

No. 667,327.

Patented Feb. 5, 1901.

T. LIDBERG.
TELEPHONE TRANSMITTER.

(Application filed Oct. 3, 1900.)

(No Model.)

Fig. 1.

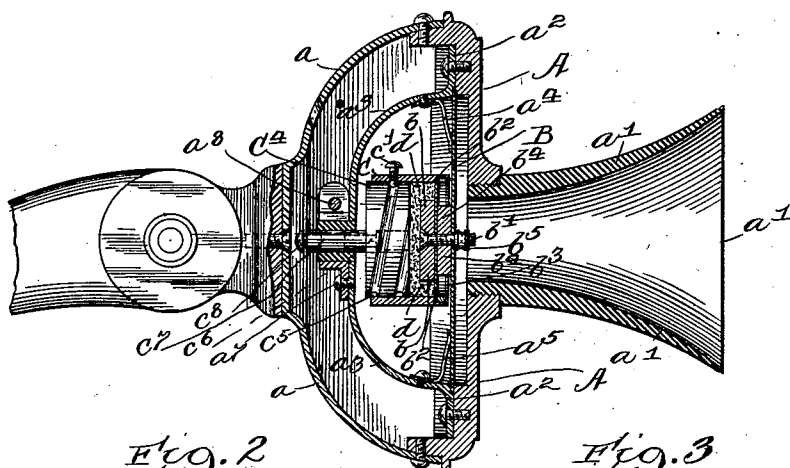


Fig. 2.

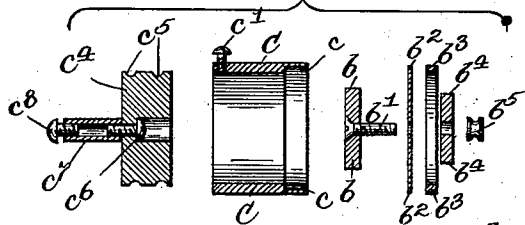


Fig. 3.

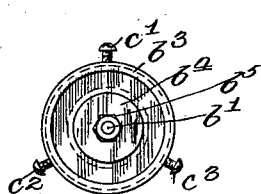
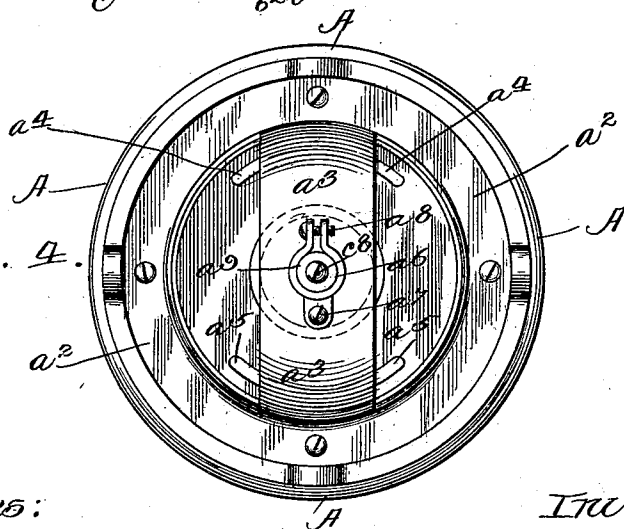


Fig. 4.



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UNITED STATES PATENT OFFICE.

TIODOLF LIDBERG, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SWEDISH-AMERICAN TELEPHONE COMPANY, OF SAME PLACE.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 667,327, dated February 5, 1901.

Application filed October 3, 1900. Serial No. 31,851. (No model.)

To all whom it may concern:

Be it known that I, TIODOLF LIDBERG, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Telephone-Transmitters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable persons skilled in the art to which it appertains to make and use the same.

One object of my invention is to produce a telephone-transmitter possessing all of the resonant and sensitive qualifications of the transmitter of the Blake type, combined with the durable and practical features of the transmitter of the Hunning type.

A further object of my invention is to produce a transmitter wherein the granules of carbon are positively and effectively confined within a given space, and whereby the space within which the said granules are confined is readily adjustable, so that the instrument may be easily adjusted after being assembled and placed in position and during the time it is being tested without the necessity, expense, and inconvenience of providing separate and distinct sizes of portions of the granular carbon-receptacle for the purpose of increasing or diminishing the space therein when required, as heretofore practiced in telephones of this description.

Another object of my invention is to provide an instrument of great simplicity, which may be cheaply constructed, easily and quickly assembled, and which provides a wide variation of adjustment after the instrument has been so assembled and is being tested, combined with great durability and cheapness in the process of construction.

In the drawings, Figure 1 is a sectional elevation of a transmitter embodying my invention. Fig. 2 shows the various parts that make up the electrical resisting medium and the case in which the said medium and electrodes are contained. Fig. 3 shows a plan view of the same after the parts have been assembled. Fig. 4 is the rear view of the transmitter with the casing removed.

In all of the views the same letters of reference indicate similar parts.

A represents a metal frame to which all the

parts of my instrument are directly or indirectly attached.

a is an inclosing casing which is fixed to the rear portion of the periphery of the disk A, which therewith incloses the working parts of the instrument.

a' is a mouthpiece screwed into the center portion of the disk A and immediately in front of the center of the diaphragm B.

a^2 is a ring by which the diaphragm is retained in position around its circumferential edges by means of the screws which are used to attach it to the disk A. Rising from this ring on opposite sides is a bridge-piece a^3 , which serves as a support for the stationary electrode of the carbon current-varying device.

a^4 and a^5 are diaphragm-springs which are attached to the bridge-piece a^3 and which bear against the diaphragm to exert an outward pressure or stress on the diaphragm for the purpose of increasing its sensitiveness. This feature of my invention has been secured to me in my Patent No. 632,355, dated September 5, 1899, and is not claimed herein.

a^6 is a clamp secured to the bridge a^3 by means of a screw a^7 . a^8 is a clamping-screw, which decreases the diameter of the said clamp when the said screw is turned therein.

b is a movable carbon button or electrode, which is attached to a small mica diaphragm b^2 by means of the screw b' and the nut b^4 , and when so assembled these pieces are attached to the large diaphragm B by means of the screw b' and the nut b^5 .

C is a metal tube, which is chambered or counterbored at one end at c .

c' , c^2 , and c^3 are three screws that are threaded into the tube C, as shown more plainly in Fig. 3. These screws are adapted to engage in the screw-thread c^5 of the stationary carbon electrode c^4 when the latter is placed within the said tube C. The stationary carbon electrode c^5 is chambered in its center to admit the screw c^6 , by means of which the tube c^7 is attached thereto. The other end of the said tube is threaded for the purpose of admitting the screw c^8 , which forms one of the terminals of my instrument. A split rubber or other insulating thimble a^9 surrounds the brass tube c^7 and is adapted to be clamped

firmly thereto by means of the clamp a^6 , whereby the stationary electrode portion of my telephone-transmitter is adjustably held in position on the bridge a^3 .

5 In assembling my instrument I place the diaphragm b^2 in the end of the tube C, which has the recess formed therein, until the said diaphragm rests upon the shoulder, due to the difference in the thicknesses of the original walls of the tube and the thin wall c . I then place the small brass ring b^3 within the tube C and press it firmly against the said diaphragm. This ring may then be soldered permanently in position in firm contact with the tube C, or the tube C may be put into a lathe after the diaphragm b^2 and the ring b^3 have been placed in position as described, and the thin walls c may be spun down until they are at right angles to their former position and form a close firm contact over the edge of the ring b^3 for the purpose of permanently retaining the centrally-perforated diaphragm b^2 in position in the tube C. The ring b^3 is not essentially necessary, as it may be entirely dispensed with, and the thin walls c may be spun down at right angles into actual contact with the diaphragm b^2 for supporting the latter within the tube C. I then place carbon electrode b inside of the tube C and put the screw through the said electrode in the manner shown in Fig. 2, placing the said screw through a hole that has been previously made in the center of the mica diaphragm b^2 . I then screw the nut b^4 over the screw b' until the said nut comes in contact with the diaphragm b^2 , and the electrode b will be thereby held firmly in place with respect to the diaphragm. I then place the screw b' , with the assembled parts attached thereto, through a hole in the center of the large diaphragm B and screw on the nut b^5 . By this means the entire movable system of electrodes is attached to the diaphragm B. I then place a quantity of granular carbon d in the tube C and insert the stationary electrode c^4 from the rear in the small end thereof after the screws c' , c^2 , and c^3 have been sufficiently withdrawn to admit of the entrance of the said electrode. These screws are adapted to enter the curved bottom screw-thread c^5 , that has been previously cut into this electrode for this purpose. Then if the space between the carbon button c^4 and the diaphragm b^2 is too large it may be decreased by first setting the screws c' , c^2 , and c^3 lightly into the thread c^5 and turning the button c^4 , when the electrode c^4 will thereby be screwed farther into the tube C. When the space has been properly adjusted in this manner, then the screws c' , c^2 , and c^3 may be firmly set, which will hold the electrode c^4 firmly in a permanent position with respect to the diaphragm b^2 .

I have found it very convenient to remove the electrode c^4 in the manner described for the purpose of varying the quantity of granular carbon d , contained within the receptacle

provided in the tube C between the two electrodes or for the purpose of making any alterations therein that may be deemed advisable without the trouble, delay, and expense of disassembling the instrument for this purpose, as has been heretofore practiced. I have also found it convenient and economical to be able to vary the space in which the granular carbon is retained after the instrument has been assembled without the necessity and expense of making new parts for this purpose, and it is also desirable because the adjustment can be so quickly made without following the usual practice of placing a larger quantity of the granular medium in the receptacle than needed and afterward removing it or placing a smaller quantity and afterward adding to it for the purpose of adjusting the relation of the space and granular material.

The operation of my instrument is apparent to those skilled in the art, and it will not be necessary for me therefore to describe in detail the method of operation.

It is of course evident that other material than carbon may be used for the stationary and movable electrodes and that a diaphragm made of other material than that described may be substituted for mica, and other means than that shown may be used for the purpose of adjusting and retaining the carbon electrode c^4 within the tube C without departing from the gist and scope of my invention.

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

1. In a telephone-transmitter, a current-varying device comprising a metal tube counterbored at one end, a flexible diaphragm adapted to rest upon the shoulder formed by the conjunction of the two diameters of the said tube, a ring surrounding the edges of the said diaphragm, for holding the said diaphragm in place, provided by turning the thin walls of the larger diameter of the said tube inwardly at right angles over the edge of the said diaphragm, an electrode fixed to the inner surface of the said diaphragm and adapted to move therewith, a stationary electrode adapted to be introduced into the open end of the said tube, a means for adjustably fixing said stationary electrode, and a granular conducting medium in the said tube between the said electrodes, substantially as set forth.

2. In a telephone-transmitter, a current-varying device comprising a metal tube counterbored at one end, a flexible diaphragm adapted to rest upon the shoulder formed by the conjunction of the two diameters of said tube, a ring surrounding the edges of said diaphragm, for holding said diaphragm in place, a permanent fastening for said ring, an electrode fixed to the inner surface of said diaphragm and adapted to move

therewith, a stationary electrode adapted to
be introduced into the open end of said tube,
a means for adjustably fixing said stationary
electrode, and a granular conducting medium
5 in said tube between said electrodes, sub-
stantially as set forth.

In testimony whereof I have signed this

specification, in the presence of two subscrib-
ing witnesses, this 19th day of September,
A. D. 1900.

TIODOLF LIDBERG.

Witnesses:

FORÉE BAIN,
M. F. ALLEN.