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T. A. HUNTER

1,921,924

LOUD SPEAKER MOTOR

Filed Feb. 13, 1930

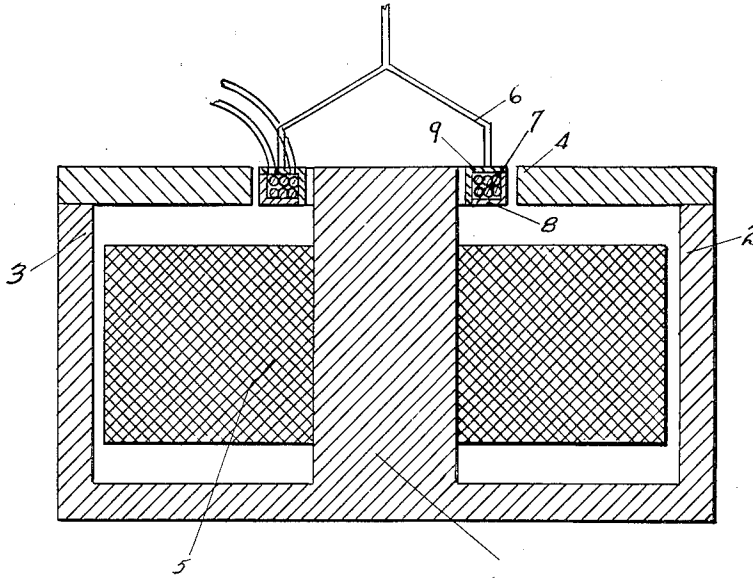


Fig. 1.

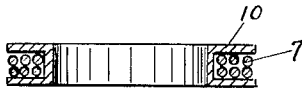


Fig. 2.

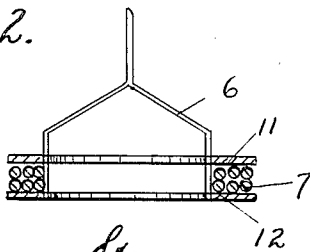


Fig. 3.

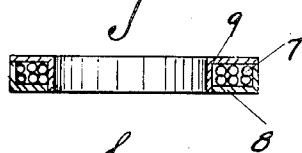


Fig. 4.

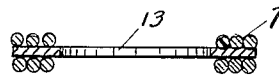


Fig. 5.

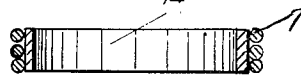


Fig. 6.

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UNITED STATES PATENT OFFICE

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LOUD SPEAKER MOTOR

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2 Claims. (Cl. 179—115.5)

My invention relates to motors for loud speakers of the moving coil type, in which a magnetic field is established, usually by a direct current excited electromagnet, about a member which carries a coil that is excited by a modulated current, thus resulting in the movement of the coil through a path axial of the magnetic field to the end that the coil mounting member sets up sound waves corresponding to the modulated current supplied to the moving coil.

This type of loud speaker is referred to as a moving coil loud speaker, and the moving coil itself is referred to as the "voice coil".

I have discovered that if the coil itself is mounted in a form made of iron or other magnetic metal, a considerable improvement is attained. In the first place, the presence of the iron form in the field gap makes it possible to use a smaller coil for the direct current excitation. The iron tends to increase the alternating current field strength resulting from the modulated current applied to the coil, thus adding to efficiency of operation. Furthermore, when the coil and form move away from the direct, current field, there is a concentration of flux in the end of the voice coil nearest the direct current field, due to the presence of the iron form, so that the movement of the voice coil is accentuated or amplified.

I accomplish my object by that certain construction and arrangement of parts of which several preferred forms are illustrated and will be described, all of them showing the invention herein, which invention will be set forth in the appended claims.

In the drawing:—

Figure 1 is a partially diagrammatic view of a loud speaker motor embodying my invention.

Figures 2, 3, 4, 5 and 6 are modifications on the principle of my invention showing different types of iron forms which will be satisfactory.

I have illustrated in the drawing a magnet structure consisting of an inner pole or core 1, with branches 2, and 3, forming a circular pole 4, outside of the end of the core 1. The field coil 5 placed about the central core serves to set up a field across the gap between the poles 1 and 4.

A mounting device 6 is illustrated, which it will be understood will be coupled to a diaphragm for emitting sound waves. The end of this device extends to a position in line with the pole gap of the magnet structure, and is there provided with a coil of wire 7.

Secured to the end of the device 6 is a form for containing the coil 7. This form is shown in Figure 1 as made up from two angle section rings

8, 9 of iron (commercially pure iron being preferred) which are set together with the coil in the chamber between them and suitably held as by soldering or otherwise. The weight of the iron form taken with the weight of the coil will be controllable within the requirements of the structure for effective operations under radio excitation.

In Figure 2 the form for the coil which is attached to the mounting device is formed of a channel-shaped annulus 10, in the channel of which the coil 7 is laid.

In Figure 3 is shown two plates 11 and 12 which are secured to the mounting device in spaced relation, with the coil set over the mounting device between the two plates.

In Figure 4 is shown the same form of coil and mounting form as is illustrated in Figure 1.

In Figure 5 is shown a single plate 13 with the coil mounted half on one side and half on the other side of it. This particular form will not possess some of the advantageous properties of my invention, as will be apparent.

In Figure 6 is shown a plain ring or annulus 14 in the form of a shallow cylinder, about which the coil 7 is mounted.

I have pointed out the advantages of my construction, which advantages are best obtained when the coil is entirely surrounded by the iron form, and next best obtained when there are portions of the form which lie above and below the coil when in use.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a moving coil type loud speaker, the combination of a moving voice coil and a moving body of magnetic material, such as iron, within which the voice coil is mounted, said body arranged to surround the coil on all sides.

2. In a moving coil type loud speaker, the combination of a moving voice coil and a moving body of magnetic material, such as iron, within which the voice coil is mounted, said body arranged to surround the coil on all sides, and comprising a pair of rings of iron of angle section secured together about the coil so as to form a closed annular housing.

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