Jan. 8, 1935. H. NEUMANN 1,987,412

ACOUSTIC APPARATUS

Filed April 5, 1932

Fig. 1

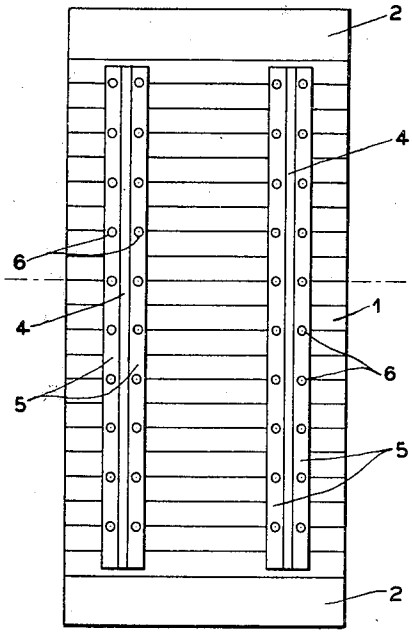


Fig. 4.

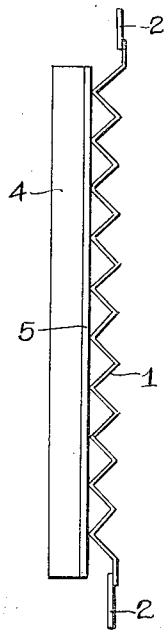


Fig. 3

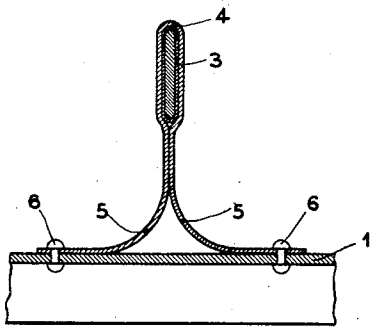
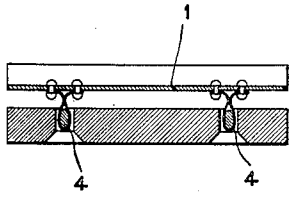


Fig. 2



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ACOUSTIC APPARATUS

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3 Claims. (Cl. 179—115.5)

This invention relates to a diaphragm, such as a corrugated piston diaphragm for electrodynamic loudspeakers.

In loudspeakers equipped with piston diaphragms intended to handle large acoustic volumes, two or more current-carrying conductors placed parallel to one another are often used. These conductors have heretofore been fastened onto the diaphragm by the aid of rivets or lugs formed integral with the conductor itself.

According to the invention, for the purpose of securing the conductor onto the diaphragm, special supporting means are used which snugly envelop the conductor wholly or partly.

The accompanying drawing shows a diaphragm according to the invention. Fig. 1 is a view upon a side of the diaphragm furnished with the current-carrying conductors. Fig. 2 is a cross-section laid through the diaphragm and the magnet system associated therewith, while Fig. 3 is a section through a conductor. Fig. 4 is a side view of the diaphragm illustrated in Fig. 1.

The diaphragm 1 consists of a rectangular sheet which is corrugated in transverse direction. The two short ends of the diaphragm are secured by the aid of supporting means 2 on to the diaphragm support. The supports 2 could, for instance, consist of a fabric. On the diaphragm 1 are fastened the conductors carrying the voice currents. They consist of a single conductor 3 made of copper or bronze. The conductor is surrounded by a shell or sheath 4 consisting of some light metal. The shell has lateral lugs or projections 5 which are fastened on to the diaphragm, e. g. by rivets.

In the embodiment shown by way of example the conductor 3 is insulated from the sheath 4 by means of an interposed layer. The latter preferably consists of a fabric such as silk which is impregnated with a hardening insulator such as varnish or shellac.

Diaphragms known in the prior art, under certain circumstances, are subject to the production of oscillations which are conducive to damages in the diaphragm system and vitiations in the reproduction of the sound. These vibrations are caused by the diaphragm system which, owing to the elasticity of the current-carrying conductors and of the supporter means, constitutes an oscillable structure whose natural period of vibration lies within, or in close proximity to, the frequency ranges used in ordinary practice for sound reproduction.

Now, these troublesome oscillatory phenomena are diminished according to the present invention. By forming the conductor in this manner so that it is snugly surrounded by a shell or sheath the internal friction of the system is greatly diminished with the result that the production of a resonant natural period is rendered more difficult.

In addition greater solidity in the connection between the current-carrying conductors and the diaphragm is insured with simultaneous reduction of the weight. If, in the manner as heretofore known and customary, the conductor is directly furnished with lugs or projections which are secured on to the diaphragm, the said lugs are made of the same material as the conductor, i. e., relatively heavy copper, whereas according to this invention a light kind of metal is employed for the supporting means.

A further advantage is secured if the conductors, in accordance with the example hereinbefore described, is insulated from the sheath surrounding it. The insulation not only increases the internal friction of the structure, but it also precludes any flow of current in case the conductor moving in the air gap of the magnetic system should happen to come in touch with the magnetic body. In order to preclude this drawback it has been suggested in the prior art to fit the pole shoes into the magnetic system so that they are insulated from each other. This is made unnecessary by the present invention.

What I claim is:

1. Electrodynamic acoustic apparatus comprising a rectangularly shaped diaphragm, corrugations in said diaphragm parallel with the shorter edges thereof, a pair of current carrying conductors, means for securing said current carrying conductors to said diaphragm parallel to the longer edges thereof and adjacent thereto, and strips of flexible supporting material connected only along the shorter edges of said rectanguarly shaped diaphragm whereby said diaphragm is unrestricted along its longer edges and is permitted to vibrate substantially as a piston.

2. Electro dynamic acoustic apparatus comprising a diaphragm, a conductor for actuating said diaphragm and means for supporting said conductor from said diaphragm, said supporting means comprising a single sheet of metallic material folded about said conductor and having portions extending to the diaphragm and secured thereto.

3. Electro dynamic acoustic device comprising a rectangular diaphragm, a pair of elongated conductors for actuating said diaphragm, means for supporting said conductors from said diaphragm, said means comprising an elongated sheath of metal folded over said conductor and having the edge portions thereof extending from said conductor to said diaphragm, means for insulating said conductor from said supporting member and means for securing the free edges of said supporting means to said diaphragm.

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