

Aug. 22, 1933.

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1,923,924

VOICE COIL FORM

Filed July 30, 1932

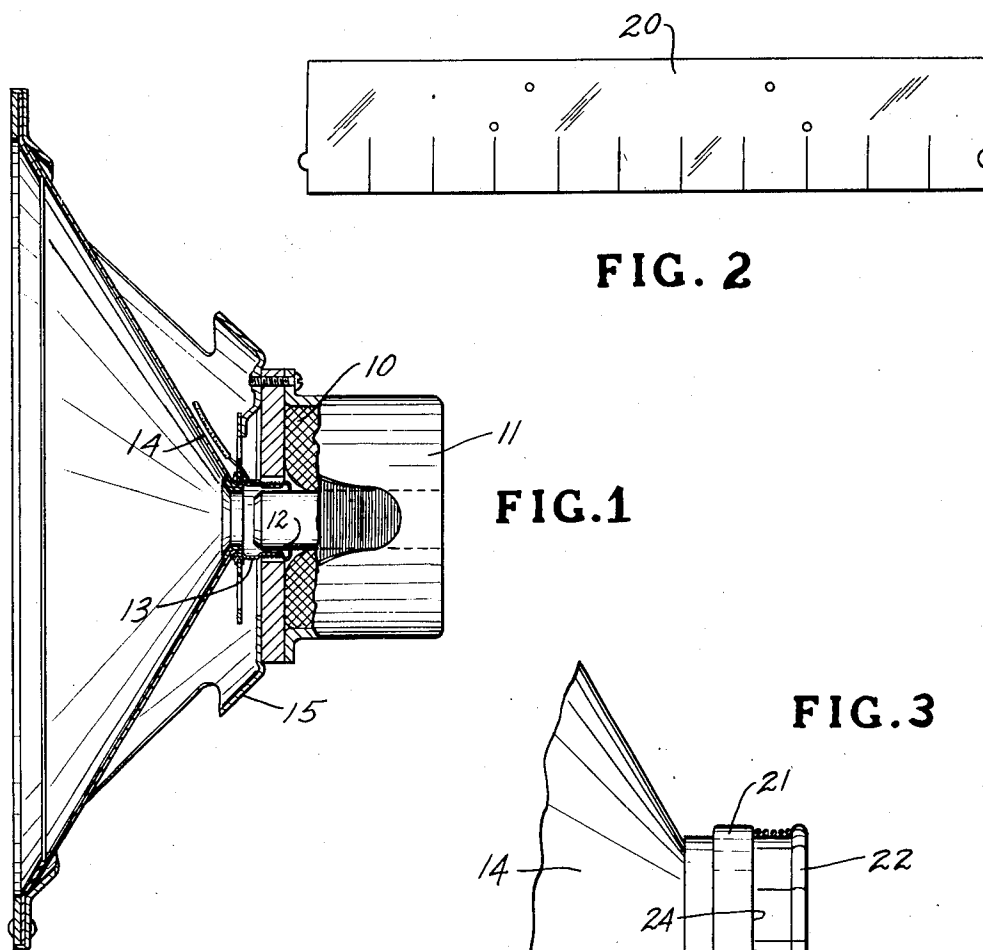


FIG. 2

FIG. 1

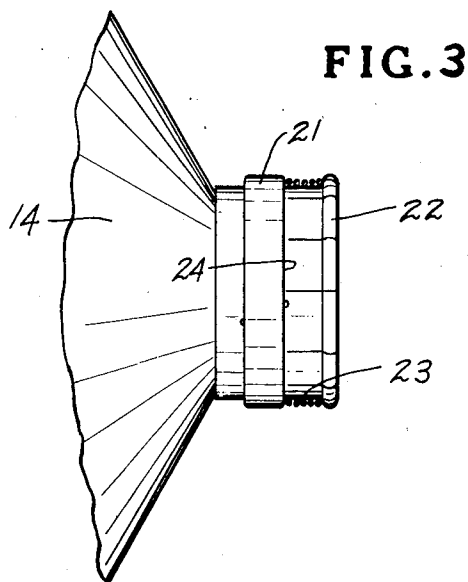


FIG. 3

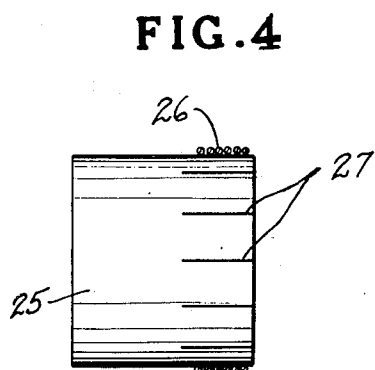


FIG. 4

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UNITED STATES PATENT OFFICE

1,923,924

VOICE COIL FORM

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Application July 30, 1932. Serial No. 626,706

5 Claims. (Cl. 179—115.5)

This invention relates to electro-dynamic speakers, and particularly to a voice coil form that is used on such devices, as well as a method of making the same. The desired construction of a voice coil form for most efficient operation necessitates the utilization of material which is extremely light in weight and yet is sufficiently strong that it will support a coil and hold it in proper form, notwithstanding the temperature ranges which occur during operation of the speaker. I have found that a voice coil form which is suitable for this purpose embodies a substantially cylindrical form, which is made of fibrous material, such as relatively stiff paper or fabric and which is deformed to provide a coil receiving groove adjacent one end thereof and to receive a diaphragm adjacent the other end thereof. One method of making a form of this character is set forth in an application, which was filed by me on May 30, 1930, Serial No. 457,552.

I have found in operating electro-dynamic devices having such coil form, particularly large power capacity, that the heat which is generated in the voice coil has a tendency to evaporate the moisture in the form, thus causing it to shrink and to pull away from the coil. This causes relative movement between the coil and the form, with the result that the speaker is rendered inoperative for the reproduction of sounds. Furthermore, there is an expansion of metallic conductor away from the form, which also tends to loosen the coil from the form.

A further object of my invention is to provide a coil form and a method of making same which will retain all the advantageous characteristics of the form, which is shown in my prior application, and which will still remain efficient under all operating temperatures.

Referring now to the drawing, Fig. 1 is a vertical section through a loud speaker embodying my invention; Fig. 2 is an enlarged top plan view of a blank from which the voice coil form may be made; Fig. 3 is an enlarged view of a completed voice coil form, and Fig. 4 is a side elevation of a coil form having a slightly different shape from that shown in Fig. 3 and embodying my invention.

The present invention is shown in connection with a loud speaker of the cone type, wherein 10 designates the field coil, 11 the shell therefor, 12 the voice coil, 13 the voice coil form, 14 the diaphragm and 15 the diaphragm housing which is usually fastened onto the forward end of the shell. The voice coil form may be made in one

manner by taking a single strip of paper 20, bending it into cylindrical form and then inserting it into a die and pressing it outwardly by means of a resilient punch (not shown) which forms a rib 21 and a bead 22 between which lies a coil groove 23. The shoulders of the rib and bead act to hold the coil in place on the form after it is wound thereon.

To eliminate the objection heretofore noted, I provide spaced slits in the form adjacent the coil receiving portion thereof. These slits may extend across the bead into the groove 23, but preferably terminate short of the shoulder 24 on the rib. Thus, the slits provide spaced tongues, which due to the deformation of the paper during the shaping thereof, have a normal tendency to spring outwardly and thereby to engage closely the inner surface of the coil. Thus, when moisture is evaporated, the form instead of shrinking away from the coil, will still adhere to it and maintain the same efficiency of operation.

The serrations in the form are preferably placed therein while it is still in the form of a blank. They do not extend into the blank a sufficient degree, however, to present any difficulty while the blank is being inserted into the die. It is therefore apparent that the invention is readily adapted for use in connection with the paper form, which I have described in my prior invention.

In Fig. 4, I have shown a voice coil form 25, which may comprise a short length of tubing of light stretchable fibrous material, and which is adapted to have a coil 26 wound thereon adjacent one end thereof and to have the coil held thereon by cementitious material. The forms may then have slits 27 arranged therein at spaced intervals adjacent the coil receiving portion. In the preferred form, these slits extend inwardly from one end of the form thus providing spaced tongues, which normally tend to expand and blow up the coil, thus preventing loose play between the coil and the form.

I claim:

1. A voice coil form having a coil receiving surface thereon and having shoulders defining axial limits of the surface, there being spaced slits extending across one of the shoulders and into the surface and terminating short of the other shoulder.

2. A voice coil form comprising a paper cylinder having a coil receiving groove therein and having one end thereof terminating in tongues which act conjointly to form at least part of the coil receiving groove.

3. A voice coil form having a coil receiving surface thereon, and having the wall thereof adjacent the surface slit at spaced intervals around the form.

5 4. A voice coil form comprising a paper cylinder having a coil receiving surface adjacent one end thereof, and having slits extending entirely therethrough and from the end of the coil partly across the coil receiving surface.

5. A method of making a voice coil form for a loud speaker comprising taking a paper strip, slitting it adjacent one edge thereof, bending the strip into cylindrical form and then deforming the cylinder to produce a coil receiving portion 80 through the slitted portion of the cylinder.

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10		85
15		90
20		95
25		100
30		105
35		110
40		115
45		120
50		125
55		130
60		135
65		140
70		145
75		150