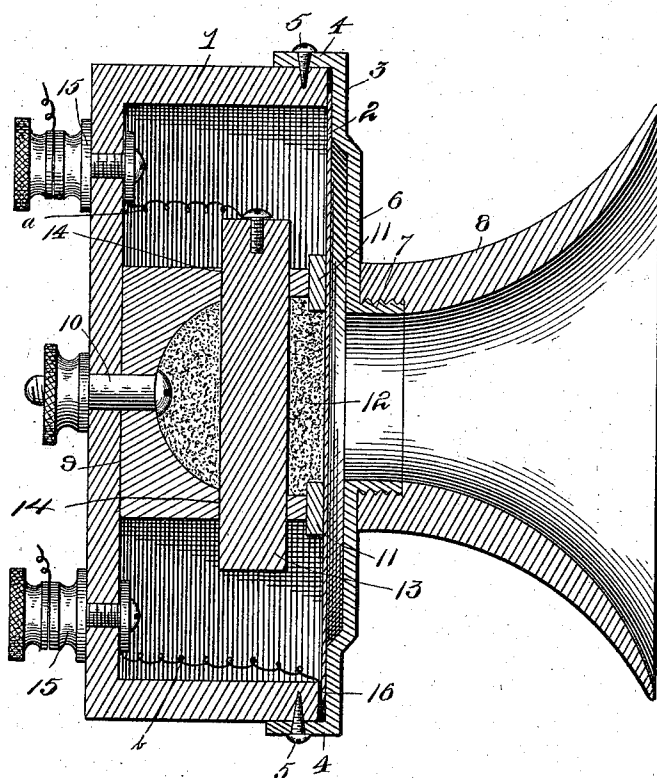


(No Model.)

E. A. BARKALOW & N. CRAWFORD.
MICROPHONE TRANSMITTER.

No. 571,504.

Patented Nov. 17, 1896.



Witnesses

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UNITED STATES PATENT OFFICE.

EDGAR A. BARKALOW AND NEHEMIAH CRAWFORD, OF KOKOMO, INDIANA.

MICROPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 571,504, dated November 17, 1896.

Application filed July 31, 1896. Serial No. 601,196. (No model.)

To all whom it may concern:

Be it known that we, EDGAR A. BARKALOW and NEHEMIAH CRAWFORD, citizens of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented a new and useful Microphone-Transmitter, of which the following is a specification.

This invention relates to microphone or telephone transmitters; and it has for its object to effect certain improvements in transmitters of this character that are operated in connection with a mass of granules of imperfectly-conducting material which is agitated by the vibratory action of the diaphragm under the influence of the sound-waves and is included in the battery or primary circuit.

To this end the invention contemplates a new and useful construction of transmitter which attains the maximum of both delicacy and volume in the reproduction of sound, while at the same time being extremely simple and having a comparatively low electrical resistance of the transmitting element.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawing the figure is an enlarged vertical sectional view of a microphone or telephone transmitter embodying the features of construction contemplated by this invention.

Referring to the drawing, the numeral 1 designates a microphone-box made of hard rubber or other suitable material and open at its front side. The open front side of the box 1 has fitted thereover the vibratory diaphragm 2, made of the usual material and clamped in place against the edges of the box by the circular metallic cap-plate 3, having a flanged rim 4 embracing the edges of the box 1 and secured thereto by means of screws 5 or other suitable fasteners. The front cap-plate 3 of the microphone-box is provided with an offset portion 6, which permits a perfect freedom of vibration for the diaphragm 2, and at its center the said cap-plate 3 is provided with an offstanding

threaded neck 7, on which is detachably fitted the mouthpiece 8 of the usual flaring or bell shape. Arranged within the microphone-box 1 in rear of the vibratory diaphragm 2 is a stationary or fixedly-positioned cup 9, detachably clamped to the rear wall or side of the box and through the closed side of the said cup. The cup 9 is made of suitable non-conducting material and is of a width nearly equaling the space between the rear wall of the box 1 and the diaphragm 2, and interposed between the annular rim of the cup 9 and the inner side of the vibratory diaphragm 2 is a circular flexible packing-ring 11, which not only serves to pack the space between the rim of the cup and the diaphragm, but also serves the important function of a damper or cushion for the diaphragm to prevent excessive or undue vibration thereof.

The stationary non-conducting cup 9 is closed at its outer side by the vibratory diaphragm 2 and is designed to be entirely filled with granulated carbon or carbon-dust 12 or an equivalent mass of granulated imperfectly-conducting material. The mass of granulated material 12 confined within the stationary cup 9 is in direct contact with the inner side of the vibratory diaphragm 2 and is illustrated as entirely surrounding a carbon pencil or bar 13, fitted in diametrically opposite and alined openings 14, formed in the walls of the cup 9 at diametrically opposite points.

The carbon pencil or rod 13 is disposed parallel with the diaphragm and has connected to one end thereof one of the wire-terminals *a*, connected with one of the binding-posts 15, fitted to the rear side of the box 1, and the other binding-post 15 has connected therewith the other wire-terminal *b*, which has a metallic connection with the diaphragm 2 at the point 16 to complete the primary or battery circuit, it being of course understood that the binding-posts 15 have the usual primary or battery circuit wire connections therewith.

While only a single pencil or rod 13 is illustrated in connection with the mass of granulated conducting material 12, it will be understood that one or more of such pencils might be used and might be only partly sur-

rounded by the granulated material without varying from the general principles of construction involved in the invention.

In the operation of the transmitter the mass of granules is agitated by the vibratory action of the diaphragm under the influence of the sound-waves, whereby the resistance of said mass to the passage of the electric current is varied correspondingly with the movements of the diaphragm, which causes the requisite variations in the current to reproduce sound.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a microphone-transmitter, the box, a vibratory diaphragm clamped over the front open side of the box and included in the primary circuit, a non-conducting cup secured within the box in rear of the diaphragm and open at its front side, a mass of granulated carbon or similar material entirely filling the cup and confined therein by the diaphragm, which is in direct contact with said material,

and a carbon pencil or rod extending through the cup and having the portion within the cup entirely surrounded by the granulated material, substantially as set forth.

2. In a microphone-transmitter, the box, a vibratory diaphragm arranged over the open side of the box and included in the primary circuit, a non-conducting cup secured within the box in rear of the diaphragm and provided with diametrically opposite aligned openings, a flexible damper or cushion-ring interposed between the annular rim of the cup and the inner side of the diaphragm, a mass of granulated carbon or similar material arranged within the cup and contacting with the inner side of the diaphragm, and a carbon pencil or rod fitted in the opposite openings of the cup and surrounded by the said mass of granular material, said pencil or rod being disposed parallel with the diaphragm, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

EDGAR A. BARKALOW.
NEHEMIAH CRAWFORD.

Witnesses:

JOHN P. HUTCHINGS,
J. R. MORGAN.