Nov. 1, 1932. P. S. HASELTON 1,885,913

RADIO APPARATUS

Filed Feb. 16, 1925

Fig. 1.

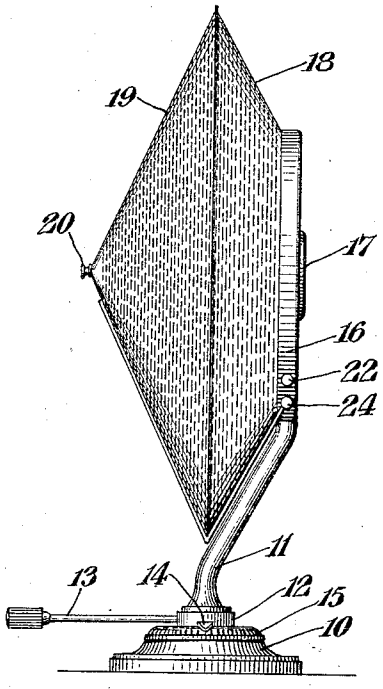
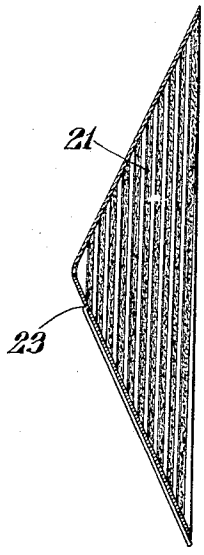


Fig. 2.



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RADIO APPARATUS

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This invention relates to radio and acoustical apparatus and particularly to improvements in the construction of antennæ and also improvements in the construction of sound amplifiers or "loud speakers" of the type used for example in connection with radio telephone receiving apparatus.

In accordance with this invention in one of its forms a radio receiving system is provided having a rotatable antenna which may be incorporated as a unitary structure with and mounted upon the loud speaker or sound emitting device of the system.

Various objects and advantages of the invention will be apparent from the following description and claims taken in connection with the accompanying drawing, in which—

Figure 1 is a side elevational view of a so-called cone type radio "loud speaker", provided with an antenna and embodying my invention, and,

Figure 2 is a sectional view taken through one of the conical diaphragms of the device of Figure 1.

The device as shown in Figure 1 may comprise a base member 10 upon which a bracket member 11 may be pivotally mounted in any desired manner, as at 12. The bracket 11 may be provided with an operating handle 13 by which it may be readily rotated or turned in the desired direction. The bracket may also be provided with an indicator as at 14 cooperating with a scale 15 fixed upon the base 10. The indicator and scale permit the device to be accurately adjusted or readjusted to face in any desired direction.

The bracket 11 should preferably be formed of non-conductive material such as a phenolic condensation product in order to avoid distortion of the radio waves. A frame member 16 may also be integrally formed with the bracket 11. A suitable electrical-sound translating device 17 may be supported within the frame 16.

A pair of abutting conical diaphragms 18 and 19 may be mounted as shown upon the frame 16. Sound impulses from the translating device 17 may be imparted to the diaphragms in any known manner as by a rod extending to the apex of the cone 19 and terminating in an adjusting nut 20.

As shown in dotted lines in Figure 1 and as illustrated in Figure 2, a conductor comprising for example an antenna, preferably of the closed loop type and of a shape generally corresponding or conforming to that of the sound emitting member, may be mounted substantially concentrically with and if desired within the conical diaphragms 18 and 19. As illustrated, the conductors of this antenna may take the form of a spiral ribbon of metallic foil, such as tin or copper foil 21. Convolutions formed by this foil may be fixed in spaced relation on the inner side of the cones 18 and 19 by the use of shellac or other insulating adhesive. One end of the spiral ribbon may be brought to a terminal post as at 22 while the other end may extend through a perforation 23 in the diaphragm 19 to the outer face of the diaphragm and then along the faces of the diaphragms to a terminal post 24.

In the above described manner the conductor wires of a loop antenna may be applied to the sound radiating diaphragms in such form that interference with the mechanical functions of the diaphragm will be avoided. At the same time, a loop antenna will be provided, the turns of which are positioned substantially in vertical planes. It will be observed that a single supporting member is thereby utilized for two purposes and at the same time a pivoted rotatable loop antenna is incorporated in a unitary structure with the sound radiating device. The pivoting support and the operating handle 13 permit the antenna to be turned to obtain maximum absorption of radiant energy from any desired direction with substantially minimum interference from radiant energy propagated from other directions.

It is also apparent that a very efficient lightweight form of antenna conductor is provided by the use of the ribbon of metallic foil since a large surface area is made available. This form of conductor is very flexible and accordingly may be easily applied and offers substantially no dampening action to the vibrating diaphragms. In the device of

Fig. 1 the metallic foil should preferably be sufficiently thin to be incapable of self-support. Such foil may be readily supported in the desired position to form the conductors of an antenna merely by the use of adhesive material for pasting the ribbon in position on the desired support. Antenna conductors as above described may also be conveniently mounted on various types of loud speakers and supports other than those illustrated.

In the above described modification, the antenna conductors, if desired, may be imbedded within the sound emitting member. In this way, the sound emitting member may be formed with the antenna and will serve to permanently hold and insulate the conductors thereof in their desired relation.

In each of the above described embodiments of the invention it will be noted that a very compact arrangement is made possible by positioning or supporting the antenna substantially concentrically with the sound emitting member. The antenna is of a configuration corresponding generally to that of the sound emitting member and accordingly the two associated devices require substantially only the space of one and yet the antenna may be freely turned to the desired angle.

If desired, the conductive foil may be crimped throughout its length as indicated in Fig. 2. Such crimping eliminates the possibility of tearing the foil in case the diaphragms or other supporting base becomes distorted.

It is not intended that the invention be limited to the specific embodiments herein described and somewhat schematically illustrated since after understanding the invention, it will be understood that the invention is also capable of many other variations and modifications coming within its scope as set forth in the following claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a sound emitting vibratory diaphragm, and means for vibrating said diaphragm, said diaphragm carrying an elongated flexible metallic conductor forming a part of the circuit or circuits for energizing said means for vibrating the diaphragm.

2. In combination, a sound emitting vibratory diaphragm, and means for vibrating said diaphragm, said diaphragm carrying a spirally arranged conductor forming a part of the circuit or circuits for energizing said means for vibrating the diaphragm.

3. In combination, a sound emitting vibratory diaphragm, and means for energizing said diaphragm, said diaphragm carrying one or more convolutions of a highly flexible metallic conductor closely conformative to the surface of the diaphragm and adapted to have currents induced therein for effecting said energizing means.

4. In radio receiving apparatus, the combination of an antenna comprising one or more turns of a conductor, and a reproducer of the signal energy received on said antenna, said reproducer having a diaphragm, the said antenna being integrally formed with the reproducer diaphragm.

5. In radio receiving apparatus, the combination of an antenna comprising one or more turns of a metal foil conductor, and a reproducer of the signal energy received on said antenna, said reproducer having a diaphragm, the said antenna being integrally formed with the reproducer diaphragm.

In witness whereof, I have hereunto subscribed my name.

PAGE S. HASELTON.