

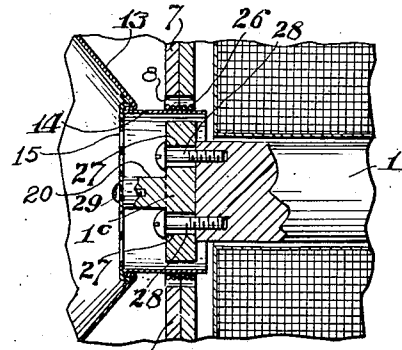
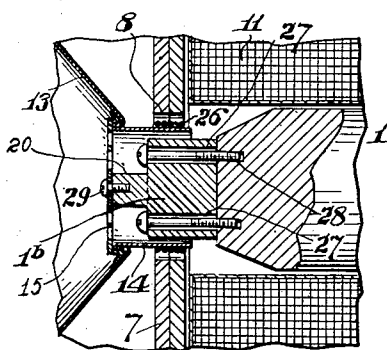
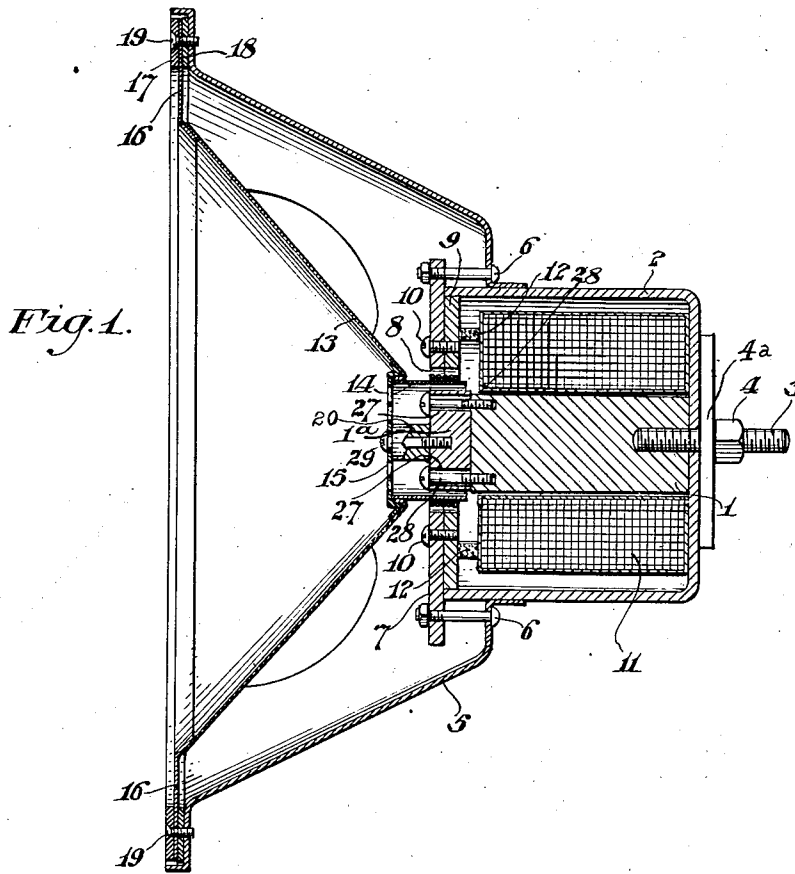
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DYNAMIC SPEAKER

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UNITED STATES PATENT OFFICE

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DYNAMIC SPEAKER

Application filed August 17, 1929. Serial No. 386,596.

My invention relates to dynamic or electro-dynamic loud speakers utilized to reproduce sound as speech, music or the like.

In accordance with my invention, at least one of the pole pieces of the speaker is provided with an adjustable portion, the position of which after the pole pieces have been assembled in approximately their correct position, is nicely adjusted, as by a gauge, to obtain exactly uniform thickness of air gap; more specifically, the core member of the field coil of the speaker has a head of equal, less or greater diameter projecting through or into a co-operating opening of a pole plate, which head is adjustably secured or held to the main body of the core member, as by one or more screws passing through openings of substantially greater diameter in the core head.

My invention further resides in the features of construction and arrangement hereinafter described and claimed.

For an understanding of my invention reference is to be had to the accompanying drawings in which:

Fig. 1 is an elevational view, with parts in section, of a dynamic loud speaker chassis or assembly.

Figs. 2 and 3 are detail views on an enlarged scale and in section, of modifications of my invention.

Referring to Fig. 1, the pole piece or core member 1 is secured within the casing 2, of magnetizable material, as by bolt 3 which threadably engages core 1. The squared portion 4 of the bolt 3 clamps core 1, casing 2, and washer 4a, of magnetizable material, securely together. Through openings in the diaphragm supporting member 5 suitably secured, as by welding to casing 2, extend the circumferentially spaced bolts or screws 6 for clamping the pole plate or structure 7 against casing 2. The opening or aperture 8 in the pole plate is substantially concentric about the axis of the core 1. To this end the plate 7 may be formed with a portion 9 of diameter corresponding to that of the interior of casing 2, or a separate plate of that diameter may be secured to the pole plate 7 as by the rivets or bolts 10.

The field coil winding 11 is held away from plate 7 by a felt washer 12 of suitable thickness to prevent obstruction to movement of the diaphragm assembly consisting of a diaphragm 13, coil form 14 and a supporting spider 15. The assembly disclosed is similar to that described and claimed in Kingsford and Davis application Serial No. 349,605, filed March 25, 1929. A thin supporting strip or ring 16, of light flexible rubberized fabric or the like, is adhesively attached to the periphery of the diaphragm and is clamped between the rings 17, 18 secured to the base of the supporting member 5, as by screws 19.

In previously known speakers of this type, the core 1 extends into the opening 8 of the pole plate 7 with the result that because of slight inaccuracies, impossible to avoid in the manufacture and assembly of the coil casing, core and plate 7, the annular air gap between the pole faces is not of exactly uniform thickness or cross sectional area. In Fig. 1, the hole in core 1 for receiving bolt 3 is shown off center to exaggerated degree.

To insure that the coil upon the coil form 14 may operate in a magnetic field which is of uniform density, the core 1 is provided with a head 1a having openings 27, as holes, slots or the like of substantially greater diameter than the clamping screws 28 which pass therethrough and threadably engage the core 1. After the casing 2, core 3 and pole plate 7 have been secured in fixed position as previously described, the head 1a is moved until it is possible to insert a cylindrical gauge of thickness corresponding to the desired air gap about head 1a within the opening 8 of plates 7 and 9. The screws 28 which were previously loosened to permit movement of head 1a in all directions in a plane parallel to plate 7 are now tightened to clamp the head firmly in position. So adjusted the head 1a is exactly concentric with the opening 8 of the pole plate 7.

The assembly of the speaker chassis is completed by securing the spider 15 to the head 1a as by screw 29 passing freely through the spider 15 which may be of nonmagnetic material, as brass, threadably to engage the head 1a. Thereafter the screws 19 are tight-

ened to clamp the diaphragm-supporting ring 16 in final position.

In the modification of my invention shown in Fig. 2, the adjustable pole head or extension 1b is smaller in diameter than the main body of the core 1, which permits the field winding 11 to be of a length substantially equal to the distance between the bottom of the casing 2 and the inner surface of pole plate 7. The spacing washer 12 of Fig. 1 is dispensed with. The coil form 14 is free to move within the air gap without obstruction by field coil 11. The speaker may otherwise be constructed and assembled as above described, the holes 27 in the pole head being of substantially greater diameter than the screws 28, so that the head 1b may be moved to permit insertion of a suitable gauge as and for the purpose above described.

In the form of my invention disclosed in Fig. 3, the head 1c is of a diameter substantially greater than that of core 1 for improved magnetic characteristics. As in the previously described modifications, the pole head is provided with holes through which the clamping screws 28 pass, the diameter of the holes being substantially in excess of that of the screws to permit adjustment of the pole head with respect to core 1 within the opening 8 of the pole plate 7. In this, as in the prior modifications, it will be understood that the bolts or screws 28 may be replaced by studs permanently attached to and extending from core 1 whose outer ends are threaded to receive nuts bearing against the outer face of the pole head.

Further, the spider standard 20 may be separate from the adjustable core head as in Fig. 1, or integral therewith as in Figs. 2 and 3. It is apparent that in these, as in many other details, the construction of the speaker may be varied without departing from my invention.

What I claim is:

1. In the assembly of a dynamic speaker having a pole piece with an adjustable head, a plate pole piece with a circular aperture, and a diaphragm-actuating coil, the method which comprises securing the pole pieces in approximately correct position, thereafter precisely centering the adjustable head within the circular aperture, securing the adjustable head in its centered position, and thereafter mounting the diaphragm-actuating coil upon the adjustable head.

2. A dynamic speaker comprising a pole piece, a pole plate having an opening substantially in registering relation with said pole piece, an adjustable head mounted upon said pole piece and projecting into said aperture, means securing said head to said pole piece concentric with said aperture, a coil movable in the air gap between said head and said pole plate, supporting structure there-

for, and means securing said supporting structure to said adjustable head.

3. A dynamic speaker comprising a pole piece, a pole plate having an opening substantially in registering relation with said pole piece, an adjustable head mounted upon said pole piece and projecting into said aperture, means securing said head to said pole piece concentric with said aperture, a coil movable in the air gap between said head and said pole plate, a supporting spider therefor, and means securing said spider substantially at its center to said head.

4. A dynamic speaker comprising a casing, diaphragm-supporting structure extending therefrom, an axial pole piece disposed within said casing, a pole plate having an aperture secured to said casing, a head adjustably secured to said pole piece and projecting into said opening, and a diaphragm-actuating assembly mounted upon said head.

5. In the assembly of a dynamic speaker having a magnetizable unit comprising an inner pole piece with a head adjustable thereon, an outer pole piece having a circular aperture, an assembly comprising a large conical diaphragm and a coil for actuating the same, and a member for supporting said assembly with respect to said unit, the method which comprises assembling said pole pieces in approximately correct position, centering said adjustable head within said aperture to define an air gap, securing said adjustable head in its centered position, and thereafter with said coil in said air gap securing said supporting member to said unit.

6. A dynamic speaker having a magnetizable unit comprising an inner pole piece with a head adjustable thereon, an outer pole piece having a circular aperture, an assembly comprising a large conical diaphragm and a coil for actuating the same, means securing said head to said first named pole piece concentric with said aperture to define an air gap, and a member secured to said unit and supporting said assembly with said coil in said air gap.

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