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Time of Request: Wednesday, August 01, 2007 12:02:21 EST
Client ID/Project Name:
Number of Lines: 119
Job Number: 1821:40504772

Research Information

Service: Terms and Connectors Search
Print Request: Current Document: 62
Source: Utility, Design and Plant Patents
Search Terms: inventor(robert /2 rines)

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UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

2539477

Link to Claims Section

January 30, 1951

Portable radio telephone

INVENTOR: HARVEY RINES ROBERT

APPL-NO: 574303 ()

GRANTED-DATE: January 30, 1951

PRIORITY: January 24, 1945 - 19450574303, United States (US)

PUB-TYPE: January 30, 1951 - Utility Patent having no previously published pre-grant publication (A)

PUB-COUNTRY: United States (US)

US-MAIN-CL: 455#95

US-ADDL-CL: 332#149, 367#3, 455#107, 455#116, 455#128, 455#550.1

CL: 455, 332, 367, 455

SUMMARY:

The present invention relates to radio transmission, and more particularly to portable radiotelephone sets.

An object of the invention is to provide a new and improved portable radio-telephone set.

Another object of the invention is to provide a simple modulated transmitter.

Other and further objects will be explained hereinafter and will be particularly pointed out in the appended claims.

The invention will now be more fully explained in connection with the accompanying drawing, the single figure of which is a longitudinal section embodying the invention in preferred form.

As disclosed in my copending application, Serial No. 492,167, filed June 23, 1943, radio waves energizing an antenna may be modulated by sonic contact with a vibrating member or column. This principle is made use of according to the present invention, in which the antenna 2, carried by a portable support 4, is mechanically connected rigidly to a vibratory member 6. The antenna 2 is of the type that emits radio waves into space in response to electrical excitation by radio-frequency energy drawn by the antenna from a radio-frequency-energy-generating electric systemprior to the emission of the radio-frequency energy as radio waves. A radio-frequency oscillator 8 constitutes such an electric system or source of radio-frequency energy connected to the antenna by a transmission line in order that the antenna may draw radio-frequency energy from the electric system, thereby to cause the antenna to emit radio waves into space.

The vertical antenna 2 produces and emits a bundle of rays of radio waves in a predeterminted field pattern. In the horizontal plane, rays are emitted from each circumferential portion of the antenna in a corresponding predetermined radial direction, producing an omnidirectional field pattern. In the vertical plane, a directional field pattern is produced, there being no end-on radia-t,ijon.

The mechanical vibrations of the vibratory member 6 may be produced by talking into a hollow sonic voice chamber 10. The voice sounds will cause mechanical vibrations of the member 6, which extends into and mechanically vibrates the antenna 2 in the end-on direction, which is at an angle to all the directions in which radio waves are emitted, and at right angles to the horizontal field pattern. These mechanical vibrations instantaneously vary the dimensions of the antenna 2 at frequencies dependent upon the frequency of the vibrations, thereby exerting corresponding variations in the energy drawn from the electric system 8. The radio-frequency waves emitted by the antenna 2 are therefore modulated in response to the mechanical speech vibrations of the vibratory member 6.

The same antenna may be adapted to receive amplitude-modulated waves which, after amplification by an amplifier 12, may be demodulated by a detector 14 connected to a loudspeaker 16.

Those elements may also be supported by the portable support 4. The oscillator 8 may be connected into circuit for transmission by a pushbutton switch 18, and the amplifier and detector 12, 14 fpr reception by a push-button switch 20.

Modifications and scope of the invention, as defined in the appended claims, will occur to those skilled in the ar

ENGLISH-CLAIMS:
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What is claimed is: 1. A radio transmitter having, in combination, a portable support, a source of radio-frequency energy carried by the support, an antenna carried by the support excited from the source to emit radio waves, and a vibratory member carried by the support and to which the antenna is mechanically connected to vibrate the antenna mechanically during the emission of the radio waves to cause the antenna to effect modulation of the emitted radio waves as an inherent response to its mechanical vibration.

2. A radio-telephone transmitter having, in combination, a source of radio-frequency energy, an antenna excited from the source to emit a bundle of rays of radio waves, each ray along a predetermined direction, and speech-responsive oJ means for varying a dimension of the antenna during the emission of the radio waves to effect speech modulation of the emitted radio waves while retaining for each ray its predetermined direction, 3. A radio transmitter having, in combination, a source of radio-frequency energy, an antenna excited from the source to emit radio waves into space, and a sonic chamber mechanically vibratory in response to sound waves and mechanicaly connected to the antenna to effect mechanical vibration of the antenna in response to the mechanical vibrations of the sonic chamber, thereby to effect modulation of the emitted radio waves.

4. A radio-telephone transmitter having, in combination, a source of radio-frequency energy, an antenna excited from the source to emit radio waves into space, and a voice chamber mechanically vibratory in response to speech and mechanically connected to the antenna to effect mechanical vibration of the antenna in response to the mechanical vibrations of the voice chamber, thereby to effect speech modulation of the emitted radio waves.

5. An electromagnetic system having, in combination, a sonic chamber, and means for exciting the external surface of the chamber electro-magnetically to emit electromagnetic waves into space, the sonic chamber being vibratory in response to sound waves to effect modulation of the emitted waves.

6. A radio transmitter having, in combination, a portable support, an antenna carried by the support of the type that emits radio waves into space in reponse to electrical excitation by radio-frequency energy drawn by the antenna from a radio-frequency-energy-generating electric system prior to the emission of the radio-frequency energy as radio waves, an electric system carried by the support for generating radio-frequency energy, means electrically connecting the

antenna to the electric system in order that the antenna may draw radio-frequency energy from the electric sytem, thereby to cause the antenna to emit radio waves into space, and a member carried by the support for varying a dimension of the antenna, thereby to effect modulation of the radio waves emitted by the antenna.

7. A radio-telephone transmitter having, in combination, an antenna of the type that emits radio waves into space in response to electrical excitation by radio-frequency energy drawn by the antenna from a radio-frequency-energy-generating electric system prior to the emission of the radio-frequency energy as radio waves, an electric system for generating radio-frequency energy, means electrically connecting the antenna to the electric system in order that the antenna may draw radio-frequency energy from by the electric system, thereby to cause the antenna to emit radio waves into space, means responsive to vibrations of speech frequency, and means controlled by the vibration-responsive means for varying a dimension of the antenna in response to the vibrations of speech frequency, thereby to effect modulation at speech frequency of the radio waves emitted by the antenna.

8. A radio-telephone transmitter as defined in claim 7 in which the speech-responsive means comprises a voice chamber mechanically vibratory in response to speech.

9. A radio-telephone transmitter having, in combination, an electric system for generating radio-frequency energy, an antenna electrically connected to the electric system in order that the antenna may draw radio-frequency energy therefrom to emit radio waves, and speech-responsive means for varying the length of the antenna in response to speech during the emission of the radio waves to modulate the radio waves.

10. In a radio transmitter having an antenna of the type that emits radio waves into space in response to electrical excitation by radio-frequency energy drawn by the antenna from a radio-frequency-energy-generating electric system prior to the emission of the radio-frequency energy as radio waves, a method of the character described that comprises feeding radio-frequency energy from the electric system in order that the antenna may draw radio-frequency energy from the electric system, thereby to cause the antenna to emit radio waves into space, producing vibrations of speech frequency, and varying a dimension of the antenna in response to the vibrations of speech frequency during the emission of the radio waves by the antenna in order to effect modulation of the radio waves emitted by the antenna.

11. A radio transmitter having, in combination, an antenna of the type that emits radio waves into space in response to electrical excitation by radio-frequency energy drawn by the antenna from a radio-frequency-energy-generating electric system prior to the emission of the radio-frequency energy as radio waves, an electric system for generating radio-frequency energy, means electrically connecting the antenna to the electric system in order that the antenna may draw the radio-frequency energy from the electric system, thereby to cause the antenna to emit radio waves into space, a mechanically vibratory member, and means mechanically connecting the antenna to the mechanically vibratory member to vary a dimension of the antenna mechanically in response to the mechanical vibrations of the mechanically vibratory member, thereby to effect modulation of the radio waves emitted by the antenna and in which the vibratory member comprises a sonic chamber mechanically vibratory in response to sound waves.

ROBERT HARVEY RIMES.

LOAD-DATE: November 14, 2005

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********** Print Completed **********

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