

April 25, 1933.

R. S. FISHER

1,906,196

ELECTRODYNAMIC REPRODUCER

Filed July 3, 1929

2 Sheets-Sheet 1

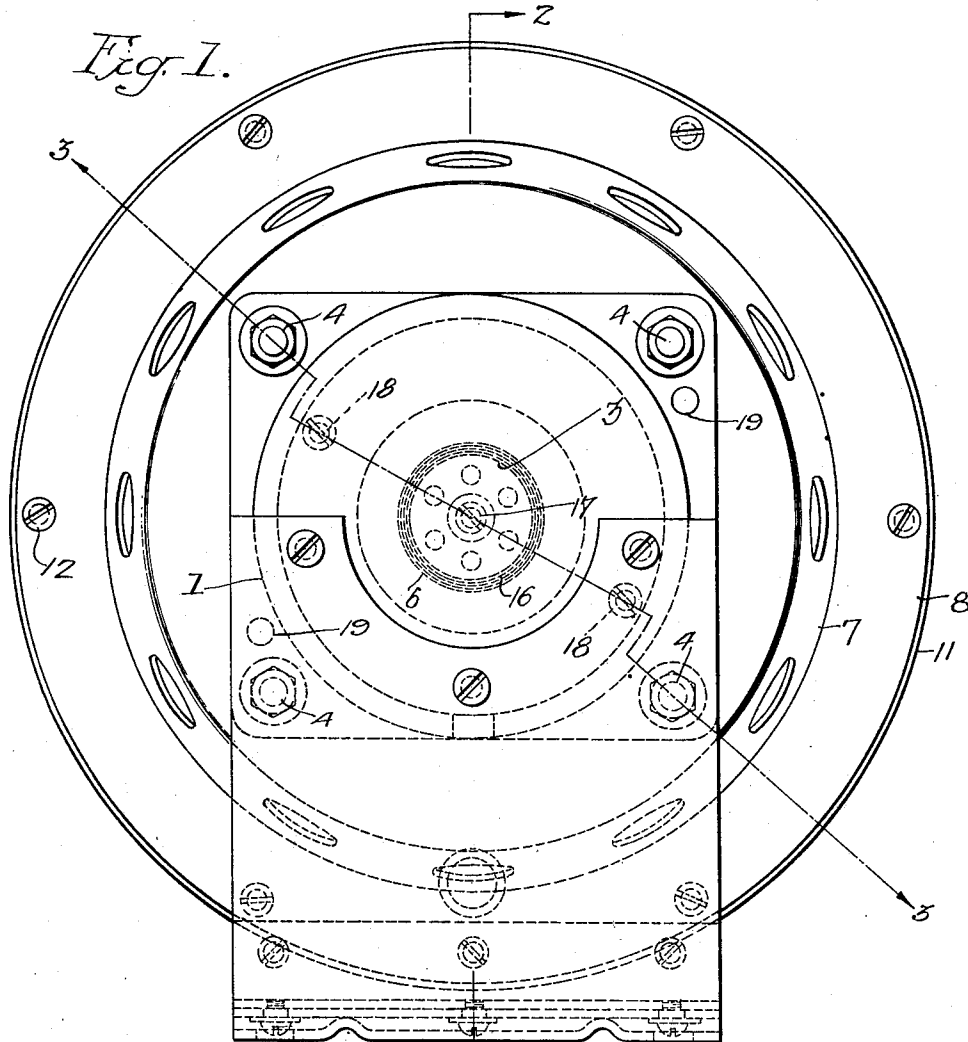
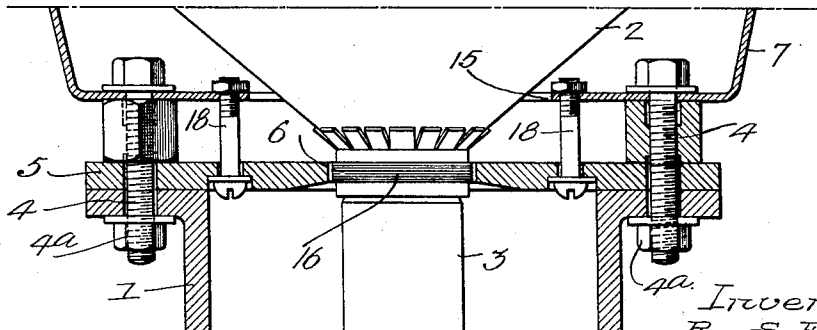


Fig. 3.



Inventor:
Roy S. Fisher;
by his Attorneys
Hawson & Hawson

April 25, 1933.

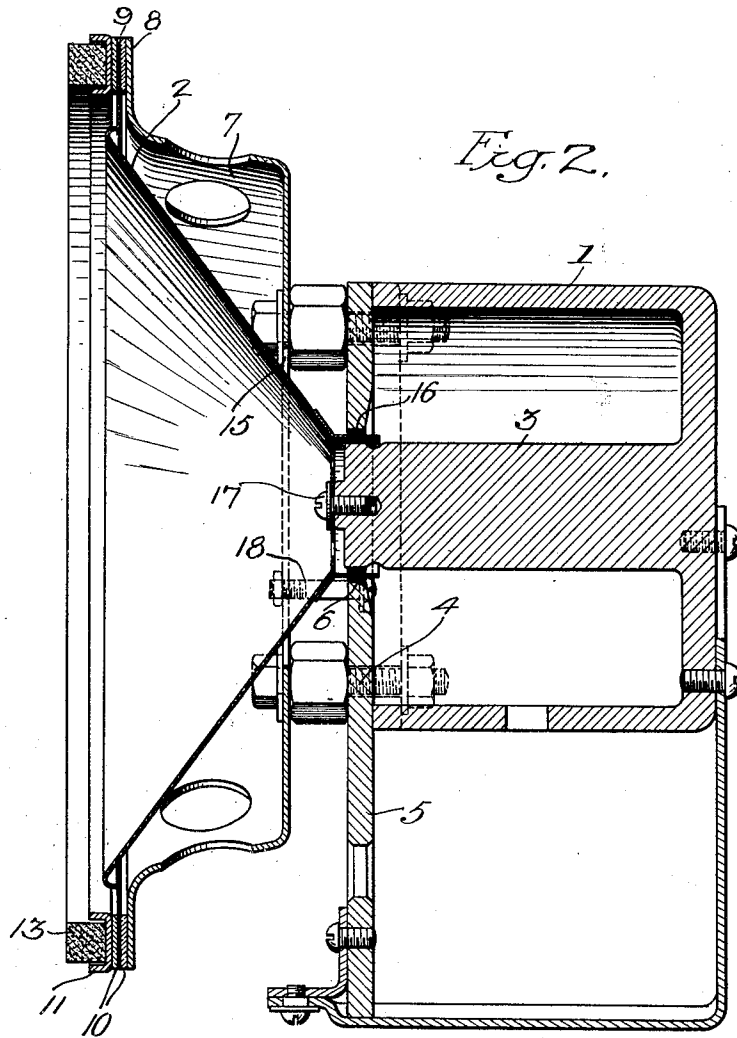
R. S. FISHER

1,906,196

ELECTRODYNAMIC REPRODUCER

Filed July 3, 1929

2 Sheets-Sheet 2



Inventor;
Roy S. Fisher,
by his Attorneys.
Hawson & Hawson

UNITED STATES PATENT OFFICE

ROY S. FISHER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO PHILADELPHIA STORAGE BATTERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

ELECTRODYNAMIC REPRODUCER

Application filed July 3, 1929. Serial No. 375,855.

This invention relates to improvements in electrodynamic sound reproducers, and the principal object of the invention is to provide a reproducer of the stated type so constructed as to render the assembly operation relatively simple and easy and productive of uniformly good results.

A specific object of the invention is to provide a novel electrodynamic sound reproducer assembly having improved means for centering the voice coil in the air gap in which it operates, as hereinafter set forth.

In the attached drawings:

Figure 1 is a rear elevational view of an assembly made in accordance with my invention;

Fig. 2 is a section on the line 2—2, Fig. 1, and

Fig. 3 is a section on the line 3—3, Fig. 1.

With reference to the drawings, the reproducer comprises a main housing 1 adapted for reception of a field coil, said housing constituting the supporting base, through elements hereinafter set forth, for a diaphragm 2, in the present instance of conical form. The housing 1 has a central core member 3 which receives the field coil, and secured to the top of the housing by bolts 4 is a cover member 5 in the form of a plate having a circular opening 6 through which the top of the core 3 projects and which normally is concentric with the latter.

The diaphragm 2 is supported in a frame 7 which, as shown in Figs. 2 and 3, is secured to the housing 1 by the bolts 4. The frame 7 has a radially projecting flange 8, to which is secured the peripheral flange 9 of the cone 2, the cone flange 9 being clamped between a pair of fibre or cardboard washers 10, which in turn are confined between the flange 8 of the frame 7 and an annular channel-shaped clamping element 11 which is secured to the flange 8 by means of screws 12 or by other suitable fastening elements. The channel 11 is adapted for reception of a felt wash-

er 13 constituting a cushion which in assembly engages a surface of the housing of the reproducer (not shown). As clearly illustrated in Figs. 2 and 3, the frame 7 is provided with an opening 15 through which the apex portion of the cone projects, and to this portion of the cone it attached a voice coil 16 which occupies a position within the gap between the core member 3 and the edge of the opening 6 in the top plate 5. In the present instance, the cone 2 is closed at the top to provide means for attaching the cone through the medium of a screw 17 to the outer end of the core 3. The top web of the cone 2 through which the screw extends is highly flexible and permits free movement of the cone axially of the coil 16 in the normal operation of the reproducer. It will be noted, however, that the screw 17 affords means for positively fixing the position of the voice coil in the gap in which it operates.

Following assembly of the cone 2 in its frame, the frame is laid flat upon the felt 13, and the cover plate 5 of the housing placed in position on the bolts 4 with the coil 16 projecting through the opening 6. Play is provided between the cover 5 and the bolts 4 to permit adjustment of the plate to center the coil in the opening 6, and in order to maintain this centered position, I provide a pair of screws 18, see Fig. 3, which unite the frame 7 and the cover 5 and which when tightened hold these parts in the adjusted position in which the coil 16 is accurately centered within the opening 6. Thereafter, the housing 1 is applied, pins 19 being provided which enter and neatly fit apertures in the plate 5 to thereby insure accurate centering of the core 3 in the opening 6 and with respect to the coil 16. The nuts 4a of the bolts 4 are then tightened and the screw 17 screwed into place to secure the diaphragm to the core. In this manner, the coil 16 is accurately and easily centered in the air gap in which it operates, and this

centered position is positively maintained by the screw 17.

I claim:

1. In an electrodynamic sound reproducer, the combination with a diaphragm including a voice coil, of a supporting frame for the diaphragm, a member having an aperture, a second member having a core element adapted to enter said aperture to form a gap in which said coil is adapted to operate, bolts for securing said frame and member together and having clearance permitting relative adjustment between the frame and said apertured member for centering the coil in the aperture, and independent means for securing together the frame and said apertured member in the adjusted position.

2. In an electrodynamic sound reproducer, the combination with a diaphragm including a voice coil, of a supporting frame for the diaphragm, a field coil container including a core for said coil, a cover plate for the container having an aperture into which said core projects to form a gap for the voice coil, means for securing the said frame, container and cover plate together, said means including bolts secured to the frame and extending loosely through holes in the cover plate whereby said cover may be adjusted upon the bolts to center the core in said aperture, and means independent of said first-named securing means for securing together the said frame and cover plate with the voice coil concentrically positioned in the said aperture.

3. In an electrodynamic sound reproducer, the combination with a diaphragm including a voice coil, of a substantially cup-shaped frame, means for clamping the peripheral portion of the diaphragm to the corresponding portion of said frame, a field coil container including a core for said coil, a cover plate for said container apertured for reception of said core, said aperture being larger than the core to form a gap for the voice coil, bolts for securing together the frame, the cover plate and the said container and having clearance permitting relative adjustment between the frame and said cover-plate for centering the voice coil in the aperture, and means independent of said bolts for securing the frame to the cover plate with the voice coil concentrically positioned within the said aperture.

4. In an electrodynamic sound reproducer, the combination with a diaphragm including a voice coil, of a supporting frame for the diaphragm, a member having an aperture, a second member having a core element adapted to enter said aperture to form a gap in which the said coil is adapted to operate, registering apertures in said frame and members, bolts adapted to enter said apertures to secure said frame and said member together, certain of said registering aper-

tures being of greater diameter than said bolts to permit relative adjustment on the bolts of said frame and apertured member for centering the said voice coil in the aperture first named and independent means for securing together the frame and said apertured member.

5. In an electrodynamic sound reproducer, the combination with a diaphragm including a voice coil, of a supporting frame for the diaphragm, a member having an aperture, a second member having an integral core element, interacting means on said members for fixing their relative positions in which the said core element is substantially centered within the aperture thereby forming a gap in which said coil is adapted to operate, said members and frame having registering apertures, bolts adapted to enter said apertures to secure the frame and said members together, certain of said registering apertures being of greater diameter than said bolts to permit relative adjustment on the bolts of said frame and apertured member for centering the said voice coil in the aperture first named and independent means for securing together the frame and said apertured member.

6. In an electrodynamic sound reproducer, the combination with a diaphragm including a voice coil, of a supporting frame for the diaphragm, a field coil casing including an integral core for said coil, a cover plate for the container having an aperture, said cover plate being dowed to said container in a position wherein the said core projects substantially central into the aperture, bolts for securing together the said casing cover plate and frame, said bolts having clearances permitting relative adjustment of the frame and cover-plate for centering the voice coil in said aperture, and independent means for securing together the frame and the cover plate with the voice coil concentrically positioned within the said aperture.

7. The method of assembling sound reproducers, which reproducers comprise a diaphragm including a voice coil, a supporting frame for the diaphragm, a field coil retainer including a core element and a member having an aperture for reception of the core and said voice coil, which consists in securing said diaphragm in its frame, thereafter securing said apertured member to the frame, with the voice coil centered in the said aperture, locating the said retainer in engagement with the apertured member, with the core in substantially concentric relation with the coil and subsequently securing the frame, the apertured member and the retainer together.

8. The method of assembling sound reproducers, which reproducers comprise a diaphragm including a voice coil, a supporting

frame for the diaphragm, a field coil retain-
er including a core element and a member
having an aperture for reception of the core
and said voice coil, which consists in securing
5 said diaphragm in its frame, thereafter se-
curing said apertured member to the frame,
with the voice coil centered in the said aper-
ture, locating the said retainer in engage-
ment with the apertured member, with the
10 core in substantially concentric relation with
the coil and securing the frame, the aper-
tured member and the retainer together, and
subsequently securing the voice coil against
transverse displacement.

15 ROY S. FISHER.

20

25

30

35

40

45

50

55

60

65