March 20, 1928. 1,663,256

G. C. LINDSEY

SOUND REPRODUCER

Filed Sept. 18, 1925 2 Sheets-Sheet 1

Fig. 1.

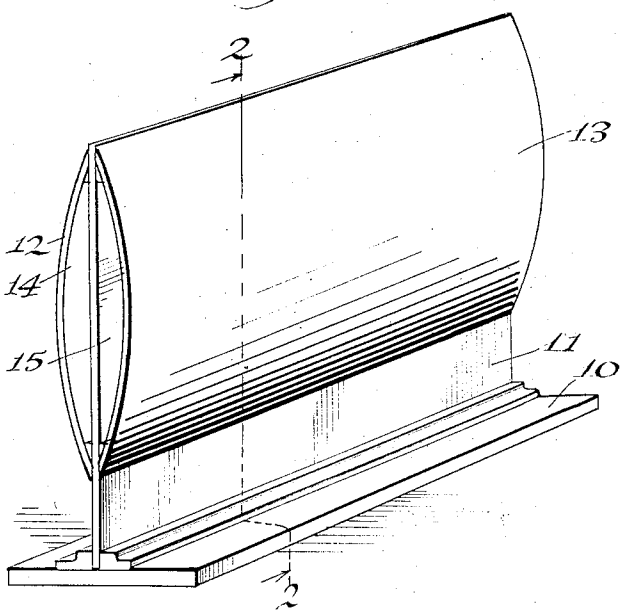

Fig. 2.

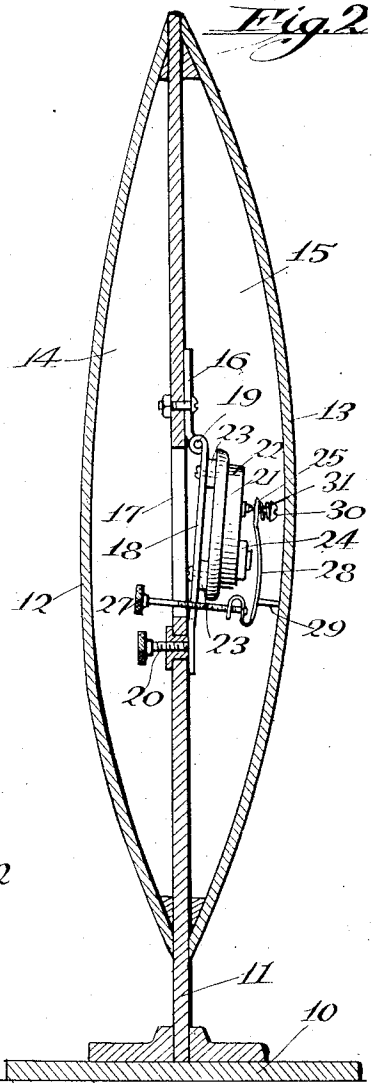

Fig. 3.

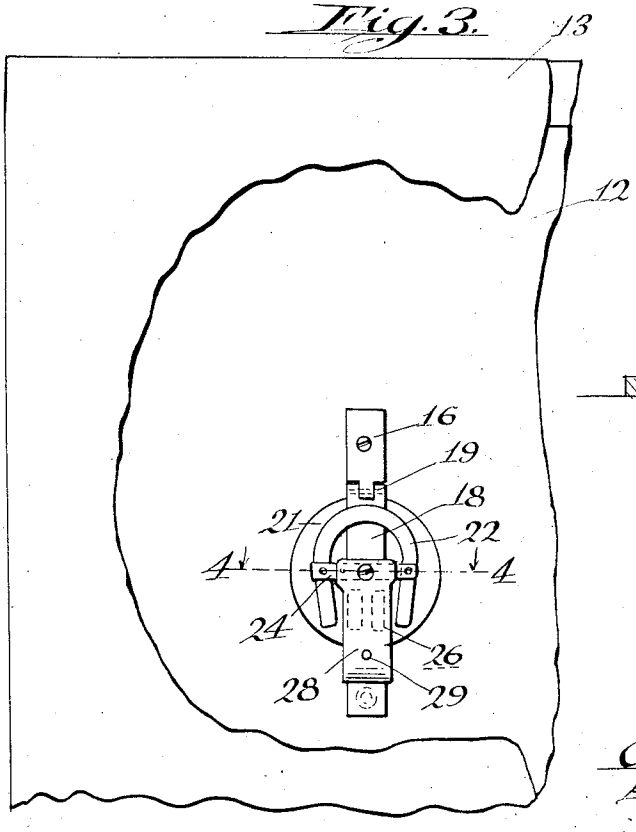

Fig. 4.

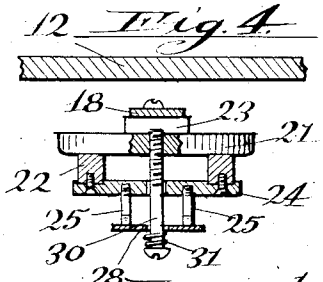

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Fig. 5.

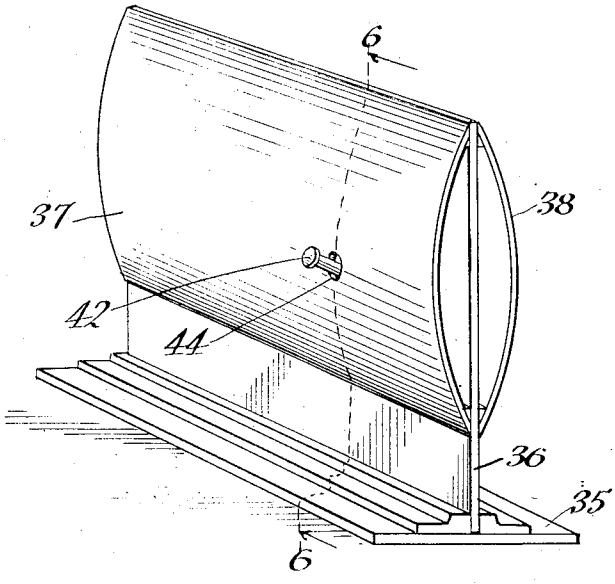


Fig. 6.

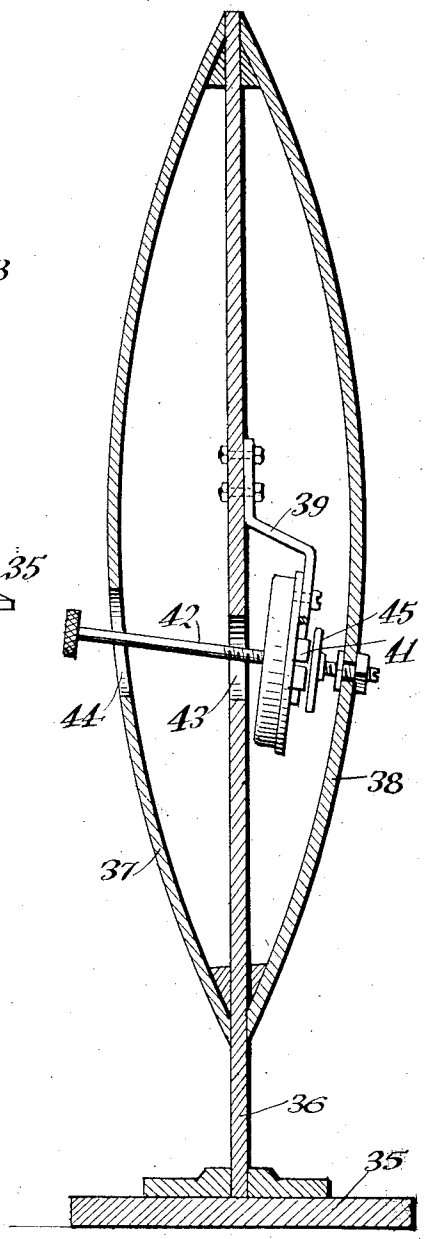


Fig. 7.

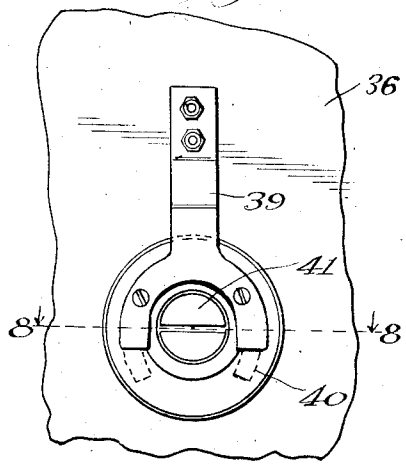
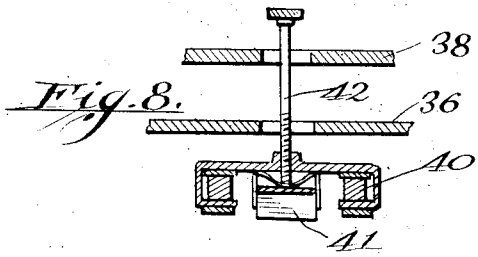


Fig. 8.



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Patented Mar. 20, 1928. 1,663,256

UNITED STATES PATENT OFFICE.

GEORGE C. LINDSEY, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF SEVEN THIRTY-SECONDS TO MICHAEL GOZZO, ONE-EIGHTH TO DON EMINGER, SIX THIRTY-SECONDS TO VICTOR P. HENDRICK, AND FOUR THIRTY-SECONDS TO ROBERT TURNER.

SOUND REPRODUCER.

Application filed September 18, 1925. Serial No. 57,153.

This invention relates to improvements in sound reproducing devices, which are especially adapted to be used in connection with radio receiving sets. The invention is an improvement over that disclosed in my pending application, Serial No. 25,269, filed April 23, 1925.

An object of this invention is to provide a sound reproducing device of novel construction which eliminates the use of a diaphragm and substitutes therefor a sounding board.

In the improved construction there is a supporting board and two sounding boards mounted thereon. An electro-magnetic unit of somewhat conventional construction is mounted upon the supporting board and has its vibrator or clapper engageable upon or connected to the sounding board so that the vibrations may be transmitted directly to the sounding board.

With the foregoing and other objects in view which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein;

Figure 1 is a perspective view of the improved sound reproducing device.

Fig. 2 is a vertical section taken substantially upon the line 2—2 of Fig. 1.

Fig. 3 is a partial side elevation of the device, parts being broken away, illustrating the unit.

Fig. 4 is a horizontal section taken upon the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of a sound reproducing device of slightly modified form of construction.

Fig. 6 is a vertical section taken upon the line 6—6 of Fig. 5.

Fig. 7 is a partial view illustrating the electro-magnetic unit employed on the construction shown in Figs. 5 and 6.

Fig. 8 is a horizontal section taken upon the line 8—8 of Fig. 7.

Referring to the accompanying drawings, wherein similar reference characters designate similar parts throughout, the improved sound reproducing device consists of a base 10, on which is vertically mounted a supporting board 11. Preferably two sounding boards 12 and 13 are mounted upon the supporting board 11, although one sounding board may prove sufficiently satisfactory. These sounding boards are curved, having their top and bottom edges secured to the supporting board and have their central portions in spaced relation thereto, dividing air pockets 14 and 15 upon both sides of the supporting board. A bracket 16 is fastened to the supporting board 11 above the aperture 17 therein and a unit supporting member 18 is hingedly connected thereto as indicated at 19. A suitable adjusting screw 20 is mounted upon the supporting board and engages the lower end of the unit supporting member 18 for adjusting it relatively to the sounding board 13.

On the unit supporting member there is mounted a suitable support 21 which supports a permanent horseshoe magnet 22, the support 21 is mounted upon the unit supporting member 18 by means of rubber cushions 23. The legs of the horseshoe magnet 22 are connected by means of a plate 24 and suitable struts 25, having knife edges projecting from the plate. Coils 26 which are adapted to be connected to the radio receiving set are arranged between the legs of the magnet 22 upon the supporting member 21. On the unit supporting member 18 there is threaded an adjusting screw 27 which carries a clapper or vibrator 28 having a needle 29 which is not fixed to but presses against the sounding board 13 with a varying pressure. A screw 30 extends through the vibrator 28 and is fastened to the unit, and a coil spring 31 is compressed between the head of the screw 30 and the vibrator, causing the end of the vibrator to engage the knife edges of the strut 25.

The operation of the device is believed to be readily apparent. The coils together with the permanent magnet 22 produce the vibrations of the vibrator or clapper 28 and as the needle 29 presses against the sounding board 13, the sounding board will be vibrated by the variations in pressure of the needle, thus producing the sound. The volume of the sound may be varied by varying the pressure under which the needle 29 presses against the sounding board 13, by adjusting the screws 27 and 20.

A peculiar feature of the improved construction is that the sound produced can be heard from all sides of the device, but there

is a slightly greater volume directly opposite the sides of the sounding boards.

The improved construction eliminates the use of a diaphragm which in reproducing sounds of large volume is apt to be overcrowded or overvibrated so as to become noisy. In the modified form of construction shown in Figs. 5 to 8 inclusive, there is a base 35, a supporting board 36, sounding boards 37 and 38 which are similar in construction to the base supporting board and sounding boards of the construction shown in Figs. 1 to 4 inclusive. In this modification however, a bracket 39 is fastened to the supporting board 36 and supports the electro-magnetic unit, having the permanent horseshoe magnet 40 and coils 41 which are adjustable by means of an adjusting screw 42, which extends through apertures 43 and 44 in the supporting board 36 and the sounding board 37 respectively. In this construction however, the vibrator which is vibrated under the action of the electro-magnetic unit is indicated at 45 and is rigidly fastened to the sounding board 38. By adjusting the adjusting screw 42 the magnitude of the vibrations imparted to the sounding board 38 by the vibrator or clapper 45 can be varied and thus the volume of sound produced can be varied.

From the above described construction it will be readily appreciated that an improved form of sound reproducing device has been provided which is simple and efficient in operation and eliminates disagreeable noises. It will also be appreciated that the complete device may be supported on any suitable supporting structure and is neat and attractive in appearance.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

What I claim is:

1. A sound reproducer comprising a support, a sounding board carried by the support, an electro-magnetic operating unit pivotally mounted on the support to permit swinging movement of the unit relative to the sounding board, means carried by the support engaging the swinging unit for adjusting the unit relative to the sounding board, a spring-tensioned vibrator having at one end a pivotal mounting on the unit and being non-connected to but pressing against the sounding board at its opposite swinging end for vibrating the sounding board, the medial portion of the vibrator overlying the actuating mechanism of the unit for vibration thereby, and means carried by the operating unit engaging the swinging end of the vibrator for adjusting the vibrator relative to the operating unit and the sounding board.

2. A sound reproducer comprising a sound responsive medium, an operating unit adapted to swing relative to the sound responsive medium, a vibrator carried by and adapted to swing relative to the operating unit, said vibrator being actuated by the operating unit and adapted to vibrate the sound responsive medium, adjusting means for swinging the operating unit relative to the sound responsive medium, and adjusting means for swinging the vibrator relative to the operating unit and the sound responsive medium.

3. A sound reproducer comprising a sound responsive medium, an operating unit, a vibrator having at one end a spring tensioned pivotal mounting on the operating unit, the medial portion of the vibrator overlying the actuating mechanism of the operating unit for vibration thereby, the opposite swinging end of the vibrator being non-connected to but pressing against the sound responsive medium for vibrating the latter, and means for adjusting the swinging end of the vibrator relative to the operating unit and the sound responsive medium.

In testimony whereof I have signed my name to this specification.

GEO. C. LINDSEY.