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TELEPHONE TRANSMITTER

Filed March 13, 1924

Fig. 1.

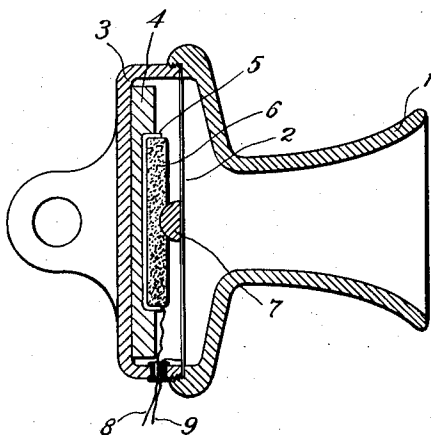
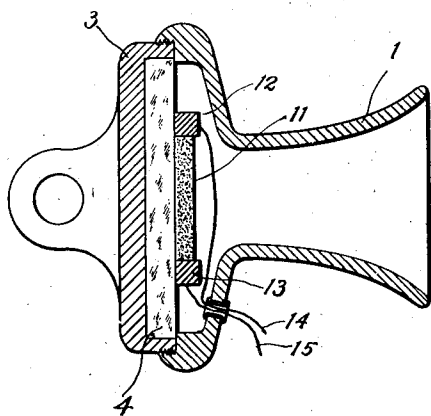


Fig. 2.



WITNESSES:

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TELEPHONE TRANSMITTER.

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My invention relates to microphone devices, and particularly to resistor materials therefor.

One object of my invention is to produce a microphone device in which the sound-responsive material is a coherent mass.

Another object of my invention is to produce a microphone device in which the sound vibrations in air are converted into vibratory electric currents without the intermediary of a diaphragm.

Another object of my invention is to produce a microphone device having a minimum number of parts.

Another object of my invention is to produce a microphone device in which the sound-responsive resistor is maintained free from packing and whereby its sensitiveness is retained without loss.

In the prior art of the construction of microphones, it has been customary to use a granular resistor material such as grains of carbon. These grains are customarily contained in a cup whose edges are protected with felt and which is placed near the surface of a diaphragm at its center. Such microphone construction is subject to packing when loud sounds are incident upon the diaphragm. The excessive pressures produced by the loud sound cause undue pressure upon the grains and they pack in such a manner that change in pressure does not produce the change in resistance which is desired.

Furthermore, such a construction requires a multiplicity of parts and, when disassembled, the contained resistor grains are subject to spilling and loss. In microphones so constructed, it has been found necessary to use a resistor material of relatively coarse grains, since fine powdered resistor material packed very readily.

I have discovered that a material composed of a mixture of finely divided carbon, such as lamp black, and rubber has a conductivity for an electric current which varied with the pressure applied to the material between the points of application of an electrical potential.

My invention consists in providing a material comprising a combination of lamp black and rubber and forming the resistor material for microphones. This material replaces the mass of loose granular material of the prior art.

Other objects and structural details of my

invention will be apparent from the following description when read in connection with the accompanying drawing, wherein:

Figure 1 is a sectional view of an embodiment of my device containing a diaphragm, 60 and

Fig. 2 is a view, in section, of an embodiment of my device without a diaphragm.

In the construction of my device, I may prepare the resistor material by first dissolving rubber in carbon disulphide, then mixing in finely divided carbon, such as lamp black, and lastly evaporating the carbon disulphide solvent. The resulting product is a mass of carbonaceous material held together by rubber within the interstices of the carbonaceous material. I may then cut the material to the size and shape required by the particular microphone in which it is to be employed.

Alternatively, I may prepare the resistor material by mixing 65 parts by weight of calcined lamp black, 35 parts by weight of crude rubber, a small amount of sulphur, which may be 3 to 8 parts, by rolling in the customary rubber compounding mill. This mixed compound may then be vulcanized in the customary manner in which rubber compounds are cured.

In Fig. 1, a sound-collecting means 1, a diaphragm 2, and a back plate or frame 3, are combined with an insulating plate 4 having a recess in one side thereof into which is fitted a conducting cup 5. Conducting cup 5 contains a mass 6 of my previously described resistor material. A button 7 is placed at the center of diaphragm 2 and caused to bear upon material 6. Lead wires 8 and 9 are connected to the conducting cup 5 and diaphragm 2 respectively and serve to conduct current to and from resistor mass 6.

In the operation of my device, sound waves are converted into fluctuating electric currents by the change in conductivity of the resistor material of my invention with change in pressure. The sound waves striking the diaphragm are converted into varying pressures upon material 6 by means of diaphragm 2 and center button 7. These varying pressures are thus translated into varying electric currents by the change in resistance of material 6 produced thereby.

Fig. 2 similarly shows a sound-collecting means 1, a back plate or frame 3, and insulating plate 4. Upon plate 4 is placed a mass 11 of the resistor material of my invention. At

opposite edges of the material 11 are provided conducting terminal blocks 12 and 13 to which are attached lead wires 14 and 15 respectively.

In the embodiment shown in Fig. 2, a diaphragm is dispensed with and sound waves are collected by collector 1 and directed upon mass 11 of the material of my invention. This mass is affected directly by the fluctuating pressures of the sound waves and its resistance changed thereby. This change in resistance then causes, in a circuit connected to conductors 12 and 13, a fluctuating electric current upon the application of an electrical potential.

By the construction described, I am able to produce a telephone transmitter device in which the objectionable features incident to a loose granular resistor material are avoided.

While I have shown only two embodiments of my invention in the accompanying drawings, it is capable of various changes and modifications without departing from the spirit thereof and it is desired, therefore, that only such limitations shall be imposed thereon as are indicated in the prior art or in the appended claims.

I claim as my invention:

1. A microphone device comprising an elastic resistor which changes its specific resistance with pressure, said resistor being directly exposed to the atmosphere, whereby air pressure variations caused by sound may be translated into electric current variations without the necessity of employing a vibrating diaphragm.

2. A microphone device comprising an elastic resistor element, a support for said element, means for applying a potential across said element, and means for directing sound directly against said element.

3. A microphone device comprising an elastic resistor element having an extended surface, means for applying a potential across said element parallel to said surface, and means for subjecting said surface directly to air pressure variations caused by sound.

4. A microphone device comprising a deformable resistor portion, said resistor consisting of an elastic material and a finely divided conducting material mixed therewith, and means for exposing said resistor directly to sound waves whereby said sound waves may be translated into electric-current variations without the intermediary of a vibrating diaphragm.

5. A microphone device comprising a deformable resistor portion, said resistor consisting of finely comminuted carbonaceous material intimately mixed with an elastic non-conducting vehicle, and means for exposing said resistor directly to sound waves without the intermediary of a vibratory diaphragm.

6. A microphone device comprising a variable resistor portion consisting of finely divided carbon and rubber, and means for exposing said resistor directly to atmospheric sound waves without the intermediary of a vibratory diaphragm.

7. A telephone transmitter comprising a chamber containing a plurality of electrodes substantially non-responsive to sound vibrations, an elastic conducting material interposed between said electrodes and exposed directly to aerial sound waves.

In testimony whereof, I have hereunto subscribed my name this 29th day of February, 1924.

JOSEPH SLEPIAN.