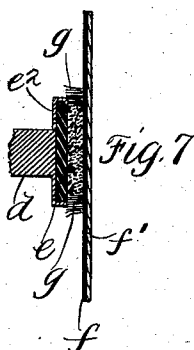
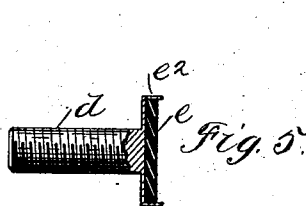
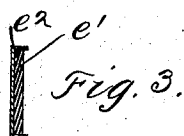
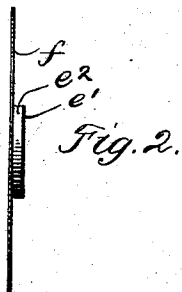
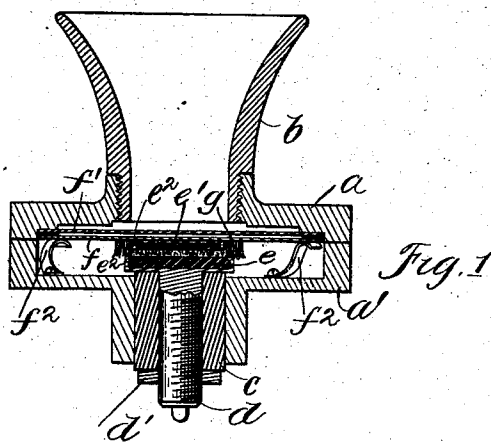


(No Model.)

A. STROMBERG & A. CARLSON.
TELEPHONE TRANSMITTER.

No. 567,324.

Patented Sept. 8, 1896.



Witnesses:
Dr. H. C. Tamm.
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Inventors:
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UNITED STATES PATENT OFFICE.

ALFRED STROMBERG AND ANDROV CARLSON, OF CHICAGO, ILLINOIS.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 567,324, dated September 8, 1896.

Application filed October 29, 1895. Serial No. 567,237. (No model.)

To all whom it may concern:

Be it known that we, ALFRED STROMBERG and ANDROV CARLSON, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephone-Transmitters, (Case No. 22,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to telephone-transmitters, and more particularly to improvements in the transmitter described in Letters Patent No. 545,922, granted to us September 10, 1895.

The object of our invention is to provide means for protecting the diaphragm against the evil effects of the moisture from the breath of one speaking into the transmitter, and, furthermore, to provide improved means for supporting the carbon electrodes or disks in position. In transmitters in which the diaphragm is formed of metal oxidation frequently takes place, due to the moisture from the breath of the person speaking into the transmitter, the diaphragm becoming oxidized or rusted to such a degree as to materially impair the operation of the transmitter. The diaphragm is sometimes made of carbon, being formed of a thin carbon plate, which serves as one electrode of the transmitter. The moisture from the breath is equally destructive of the carbon diaphragm, as the moisture penetrates the carbon and causes it to disintegrate. Furthermore, the presence of the moisture very materially impairs the operation of the transmitter.

With these objections in view it is the object of the present invention to provide means for preventing the access of moisture to the outer surface of the diaphragm, and for this purpose we provide an additional or auxiliary diaphragm situated in front of the main diaphragm, and made of a moisture-proof material, such as hard rubber, isinglass, or the like. The auxiliary diaphragm or plate may be mounted upon the surface of the main diaphragm, or, preferably, situated at a short distance from the main diaphragm, so that an air-space is formed between the two diaphragms. In the transmitter of our inven-

tion this air-space performs a useful function, as it forms a sort of cushion, which prevents the transmitter from being too sensitive and permits the approach of the speaker nearer to the diaphragm than is advisable when the cushion is absent. We are thus enabled to construct a telephone which is absolutely moisture-proof, as it is impossible for moisture to gain access to the interior of the transmitter, the auxiliary diaphragm being secured at the edge, so that the entrance of the moisture is prevented, the construction of the casing being otherwise such that the moisture cannot enter at other points.

A further feature of our invention is the provision of improved means for mounting the carbon disks, which serve as the electrodes, in their supports. When a carbon disk is to be mounted upon a metallic diaphragm, it has been the practice heretofore to electrolytically deposit copper upon the face of the carbon disk, whereby the disk may be soldered to the metallic diaphragm, or to such other metallic support as may be provided. We have found, however, that the acid to which the carbon is subjected when in the electrolytic bath has a deleterious effect upon the carbon, impairing the efficiency of the transmitter, while the carbon soon crumbles or wastes away. It is thus desirable to secure the carbon disk to its support in some other manner than by the deposition of copper thereon, and, in accordance with our invention, we mount the carbon disk in a cup-like or cylindrical support, the rim of the cup or cylinder being turned in to engage the carbon disk at the edges, and thus maintain the carbon in position.

We will describe our invention by reference to the accompanying drawings, in which—

Figure 1 is a sectional view of the transmitter embodying our invention. Fig. 2 is a view of the diaphragm, showing the carbon disk mounted thereon through the agency of the cup or cap of our invention. Fig. 3 is a sectional view of the disk and cup before the rim is turned in. Fig. 4 is a similar view after the rim is turned in. Fig. 5 is a view, partially in section, showing the stationarily-mounted disk before the rim is turned in. Fig. 6 is a view thereof after the rim has been turned in. Fig. 7 is a view showing the aux-

iliary diaphragm mounted directly upon the face of the main diaphragm.

Like letters refer to like parts in the several figures.

- 5 The casing as preferably constructed comprises two parts *a a'*, adapted to be bolted or otherwise secured together, a hard-rubber mouthpiece *b* being screwed into the portion *a*. An insulating-plug *c* passes through the rear of the casing, and through this plug the screw *d* passes, a lock-nut *d'* being provided for maintaining the screw in any adjusted position. The stationary carbon electrode or disk *e* is mounted upon the end of the screw *d*. Within the casing is provided the main diaphragm *f*, and in close proximity thereto the auxiliary diaphragm *f'*, the diaphragms being held in position preferably by springs *f² f³*, which press the edges of the diaphragm against the upper face of the casing. The diaphragm *f* is made of metal or carbon, and the diaphragm *f'* is made of rubber, mica, or the like. Upon the diaphragm *f* is mounted the carbon electrode *e'*, between which and the electrode *e* is interposed granulated carbon. A ring *g* of felt is secured to the diaphragm and presses by its face against the electrode *e* or its support to prevent the escape of the granulated carbon, while not materially affecting the movement of the diaphragm. The carbon disk or electrode *e'* is maintained within the cap or cup *e²*, having a rim adapted to be turned in at the edge, as shown in Fig. 4, to clamp the electrode in position. The electrode is thus held in intimate contact with the surface of the metallic cup or cap, and the cup may be soldered or otherwise secured to the diaphragm. The carbon remains in its original pure state and is not affected as is the case when the carbon is electroplated. Likewise, a cup or cap *e²* is provided upon the end of the screw *d*, within which the electrode *e* is placed, the end of the rim being turned in to clamp the electrode in position and to press the electrode firmly against the metallic cap to secure good electrical contact.

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

1. In a telephone-transmitter the combination with the main diaphragm, of the auxiliary diaphragm situated in front of the main diaphragm and composed of material which is not affected by moisture, the edges of said auxiliary diaphragm being firmly clamped to prevent the entrance of moisture or water around the edges of the diaphragm, an air space being left between said diaphragms whereby the transmitter is rendered moisture proof and the transmission is facilitated by the air-space; substantially as described.

2. In a telephone-transmitter, the combination with a metal diaphragm, of a metal cup soldered or otherwise secured to the rear face of said diaphragm, said cup being provided with a shallow peripheral rim, a thin plate or disk of carbon forming one electrode of the transmitter and resting within said cup, the edges of the rim of the cup being turned in to rest upon the outer face of the thin carbon disk to maintain the same securely within the cup without crushing the edges of the thin carbon disk, a plate or disk of carbon mounted stationarily and situated opposite the face of the thin carbon disk mounted upon the diaphragm, granulated carbon interposed between the two carbon surfaces thus provided, and means for maintaining the granulated carbon in position; whereby a transmitter is provided in which the carbon electrode mounted upon the diaphragm is of minimum weight and resistance and is securely mounted upon the diaphragm without the necessity of electroplating the same; substantially as described.

In witness whereof we hereunto subscribe our names this 22d day of October, A. D. 1895.

ALFRED STROMBERG.
ANDROV CARLSON.

Witnesses:

W. CLYDE JONES,
JOHN W. SINCLAIR.