June 5, 1934. A. T. VAN URK 1,961,180

ELECTROACOUSTIC DEVICE

Filed Sept. 12, 1930

Fig. 2

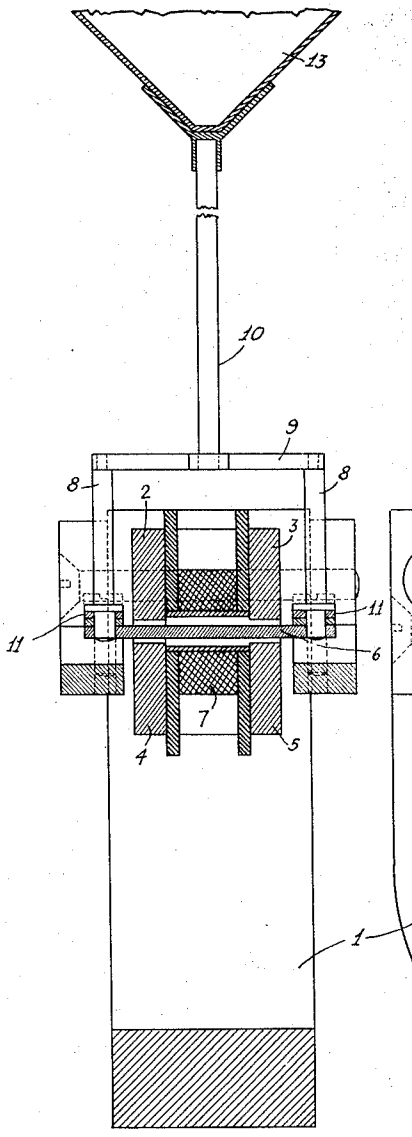
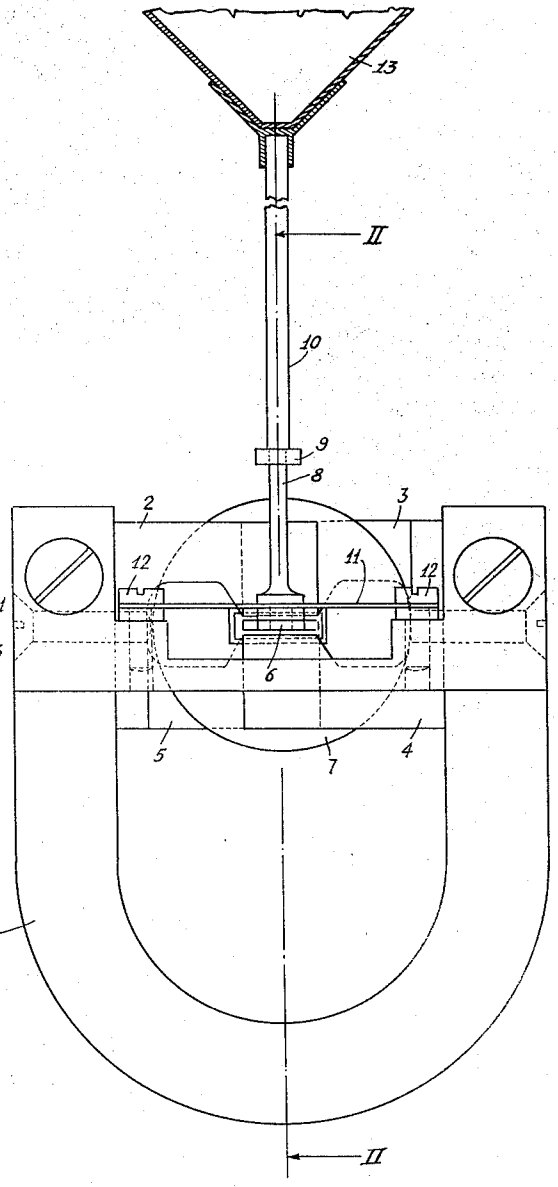


Fig. 1



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UNITED STATES PATENT OFFICE

1,961,180

ELECTROACOUSTIC DEVICE

Arend Thomas van Urk, Eindhoven, Netherlands, assignor to Radio Corporation of America, a corporation of Delaware

Application September 12, 1930, Serial No. 481,448
In the Netherlands September 27, 1929

3 Claims. (Cl. 179—115)

The invention concerns devices for converting electrical into acoustic oscillations or inversely such, for example, as loudspeakers, microphones or the like, comprising a ferromagnetic armature which actuates, by means of one or more members, the vibrating member whereby the acoustic vibrations are produced.

According to the invention, in such a device at least one of the members serving for the connection of the armature and the vibrating member, consists entirely or partly of a relatively to resonance phenomena so called "dead" material, for example of pressed material. A "dead material" must hereinafter be understood to mean a material whose natural frequency is not located in the frequency range reproduced by the said devices. Such is, for example the case with pressed material prepared with the aid of artificial resins, pitch or the like. It has been stated that these pressed materials have a great internal damping owing to which they are eminently suited to serve as material for the members above referred to which, owing to their function, have the tendency of showing a strong resonance at a determined sound frequency. It has been found that such members, which hitherto have been made of metal, have such a pronounced natural resonance that they have a harmful effect on the quality of the sound reproduction.

The invention has for its object to obviate the said disadvantage. Besides, it affords the advantage that the members can be pressed in one operation into the desired shape so that their manufacture is extremely suitable for mass-production.

In one particular embodiment of the invention in which the armature actuates, by means of at least two members, a yoke on which the style for the vibrating member is mounted, this yoke consists, for example, of artificial resin.

In order that the invention may be more clearly understood and readily carried into effect, it will be described more fully with reference to the accompanying drawing which represents, by way of example, one embodiment of the invention.

In the drawing:

Figure 1 is a lateral elevation of a loud speaker according to the invention.

Figure 2 is a longitudinal section taken on the line II—II of Figure 1.

To the limbs of a permanent horse shoe magnet 1 are secured four pole shoes 2, 3, 4 and 5 in such manner that 2 and 5 or 3 and 4 respectively have the same polarity so that in the rather narrow gap between 2 and 4 or 3 and 5 respectively oppositely directed fields are produced.

In the gaps in movably arranged a soft iron armature 6 which is surrounded with some play by a coil 7 through which are led the speech currents to be converted into acoustic vibrations. The two ends of the armature are secured to the middles of the two laminated springs 11 the free ends of which are clamped by screws 12. The rectilinear reciprocating motion of the armature 6 is transferred by means of two rods 8 secured to the laminated springs 11, and of a yoke 9 secured to the said rods, to a rod 10 which acts on the vibrating member such as the cone 13. The laminated springs 11, the rods 8, the yoke 9 and the rod 10, which consequently constitute the members with the aid of which the connection between the armature 6 and the vibrating member may be established, may be made, for example of an artificial resin such as Bakelite. For the results to be obtained with this invention it has been proved to be sufficient in some cases to make only the yoke 9 of Bakelite.

What I claim is:

1. In an acoustic system comprising an armature and a vibratile diaphragm, a pair of oppositely disposed springs yieldably supporting said armature said springs being formed of an artificial resin and a driving connection between said armature and diaphragm.

2. The device of the preceding claim in which said driving connection is also formed of artificial resin.

3. In an acoustic system comprising a diaphragm and an armature, means for connecting said diaphragm and armature comprising an elongated rod, a cross member secured to one end of said rod and a pair of oppositely disposed extensions secured to the ends of said armature and cross member respectively, said connecting means having a natural resonance period outside of the frequency range to be reproduced by said system and spring means of artificial resin for supporting said armature.

AREND THOMAS VAN URK.