

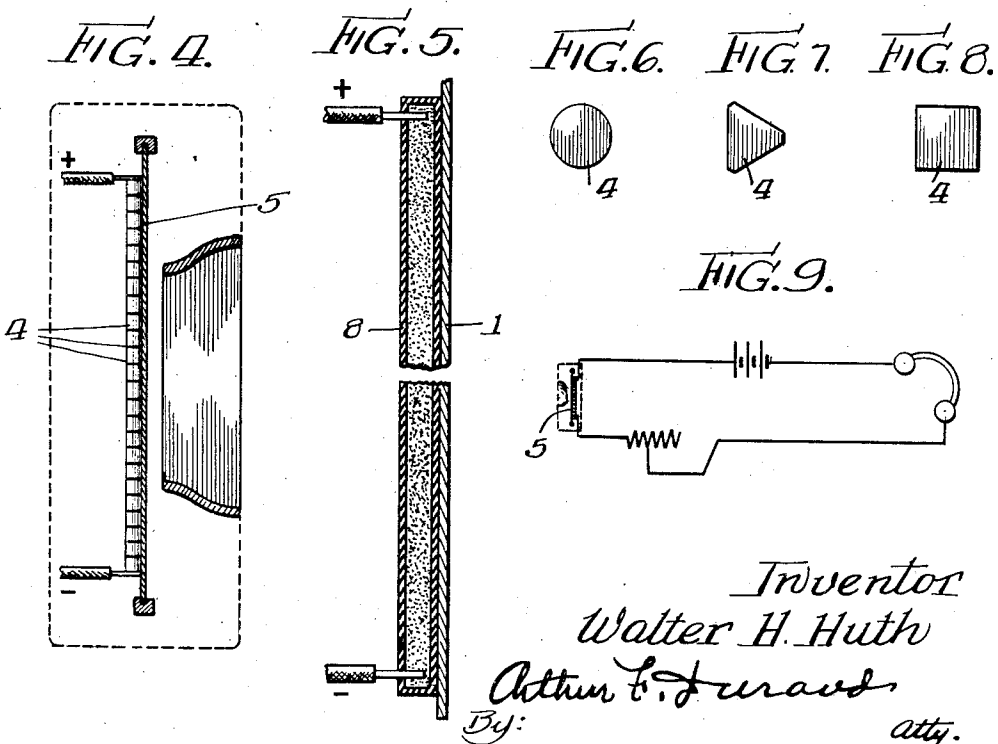
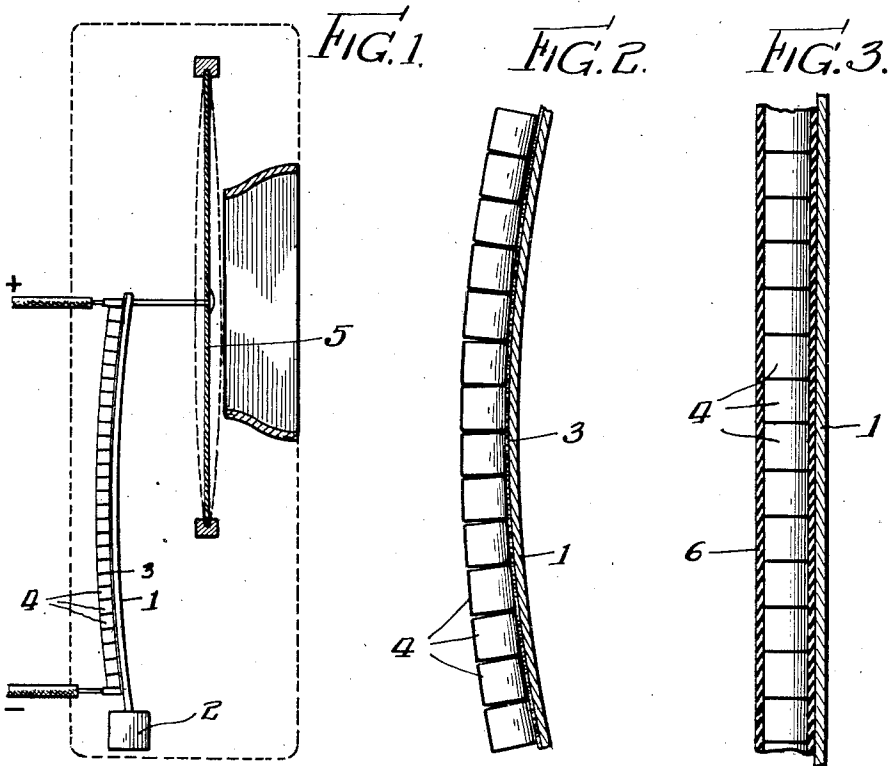
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MICROPHONE

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## MICROPHONE

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11 Claims. (Cl. 179—122)

This invention relates to microphones of the kind in which carbon or graphite, or similar variable resistance material, is employed to vary the resistance of the instrument in accordance with the sound waves that impinge on the diaphragm of the microphone.

Generally stated, the object of the invention is to provide a novel and improved construction and arrangement whereby a flexible resistance is provided, and arranged to be flexed back and forth by the vibrations of the diaphragm of the instrument, thereby to vary the resistance of the microphone circuit, for the usual and well known purpose.

It is also an object to provide certain details and novel features of construction and combinations tending to increase the general efficiency and desirability of a microphone of this particular character.

To the foregoing and other useful ends, the invention consists in matters hereinafter set forth and claimed and shown in the accompanying drawing, in which—

Fig. 1 is a diagrammatic view showing a microphone embodying the principles of the invention.

Fig. 2 is an enlarged side elevation of the variable resistance of said microphone.

Fig. 3 is a view similar to Fig. 2, showing a different form of the invention.

Fig. 4 is a view similar to Fig. 1, showing a different form of the invention.

Fig. 5 is a view similar to Fig. 3 of the drawing, showing a different form of the invention.

Figs. 6, 7 and 8 are detail views, each showing a specifically different form of the invention.

Fig. 9 is a diagrammatic view of the complete transmitting circuit of the microphone.

As thus illustrated, referring to Figs. 1 and 2 of the drawing, the invention comprises a flexible support 1, preferably of resilient material, mounted at its lower end in a support 2, of any suitable character. A strip of insulation 3 is provided on the surface of the support 1, and blocks of carbon or similar material 4 are secured to said insulation in any suitable or desired manner, in position to engage each other. The upper end of the flexible support 1 is suitably connected to the diaphragm 5 of the microphone. Sound waves impinging on said diaphragm will flex the support 1, and thereby cause the blocks 4 to exert a variable pressure on each other, thereby characterizing the current flow in the circuit of these blocks, thereby transmitting the voice currents over the circuit to the

receiving end of the latter, as indicated in Fig. 9 of the drawing.

If desired, the blocks 4 can be encased in a rubber tube 6, or other flexible insulating material, as shown in Fig. 3 of the drawing.

The blocks of carbon or similar material can be either cylindrical, as shown in Fig. 6, or triangular, as shown in Fig. 7, or square, as shown in Fig. 8 of the drawing, or they can be of any other suitable form, if so desired.

As shown in Fig. 4 of the drawing, the blocks 4, constituting the variable resistance, are mounted directly on the back of the diaphragm 5 of the microphone, and insulated therefrom, and the flexing of the diaphragm causes a flexing of the variable resistance with resulting variable pressure upon the blocks.

As shown in Fig. 5 of the drawing, carbon particles 7 are encased in a flexible envelope 8, such as a rubber tube, and this tube may be fastened to the flexible support 1, or to the back of the diaphragm itself, for in either event the flexing of the tube will cause a disturbance of the carbon particles therein, with the resulting variation of resistance to the passage of the electric current in the microphone circuit.

Thus, in each form of the invention, a flexible resistance unit is provided, which will vary the resistance of the microphone circuit, by the flexing or bending thereof, as a result of the vibrations of the microphone diaphragm.

It will be seen, therefore, that the variable resistance unit is essentially of that kind in which the unit contains a suitable quantity of non-cohering and separable portions of a non-metallic substance, and mounted and connected to be flexed and bowed between the opposite ends of the unit by the vibrations of the microphone diaphragm. For this purpose, granular carbon can be employed, graphite, or other non-metallic substances. In the form of the invention shown in Figs. 1, 2, 3 and 4, it will be seen that the insulation between the carbon blocks and the diaphragm, or other flexible support, causes the blocks to move farther apart at their outer sides, than at their inner sides where they are held by the insulation.

In effect, the resistance unit, in each form of the invention, is in the form of a flexible rod of fixed length and diameter, but containing interengaging portions of a suitable resistance material such as the blocks 4, or the granules in the tube 8, so that the resistance of the entire length of the unit is varied by the flexing thereof.

Such flexing on a definite curve or curves is the only distortion of the unit.

What I claim as my invention is:

1. A variable resistance for a microphone or  
5 other variable resistance instrument, comprising a flexible resistance unit of suitable fixed length, of rod-like form, having a substantially greater length than diameter, the latter being fixed, containing non-cohering and separable portions of  
10 a suitable resistance substance, all mounted and connected to be flexed and bowed on a definite curve or curves between the opposite ends thereof by the vibrations of the instrument, and means at the opposite ends of said flexible rod-like  
15 variable resistance unit to include the latter lengthwise in an electrical circuit.
2. A structure as specified in claim 1, said unit comprising a series of carbon blocks having insulating support and engaging each other with  
20 variable pressure when the unit is flexed.
3. A structure as specified in claim 1, said unit comprising a flexible insulating tube having separate interengaging pieces of carbon therein.
4. A structure as specified in claim 1, comprising  
25 a flexible support for said unit, with one end of said support connected to the diaphragm.
5. A structure as specified in claim 1, said unit being mounted and carried directly on the back of the diaphragm to flex with the latter.
- 30 6. A structure as specified in claim 1, said unit comprising a flexible tube of insulating material, with interengaging particles of carbon contained therein.
7. A variable resistance unit in effect in the  
35 form of a flexible rod of a fixed length and diameter, containing interengaging portions of a

suitable resistance material, means to flex or bend said unit laterally between its opposite ends, and means at the latter to form electric terminals to include the entire length of the unit in an electric circuit.

8. A structure as specified in claim 7, said portions comprising carbon blocks fastened face to face on a flexible support.

9. A structure as specified in claim 7, said portions comprising granules contained in a flexible hollow support.

10. A variable resistance for a microphone or other variable resistance instrument, comprising a flexible resistance unit of suitable length, of rod-like form, having a substantially greater length than diameter, containing non-cohering and separable portions of a suitable resistance substance, all mounted and connected to be flexed and bowed between the opposite ends thereof by the vibrations of the instrument, and means at the opposite ends of said flexible rod-like variable resistance unit to include the latter lengthwise in an electrical circuit, said unit comprising a series of carbon blocks having insulating support and engaging each other with variable pressure when the unit is flexed.

11. A variable resistance unit in effect in the form of a flexible rod containing interengaging portions of a suitable resistance material, means to flex or bend said unit between its opposite ends, and means at the latter to form electric terminals to include the entire length of the unit in an electric circuit, said portions comprising carbon blocks fastened face to face on a flexible support.

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