block supports the other. The patentee prefers that the fibres of the wood in each square block should form an angle with the surface of from 65 to 75 degrees. Claim, the application of the form of block as described.

The second part of this invention relates to a new mode of connecting wooden blocks by means of keys, tongues, or tenons, inserted in mortises cut in the sides of the block; by means of which, every block is connected to and supported by those blocks which are in contact therewith. This improvement consists of a square block with vertical sides, but having the ends inclined with the fibres of the wood at an angle of from 65 to 75 degrees. In the middle of each of the two vertical sides of each block is a cavity or mortise, which is made with a circular cutter, and in such manner that the mortises will correspond with each other. Into these mortises, when laying down the blocks, is to be inserted a key, tongue, or tenon, made of oak about one inch thick, and of a diamond form, the lateral corners of which fit tight into the aforesaid mortises formed in the side of each block, so as to connect and support each other; or metal keys may be employed, in which case they will not require to be more than half an inch thick; and in forming the key-blocks, for taking up when the road requires repairing, the mortises in such block are cut so as to come out at one end of the block or blocks. There are other modifications of this block, one of which consists in making the mortises in the four corners of the blocks of each alternate row. Claim is, the mode of connecting the blocks for pavements by means of tongues or tenons inserted into mortises, as described.

The third improvement consists in the adoption of a regular system of uniform grooving, in order that a good foothold may be obtained for horses and other animals; and also for the application of machinery for the purpose of renewing and deepening the grooves, and removing any dirt which may have accumulated. The grooves may be arranged in lines, so as to cross each other at right angles, each line being at an angle of 45 degrees with the

side of the road; or there may be a series of lines parallel to the side of the street, and others crossing them diagonally; but whatever be the form of such grooving, the blocks are to be cut so that the grooves may form continuous and unbroken lines, *in order that any suitable tool* or instrument may be passed from end to end for the purpose of clearing out and deepening them: and for which the patentee claims the system of uniform grooving of the upper surface of wood pavements, and its application in the manner and for the purpose described.

The fourth improvement relates to machinery for the purpose of preparing and cutting the wooden blocks described. Having prepared the square blocks, they are separately placed between two slides, in a horizontal machine, and are forced forward by suitable means, and over two circular saws fixed upon an inclined shaft (which shaft is below the slides upon which the blocks move), and at such a height as to cut the blocks on two sides half way through; they next come in contact with two horizontal saws, which make the saw-cuts, as described above, parallel with the upper and under surface of the block. There are also certain horizontal revolving cutters, which can be brought in contact with the sides of each block for forming the mortises, and V cutters for forming the grooves in the upper surface of the blocks. The claim is, the arrangement of machinery for cutting and preparing wooden blocks for pavements.

The fifth improvement consists in machinery for cleaning and repairing the grooves in the upper surfaces of wooden blocks. The apparatus for cleaning out the grooves is of the form of a rake, having a series of teeth or prongs, capable of being set to the proper width for the grooves in the surface of the road; the handle is also made or attached to the rake, so as to be set at any required

angle with the line formed by the teeth. In order to clean out the accumulated dirt, the teeth of the rake are placed in the grooves on one side of the road, and the instrument drawn across. Another machine consists of a frame running upon four wheels, with peripheries of a V form, which run in the grooves formed in the surface of the road; the upper part of the frame supports a cranked shaft, having a fly wheel with a flat periphery, round which is passed a strap, which gives motion to a pulley keyed on the end of a horizontal shaft, supported by the frame of the machine near the surface of the road; and upon this shaft there are three, four, or more V cutters, set at such distances apart as to correspond with the grooves in the surface of the road. The operation is as follows: a man stands upon a platform or frame of the machine, and, by means of the crank shaft, gives a rotary motion to the fly wheel; which motion is imparted, by means of the strap, to the cutters. During this operation another man pushes the machine forward, and in a direction of the grooves formed in the surface of the road. Claim is, for the machinery for clearing and repairing the grooves in the upper surface of wooden pavement.

SPECIFICATION enrolled 21st December, 1842, of a PATENT granted 23rd June, 1842, to HENRY BEWLEY, of the city of Dublin, licentiate apothecary and chemist, for "*an improved chalybeate water.*"

IT is well known, at least among the medical faculty, that iron is extensively used for medicinal purposes, prepared either according to pharmaceutical works, or according to the extemporaneous prescriptions of medical practitioners,

or as it exists in natural chalybeate waters. But of the artificial preparations of iron in common use, some are liable to rapid decomposition, and consequently varying in strength; while others are insoluble until they meet with an acid in the stomach, and therefore act with more or less efficacy: some, again, are liable to disorder the stomach, while most are nauseous to the taste. The natural chalybeate waters are also liable to rapid decomposition, and can seldom be transmitted as an article of commerce, without having their efficacy impaired by transport or keeping. The object, therefore, of the patentee is, to make a chalybeate water more agreeable to the palate, and capable of keeping for any length of time; which is effected by dissolving, in a mixture of ten pints of water and three ounces and a half of good commercial sulphuric acid, of about 1.840 specific gravity (the mixture being contained in a stone ware, porcelain, or other vessel, set in a sand bath), one pound of crystallized sulphate of iron, such as is sold by manufacturing chemists for medicinal purposes. The heat of the solution being raised to the boiling point, nitric acid, of specific gravity 1.240, is to be occasionally added, stirring the solution frequently, until it ceases to give off vapours of an orange colour, which is an indication that the iron has attained a state of peroxide. This peroxidized solution is then poured into about ten gallons of water; to which is to be added (stirring at the same time) water of caustic ammonia, to precipitate the peroxide of iron, until the ammonia is in excess. The precipitate is then collected in a filter, and well washed in water. The patentee then dissolves about eight ounces of crystallized citric acid in about four times its weight of water, in a stone ware or other suitable vessel, set in a sand bath raised to a temperature of from 160° to 180° Fahrenheit, and adds to the solution the peroxide

of iron, as above; and in this moist state continues to add the peroxide, with agitation, until it ceases to be dissolved; that is, until the citric acid is as fully saturated with the peroxide of iron as their affinities will admit of; and after that the solution is filtered. The exact strength of the solution of citrate of iron is then ascertained, by evaporating a certain quantity to dryness, and then weighing the dry ferruginous salt. Having ascertained the strength, it is then mixed with a weak simple syrup of sugar, or with syrup flavoured or aromatized according to the taste, and in proportions corresponding with the degree of ferruginous strength desired to be given to the mixture; which is stated to be in such proportions that each fluid ounce shall contain thirteen grains of citrate of iron. One ounce of this mixture is then put into a seven-ounce bottle, which is to be filled up with about five ounces of water, charged with three or four times its volume of carbonic acid gas, by means of a soda-water machine. When the bottle has been filled, it must be corked immediately, and the cork secured in the ordinary manner.

The inventor states that he also prepares a modified triple combination of citric acid with the oxide of iron, by adding to citrate of iron, as above described, ammonia, potash, or soda; and instead of citrate of iron, other suitable organic salts may be employed.

The patentee claims as his invention the manufacture of an improved chalybeate water, whether such be prepared by the particular method as herein before described, or by any other analogous method or process.

A DISCLAIMER and Memorandum of Alteration have been entered, on the 22nd December, 1842, with the Clerk of the Patents, in the matter of the Patent granted 27th May, 1835, to JOHN GEORGE BODMER, of Bolton-le-Moors, in the county palatine of Lancaster, civil engineer, for his invention of "*improvements in machinery for preparing, roving, and spinning cotton and wool.*"

The Patentee declares, that having, since the taking of such letters patent, and since the enrolment of his Specification, discovered that the improvements in the willow or opening machine, and also the feeding plate of the blowing machine, are not new, as regards their application to other materials than cotton, he disclaims, and omits the words "*and other fibrous materials,*" in the said Specification written; and for the reason aforesaid he also adds the words "*as applicable to working cotton only,*" after the words "*blowing machine,*" in his said Specification.

SPECIFICATIONS NOT ENROLLED.

MOSES POOLE, of Lincoln's Inn, gentleman, for "*improvements in obtaining the colouring matter from wool and woollens dyed with indigo,*" due 21st December, 1842.

THOMAS GAUNT, of No. 10, Dalby Terrace, City Road, for "*improvements in the means of applying any such power as is, or may be used, for propelling vessels or carriages, to produce locomotion thereof,*" due 21st December, 1842.

Scientific Notices, &c.

Practical Essays on Mill Work and other Machinery, by Robertson Buchanan, Engineer; with notes and additional articles containing new researches on various subjects, by Thomas Tredgold, C.E., and now revised into a Third Edition, with additions, by George Rennie, Esq., C.E., F.R.S. London, John Weale: 8vo., p. p. 479; 1842. With an Atlas of Plates, in folio.

Practical Examples of Modern Tools and Machines: Being supplementary to the edition of Buchanan on Mill Work and other Machinery. Now first published. Edited by George Rennie, C.E., F.R.S. London, John Weale: 8vo., p. p. 27. With an Atlas of Plates, in folio.

A SOUND practical work, elucidating the first principles, and exhibiting the progressive improvements in British machinery, particularly of that important class denominated TOOLS, has been long wanted. It is therefore we hail with sincere pleasure the completion of this elaborate, and, as regards the industrial prosperity of our country, truly national publication.

It has frequently been observed as a singular fact, that whilst France has produced many valuable aids to the mechanist, such for instance (we quote from memory, and are by no means sure we have selected the best examples) as the *Industriel;* the *Recueil des Machines qui servent à l'économie rurale et industrielle;* the *Choix de Modèles appliqués à l'enseignement du dessin des Machines;* the former edited by Messrs. Christian and Le Blanc, and the two latter, we believe, by M. Le Blanc alone. Great Britain, immeasurably superior in every department of mechanical engineering, has actually added little or nothing to the general stock of information, since, if we except Messrs. Blunt and Stephenson's "Machinist and Civil Engineer," Mr. Tredgold's accurate and splendid work "On the Steam Engine," Professor Willis's "Principles of Mechanism," with one or two other treatises of a secondary and very inferior character, such as Nicholson's "Operative Mechanic," we may ransack the vast resources of English literature in vain; the enquirer must not

look for assistance to direct his studies from the portfolios of his countrymen, whilst on the contrary he will find the pages of "L'Industriel," and similar foreign periodicals, teeming with representations of the rarest productions of British inventive genius. This is abundantly vexatious, still it is notoriously true that the case is as we have stated it. We know not to what source to attribute this strange apathy; it cannot be assumed that we are less industrious, or less enterprising than our Continental neighbours; on the contrary, we are more so. The deficiency we have pointed out must, we suspect, be attributed to the caution of the publisher, rather than an indolence on the part of the author,—said to be, and too often with truth, the concomitant of genius. This, we apprehend, to be the real cause of a dearth of works on practical mechanism, to which we have just alluded; but that the subject is extremely popular, nay more, so much so, as to render any treatise by a competent pen a safe speculation in a mercantile point of view, is, we think, clearly made apparent, by the publisher of the work before us, in his address, and in which he states with honest pride, the large numbers sold within given periods of time, of his own publications, nearly all of which fall within the category with which we started.

A better, at all events a more general, illustration may be deduced from the work now before us, and we trust the results will prove equally satisfactory. This volume is based on and contains the Essays of Robertson Buchanan; these are too well known to engineers to require any critical examination at our hands. Mr. George Rennie has reprinted these essays, and added a fund of very valuable information, derived from his own experience; this portion doubtless forms the most interesting part of the work; and it may be questioned, whether in the present advanced state of science an original treatise by Mr. Rennie would not have proved quite as satisfactory, as well to himself as to the student. An editor is, in a great measure, compelled to adopt the course indicated by his author; this necessarily operates injuriously, as it tends to cramp the energies of the mind, and too often reduces the functions of the intellect to the level of mere mechanical agency. This, as our readers must observe, is merely the expression of an abstract opinion, and has no reference whatever to the execution of the present

work, viewed as a reproduction; since Mr. Rennie, in his editorial capacity, affords abundant proof both of ability, research, and impartiality.

It has been objected, we believe, that the character of Buchanan's essays is far too elementary for men of science, at the present day; this, we confess, is an objection, the force of which we do not comprehend; if, nevertheless, it be worth while to refute an observation evidently dictated either by splenetic ill-will, or disappointed hopes, we need only refer the hypercritic to the distinct declaration embodied in the title-page of the book, viz., "*Practical Essays on Mill-work and other Machinery*," as the most satisfactory answer to this extremely liberal criticism. The author tells us in his preface that his object has been "to collect and arrange facts, with a view to deduce rules to guide the millwright in a part of his business, which there is reason to suppose has hitherto, in most cases, been conducted at random; and again he remarks, "With a view to practical utility, I have endeavoured to adapt the style of these essays to the comprehension of such operative mechanics as have not had the advantage of mathematical instruction."—P. 5, 6.

This, we think, is so explicit, free too from all pretence, that we are bound to infer that no man, unless predetermined to cavil, could have expected any other than a plain elementary treatise, suited to the wants and capacities of millwrights; yet, although little is assumed, much is given. To enable our readers to appreciate the real value of this work, we shall extract from Mr. Rennie's able preface a brief detail of the essays themselves; which "consist of a series of treatises, seven in number, on several of the elementary parts of machinery." The first essay treats on the configuration of the teeth of wheels. In perusing it, we are at once struck with its resemblance to the admirable treatise of Camus, published in 1782, and which the author duly acknowledges. "The subject is divided into two parts; firstly, the principles as laid down by Camus; secondly, the application of these principles to different kinds of spur and bevil gear."—P. 7.

The second essay refers "to the shafts of mills, and is divided into five chapters, containing a general description of shafts most employed in mill-work, and the strains to which they are

subject from lateral stress and tension; the strength and stiffening of shafts, journals, and gudgeons, with reference to the strength of materials, according to the experiments of different authors. The subject of tension is briefly examined in conjunction with lateral stress; and the table of shafts, at the end of the fifth chapter, takes into consideration the two kinds of resistance."—P. 12.

The third essay is "on the construction and durability of the longitudinal connection of shafts denominated couplings."—P. 18.

The fourth essay relates "to the method of disengaging and re-engaging Machinery while in motion," and may be fairly included in the third essay on couplings, "with the exception of the fast and loose pullies, and friction clutches, which are found to be the simplest and best for engaging and disengaging Machinery without shocks."—P. 20.

The fifth essay is "on the mechanism for equalizing the motion of Mills, and relates to the changes of velocity to which every first mover is subject, either from an increase or diminution in the supply of power, or where the power is uniform, from the increase or diminution of the resistance required to be overcome. This is accomplished by means of double or conical pendulums or balls, either for regulating the supply of wind, water, or steam, according to the quantity of action required."—P. 21.

The sixth essay "relates to the changing the velocity in Machinery by means of alternating pullies, alternating cones, friction wheels, mules, and double speeds, as applied to cotton spinning."—P. 30.

The seventh essay "treats of the framing of Mill-work and small Machinery, according to the principles of Robison and Tredgold. The object of framings in mill-work is to support and maintain the different parts of machines in their proper and relative distance, so that all the wheels shall work as smoothly as possible, and without shocks or vibrations; for this purpose it is necessary that the framings be made in conformity to the strictest rules of science, that is, with reference to the composition and resolution of forces, that the resultants of these forces should be represented by ties or struts; in short, that all

pressure should be so distributed and resisted as to maintain a perfect state of equilibrium throughout."—P. 33.

An eighth essay, although not in the original edition of Buchanan is added; this treats of the geometrical and practical methods of finding the centres of gravity of Mill Wheels, illustrated by examples of two, three, or four wheels keyed upon the same shaft.—P. 33.

Mr. Rennie has not contented himself with a mere verbal reprint of these essays, with occasional corrections and illustrations; a large amount of new and valuable matter is condensed in the shape of appendixes, and he would seem to have undertaken the responsible charge of editor, with a feeling of enthusiastic attachment to his profession, and a sincere desire to inculcate sound practical knowledge to all who are willing to receive it at his hands. Thus from the well-replenished garner of his own matured experience, aided by the willing contributions of scientific friends, he has raised a noble and enduring monument to the mechanical genius of Great Britain.

One word more, ere we conclude; the plates, nearly one hundred in number, are intended to exhibit the progressive improvements in mechanical science, more especially as regards tools, those wonderful specimens of human skill, which enable this country to compete successfully with the whole civilized world. A very interesting communication on this subject, by Mr. Nasmyth of Manchester, is appended to the work, and we are sure it will be sufficient to mention that the plates, engraved in a superior style, by Lowry, exhibit the best specimens of modern machinery from the works of Messrs. Nasmyth, Gaskell and Co., Messrs. Sharp and Roberts, Mr. F. Lewis, Messrs. Fairbairn and Co., Messrs. Benjamin Hick and Son, Messrs. Maudslay and Field, Messrs. Maclea and March, Messrs. Whitworth and Co., Messrs. Carmichael, and others, to recommend this work to every practical engineer. In fine, our best thanks are due, both to the editor as also to the spirited publisher, for the share each has borne in the production of a volume which should, and we doubt not will, find a place on the shelves of every machinist, whether professional or amateur.

List of New Patents.

PATENTS GRANTED IN ENGLAND, FROM DECEMBER 28th, 1842, TO JANUARY 28th, 1843.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

Alonzo Grandison Hull, of Clifford-street, Middlesex, doctor of medicine, for "improvements in electrical apparatus for medical purposes, and in the application thereof to the same purposes." Sealed December 28.

Thomas Thompson, of Coventry, weaver, for "certain improvements in weaving figured fabrics." Sealed December 28.

Henry Crosley, of the city of London, civil engineer, and George Stevens, of Limehouse, gentleman, for "certain improvements in the manufacture of sugar and the products of sugar." Sealed December 28.

Edward Thomas, Lord Thurlow, of Ashfield-lodge, Ixworth, Suffolk, for "an improvement or improvements in bits for horses and other animals." Sealed December 29.

Benjamin Bailey, of Leicester, frame-smith, for "improvements in machinery employed in the manufacture of stockings, gloves, and other frame-work knitted fabrics." Sealed December 29.

John Stephen Bourlier, of Sherborn-street, Blandford-square, engineer, for "certain improvements in machinery used in printing calicoes, silks, paper-hangings, and other fabrics." Being a communication. Sealed December 29.

Joseph Rock, junior, of Birmingham, factor, for "improvements in the construction of locks." Sealed December 29.

Henry Samuel Rush, of Sloane-street, Middlesex, for "improvements in apparatus for containing matches for obtaining instantaneous light." Sealed December 29.

Baron Victor de Wydroff, of Old Bracknell, Berkshire, for "improvements in the construction of railways, and in wheels to run on railways, and in apparatus for cleaning the rails." Sealed December 29.

John Bishop, of Poland-street, Westminster, jeweller, for "improvements in apparatus for portioning steam power, and also improvements in plugs, cocks, or taps, for steam, gases, and liquids." Sealed December 29.

Crawshay Bailey, of Nant-y-Glo Iron Works, Monmouth, esquire, for "certain improved construction of rails for tramways and railways." Sealed January 11.

James Harvey, junior, of Regent-street, goldsmith, for "certain improvements in steam engines." Being a communication. Sealed January 11.

William Ritter, of 106, Fenchurch-street, gentleman, for "improvements in crystallizing and purifying sugar." Being a communication. Sealed January 11.

Julian Edward Disbrowe Rodgers, of Upper Ebury-street, Middlesex, chemist, for "certain improvements in the separation of sulphur from various mineral substances." Sealed January 12.

William John Loat, of Clapham, Surrey, builder, for "an improved mode of constructing floors and roofs." Sealed January 12.

Pierre Armand, Le Comte de Fontainemoreau, of Skinner's-place, Size-lane, for "a certain process, or processes, of combining clay with some other

substances, for the production of a certain 'ceramic paste,' capable of being moulded into a variety of forms; and in the application thereof to several purposes." Being a communication. Sealed January 14.

JAMES HARVEY, of Bazing-place, Waterloo-road, timber merchant, for "improvements in paving streets, roads, and other places; some of which improvements are his own invention, and others have been communicated to him by a foreigner residing abroad." Sealed January 14.

WILLIAM SNELL, of Northampton-square, gentleman, for "improvements in machinery for the manufacture of farina." Sealed January 14.

NATHANIEL CARD, of Manchester, candle-wick manufacturer, for "certain improvements in the manufacture of candle-wicks, and in the machinery or apparatus for producing such manufacture." Sealed January 14.

HENRY HUSSEY VIVIAN, of Singleton, Glamorgan, esquire, and WILLIAM GOSSAGE, of Birmingham, manufacturing chemist, for "certain improvements in treating or reducing ores of zinc; also certain improvements in furnaces to be used for reducing ores of zinc; part of which improvements are applicable to other furnaces." Sealed January 14.

JAMES HAMER, of Wardour-street, engineer, for "improvements in propelling vessels." Sealed January 19.

THOMAS, EARL OF DUNDONALD, of Regent's-park, for "improvements in rotary or revolving engines, and in apparatus connected with steam engines, and in propelling vessels." Sealed January 19.

JOSEPH KIRKMAN, junior, of Soho-square, piano-forte manufacturer, for "improvements in the action of piano-fortes." Sealed January 19.

THOMAS WILLIAM BENNETT, of Gray's-inn-road, timber merchant, for "improvements in paving or covering roads, streets, and other ways or surfaces." Sealed January 19.

LUKE HEBERT, of Dover, civil engineer, for "certain improvements in machines for grinding, and for dressing or sifting grain and other substances." Sealed January 19.

WILLIAM BATES, of Leicester, fuller and dresser, for "improvements in the dressing and getting up of hosiery goods, comprising shirts, drawers, stockings, socks, gloves, and other looped fabrics, made from merino, lamb's wool, worsted, cotton, and other yarns; and in machinery for raising the nap or pile on the same." Sealed January 19.

THOMAS SUNDERLAND, of Albany-street, Regent's-park, esquire, for "improvements in moving floating bodies through water and air, and in accelerating the flow of water, air, and other fluids, through shafts, pipes, and other channels." Sealed January 19.

URIAH CLARKE, of Leicester, dyer, for certain improvements in frame-work knitting machinery, and a new frame-work knitted fabric." Sealed January 21.

FREDERICK ALBERT WINSOR, of Lincoln's-inn-fields, barrister at law, for "a new apparatus for the production of light." Being a communication. Sealed January 26.

CHARLES FREDERICK BIELEFELD, of Wellington-street North, Strand, papier maché manufacturer, for "improvements in suspending or hanging swing looking glasses, and other articles requiring like movements." Sealed January 26.

WILLIAM PALMER, of Sutton-street, Clerkenwell, manufacturer, for "improvements in the manufacture of candles." Sealed January 26.

HENRY CHAPMAN, of Arundel-street, Strand, for "a fabric for maps, charts, prints, drawings, and other purposes." Sealed January 26.

FRANCIS MC GETRICK, of Ernest-street, St. Pancras, artisan, and MATTHEW BAILEY TENNANT, of Henry-street, Regent's-park, gentleman, for "improvements in apparatus for preventing the engines and carriages from going off railways, and for removing obstructions on railways." Sealed January 26.

EDWARD SMALLWOOD, of North-lodge, North-end, Hampstead, gentleman,

for "improvements in covering roads, ways, and other surfaces." Sealed January 26.

ROBERT GOODACRE, of Ullesthorpe, Leicester, gentleman, for "certain improvements in weighing apparatus, applicable to cranes and other elevating machines, whereby the weight of goods may be ascertained while in a state of suspension." Sealed January 26.

JAMES BOYDELL, junior, of Oak Farm Works, near Dudley, Stafford, iron master, for "improvements in the manufacture of metals for edge tools." Sealed January 26.

GEORGE PARKER BIDDER, of Great George-street, civil engineer, for "an improved mode of cutting that kind of slates commonly called roofing slates, though sometimes used for other purposes." Sealed January 26.

WILLIAM JAMES GRANSTREET, of Blackfriars-road, gentleman, for "certain improvements in machinery or apparatus for producing or obtaining motive power." Sealed January 26.

JOSEPH KIRBY, of Banbury, Oxford, gentleman, for "improved apparatus for manufacturing bricks, tiles, and other articles from clay or earthy materials." Sealed January 26.

GEORGE PHILLIPS BAYLY, of 146, Fenchurch-street, brush maker, for "certain improvements in brushes." Sealed January 26.

MARTYN JOHN ROBERTS, of Brynycaeran, Carmarthen, esquire, for "improvements in dyeing wool and woollen fabrics." Sealed January 26.

WILLIAM WEILD, of Manchester, engineer, for "certain improvements applicable to window blinds and curtains; parts of which improvements are also applicable to doors." Sealed January 28.

DAVID ISAAC WERTHEIMBER, of West-street, Finsbury-circus, gentleman, for "improvements in calculating machines; part of which improvements is applicable to purposes where wheel-work is required." Being a communication. Sealed January 28.

JOHN BARROW, of East-street, Manchester-square, engineer and smith, for "certain improvements in the manufacture and hanging of window sashes." Sealed January 28.

PATENTS GRANTED FOR SCOTLAND, FROM DECEMBER 25th, 1842, TO JANUARY 25th, 1843.

ROBERT WILSON, manager at the works of Messrs. Nasmyth, Gaskell and Company, Patricroft, near Manchester, in the county of Lancaster, engineer, for "certain improvements in the construction of locomotive and other steam engines." Sealed December 27.

GABRIEL HIPPOLYTE MOREAU, of Leicester-square, in the county of Middlesex, gentleman, for "certain improvements in propelling vessels." Sealed December 27.

JAMES MORRIS, of Cateaton-street, in the city of London, merchant, for "improvements in locomotive and other steam engines." Being a communication. Sealed December 27.

HENRY SAMUEL RUSH, of Sloane-street, in the county of Middlesex, mechanic, for "improvements in apparatus for containing matches for obtaining instantaneous light." Sealed December 29.

JOHN RAND, of Howland-street, Fitzroy-square, in the county of Middlesex, artist, for "improvements in making and closing collapsable vessels." Sealed December 29.

HENRY BEAUMONT LEIGON, of Greenwich, in the county of Kent, doctor of medicine, for "improvements in the act of depositing and manufacturing

metals and metal articles, by electro-galvanic agency, and in the apparatus connected therewith." Sealed December 30.

Robert Logan, of Blackheath, in the county of Kent, esquire, for "improvements in obtaining and preparing the fibres and other products of the cocoa nut and its husks." Sealed January 9.

Charles Hancock, of Grosvenor-place, in the county of Middlesex, artist, for "certain improvements in printing cotton, silk, woollen and other fabrics." Sealed January 11.

James Gardner, of Banbury, in the county of Oxford, ironmonger, for "improvements in cutting hay, straw, and other vegetable matters for the food of animals." Sealed January 11.

John Stephen Bourlien, of Sherborn-street, Blandford-square, in the county of Middlesex, engineer, for "certain improvements in machinery used in printing calicoes, silks, paper hangings, and other fabrics." Being a communication. Sealed January 12.

George Wilton Turner, of Gateshead, in the county of Durham, doctor in philosophy, for "improvements in the manufacture of alum." Sealed January 12.

William Wood, of Holborn, in the county of Middlesex, carpet manufacturer, for "a new mode of weaving carpeting and other figured fabrics." Sealed January 13.

Mathew Gregson, of Toxteth-park, Liverpool, in the county of Lancaster, esquire, for "an invention or improvement applicable to the sawing or cutting of veneers." Sealed January 16.

Samuel Hall, of Basford, in the county of Nottingham, civil engineer, for "improvements in the combustion of fuel and smoke." Being a communication. Sealed January 18.

Joseph Beamon, of Smethwick, in the parish of Harborne, in the county of Stafford, iron master, for "an improvement in the manufacture of malleable iron." Sealed January 18.

Alexander Johnson, of Hillhouse, in the county of Edinburgh, esquire, for "improvements on carriages, which may also be applied to ships, boats, and other purposes where locomotion is required." Sealed January 20.

John Thomas Betts, of Smithfield-bars, in the city of London, gentleman, for "improvements in covering and stopping necks of bottles and other vessels." Being a communication. Sealed January 23.

Thomas Thompson, of Coventry, in the county of Warwick, weaver and mechanist for "certain improvements in weaving figured fabrics." Sealed January 23.

Julian Edward Disanowe Rodgers, of Upper Ebury-street, in the county of Middlesex, chemist, for "certain improvements in the separation of sulphur from various mineral substances." Sealed January 25.

PATENTS GRANTED IN IRELAND FROM 25th DECEMBER, 1842, TO 25th JANUARY, 1843.

Isham Baggs, of Wharton-street, in the county of Middlesex, chemist, for "an improvement or improvements in the production of light." Sealed December 29.

Samuel Carson, of York-street, Covent-garden, in the county of Middlesex, gentleman, for "improvements in purifying and preserving animal substances." Sealed December 29.

William Coley Jones, of Vauxhall-walk, in the parish of Lambeth, in the county of Surrey, for "improvements in treating or operating upon a certain

unctuous substance in order to obtain products therefrom for the manufacture of candles and other purposes." Sealed December 29.

GEORGE EDMUND DONISTHORPE, of Bradford, in the county of York, top manufacturer, for "improvements in combing and drawing wool and certain descriptions of hair." Sealed December 30.

CHARLES MAURICE ELIZEE SAUTTER, of Austin-friars, in the City of London, gentleman, for "improvements in the manufacture of sulphuric acid." Being a communication. Sealed December 30.

JAMES MORRIS, of Cateaton-street, in the City of London, merchant, for "improvements in locomotive and other steam engines." Being a communication. Sealed December 30.

WILLIAM COLEY JONES, of Vauxhall-terrace, in the county of Surrey, practical chemist, and GEORGE FERGUSSON WILSON, of Vauxhall, in the same county, gentleman, for "improvements in operating upon certain organic bodies or substances, in order to obtain products or materials therefrom for the manufacture of candles and other purposes." Sealed December 30.

GABRIEL HIPPOLYTE MOREAU, of Leicester-square, in the county of Middlesex, gentleman, for "improvements in steam generators." Sealed January 9.

GABRIEL HIPPOLYTE MOREAU, of Leicester-square, in the county of Middlesex, gentleman, for "improvements in propelling steam vessels." Sealed January 14.

THOMAS WRIGLEY, of Bridge-hall Mills, in the county of Lancaster, paper manufacturer, for "improvements in machinery or apparatus for manufacturing paper." Sealed January 20.

THOMAS RIDGWAY BRIDSON, of Great Bolton, in the county of Lancaster, for "improvements in machinery or apparatus for stretching, drying, mangling, and finishing woven fabrics." Sealed January 21.

The Record

OF

PATENT INVENTIONS.

No. VI.

SPECIFICATION enrolled 5th January, 1843, of a PATENT granted 12th July, 1842, to THOMAS DEAKIN, of Sheffield, in the county of York, merchant and manufacturer of hardware, for "*improvements in the manufacture of parts of harness and saddlery furniture.*"

THESE improvements relate to the manufacture of several parts of harness and saddlery furniture, which may or may not be combined with metallic substances, such as hooks, turrets, stands, loops, frontlets, rosettes, circles and guards for the back part of harness saddles, parts of ames, buckles, and other parts of saddlery; which are made by cutting a piece of horn of the required size and shape for the article intended, and boiling or softening the same, and then placing it between a pair of dies of the required form, and submitting the same to the action of a press, and afterwards finishing the same, by turning, filing, or scraping. The turrets may be made by uniting a metallic screw to that part where the reins pass through, and to the shank of the turret, by boring a hole, and then

inserting the screw, which, when submitted to the action of a press, unites them firmly together. Another method of making turrets is, by providing a metal skeleton, and covering the same with horn; or the same may be covered with whalebone, by lopping, in the same manner as in lopping the handles of whips.

SPECIFICATION enrolled 6th January, 1843, of a PATENT granted 6th July, 1842, to JOHN HARRISON SCOTT, of Somers Town, in the county of Middlesex, engineer, for "*certain improvements in metal pipes, and in the manufacture thereof.*"

THESE improvements in metal pipes consist in casting upon one end thereof a male screw, and at the opposite end a small projecting flange; and upon any part of the pipe, a nut, having a female screw of the same pitch as the male screw, and in such manner, that when taken from the sand the nut shall turn freely on the pipe, but will be prevented slipping off the same by the raised part, which forms the male screw at one end, and the projecting flange at the other. This is effected by preparing a pattern or mould of the same form as the external part of the nut, an impression of which will be made in the sand at the same time as the pipe is made; a core of loam or sand is then provided for the pipe in the usual way, and another for the nut, which latter has a hole through it, of the same diameter as the external diameter of the pipe; the external diameter of the core, which is equal to the internal diameter of the nut to be cast, has a screw formed upon it, of the same pitch as that formed on the end of the pipe, which screw forms the female screw of the nut; in placing

the core in the mould, the core for the nut is slipped upon that of the pipe, and the two cores are supported by templets in the usual manner, and the melted metal poured into the mould; it will therefore be seen, by those conversant with moulding, that the nut will be cast so as to work loosely upon the pipe. When it is required to join two or more of these pipes together, it is only necessary to place that end of the pipe having the small projecting flange, against that end of the other having the male screw; and by placing a leather washer between them, and then slipping the nut over the pipe, and screwing it upon the end, the ends of the two will be drawn together so as to form a perfect joint. Another mode is by casting the pipe first, and then casting a loose nut upon it.

With respect to wrought iron pipes, the mode pursued is as follows:—a nut being slipped upon the pipe, the end is made red hot, for the purpose of what is technically termed by smiths, "jumping," or forming a collar thereon, which is of such diameter, as to allow the screwed part of the nut to slip over it, in order to be screwed on to the end of the pipe to which it is to be connected, precisely in the same manner as the joints of pipes in fire engines are made.

The same method is adopted in leaden pipes, except that the collar may be formed by cold hammering.

The last improvement consists in making a joint in pipes, to allow of the expansion and contraction caused by variations in temperature. One of the pipes forming such joint is lapped with hemp or tow, and fits into a socket formed on the end of another pipe, made of three different diameters, the first of which is equal to the bore of the pipe, the second to the external diameter of the pipe, and the third somewhat larger, for the purpose of receiving

the packing of hemp or tow, which is forcibly compressed between two rings, and upon the pipe which fits into the socket, by means of a nut, as above described, somewhat similar to a stuffing box for a piston, the pipe sliding in and out of the socket, and through the packing, by expansion and contraction in the same manner.

The inventor claims, first, the mode of casting at one operation, metal pipes, with nuts loosely encircling the same, and inseparable from them; secondly, the mode of casting pipes within nuts or screws which have been previously cast, and joining such pipes together; thirdly, the mode of casting nuts upon pipes, which pipes have been previously cast; fourthly, the mode of raising flanges on the end of wrought iron and other soft metal pipes, after the nuts have been slipped thereon; fifthly, the mode of providing for the contraction and expansion, or lengthening of metal pipes, from variations of temperature.

SPECIFICATION enrolled 6th January, 1843, of a PATENT granted 6th July, 1842, to GEORGE EDWARD DONISTHORPE, of Bradford, in the county of York, for "*improvements in combing and drawing wool, and certain descriptions of hair.*"

THIS invention relates, first, to the construction of combs employed in machinery for combing wool and certain descriptions of hair, and consists in making such combs with teeth set at a coarser gauge at that end where the combs first commence to work the wool or hair, and of a finer gauge at the other end, at which the teeth are caused to penetrate the wool closer up to the head of the comb containing the wool, the working comb being set nearer

at one end than at the other to the comb containing the wool or hair to be combed.

The second improvement consists in combing working combs, with combs which move in a circular or endless course. Thirdly, in apparatus for filling combs with wool or hair. Fourthly, in applying steam or hot water to the heads of combs which are placed on revolving axes, where such combs have a movement to and from their axis of motion, in addition to their rotary motion. Fifthly, in the application of drawing off rollers.

The sixth and last improvement relates to using two or more rotary combs, with a moving endless comb.

This machine consists of a comb, which may be composed of a number of segments, so as to form a circular or endless comb, supported in a horizontal position by a suitable frame; the rim or circle which supports the teeth of the comb is made hollow, so as to admit of the circulation of hot water or steam. The periphery of this circular comb forms a continuous rack or wheel, into which gear the teeth of a pinion, which gives a slow rotary movement to the endless comb; on one side of this comb is a pair of fluted drawing rollers, each having an endless belt of woollen or felted cloth; the object of these rollers, which have a greater speed than the circular comb, is to draw the wool from the comb as it moves round, and form it into a sliver; on the opposite side, or thereabouts, of the drawing rollers, is fixed the delivering apparatus, consisting of two pair of rollers, through which the wool passes; the axes of the rollers are supported by means of two side plates, the ends of which are attached to an horizontal shaft, receiving, by means of a bevil wheel and sector, an alternate backward and forward motion, so as to move the delivery rollers through a portion of a circle, and thus produce a lashing motion, which lashes the wool upon the

circular comb. These rollers, besides having the motion described, have a continuous rotary motion for delivering the wool; and also a running back or retrogade motion, which takes place when the wool has been lashed on to the circular comb.

The construction of the combs alluded to in the fourth part of these improvements, is as follows: upon a hollow axis are keyed two wheels, having hollow arms, and also hollow rims or peripheries, supporting three hollow shafts, equidistant from each other, and parallel with the axes of the wheels which support them; these shafts are supported by suitable bearings formed in the peripheries of the wheels, and in such manner as to establish a communication for the circulation of steam or hot water, which passes through the axes of the wheels and into the arms thereof, and from thence through the peripheries to each of the three shafts, for the purpose of heating the combs which are attached to them. These shafts, together with the combs, besides having a motion round the axes of the wheels which carry them, turn upon their own axes, by means of eccentrics or tappets actuating the shafts upon which they are fixed, in such manner that the points of the combs when piercing the wool, are drawn towards the axis of rotation, or that of the wheels.

The last improvement shows the application of two or more rotary working combs, to the circular or endless comb.

The inventor claims, first, the mode of constructing working combs, with the teeth set coarser at one end than at the other; secondly, the combining rotary combs with a curved or endless comb, when such combs have movement towards their axes when revolving, and at the time of combing the wool; also the causing rotary combs to work nearer at one end than at the other to a circular comb

with which they are working, when the combs are filled by other means than by revolving combs; also the combing an endless comb with working combs, so that the swell or convexity of the comb produces an angular spuce between it and the working comb, whereby the wool or hair will be first combed at the ends, and progressively up to the head of the comb; thirdly, the mode of lashing and filling the comb, as described; fourthly, the application of steam or hot water to heat rotary combs, when such combs have a movement towards the axes of motion, as described; fifthly, the application of drawing rollers, for drawing off the wool from combs; sixthly, the combining two or more axes with fixed combs, with an endless moving comb, as described.

SPECIFICATION *enrolled* 6th January, 1843, of a PATENT granted 7th July, 1842, to JOHN BIRD, of Manchester, in the county of Lancaster, machinist, for "*certain improvements in machinery or apparatus for raising or forcing water and other fluids; which said improvements are also applicable as an engine, to be worked by steam, for propelling vessels, and other purposes.*"

THE first part of this invention relates to a machine or apparatus for raising and forcing water and other fluids; and consists of a horizontal cylinder, through which is passed a shaft supported in suitable bearings. This shaft, which is of peculiar external form, contains three sliding pistons, equidistant from each other, which fit and slide into recesses formed in the shaft, and are kept in close contact with the internal diameter of the cylinder, by

means of suitable springs. The induction pipe passes through the underside of the cylinder in a vertical direction; and at right angles to it (in a horizontal position), is the eduction pipe. In the inside of the cylinder, between the eduction and induction ports, and extending the whole length of the cylinder, is a projection, which also contains a sliding stop or piston, kept in contact with the periphery of the shaft by means of springs. This projection, which is bevilled off at each side, serves to force the three sliding pistons, as the shaft revolves, into their recesses. The action is as follows: motion being given to the shaft by means of a handle, one of the three pistons, in leaving the aforesaid projection, will be forced out of its recess by means of its springs, and will be in contact with the interior diameter of the cylinder; and in leaving the aforesaid projection, will form a partial vacuum; which space will be filled with water from the induction pipe, and the water will be carried forward by the succeeding piston, which in its rotation will also produce a similar effect; and in this manner the water is carried partially round the cylinder, and finally delivered through the eduction pipe.

Another modification of this engine is as follows: it consists of a cylinder with a shaft passing through it in the form of a double cam, extending across the cylinder, and touching each side. Below the cylinder is a recess, into which works a metal slide which is kept in contact with the cam or piston by means of springs placed within the recess. In the lower part of the cylinder are two apertures, one on each side of the metal slide, through which the water, or other fluid, is received and delivered by the rotary motion of the piston; the peculiar form of the piston (which has been stated to be like that of a cam), causes the metal slide to move into the recess at each

half-revolution of the shaft or piston, so as to allow the latter to pass, and also to form a stop between the eduction and induction pipes.

Another improvement is for the construction of a paddle-wheel, with floats to slide in and out of recesses by means of a piece of metal placed eccentric with the wheel; the object being to force each float into its recess before leaving the water.

The inventor, in describing a ship's pump constructed as above, proposes, in cases where the pump is considerably above the water-line, to let the water from such pump or pumps fall upon a water-wheel; and employ the power thus obtained to some useful purpose, such as assisting in the working of the pumps.

Improvements in valves.—This part of the invention consists in the application of a ball of cork, wood, or a hollow ball of copper, to be attached to a foot-valve to act as a float, and thereby assist in raising the same when required.

The last part of this invention relates to improvements in pistons, and certain novel methods of working the same. The pistons are made with two discs of metal, having a washer of cork between them, similar to the packing of an ordinary piston; the edge or rubbing surface of the cork is then bound round with a piece of sheet-brass; which latter is forced against the sides of the cylinder by the elasticity of the cork.

The peculiar mode of working pistons for raising or forcing water, and other purposes, is as follows: through the top part of a cylinder is a horizontal shaft, upon which and within the cylinder are two loose bosses, each having a stud which projects into a spiral slot formed in the shaft; the arrangement being such, that on giving a rotary motion to the shaft by a handle or winch, the two bosses

simultaneously approach and recede from each other; to each of these bosses is connected the end of a lever; these levers cross each other, and are connected together by a pin-joint; and at the extreme ends of these levers are two other levers, crossing each other and connected together by pin-joints; the whole consisting of a series of levers jointed together in the manner described, and finally to the piston, which cause the same, by the rotation of the shafts, to be raised and depressed in the cylinder. The water is admitted to the cylinder on the underside of the piston, by means of a pipe provided with a valve, which enters the cylinder at one side, and is delivered th.ough a pipe at the other side.

Another mode of obtaining a rectilinear traverse motion of a piston or pistons is as follows: in this case, there are two pistons in the same cylinder, which is provided with eduction and induction passages at both ends. The piston rod forms a screw having several threads, and commencing from the middle, with right and left-hand threads; the pistons, which are connected together with rods, have each a pair of dies, corresponding with the threads formed on the piston rod. Suppose one pair of these dies to be in gear with the right-hand screw of the piston rod, and a rotary motion to be given to the same, the effect would be, that the pistons would move in one direction towards the end of the cylinder; and on arriving at that point, the dies which forced the pistons forward would be thrown out of gear, and the dies of the other piston thrown into gear with the left-hand screw, which would have the effect of forcing the pistons in an opposite direction, and so on alternately.

Another improvement consists in connecting the pistons of two cylinders together, by means of gearing; the cylinders are parallel to each other, and the piston rods are

made with spiral grooves or screws having several threads. These grooves receive a projecting pin or pins attached to the piston. On admitting steam into one of the cylinders, the piston is forced from one end of the cylinder to the other; by which means, a rotary motion is imparted to the piston rod, and also, by means of the spur wheels, to the piston rod of the other cylinder, thereby causing the piston in this cylinder to traverse in a direction of its length; which latter cylinder is for the purpose of raising and forcing the water; the steam is then reversed in the steam cylinder, and the piston rods and pistons are driven in an opposite direction, and so on alternately.

The patentee claims, first, the construction and combination of revolving vanes or pistons, also the paddle-wheel; secondly, the arrangement of levers for working the pistons, together with the peculiar construction of the same; thirdly, the arrangement of parts for converting the rectilinear traverse of a piston into a rotary motion in the piston rod, also the application of the buoyant valve introduced at the foot valve.

SPECIFICATION enrolled 6th January, 1843, of a PATENT granted 9th July, 1842, to JOHN PETER BOOTH, of the county of Cork, merchant, for "*certain improvements in machinery and apparatus for working in mines, which are applicable to the raising, lowering, and transporting of heavy bodies, and also affording assistance in promoting a more perfect ventilation of the mine.*"

THE first of these improvements relates to a mode of arresting the descent of a car or box in a mine in the event

of the suspension rope or chain breaking. The box or car is guided in its ascent and descent in the mine by brackets or projections at the top and bottom of the car, which are made to clip or embrace a vertical square bar of iron fixed to the side of the mine, and extending from top to bottom thereof; that side of the square bar which is adjacent to the car forms a series of ratchet teeth. The top guides of the box carry the axis of a lever, having a short and long arm, which latter projects over the car and is held in an inclined position by means of a short chain, one end of which is attached to the said lever, and the other made fast to the suspension rope; another chain is also attached to the long arm of the lever which supports the platform within the car or box; by this arrangement, if the suspension rope should break, the inclined bar will be drawn down by the weight of the platform falling, and its opposite or short end raised and thus be brought in contact with the ratchet teeth, so as to arrest the progress of the falling body; for the purpose of ensuring a more instantaneous action of the lever, an auxiliary rope may be employed, which passes over the pulley at the top of the shaft in the same manner as the suspension rope, the former being attached to the short arm of the lever so as to raise and bring the same into action immediately the principal or suspension rope breaks. The top of the car or box is covered with a grate or bars of wrought iron, in order to prevent the rope from falling upon any person who might happen to be on the platform.

The second improvement relates to the application of a screw-shaft for raising the car or box in mines; this consists of a screw shaft, or a shaft having a number of consecutive inclined planes formed thereon extending the whole depth of the mine, and supported from the side by suitable brackets, a portion of the thread being cut away

in order to receive the same; to the side of the car or box are two anti-friction pullies which enter the space formed in the thread and rest upon the thread or inclined plane, or planes thereof, thus by giving motion to the screw by means of a bevil wheel keyed on the top, and also other suitable machinery, the rotary motion of the screw will cause the ascent or descent of the box as may be required; and by having two anti-friction rollers, one placed above the other, one will always be in contact or rest upon the inclined part of the screw, while the other is passing over the opening formed for the reception of the brackets. The anti-friction wheels of the car or box are kept in contact with the screw by means of a guide rod and guide pullies attached to the car.

The third improvement consists in the employment of the power derived from the revolving screw-shaft for the purpose of making a fan or air pump apparatus for injecting pure air into or abstracting foul air from mines during the operation of working, in order to assist the ventilation. The patentee claims, first, the apparatus for arresting the descent of the car or box in the event of the suspension chain or rope breaking; secondly, the employment of a screw-shaft or shafts for working the carriage or box, also the mode of enabling some of the rollers of the car to keep constantly in contact with the surface of the screw whilst others are passing over the open parts of the thread; and thirdly, the derivation of the power for working the ventilating apparatus from the rotary motion of the screw-shaft.

SPECIFICATION enrolled 6th January, 1843, of a PATENT granted 6th July, 1842, to JOSEPH HALL, of Cambridge, in the county of Cambridge, agricultural implement maker, for "*certain improvements in machinery for tilling land.*"

THE first part of these improvements relates to a crushing or delving machine, and consists of a frame supported by ordinary wheels; to each side of the frame is affixed what the patentee calls a "parellel motion and tilting frame;" these latter frames support two horizontal shafts or axles extending across the machine, and upon the first or foremost of these axles are keyed three wheels, to the peripheries of which are attached a number of delvers or crushers in such manner that they may have a little play endways, and also forwards and backwards, but not so as to turn over. These blades, delvers, or crushers, are also affixed in an inclined position with respect to the axis of the wheel, in such manner that they come in contact with the ground end foremost; the second or after axle contains two of these wheels keyed on the shaft in such a manner that they work between the spaces formed by the two outside and middle wheels of the fore axle; the parallel motion and tilting frames which support these axles are constructed of several parts, so that they may preserve their parallelism with respect to the line of motion, and also with respect to one another under every circumstance, and the frames, together with the wheels, are capable of being raised or lowered by means of a screw so as to regulate the depth to which the delvers and crushers shall penetrate the ground. This machine is drawn by a horse or other power, and the hind wheels being placed on the axle so as to enter the spaces of the other

three on the foremost axle, serve, besides crushing and breaking up the soil, to clear the three wheels of any earth or rubbish which may adhere thereto. Note.—This machine can, if required, be constructed with one set of delvers instead of two.

The inventor claims the connecting the axles of wheels carrying delvers or crushers with parallel motion, and tilting frames, together with the mode of elevating and depressing the same by means of a screw rod, whereby the depth to which the delvers are to penetrate the ground can be regulated.

The second part of the invention consists of an improved harrowing machine, the construction of which is similar to that before described, so far as regards the frame work and parallel motion and tilting frames, but with a single axle, which, instead of carrying the delvers and crushers, is armed with tines capable of being set to any angle required with respect to the ground.

Claim, is the harrowing machine, constructed on the same principle as the delving and crushing machine, and the application to such machine of a parallel motion and tilting frame.

The third part of the invention is for a rolling machine, which is constructed on the same principle as that last described, only that instead of tines, a plane roller is substituted.

Claim, the rolling machine, as being constructed on the same principle.

The fourth improvement consists of a double plougling machine, of the same construction as that last described, but that the axle carries two ploughs instead of the roller, so that in ploughing, two furrows shall be made parallel to each other.

Claim, is for the ploughing machine, in which two or more ploughs are employed.

The fifth improvement relates to a harrow and dibbling machine, and consists in making the harrows circular instead of square, and inserting at equal distances in the periphery thereof a number of tines, so that the circular harrow only requires to be turned on its edge to convert it into a dibbling machine.

Claim, the harrowing and dibbling machine, so far as respects the combination of the two operations in one machine.

The sixth improvement is for an expanding spade, which consists of a handle of ordinary construction, having three prongs, spikes, or blades attached to the end thereof; the middle one is connected to the handle in the usual manner, the other two being connected to the middle one by means of levers or arms moving upon pin joints; to the ends of these spikes are other two levers, connected in like manner to the spikes and also to a hoop or ferule which slides upon the handle, and is provided with a set-screw for the purpose of affixing it to any part of the same; thus by sliding the hoop on the shaft of the spade, the two lateral spikes will be moved further from or nearer to the middle or centre one, as may be desired, still keeping parallel to each other.

The seventh improvement consists of an expanding rake, the construction of which is exactly similar to that of the expanding spade.

The eighth improvement is for a land crab or weed extractor, and consists of a handle similar to a common spade, provided at the end with two prongs, at the root of which there is a gripper in form of a S attached to the instrument by a pin-joint passing through the middle of

the gripper, the top part of it, as at *e*, branches out in two parts, and to the lower part, as at *i*, is attached a slender rod which passes through loops formed on the under side of the handle of the instrument. The action of this instrument is as follows: when the weed has been uprooted by the two prongs of the fork, the slender rod is pulled up towards the handle of the instrument, which brings the end *e* of the forked gripper down upon the prongs and thus secures the weed.

Claim is, for the land crab or weed extractor, and the several parts of which the same is composed.

SPECIFICATION enrolled 7th January, 1843, of a PATENT granted 7th July, 1842, to WILLIAM FAIRBAIRN, of Manchester, in the county of Lancaster, engineer, for "*certain improvements in the construction of metal ships, boats, and other vessels; and in the preparation of metal plates to be used therein.*"

THESE improvements consist in preparing or rolling the iron intended to be used in the construction of ships and vessels, by forming at each edge, and the whole length of the plate, a raised border, or in other words, the plate is made at each side or edge where the rivets pass through, something like double the thickness of any other part of the plate; one side of the plate being plain, which is to be the outside in the construction of a vessel, the other side having two projecting edges or borders. The rivet-holes on the plain side of each plate are to be countersunk, so that the head of the rivet may be flat or flush with the face of the plate; and in joining two or more plates together, they are not to overlap each other, as hitherto practiced, but the plates are placed with their edges

together; and behind the two is placed a metal band, bar, or rib, perforated with a double row of holes, to correspond with the holes in the edge of each plate, and the whole are firmly rivetted together so as to form a water-tight joint; and where greater security or strength is required, the metal bands or bars are made in the form of a T, or with a projection on the back side; by this arrangement, the resistance of a vessel in the water will not be so great, and the plates at the parts where the rivets pass through will be equal in strength to any other part of the plate; whereas in those of ordinary construction, the plates are considerably weakened by making the rivet-holes, as such parts have always been found to give way when the plate itself has remained entire.

The Claim is for the construction of metal ships, boats, and other vessels, and the preparation of plates to be used therein, and the manner of uniting them by bands, bars, or ribs and rivets, as hereinbefore described.

SPECIFICATION enrolled 7th January, 1843, of a PATENT granted 7th July, 1842, to JAMES TIMMINS CHANCE, of Birmingham, in the county of Warwick, glass manufacturer, for "*improvements in the manufacture of glass.*" Being a communication.

THE object of this invention is to construct a kiln for flattening sheets or plates of glass which have been previously blown and formed into cylinders, and which are afterwards split or cut open and formed into plates; so that such plates after having left the flattening chamber, may not pass at once into a cold temperature and become stiff, but be subjected to a regular decrease or gradation

of cooling, and also that the sheets of glass may not be lifted up before they have become stiff and rigid; the plates being conveyed directly from the flattening chamber to the annealing oven. By this arrangement, also, the workmen may be successively employed in flattening sheets in the same kiln, and at the same time as the others are cooling.

The annealing and flattening chambers, as constructed according to this invention, consist of two circular buildings, having a communication from one to the other. In the centre of each building is a piece of masonry or brickwork, so as to form an annular space between the said brickwork and the external walls. Each of these annular spaces is provided with a cast-iron plate or frame, mounted upon wheels or castors; the inner edge of each of the frames forms an internal wheel, which takes into, and is driven by a pinion keyed upon a vertical shaft connected to suitable machinery for giving a rotary motion to the frames, one of which supports the "lagres" and flattening stones, which are eight in number, arranged round the face or upper surface of the circular or annular plate.

The plate in the next chamber, or annealing kiln, presents a surface of copper, or other metallic wires, stretched upon the frame so as to form radial lines, and upon which the plates of glass, after leaving the flattening kiln, are placed. The mode of operation is as follows:—each of the kilns is heated by a stove or grate; the cylinders of glass are inserted through a hole in the external wall, and deposited on one of the flattening stones; the frame is then moved round, so as to bring that flattening stone upon which the cylinder is placed opposite another hole, through which the flattener introduces suitable instruments for opening out the cylinder, in the ordinary man-

ner; after which the sheet of glass, together with the frame, moves on still further; the like operation being performed on the next succeeding stone, until it finally arrives at the aperture where the two buildings join together; at which time, the sheet or plate will have become sufficiently stiff and rigid to be removed from the flattening stone on to the wire frame of the annealing chamber. This part of the building is lighted with gas, so that the workman is enabled to conduct the operation of moving the glass from one table to the other, a small hole being made between the two buildings for that purpose. The flattening kiln is provided with another grate, having a fire, for the purpose of re-heating the flattening stone from which the plate has been removed previous to placing another cylinder on the same. The said sheets of glass will be carried upon the wires round the annealing chamber, until they arrive opposite a door or opening, where they are withdrawn in an annealed state: the whole operation being conducted without interrupting any part of the process.

Another modification of the above consists in connecting a long gallery, or annealing arch, with flattening and cooling chambers, which are built at one end of the arch, in which the plates of glass, which are piled up on suitable carriages, are drawn by means of a chain along the annealing arch.

The patentee claims the mode of constructing and arranging a flattening chamber, so that each sheet of glass may, without being lifted, be carried through a succession of temperatures, between the high temperature of the flattening chamber, and the temperature suitable for rendering such sheet of glass stiff and rigid; and in such manner, that the workmen may go on flattening several cylinders in the same furnace, during the interval occupied

in conveying each sheet of glass through a succession of temperatures; also the combining with a flattening kiln such an annealing kiln that the sheets or plates will not remain stationary during the annealing process; and lastly, the arranging of apparatus for conveying sheets of glass along an annealing kiln combined with a flattening kiln, so that the sheets may be kept isolated, thereby shortening the time occupied in annealing such plates.

SPECIFICATION enrolled 7th January, 1843, of a PATENT granted 7th July, 1842, to CHARLES AUGUSTUS PRELLER, of Eastcheap, in the city of London, merchant, for "*improvements in machinery for preparing, combing, and drawing wool, and goats' hair.*" Being a communication.

THIS invention relates to the preparing, combing, and drawing of wool, or hair of a short staple, and consists in submitting the same, after it has been washed with soap and water in the usual manner, to certain mechanical operations, in which heat or oil is not required to be employed during such process of preparing, combing, and drawing.

The first process to which the wool or hair is submitted, is that of being carded; this operation is performed by a machine, consisting of two carding cylinders, each about nineteen inches wide, the first being covered entirely with fillets, and the second with sheet cards, of about four inches wide, with about a quarter of an inch of space between each sheet; from this latter cylinder, there will be a series of films of wool or hair produced, which are to be doffed in the ordinary manner; the films or slivers

are, by means of suitable apparatus, wound very tightly round a large bobbin, on which they remain for twelve or fourteen days, which will have the effect of taking out the natural curl of the wool or hair, without the application of heat; and the wool or hair will then be ready for the subsequent operation of drawing and combing. The wool or hair, after the process of carding as above, is passed through the feed rollers of a combing machine, and is there acted upon by combs, fixed at intervals in the periphery of a large wheel or drum, the combs being fixed so as to form lines parallel with a tangent of the said drum, and at every revolution the combs come in contact with a cylinder having a slow rotary motion, and covered with wire cards; the fibres retained by these cards are stripped from the same, and again passed through the feed rollers, to be acted on by the combs. The arrangement of the card cylinder is such, that it gradually recedes from the combs as they (during the rotary motion of the comb cylinder) become filled with wool or hair; and when full, the machine stops, and the combs are emptied of the wool by means of hand combs, and the wool taken to the drawing apparatus.

This machine consists of an inclined endless chain of combs, placed back to back, with their teeth in a horizontal position, and a multiplicity of wheels for giving motion to the various parts of the apparatus. The endless chain of combs, after having been regularly and evenly filled by certain manipulations, motion is given or communicated to the machine, and the wool is drawn from the aforesaid combs by means of rollers, and afterwards passed along an endless cloth, at the end of which there is a large revolving drum, round which the fibres or slivers of wool or hair are wound; on the axis of this cylinder is a worm, taking into and driving a worm wheel, or count

Plate 1.

Ja.s Crutchett's Imp.t in the Manufacture of Gas.

Fig. 1.

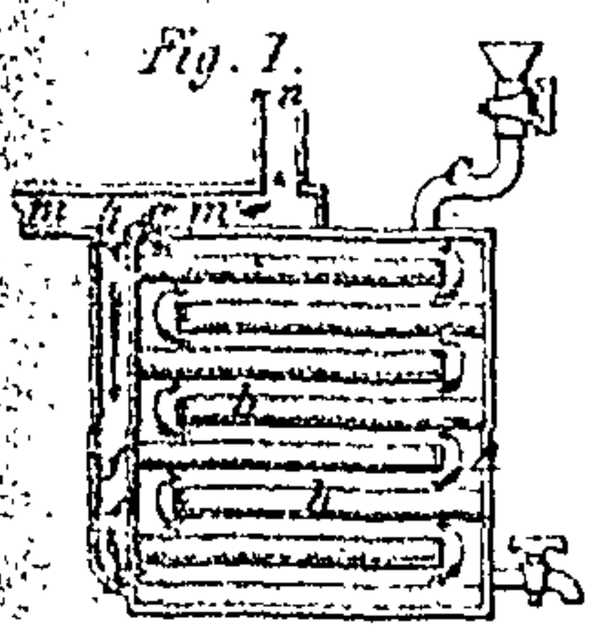


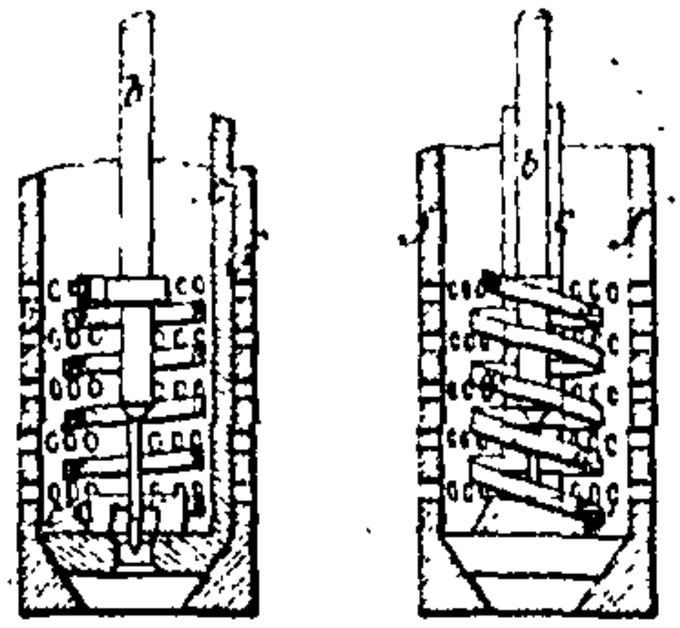
Fig. 2.



Fig. 3.



T. S. Clement's Imp.t in Thermometers.



Hodgson's Imp.ts in obtaining images.

Fig. 1.

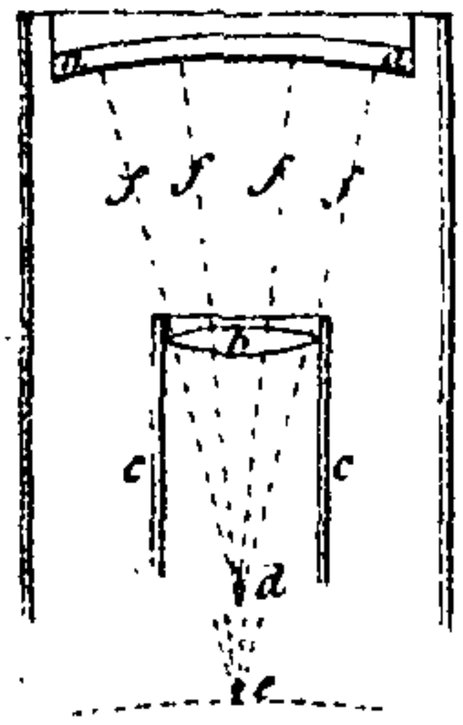


Fig. 2.

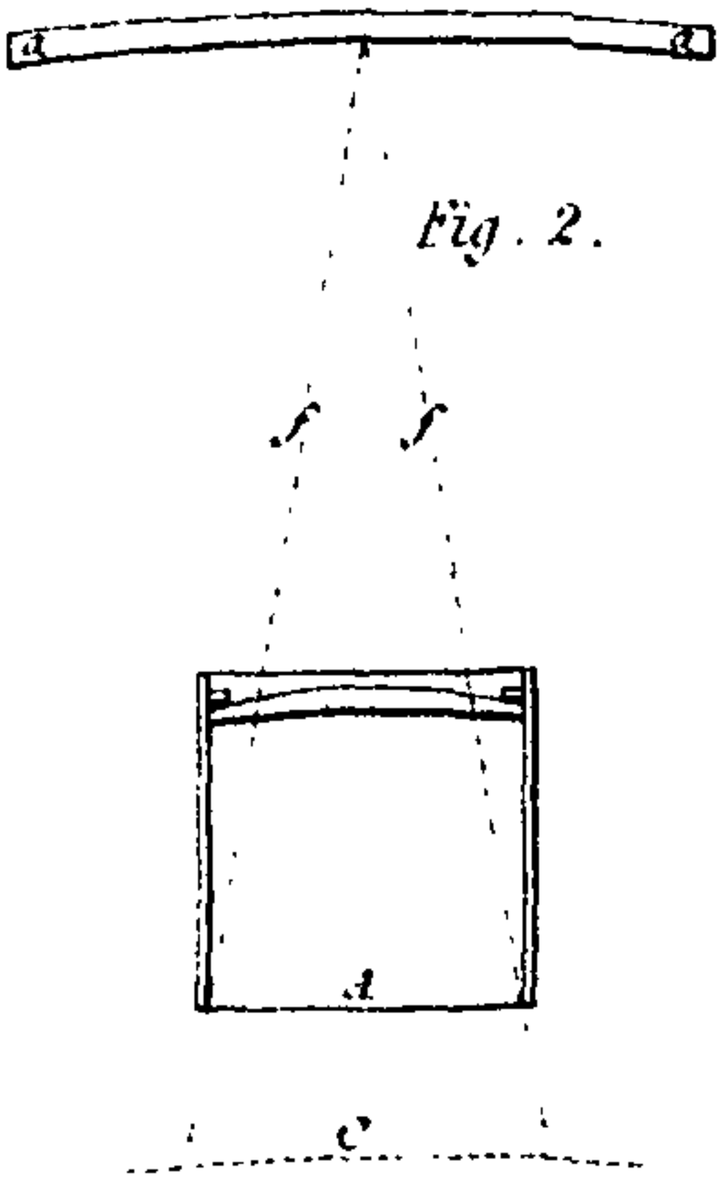
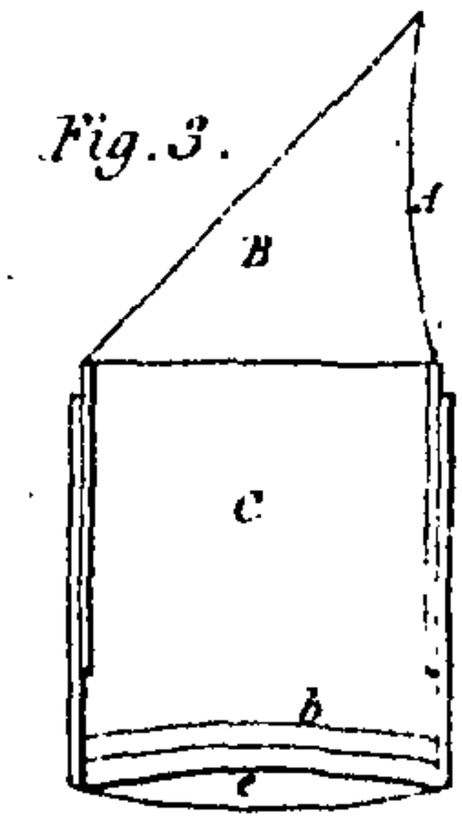


Fig. 3.



J.B.F. Jouannin's Imp.ts in regulating the speed of Engines.

Fig. 1.

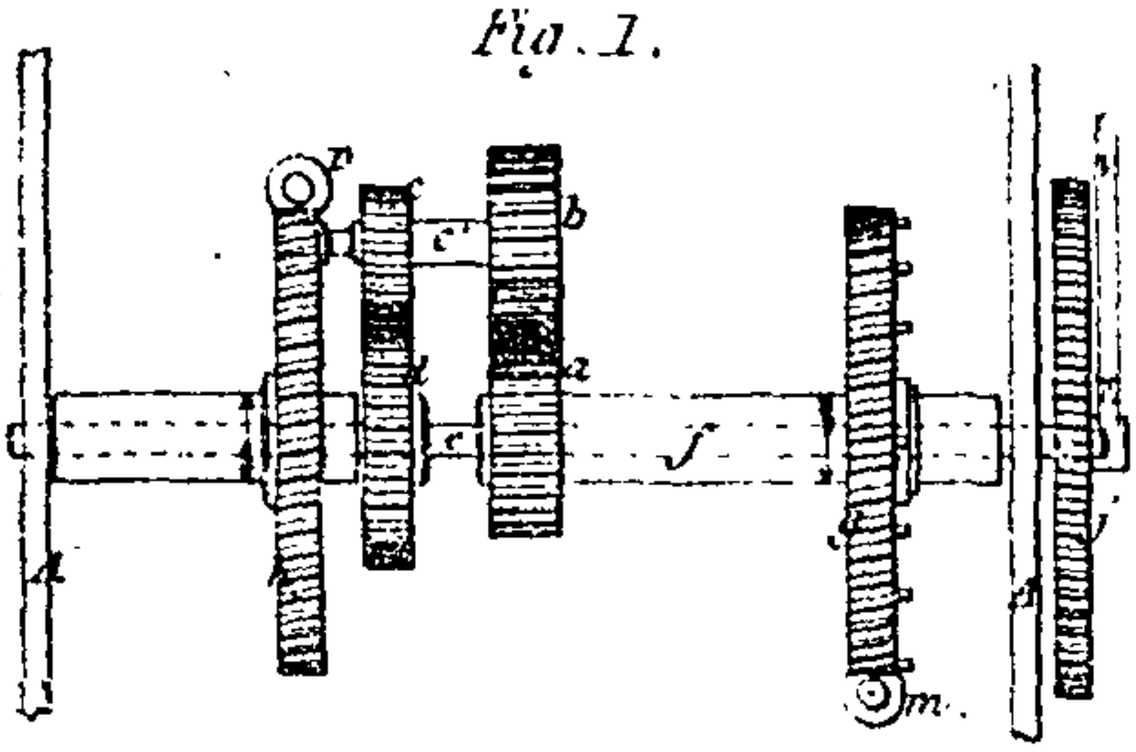
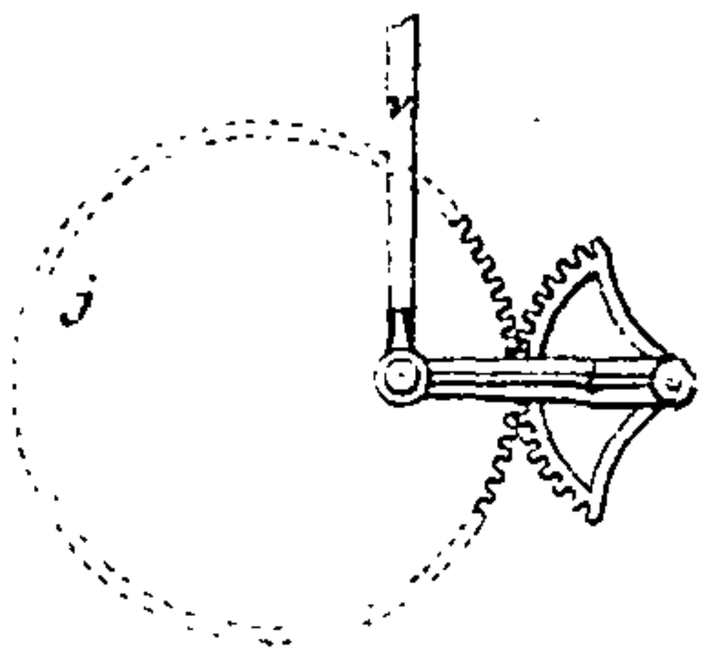


Fig. 2.



F Man. R...

wheel, which, when a certain quantity of wool has been wound on the drum, rings a bell; the sliver is then taken off, being ready for the subsequent operations of the various machines employed in the manufacture thereof.

The patentee claims, as his invention, the mode of arranging the combing operations of machinery, that slivers or rovings of wool or hair may be wound on bobbins, and there remain for several days, in order to remove the curl, and then to be combed out, and the successive layers to be acted on by a card; the wool or hair being afterwards drawn from the combs: also the arranging of combing machinery, that the combs may be filled with successive quantities of wool or hair, each quantity being operated on by a card surface, which recedes from the comb or combs as they gradually become filled.

SPECIFICATION enrolled 7th January, 1843, of a PATENT granted 7th July, 1842, to RICHARD HODGSON, of Montague Place, in the county of Middlesex, gentleman, for "*improvements in obtaining images on metallic and other surfaces.*" (With a Drawing.)

THE first part of these improvements relates, first, to those optical instruments, where images are obtained on surfaces by means of reflecting mirrors, and consists in causing images which are reflected to pass through a lens or lenses, which lens is interposed between the mirror and the receiving surface; and also in passing an image from a mirror through a tube, which is between the mirror and the receiving surface; and secondly, to improvements in refracting cameras, by applying lens or lenses.

In plate 7, fig. 1 is a camera box, 12 inches long, having a mirror *a*, ground with two different curvatures, the face

being 10 inches in radius, and the back or silvered surface 16 inches in radius; *b*, an achromatic lens of about 10 inches focus; *c*, a tube containing the lens; *d*, the point of focus; *e*, the point of focus of the mirror, without the correcting lens; *f*, *f*, *f*, *f*, the rays of the mirror. Supposing the object to be at an infinite distance, such as the sun, or a star, the rays of which are parallel before they become reflected, but converge afterwards to the point *e*, but by the interposition of an achromatic lens *b*, the rays *f*, *f*, *f*, *f*, converge to the focus on the point *b*, and in passing through the lens, not only is the spherical aberration corrected, but the chromatic is said to suffer a greater diminution.

Fig. 2 is intended to show a mirror in a similar box, and which is also of the same radius; in this case the object is supposed to be at a distance of about 8 or 10 feet; the lines *f*, *f*, are supposed to be the rays from the extreme points of the object, which, after reflection, would form a curved image of the object on the line *c*, but by the interposition of a correcting lens, which in this case is a meniscus of about 14 inches focus, the curvature of the rays is increased, and much of the spherical aberration is said to be done away with, the image being formed upon the line A. By the introduction of a correcting lens, the patentee states, that a mirror of any dimensions may be employed; whereas, in the present reflecting cameras the apertures are obliged to be diminished, by means of diaphragms, in order to cut off the aberration; besides several other advantages which are mentioned in the Specification; the object of the invention being principally in the introduction of a correcting lens or lenses, either simple or compound, between the mirror and the receiving surface, for the purpose of abating the chromatic and spherical errors, which lenses are to be inclosed in a tube capable

of sliding and adjusting as may be required, although the inventor does not confine himself to the use of a tube or tubes.

Fig. 3 is a tube for a refracting camera, consisting of a prism A and B of different glasses; the first, A, being a double convex lens of crown glass, forming, with the prism B, of flint glass, an achromatic object glass, the rays from which would form a focus of about 8 inches beyond them. The lenses *b* and *e* form a correcting lens; *b* is a concave convex flint glass, with its convex side towards the object; *e* is a double convex crown glass, of unequal radii, the lesser radius being towards the image; these correcting lenses of 12 inches focus, increasing the concentration of the rays, will form the image about 4 inches beyond it, increasing at the same time its intensity; *c* is a tube, which holds the prism, sliding within another tube, which latter holds the lenses, and enables the same to be adjusted according to the distance of the object. These improvements are stated to consist in the introduction of a prism, with curved surfaces, which prism may be either single or compound, with silvered or unsilvered surfaces; and also for the introduction of a lens or lenses, placed beyond the prism, to correct and gather the rays to a shorter focus.

The inventor claims the construction of an optical instrument, described, where images are obtained on surfaces by reflecting mirrors, in which the images reflected are caused to pass through a lens or lenses, interposed between the mirror and the receiving surface; and he also claims the passing of the image or images through a tube interposed between the said mirror and the receiving surface; and lastly, the mode of combining a prism of curved surfaces, with lens or lenses, in refracting cameras.

SPECIFICATION enrolled 7th January, 1843, of a PATENT granted 7th July, 1842, to WILLIAM REVELL VIGERS, of Russell-Square, in the county of Middlesex, for "*a mode of keeping the air in confined places in a pure or respirable state, to enable persons to remain or work under water, and in other places, without a constant supply of fresh atmospheric air.*" Being a communication.

THESE improvements in purifying or rendering the air in confined places, such as holds of ships, cellars, vaults, courts, theatres, diving apparatus, and so forth, respirable, consist in absorbing the carbonic acid gas, whereby such air has become more or less contaminated by the breathing of men or other animals, or burning of candles, lamps, fires, or blasting with gunpowder; and also in supplying to the air from which the carbonic acid gas has been absorbed, so much oxygen gas as may be requisite for replacing the oxygen which may have been abstracted during such breathing and burning. The absorption of carbonic acid gas from the air which may have become contaminated is effected by causing the air to pass through an alkali, rendered caustic by mixing it with quicklime, which has been recently burned, and mixing these substances with water. To restore in confined places oxygen to air which may have become deficient thereof, is effected by preparing oxygen gas by any of the well known means, and by forcibly compressing it in a vessel of iron or other suitable material provided with a stop-cock, so as to allow the gas to escape into such air; or the same may be effected by potash previously prepared in a state of peroxide of potassium, that is potassium charged with an additional portion of oxygen beyond what is contained in

caustic potash. Fragments of such potash, when put into water, will give out the said additional portion of oxygen. But the most important feature of the invention is the removal of carbonic acid gas from the air in confined places, and that alone will be capable of keeping the air in a respirable state. The manner in which this is effected is as follows:—in a room or other place where the air is impregnated with carbonic acid gas, is to be placed a bucket or pail containing the mixture of lime and potash, into which is made to dip the end of a pipe proceeding from a pair of bellows, which may be of any desired construction; by working the bellows, the air in the room will be brought in contact with, and forced through the mixture, and will rise in bubbles to the surface, and pass off into the room again in a pure state: the lime having, by its recent burning, been deprived of carbonic acid, has a strong tendency to absorb carbonic acid, and when the lime is mixed with the potash, the latter is absorbed by the lime and deprived of its carbonic acid and rendered caustic; and this mixture will have a strong tendency to absorb the carbonic acid from the air which is brought into contact with it. The inventor states that the proportion of the above mixture for each person in the room, (and the same quantity or thereabouts may be allowed for every lighted candle) is four oz. of potash, (or soda of good commercial strength will answer,) twenty oz. of newly burnt quicklime and twelve lbs. of fresh water, which, when mixed, will be in a milky or creamy state. The Specification is accompanied with three sheets of drawings, with a description of various modifications of apparatus for receiving or extracting the air from confined places, and forcing the same through a solution as above described, some of which are effected by a double pair of bellows similar to those employed in musical or-

gans and others, by a cylinder having a piston, which apparatus can be placed in any convenient part of a mine, with pipes leading to and from the several parts where the air is required to be purified; and in combination with such apparatus the mode, as described, of supplying oxygen may be employed, or a quantity of common atmospheric air may be forcibly compressed into a suitable vessel, and allowed to escape, as may be desired. The drawings also describe a diving bell somewhat of an elliptical form, and having a box or compartment at each end capable of withstanding a great pressure, into each of which is to be forcibly compressed common atmospheric air; above these compartments are two other boxes of smaller dimensions which may be filled in the same manner with oxygen: a small apparatus for absorbing the carbonic acid gas, having a pair of bellows worked by means of a spring or clock-work, may also be employed. The compartments, each of which is provided with a stop-cock, are to be filled with atmospheric air and oxygen, as described, previous to going down, and as the water, by the superincumbent weight, rises in the bell, the pressure inside the bell may be restored by opening one of the stop-cocks leading to the air chambers, and when a greater supply of oxygen is required, it will only be necessary to open one of the cocks leading to the chambers above, the carbonic acid gas being absorbed in the manner described; the bell is also provided with a stop-cock for letting out the air when required, which can be renewed by that contained in the air chambers.

The patentee claims, first, the mode of keeping the air in confined places in a pure and respirable state by causing the air to pass in currents through, and in contact with, caustic alkali and quicklime, or with quicklime alone without alkali, for the purpose of absorbing the

Plate 8.

Perring's Wood Paving

Fig 12.

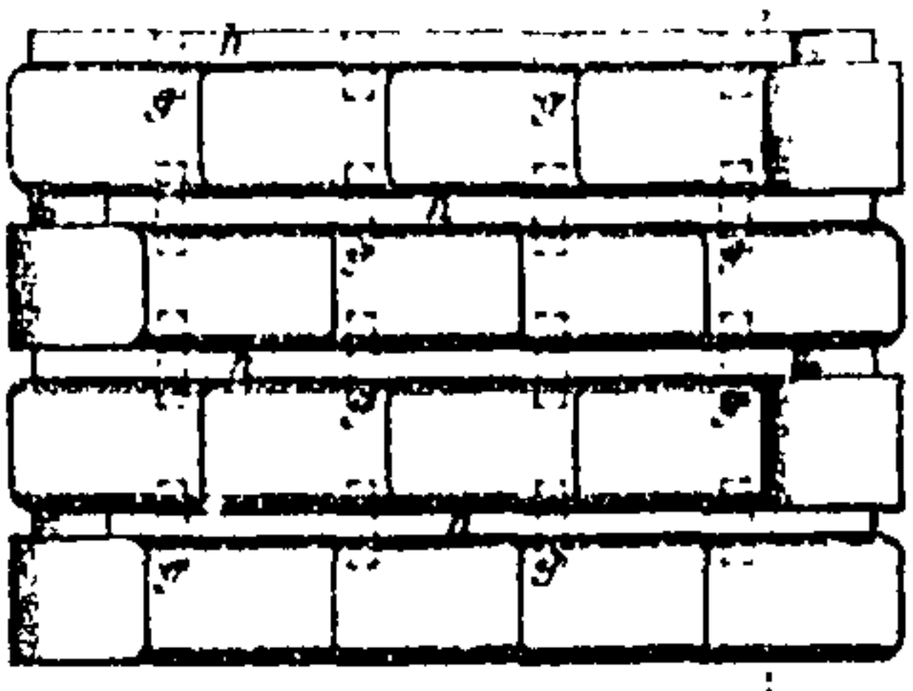


Fig. 13.

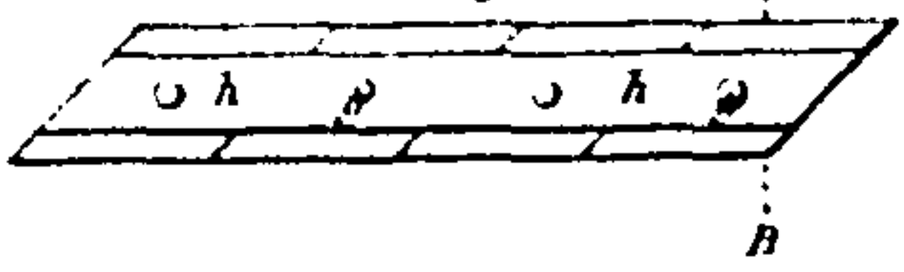


Fig. 1.

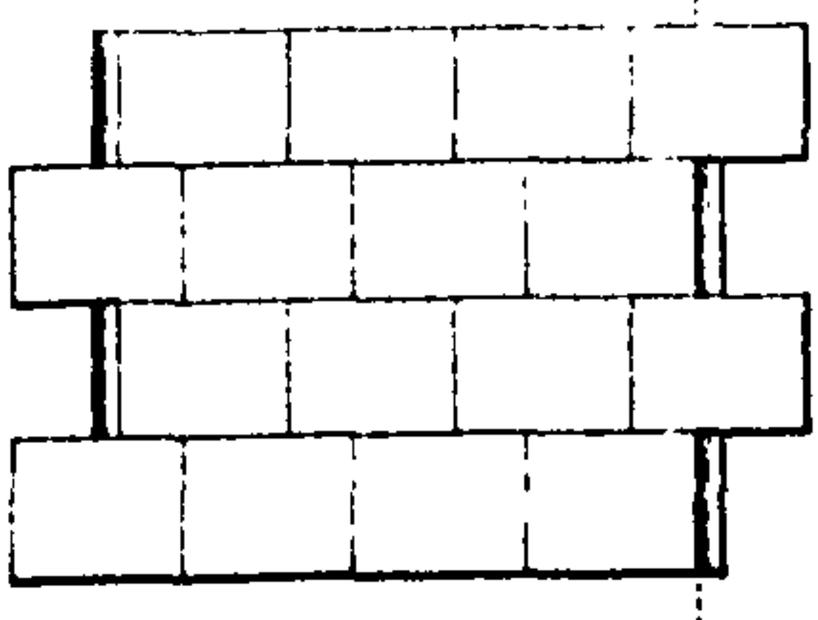


Fig. 3.

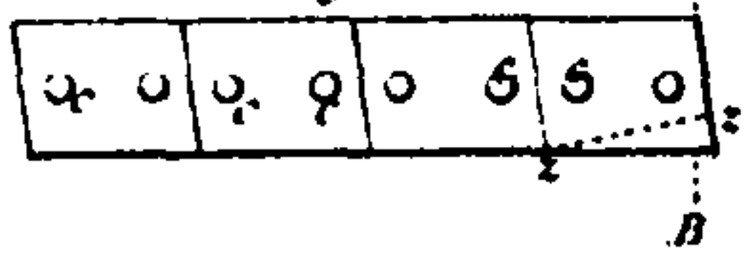


Fig. 5.

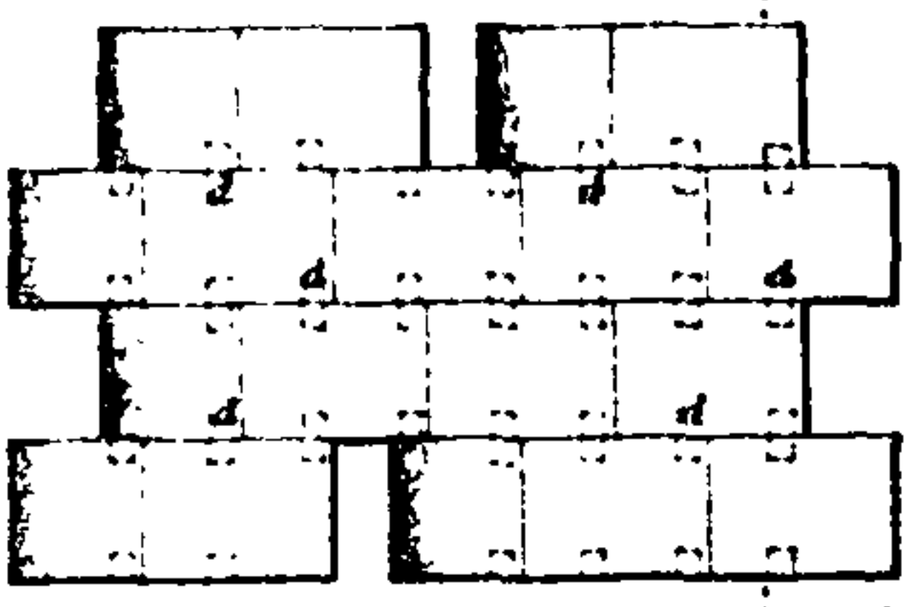


Fig. 6.

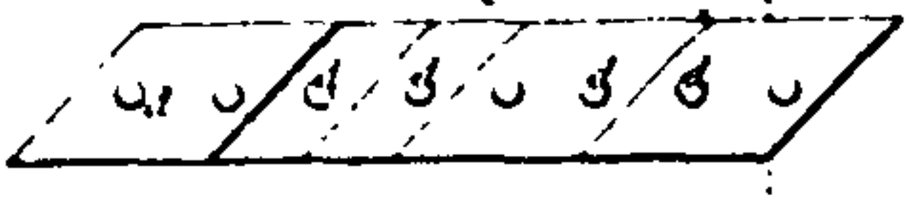


Fig. 8.



Fig. 7.

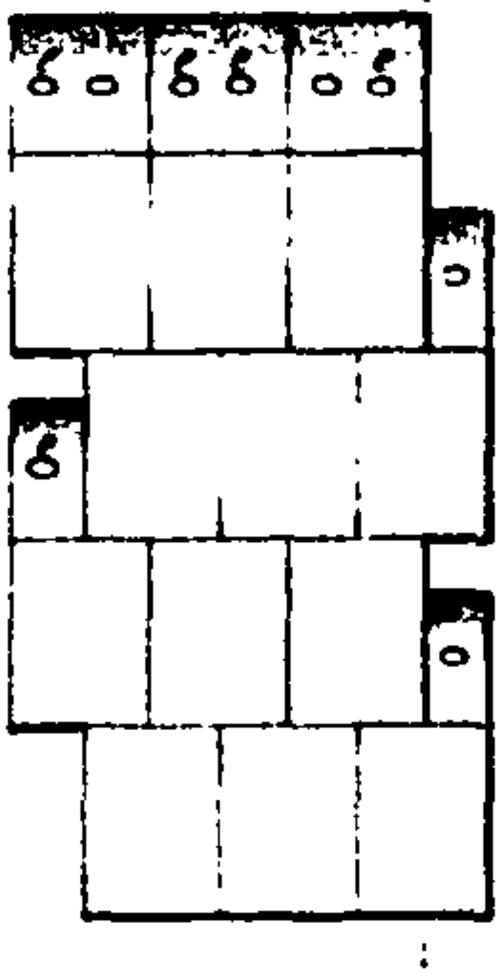


Fig. 2.

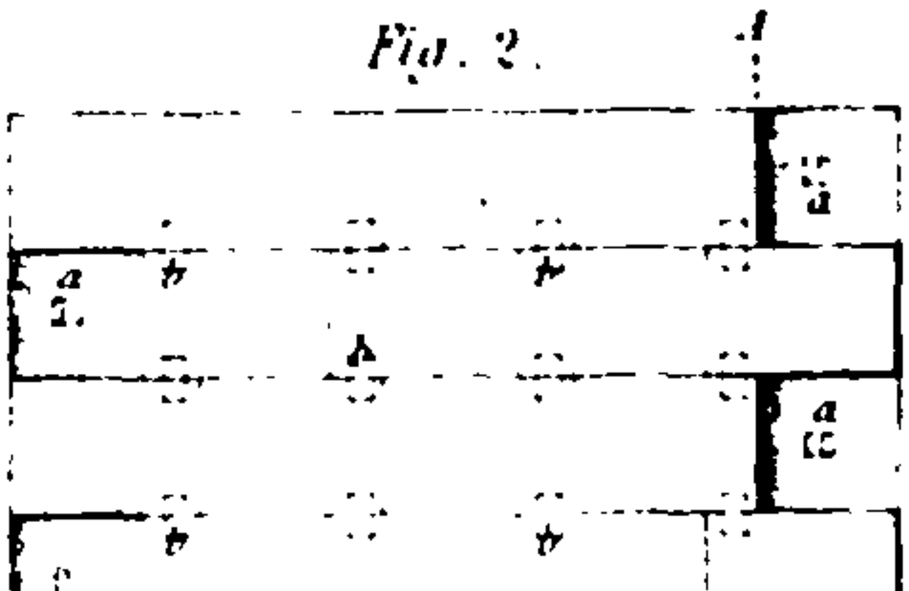


Fig. 11

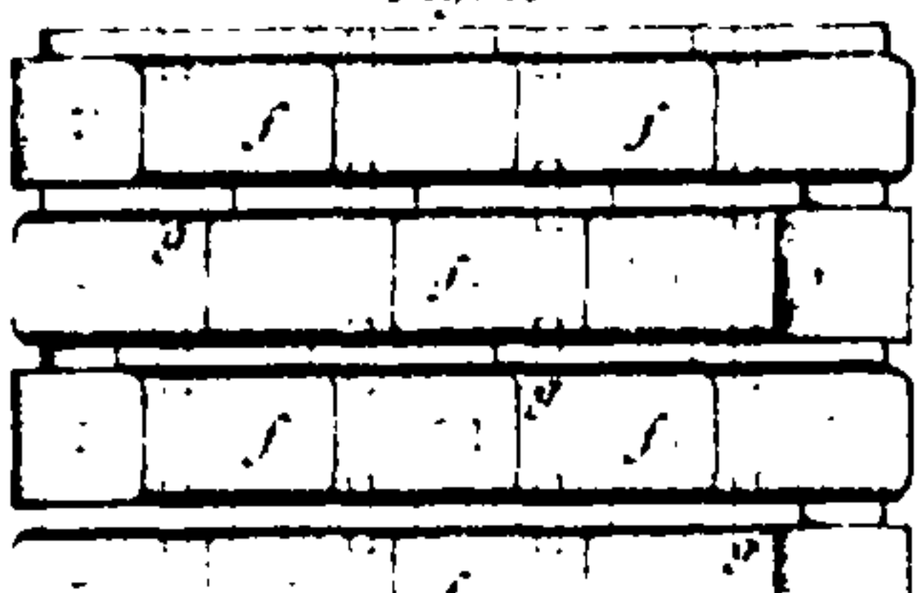


Fig. 4

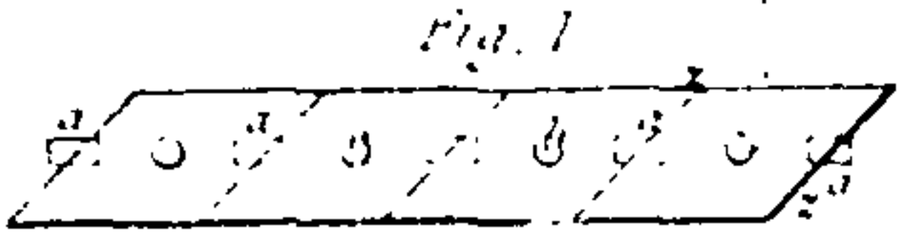
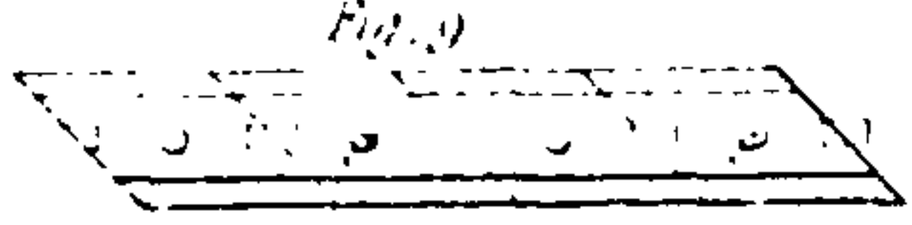


Fig. 10.



Fig. 9



carbonic acid gas, in order to keep it in a respirable state; secondly, the mode of restoring to the air in confined places after such air has been freed from the contamination of carbonic acid gas, as much oxygen as may be deficient, by a suitable closed vessel, or by the means above described; thirdly, the mode of letting out into the air, in confined places, a copious influx of common atmospheric air from some suitable strong vessel, into which it has been previously forced or compressed by any of the means already known.

SPECIFICATION enrolled 7th January, 1843, of a PATENT granted 7th July, 1842, to JOHN PERRING, of Cecil House, Strand, hat manufacturer, for "*improvements in wood paving*."

1. In plate 8, fig. 1 is a side view or elevation of a course of four blocks, cut across the grain to a mitre or angle of 45°, with their surfaces.

2. These blocks I pin or peg together at the centres of their sloped sides as marked *a a*, and at the centres of their vertical sides as marked *b b*, by pegs or pins placed at the points of intersection of lines drawn diagonally across the sloped and vertical sides; and it is an essential feature of this part of my improvements in wood paving, that the blocks should be connected together by pegs or pins situate as nearly as possible at the centres of their sloped and vertical sides.

3. Fig. 2 is a plan of four courses of blocks, each alternate course inclining from channel to channel, or from one side of the road to the other in opposite directions, in

which the central connections are also shown by the dotted lines *a* and *b*.

4. By this arrangement, the joins or joints both at the upper and under surface of the blocks will be broken or bonded throughout in the direction of the line of traffic, and when one plane or surface becomes worn, the other may be brought into use. The surfaces may be grooved in any convenient manner.

5. When the blocks are to be laid upon a concrete or other artificial substratum in a place where the traffic is considerable, I make them six inches in depth, and the pins or pegs not less than one inch in diameter. The channel blocks, which are formed of two courses of blocks united as before described, should be one inch shallower than the blocks for the carriage-way.

6. Although any required area of carriage-way may be covered with blocks from channel to channel, and in the direction of the line of traffic, in a perfectly united mass, yet it is in most cases desirable for the greater facility of the laying down, removing, and replacing of the blocks, that they should be pinned or pegged together in slabs or masses, say of from sixteen to twenty-four blocks each. And in commencing to lay these slabs or masses down, the blocks must be cut off as in the line of A B, so as to abut firmly against the channels, and to agree with the curve of the carriage-way in the line of traffic.

7. It will be obvious that the blocks will be best united at their sloped sides first, and then, course by course, at their vertical sides.

8. I cut the blocks from squared timber, having the core as nearly as possible at the centre. Supposing the timber to be six inches square, I cut it at distances of six inches, measured perpendicularly between the planes of the sections, so that when the block is placed in its proper posi-

tion in the paving, the vertical depth of the block will be equal to the depth of the timber, as it lies horizontally prepared for cutting, that is, equal to the distance z z, measured at right angles to the sloped sides; my rule being, that the vertical depth of the block shall be equal to, or not less than the distance measured at z z.

9. If the blocks are cut of the dimensions, and at the angle above described, the pressure on the outer, or younger and weaker fibres, will be supported in a vertical line, by the central and stronger fibres of the wood; and a similar advantage will attend the use of timber cut at angles less than 45°, such as any angle between 40° and 45°, provided the same dimensions of block be used. And I consider the adoption of some angle between 40° and 45°, with the dimensions above mentioned, an important feature of my invention, as it enables me to use comparatively young or open grained timber, since, in blocks cut of the dimensions, and at the angles above mentioned, there will be no part of the more tender fibre which is unsupported, in a vertical line, by that which is harder.

I claim, as part of this invention, so far as the same is stated in the above paragraphs, firstly, the improvement in wood paving, whereby the blocks are cut and placed so that the central or stronger fibres shall always assist in supporting the external or weaker fibres; whereby also the blocks are arranged so as to break joint, and be bonded together continuously throughout, at both surfaces; and whereby also the blocks are pegged together at the centres of both their vertical and sloped sides. And I claim, secondly, as of my invention, the improvements in wood paving, whereby the blocks are pinned or pegged together, by pins or pegs at the centres both of their sloped and vertical sides, in the manner described, at whatever angle the block may be cut.

10. Fig. 3 is a side view or elevation of a course of four blocks, cut across the grain at an angle of 80° with their surfaces. Fig. 4 is a plan of four courses of such blocks, each alternate course inclining from channel to channel, or from one side of the road to the other, in opposite directions. These blocks are pinned or pegged together in a central line, intermediate between the two surfaces, at their vertical sides only, by pins or pegs marked *c c*.

11. The observations in the paragraphs marked 4, 5, 6, and 8, as applicable to figs. 1 and 2, are also applicable to figs. 3 and 4.

12. In wood paving constructed of blocks cut at the angle of 80°, the principle before adverted to, of having the external or weaker fibres supported by the central or stronger fibres, does not exist in the same manner as in blocks cut at angles of from 40° to 45°, since the fibres of the blocks cut at an angle of 80° will deviate only 10° from the vertical; and, consequently, it is necessary to use older and closer grained wood, or timber of such a size that the blocks cut from it shall have their fibres of, as nearly as possible, uniform strength throughout. If the wood be of the best quality, as to fibre, I prefer cutting the timber at an angle of 80°; but if the timber be not of the best quality, a somewhat smaller angle may be adopted with advantage: the angles may range from 75° to 80°.

I claim, as my invention, so far as the same is stated in the above paragraphs 10, 11, and 12, firstly, the improvement in wood paving whereby blocks cut at angles varying from 75° to 80° are united together by pegs at their vertical sides, as above described; and secondly, the improvement in wood paving by the use of two pegs on the central line, as above described, of the vertical sides, whatever the angle of the blocks.

13. Fig. 5 is a modification, in which the blocks incline in the same direction from side to side of the carriage-way. The joins or joints are broken or bonded alike throughout, at both surfaces, and the blocks are connected together in a central line, intermediate to the two surfaces, at their vertical sides only, by pins or pegs marked *d d*. Fig. 6 is an elevation of four of these blocks.

14. Fig. 7 is a modification, in which the blocks incline in the same direction lengthwise of the carriage-way. The joins or joints in this modification are broken or bonded throughout at both surfaces. But the blocks are connected together, in a central line, intermediate to the two surfaces, at their sloped sides only, by pins or pegs marked *e e*. Fig. 8 is an elevation of four of these blocks.

15. In the modification, fig. 5, where the pavement is laid down in slabs or masses, I prefer that they should be occasionally keyed at the sides, by the intersection of projecting blocks with the adjoining slabs or masses, so that they may be kept steady in their places. And in the modification, fig. 7, it will be advisable, when laid in slabs or masses, so to let them intersect each other, that the joins or joints of the slabs or masses may also be broken from side to side of the carriage-way.

16. A peculiar advantage of these two modifications, as shown in figs. 5, 6, 7, and 8, consists in the facility with which any number of slabs or masses may be removed and replaced.

17. The observations in the paragraphs numbered 4, 5, 6, 7, and 8, as applicable to figs. 1 and 2, are also generally applicable to figs. 5, 6, 7, and 8.

I claim, as of my invention, so far as the same is stated in paragraphs 14, 15, 16, and 17, the improvements in

wood paving, consisting in the modifications of arrangements and connection therein described.

18. Fig. 9 is a side view or elevation of a course of four blocks, having slips of wood attached to them of about one inch in thickness, and coming to within about one inch of the upper and lower surfaces of the blocks, either of which surfaces may be placed upwards. Fig. 10 is an end view of a block having such a slip of wood attached, and fig. 11 is a plan in which sixteen blocks are united by pegs *f* on the sloped sides, and by pegs *g* on the vertical sides, and having such slips of wood arranged between the courses, and in a direction transverse to the line of traffic. Slips of wood may also be fixed by similar means to the sloped sides of the blocks, although not shown in the Drawing.

19. These slips of wood are for the purpose of separating the blocks, so that a sure foot-hold may be afforded to horses and other animals without reducing the substance of the blocks. It is desirable that in these slips the fibre or grain of wood should run horizontally: and it will be generally found that they can be made from the comparatively waste material formed in squaring the wood in the manufacture of the blocks, by which a considerable saving can be effected in the cost of the wood pavement.

20. Fig. 12 is a plan of four courses of blocks, connected together at their vertical sides by pins or pegs marked *g*, and held together in a transverse direction by the slips of wood marked *h*, which slips of wood, instead of being separated at the sloped line of junction between each block, run the full length of the course of blocks. Fig. 13 is a side view or elevation of four blocks thus connected. I prefer having the holes in the slips of wood for this purpose as much larger than the circumference

of the pins or pegs, as will admit of a little play, so that each mass or slab may take the required curve across the carriage-way.

21. The slips of wood on the outer sides of each mass or slab may be of half the thickness of those at the inner sides of the blocks; but if used as laid down in the Drawing, the blocks at the side not connected by a slip of wood may be held together by iron cramps.

22. The observations contained in the paragraphs numbered 4, 5, 6, 7, and 8, as applicable to figs. 1 and 2, are generally applicable to figs. 9, 10, 11, 12, and 13.

23. But I must here remark, that where the wood paving is to be laid on an inclined plane, I prefer increasing the number of interstices formed from channel to channel, by the application of slips of wood in the manner already described, reducing thereby the thickness of the block in the direction of the line of traffic, and thus still further securing the foot-hold.

24. It will be obvious that other elastic substances besides wood may be used between the blocks, but I believe that none will be found so economical as wood.

I claim as my invention, so far as the same is stated in paragraphs 18, 19, 20, 21, 22, 23, and 24, the improvement in wood paving by the use of slips of wood, or other elastic substances, between blocks of whatever shape, for the purpose of affording a secure foot-hold.

In witness, &c.

JOHN PERRING.

SPECIFICATION enrolled 9th January, 1843, of a PATENT granted 9th July, 1842, to JEAN BAPTISTE FRANÇOIS JOUANNIN, of Upper Ebury Street, Pimlico, in the county of Middlesex, mechanic, for "*certain improvements in apparatus for regulating the speed of steam, air, or water engines.*" (With a Drawing.)

THIS apparatus for regulating steam, air, or water engines, consists of a machine composed of clock work, and also of certain combinations of wheel work, which the inventor calls differential gearing; this gearing is placed between the clock and the engine to be regulated; and in order to effect the above, the axle, upon which the differential wheels work, is caused to move in one way or the other with a certain speed, when the movement is produced by one power alone, but with double the speed when another power is added to that already in action, provided both powers are acting the same way; but if those powers are made to act with the same power in an opposite direction the axle will remain stationary; again, if the speed of the two forces should not be equal, the axle will have such an amount of motion as will correspond to the difference between the two speeds. The following is a description of the differential wheels: in plate 8, fig. 1, A A represents a portion of the two sides of an ordinary going clock, the works of which are below the axle *e*; *a* is a wheel gearing into the wheel *b*, which has fifteen teeth; *c* is a wheel having ten teeth, and is in gear with the wheel *d*, which has twenty teeth; the wheels *c* and *b* are each fixed on a hollow axle *c'*, which turns loosely on a pin or stud fixed to the worm wheel *h*, which worm wheel is keyed on the end of a hollow axle turning loosely upon the common axle *e*, as will be seen by the dotted lines; *g* is also a worm wheel keyed on the

hollow axle *f*, which also turns loosely upon the axle *e*. Suppose the wheel *g* as a first mover to make one revolution, and that the wheel *h* remains stationary, the wheel *a*, which is mounted upon the same axle as the wheel *g*, will also make one revolution, and the same amount of motion will also be given to the wheels *b* and *c*; this latter wheel gears into the wheel *d* fixed on the common axle *e*, which will cause such wheel and axle to make half a revolution; again, suppose the first mover *g* to remain stationary, and the wheel *h* to be in motion, such wheel will carry round with it the two wheels *c* and *b*, which are connected together, thus making an orbicular motion round the wheels *a* and *d*, therefore, as the wheel *b* is of the same diameter as the wheel *a*, and the wheel *c* must revolve with the wheel *b*, the wheel *d*, which gears into the wheel *c*, will make for every rotation of the wheel *c* one-half revolution, as also the axle *e*, as in the former case; it will therefore be seen by those conversant with mechanics, that if the wheels *g* and *h* revolve together and with the same speed, that the wheel *d* and axle *e* will remain stationary; but the instant there is any increase or decrease in the velocity of either, then a certain amount of motion will be given to the wheel *d* and axle *e*. The wheels *g* and *h* have been considered as first movers, but in reality they are not, as the one is connected with the engine, and the other with the clock work. We have also considered the Drawing as being an elevation, but will now suppose it to be a plan of the differential wheel and clock work: *m* is a screw with two threads, and fixed on to a vertical shaft and taking into the wheel *g*, which shaft and worm are actuated by the engine, so as to produce 150 revolutions of the wheel *g* per hour in the direction of the arrow; *p* is also a screw which takes into the wheel *h*, and is fixed on a vertical shaft, the threads of the screw being so much inclined as to allow of the shaft being

driven by the weel *g*; on the top of the shaft there is an escapement, actuated by a pendulum, connected with the pendulum of the clock, and which consequently partakes of the same movements or vibrations; these, in this case, are 4,500 beats per hour, and these vibrations allow the wheel *h* to make 150 revolutions per hour; therefore, if the wheel *g* is turned by the engine at the rate of 150 revolutions per hour, and the wheel *h*, which is connected with the clock, makes 150 revolutions in the same time, there will be no motion imparted to the wheel *d* or axle *e*, but, if from any increase or decrease in the pressure of steam, or from any other cause, the speed of the engine should be greater or less, the same alteration will take place in the wheel *g*, and motion will be given to the axle *e*; and the same will be imparted to the throttle valve in the following manner: *j* is a wheel keyed on the end of the common axle *e*, and geared into a segment wheel, as will be seen in fig. 2; on the axis of the segment wheel is an arm *t*, to the end of which is attached by a pin-joint the rod *v*, which rod is connected to the throttle valve in the ordinary manner.

Claim.—The differential wheel work, as described, for regulating the speed of any motive power, or when such wheel work is acted upon by two powers.

SPECIFICATION enrolled 12th January, 1843, of a PATENT granted 12th July, 1842, to WILLIAM HENRY STUCKEY, of Saint Petersburgh, but now of Upper North Place, in the county of Middlesex, esquire, for "*a pneumatic engine, for producing motive power.*"

THIS machine or apparatus consists of a wheel having four hollow or tubular arms affixed to a horizontal axis; this

axis consists of a cylinder having a division in the middle, and provided with two pistons, the rods of which work through stuffing boxes at each end of the double cylinder or axis of the wheel. The outer end of each of the tubular arms also terminates in a cylinder, each of which (they being four in number) is provided with a piston; these cylinders, it will be observed, are open at one end to the atmosphere, and at the other end to the tubular arm; to the ends of each of the piston rods, which pass through guides, is attached, by a pin-joint, the short arm of a bent lever, and to the long arm of each of the levers is attached a weight. These weights and levers are connected together, by two cords passing over certain pullies and extending across the wheel, so as to connect the lever of each piston on one side of the wheel with that of the other; the arrangement being such that when one of the four pistons is forced outwards, the weight and end of the lever of that piston will be forced inwards towards the centre of the wheel, the lever and weight on the opposite side of the wheel being forced outwards, or in a direction from the centre of the wheel.

In preparing this engine for action, the wheel is to be turned so as to bring two of its arms in a vertical position, and as much mercury poured into that cylinder which is on the top side of the wheel (the piston being previously removed) as will fill that arm, from the part where it joins the axis or horizontal cylinder up to the bottom of the other (the outer) cylinder, which mercury will force the piston in the horizontal cylinder to the extreme of its range; the piston of the top cylinder is then replaced, and the wheel turned round so as to bring the next arm in a vertical position, which, it should be observed, communicates with the other horizontal cylinder forming the axis; during such motion of the wheel, the mercury will have

passed into the other arm, and by its pressure forced out the piston and altered the position of the weights, as described, and also formed a vacuum in one part of the horizontal cylinder, viz., between the piston and that part which divides the cylinder; the next arm is then filled in like manner, and the same result obtained. It should be observed that each of the arms is provided with a cock, the action of which will be described hereafter. The patentee, after describing the apparatus, adds, that it will be understood, from what has been stated, that when any two of the tubes are in a vertical position, and the mercury or other suitable fluid has descended to the bottom of the lower tube, its pressure on the piston of the outer cylinder will cause the weight connected with that piston to turn inwards towards the centre of the wheel, by which movement a strain is exerted on the cord, which throws up the top weight and causes it to force down the piston of the top cylinder on the surface of the mercury or other fluid in the upper tube, whereby any excess of pressure at the bottom of the lower tube is transferred to the top piston, where it acts in aid of the atmospheric pressure on the vacuum obtained, as described. The four cocks have regulating rods connected to them, so that as each tube or arm comes into a vertical position the cock is opened, but as the arm moves to a horizontal position the cock is closed, so that the mercury always keeps its proper position in the tubes or cylinders, and is acted on by a pressure of the atmosphere, at that point only where such pressure can be of service. The power of this engine is stated to be in proportion to the vacuum produced, and to the altitude of the column of mercury employed. The inventor states that the inner cylinder may be dispensed with, the tubes being made to communicate directly with each other, in which case ec-

centrics should be used, to turn the weights to the extent of about half a circle.

The patentee claims, the producing of motive power by an engine, as described, however such engine may be varied in its constructive details, as long as the same general system of action is followed, and the same elements are employed to produce it.

SPECIFICATION enrolled 12th January, 1843, of a PATENT granted 12th July, 1842, to JEAN LEANDER CLEMENTS, of Saint Martin's Lane, in the county of Middlesex, engineer, for "*improvements in apparatus for ascertaining the temperature of fluids, and also the pressure of steam.*" (With a Drawing.)

THIS invention relates to the constructing of a thermometrical apparatus, by causing a compound bar of two materials to be fixed at one end to a vertical spindle or shaft, round which the bar is made to coil, and fixed at the other end to a fixed point; and secondly, to an apparatus for ascertaining or indicating the temperature of the water in which a ship or other vessel is sailing, by causing a compound bar to be subjected to the action of the temperature of the water, which compound bar gives motion to an axis or rod passing into the ship or vessel, and also to an arrangement of mechanism for indicating or pointing out, on a suitable graduated scale, the varying temperatures by means of which persons on board a ship or vessel may be enabled to ascertain whether the vessel is passing from deep to shallow water, or *vice versâ*, or the approach of ice, by the degrees of temperature indicated by the thermometer. In plate 8, *a* is the compound bar of silver and platina,

soldered together, and in the form of a coil, the silver being inside and the platina outside. The bottom end of this compound bar is screwed to a fixed point *c'* of the bar or foot step *c*, the other end being fixed in like manner to the axis or rod *b*, which rod can be extended to any length required, so as to reach upon deck, and for the sake of greater security, is inclosed in a tube *f*, the bottom end of which, together with the coiled bar, pass through the ship's bottom in such manner that the bar may be immersed in the water. There are brackets or bearings which project from the rod *c*, for the purpose of supporting the rod or axis *b*.

The action of this apparatus, and its application to steam boilers for ascertaining the temperature of the steam within the boiler, will be readily understood by the following description: to the top of the axis or rod *b* is connected a train of wheel work, inclosed in a box, which gives motion to index hands moving over a graduated index plate; thus, upon any variation of temperature, the coil, by its contraction and expansion, will give motion to the axis or rod *b*, which motion is, with the greatest precision, indicated by the hand or hands on the dial plate.

The inventor claims, the mode of constructing a thermometrical apparatus, by means of a coiled bar, which is made to give motion to an axis or rod turning in bearings; secondly, the mode of constructing such apparatus for ascertaining the temperature of water in which ships or vessels are moving, by means of a compound bar below the surface of the water, which bar is to give motion to an axis, which axis points out the temperature of the water acting upon the compound bar.

SPECIFICATION enrolled 12th January, 1843, of a PATENT granted 12th July, 1842, to JAMES CRUTCHETT, of William Street, Regent's Park, in the county of Middlesex, engineer, for "*improvements in manufacturing gas, and an apparatus for consuming gas.*" (With a Drawing.)

THESE improvements in manufacturing gas consist in mixing with coal, oil, or other gas, certain proportions of atmospheric air, oxygen, or of oxygen and atmospheric air, in order to cause more perfect combustion, and also for introducing, as an additional element, vapours of naphtha or other volatile hydro-carbon, so as to form a triple combustion. The patentee states that he has used with advantage as much as 25 per cent. of atmospheric air with coal gas, but from 5 to 15 is preferable, and with oil gas, various proportions, up to 80 per cent., according to the quantity of gas required.

In order to mix atmospheric air with gas, the patentee employs a meter of ordinary construction, except that the meter is constructed with two compartments, and the shaft or axis of the drum is elongated; upon this elongated part is fixed another drum, similar to that for measuring gas, the size of which must be regulated according to the quantity of air intended to be admitted for the purpose of mixing with the gas; it will be evident that a station meter of this construction could be erected at the gas works, or the meters of the consumers might be constructed on the same principle. When the combination of air with volatile naphtha is to be introduced, the inlet pipe of the gas meter, or that pipe which previously admitted the atmospheric air, is connected with an apparatus shown at fig. 1, plate 8; A A is a rectangular air-tight box having a number of trays *b b*; these trays, and also the bottom

of the box, are filled with naphtha by means of a pipe *c*; the cock *d* is intended to carry off the overflow; *f* is a pipe attached to the case A A, which enters or communicates with the bottom thereof; at *g*, *i* is a valve which, when in a horizontal position, closes the openings *k l*, and when in a vertical position, opens the passages *k l*, but closes the passage *m m'*, so as to stop all communication; but through the rectangular box, as will be seen by the direction of the arrows, the pipe *n*, which is a continuation of the pipe *m m'*, to be connected with that pipe of a meter which admitted atmospheric air. Suppose the valve *i* to be in a vertical position the atmosperic air will pass down the pipe *f* through the opening *g* and over the trays containing the naphtha, and will pass through the pipe *m' n* to the meter impregnated with the vapours from the naphtha, which admixture can be regulated to any amount by means of the valve *i*.

The improvements in consuming gas consist in employing a burner of the form shown in fig. 2, by means of which the light is concentrated as much as by concentric ring burners, with this further advantage, that the light is not intercepted by any horizontal parts, and only one inlet is required, and the same will be more readily made; the section of this burner may be flat, although the patentee prefers it to be conical, and to rise spirally, as shown at fig. 3.

The patentee claims, first, the admixture of atmospheric air, or other supporter of combustion, and in any proportions with coal or other gas, previous to its issuing from the meter; secondly, the mode of employing the pressure of gas by the intervention of suitable parts to draw in the air; thirdly, the use of a drum revolving in water for drawing in the air or other vapour, and the mode of connecting the same with the meter; fourthly,

the triple compound of combustible gas with air, or gas capable of supporting combustion, and vapour of volatile hydro-carbon, for the purpose of combustion, together with the mode of forming burners.

SPECIFICATION enrolled 16th January, 1843, of a PATENT granted 16th July, 1842, to JOHN BENTON, of Birmingham, land agent, for "*certain improvements in propelling, retarding, and stopping carriages on railroads.*"

THIS invention relates, first, to a mode of propelling carriages on railroads by the application of stationary power; and consists in forming an excavation the whole length of the line. At intervals, in the brickwork forming the excavation, and at each side thereof, are plummer blocks supporting the two ends of a horizontal axis extending across the excavation; each of these axes, or horizontal shafts, supports two large wheels, and also a drum placed between the two wheels, round which pass two endless chains. These chains also pass round the drums of the two adjacent shafts, and so on throughout the whole line; which is to be divided into sections of about a mile in length. In the middle of each of these lengths is a stationary engine, for the purpose of giving motion, by means of the aforesaid endless chains, to the train of wheels; a suitable piece of metal is bolted to the underside of each carriage, and at each side thereof, to receive the peripheries of the wheels, which are rounded, and upon which the carriages rest; so that by giving motion to the wheels, the said train of carriages will be "carried" or propelled over the rotary railroad. There is also a certain arrangement described in the Specification for

retarding the progress of the carriages, by applying a break attached to the carriage to the sides of the rotary wheels; there are other wheels to each carriage, which work in tracks formed on each side of the brickwork, but without touching such tracks; the object of these wheels is to support the carriage, in case of accident to any of the rotary wheels or axes.

Another improvement is stated to consist in a novel mode of applying stationary power, whereby carriages can be brought up inclines of much greater acclivity than is practicable by the use of locomotives, and whereby tunneling and embankments will be avoided. The inventor proposes to effect this by having stones, or other ponderous substances, placed on any convenient number of carriages, on another line of rail, at the summit of the incline, and reserved there until the arrival of the train at the bottom of the incline. A rope is then connected to the ballast-waggon, and is passed round a drum fixed on a vertical axis and attached to the train; the ballast-waggon is then allowed to descend, which will draw the train up the incline; when the train has reached the summit, the ballast-waggons are to be drawn back to the top of the incline, either one at a time or all together, by means of a steam engine or other stationary power, ready for the next train. Instead of using a ballast-waggon, the inventor prefers using water, where such can be conveniently obtained; for this purpose, he places a water-wheel at the top of the incline, and connects the same to a drum working on a horizontal axis at the top of the line of rails up which the train is to be drawn; the water-wheel may be driven by a stream from an artificial reservoir, at a proper altitude, and in any convenient situation. The water, after passing the wheel, is received into a second reservoir, situated at a lower level, from which it

is to be pumped back again by a steam engine or other power.

In order to ensure a good foundation for the stationary axles, the inventor employs a mastic composition of slaked lime; after it is cool, about one-third of its weight of powdered quicklime is to be added, and also as much water as will form it into a pulp, which will cause the same to effervesce; whilst in this state, the mixture is to be used for fixing the wall-plates or casings, adding thereto about an equal quantity of pebble stones, or small pieces of brick, with cows' hair, rushes, or other tenacious matter, the whole being mixed well together during the effervescence.

The Specification also describes a mode of giving signals, by means of the train or carriage acting upon a lever in some determined point of the line; which lever, by means of a wire, rings a bell at the station or engine-house of the stationary engine; by means of which the distance of the train of carriages will be ascertained. The drag or break consists of two levers, jointed together and acted upon by a train of wheel-work, so as to force the ends of the levers out in a lateral direction, and against side plates formed in the brick-work at each side of the excavation before referred to, or the same may be caused to act against the sides of common rails.

Another improvement consists in the application of an axle, supported by two arms, in front of the driving wheels of the engine, when running on common rails. Upon the axle, and just above the rails, are two pullies with concave peripheries: the object of this apparatus is to support the engine in case of its axle breaking; in which case, the pullies would drop on the rails, and, in consequence of their peripheries being concave, would keep

the engine in a direct course until the same could be stopped.

The Claims are, first, the arrangement of a rotary railroad, as described; secondly, the construction of carriages to be propelled on the same, having grooved slides, which receive the periphery of the wheels, and also the projecting wheels which are attached to the beds or framework of the carriages, for running in the safety-grooves or tracks; thirdly, the peculiar construction of the endless chains; fourthly, the mode of preparing and using the mastic or cement; fifthly, the mode of using the force of gravity, through the medium of ballast-waggons, in connection with steam power, for propelling railway trains up inclines, and the mode of returning to the summit of the incline such ballast-waggons, by means of stationary power; sixthly, the mode of employing water power; seventhly, the mode of retarding and stopping trains by pressure levers; eighthly, the peculiar mode and application of signals, as described; and lastly, the application of safety-rollers, with concave surfaces, in front of locomotive engines, to support the engine in case of accident.

SPECIFICATION enrolled 16th January, 1843, of a PATENT granted 16th July, 1842, to JOSEPH SCHLESINGER, of Birmingham, manufacturer, for "*certain improvements in ink-stands and in instruments for filing or holding papers and other articles.*"

THE first of these improvements consists in forcing the ink from a cylindrical vessel or reservoir into a dipping cup or cups attached to the side of such vessel by means

of a piston pressing on the surface of the ink, which piston is actuated by a screw.

Claim is, the construction of inkstands, in which ink is raised into a dipping cup by the descent of a piston on the surface of the ink contained in a cylindrical reservoir.

Another modification of this inkstand consists in forcing the ink from a cylindrical reservoir into two dipping cups which are on each side of the reservoir by means of a plunger, which is raised and lowered in the same manner as the piston above described.

Claim is, for the construction of inkstands, in which the descent of a plunger in the reservoir causes the ink to be displaced, and thereby raise the ink into a dipping cup or dipping cups.

There is also another modification of the foregoing, which consists of two cylindrical reservoirs, each having a plunger actuated by screws. These screws are attached to the lid or cover of each vessel; on the top part of each of the screws is fixed a spur wheel, and between these wheels and gearing into them is a pinion, by turning the axis of which the plungers will be simultaneously raised or lowered according to the direction of motion of the pinion, so that the ink from each of the vessels can be forced into a dipping cup or dipping cups as may be required.

Claim, the mode of combining two inkstands in such a manner that the ink from two reservoirs is made to flow simultaneously, by one operation, into a dipping cup or dipping cups communicating with such reservoir.

The improved letter file consists of a bar of metal, to each end of which is rivetted the one end of a bent spring, the other end being in like manner fixed to the edge of a square board of paper or other material to the middle of the bar, and at right angles to it is attached an orna-

mental lever moving upon a fulcrum or joint. By press ing on the end of the lever, the bar will be raised from the board, so that the edge of a sheet of paper may be placed under it, or between such bar and the square paper board, and on removing the finger from the lever, the springs will cause the bar to be pressed upon such sheet of paper, and thereby hold the same: if deemed necessary, the underside of the bar may be serrated.

Another modification of this apparatus consists in making the bar which holds the papers to move on pivots, working in cylindrical cups or steps, each step containing a convolute spring, one end of which is attached to the axis, and the other to the step; this bar is also raised by pressing the finger on a lever, and is forced upon the papers by means of the aforesaid springs.

Claim, the mode of constructing letter clips or apparatus hereinbefore described, by means of which letters, papers, or other articles, such as ladies' work, &c., can be held together.

SPECIFICATION enrolled 16th January, 1843, of a PATENT granted 16th July, 1842, to JOHN CHATWIN, of Birmingham, in the county of Warwick, button manufacturer, for "*improvements in the manufacture of covered buttons.*"

THIS invention relates to those buttons which are made by dies and pressure. In making covered buttons, the material of which they are covered is generally very expensive, and according to the present mode of manufacturing such buttons, a large portion of the material is folded within and inclosed in the interior of the button; the object of this invention is to cover such buttons with

less material, and consequently to have less waste. For this purpose, the inventor provides a disc of brass or other suitable material (preferring brass) and subjects it to the action of several pairs of dies, so as to cause the edge of the disc, all round, to be turned back, or in other words to be parallel with the face of such disc, but not to touch the face. A disc of the covering material is then placed under the edge so turned, and the metal and covering material are then placed in suitable dies, whereby the edge is forced upon the said material, and the proper form is given to that part of the button which forms the face; so that in place of the covering material being folded into the interior of the button as heretofore practised, the outer circumference of the covering material is securely held by the folding over of the metal at the outer edge of the metal shell, by which means that quantity of covering material which was heretofore necessary for folding into the interior of the button will be saved. The Specification also describes the mode of covering both sides of metallic buttons; which mode, in addition to saving material, will be found very useful, when the covering material has a central pattern.

The inventor claims, as his invention, first, the mode of manufacturing pressure-made buttons, by causing the covering of the fronts to be fixed to the metal shell by folding the edge thereof over; secondly, the mode of forming the shells of such buttons, by causing the shells to be pressed into a form after being covered.

SPECIFICATION enrolled 16th January, 1843, of a PATENT granted 16th July, 1842, to JOSEPH BARLING, of High Street, Maidstone, in the county of Kent, watchmaker, for "*certain improvements in producing rotary motion in machinery worked by manual labour.*"

THIS invention relates to certain improvements in producing rotary motion in machinery worked by manual labour, and consists in a peculiar combination and arrangement of levers, whereby the muscular power of men is capable of being advantageously employed, and more uniformly imparted than when similar power is applied to a winch or handle, as commonly used in machines worked by manual labour; and it seldom occurs that the power of more than three men can be exerted upon a winch or handle at the same time, an objection which is entirely obviated by the before mentioned arrangement of levers, as it will appear evident, that the power being exerted alternately in a vertical direction (such as that employed in a fire engine) instead of a continuous circular direction, presents a more favourable position to the body, and consequently produces greater effect of the muscular power; this is very considerable when a number of men are employed, which this peculiar arrangement admits of.

To a horizontal axis, supported in a suitable framing, is firmly fixed a lever or levers, having eye-holes at each end, through which are passed two wooden handles, in the same manner as the vibrating lever of a fire engine; at some convenient distance between one of the handles and the axis of the lever, is fixed, by a pin-joint, one end of a vertical connecting rod, the lower end of which is attached in like manner to one end of a horizontal lever, which works at its opposite end upon a stud, fixed to the

framing of the machine; this last mentioned lever, which is of the second order, gives motion, by means of a vertical connecting rod, to a crank fixed upon a horizontal shaft, upon which is keyed a fly wheel for carrying the crank past its dead points, or top and bottom centres; by this arrangement, it will be observed that any number of men can be employed to work this apparatus; and on giving a reciprocating movement to the handles of the machine, rotary motion will be imparted to the crank and crank shaft, which motion can, by any of the well known means, be employed in driving machines worked by manual labour.

The patentee does not claim any of the separate parts referred to, except when the same are combined and arranged in the manner described and represented by the Drawings, for the purposes of producing rotary motion in machinery worked by manual labour.

SPECIFICATION enrolled 23rd January, 1843, of a PATENT granted 23rd July, 1842, to CHARLES ROBERT AYERS, of John Street, Berkeley Square, in the county of Middlesex, architect, for "*improvements in ornamenting and colouring glass, earthenware, porcelain, and metals.*" Being a communication.

THIS invention consists in applying the colour in a state of powder through screens of perforated metal or other material, or through lace or other reticulate or open fabric; or the design may first be impressed on the surface of the glass or other material, by a suitable block, with any adhesive matter, and then, by dusting over the powdered colour so that it adheres only to those parts printed by the block, the colour is then fixed in the ordinary manner.

In applying lace or other open fabrics, by means of

which very cheap and ornamental grounds may be obtained on glass, earthenware, &c. The inventor first spreads on with a soft brush any suitable adhesive matter, such as the essence of lavender; after which, the lace or other reticulate fabric or perforated screen is laid over the surface to be covered or ornamented, and the colour applied, which will adhere to those parts only which are uncovered; the screen or fabric is then removed, and the colour fixed by fire. For the purpose of laying on the colour, the patentee prefers to have it in a box or closed case, in a pulverized state, in which a dust is to be raised, so that the particles of colouring matter will be in suspension, then, by inserting the article to be coloured, such colouring matter will be evenly deposited over the surface. It will therefore be seen, that any pattern may be applied in the same manner as stencilling. In ornamenting convex and concave surfaces, such pattern or screens are to be employed as will yield, such as ornamental lace or paper screens; the colour being applied, the same may be fixed by burning, in the ordinary manner; the patterns or screens in this case being left on, will be consumed by the process, and the article coloured in those places which were left uncovered by the screen.

The patentee claims, first, the mode of colouring and ornamenting glass, china, earthenware, porcelain, or metal, by applying colour in a state of powder, or through perforated screens, or through lace or other open fabric, when combined with fixing such colour by heat; secondly, the mode of colouring or ornamenting glass, &c., by causing the surface to be impressed with the desired pattern, by a wooden or other block, with adhesive matter applied thereto, and then dusting over the desired colour in a state of powder, when such process is combined with the subsequent process of fixing the colours by heat.

SPECIFICATION enrolled 23rd January, 1843, of a PATENT granted 23rd July, 1842, to JOSEPH PARTRIDGE, of Bowbridge, near Stroud, in the county of Gloucester, dyer, for "*certain improvements in cleansing wool.*"

THESE improvements consist in certain arrangements in machinery for removing the extraneous matter from wool after it has been dyed, or after coming from the scouring lye, by means of which the matter which adheres to the fibres of the wool will be effectually removed. The first machine described consists of a double cylindrical vessel, or a vessel consisting of two cylindrical parts, so as to leave an annular space between them; in the centre of the vessel is a vertical shaft provided at its lower part with two arms, to which are attached, by means of pin-joints, the axes of two rollers of wood, stone, or other suitable material, weighing from 500 to 600 lbs.; by giving motion to the vertical shaft, which is effected by a pair of bevil wheels, actuated by some first mover, the two rollers are caused to travel round the annular space of the cylindrical vessel similar to a cyder mill. The process of washing or cleansing wool after coming from the scouring lye or dyeing process is as follows: the machine is fixed in a situation adjacent to a stream of water, which is allowed to run in at one side of the vessel and out at the other, through a reticulate wire work or perforated plate; the wool to be operated upon being put into the vessel, motion is given to the vertical shaft which causes the rollers to pass over the wool, and thus compress the fibres, which are subsequently opened by the rush of water passing through the vessel; and in this manner the process is continued, the fibres being alternately compressed and

opened, together with the stream of water passing through the machine, have the effect of carrying off and entirely removing the extraneous matter which adheres to the wool. The second machine, which is intended to be used where the supply of water is not very plentiful, consists of an oblong box, the sides of which are lined with perforated plates or reticulate wire work; the wool to be cleansed is placed in the box, and is operated upon by two stampers, which are alternately raised and let fall on the wool by means of tappet wheels or other suitable contrivance. These wheels act on projecting pieces affixed to the vertical stampers. Water is also employed in this case, but not in such large quantities. The third machine consists of an oblong box with rounded ends, and is provided with two peculiar formed drums or beaters on each side, which are turned by bevil gearing; this box is so constructed as to form a channel all round it, in which the wool is placed, and through which a stream of water is allowed to pass; below each of these rotary drums or beaters, which have spikes, is an inclined plane or block of wood, capable of adjustment, against which the wool, as it floats, and is carried round the channel or trough, is beaten and pressed by the rotary action of the beaters.

The inventor claims the use of the machines described, for the sole purpose of cleansing wool from the scouring lye and other matter; which machines may be used either separately or alternately as may be found necessary, except for white wool, which is to be cleaned with the machine last described.

SPECIFICATION enrolled 23rd January, 1843, of a PATENT granted 23rd July, 1842, to EUGENE DE VARROC, of Bryanstone Street, Portman Square, in the county of Middlesex, for "*apparatus to be applied to chimnies to prevent their taking fire, and for rendering sweeping chimnies unnecessary.*"

THIS invention relates to the application of reticulated metal surfaces, at the commencement, or near the entrance, of the chimney, in order to prevent the passing of the flame, and also to intercept the soot.

The apparatus consists of two cylinders of wire-cloth, one within the other, but so constructed that the surfaces of the two cylinders touch, or are in contact, with each other. The inventor prefers to make the cylinders of wire-cloth, having sixty-four holes to the square inch, or closely perforated metal plates may be employed, but such will not be found as useful as wire-cloth. The cylinder, which is mounted upon an axis, is fixed in the chimney, as near the fire as convenient, the flue or chimney being so constructed as to prevent any passage for the smoke but through the double-wire cylinder, the wires forming the reticulate, or open work, of one cylinder, being made to cross those of the other cylinder. By this arrangement, the flames and soot will be prevented from passing through the cylinder; but there will be sufficient draught through the cylinder for the fire, and the chimney beyond the apparatus will not be coated with soot, the same being deposited on or about the apparatus, which will require to be brushed off every morning, and, if desired, the cylinder can be turned partially round, so as to present another part of its periphery.

A modification of this apparatus, composed of a number

of perforated plates, and arranged in a rectangular form, is shown, as being applied to the chimney of a steam engine boiler; in which case, there are brushes constructed for clearing the same occasionally from soot.

The claim is, for an apparatus composed of woven wire-cloth, or perforated plates of metal, near to, or at the entrance, into chimnies.

SPECIFICATION enrolled 23rd January, 1843, of a PATENT granted 23rd July, 1842, to ALEXANDER JOHNSTON, of Hillhouse, in the county of Edinburgh, esquire, for "*certain improvements in carriages; which may also be applied to ships, boats, and other purposes where locomotion is required.*"

THIS invention consists in the application of pullies or rollers to the underside of locomotive engines and carriages; which rollers act against the side or edge of the rails, in order to reduce the friction caused by the flanges of the wheels binding on such part of the rails in turning curves, &c. To a four or six-wheeled engine, the patentee employs four of such rollers, that is to say, two on each side, which are to be supported on the underside, or frame-work of the engine or carriage, by suitable stays, so as to come in contact with the side or edge of the rail. With respect to common carriages or carts, having two wheels, the patentee employs two (instead of four) rollers, and proposes to lay rails along the common roads or streets; in this case, the stays, or other supports of the rollers, should be so constructed, as to be capable, by the application of a lever or other mechanical contrivance, of raising the said rollers from the ground when the carriages

are passing over common roads, where no rails are employed; in four-wheeled carriages, four rollers are to be employed, two for guiding the fore-wheels, and two for the hind wheels; or the rails may be made with a hollow or concave face, so as to receive the periphery of the wheels, and thereby guide them in the proper course or track.

The inventor claims the exclusive use of rollers, for the purpose described, either on railroads or lines of rails laid on common roads or streets.

The patentee has, by a Disclaimer entered with the Clerk of the Patents, 23rd January, 1843, disclaimed all that part of the title containing the following words:—"which may also be applied to ships, boats, and other purposes where locomotion is required."

SPECIFICATION enrolled 28th January, 1843, of a PATENT granted 29th July, 1842, to JULES LEJEUNE, of North Place, Regent's Park, in the county of Middlesex, engineer, for "*improvements in accelerating combustion; which improvements may be applied in place of the blowing machines now in use.*"

THE first part of these improvements relates to those furnaces, (either for smelting iron or other purposes,) in which anthracite coal is used, and consists in creating a blast of air by the application of a jet of steam, whereby the ordinary blowing machine will not be required. For this purpose the patentee introduces into the tuyere iron the end of a small pipe leading from a boiler, in which steam is generated at a pressure depending on the force of blast required, which blast or current of air is obtained by

permitting the steam to issue from the pipe into the tuyere iron, or hole of the furnace, which causes the air to rush in simultaneously with the steam.

The claim for this part of the invention is the mode of accelerating the combustion of anthracite coal in furnaces, by combining therewith a blast of air caused by steam, as described.

The second part of these improvements relates to a mode of accelerating the blast of furnaces where blowing machines are employed, and consists in making the outer end of the tuyere iron or pipe considerably larger than the end of the blast pipe which enters it, observing that the tuyere pipe should be parallel (or tubular,) or at least so near parallel that the sides do not make an angle of more than fifteen degrees, or the beneficial effect will be destroyed; by this arrangement, an increase of blast will be obtained by the rush of air entering the annular space formed by the tuyere pipe, and the end of the pipe leading from the blowing machine.

The claim for this part of the invention is the mode of obtaining an increase of volume of air by causing a blast of air to be passed through a tube or tubular opening into a furnace or other apparatus, the sides of which are parallel, or so nearly parallel that they do not make an angle of more than fifteen degrees.

SPECIFICATION enrolled 28th January, 1843, of a PATENT granted 29th July, 1842, to THOMAS BELL, of Saint Austell, in the county of Cornwall, mine agent, for "*improvements in the manufacture of copper.*"

THE copper ore to be operated upon is first reduced, so as to pass through a sieve having four holes to the square

inch; the ore is then thrown into an air or smelting furnace together with a portion of lime, say from one to two parts of lime to every twenty parts of copper ore, which may be either slaked or unslaked; the lime and ore are then spread evenly on the bottom of the smelting furnace; after the whole is melted and mixed together, which mixing may be effected by introducing a suitable tool through a hole in the brickwork, made for that purpose, another charge of copper ore of from one ton to one ton and a half, according to the size of furnace, is then thrown in together with a quantity of lime-stone, chalk, or other carbonaceous matter, the quantity of which will depend upon the judgment of the smelter; after the second charge is melted, which will be in a few hours, this melted ore is drawn off into moulds of sand. This melted mass will be composed of vitrified copper ore, iron, sulphur, earthy or calcareous matter, &c., and when cold is broken into pieces of about ten or twelve pounds weight. The Drawing shows a double air or smelting furnace worked with one fire, the advantage of which is stated to be economy of fuel. The mode of working both furnaces is the same as in the case of a single furnace.

After the ores have been broken into pieces as above described, the vitrified copper is put into a cupola, in which a fire has been lighted with coke, wood, charcoal or anthracite coal, and melted down by means of a blast obtained from a fan or ordinary blowing machine, the melted mass being allowed to run out at an aperture at the bottom of the cupola, from which it falls into a reservoir containing water, which is kept cool by means of a stream of water, which is continually running in; by this process the copper and earthy matter is separated; after which, the granulated copper goes through the necessary operations of washing and cleansing, and finally through

the usual process of smelting, for the purpose of further reducing it into fine copper.

The advantages of the processes described are stated to be a saving of time in bringing the copper contained in the ore into a granulated fine pink metal, together with a saving of fuel, and also of expence in the number of furnaces required to smelt a given quantity of ore, and moreover a saving of copper obtained from a given quantity of ore; for which the inventor claims the mode of treating copper ore, by causing it to be melted in order to get it into suitable sized blocks or lumps, and then smelting the same in a blast furnace, and subsequently melting the same from the product therefrom by washing apparatus, as described; the inventor, in conclusion, states that he does not claim such processes when separately considered.

SPECIFICATIONS NOT ENROLLED.

Lady Ann Vavasour, of Melbourne Hall, York, for "*certain improvements in tilling land,*" due 7th January, 1843.

Edward Cobbold, of Melford, Suffolk, Master of Arts, Clerk, for "*certain improvements in the means of supporting, sustaining, and propelling human and other bodies on and in the water,*" due 28th January, 1843.

Scientific Notices, &c.

On the recent application of Electricity to the Arts and Manufactures of the Country; from a paper read at the Society of Arts, on the 3rd February, 1843, by FRANCIS WHISHAW, Esq.

It is at all times a pleasing task to trace the gradual improvement in any particular branch of the arts, and more especially of that from which so many and vast benefits have already been derived, and in which the interests of mankind at large are so deeply involved.

Electricity has of late years engaged the attention of some of the most scientific persons of the present age.

The numberless purposes to which it may hereafter be applied, and the benefits which may in future days flow plenteously from this prolific source, it is not in the power of man even to conjecture.

Among the principal uses to which Electricity has already been applied, may be mentioned the following, viz.—Telegraphs—Sub-marine Operations—Electro-Metallurgy—The Electrotype and Electro-tint—Copper Sheathing—and Electro-plating and Gilding.

With what success its application to the above branches of the Arts and Manufactures has been attended, I shall endeavour to show, in the present and in future communications.

And first, with regard to Telegraphs.—Any one who is acquainted with the old system of transmitting signals by means of the Semaphore, and which is still in use between London and Portsmouth, must be aware of the numerous failures and disappointments which, from various causes, occur continually in the practical working of this uncertain system. Indeed, at times, the communication is entirely cut off for days together: and at other times the Semaphoric dispatch is stopped half way, and then post-horses are required to carry it forward.

It is no wonder, then, that so important a subject should have attracted the attention of professor Wheatstone and Mr. Cooke,

who had both been labouring in the same field of extensive usefulness for a long time, before they became associated as joint patentees of the Electric Telegraph.

Mr. Cooke has, for some time past, been engaged in extensive experiments on his own grounds at Kidbrooke, near Blackheath, and entirely at his own expence, with a view to reducing the cost of constructing and laying down this simple yet beautiful contrivance; the results which he has obtained from these experiments are indeed highly satisfactory; and he is now enabled to lay down the Telegraph complete, at something like half the original estimated cost.

On this improved plan is the extensive line of Telegraph on the Great Western Railway constructing at the present time; six miles of which are already completed, and the remaining few miles will very shortly be laid down. The iron tubes hitherto found necessary to protect the wires, are now dispensed with, and the insulated wires are suspended between, and carried over, iron or wooden standards, ranged at convenient distances along the Railway. Where the standards are of iron, they are capped with wood. On the Great Western Railway the standards are nine feet high above the ground; some being of iron and others of wood; but where the Telegraph is to be carried across a district of country, irrespective of a railway, the standards are intended to be twenty-five feet in height.

Before practically carrying out this great improvement, Mr. Cooke consulted some of the first railway engineers of the day, as to the liability of the wires being injured, and the electric current thus cut off, either by wanton or mischievous persons.

The opinion of the authorities thus applied to, were sufficiently satisfactory to induce him to proceed with his new and economical mode of constructing and laying down the Telegraph, for it is obviously of less importance to preserve a never-failing electric communication between any given points, than to preserve the lives of our fellow-men. So long, therefore, as every precaution is taken by managers of railways furnished with the Telegraph to prevent the occurrence of accidents to the latter, so long will the former be guarded by an equal amount of protection.

The Electric Telegraph has, for some time past, been in daily

use on the Blackwall, Manchester and Leeds, and Edinburgh and Glasgow Railways; it has also been laid down on the Great Western Railway, in the London division; and an additional extent, as already adverted to, will shortly complete the communication between London and Windsor. Mr. Cooke has an order to lay it down on the railway now in course of construction between Norwich and Yarmouth; and it is not very improbable, that within a comparatively brief space of time, the Government of this great country will cause it to be introduced between London and the Naval Depôt at Portsmouth. From professor Wheatstone's well known experiments, it is ascertained that electricity travels at the rate of 200,000 miles in a second of time; so that four signals may be transmitted and answered, through the agency of the Electrical Telegraph, a distance equal to twice round the globe, in a second of time.

Mr. Cooke, in his proposition for working single lines of railway under the protection of the Telegraph, thus describes the principles on which it is constructed:—

It was discovered by Oersted, that a magnetic or compass needle may, through the agency of a voltaic current, be invested with an artificial polarity. Thus a natural stream of electricity passing round the circumference of the earth, causes magnetic needles in general to be deflected at right angles to its course, or towards the North and South poles; so an artificial stream of Electricity of adequate strength, will cause magnetic needles, placed within its influence, to be similarly deflected at right angles to its course, whatever that may be.

If then, a magnetic needle were placed parallel, and near to any part of a conducting wire, which we will suppose to be laid down between London and Blackwall, the transmission of an Electric current from a voltaic battery, would cause the needle to change its position, so as to stand, during the continuance of the current, at right angles to the wire; being turned in one direction or the other, according to the course of the current. If this deflection of the needle were limited by two fixed stops, placed respectively at the two sides of one of its poles, the motion of that pole to one stop might evidently constitute one signal, and its motion to the other stop, another signal.

On these principles, the Telegraph on the Blackwall Railway

is constructed, and not fewer than 2,500 signals are daily transmitted on that line by means of the Telegraph. Before, however, describing the mode of telegraphing on that Railway, it may be as well to give an outline of the peculiar system of working the Railway itself; from which it will appear to the most casual observer, that without the aid of the Electric, or some equally efficient Telegraph, it would be impossible, with any degree of safety, to carry on the traffic of that line.

The Blackwall Railway is worked by a pair of marine condensing engines, placed towards either end of the line; those for the *up* traffic being fixed beneath the line of the Railway at the Minories station, and those for the *down* traffic on the west side of the Brunswick Wharf Road, at Blackwall; the distance between the engine stations being about 5466 yards, (3-105, or 3 $\frac{1}{10}$ miles.) The whole length of each rope is equal to twice the distance between the engine-houses, added to about fourteen turns of the rope on each drum; and while the London engine is winding up the rope with the Blackwall and intermediate traffic, the drum of the Blackwall engine is giving it off at the other end.

We may for the sake of illustration, suppose the engines and ropes to be at rest. It is required to work the *up* traffic, or, in other words, to draw the carriages from Blackwall and the intermediate places, to London; the Blackwall carriages, and one carriage at each of the intermediate stations, are attached to the rope; the London engine is set in motion, and the rope is wound up on the large drum at the Minories station, at the rate of about twenty-six miles an hour. The first carriage which arrives in London is that from Shadwell; the next, that from Stepney; and so on, at intervals in proportion to the respective distances between the intermediate stations and that of London. So much for drawing all the traffic to one point. But it is requisite to leave the passengers at several different points, or which is the same thing, at the several intermediate stations, as well as the terminal station.

The *down* train, that is, the train from London to Blackwall, and the intermediate places, is arranged in the following order:—First, the carriages intended to proceed the whole distance; then the Poplar carriage; afterwards the West India Dock, Limehouse, Stepney, and Shadwell carriages. As in the case of the *up* train, all the carriages are attached to the rope,

and the Blackwall engine set in motion; the Shadwell carriage is first detached from the rope, at a sufficient distance from that station to allow of its reaching its destination by the impulse acquired in its course from London; next, the Stepney carriage is detached; and so on, till the arrival of the first carriages of the train at the Blackwall terminus.

Now these operations are not merely performed once or twice, but a great many times every day. How, therefore, could the Blackwall Railway be worked according to the system now in use, without a most certain and complete communication being kept up between all the different officers of the Railway. This certain and complete communication is effected in a beautiful manner, by the Electric Telegraph laid down by Mr. Cooke; and it may be seen in daily practical operation.

The system of Telegraphs adopted for carrying on the traffic of the Blackwall Railway, and which is worked by lads, or porters, or breaksmen, has been the means of preventing any accident, worthy of notice, to millions of passengers, during the two years and a half in which the railway has been at work; for it is absolutely necessary that a complete understanding should exist between the breaksman at one terminus, and the engine-man at the other, "as a very skilful adjustment of the quantity of rope released, is requisite to preserve it from injury."

Again, in stopping a train, or part of a train of carriages, even more care is necessary; for if the engine-man at the Blackwall engine-house "were to turn off his steam before the breaksman at the Minories station, had begun to apply his break," the rope must suffer from over-slackness; or if the breaksman were to put on his break while the engine at the distant terminus was still exerting its full power, it might be broken by the excessive strain. "Even the ordinary stopping of a train could not be effected without danger to the rope;" and an unexpected stoppage (now a matter of almost every day occurrence and perfect facility, even while the rope is at its full speed,) would, without this beautiful apparatus, be attended with certain injury.

The signals are given by pointers, each suspended vertically on an axis moving freely through the face of a dial. Behind this dial, a magnet is fixed on the same axis as the pointer, so that both move together. A portion of the conducting wire is

coiled many times longitudinally round a frame on which the magnet moves, so as to subject the magnet to the multiplied deflecting force of the voltaic current. The motion of the magnet is limited, on both sides, by fixed stops.

We may suppose three of these exceedingly simple instruments, included in the same conducting wire, to be placed, the first at the Minories, the second at Limehouse, and the third at Blackwall. The general effect of this arrangement is, that the transmission of electricity along the conducting wire, and consequently through the convolutions of wire surrounding the respective magnets, deflects those magnets with a sudden and decided motion, to one of the stops, and causes the pointers to indicate corresponding and simultaneous signals upon the dials of each of the instruments at the Minories, Limehouse, and Blackwall stations.

Each instrument is provided with a battery and a handle, by which a porter or policeman is enabled, at pleasure, to connect the conducting wire with his battery. By moving the handle to the right or left, either of the signals can be instantaneously transmitted from any one of the instruments to all the others, which, by means of their own handles, have the power of sending back signals in reply.

Correctness is insured by the simultaneous appearance of the signal in the instrument of the operator and that of the recipient. The signals in the case before us are, "Go on" and "Stop," in reference to the starting and stopping of the engines. Eight signals can be given by means of the materials used on the Edinburgh and Glasgow railway. Each needle is marked by its distinct handle. If the signal answering to No. 1 is to be transmitted, then the two pointers are made to converge upwards at the same instant. If the signal answering either to No. 2 or No. 3 is required to be given, then the left-hand pointer will effect the object. If the signal corresponding either with No. 4 or No. 5 is wanting, then the right-hand pointer is moved towards the one or other of these figures, as may be required. If the pointers are made to rest diagonally in one direction, the signal corresponding with No. 6 is indicated; and if in the other, that corresponding with No. 7 is transmitted. And lastly, the signal corresponding with No. 8 is effected, by causing the pointers to converge downwards at the same time. Thus, by

different arrangements of the figures or letters in the dials, any required number of signals may be given.

From the experience which Mr. Cooke has had in working the Telegraph on the Great Western Railway, he is enabled to state positively that electro-telegraphic communications may be transmitted to the extent of seventy-eight miles, without any intermediate stations; and that the most complete and extensive correspondence can be carried on with only two or three wires.

Law Reports on Patent Cases.

IN THE COMMON PLEAS, 8th February, 1843.
(Before Mr. Justice Coltman.)

ELLIOT v. HAMMOND AND OTHERS.

The Attorney General and *Mr. Serjeant Richardson* were for the Plaintiff; *Sir T. Wilde, Mr. Serjeant Bompas, Mr. Allen*, and *Mr. Roach*, for the Defendants.

This was an action brought by the Plaintiff, who is the patentee of a "satin flexible button, with a figured centre," against the defendants, as the manufacturers of the "Italian twist button," for an infringement by them of his patent. The Court was occupied during the whole of Tuesday with the Plaintiff's evidence, and yesterday the case was opened on the part of the defendants. The testimony of the witnesses, as to the objects in dispute, was so mixed up with technical descriptions of the process of cloth and button manufacture, and bore such constant reference to a variety of samples produced in Court, that it is impossible to give it in anything like connected detail, and even if it were possible, it would have no general interest when given. The Defendants' evidence attempted to establish, that the buttons manufactured by the Defendants were made of twisted silk; that those of the Plaintiff were of organzine; and that organzine and twist are distinct and separate fabrics, the former being suited for the manufacture of satin, which the latter was not. The evidence also attempted to establish, that the Plaintiff had acknowledged buttons of twisted silk, such as those manufactured by the Defendants, to be without the limits of his patent; and further, that the Plaintiff had actually purchased from one of the witnesses buttons manufactured by the Defendants. In 1840 a verdict was recovered by the present Plaintiff against one Aston, on an infringement of this same patent; but in that case it was proved that the Defendant along with the twist had also mixed up some organzine thread in the manufacture of his buttons.

The Court was occupied with the examination of the witnesses to so late an hour that it was at first doubtful, on the closing of the Defendants' evidence, whether the case should proceed; but

The Jury expressed a wish to finish it, and, at a late hour, found a verdict for the Defendants.

BAIL COURT.—11th February, 1843.
(Sittings at Nisi Prius, before Mr. Justice Wightman and a Special Jury.)

HALL v. HUTCHINSON AND PIM.

The Plaintiff is the patentee of an improved steam condenser, by which the power of the engine can be increased without increasing the danger, and which

produces other advantages of an important character in the efficiency and economy of the steam-engine. The Defendants are two of the Directors of the St. George Steam Packet Company, who are the owners of a great many steam vessels trading from this country to Ireland, the continent of Europe, and America; and the question between the parties in the action, which was of great importance to themselves but of little or none to the public, turned entirely upon the construction of an agreement as to the terms upon which the Defendants were to be at liberty to apply to their vessels the patent machinery of the Plaintiff. It was in the first instance agreed that the Defendants should, in consideration of paying £1. per horse power per annum, have the enjoyment of the Plaintiff's invention, during the continuance of his patent, in sixteen vessels, which were named in the contract, and that in certain events they were to have the power of substituting other vessels in the room of those expressly named in the bargain. They applied the new condenser to two only of the sixteen; but subsequently used the patent in the case of six other vessels, none of which was included in the original contract. It was in reference to these latter vessels that the present action was brought.

The Solicitor-General (with whom were Mr. Erle and Mr. Cowling) stated the Plaintiff's case, and contended, that as, according to the original contract, the Defendants would be entitled to use the patent machinery in the six vessels in question for the remainder of the time during which the patent was to run, so the Plaintiff had a right to receive £1. per horse power for every one of the six vessels, and for every year of that time, except in some contingencies, which it is unnecessary to mention.

Mr. Kelly (with whom were Mr. Knowles, Mr. Crompton, and Mr. Corry) appeared upon the part of the Defendants, and, in answer to the case which had been made upon the part of the Plaintiff, upon what may be called the first contract, set up a second one, which was to be deduced by inference from some correspondence which took place between the parties, and by which, according to the learned counsel, it was agreed between them that the Defendants should be at liberty to apply the improved machinery to other vessels to the extent of the horse-power of the fourteen vessels to which the patent condensers were not applied. The learned counsel further contended, that, supposing this view of the case not to be correct, he should insist that the utmost amount which the Plaintiff could recover was that which resulted from calculating the amount of the horse-power of those six vessels, and the time for which the patent condensers had been used therein with reference to the sum of 8s. per horse-power per year—as the Plaintiff had allowed the Waterford Company to use his patent at that rate, and had originally contracted, that, if ever he reduced his terms to any other party, he would make the same reduction to the Defendants.

The Solicitor-General, in reply, contended that there was no second contract at all, and that the correspondence had no effect upon the original bargain, and was not entered into with any reference to it. With regard to the proposed reduction of the terms upon which the calculation was to be made, the learned gentleman showed that the charge to the Waterford Company, all things being considered, was really higher than that which had been made to the Defendants.

The learned Judge having left the whole case to the Jury, and expressed his own opinion to be in favour of the view taken by the Solicitor-General,

The Jury found a verdict for the Plaintiff in general; finding, moreover, that the amount of the damages ought to be calculated upon the principle contended for upon that side of the case.

It was agreed that the particular amount for which the verdict was to be finally entered up, and which ranged between £1,700. and £2,000. should be settled out of Court.

List of New Patents.

PATENTS GRANTED BY THE FRENCH GOVERNMENT DURING THE SECOND QUARTER OF 1842.

(*Continued from page 255.*)

Ledru and Co., 40, Rue d'Angoulême du Temple, for "a simple means of preserving iron and steel from the action of rust."

Miller, at M. Truffaut's, for "improvements in steam-engines."

Pigeot fils, of Rouen, for "improvements in cotton looms."

Rollr, of St. Chamond (Loire), for "a new wheel for locomotives."

Rohaelt and Bouy, 16, Rue Mandar, for "a new gas-burner, the flame of which remains always steady."

Tardy, Rue et Hotel Montesquieu, for "a new mode of manufacturing casks."

Venet, Rue Traversiere Saint Antoine, 9 Bis, for "a new oil-mill."

Zang, 92, Rue Richelieu, for "improvements in the making of bread."

Bedouin, of Marseilles, for "a new system of draw-bridge."

Beslay, 17, Rue Nve. Popincourt, for "improvements in the manufacture of oil cloths."

Bigot, sen., of Elbeuf, for "improvements in the apparatus for evaporating liquids."

Bosson, at M. Feron's, 2, Place Scipion, for "improvements in spinning machines."

Bouin, 26, Rue des Saints Peres, for "a new lamp, called Lampe a air sans renversement."

Collard-Nouion, at M. Perpigna's, Rue de Choiseut, 2 Ter, for "improvements in the manufacture of baskets for the package of wines."

Cornac fils, and Arman, of Bordeaux, for "a new system of constr icting dry docks."

Delaunay, of Marseilles, for "a grease for carriages, etc., called suif oxygene."

Ducret, of Cambray, for "a new mode of lighting by gas extracted from soot."

Escoffier and Campistron, of Aix, for "a new furnace to heat irons."

V. Fumiere, of Rouen, for "a substitute for the leather employed in carding-combs."

Gobert and Chaplain, at M. Leblanc's, 285, Rue St. Martin, for "addition to the wheels of carriages, which shall enable them to remove all obstacles lying in their way."

Gouneau, 129, Avenue des Champs-Elysees, for "a new printing ink."

Guilbert, of St. Quentin, for "improvements in the manufacture of muslins."

Hale, at M. Perpigna's, for "an improved means of packing gunpowder and provisions."

Jean, Rue St. Denis, Passage Basfour, 7, for "a new apparatus for lighting called appareil solaire."

Kuhsla, of Soultz-sous-Forets (Bas-Rhin), for "a water-proof paper."

Laur, 10, Rue du Four St. Honore, for "a new plough."

Lecoiste, at M. Perpigna's, for "improvements in furnaces."

Legrand, 5, Rue Vivienne, for "a mode of purifying whale oil."

Lovsel, Rue Bretonvilliers, for "improvements in chess-boards."

Manigot, of Lyons, for "improvements in the manufacture of tulle."

Ozanne, 11, Rue d'Orleans Saint-Marcel, for "a mode of imparting the qualities of age to new wines."

Pithay, 110, route d'Allemagne, at La Villette, for "improvements in tanning, so as to render the leather waterproof."

Platen, of Muthausen, for "improvements in the manufacture of files."

Rex, at M. Perpigna's, for "a means of obtaining a moving-power in navigation from the wind and the waves."

Ricard, of Rouen, for "a new mull jenny for cotton or wool."

Rigollot, of Lyons, for "a gas regulator or governor."

Rockel, of Metz, for "improvements in lamps."

Rolland, of Tours, for "a new mode of boring wells, so as to obtain a constant supply of clean and pure water."

Schmitz, of Arras, for "improvements in water-wheels."

Smith, at M. Perpigna's, for "improvements in the manufacture of gas-burners."

Tisserand, of Auxonne, for "a new hydraulic pump."

Barbaux, of Lambres, (Pas-de-Calais), for "improvements in the crystallisation of beetroot-sugar."

Baudon Porcher, of Lille, for "a new calorifère."

Cabarit, of Mazanet (Tarn), for "an apparatus for the oiling of wool."

Carlier, of Lyons, for "improvements in the manufacture of iron steam boats."

Coxhead, at M. Lefort's, 2, rue Neuve des Mathurins, for "a new spirit lamp."

Disaulle, 66, Faubourg St. Martin, for "a machine to grind colours, chocolate, &c."

Duval, Rue Amelot, 52, for "a mode of making clasps by machinery."

Fano, 21, Rue Pastourelle, for "a case with divisions for various purposes."

Gaudon Aubry, of Reims, for "a new percussion gun to discharge several times without reloading."

Gautier, at M. Ramelin's, Allée des Veuves, 99, for "a complete system of fabrication of indigenous sugar."

Guillot, Rue St. Avoye, 57, for "a cellular van for the conveyance of prisoners."

Janisset, 55, Rue Neuve des Petits Champs, for "a new cosmetic, called Crème du Liban."

Jerome, of Plachy-Buyon (Somme), for "a machine to clean wheat."

Lecarpentier, 18, Rue St. Pierre Popincourt, for "a new mode of washing metallic residuum."

Lefrançois, 72, Rue St. André des Arts, for "a composition to take out grease and stains, without injury to the colour."

Lemaire, of Arras, for "improvements in ploughs."

Lemarquirre and Reclus, Rue Montpensier, 34, for "improvements in pumps to give a continuous flow."

Meurs, at M. Rattier's, 4, Rue des Fossés-Montmartre, for "the means of extending and improving the uses of wood."

Michaud, of Luxeuil (Haute-Saone), for "a new economical kitchen stove."

Millot, 77, Rue Neuve des Petits Champs, for "a new busk for stays."

Minier, at M. Perpigna's, for "a new Calorifère."

Molinie, at M. Armengaud's, 34, Rue St. Louis, au Marais, for "a machine to cut corks."

Pion, at M. Leblanc's, Rue St. Martin, 285, for "a new process of washing wool."

Rupigoli, of Havre, for "a ship-pump."

Schneider & Co., of Creuzot (Saône-et-Loire), for "a machine called Marteau vertical à vapeur."

Simon, 18, Rue Neuve St. Martin, for "a machine to dress boot legs."
Souty, at M. Reynaud's, for "*a new composition for picture-frames*," &c.
Stephenson, at M. Martin's, 11, Rue Chaptal, for "improvements in locomotives."
Stocker and Rowley, at M. Coutan's, 18, Rue Bautreillis, for "an improved mode of making clasps."
Vielcoq and Dureuille, 7, Rue Neuve Saint Augustin, for "*a process of* painting and gilding over cement."
Boiones, 27, Rue Neuve des Mathurins, for "an instrument to ascertain the temperature of steam in boilers."
Collados, at M. Dassier's, 7, Rue Bergère, for an instrument to ascertain the *power of naval steam engines*."
Davies, at M. Perpigna's, for "improvements in the construction of drawing-plates."
Dumont and Journet, 8, Rue de Grenelle St. Honoré, for "an instrument for taking profiles."
Durand de Monestrol, 30, bis, Rue de Rivoli, for "a system of railroad of diminished curves."
Fournier, 3, Barrière des Martyrs, for "a new system of fire-hearths."
Gas, of Ruch (Gironde), for "a self-regulating and economical calorifère."
Huet, of Rouen, for "an apparatus to facilitate the passage of smoke from chimnies."
Kirk, at M. Perpigna's, for "improvements in the manufacture of lace."
Launay, 64, Rue des Fossés du Temple, for "an improved means of purifying syrups."
Loba, at M. Reynaud's, for "improvements in the making of paste."
Meyer & Co., Mulhausen, for "*improvements in steam-engines*."
Micon, Rue de Meaux, Barrière du Combat, for "movable paper-hangings."
Pape, 19, Rue-des-bons-enfans, for "a new system of tuning musical instruments."
Poirier, 19, Rue-pont-aux-Choux, for "a substance for cleaning gloves."
Quinet, 6, Rue-du-coq, St. Honoré, for "*the application of filigrane to* various branches of industry."
Reich & Co., 12, Rue-de-l'Echiquier, for "a machine for the manufacture of leaf-metal and bronze powder."
Renoux, at M.M. Marchaud and Lhomme, 26, Rue-de-Charonne, for "an *apparatus for printing stuffs, cottons, &c.*"
Staite, at M. Perpigna's, for "a new steam engine."
Wagner, at M. Perpigna's, for "a mode of printing on leather, &c., by lithography."
Walsh, at M. Truffaut's, for "a means of preserving vessels from injury by *sea water or insects*."
Wood, at M. Perpigna's, for "improvements in the manufacture of steam-valves."
Aury and Favard, of Lyons, for "improvements in the manufacture of silks, &c."
Badin, 12, Rue-des-Ecouffes, au Marais, for "a substituto for horse-hair and bristles."
Barley, 3, Rue-St.-Fiacre, for "the application of the Jacquard roller to bobbin lace looms."
Barthelemy, 19, Rue-de-Rivoli, for "a means of producing steam of great intensity."
Batilliat, of Mâcon, for "a new aromatic composition, called Orientale."
Beaudoin, at M. Reynaud's, for "improvements in the uses of bitumen."
Beau, 12, Rue-St.-Pierre-Montmartre, for "an instantaneous copying machine by simple contact without rollers."
Bellan, of Toulouse, for "*a new lamp*."
Bienayme, at M. Gaulobled's, 5, Quai-Voltaire, for "improvements in clock work."

Biggs, at M. Bouy's, 23, Rue-St.-Laurent, at Belleville, for "the means of securing hats, caps, &c., on the head."

De Bourgoing and Du Tremblay, Rue-du-chemin-de-Versailles, 8, for "a new process of enamelling."

Melles. Charrason, 11, Rue-du-Dauphin, for "improvements in stays, gowns, &c."

Fote and Tissot, of Lyons, for "improvements in the unwinding of silks, &c."

Delebarre, of Rouen, for "a new loom."

Doguée, jun., at T. Testo's, jun., Ministry of Public Works, for "a new brick-making machine."

Ferry, 34, Rue-de-beaune, for "diaphanous and coloured paintings to be used as screens, etc."

Godde de Liancourt and Lebrun, 34, Rue-neuve des Mathurins, for "a girdle, as a means of safety in case of shipwreck."

Guillard-Meynier, of Lyons, for "improvements in the preparation of bitumen and resinous substances."

Guyot, 10, Rue-de-la-victoire, for "improvements in the manufacture of liquid-hydrogen."

Jay, 5, Rue-des-Fossés-montmartre, for "an instrument to measure the head and ascertain its conformation, called Jayolype."

Kessler, of Nancy, for "improvements in looms."

Lamoire-Gautier, of Daigny (Ardennes), for "improvements in the manufacture of shovels."

Lauroi, 4, Place Ste. Opportune, for "an instrument to test the purity of oils."

Maquet and Payat, of Valence, for "an instrument called Métromètre, to take the measure for clothes."

Marcadet, 4, Rue-de-la-chaussée-d'antin, for "an improved umbrella."

Mareste, of Cognac, for "an improved still."

Myevre, of Lyons, for "an improvement in carding-combs."

Neville, Nash & Co., 19, Passage-saulnier, for "improvements in the preparation of silk."

Ristroph & Co., of Nancy, for "a new paper, called Papier à reflet métallique."

Smith, at M. Perpigna's, for "improvements in chains."

Taylor, at M. Perpigna's, for "improvements in locomotion."

Thomas, at M. Perpigna's, for "a remedy against sea-sickness."

Villain, of Havre, for "an improved port-hole for ships."

Valon and Petel, at MM. Cavé and Tollié, 147, Rue-St.-Martin, for "improvements in the manufacture of the fecula of potatoes."

De Wodpol, of Saumur, for "a machine to beat hemp and flax."

Wurdiser, 9, Passage-saulnier, for "a mode of making charcoal, called Charbon refait."

Aroux, of Etheuf, for "a new stuff of mixed cotton and wool."

Aubaric and Coxmer, of Montpellier, for "winter shoes of continued warmth."

Berensdorf, 300, Rue-douffetard, for "a machine to reduce dye-woods to powder."

Blanchet, 42, Rue-St.-Louis, for "improvements in the manufacture of chocolate."

Boas, 3, Rue-Bourbon-Villeneuve, for "improvements in the manufacture of shawls without waste."

Carr, at M. Bouy's, for "a new break for railway-carriages."

Chemery and Girardot, of Sedan, for "a new loom."

Mlle. Chillot, Rue-neuve-Trufault, 2, at Batignolles-Monceaux, for "the manufacture of mattresses and cushions stuffed with cork, bladders, or tubes."

Cochrane, at M. Duret's, Rue-vide-gousset, 4, for "improvements in candlesticks."

Constance, 9, Rue-de-l'eperon, for "a system of reproduction in typography."

Croutelle, of Reims, for "improvements in the manufacture of thread."

Dalmont, 63, Rue-St.-Nicolas-d'Antin, for "a new water-closet."

Fauquet, of Bolbec, for "improvements in cotton printing."

Fortant, 24, Rue-Dupetit-thouars, for "an improved coffee-filterer."

Fournier and Pontremoli, 240, Rue-St.-Denis, for "a cloth for collars."

Fyfe, at Landron's, 3, Rue-des-Fossés Montmartre, for "a code of signals for railways or at sea."

Hanriot, 7, Rue-de-grenelle, St. Honoré, for "new gas and oil-lamp apparatus."

Heilmann, 11, Rue-geoffroy-Langevin, for "buttons without sewing, &c."

Herbelot, fils, and Genet-Dufay, at M. Boulay's, 5, Rue-neuve St. Eustache, for "improvements in the manufacture of bobbin-net, &c."

Huguin, 23, Rue-de-bondy, for "a system of vidange inodore."

Japy, fils, of Berne (Doubs), for "improvements in stamping with machinery."

Laury, 29, Rue-tronchet, for "improvements in calorifères and stoves."

Lebarbier, of Lille, for "an improved means of using anthracite coal."

Lerchan, at M. Poundu's, 15, Rue-des-Maçons-Sorbonne, for "an instrument, called chrononome, for reading music."

Lee, at M. Truffaut's, for "improvements in the manufacture of sulphate of soda and chlorine."

Le-grand, of Bar-sur Aube, for "a machine for dressing mill-stones."

Lehoult & Co., of St. Quentin, for "improvements in the jacquard loom."

Leistenschneider, of Pencey-les-Pellorey (Côte-d'Or), for "the manufacture of continuous paper."

Lemire, 52, Rue-des-Martyrs, for "improvements in the manufacture of soap."

Leroy, 11, Rue-d'Anjou, Au-Marais, for "improvements in window-shutters."

Maides, at M. Truffaut's, for "improvements in furnaces and fire-places."

Mathey, of Thann, (Haut-Rhin), for "improvements in looms."

Monrocier, of Entrechaux (Vaucluse), for "improvements in the manufacture of sulphate of lime."

Montal, 36, Rue-Dauphine (passage Dauphine), for "improvements in musical instruments."

Ollat, of Lyons, for "a means of figuring velvets, &c."

Passenger, at M. Truffaut's, for "improvments in the manufacture of lamps."

Constant, Pougeot & Co., of Audincourt (Doubs), for "a new ventilator."

J. Salmon, at M. Pommier's 25, Rue-Coquillière, for "a new manure called végéto-salin-azoté."

Schmitt, of Valenciennes, for "a new corn mill."

T. Stopford, at M. Landron's, 3, Rue-des-Fossés-Montmartre, for "improvements in steam navigation."

Vauris, of Lyons, for "a new mode of making wigs."

Mme. P. Warenier, of Roubaix, for "improvements in the making of floors, &c."

D. Warren, of Roubaix, for "improvements in the manufacture of screws."

J. Yonge, at M. Truffaut's, for "machinery for cleaning and tanning skins."

Benini, 18, Galerie Colbert, for "improvements in bonnets."

J. Broise, of Lyons, for "improvements in wig-making."

X. Bronikowski, at General Ben's, 5, Place-de-l'Odéon, for "a mode of making flour from cooked potatoes."

J. Chegut, at M. Gourlet's, 171, Foubourg St. Martin, for "an improved mode of making pâte de guimauve."

Mlle. M. Chiris, 23, Foubourg St. Honoré, for "improvements in the Brumah pump."

J. Constantin, at Perpigna's, for "improvements in the manufacture of artificial flowers."

B. Fourneyron, at Perpigna's, for "improvements in steam engines."

C. Guillonet, 28, Rue-de-l'Ecole Vaugirard, for "a machine to beat and sweep carpets."

Kaull, Vicard & Co., of Marseilles, for "the purification of oil."

E. Lebreton, at M. Perpigna's, for "an apparatus for burning resinous oils, &c."

F. Libault, 14, Rue-des-Lombards, for "a new irrigator."

T. Lobstein, of Strasbourg, for "an improved stove."

H. Pape, 19, Rue-des-Bons-Enfans, for "a machine to cut felt, &c."

E. Phillippe and L. Villeseque, 19, Rue Château-Landon, for "a machine to press grapes."

L. Lhien, of Lyons, for "improvements in silk manufacture."

Poelmann, at M. Digweed's, 35, Faubourg St. Honoré, for "improvements in the jacquard loom."

Mme. la Marquise de Raincourt, of Fallon, (Haute Saône), for "a new stove."

Vichrat, jun. at M. Reynaud's, for "a portative calorifère."

A. Badon, 52, Rue-Lafitte, for "a new system of paving, and the composition of bricks of asphaltum."

F. Barthelemy, 8, Rue-Mandar, for "an anti-electric plate to cure nervous affections."

G. Belegue, Donarnenez (Finistere), for "improvements in ship rigging."

M. Cretenier, of Epernay Marne, for "improvements in the preparation of wool."

Cretenier, of Epernay, for "improvements in the process of carding and cleaning wool, &c."

De Bergue & Spreaficos, 228, Quai de Jemmapes, for "a machine whose moving power is voltaic electricity."

Dumont, 39, bis, Rue de Flandre, at La Villette, for "the manufacture of a charcoal for the blanching of syrups and other liquids."

Enerle, of Nay (Basses-Pyrénees), for "a machine to clean the refuse of cotton, &c."

Erhard, of St. Louis (Haut-Rhin), for "an economical evaporating apparatus."

Fauquet, of Rouen, for "improvements in the printing of cravats."

Friou, of Haroue (Meurthe), for "a cure for epilepsy."

Girault, 13, Rue Descartes, for "an improved system of constructing bridges, &c."

Guimbal, of Issoire (Puy de Dôme), for "a machine for making nails."

Guyon, of Dôle (Jura), for "an improved kitchen culinary apparatus."

Guyon, of Dôle (Jura), for "an apparatus to prevent the smoking of chimnies."

Luc Hebert, of Roubnix, for "improvements in iron and other metal bedsteads."

Labourlat, 340, Rue St. Honoré, for "an improvement in the manufacture of clasps."

Lecoq and Co., 2, Rue du Harlay, au Marais, for "an improvement in scales."

Lemesre, of Roubaix, for "improvements in looms."

Meeus, at Lemoine's, of Wazemmes (Nord), for "an application of caoutchouc in the manufacture of cloths."

Perrot, 4, Rue St. Patrice, for "an improvement in tools, for working in wood, and various metals."

Prince, at M. Duret's, for "an improved method of supporting bodies in water."

Raisal, 42, Rue Neuve St. Denis, for "an apparatus to place two bedsteads in space now occupied by one."

Roux Duremert, 33, Rue Michel-le-Comte, for "the application of caoutchouc and air to articles of saddlery."

De Saillet, 1, Rue du faubourg St. Honoré, for "a cork-cutting machine."

Servieu, at M. Reynaud's, for "improvement in the making of trowsers."

Andre, of Sedan, for "an economical mode of heating boilers."

Barrabe, of Domfront (Orne), for an improved mode of raising heavy bodies."

Barruel, at the Sarbonne, at Paris, for "an improved method of making liquid magnesia."

Bergeron, Passage-du-Grand-Cerf, 44,. Rue-St. Denis, for "an apparatus to give support to the uterus."

Briet, 29, Rue-Notre-Dame-de-Nazareth, for "a new lamp-glass."

Constantin, Avenue-de-Clichy, 38, for "a improved means of excavation."

Coltiau and Boissard, 8, Rue-Ste.-Croix-de-la-Bretonnerie, for "a new lamp."

Dantin, of Auxerre, for "an improved candlestick."

D'Arbois and David, 55, Rue-de-la-Roquette, for "a rotative steam engine."

De Labarcssias, of Rouen, for "an improved lithographic press."

Landgraber, at Perpigna's, for "artificial asphaltum."

Marneur, of Senonches (Eure-et-Loir), for "a means of polishing iron of the first fusion."

Magnus, of Besançon, for "a machine called Voiture-cheval-mécanique, having a hold on the ground, and impelled by steam or other power."

Tauvin, 50, Rue-de-la-Chaussée-d'Antin, for "candles without wicks."

Valle, 3, Rue-de-l'Arbre-Sec, for "a substitute for size for canvass."

Rossignol, of Lyons, for "an improved method of fixing bolts."

Sterlingue & Co., 37, Rue-Poissonniére, for "a machine to beat leather."

Tardy & Co., of Valence, for "an improved mode of working silk."

Condet, of Reims, for "improvements in the preparation of wool and cotton."

Armand and Brossard, of Lyons, for "an improved mode of making military gaiters."

Arnoux, of Bourges, for "a wire basket for the use of mines."

Baudoin, at M. Armengaud's, 31, Rue-St. Louis, for "a means of rendering shoes and boots waterproof."

Bois, at M. Reynaud's, for "an improved rotative engine."

Bose and Tuillier, 17, Rue-Montorgueil for "improvements in locomotives, &c."

Boulon, 315, Rue St. Honoré, for "an improved method of copying letters, &c., without press."

Cerizian and Co., 64, Rue Ménilmontant, for "a machine for the purpose of excavating."

Colas, 102, Rue St. Honoré, for "a machine called Sécateur à engrenage."

Daly, 6, Rue Furstemberg, for "a new system of paving."

George, 36, Boulevard de la Barrière Montmartre, for "a machine for excavating, &c."

Lejeune, 97, Rue St. Honoré, for "an improved method of making silk hats."

Llonens, at the Comte de Septeun's, 11, Rue Neuve des Capucines, for "a remedy for ague."

Manoky, of Lyons, for "a piano combining the properties of the organ."

Pidault, 11, Rue St. Louis, at Batignolles-Monceaux, for "an improved fowling-piece."

De Precorbin, 12, Rue de Castiglione, for "an improved machine for striking coins and medals."

Rogeat, of Lyons, for "improved stoves and furnaces."

Trapot, 93, Allée des Veuves, for "making stained paper by mechanism."

Birch, at M. Truffaut's, for "improvements in the making of shoes."

Dewilde, of Arras, for "a condenser applicable to all kinds of steam engines."

Lagrange, at M. Perpigna's, for "a new system of the mechanical application of the action of man."

De St. Gilles, Rue St. Nicolas St. Martin, 22, Passage Chausson, 10, for "improvements in looms."

Schmidt, of Strasbourg, for "an improved method of taking measure of the human body."

Wilkins, at M. Truffaut's for "the employment of certain substances to improve soils."

Abribat, of Bordeaux, for "improvements in the manufacture of sugar."

Berthou and Couturier, 3, Rue J. J. Rousseau, for "a mosaic on wood and card board."

Shelley, 14, Rue-Hauteville, for "a new canvas, called Canevas des Gobelins."

Corbie, 41, Rue-des-Amandiers, at Belleville, for "improvements in stoves, &c."

Deslandes, 12, Rue-du-Petit-Lion St. Sauveur, for "a gas regulator."

Duquesnoy, 85, Faubourg St. Denis, for "an improved Biberon."

Esmein, of Nantes, for "artificial manures."

Fontaine Perrier and Naudin, 7, Rue-chapon, for "a feet par mer, called Caloripède."

Morel, of Vinne (Isère), for "an improved clog."

Pivant, at M. Armengaud's, for "an improved mode of soldering."

Poole, at M. Truffaut's, for "improvements in the dressing of wool."

Romaner, Barraud & Co., at M. Perpigna's, for "an improved steam boiler."

PATENTS GRANTED IN ENGLAND, FROM JANUARY, 31st, TO FEBRUARY 25th, 1843.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

George Benjamin Thorneycroft, of Wolverhampton, iron-master, for "improvements in furnaces used for the manufacture of iron, and also in the mode of manufacturing iron." Sealed January 31.

William Maugham, of Newport Street, Lambeth, chymist, for "an improvement in preparing aerated water." Sealed January 31.

William Barnard Bodby, of Saint Mary, Newington, surgeon, for "improvements in apparatus and means for opening, shutting, and fastening every description of sliding and lifting window sashes, windows and window shutters." Sealed January 31.

William Robinson Shaw, of Leeds, engineer, for "certain improvements in feeding or supplying steam boilers with water." Sealed January 31.

Samuel Kirk, of Halybridge, Lancaster, cotton spinner, for "certain improvements in machinery, or apparatus for preparing cotton and other fibrous substances for spinning." Sealed January 31.

Charles Hancock, of Grosvenor Place, artist, for "an improved means of dyeing or staining cotton, woollen, silk, and other fabrics, and rendering them repellant of waters and moisture." Sealed January 31.

Charles Clark, of Great Winchester Street, London, merchant, for "an improved pyro-hydro pneumatic apparatus, or means of generating, purifying, and condensing steam and other vapours, and of extracting from vegetable

substances the soluble portions thereof; as also the application of parts of the said apparatus to other heating, evaporating, and distilling purposes." Sealed January 31.

James Clark, of Glasgow, power-loom cloth manufacturer, for "an improved mode of manufacturing certain descriptions of cloths." Sealed February 1.

John Hill, of Manchester, machine maker, for "certain improvements in, or applicable to looms for weaving carpets and various other fabrics, in which raised loops or a raised pile constitute the face or the figure of the fabric." Sealed February 11.

Robert Hicks, of Old Burlington Street, Middlesex, surgeon, for "certain improvements in apparatus for impregnating liquids with gas." Sealed February 11.

Joseph Morgan, of Manchester, manufacturer of patent candle-making machines, for "improvements in the manufacture of candles." Sealed February 11.

Jonathan Badger, of Sheffield, carpenter and builder, for "improvements in the construction of bedsteads for invalids." Sealed February 11.

Christopher Nickels, of York Road, Lambeth, gentleman, for "improvements in the manufacture of fabrics made by lace machinery." Sealed February 11.

Thomas Ensor, of Milbourne Port, glove manufacturer, for "improvements in the manufacture of leather gloves." Sealed February 11.

Henry Du Bochet, of South Mall, Ireland, piano-forte tuner, for "a new method of making piano-fortes." Sealed February 11.

Thomas Wolversan, of Salisbury, iron founder, for "certain improvements in axle-trees and axle-tree boxes." Sealed February 11.

Alfred Brewer, of Surrey-place, Old Kent Road, wire weaver and felt manufacturer, for "improvements in machinery for manufacturing paper." Being a communication. Sealed February 11.

George Ebenezer Doubney and Edward Phillips Doubney, of Mile-end, Portsea, candle manufacturers, for "improvements in the manufacture of dip and mould candles." Sealed February 17.

James Boydell, junior, of Oak Farm Iron Works, near Dudley, iron-master, for "improvements in apparatus for retaining the wheels of carriages, in the event of an axis breaking, or otherwise." Sealed February 17.

Henry Ross, of Leicester, worsted manufacturer, for "improvements in combing and drawing wool and other fibrous substances." Sealed February 17.

Charles Brook, of Meltham Mills, York, cotton spinner, for "certain improvements in the apparatus used for purifying gas." Sealed February 17.

William Newton, of Chancery-lane, civil engineer, for "an improved system of working coal mines, and quarries of stone marble and slate; which may also be applied to the making of tunnel borings, or to other purposes of the like kind." Being a communication. Sealed February 20.

John Kyner, of Pontardalais, South Wales, coal proprietor, and Thomas Hodgson Leighton, of Llanelly, Carmarthen, chemist, for "improvements applicable to the burning anthracite or stone coal and other fuel for the purpose of obtaining heat." Sealed February 21.

Joseph Crannis and Robert Kemp, both of Southwark, furriers, for "certain improvements in wood paving." Sealed February 21.

Benjamin Brunton Blackwell, of Newcastle-upon-Tyne, gentleman, and William Norris, of the city of Exeter, civil engineer, for "an improvement in coating iron nails, screws, nuts, bolts, and other articles made of iron, with certain other metals." Sealed February 21.

Lawrence Holker Potts, of Greenwich, doctor of medicine, for "a new or improved method or methods of conveying goods, passengers, or intelligence." Sealed February 21.

Henry Clarke, of Drogheda, Ireland, linen merchant, for "improvements in machinery for lapping and folding all descriptions of woven textures and surface fabrics." Sealed February 23.

Francis Roubiliac Conder, of Highgate, engineer, for "improvements in the cutting and shaping of wood, and in the machinery for that purpose." Being a communication. Sealed February 23.

John Haggerston Leathes, of Norwich, gentleman, and William Kirkaoe, of the same place, asphalte manufacturer, for "certain improvements in coffins." Sealed February 25.

PATENTS GRANTED FOR SCOTLAND, FROM JANUARY 25th, TO FEBRUARY 25th, 1843.

George Benjamin Thorneycroft, of Wolverhampton, iron-master, for "improvements in furnaces used for the manufacture of iron, and in the mode of manufacturing iron." Sealed February 1.

James Boydell, Jun., of Oak Farm Works, near Dudley, in the county of Stafford, iron master, for "improvements in the manufacture of metals for edge tools." Sealed February 1.

James Clark, power loom cloth manufacturer, in Glasgow, in that part of Great Britain called Scotland, for "an improved mode of manufacturing certain descriptions of cloths." Sealed February 2.

Tavernen John Miller, of Millbank-street, Westminster, oil merchant, for "improvements in apparatus for supporting a person in bed or when reclining." Sealed February 13.

Samuel Kirk, of Stalybridge, in the county of Lancaster, cotton spinner, for "certain improvements in machinery or apparatus for preparing cotton and other fibrous substances for spinning." Sealed February 13.

Charles Thatcher, of Midsomer Norton, in the county of Somerset, brewer, and Thomas Thatcher, of Kilmersdon, in the said county, builder, for "certain improvements in drags or breaks to be applied to the wheels of carriages generally." Sealed February 22.

PATENTS GRANTED IN IRELAND FROM JANUARY 25th, TO FEBRUARY 25th, 1843.

John George Bodmer, of Manchester, in the county of Lancaster, for "certain improvements in the manufacture of metallic hoops and tyres for wheels, and in the method of affixing the same for use, and also improvements in the machinery or apparatus to be employed therein." Sealed January 27.

James Clark, of Glasgow, power loom manufacturer, for "an improved mode of manufacturing certain descriptions of cloths." Sealed February 1.

Julian Edward Dishrowe Rodgers, of Upper Ebury-street, in the county of Middlesex, esquire, for "improvements in the separation of sulphur from various mineral substances." Sealed February 18.

Thomas Thompson, of Coventry, in the county of Warwick, weaver and machinist, for "certain improvements in weaving figured fabrics." Sealed February 18.