Nov. 30, 1926. 1,608,845

J. D. ELBERT

LOUD SPEAKER FOR RADIOS

Filed May 20, 1925 2 Sheets-Sheet 1

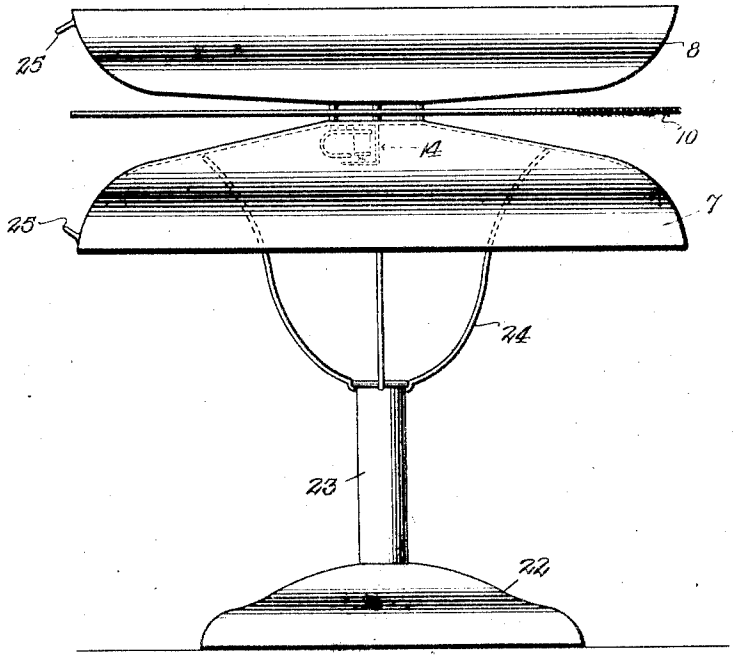


Fig. 1.

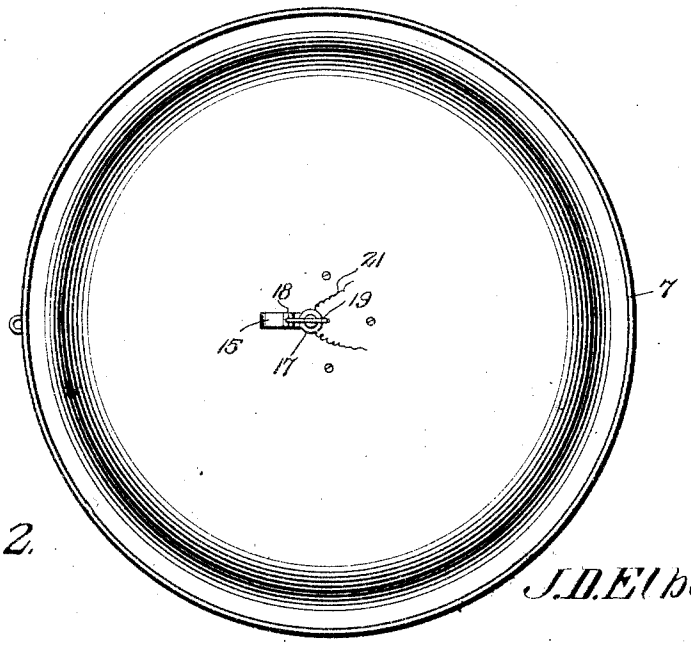


Fig. 2.

Inventor
J. D. Elbert,
By Bernard S. Lovell
Attorney

Nov. 30, 1926. 1,608,845

J. D. ELBERT

LOUD SPEAKER FOR RADIOS

Filed May 20, 1925 2 Sheets-Sheet 2.

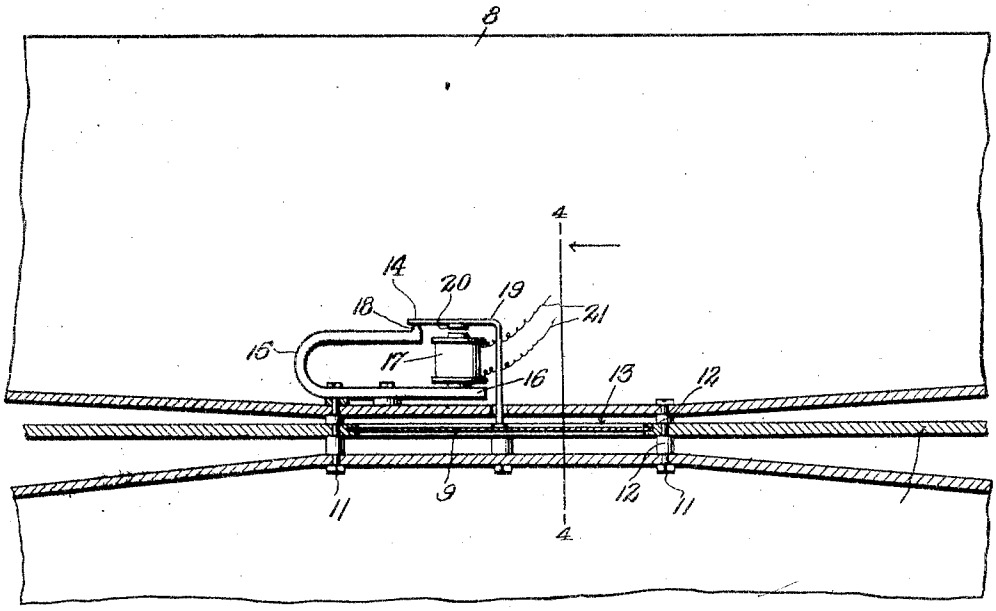


Fig. 3.

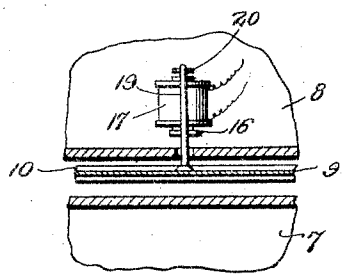


Fig. 4.

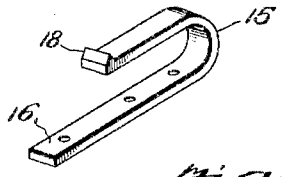


Fig. 5.

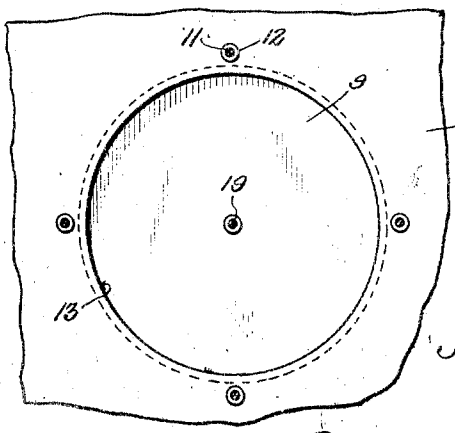


Fig. 6.

Inventor
J. D. Elbert,
By Bernard S. Garvey
Attorney

Patented Nov. 30, 1926. 1,608,845

UNITED STATES PATENT OFFICE.

JOHN D. ELBERT, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF FORTY-FIVE ONE-HUNDREDTHS TO GEORGE L. STEWART, OF SAN FRANCISCO, CALIFORNIA.

LOUD SPEAKER FOR RADIOS.

Application filed May 20, 1925. Serial No. 31,554.

The present invention relates to loud speakers for radios one of the objects of which is to provide an exposed diaphragm which coacts with sound deflectors to clarify, as well as amplify, the sound transmitted from the radio instrument.

Other objects of the invention are to provide loud speakers adapted for use with any kind of radio instruments and of such construction that sound emanating from the diaphragm passes directly into the opening unimpinged by sound boxes or any means productive of directional amplification; to provide an amplifier which may be supported on a base or suspended from the ceiling or other support; and to provide a sound amplifier of very simple construction which will last for an indefinite period of time and may be manufactured at a very low cost.

It is, of course, to be understood that while this device is designed primarily as a loud speaker for radio instruments, it is susceptible of a variety of uses where the amplification of sound is desired, and hence it is a further object of the present invention to provide generally a sound amplifier substantially of the type hereinafter described.

Other objects of the invention will be apparent from the following description of the present preferred form of the invention taken in connection with the accompanying drawings wherein:—

Fig. 1 is a side elevational view of a loud speaker constructed in accordance with the present invention;

Fig. 2 is a plan view of one of the sound deflectors used in the present invention;

Fig. 3 is a detail enlarged fragmentary sectional view of the loud speaker showing to advantage the manner of connecting the sound deflectors, diaphragm and sound responsive means together;

Fig. 4 is a detail fragmentary sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a detail perspective view of a supporting element constituting a part of the sound responsive mechanism; and

Fig. 6 is a detail enlarged fragmentary plan view of the diaphragm and diaphragm supporting structure.

The loud speaker constructed in accordance with the present invention consists especially of a pair of sound deflectors 7 and 8 which are shown in the present instance to be of substantially semi-spherical configuration and are adapted to be arranged so that their closed faces are in close proximity to each other. The deflectors are preferably non-metallic and effectively function by having their contours substantially as shown in Fig. 1 of the drawings. It will be noted that the lower deflector 7 has its apex flattened and the face leading from the flattened portion disposed at an inclination of decidedly greater pitch than the inclination of the closed or inner face of the upper deflector 8.

The diaphragm used in the present invention is shown at 9 and is preferably mounted in a discal supporting structure 10 which is secured between and spaced from the proximate faces of the deflectors by bolts and washers 11 and 12 respectively. The diaphragm may be made from any one of various materials now employed for use in sound diaphragms and is mounted in a circular opening 13 formed centrally in the support 10. The wall of this opening is shown in the present instance as provided with an annular groove into which the periphery of the diaphragm is inserted. By preference, the diaphragm supporting structure 10 is spaced further away from the inner face of the lower deflector 7 than from the inner face of the upper deflector 8 to provide greater selectivity in the transmission of sound in the manner hereinafter set forth. Also, by preference, the sound responsive mechanism, generally designated 14, is mounted within the lower deflector 7 although if desired this mechanism may be mounted in the upper deflector as shown in Figs. 3 and 4.

The sound responsive mechanism, in the present instance, consists of a supporting arm 15 substantially of U-shape having one of the arms thereof slightly extended, as indicated at 16, to receive a magnetic coil 17. The supporting U 15 is detachably mounted either on the deflector 7, as shown in Fig. 1, or on the deflector 8, as shown in Figs. 3 and 4. The outer terminal of the shorter end of this support is provided with an integral abutment 18 which is adapted to be impinged by the free end of the movable part of the sound responsive means, which is generally designated 19. This movable part consists especially of an arm, one end of which is concentrically mounted in the diaphragm 9 and the opposite end bent at right

angles and engaged with the abutment 18 in the manner above described. The intermediate portion of the inner face of the right angled terminal is equipped with an enlargement 20 which serves as an armature adapted to be attracted when the magnetic coil 17 is energized, thereby undulating the diaphragm 9 in a manner well known in the art. The magnetic coil is energized by electric curicuit wires 21. Any suitable means for supporting the loud speaker may be employed, such, for instance, as the supporting medium illustrated in Fig. 1, which consists of a base 22, pedestal 23 and diverging arms 24, the free ends of which latter embrace the inner face of the deflector 7. This means is especially adapted for supporting the device on a table or the like. On the other hand, should it be desired to suspend the speaker from the ceiling or like support, this may be done by engaging suitable suspension means with loops 25 which are mounted on the outer faces of the deflector 7 and 8.

In use of this device, the sound responsive means is actuated under influence of the electrical current passing through the circuit wires 21 which energizes the magnetic coil 17 and causes the diaphragm 9 to be undulated. Tones of low pitch pass from the diaphragm through the space between the supporting disk 10 and the lower deflector 7 while tones of higher pitch pass through the space between the disk 10 and the upper deflector 8. Tones of intermediate pitch would pass through the spaces both above and below the diaphragm supporting disk 10. The tones are gradually amplified as they pass from the diaphragm outwardly toward the outer periphery of the diaphragm supporting disk 10 and deflectors 7 and 8.

It is, of course, to be understood that various changes may be made in this device to adapt the same for use in different ways but one of the preferred forms of using the invention is set forth herein to show the principle of the invention.

What is claimed is:—

1. A loud speaker including a plurality of deflectors equipped with an interengaged interposed diaphragm, and means carried by one of the deflectors and engaged with the diaphragm for undulating the latter.

2. A sound amplifier including sound deflectors equipped with an exposed electrically operated diaphragm therebetween.

3. A sound amplifier including an electrically undulated diaphragm, and sound deflectors mounted on the opposite sides of said diaphragm in relatively close proximity thereto, said deflectors diverging at a point beyond the diaphragm.

4. A sound amplifier including a pair of plates equipped with an interposed diaphragm and means for undulating the latter, said plates and diaphragm being held in fixed position and in close proximity throughout the expanse of the diaphragm, the plates diverging at a point beyond the diaphragm.

5. A loud speaker including a pair of substantially hemispherical deflectors, a diaphragm interposed between the proximate faces of the deflectors and connected thereto, and electro-magnetic means mounted in one of the deflectors and in connection with the diaphragm for undulating the latter.

JOHN D. ELBERT.