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G. R. EATON

MICROPHONE

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Fig.1.

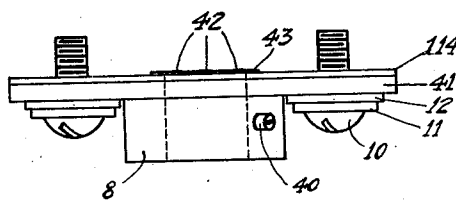
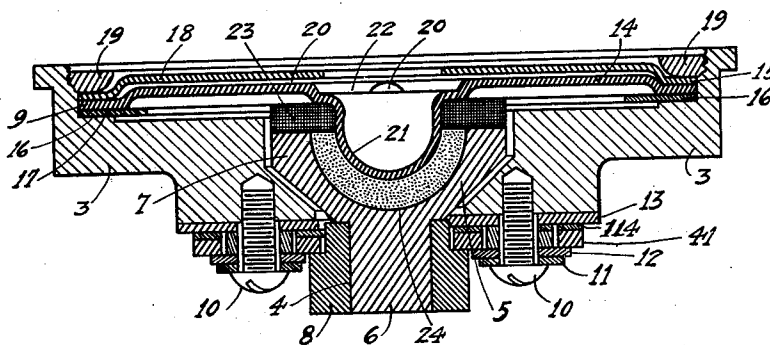


Fig. 2.

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UNITED STATES PATENT OFFICE

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MICROPHONE

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5 Claims. (Cl. 179—122)

My invention relates to telephone instruments in which an electrical current is modified by passing thru a pair of electrodes separated by finely divided conducting material such as carbon or some similar substance, the resistance of which is variable under the influence of one of the electrodes which is actuated by sound waves impinging thereon. It relates more particularly to telephone transmitters for use in the hand set or French type telephone in which the receiver and transmitter are combined in a single instrument, though its usefulness is not limited to such a structure.

Due to the various positions in which a telephone instrument of this type is held while in use the type of transmitter used in the desk stand telephone does not work satisfactorily therein. Transmitters comprising a back electrode having therein a substantially semispherical cavity within which a semispherically shaped front or movable electrode is positioned have proven particularly satisfactory in these instruments. In this type of transmitter the electrodes have therebetween a layer of granular conducting material in such an amount as to insure contact between the electrodes and the granular material at all times and in all positions in which the instrument may be placed.

An object of my invention is the provision of a simple, easily manufactured and economical transmitter which is equally efficient in any position in which it may be placed while in use.

A feature of my invention is the elimination of a movable front contact mounted separately from the diaphragm.

One form of my invention resides in the provision of a movable electrode formed integral with the diaphragm of the transmitter.

In the accompanying drawing, Fig. 1 shows a cross-section of a preferred embodiment of the transmitter of my invention, and

Fig. 2 shows in detail a portion of the same.

The embodiment of my invention shown in the drawing comprises a cup-shaped supporting member 3 composed of suitable material and having a central opening 4 through which extends the portions 5 and 6 of a funnel shaped member 7 of suitable conducting material which forms the back electrode of the transmitter. The portion 6 also extends thru the central orifice shown in dotted lines in Fig. 2 of a member 8, where it is held by a screw 40 which passes thru the member 8 and engages the said portion 6. Screws 10 extend thru bushings 11, insulating washers 12 and 13 and a conducting plate 114 and engage

tapped orifices in the supporting member 3 to secure the members 8 and 41 in position relative thereto. The member 8 has a reduced portion 43 which passes thru a central orifice in members 41 and 114 and prongs 42 are turned over the plate 114 to secure the said members as a unit.

A diaphragm 14 has its periphery 9 associated with the inner peripheral edge 15 of the supporting member 3. A ring-shaped insulator 16 fits between periphery 9 and a shoulder 17 of member 3 and a retaining disc 18 having a central opening engages the other side of periphery 9. A clamping ring 19 has screw threaded engagement with the member 3 and forces the disc 18, the diaphragm 14 and insulator 16 against shoulder 17 and thereby clamps the edge 9 of diaphragm 14 against movement.

Radial fins or raised portions 20 are provided in the diaphragm 14 for strengthening the same and the central portion 21 is depressed to form a semispherical portion. A shoulder 22 is formed between the depressed portion 21 and the diaphragm proper which engages a ring 23 formed of felt or some similar material which engages the end of the back electrode 7. The shoulder 22 and radial fins 20 serve to infinitely strengthen the diaphragm 14 and increase the efficiency of the transmitter. The semispherical depression 21 enters a concave portion 24 formed in the back electrode 7 which may be concentric with the depression 21. The back electrode 7, depressed portion 21 and the ring 23 form a chamber into which granular carbon is placed in an amount sufficient to insure a good electrical contact between the electrodes at all times. The convex face of the depressed portion 21 is supplied with a plating of gold or other like conducting metal to insure a good contact between the carbon granules and front electrode at all times. External electrical connections may be made to the conducting plate 114 and member 3 which may be provided with terminals of any desired type.

While I have shown and described a preferred embodiment of my invention I do not wish to be limited to the same but aim to cover all that which comes within the spirit and scope of the appended claims.

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

1. In a microphone transmitter, a supporting member, a relatively stiff diaphragm, sufficiently thin to vibrate between its center and the supported periphery, a shoulder on said supporting member for receiving the periphery of said diaphragm,

a clamping member for securing said diaphragm on said shoulder, a light, thin, metallic, generally semispherical, hollow electrode fixed with said diaphragm substantially centrally thereof and extending laterally therefrom, said electrode having a surface of substantially unvarying conductivity, a fixed electrode mounted on said support, said fixed electrode having a generally semispherical microphone chamber therein, the electrode on said diaphragm being positioned substantially concentrically within said microphone chamber, the adjacent surfaces of said electrodes being spaced apart, granular microphonic material in the space between said electrodes and means for confining said microphonic material within said chamber.

2. In a microphone transmitter, a supporting member, a relatively stiff diaphragm, a shoulder on said supporting member for receiving the periphery of said diaphragm, a clamping member for securing said diaphragm on said shoulder, substantially the entire surface of said diaphragm within its clamped periphery being exposed to the actuating voice currents, a light, thin, metallic, generally semispherical, hollow electrode fixed with said diaphragm substantially centrally thereof and extending laterally therefrom, a fixed electrode mounted on said support, said fixed electrode having a generally semispherical microphone chamber therein, the electrode on said diaphragm being positioned concentrically within said microphone chamber, the adjacent surfaces of said electrodes being spaced apart, granular microphonic material in the space between said electrodes and means for confining said microphonic material within said chamber.

3. In a microphone transmitter, a supporting member, a relatively stiff, substantially flat circular diaphragm of sheet metal, sufficiently thin to vibrate between its center and the supported periphery, an annular shoulder on said supporting member for receiving the periphery of said diaphragm, a clamping ring for securing said diaphragm on said shoulder, a light, thin metallic, generally semispherical, hollow electrode fixed with said diaphragm substantially centrally thereof and extending laterally therefrom, said electrode having a surface of unvarying conductivity, a fixed electrode mounted on said support, said fixed electrode having a generally semispherical microphone chamber therein, the electrode on said diaphragm being positioned substantially

concentrically within said microphone chamber, the adjacent surfaces of said electrodes being spaced apart, granular microphonic material in the space between said electrodes and resilient means for confining said microphonic material within said chamber.

4. In a microphone transmitter, a supporting member, a relatively stiff, substantially flat circular diaphragm of sheet metal, sufficiently thin to vibrate between its center and the supported periphery, an annular shoulder on said supporting member for receiving the periphery of said diaphragm, a clamping ring for securing said diaphragm on said shoulder, a light, thin metallic, generally semispherical, hollow electrode fixed with said diaphragm substantially centrally thereof and extending laterally therefrom, said electrode having a surface of unvarying conductivity, as by plating of a rare metal on its convex portion, a fixed electrode mounted on said support, said fixed electrode having a generally semispherical microphone chamber therein, the electrode on said diaphragm being positioned substantially concentrically within said microphone chamber, the adjacent surfaces of said electrodes being spaced apart, granular microphonic material in the space between said electrodes and resilient means for confining said microphonic material within said chamber.

5. In a microphone transmitter, a supporting member, a relatively stiff diaphragm, a shoulder on said supporting member for receiving the periphery of said diaphragm, a clamping member for securing said diaphragm on said shoulder, substantially the entire surface of said diaphragm within its clamped periphery being exposed to the actuating voice currents, a light, thin, metallic, generally semispherical, hollow electrode fixed with said diaphragm substantially centrally thereof and extending laterally therefrom, a fixed electrode mounted on said support, said fixed electrode having a microphone chamber therein, defined by at least part of a generally semispherical surface, the electrode on said diaphragm being positioned concentrically within said microphone chamber, the adjacent surfaces of said electrodes being spaced apart, granular microphonic material in the space between said electrodes and means for confining said microphonic material within said chamber.

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