Nov. 21, 1933. E. C. JEFFERIS 1,936,396

LOUD SPEAKER

Filed May 10, 1933

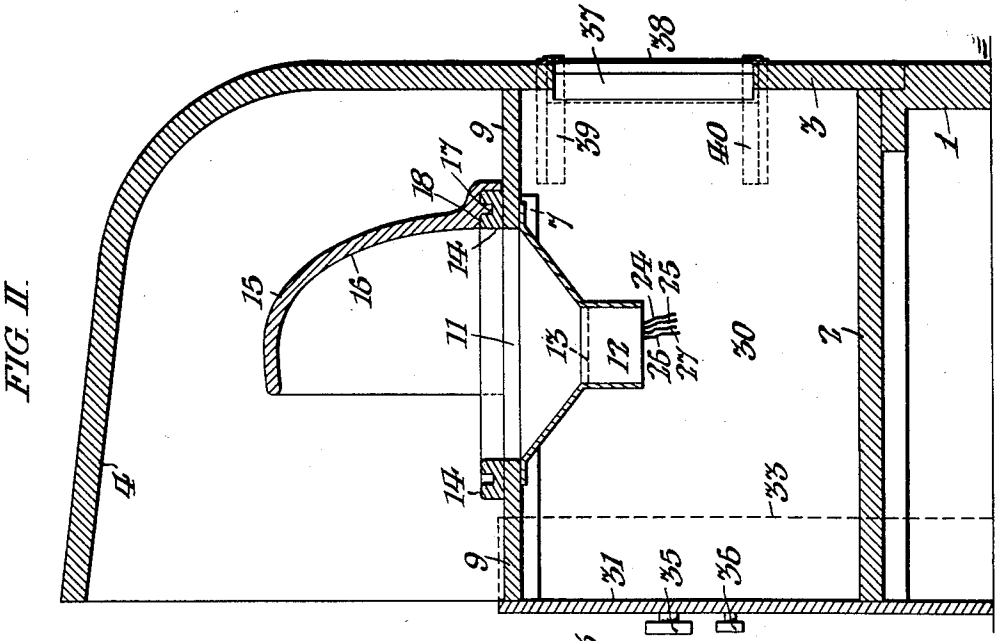


FIG. II.

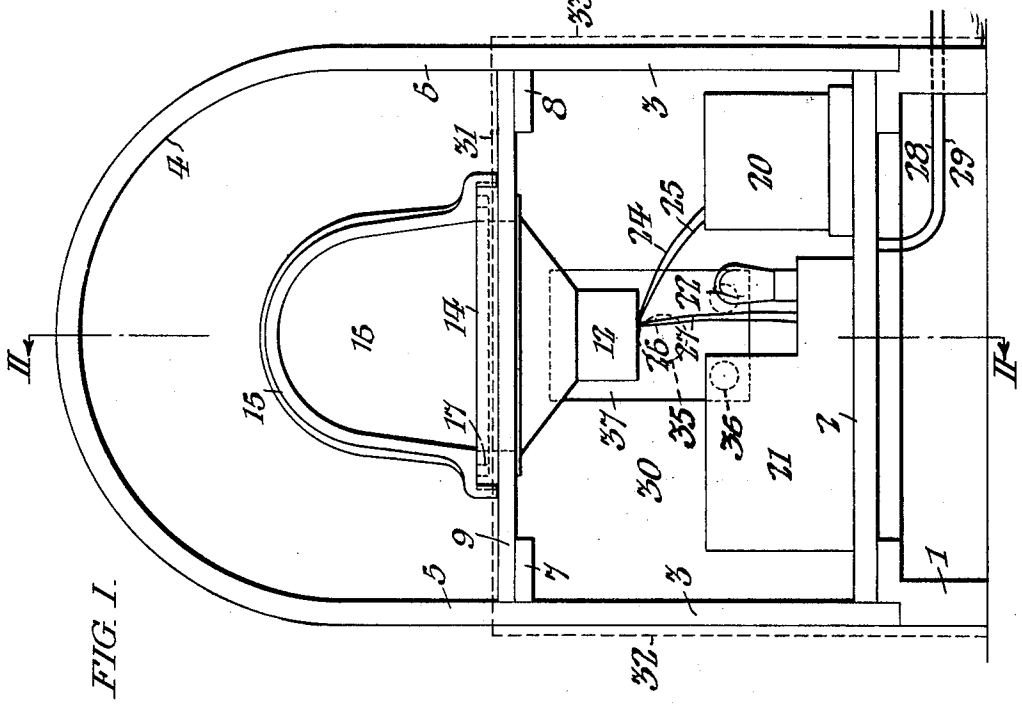


FIG. I.

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Patented Nov. 21, 1933 1,936,396

UNITED STATES PATENT OFFICE

1,936,396

LOUD SPEAKER

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Application May 10, 1933. Serial No. 670,219

4 Claims. (Cl. 181—31)

My invention relates to apparatus for radio reception and particularly the construction and arrangement of the essential elements of the sound reproducing device, whereby the acoustic effects may be advantageously varied.

As hereinafter described, my invention includes a sound reproducing device comprising an outer casing with a horizontal partition intermediate of its height supporting a circular diaphragm presented in a horizontal plane beneath a circular opening in said partition, said diaphragm being operatively connected with an electric motor for vibrating it with radio impulses; said partition supporting a track in concentric relation with the axis of said diaphragm, and what I term a bell-shaped throat which is a sector of a hollow parabolic shell having at the lower edge thereof means for engaging said track, whereby said throat may be shifted circumferentially with respect to said track to present its sound reflecting surfaces in any desired direction within a sound amplifying hood forming the top of said casing and overhanging said throat and the parts connected therewith. Said hood is open at one end for projection of sound waves therefrom under impulses from said diaphragm, and the purpose and effect of making said throat adjustable as aforesaid in said hood is to vary the volume and tone of the sounds thus projected, as hereinafter described.

My invention includes the various novel features of construction and arrangement hereinafter more definitely specified.

In said drawing, Fig. I is a front elevation of said casing and its appurtenances, including said hood and adjustable throat, the latter being in concentric relation with said hood and in the position to project the maximum volume of sound from the diaphragm.

Fig. II is a vertical sectional view of said structure taken on the line II, II, in Fig. I in the direction of the arrows on said line.

In said figures, said casing includes the base 1 supporting the floor 2 and the outer shell 3 including the sound reflecting hood 4 at the top thereof. As indicated, the upper portion of said hood is half of a hollow cone having a rounded back, and the side walls 5 and 6 of said casing extend vertically in connection with said conical portion so that the entire casing is designed for reflection and projection of sound in the direction to the left of Fig. II.

Said casing walls 5 and 6 have inwardly extending brackets 7 and 8 supporting the partition 9 which is normally in stationary position in said casing but may be slid to the left in Fig. II to afford more ready access to the parts carried thereby. Said partition has the circular opening 11 therethrough and the sound reproducing device 12 which is supported by said partition in concentric relation with said opening 11 includes a diaphragm 13 presented in a horizontal plane beneath said opening.

Said partition 9 is provided with the circular track 14 in concentric relation with said opening 11 and the diaphragm 13 beneath it. The bell-shaped throat 15 is a sector of a hollow parabolic shell having the inner sound reflecting surface 16 for projecting the sounds from the reproducer laterally with respect to said hood 4. Said throat 15 has means for engaging said track 14, including the arcuate rib 17 and arcuate flange 18. It is to be understood that said throat 15 is readily movable circumferentially with respect to said track and in concentric relation with the sound reproducing device so that, in the position shown, it projects the maximum volume of sound waves toward the left in Fig. II in concentric relation with the outer hood 4 of said casing. However, if said throat 15 be reversed in position to present its sound reflecting surface 16 at the left in Fig. II, the effect is to project the sound waves toward the back, closed, portion of said hood 4 and to very materially minimize the volume of sound projected. The acoustic effect of the cooperation of said hood 4 and movable throat 15 may be advantageously varied by merely turning said throat 15 upon its track 14 so that the operator may instantly and readily control and vary the volume and quality of the sound emitted from said casing independently of any electrical controlling means appurtenant to said sound reproducing device 12 and, of course, such mechanical variation of the volume and quality of the sound produced may be cooperatively employed in conjunction with any electrically operative means for controlling the volume and quality of the sound reproduced.

The electrically operative means above contemplated may be of any convenient form. For instance, in Fig. I, I have indicated a container 20 for the usual transformers and the container 21 for a series of evacuated bulbs containing electrodes, one such bulb being indicated at 22 in Fig. I. Said sound reproducing device 12 is connected with the contents of the casing 20 by the electrical conductors 24 and 25 and with the casing 21 by the electrical conductors 26 and 27, and said apparatus is operatively connected with

the conductor 28 leading to any suitable antenna and with the ground conductor 29.

Said electrically operative means is conveniently supported by the floor 2 within the compartment 30 of said casing shell 3, and I find it convenient to normally maintain said compartment closed by the cover 31 which is normally held in the position shown in Fig. II by its opposite side flanges 32 and 33 which are indicated in dotted lines. Said cover 31 conveniently supports the knobs 35 and 36 by which the electrically operative means aforesaid may be manipulated.

Moreover, I find it convenient to provide the opening 37 in the back wall of said casing shell 3 with the door 38 which is fitted to slide to and from its closed position shown in Fig. II in the guide flanges 39 and 40 which are fixed on said casing shell 3. Said opening 37 not only affords convenient access to the contents of said compartment 30, but may be used for ventilating said compartment which becomes heated during the operation of the apparatus.

However, I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:

1. In a loud speaker for radio apparatus; the combination with a casing including means supporting a diaphragm in a horizontal plane, and an electrically operative sound reproducing device for vibrating said diaphragm; of a horizontally extending track in concentric relation with said diaphragm at the top thereof and a bell-shaped throat which is a sector of a hollow substantially parabolic shell, having means at its lower edge for engaging said track in circumferentially adjustable relation therewith; whereby sound waves projected vertically from said diaphragm may be projected laterally in different directions in accordance with the circumferential position of said throat on said track.

2. Apparatus as in claim 1, including a sound reflecting hood overhanging said throat, in stationary relation with said sound reproducing device; whereby the volume and quality of sound projected from said hood in waves formed by said diaphragm may be varied by varying the relative position of said throat in said hood.

3. In a loud speaker for radio apparatus, the combination with an outer casing having its upper portion forming the half of a hollow cone with a rounded back and its side walls extending vertically in continuation of said hood; of a horizontal partition in said casing separating said hood from the lower portion of the casing; said partition having a circular opening therethrough; a sound reproducing device supported by said partition and including a diaphragm presented beneath said opening in concentric relation therewith, and electrically operative means for vibrating said diaphragm; a track supported by said partition, at the top thereof, in concentric relation with said opening; and a bell-shaped throat which is a sector of a hollow substantially parabolic shell, having means at its lower edge for engaging said track in circumferentially adjustable relation therewith; whereby sound waves projected vertically from said diaphragm may be projected laterally in different directions in accordance with the circumferential position of said throat on said track and with acoustic effects varying in accordance with the relative position of said throat in said hood.

4. In a loud speaker for radio apparatus, the combination with a sound reproducing device including a circular diaphragm and electrically operative means for vibrating said diaphragm; of a bell-shaped throat which is a sector of a hollow substantially parabolic shell; and means supporting said throat in coaxial relation with said diaphragm and with freedom for circumferential adjustment with respect thereto; whereby sound waves projected into said throat parallel with the axis of said diaphragm may be projected laterally to said axis, from said throat, in different directions in accordance with the circumferential position of said throat, including a sound reflecting hood overhanging said throat, in stationary relation with said sound reproducing device; whereby the volume and quality of sound projected from said hood in waves formed by said diaphragm may be varied by varying the relative position of said throat in said hood.

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