No. 827,625. PATENTED JULY 31, 1906.

C. C. GILCHREST.

TELEPHONE TRANSMITTER.

APPLICATION FILED MAR. 25, 1905.

Fig. 1.

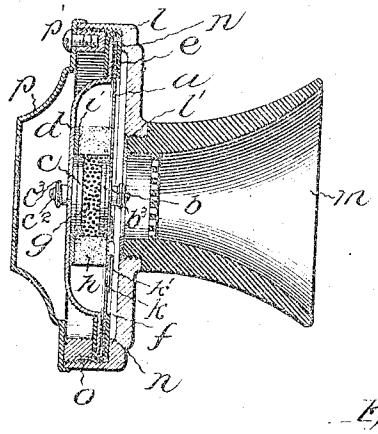


Fig. 2.

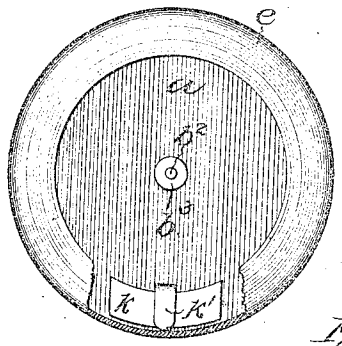


Fig. 3.

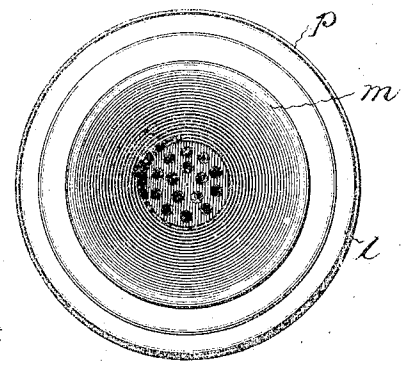
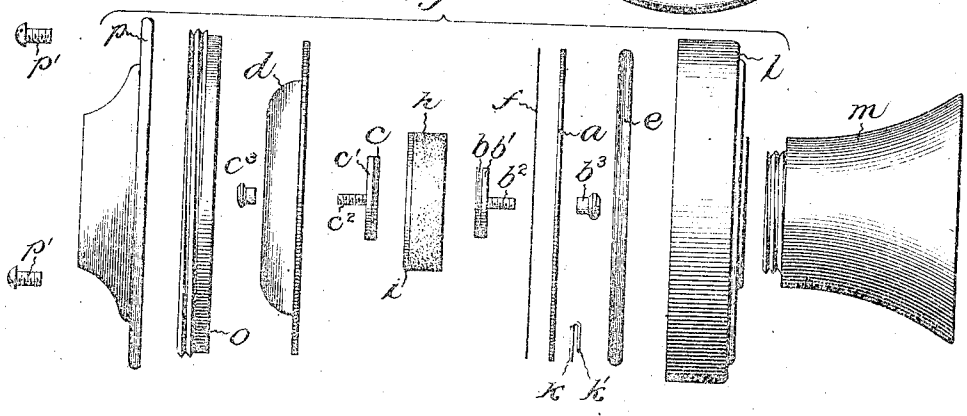


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TELEPHONE-TRANSMITTER.

No. 827,625. Specification of Letters Patent. Patented July 31, 1906.

Application filed March 25, 1905. Serial No. 252,050.

To all whom it may concern:

Be it known that I, CHARLES C. GILCHREST, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Telephone-Transmitters, of which the following is a full, clear, concise, and exact description.

My invention relates to a telephone-transmitter of the type wherein carbon or other similar material is interposed between a pair of electrodes adapted to be moved relatively to one another to vary the resistance between them.

My object is to provide a telephone of this type which will be simple and cheap to manufacture and whose working parts will be easy to assemble, replace, and renew. With this aim in view I assemble the transmitter-electrodes and their supporting parts as a unit and mount them as a single part in a suitable frame.

I will describe my invention by reference to the accompanying drawings, wherein—

Figure 1 is a longitudinal sectional view of a transmitter embodying my invention. Fig. 2 is a front view of the transmitter with the case removed and a portion of the damping-ring broken away to show the contact-terminal of the diaphragm. Fig. 3 is a front view of the transmitter; and Fig. 4 is a view of the several parts of the transmitter, showing said parts in the relative positions in which they are assembled.

The same letters of reference designate the same parts wherever they are shown.

The diaphragm *a* of the transmitter carries at its rear an electrode *b*, preferably of carbon, which faces a similar electrode *c*, mounted within a cup or dish *d*. The edge or rim of the cup *d* forms a flat seat adapted to support the diaphragm. Means are provided for preventing short-circuiting of the electrodes by said diaphragm and cup, said means preferably comprising an insulating-washer *f*, interposed between the rim of the cup and said diaphragm. A band of heavy elastic rubber *e* is provided for binding or clamping together said cup and diaphragm and interposed insulating-washer, said band being stretched over the edges of said parts as they are assembled. This band serves also as a damping-ring.

The electrode *b* may be mounted upon a suitable supporting-plate *b'*, carrying a shank b^2, which passes through the diaphragm *a*, a nut b^3 screwing upon the shank to bind the support *b'* in place. Similarly, the electrode *c* may be provided with a supporting-plate *c'*, carrying a shank c^2, passing through the disk or cup *d*, a nut c^3, screwing upon the shank c^2 to bind the support *c'* in place and serve as a terminal for said electrode.

The two electrodes *b c* are surrounded by a ring of felt *h*, and granules of conducting material *g*, such as carbon, are placed between said electrodes *b c* in the chamber inclosed by said felt ring. I preferably attach a washer *i* of non-elastic material to the ring *h*, which fits tightly upon the periphery of the supporting-plate *c'* of electrode *c* to hold the ring upon such electrode and form a cup in which the granules may be poured and held when the transmitter is being assembled. The ring *h* is flush with the diaphragm *a*, so that a closed chamber is formed for the granules.

It will be noted that the air imprisoned or sealed between the diaphragm and cup, as well as the elastic ring *h*, serves as a dampener for the diaphragm, so that it is unnecessary to employ a spring for this purpose, as was done in transmitters of the prior art.

By virtue of the arrangement above described—that is, the mounting of the opposed electrodes rigidly upon the diaphragm *a* and the cup-shaped frame or dish *d* with an elastic ring surrounding the edges of the electrodes and inclosing the space between them—it is possible to assemble the transmitter and obtain maximum transmission by merely bringing the above-mentioned parts together and holding them in position by means of the elastic damping-ring without requiring any adjusting of the electrodes, since the diaphragm in assembling the transmitter is not put under any initial tension, which would tend to impair the transmission.

The working circuit of the transmitter may, if desired, be readily kept insulated from the frame by reason of the use of the rubber band, which acts to clamp the working parts together and may serve also to electrically insulate the same from the frame. In the present embodiment of the invention, however, the diaphragm *a* is provided with a terminal device consisting of a plate *k*, lying

between the damping-ring and front surface of the diaphragm in contact with the metallic surface thereof (the japanning of the diaphragm being removed at this point) and a lip or terminal k', extending from the plate k and lying upon the outside of the damping-ring in position to contact with the inside of the metallic inclosing case. The case thus forms one terminal of the transmitter and the binding-post c^2 and nut c^3 the outer terminal thereof.

The working parts of my transmitter when assembled form a unit and may be inserted in and removed from a suitable frame as a single part. I preferably insert the transmitter unit within a cup-shaped frame l, having a central opening l' therein, into which a suitable mouthpiece m may pass, said mouthpiece being screwed into the plate over said opening. The said frame may be provided with an inner annular shoulder n, against which the portion of the damping-ring upon the diaphragm rests in order to insure free vibration of the diaphragm.

A binding-ring o is adapted to be screwed within the frame l until it rests against the portion of the damping-ring over the rim of the cup d, so holding the transmitter in proper position. A suitable back plate or cover p may then be secured to the binding-ring, preferably by screws p' p', as shown.

The transmitter above described, while efficient and substantial, is very simple and cheap to manufacture. The parts require but little skilled labor to produce or assemble. They are compact, easily fitted together, and when in place are readily accessible for purposes of adjustment or repair.

I claim—

1. In a telephone-transmitter, the combination with a diaphragm, of an electrode carried thereby, a cup or dish supporting said diaphragm, but insulated therefrom, a second electrode within said cup and secured thereto, coöperating with said first-mentioned electrode, and an elastic band fitting over the edges of said diaphragm and cup and binding the same together.

2. In a telephone-transmitter, the combination with a diaphragm, of an electrode carried thereby, a cup having a flat brim supporting the outer edge of said diaphragm, a second electrode within said cup and secured thereto facing said first-mentioned electrode, granules of conducting material within said cup between said electrodes, means for preventing the short-circuiting of said electrodes by said diaphragm and cup, and an elastic ring inclosing the outer edges of said cup and diaphragm to bind said parts together.

3. In a telephone-transmitter, the combination with a diaphragm, of an electrode carried thereby, a cup having an outwardly-projecting rim, a second electrode within the cup and secured thereto facing said first-mentioned electrode and insulated to prevent a short circuit of said electrodes by said diaphragm and cup, an elastic damping-ring inclosing the outer edges of the diaphragm and said rim to bind said parts together, an insulating cushion-ring within which said electrodes project to form a chamber, and granules of conducting material in said chamber between the electrodes.

4. In a telephone-transmitter, the combination with a diaphragm, of a carbon electrode carried thereby, a cup having an outwardly-projecting rim, a second carbon electrode within said cup and secured thereto facing the first-mentioned electrode, a rubber damping-ring inclosing the outer edge of said diaphragm and the rim to bind said parts together, an insulating-washer between said diaphragm and rim, a felt ring between the cup and diaphragm carrying a washer fitting tightly upon one of said electrodes to form a cup, the other electrode projecting into the mouth of the cup, and carbon granules in said cup between said electrodes.

5. In a telephone-transmitter, the combination with a metal diaphragm, of an electrode carried thereby, a cup having an outwardly-projecting rim, a second electrode within the cup, a supporting-plate therefor, a shank carried thereby passing through said cup, a nut for the shank adapted to bind said plate in position and serve as a terminal for said electrode, a damping-ring inclosing the outer edges of the diaphragm and rim to bind said parts together, said diaphragm and cup being insulated from each other, granules of conducting material within said cup between said electrodes, a contact-plate between said damping-ring and diaphragm in contact with said diaphragm, and a lip or terminal piece connected with said plate and lying upon the outer surface of said damping-ring.

6. The combination with a telephone-transmitter comprising a diaphragm, an electrode carried thereby, a cup, an electrode carried therein facing said first-mentioned electrode, a damping-ring for binding said diaphragm and cup together, said parts being insulated from each other, and granules of conducting material in said cup between said electrodes, of a containing-case for the transmitter having a central opening therein, and a mouthpiece secured in said opening.

7. The combination with a telephone-transmitter, of a transmitter unit, an elastic clamping-ring therefor, a containing-case for said unit, comprising a cup-shaped frame within which the transmitter is carried, said frame having a central opening therein, a binding-ring adapted to be screwed within the frame to lie against the rear of the transmitter and lock the same in position, a back plate secured to said ring, and a mouthpiece supported over the opening in the frame.

8. The combination with a telephone-transmitter comprising a diaphragm, an electrode carried thereby, a cup, an electrode carried therein facing said first-mentioned electrode, a clamping-ring for binding said diaphragm and cup together, said parts being insulated from each other, and granules of conducting material in said cup between said electrodes, of a containing-case for the transmitter comprising a cup-shaped frame within which the transmitter is carried, an annular shoulder in the inner surface of the front wall of the frame upon which the portion of the damping-ring upon the diaphragm rests to allow said diaphragm free vibration, a binding-ring adapted to screw within the frame against the portion of the damping-ring upon said rim to lock the transmitter in position, and a back plate secured to said binding-ring, said frame having a central opening therein, and a mouthpiece secured to the frame over said opening.

9. The combination with a telephone-transmitter unit comprising a diaphragm, an electrode carried thereby, a cup supporting said diaphragm, an insulating-washer between said cup and diaphragm, a second electrode within said cup and secured thereto cooperating with said first-mentioned electrode, and an elastic clamping-ring for binding said diaphragm and cup together, of a cup-shaped frame within which said transmitter unit is placed, said frame having a central opening therein, and a washer screwing into said frame to bind the transmitter unit in position.

10. The combination with a transmitter unit comprising a diaphragm, an electrode carried thereby, a cup supporting said diaphragm but insulated therefrom, a second electrode within said cup and secured thereto, coöperating with said first-mentioned electrode, and an elastic damping-ring fitting over the edges of said diaphragm and cup and binding said parts together, of a metallic containing-case for said transmitter unit, and a contact-piece *k* lying next to the diaphragm inside the damping-ring and having a portion *k'* adapted to make contact with the metallic case.

11. A transmitter unit comprising a diaphragm, an electrode carried thereby, a cup-shaped support for said diaphragm, an elastic ring for clamping said support and diaphragm together, an electrode carried by said support facing said first-mentioned electrode, means for preventing short-circuiting of said electrodes by said diaphragm and support, an insulating-ring surrounding the edges of said electrodes to form a chamber, and granules of conducting material within said chamber between the electrodes; whereby the transmitter when assembled gives maximum transmission without requiring adjustment.

12. A transmitter unit comprising a diaphragm, an electrode carried thereby, a cup-shaped support for said diaphragm, an elastic ring for clamping said support and diaphragm together, an electrode carried by said support facing said first-mentioned electrode, means for preventing short-circuiting of said electrodes by the diaphragm and its support, a cushion-ring surrounding the edges of said electrodes to form a chamber, said cushion-ring lying flush with the diaphragm, and forming, together with the air imprisoned between the support and diaphragm, a dampener for the diaphragm, and granules of conducting material within said chamber between the electrodes.

13. In a transmitter the combination with a diaphragm and a cup-shaped support therefor, of electrodes associated with said diaphragm and support, an elastic clamping-ring adapted to clamp said diaphragm and support together to imprison a body of air between them, whereby said imprisoned air constitutes a damper for the vibrations of said diaphragm.

14. In a transmitter the combination with an air-tight diaphragm and an air-tight dished support therefor, of electrodes associated therewith and adapted to be actuated by the vibrations of said diaphragm, an elastic ring embracing the peripheries of said diaphragm and support and sealing the same together to form an air-tight chamber between them, whereby a body of air is confined to serve as a damping device for the vibrations of said diaphragm.

15. In a transmitter the combination with a transmitter-casing, of a transmitter unit comprising a diaphragm, a disk-shaped support therefor, associated electrodes adapted to be actuated by the vibrations of said diaphragm, and an elastic ring clamping said diaphragm and support together and adapted to insulate the same from the casing, whereby the working parts of the transmitter are kept independent of the casing and may be inserted in and removed from the casing as a unit.

In witness whereof I hereunto subscribe my name this 14th day of February, A. D. 1905.

CHAS. C. GILCHREST.

Witnesses:
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