J. J. COMER.

DIFFERENTIAL MICROPHONE TRANSMITTER.

APPLICATION FILED OCT. 24, 1910.

1,033,086.

Patented July 23, 1912.

3 SHEETS—SHEET 1.

FIG. 1.

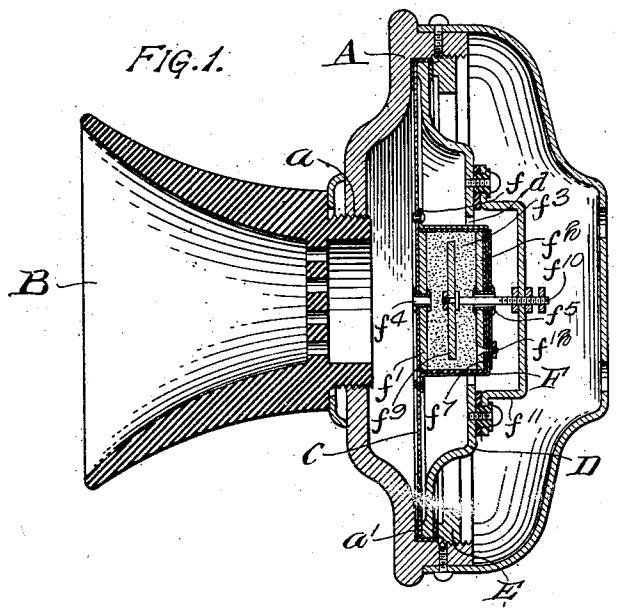


FIG. 3.

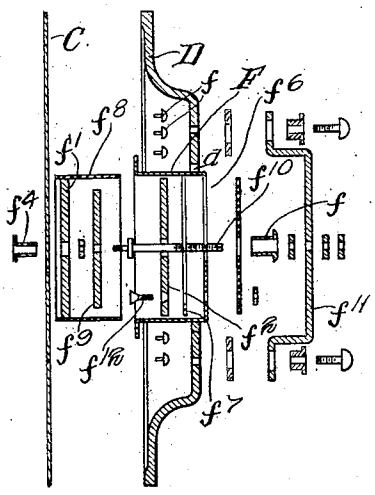
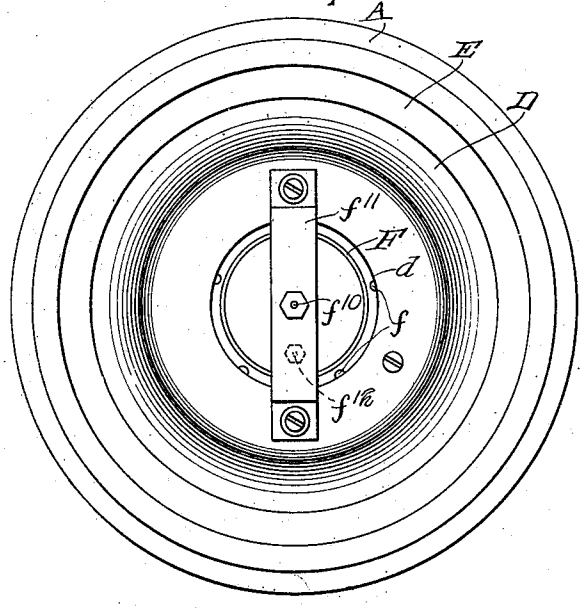


FIG. 2.



WITNESSES

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3 SHEETS—SHEET 2.

FIG. 4.

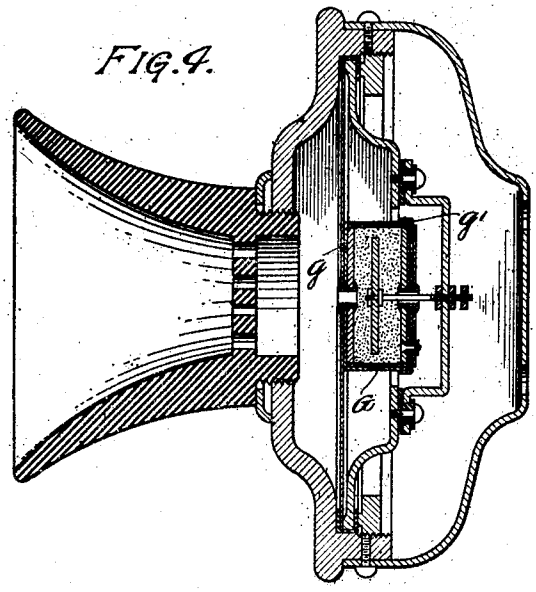


FIG. 6.

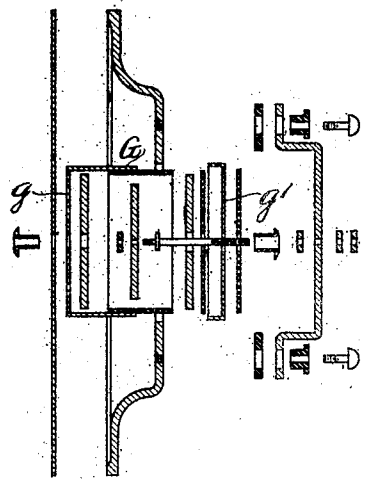
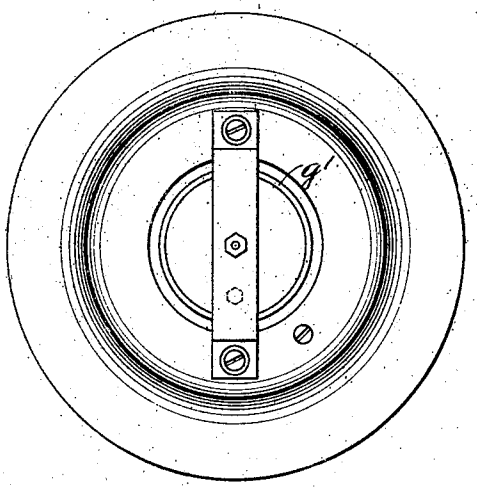


FIG. 5.



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3 SHEETS—SHEET 3.

FIG. 7.

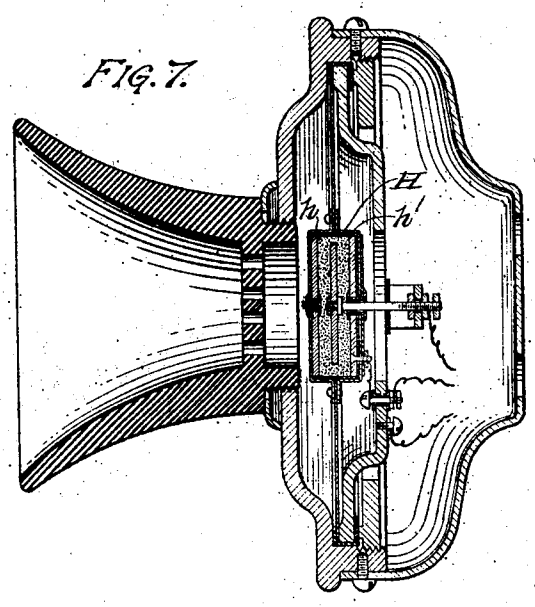


FIG. 9.

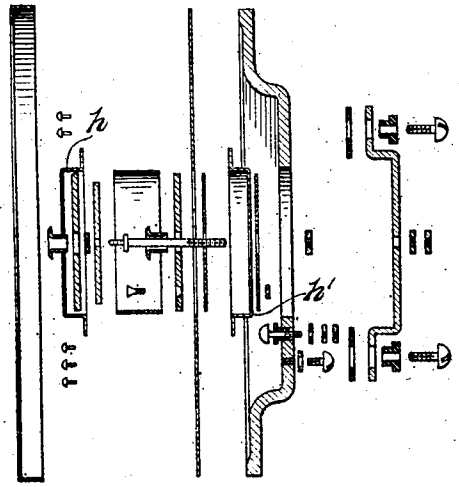
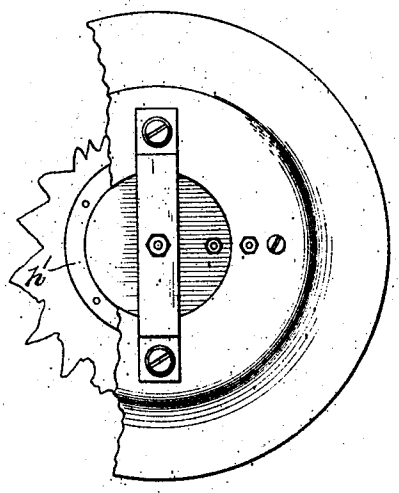


FIG. 8.



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UNITED STATES PATENT OFFICE.

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DIFFERENTIAL MICROPHONE-TRANSMITTER.

1,033,086. Specification of Letters Patent. Patented July 23, 1912.

Application filed October 24, 1910. Serial No. 588,788.

To all whom it may concern:

Be it known that I, JOHN J. COMER, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Differential Microphone-Transmitters, of which the following is a specification.

My invention relates to transmitters of the kind ordinarily known as differential transmitters.

The object of my invention is to provide an improved construction and arrangement whereby the plunger or intermediate electrode of a transmitter of this kind is held stationary between two movable electrodes. In this way I combine the agitation or shaking of the carbon granules with the differential principle of transmission in a microphone in which at least one of the electrodes is stationary. Such a transmitter is, I find, especially adapted for use in loud speaking systems, or in systems for loud transmission, such, for example, as those employed for music or other similar purposes, it being essential in such cases that the enunciation and tone be clear and pure, and it being necessary very often, in order to obtain these results, to use heavy currents, or at least currents much too heavy for the ordinary transmitter.

To the foregoing and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a longitudinal section of a differential microphone transmitter embodying the principles of my invention. Fig. 2 is a rear view of said transmitter with cap or covering removed to show the microphone. Fig. 3 is a sectional view of the microphone parts separated. Figs. 4, 5 and 6 are similar views showing another form of my invention. Figs. 7, 8 and 9 are similar views showing still a third form of my invention.

As thus illustrated, and referring to Figs. 1 to 3 inclusive, the transmitter comprises the front plate A having an opening therein for the usual mouthpiece B. The diaphragm C is seated against a shoulder a^1 on the inside of said plate, and insulated therefrom, as shown, and held in place by a disk D which is in electrical contact therewith. Said disk is provided with a central aperture d and is held in place by a clamping ring E that screws into said plate A, there being insulation between the said ring and disk whereby the diaphragm and disk are insulated from the plate A, in the manner shown. A sheet metal box or cup F has its mouth or open end provided with a flange f which is secured to the back of the diaphragm C, to form a microphone chamber for containing the front and back electrodes f^1 and f^2 and the granular carbon f^3. The said front electrode is secured by a hollow rivet f^4 to the diaphragm, and the said back electrode is secured by a hollow rivet f^5 to the back wall f^6 of the box F, being separated therefrom by a disk of mica f^7. The granular carbon f^3 is insulated from the box F by a cylinder of mica f^8. The fixed or stationary electrode f^9 is secured to a stem f^{10} and interposed between the two movable electrodes, being in the nature of a plunger. This stem extends through the rivet f^5 and is adjustably secured to the bridge f^{11}, which latter is secured to the disk D but insulated therefrom. Fluffy asbestos is used for filling the holes in the rivets f^4 and f^5, to prevent the granular carbon from escaping, the opening in the rivet f^4 being used for filling the box—that is, for introducing the said granular carbon after the parts are all assembled. The circuits for said electrodes may be of any suitable character. As shown, one terminal wire goes to the disk D, to thereby in effect connect with the front electrode f^1, another goes to the screw f^{12} that is secured to the back electrode f^2, and the third wire connects with the bridge f^{11} to thereby connect with the electrode f^9. When operated differentially, I find that the above described microphone transmitter will produce good results with heavy currents, and is, therefore, especially adapted for use in loud-speaking systems.

In Figs. 4 to 6 inclusive, the construction is substantially the same as that previously described, except that in this case the microphone box or cup G has the integral end wall g thereof secured to the diaphragm, and the open rear end of said box or cup is closed by a cap g^1 of flexible sheet metal.

In Figs. 7 to 9, inclusive, the construction is in effect the same as that shown in Figs. 1 to 3, except that the microphone box H is disposed in an opening in the center of the diaphragm, and is formed by two cups or halves h and h^1 that are secured to opposite

sides of the diaphragm to cover said opening and form a chamber between them.

Thus it will be seen that I provide a microphone box that is secured to the diaphragm, and that the mode of operation is such that the said box, although preferably made of sheet metal, does not need a flexible wall or auxiliary diaphragm, as both the front and back electrodes move by reason of the flexibility of the single large and usual diaphragm, while the middle or intermediate electrode remains fixed, or stationary to increase the resistance first on one side thereof and then on the other.

What I claim as my invention is:

1. In a transmitter, a diaphragm, front and back electrodes carried by and movable with said diaphragm, a stationary electrode between said front and back electrodes, a support, and a connection from said stationary electrode to said support, which connection is secured to said support.

2. In a transmitter, a diaphragm, a support, a differential microphone box carried on said diaphragm and movable therewith, a connection extending inside of said box, and means for securing said connection to said support.

3. In a transmitter, a diaphragm, a differential microphone box mounted on and movable with said diaphragm, a disk for clamping said diaphragm in place, a bridge on said disk, and a connection secured to said bridge and extending inside of said box.

4. In a transmitter, a diaphragm, a sheet metal box secured centrally of said diaphragm, a pair of electrodes in said box and movable therewith, a stationary electrode disposed between said movable electrodes, a support back of said box, and a connection secured to the said support and extending through one of said movable electrodes to said stationary electrode.

5. In a transmitter, a diaphragm, a differential microphone box mounted on and movable with said diaphragm, a support, a connection extending inside of said microphone, and means for adjustably securing said connection to said support.

Signed by me at Chicago, Illinois, this 12th day of October, 1910.

JOHN J. COMER.

Witnesses:
WM. B. DURNION,
E. H. CLEGG.