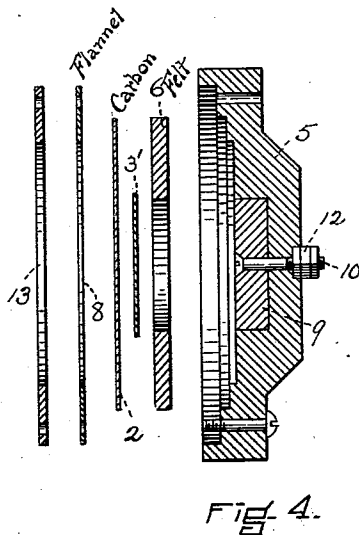
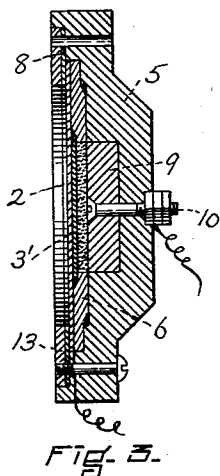
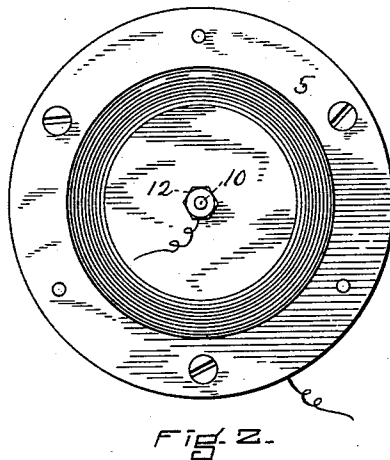
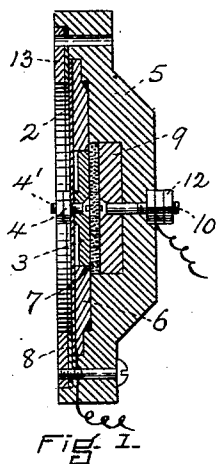


(No Model.)

F. A. RAY.
TELEPHONE TRANSMITTER.

No. 572,182.

Patented Dec. 1, 1896.



WITNESSES.

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UNITED STATES PATENT OFFICE.

FOREST A. RAY, OF BOSTON, MASSACHUSETTS.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 572,182, dated December 1, 1896.

Application filed October 23, 1895. Serial No. 566,591. (No model.)

To all whom it may concern:

Be it known that I, FOREST A. RAY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, 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 others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

My invention relates to a telephone-transmitter of the granular-carbon type or that class which employs finely-divided conducting material as a variable-resistance medium between the two electrodes of the transmitter.

The invention consists in details of construction whereby the tendency of the finely-divided conducting material to pack is reduced or overcome, and, furthermore, in the mode of mounting the diaphragm between cushion-rings, by which construction the instrument is made sensitive and transmits a strong natural tone or sound, and a hard metallic sound is obviated.

In the drawings, Figure 1 is a sectional elevation of a transmitter fitted with a piston-electrode and embodying my invention. Fig. 2 is a rear view of the same instrument within the case, showing the screws by which the assembled parts are held together, as well as the holes for the screws by which it is attached to the inside of the telephone box or door. Fig. 3 illustrates a sectional elevation of a modified construction of a transmitter embodying my invention. Fig. 4 illustrates details of construction of the instrument shown at Fig. 3 with all the parts removed from the case with the exception of the back electrode of the instrument.

The same numbers throughout this specification represent the same or corresponding parts.

In the drawings, 2 represents the sound-receiving disk or diaphragm, to which an all-carbon piston-electrode 3 is secured by a screw 4 passing through it and the diaphragm. Retaining-nuts 4' are supplied by which these several parts are locked together. The case

comprises a circular disk 5, adapted to be attached to the inside of any telephone box or door for telephone purposes of any kind. Between the diaphragm and the case 5, of the instrument is placed a very soft disk of felt 6, or any other soft yielding and insulating material, and which extends to the full diameter of the diaphragm. Said disk is centrally pierced with a hole 7, made just large enough to admit the piston-electrode.

The fixed or back electrode 9 is of carbon and is set into a recess formed in the case 5 and secured therein by a screw 10, which passes through this electrode and the case, while a nut 12 holds them together. This screw 10, which is provided with additional nuts to act as checks, forms one of the terminals of the transmitter.

One of the features in the construction of my transmitter is in interposing cushion-rings between the diaphragm and the contiguous supporting parts of the transmitter. As before premised, the rear disk is of felt, while the front cushion-ring 8 by preference is of some soft fibrous or textile material, as flannel, leather, or analogous substance. By such an arrangement the metallic tones are obviated to a great degree, and the tones of the instrument are modulated and rendered softer and more agreeable.

To retain the various assembled elements hereinbefore described within the case or in their respective positions, a retaining-ring 13 is applied, as shown. This ring is preferably composed of metal or vulcanized fiber and is pierced to admit fastening-screws, which enter the material composing the case.

Now it will be seen on reference to the drawings that the diaphragm is held by the rings 13 and 8 against the felt disk 6, which is compressed at its outer edge between the diaphragm and the shoulder within the transmitter-case. The felt disk is made just thick enough to exert a very gentle pressure between the case and the diaphragm, except around and between its edge and the shoulder within the case, where the felt presses with a firm and even pressure against the diaphragm. By the use of this felt disk, together with the soft textile or fibrous ring 8, the diaphragm of the transmitter is perfectly damped and at the same time free to vibrate,

while the size of the granular-carbon cell employed renders the instrument sensitive and not liable to pack.

5 The cell of the transmitter should be nearly filled with any good fine granulated carbon and electrical connection made with its diaphragm in any suitable manner to form the remaining terminal of the transmitter.

10 In Figs. 3 and 4 the transmitter is without the carbon piston-electrode 3, while a thin carbon disk 3' is substituted, this disk being soldered to the diaphragm. In lieu of attachment in this manner the center of the diaphragm may itself be coated with carbon in any suitable
15 manner, which will answer in this way to form a carbon electrode for the transmitter. However, when the disk electrode 3' is employed the final electrode 9 is made slightly thicker to avoid too great a depth of the carbon cell,
20 which would otherwise create excessive resistance in the instrument.

Furthermore, it is to be understood that especial advantage is gained by the method herein shown of arranging dampers and hold-

ing the diaphragm of my transmitter, whereby its tone is made loud and natural, the enunciation clear and distinct, while at the same time the instrument is rendered sensitive as well as non-metallic. 25

What I claim is—

30 The combination with a sound-receiving diaphragm, a thin carbon disk affixed on one side thereof, and an apertured damper-disk to cover the remaining side surface of the diaphragm, of an exterior casing, a fixed electrode therein, an exterior retaining-ring, a
35 felt damper-ring circumferentially between the retaining-ring and the diaphragm, and a cell to contain finely-granulated material as a variable resistance, substantially as set forth and described. 40

In testimony whereof I affix my signature in presence of two witnesses.

FOREST A. RAY.

Witnesses:

H. E. LODGE,
FRANCIS C. STANWOOD.