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ELECTROACOUSTIC CONVERTER

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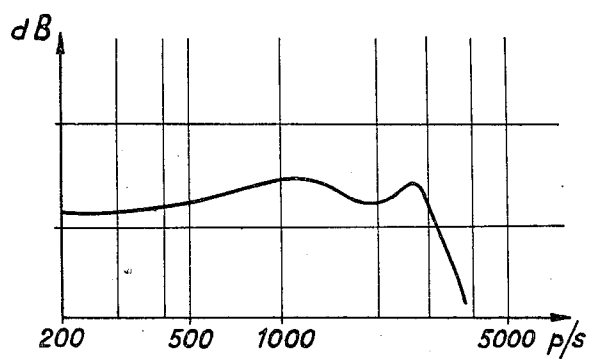
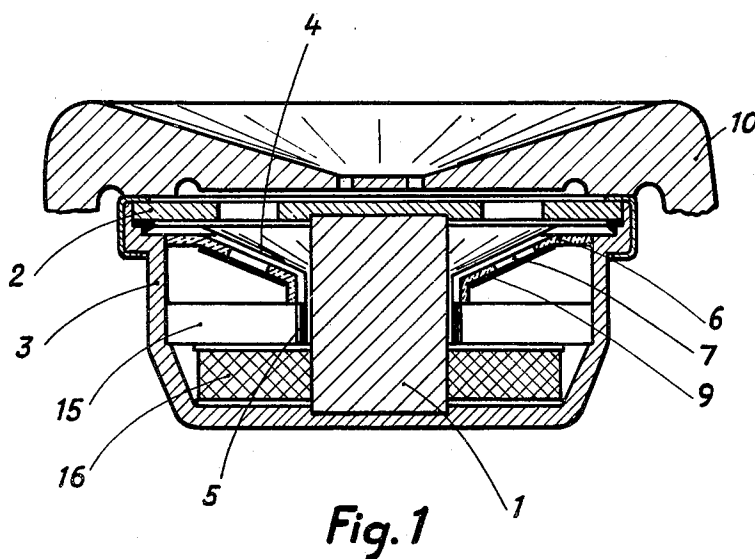


Fig. 2

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ELECTROACOUSTIC CONVERTER

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1 Claim. (Cl. 179—115.5)

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The present invention relates to electro-acoustic converters. The device comprises a diaphragm which actuates or is actuated by an electro-dynamical system consisting of a moving coil placed on a cylindrical body, which is fixed to the diaphragm or constituting a part of the same, and a magnetic circuit giving a high induction in an air gap, in which the moving coil is located. The diaphragm is in a well known manner enclosed within the magnetic circuit.

The present invention relates to such a shaping of the coil in an electro-acoustic converter of the above-mentioned kind, that the space available in the air gap may be better utilized, and the difficulties arising by the installation of a moving coil of general type, due to the thinness of the thread, may be eliminated. This is achieved by a device according to the invention in such a way that the coil may constitute one of the windings of a transformer, the iron circuit of which wholly or partly consists of the magnetic circuit.

The invention will be described more closely with reference to the accompanying drawing, in which Fig. 1 shows in cross-section an embodiment of an electro-dynamic telephone receiver according to the invention and Fig. 2 shows the sensibility of the device as a function of the frequency.

In Fig. 1 a part of a suitable container 10 for telephone receivers is indicated. The magnetic circuit comprises a cylindrical central part 1, which is fixed in the bottom of a cylindrical cup 3, the free end of said central part being in magnetic contact with a cover 2 of the cup 3. Both the container 10 and the lid 2 are provided with holes for the passage of sound waves. Around the central part 1 there is furthermore a ring-shaped magnet 15. The central part 1, the cover 2 and the cup 3 are so dimensioned and arranged, that they together constitute a magnetically conducting circuit being suitable for the permanent flux of the magnet 15. In the air gap between the magnet 15 and the central part 1 a moving coil 5 is arranged connected with a diaphragm 4. The diaphragm 4 is at its outer edge stretched between the cover 2 and the cup 3. Concentrically to the central part 1 and between the magnet 15 and the bottom of the cup 3 a winding 16 is provided. In the space, bounded by the diaphragm 4, the cup 3 and the magnet 15, an inserted member 6 is arranged for producing a suitable volume behind the diaphragm. The inserted member 6 is provided with holes 7 of a certain size, and these holes are covered by

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silk cloth 9 of a suitable thickness and density.

A characteristic feature of the device is the embodiment of the moving coil 5. It consists of one short-circuited strip of copper, whereby the space between the magnet 15 and the central part 1 can be utilized better than if the coil should consist of a plurality of windings insulated from each other. Thereby the difficulties are eliminated, which arise by installation of the wire ends to fixed contact plates from a movable moving coil of the general type. This embodiment of the coil 5 is enabled by the insertion of the coil 16, whereby the electrical energy may be fed into the device, respectively derived from the same, by a transformer effect. In order to reduce the losses of the iron circuit of the transformer, the details 1, 2 and 3 are formed from a so called free cutting steel, which has been treated in a suitable way. For obtaining a high induction in the air gap the magnet 15 is manufactured of a high retentivity magnetic alloy, such as one of the alloys commercially sold under the trade name "Alnico." The inserted member 6 made of a non-magnetic material produces a displacement of the self resonant frequency towards a higher value. Also the silk cloth 9 placed in front of the holes 7 serves to give the device an almost constant sensibility as regards the frequency. In Fig. 2 there is shown how the sound pressure varies as a function of the frequency with an input electrical effect of constant magnitude.

We claim:

In an apparatus for reproducing sound, a cylindrical pole frame having a closed and an open end, a plate having sound transmitting apertures therein closing the otherwise open end of said cylindrical pole frame, a core positioned centrally of and between the closed end of said cylindrical pole frame and said plate, a diaphragm having a rim secured to the cylindrical pole frame and a cylindrical section surrounding said core, a voice coil concentrically positioned with respect to the cylindrical section of said diaphragm and said core, a second coil surrounding said core intermediate the closed end of the cylindrical pole frame and the voice coil, and a ring shaped permanent magnet of a high retentivity magnetic alloy within the cylindrical pole frame intermediate the closed end of and cover plate on the latter and having a central aperture therein closely receiving said core and forming with the latter a high intensity gap in which said voice coil is positioned, said ring shaped permanent magnet forming with the cy-

lindrical pole frame, the plate and core a paramagnetic circuit for the voice coil, and with the cylindrical pole frame, closed end of the latter, and core a parallel paramagnetic circuit for the second coil, both of said paramagnetic circuits being continuous except for the narrow gap between the wall of the central aperture in the ring shaped permanent magnet and the core.

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