Sept. 4, 1934. J. JENSEN 1,972,345

CONE HOUSING

Filed Jan. 31, 1933

Fig. 1.

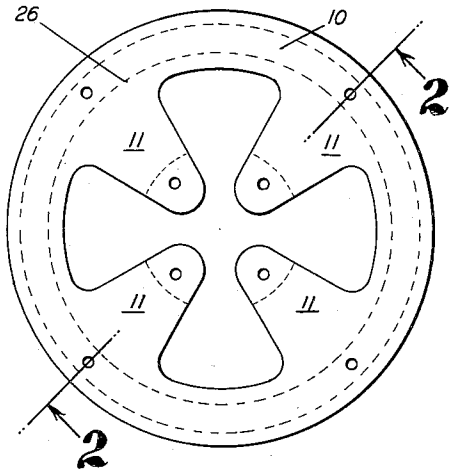


Fig. 2.

Fig. 3.

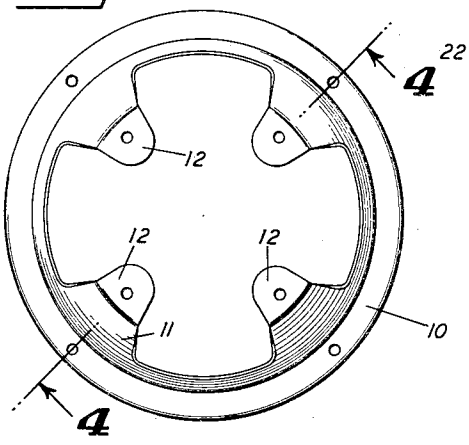


Fig. 4.

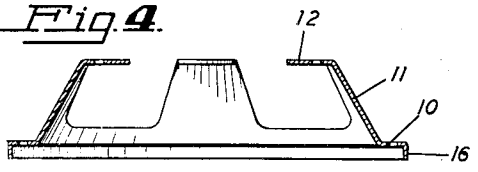
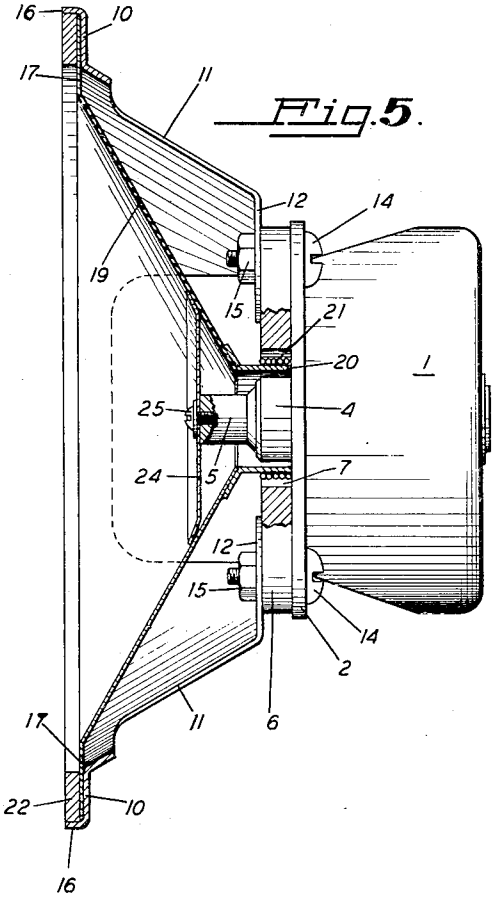


Fig. 5.



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CONE HOUSING

Jack Jensen, Oakland, Calif.

Application January 31, 1933, Serial No. 654,439

3 Claims. (Cl. 181—31)

My invention relates to cone housings for use in conjunction with converters of electricity into sound, or vice versa, and more particularly to such a housing which will enclose or support a diaphragm member in the form of a cone or equivalent sound producing or receiving means; this application being a continuation in part of my coperiding application for Electromagnetic speaker, Serial No. 357,936, filed April 25, 1929.

Among the objects of my invention are: To provide a simple and relatively inexpensive cone diaphragm housing; to provide a simple method of forming a cone housing; to provide a cone housing formed by a bending operation; and to form a sheet metal cone housing out of a minimum area of sheet stock.

Other objects of my invention will be apparent or will be specifically pointed out in the description forming a part of this specification, but I do not limit myself to the embodiment of my invention herein described, as various forms may be adopted within the scope of the claims.

Referring to the drawing, which illustrates an embodiment of my invention:

Figure 1 is a plan view of circle of sheet metal stock, blanked out to form a rim and radial arms.

Figure 2 is a sectional view taken along a plane indicated by the line 2—2 in Figure 1.

Figure 3 is a view in elevation of the housing after the radial arms have been bent.

Figure 4 is a sectional view taken along a plane indicated by the line 4—4 in Figure 3.

Figure 5 is a view partly in section and partly in elevation of the cone housing as applied to a sound reproducer of the moving coil type.

While the use of cone diaphragms for the production of sound when attached to a driving motor operated by electricity is the most common use of such diaphragms, it is well known in the art that such a mechanism is reversible and that electricity may be generated by sound waves moving the cone. My invention is therefore not to be limited to a sound reproducer, but will apply equally well in a converter of sound into electricity, such as a microphone. Neither is my housing to be limited to enclose a cone diaphragm alone, as there are many equivalent diaphragms known in the art which my invention will satisfactorily house and support, nor is any particular type of driving mechanism essential.

In the drawing, which shows a preferred form of the invention as applied to a sound reproducer of the moving coil type, a hollow cylindrical field pot 1 is provided with an out-turned rim 2, and a central pole piece 4. This pole piece has a reduced projection 5 extending outwardly therefrom. Inside the pot, not shown, is a field coil wound on the central pole, for purpose of magnetizing the entire structure.

Fitted to the rim 2, of the pot, is a top plate 6 which is centrally bored to allow the central pole to pass through, leaving between them an annular air gap 7. A cone housing comprising a rim 10, legs 11, and feet 12 is fastened to the top plate by means of bolts 14 which pass through holes (not shown) in the rim 2, top plate 6 and feet 12, and which are secured in place by nuts 15.

A lip 16 is provided on the outer circumference of the housing to receive and position a flexible outer edge 17 of a cone 19. The inner end of the cone has a coil ring 20 fastened thereto, on which is wound wire 21 to form a moving coil assembly. The spacing of the cone is such as to place this coil within the annular air gap 7.

The outer flexible edge 11 of the cone is preferably cemented in place and protected by a cardboard or other soft washer 22, while the moving coil is maintained centrally in the air gap by a flexible centering disc 24, attached to the cone at its outer circumference and fastened to the reduced projection 5 of the central pole piece by a screw 25.

The device is operated in a manner well known in the art, namely by passing a direct current through the field coil inside the pot to cause a strong magnetic flux to exist in the annular air gap, and then passing alternating current through the wires of the moving coil. The coil will move in and out of the air gap in accordance with the alternations of the current in the wire, and will carry the cone with it, thus causing air to be set in motion.

As my invention has to do with the cone housing, and method of making the housing, I have shown two steps in the procedure in Figures 1 and 2.

Flat sheet metal stock is preferably placed in a punch press and a circular disc 26 is blanked out, this disc comprising the rim portion 10 and a number of inwardly radiating arms 11, in this case four. The various necessary holes are preferably punched also at the same time. Each of the radial arms is then bent outwardly adjacent their attachment to the rim, and their ends are then bent over in a plane parallel to the rim to form the feet 12 which may be used to attach the housing to the remainder of the speaker mechanism. If desired, the lip 16 may be formed during the same operation.

In this manner a cone housing is formed from

a disc but very little larger in circumference than the circumference of the completed housing, in contradistinction from the usual method of deep drawing from a large disc which can supply metal to the draw from the periphery, the excess not used being later trimmed off to the desired finished housing size.

No such drawing operation is necessary in forming the housing of my invention, and the reduction in cost effects a marked saving in the production cost of the completed speaker.

Another costly production feature is eliminated by the use of my invention, namely the step comprising the usual blanking operation to form the supporting arms, which in the drawn type of housing must be performed after the draw has been completed. Either an extremely complicated and costly die must be made to blank out the spaces between the arms at one operation, or, as is customary, these spaces must be blanked out one at a time, the operator turning the housing on the die to the proper point. These spaces are all blanked out while the stock is flat in the housing herein described, thus still further reducing production costs.

During the process of making the cone housing of my invention, there is no loss of partly finished housings due to irregularities in the metal stock causing tearing during a drawing process. The bending operation by which the arms are extended to form the housing of my invention does not strain the metal sufficiently to cause such loss, and the rejection of partly finished housings is therefore practically eliminated.

I claim:

1. A cone housing for a sound reproducer comprising a disc having portions removed from the interior thereof to form an outer rim and a plurality of inwardly radiating arms, said arms being bent adjacent their junction with said rim to form supporting feet for said rim.

2. A cone housing for a sound reproducer comprising a disc having portions removed from the interior thereof to form a rim and a plurality of inwardly radiating arms, said arms being outwardly bent to describe a cone and formed at their ends into feet whereby said housing can be mounted on said sound reproducer.

3. In a loud speaker having a substantially cone shaped diaphragm and an actuating motor attached thereto, means for supporting the rim of said diaphragm which comprises a disc having portions removed from the interior thereof to form a peripheral shelf on which said rim may rest, and a plurality of inwardly radiating arms, said arms being bent adjacent said junction with said rim to form an enclosure for said cone, and fastened at their free ends to said actuating motor thereby positioning said cone in proper operating relationship with said motor.

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