

(No Model.)

C. CUTTRISS.
TELEPHONE.

No. 464,959.

Patented Dec. 15, 1891.

Fig. 1

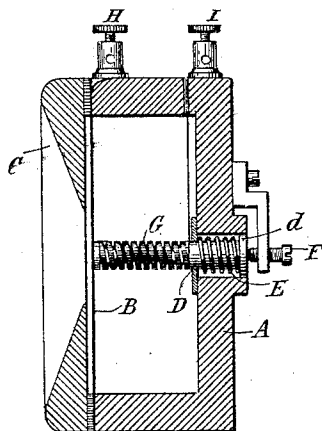


Fig. 2

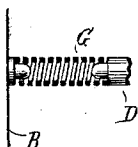
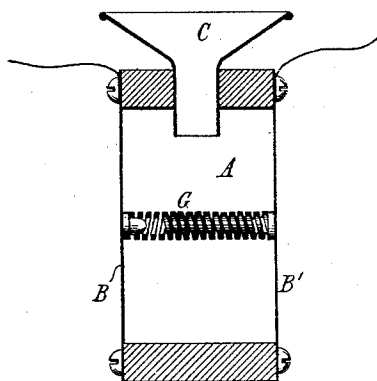


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES CUTTRISS, OF NEW YORK, N. Y.

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 464,959, dated December 15, 1891.

Application filed July 22, 1891. Serial No. 400,279. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CUTTRISS, a subject of the Queen of Great Britain, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Telephones, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention is an improvement in telephonic transmitters in which the undulations or changes in a current corresponding to the sound-waves of articulate speech are produced by the variations of the resistance of a part of the electric circuit due to the action thereon of a vibrating diaphragm.

The invention consists, broadly, in the combination, with a vibrating diaphragm, of a resistant and resilient conductor included in the transmitting-line or local circuit by the connection of its two ends with the diaphragm and a stationary terminal support, respectively, and which is bent or wound upon itself spirally in such manner that by the vibration of the diaphragm the convolutions will be closed upon themselves and to a greater or less extent according to the amplitude of the vibrations, whereby that portion of the circuit including and formed by the resistant conductor will be shunted or short-circuited to a correspondingly-varied degree and in accordance with the waves of the sounds impinging upon the diaphragm.

Specifically and in its preferred form my invention is embodied in a transmitter provided with a diaphragm, with which is arranged a spiral of carbon included in the circuit and secured to or held in contact with said diaphragm by an adjusting-screw or like device, so that the vibrations of the said diaphragm will be imparted to the spiral substantially in the direction of its central axis, whereby its spires will be brought more or less into contact or into more or less intimate contact with each other in accordance with the vibrations. Such a transmitter I have found to be exceedingly cheap and simple in construction, very efficient in its operation, easy of adjustment, and capable of varied and extended use.

The invention is shown in detail in the accompanying drawings, in which—

Figure 1 is a central sectional view of the instrument complete. Fig. 2 is a view of the carbon spring or spiral detached from the instrument, and Fig. 3 is a central section of a modified form of the instrument.

A is a small box or case of ordinary description, provided at one end with any suitable form of diaphragm B, by which I mean any such device as has been used in similar instruments for receiving the sound-waves and imparting its vibration to the electrodes. In front of this diaphragm I have shown a mouth-piece C. In the rear of the case is a brass plug or block D, provided with a head *d* at its rear end. This plug is passed into a socket or recess in the rear end of the case A, its forward end entering said case. A spiral spring E surrounds the plug and tends to force it outward or away from the diaphragm. This tendency is counteracted and provision made for adjustment of the position of the plug by a set-screw F, placed in any suitable manner in the rear of the plug and bearing on its head.

Between the diaphragm B and the plug D, and, it may be, secured to both, is a carbon spiral G. I make this spiral by winding a carbonizable strip spirally around a suitable former or mandrel and carbonizing the same in a muffle in a manner similar to that followed in the manufacture of carbons for incandescent lamps. It may, however, be prepared in any other way, it being only necessary that it should have a certain degree of elasticity or resiliency, and so that under the influence of the vibrating diaphragm it may be compressed or bent so that its spires, or in general different parts of its surface, may close upon themselves or be forced into more intimate contact, whereby the resistance of the strip as a whole will be varied in accordance with the vibrations of the diaphragm. The spiral may be composed of other materials, such as are known in the art to be capable of producing the same or similar results, and it is desirable that it have a square or rectangular cross-section, in order to secure as broad and even a surface of contact as possible between its different parts.

I may mention that I have produced excellent results by using a spiral composed of a carbonized strip of vulcanized fiber.

The connection with the usual local circuit

is made to binding-posts H and I, which are connected, respectively, with opposite ends of the spiral. The proper adjustment of this spiral is readily secured by turning the set-screw F to advance the plug D and close the spires or to permit the plug to recede and the spires to open.

It will be apparent from the nature of my invention that it is not limited in any sense to the specific form of construction or arrangement which I have shown for illustration. For instance, it is obvious that the function of the stationary support is to oppose the movement of the diaphragm. When, therefore, some such means of securing greater amplitude of vibration—such as double diaphragms—is employed, the stationary support is an imaginary point, for the diaphragms in such case move in opposite directions. I have illustrated this in Fig. 3, in which the case A is provided on opposite sides with diaphragms B and B'. The ends of the carbon spiral are connected to the two diaphragms, respectively, so that when the sound-waves are directed into the case through a mouth-piece C or are directed simultaneously against the exposed faces of both diaphragms the movements of both co-operate to distend and compress the spiral.

What I claim is—

1. In a telephonic transmitter, the combination, with a diaphragm, of a resilient resistant conducting-strip included in the circuit by the connection of its two ends to the diaphragm and a stationary terminal support,

respectively, the said strip being bent or wound upon itself spirally in such manner that by the vibration of the diaphragm its convolutions will be closed upon themselves and to a greater or less extent in accordance with the amplitude of such vibrations, as set forth.

2. The combination, in a telephonic transmitter, with a vibrating diaphragm, of a carbon spiral connected therewith and included in the circuit, and adapted to be compressed and released by the movements of vibration of said diaphragm.

3. In a telephonic transmitter, the combination, with a vibrating diaphragm and a stationary support, of a carbon spiral included in the circuit and interposed between the diaphragm and the fixed support, as set forth.

4. In a telephonic transmitter, the combination, with the diaphragm and a plug or block adjustable toward and from the same, of a carbon spiral interposed between the diaphragm and the adjustable plug and included in the electric circuit, as set forth.

5. The combination, in a telephonic transmitter, with the diaphragm and a stationary support, of a carbon spiral interposed between the same and formed of a strip square or rectangular in cross-section, as herein set forth.

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