Dec. 24, 1935. H. N. ROWE 2,025,127

ELECTRODYNAMIC SPEAKER UNIT

Filed Sept. 1, 1934

FIG. 1.

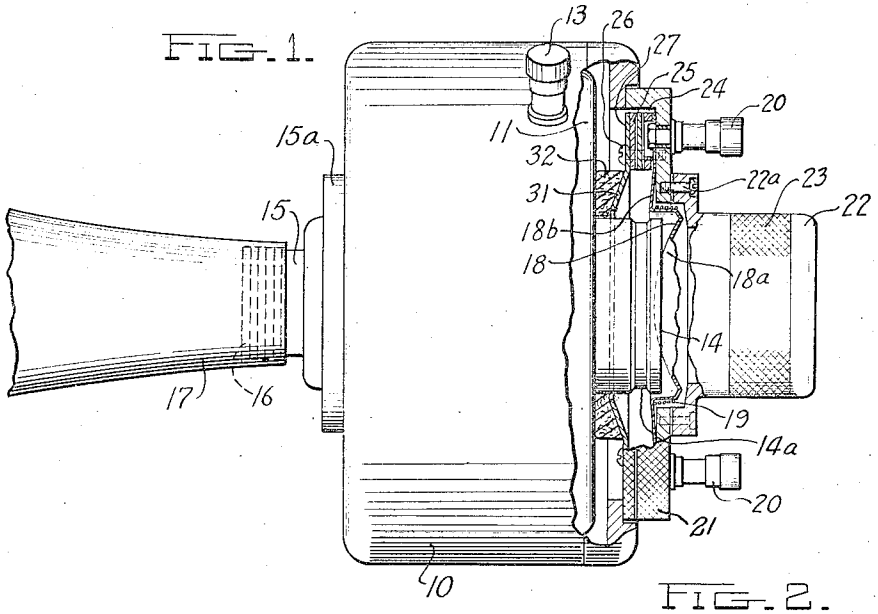


FIG. 2.

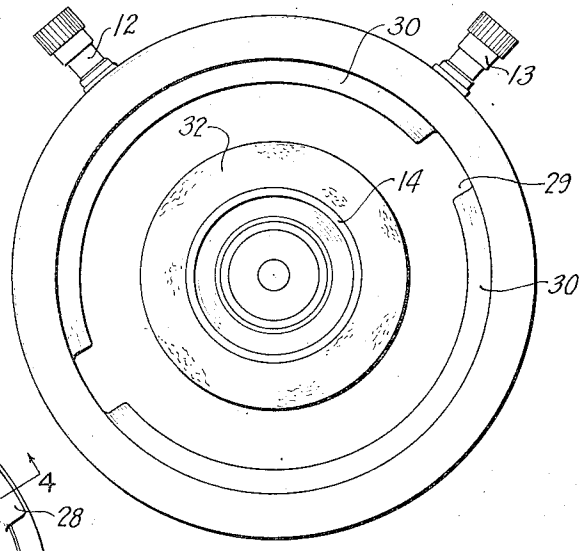


FIG. 3.

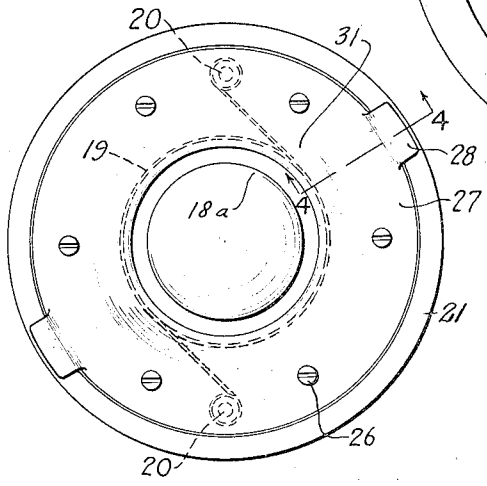
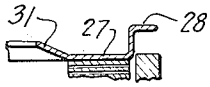


FIG. 4.



Inventor

Horace N. Rowe

By Owen & Owen

Attorneys

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ELECTRODYNAMIC SPEAKER UNIT

Horace N. Rowe, Toledo, Ohio, assignor to Fox Sound Equipment Corporation, Toledo, Ohio, a corporation of Ohio

Application September 1, 1934, Serial No. 742,426

3 Claims. (Cl. 179—115.5)

This invention relates to acoustic devices, such as loud speakers, used for public address systems, either out-of-doors or indoors, but more particularly to the unit containing the electrodynamic diaphragm.

Heretofore, much trouble and annoyance has been caused by loud speaker units of the above character, since the diaphragm not infrequently requires replacement, repair or adjustment, and since this part has been fixedly secured in the housing, that for repair, adjustment or replacement to be made, it not only requires disassembly of practically the entire unit, but also necessitates removal of the horn. This not only takes considerable time and effort, but requires the services of a person skilled in the intricacies of the particular mechanism and renders the speaking system entirely useless temporarily.

An object of this invention is to overcome the above difficulties and produce a simple and efficient speaker unit having the new and improved features of construction, arrangement and operation hereinafter described.

The invention is shown by way of illustration in the accompanying drawing, in which:

Figure 1 is a side elevational view partly in section of the invention as applied to an electrodynamic speaker;

Figure 2 is a rear end view of the device shown in Figure 1 with the head removed;

Figure 3 is an inside view of the head; and

Figure 4 is a sectional view on the line 4—4 of Figure 3.

The illustrated embodiment of the invention comprises an electrodynamic device in the form of a loud speaker unit having a casing 10 of steel or other suitable material, in which is disposed a coil 11, the ends of which are connected to binding posts 12 and 13 respectively. Disposed centrally of the casing 10 and within the coil 11 is a metallic tube 14 providing a pole piece, the opposite ends of which are open, one end 15 projecting outside of the casing 10 being retained in place by a coupling 15a of zinc die cast or other suitable non-magnetic material, and having screw threads 16 to receive a horn 17. Formed in the outer end portion of the tube 14 is an annular groove 14a in such position as to concentrate the magnetic flux in close juxtaposition to the diaphragm 18. Cooperating with the opposite end of the tube 14 is a diaphragm 18 of the well known piston type having a coil attached thereon which is movable in a magnetic field. The ends of the coil 19 are attached to binding posts 20 on the head 21. Secured to the head 21 by screws 22a is an annular outwardly projecting cap 22 of brass, or other non-magnetic material, the outer end of which is closed, the cap being knurled at 23 to enable the head to be grasped readily for attaching or detaching the same to or from the housing 10.

It will be noted that the head 21 is recessed at 24 to receive the outer edge portion of the vibratory diaphragm 18 on which are mounted a series of insulated rings or washers 25 held in place by screws 26 which also hold an outer ring 27 in place. The diaphragm 18 comprises a stiff dish-shaped piston portion 18a and a flexible corrugated portion 18b and a flat edge portion which is held in clamped relation. In rear of the piston portion is provided an air chamber within the cap 22 against which the piston portion operates, as will be readily understood.

The ring 27 is provided with a pair of diametrically opposed spring fingers 28 at the outer edge thereof, which are adapted to register with notches 29 in the rim of the housing 10. It is apparent that by placing the fingers 28 in registry with the notches 29 the head 21 may be moved into engagement with the housing 10. Thereafter by turning the head 21 the fingers 28 are forced beneath flanges 30, which project inwardly from the casing, as shown on Figure 2, thereby establishing satisfactory frictional engagement to retain the parts in assembled relation with the piston portion 18a of the diaphragm disposed directly in rear of the open end of the tube 14.

The inner edge portion of the ring 27 is embossed or pressed outwardly, as indicated at 31, and this portion is adapted to be forced into engagement with a ring 32 of felt, or other suitable compressible material, which surrounds the tube 14 and rests against the coil 11, thereby holding the parts securely and satisfactorily in place.

Details of description of the construction and operation of the electrodynamic speaker, such as the piston diaphragm, coil, etc., is not given because the same are well known to those skilled in this art. A cardinal feature of this invention resides in mounting the diaphragm at one end of the casing and providing a sound passage from the diaphragm to the opposite end of the casing where a horn may be suitably mounted. This enables the diaphragm to be readily and conveniently removed from the casing when in need of repair, replacement, or adjustment, by substituting another mounting or head containing a diaphragm which has been tested in the shop and is ready for service. Thus, with a minimum

amount of time and effort, the speaker can be conditioned for use.

In another aspect, this invention provides an electrodynamic device in which the diaphragm is carried by a detachable mounting which can be readily mounted or detached from the casing, the casing carrying a centrally disposed tube providing a sound passage therethrough and arranged to cooperate for this purpose with the diaphragm. At the opposite end of the casing and in communication with such sound passage, a horn can be conveniently mounted. It is, therefore, apparent that the invention is not limited to the particular features of construction, operation and arrangement above described, but numerous changes may be made from a standpoint of design, arrangement and operation without departing from the spirit of the invention, especially as defined in the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In an electrodynamic speaker having a casing enclosed coil and a vibratory diaphragm, a head adapted to close one end of the casing, means for mounting said diaphragm on said head, a cap carried by said head and extending outwardly therefrom in the rear of said diaphragm to form an air chamber therefor, fingers carried by said head, a flange disposed on said casing having slots therein to receive said fingers whereby rotation of said head causes said fingers to engage said flange in a detachable connection, and a tube extending through said casing for emitting sound from the opposite end thereof.

2. In an electrodynamic speaker having a casing enclosed coil and a vibratory diaphragm, a head adapted to close one end of the casing, means for mounting said diaphragm on said head, a cap carried by said head and extending outwardly therefrom in the rear of said diaphragm to form an air chamber therefor, a ring carried by said head and having its inner periphery pressed inwardly, spring fingers formed from said ring, a flange disposed on said casing and having slots therein to receive said fingers whereby rotation of said head causes said fingers to move behind said flange in a detachable connection, a resilient body of fibrous material carried by said casing and adapted to abut the inwardly pressed area of said ring when said head is positioned on said casing, and a tube extending through said casing for emitting sound therefrom.

3. In an electrodynamic speaker having a casing enclosed coil and a vibratory diaphragm, a head adapted to close one end of the casing, means for mounting said diaphragm on said head, a cap carried by said head and extending outwardly therefrom in the rear of said diaphragm to form an air chamber therefor, a ring carried by said head and having its inner periphery pressed inwardly, spring fingers formed from said ring, a flange disposed on said casing and having slots therein to receive said fingers whereby rotation of said head causes said fingers to move behind said flange in a detachable connection, a resilient body of fibrous material carried by said casing and adapted to abut the inwardly pressed area of said ring when said head is positioned on said casing, a tubular pole piece carried centrally of said casing and projecting from the end thereof opposite to said head, and a horn detachably connected to said pole piece.

HORACE N. ROWE.