No. 885,007. PATENTED APR. 21, 1908.

A. E. BEACHUM.

TELEPHONE TRANSMITTER.

APPLICATION FILED AUG. 7, 1907.

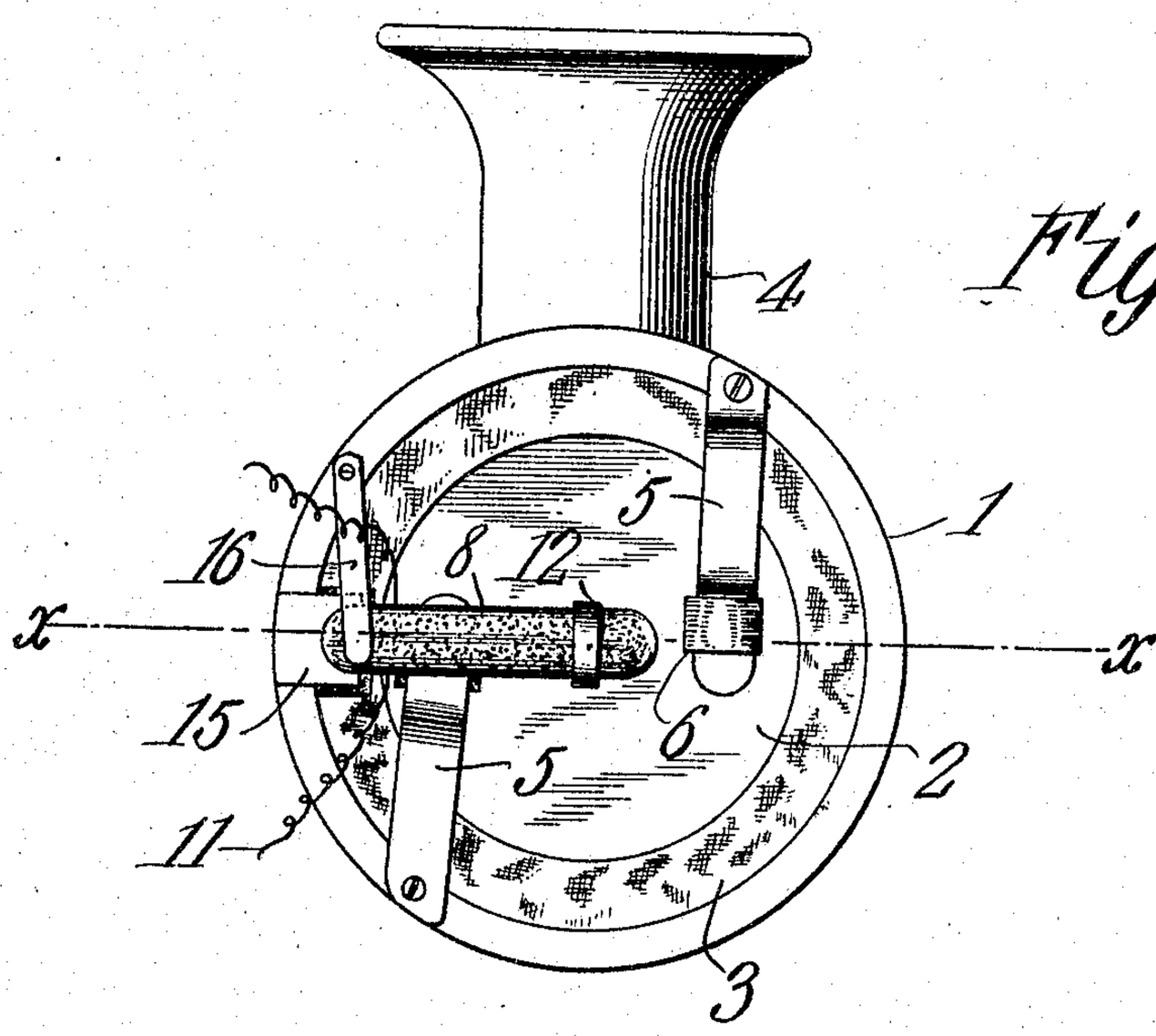

Fig. 1.

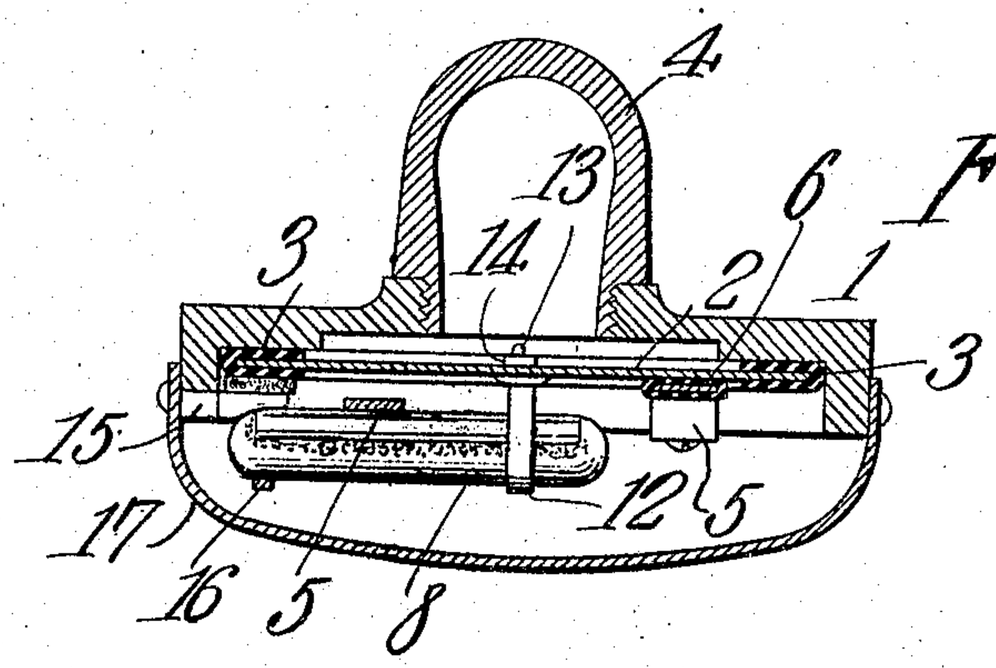

Fig. 2.

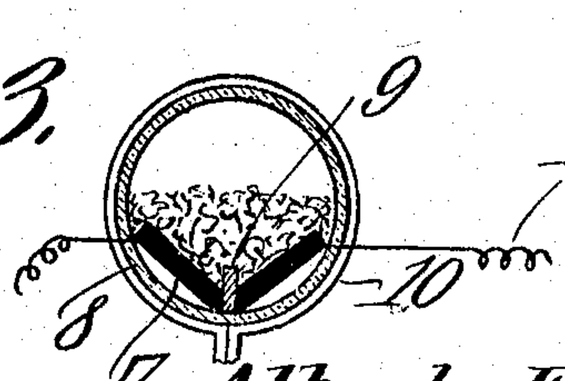

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALBERTA E. BEACHUM, OF POLKTON, NORTH CAROLINA.

TELEPHONE-TRANSMITTER.

No. 885,007. Specification of Letters Patent. Patented April 21, 1908.

Application filed August 7, 1907. Serial No. 387,525.

To all whom it may concern:

Be it known that I, ALBERTA E. BEACHUM, a citizen of the United States, residing at Polkton, in the county of Anson and State of North Carolina, have invented a new and useful Telephone-Transmitter, of which the following is a specification.

This invention has reference to improvements in telephonic transmitters, and its object is to produce a transmitter of the loud speaking type wherein the microphonic element is self adjusting, non-packing, non-burning to strong currents, and has great carrying capacity, efficiency, and durability.

The invention consists essentially in a telephonic transmitter, the microphonic element of which consists of a vacuum tube containing separated electrodes bridged by a mass of granulated conducting material. The tube is supported near one end at the center of the diaphragm, which latter may be of the ordinary type, and the other end of the tube may be supported at a convenient point on the casing, so that the tube may participate in the movements of the diaphragm.

The invention will be best understood from a consideration of the following specification, taken in connection with the accompanying drawings, in which

Figure 1 is a plan view of the improved transmitter with the protecting casing removed. Fig. 2 is a section therethrough on the line *x*—*x* of Fig. 1. Fig. 3 is a section on an enlarged scale through the microphonic element.

Referring to the drawings, there is shown the usual receptacle 1 in which is seated a diaphragm 2 surrounded at its periphery by dampening gaskets 3 as is usual in telephonic transmitters. Attached to the receptacle 1 is a mouthpiece 4, but, instead of projecting straight out from the receptacle, after the manner of the more ordinary forms of transmitters, this mouthpiece projects first outward from the receptacle and then parallel therewith, so that the diaphragm may lie flat, or substantially so, that is, the diaphragm is located in the horizontal plane or in a plane approaching the horizontal. The diaphragm is held in place by the usual springs 5 fast at one end on the receptacle 1 and at the other end engaging the diaphragm through the intermediary of dampening sleeves 6. As thus far described, the transmitter does not differ in any material respect from transmitters in commercial use.

The microphonic element comprises a plurality of circuit terminals which may be in the form of plates, and in the drawings two such plates 7—7, preferably of carbon, although not necessarily so, are shown. These two plates are housed in a tube 8 of non-conducting material, such, for instance, as glass. The plates are placed with their edges in juxtaposition but not into actual contact, being separated by a narrow band 9 of insulating material, such, for instance, as mica.

Within the tube is placed a quantity of granulated material 10 which may be composed of carbon granules, though not necessarily confined to carbon, since I have found that other granulated materials will answer the purpose quite well. To each carbon plate there is attached a conductor 11 which may be carried out through the glass tube 8 and sealed therein in any well-known manner.

When the conducting plates 7 and the granulated material 10 have been properly placed within the tube 8, the latter is exhausted by means of a suitable vacuum pump and then sealed. The microphonic element, as shown, therefor consists of a vacuum tube containing two spaced and insulated electrodes of comparatively large area bridged by a mass of conducting granules.

Near one end the tube 8 is encircled by a band 12 from one side of which extends a stud 13 passed through the center of the diaphragm and held thereto by a nut 14, or otherwise. The tube 8 is spaced a short distance from the diaphragm by the band or collar 12, and this tube is disposed radially with reference to the diaphragm and its other end is supported by a bracket 15 projecting from the receptacle 1. The end of the tube resting on the bracket 15 may be held in place by a suitable spring 16 fastened to the receptacle 1. Finally a protecting casing 17 is secured to the receptacle 1 so as to inclose that side of the receptacle containing the diaphragm and microphonic element.

Now let it be assumed that the parts are all properly assembled and that the transmitter is connected up in the telephone circuit in the usual manner, but with the diaphragm approximately horizontal and

the microphonic element above the same. Now, when sound waves strike the diaphragm, the motion imparted to the diaphragm by such sound waves is transmitted to the vacuum tube and disturbs the granules to an extent corresponding to the amplitude of vibration of the sound waves. The resistance of the microphonic element is, of course, correspondingly varied and the sound waves are converted into electric undulations in the usual manner. However, the carbon granules are not packed in place and cannot become packed in use. Also, because of the vacuum, the displacement of the granules meets no resistance except that of their inertia, consequently, there is greater freedom of movement and greater variation of resistance with the result that the transmitter is loud speaking. Furthermore, heavy currents may be used without danger of burning the granules, owing to the fact that they operate in a vacuum. For this reason, the transmitter has greater carrying capacity than other types of transmitters.

Because of the peculiar construction, the microphonic element is self adjusting for strong or weak sounds and no adjustments are necessary in assembling the instrument.

Furthermore, by the use of the vacuum tube, all moisture is excluded from the microphonic element and the latter is therefore moisture-proof.

What is claimed is:—

1. In a telephonic transmitter, a diaphragm and a microphonic element consisting of a vacuum tube parallel to and connected to the diaphragm, carbon terminal plates within and extending longitudinally of the tube and in close relation to but insulated one from the other, and carbon granules also within the tube for bridging said terminal plates.

2. A telephonic transmitter including a diaphragm and a microphonic element comprising a vacuum tube connected to the diaphragm and extending parallel therefrom, said tube inclosing circuit terminals and a mass of conducting granules for bridging said terminals.

3. A telephonic transmitter including a diaphragm, and a microphonic element composed of a vacuum tube connected near one end to the center of the diaphragm and supported at the other end to lie parallel with the diaphragm, said vacuum tube containing circuit terminals, and a mass of conducting granules for bridging said circuit terminals.

4. A telephonic transmitter comprising a suitable receptacle, a diaphragm carried thereby, and a vacuum tube connected at one end to the center of the diaphragm and having the other end supported by the receptacle, said vacuum tube containing a plurality of separated insulated carbon plates each with one edge adjacent to but out of contact with the like edge of the next plate, and a mass of carbon granules for bridging said plates across the adjacent edges.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALBERTA E. BEACHUM.

Witnesses:
C. W. THOMAS,
T. E. MONROE.