

W. W. DEAN.
TELEPHONE TRANSMITTER.
APPLICATION FILED JAN. 27, 1902.

1,141,107.

Patented June 1, 1915.

Fig. 1.

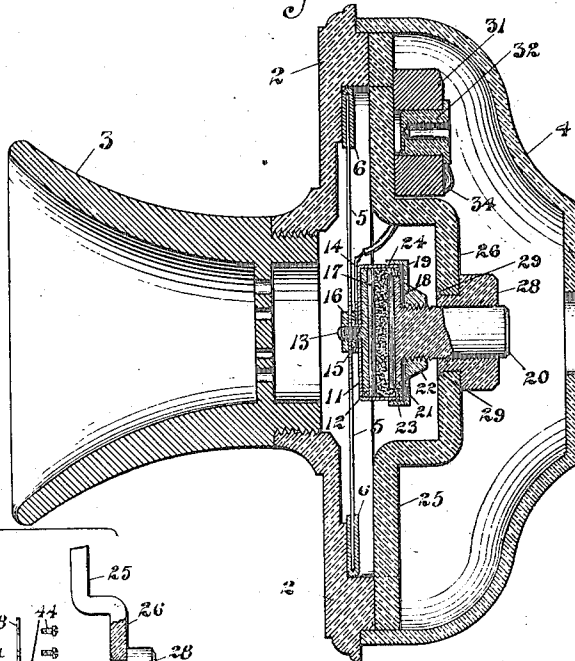


Fig. 4.

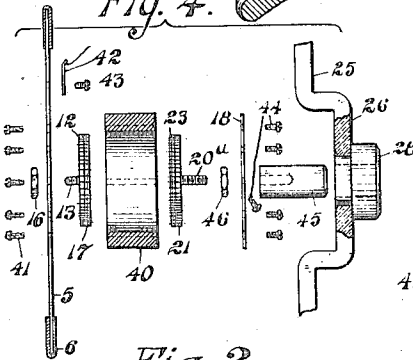


Fig. 2.

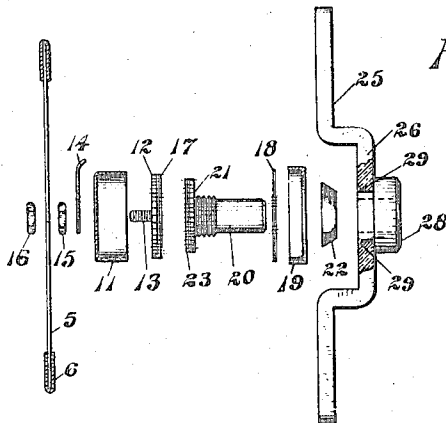


Fig. 6.

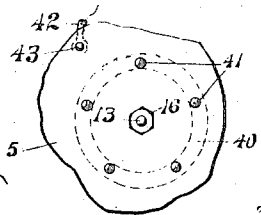


Fig. 5.

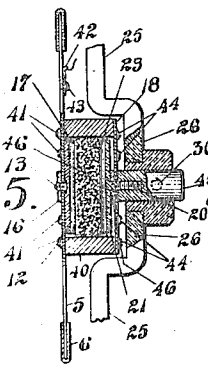
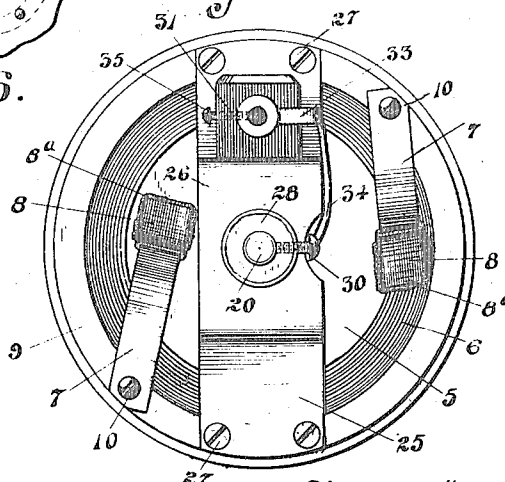


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM W. DEAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TELEPHONE-TRANSMITTER.

1,141,107.

Specification of Letters Patent.

Patented June 1, 1915.

Application filed January 27, 1902. Serial No. 91,456.

To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Telephone-Transmitters, (Case No. 54,) of which the following is a specification.

My invention relates to telephone transmitters of the type employing comminuted conducting material as the resistance varying medium interposed between two electrodes adapted to partake of relative movement.

In my Patent No. 687,499, dated November 26th, 1901, I have shown, described and generically claimed one species of my invention, in which the diaphragm is laterally offset, and the chamber for the comminuted material is located in such offset portion.

The subject matter of the present application forms a different species of the same generic invention, illustrated in said patent, and embodies a structure in which the chamber for the resistance varying medium is located in a separate cup carried by the diaphragm.

A supplemental diaphragm or ring serves to close the cup and suitable electrodes associated with said cup and supplemental diaphragm are provided within the chamber, the back electrode, which is associated with said supplemental diaphragm, being preferably provided with a rigid abutment or support.

In the accompanying drawing, forming a part of this specification, in which the same reference characters designate like parts throughout, Figure 1 is a sectional view of the invention; Fig. 2 is a view of the detached parts thereof; Fig. 3 is a back view of the same; Fig. 4 is a view of the detached parts of a modified form; Fig. 5 is a sectional view of the same, and Fig. 6 is a face view of the diaphragm thereof.

A support or front piece 2, of any desired form carries the usual mouth piece 3 and is supported by the inclosing casing 4.

The main diaphragm 5 is provided upon the periphery with the usual packing-ring 6 of rubber or similar material, and is adapted to be yieldingly pressed against the face or support 2 by means of the springs 7 carrying pads 8 of rubber or like material upon

the free ends and bearing upon pads of felt or flannel 8^a, their other ends being secured to the raised rib 9 by suitable screws 10.

The cup which holds the comminuted material, preferably granular carbon, and forms the chamber, is a receptacle 11, preferably of light metal. Within this cup or chamber is supported one of the electrodes of the microphone, which preferably takes the form of a metal disk 12, provided with a threaded shank 13 adapted to extend through an aperture in the bottom of the chamber 11. A washer or terminal clip 14 is then slipped over the threaded shank 13 and a nut 15 is tightened against the same to bind them in intimate and firm mechanical and electrical contact. The said shank is then extended through a central aperture in the diaphragm 5 and a nut 16 placed thereon, and screwed tightly against the outer face of the diaphragm to firmly secure the cup or chamber thereto. Upon the face of the disk 12 a carbon disk 17 is mounted, preferably by electroplating the face of the carbon disk and then soldering the same to the disk or plate 12. It will be understood that the electrode may be formed in any other desired manner. The side walls of the chamber may be lacquered or otherwise insulated, or they may be depended upon to form the electrode, though not so efficiently.

The flexible supplemental diaphragm 18 of mica or any other suitable material is clamped at its periphery to the edge of the cup or chamber by means of a set ring 19, which is tightly forced thereover, the supplemental diaphragm or ring thus serving to close the chamber, thereby avoiding the use of felt, plush, or other material which compresses in time. This mica diaphragm 18 is provided with a central opening through which the shank 20, carrying the back electrode plate or disk 21, is adapted to pass. The said shank is threaded in the rear of the mica ring 18 and a nut 22 is placed thereon and tightened against the ring to firmly clamp it between the nut and disk. The face of the disk 21 is also provided with a carbon disk 23, mounted in a manner similar to the disk 17. The back electrode is of less diameter than the chamber to permit the freer vibration of the mica diaphragm and also to allow the

granules 24 to rest upon the periphery of the electrode as well as between the electrodes.

A transverse support or bridge piece 25, having its central portion 26 rearwardly deflected to accommodate the chamber and related parts, is mounted at the ends upon the front plate 2 and is secured thereto by suitable screws 27. It is provided with a central opening adapted to receive the shank of the block 28 which is preferably rigidly secured to the bridge as by upsetting the metal at points 29. The shank 20 passes through this block 28 and may be adjusted in position within the base thereof and clamped in place by means of the set screw 30. The electric circuit from the rear electrode is completed through said shank 20 and bridge 25 and may be extended in any desired way.

Upon one end of the bridge 25 an insulating block 31 is mounted in any suitable manner, in which block is held a binding post 32, adapted to receive the end of a conductor from one side of the transmitter circuit, and having a clip 33, from which a conductor 34, leads to the clip 14. A set screw 35 is used to secure the said end of the circuit conductor to the post and as it passes through the walls of the block 31, it assists in holding the post 32 in place. These parts are therefore in the side of the circuit from the front electrode of the instrument.

In operation the sound waves impinge the diaphragm 5 and set it in vibration, thereby causing the electrode carried by it to approach the stationary electrode and to recede therefrom to vary the resistance through the microphone.

In the modification shown in Figs. 4, 5 and 6, the same front piece 2, inclosing casing 4, and mouth-piece 3, as shown in Fig. 1, are intended to be used. The cup or receptacle forming the chamber for the granules in this form of the invention is composed of a hard rubber ring 40, adapted to be secured to the rear face of the diaphragm 5 by means of suitable screws 41 passing through the diaphragm and threading into the edge of the ring 40. The front electrode 17 is formed in a manner similar to that shown in Fig. 1, and is secured to the plate 12 provided with the shank 13 passing through an aperture in the diaphragm 5 and firmly secured thereto by a nut 16. A terminal clip 42 is adapted to be secured to the diaphragm 5 by means of a suitable screw 43, one side of the circuit of the transmitter being completed through this clip. A supplemental diaphragm or flexible member 18 which is adapted to close a cup 40 is arranged to be secured at its edge to the edge of the ring 40 by means of screws 44 passing through suitable apertures

in the diaphragm and threading into the ring. This supplemental diaphragm is a thin sheet metal, but, of course, may be made of other suitable material. The back electrode 23 corresponds to the similar electrode of the transmitter shown in Fig. 1, and is secured to a similar plate 21 provided with a shank 20^a adapted to thread securely into a metal block 45, a nut 46 being placed upon the said shank in the rear of the supplemental diaphragm 18 to secure the electrode and diaphragm or flexible member together. The block 45 passes through an aperture in a second block 28 fixed in the rearwardly deflected portion 26 of the bridge strip 25, and is adapted to be adjustably secured therein by means of a suitable set screw 30 in a manner similar to that of Fig. 1. The bridge in this case corresponds in all respects with that shown in Fig. 1, and is secured in notches in the raised rib 9 of the front piece 2 in the same way. These parts are shown assembled in Fig. 5 and the granular carbon 46 is placed in the cup or chamber formed by the ring 40 and between the front and rear electrodes. In the operation of the device, the sound waves strike the diaphragm 5 and set it together with the front electrode into vibration. The rear electrode is secured in the block 28 during this movement of the diaphragm and the carbon between the two electrodes is therefore subjected to a varying pressure, the current passing through the microphone being correspondingly changed to agree with the sound waves striking the diaphragm. In Fig. 6 the face of a portion of the diaphragm is shown showing the location of the apertures through which the screws 41 pass to secure the ring 40 in place upon its rear face.

It is apparent that various modifications may be made in the details of construction without departing from the spirit of the invention, and I, therefore, do not wish to be limited to the precise details shown.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

In a telephone transmitter the combination with a front plate, of a bridged member supported thereby, a suitable main diaphragm carried by said front plate, a support and independent chamber for the granules carried by said diaphragm and detachably secured thereto, said chamber comprising a cup-shaped member having a supplemental diaphragm and clamping ring forced over the periphery of said member for peripherally securing said supplemental diaphragm to said member so as to seal the same, a pair of disk faced studs one secured to said cup member and main diaphragm and the other being secured in said auxiliary diaphragm, the disk portions of said studs

being located within said chamber, a pair of electrodes carried inside of said member by said studs, means for rigidly securing the stud associated with the auxiliary diaphragm directly to said bridge member, and
5 comminuted conducting material within said chamber between said electrodes.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM W. DEAN.

Witnesses:

T. W. DUNBAR,
ROBERT LEWIS AMES.