Aug. 28, 1934. A. HERRMANN 1,971,452

DIAPHRAGM FOR ELECTRODYNAMIC LOUD SPEAKERS

Filed March 11, 1932

Fig. 1

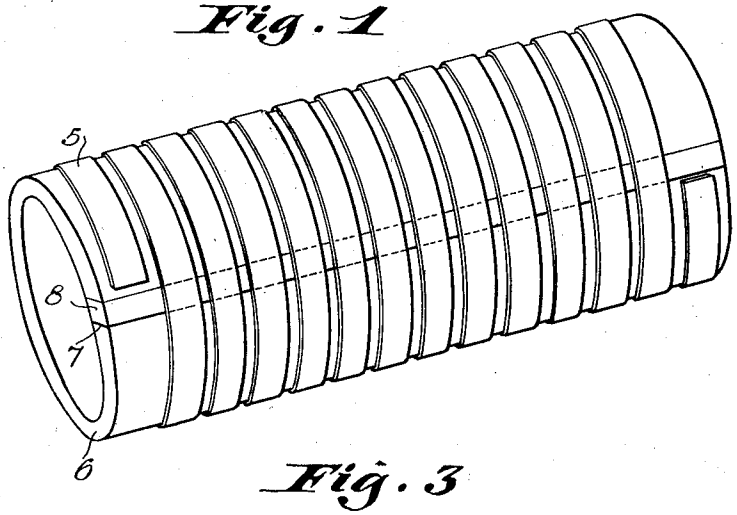


Fig. 3

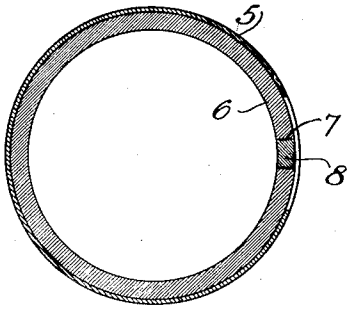
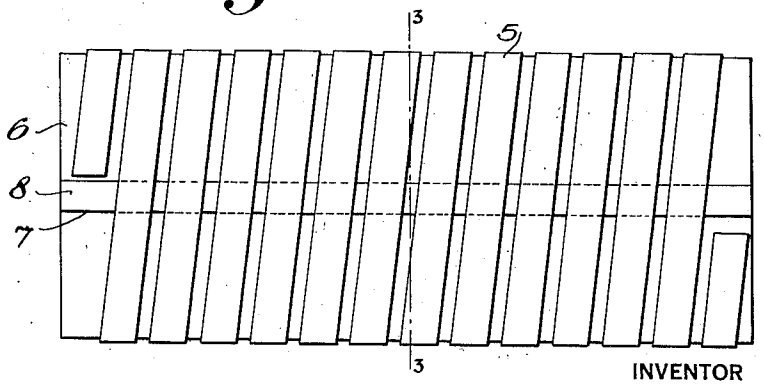


Fig. 2



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Patented Aug. 28, 1934 1,971,452

UNITED STATES PATENT OFFICE

1,971,452

DIAPHRAGM FOR ELECTRODYNAMIC LOUD SPEAKERS

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Application March 11, 1932, Serial No. 598,155
In Germany March 16, 1931

1 Claim. (Cl. 175—339)

In co-pending application Serial Number 590,856 filed February 4th 1932 electrodynamic loud speakers have been disclosed whose diaphragms substantially consist of the conductors carrying the voice currents.

The conductors consist of metal foil, most particularly aluminum foil which is wound in closely adjacent turns or spires. The individual turns of the foil are united together to result in the diaphragm. According to the copending application the connection of the turns is to be effected by the aid of silk bands.

However, diaphragms of the kind here outlined according to the present invention can be made also in a simpler way, while in addition the weight of the diaphragm is substantially reduced, if in lieu of the previously disclosed scheme the constituent turns of the foil are pasted together with insulation material.

This pasting is suitably effected in this manner that the turns are wrapped upon a former or support, whereupon they are cemented or pasted together by liquid substance such as an agglutinant, which hardens when exposed to the air. What is particularly suited, for instance, are hardening lacquers, phenol condensation products or cellulose, and among the latter phenol cellulose has turned out very serviceable.

The invention is illustrated in the accompanying drawing in which Fig. 1 illustrates one modification of the former and the manner in which the winding is wound on the former. Fig. 2 is a plan view of the former and winding shown in Fig. 1, and Fig. 3 is a sectional view on line 3—3 of Fig. 2. While the cross sectional view shown in Fig. 3 illustrates the former and coil as circular in cross section, it is to be understood that this illustration merely illustrates one type of winding which is made in accordance with the invention, and that the winding may be oval in cross section or assume any other desired form.

The manufacture of the diaphragms may be effected as follows:

A thin metal foil 5 is wrapped in closely adjacent turns upon a metallic cylinder 6. The latter is thereupon dipped, with the foil, in the liquid agglutinant and thereupon withdrawn therefrom again. During the drying of the insulation substance the cylinder is turned with the foil so that the agglutinant will throughout turn out of even thickness. After drying of the insulator, the cylinder is withdrawn from the diaphragm resulting from the pasting together of the turns.

In order to prevent the diaphragm from adhering to the former or support, the latter is suitably coated with a smooth layer of a substance soluble in water prior to the wrapping. What is most suitably employed therefor is a kind of material which will not crystallize when drying and preserve a smooth surface, say, a mixture of glucose and pentose (grape sugar and dextrin).

After application and pasting of the foil the device is dipped in water so that the intermediate layer will be dissolved.

The cylinder representing the former or support could also be so arranged that after the opening or removal of a locking means or the like, it will decrease in cross-section. For this purpose for example, the metallic cylinder may be split as at 7 so as to impart to it a springy bias tending to reduce the cylinder cross-section. The cylinder is spread open by suitable supporting means when the foil is wound and immersed in the agglutinant. After the drying of the diaphragm this support or spreader is removed.

It is also feasible to insert a spacer or intermediate piece 8 in the springy cylinder which is removed after drying so that the cylinder will then also become reduced in cross-section. The cylinder is preferably of an elongated oval form.

The diaphragm after manufacture can be given a suitable shape adapted to the particular form of construction of the loud speaker to be equipped therewith.

What I claim is:

The method of constructing a voice winding for electrodynamic acoustic apparatus from a strip of flat metallic foil and an aggultinant which consists of coating a former with a smooth soluble substance, winding said strip of flat metallic foil spirally on said former, immersing said former and winding into an agglutinant, withdrawing said former and rotating it while the agglutinant is drying, submerging said former and winding in a substance which will dissolve said soluble substance, and removing said winding from said former.

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