July 30, 1935. F. REISZ 2,009,520

ELECTROACOUSTIC DEVICE

Filed Jan. 18, 1934

Fig. 1

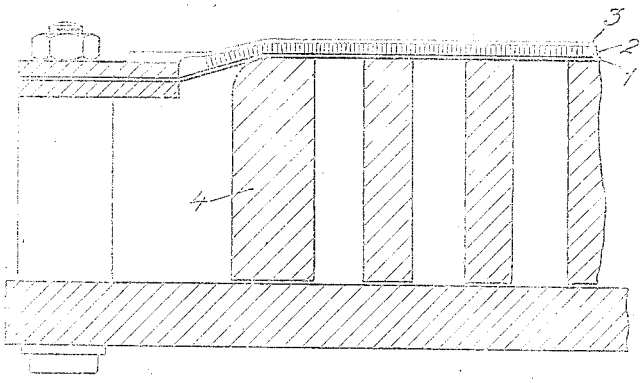


Fig. 2

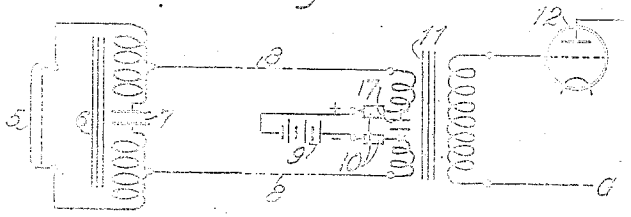
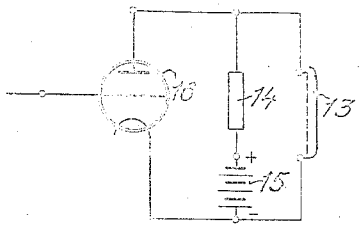


Fig. 3



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ELECTROACOUSTIC DEVICE

Eugen Reisz, Paris, France

Application January 18, 1934, Serial No. 707,190
In Germany June 29, 1933

5 Claims. (Cl. 179—111)

This invention relates to a microphone, telephone receiver or loudspeaker of the condenser type.

The object of the invention is to improve the construction of apparatus of this character, particularly with respect to its electrostatic capacity, and consequently the impedance characteristic thereof. In accordance with the invention, the electrostatic capacity of a microphone of the condenser type, for example, is increased to such an extent that the electric connection with the associated amplifying apparatus can be effected without taking into consideration the length of the conductors between the microphone and the amplifier. The invention may also be applied advantageously to sound reproducers of the condenser type.

In apparatus of the character described, according to the invention, a dielectric is employed comprising a fluid having a high dielectric constant. The fluid is preferably absorbed in a suitable medium or vehicle, for example, of paper or the like. If the microphone or reproducer comprises an arrangement in which the diaphragm engages or rests upon a perforated stationary metal electrode, as in the construction shown in my German Patent No. 455,151 or U. S. Patent No. 1,859,170, a thin coating of collodion, celluloid or the like is preferably provided to prevent the vehicle from adhering to the electrode.

For a better understanding of the invention, reference should be had to the accompanying drawing, wherein

Fig. 1 is a fragmentary view in cross section of a microphone or reproducer of the condenser type embodying the invention; and

Figs. 2 and 3 are circuit diagrams illustrating applications of the invention.

As shown in Fig. 1, the invention is embodied in the diaphragm of a microphone, telephone receiver or loudspeaker of the condenser type. The diaphragm comprises an extremely thin coating 1 of collodion, celluloid or the like on a disc or sheet 2 of paper or the like impregnated with a fluid of high dielectric constant, the disc or sheet 2 having an extremely thin conducting covering or coating 3, preferably of metal foil. The disc 2 may be impregnated with a liquid, such as water or glycerin, the dielectric constants of which are 80 and 40 times greater than air, respectively. The layer 3 may consist, for example, of aluminium or gold foil.

The purpose of the coating 1 is to prevent the moist paper from adhering to the perforated metal electrode 4. On the other hand, the outer coating 1 is strongly damped by the paper disc 2 so that it is unnecessary to damp the air vibrations in the passages in the electrode 4 to a great extent; that is, the lower ends of the passages need not be completely closed. It has been demonstrated in actual practice that, by constructing the diaphragm as described above, the electrostatic capacity may be increased 100-fold as compared with prior apparatus of the same size.

In Fig. 2 is shown, by way of example, a circuit in which a microphone 5 embodying the invention is connected to an amplifier. The terminals of the microphone 5 are connected to an auto-transformer 6 having a condenser 7 connected between the windings thereof. The transformer 6 is connected to the amplifier by conductors 8 through which current is supplied to the microphone from a battery 9. Resistors 10 of high ohmic resistance are connected to the terminals of the battery 9 and in series relation with the primary windings of an input transformer 11 of the amplifier, the secondary winding of the input transformer being connected to an amplifier tube 12 in the usual manner. A condenser 17 is connected between the primary windings of the transformer 11 in shunt relation with the battery 9. A microphone constructed in accordance with the invention is particularly suitable for use in a system of this kind because its high electrostatic capacity minimizes the effect of variations in the length of the conductors 8 between the microphone and the amplifier.

The invention is also of value in systems where the improved apparatus is used as a telephone receiver or loudspeaker. Such a system is illustrated in Fig. 3 where the reproducer 13 is energized through the anode resistance 14 from a battery 15 and is connected in the output circuit of the final amplifier tube 16 of a conventional amplifier.

It is to be noted that the microphone or telephone need not be directly connected with the associated amplifier as the great capacity thereof makes it possible to use a transformer which permits the impedance of the microphone or telephone to be transformed to any desired value.

I claim:

1. An acoustic device of the condenser type comprising a stationary electrode and a diaphragm having a conducting aluminium foil, an absorbent layer impregnated with glycerine, and a layer of celluloid adjacent the electrode.

2. An acoustic device of the condenser type comprising a stationary electrode and a dia-

phragm having a conducting gold foil, an absorbent layer impregnated with glycerine, and a layer of celluloid adjacent the electrode.

3. An acoustic device of the condenser type comprising a stationary electrode and a diaphragm having a conducting aluminium foil, an absorbent layer impregnated with glycerine, and a layer of collodion adjacent the electrode.

4. An acoustic device of the condenser type comprising a stationary electrode having openings therein, a conducting diaphragm overlying said electrode and a flexible sheet interposed between said electrode and said diaphragm containing a liquid having a high dielectric constant, said sheet having an insulating coating on the side in contact with said stationary electrode.

5. An acoustic device of the condenser type comprising a stationary electrode having openings therein, a conducting diaphragm and an interposed paper sheet impregnated with liquid having a high dielectric constant, said sheet having a coating of celluloid on the side in contact with said stationary electrode.

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