J. COLLINS.

TELEPHONE TRANSMITTER.

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1,067,718.

Patented July 15, 1913.

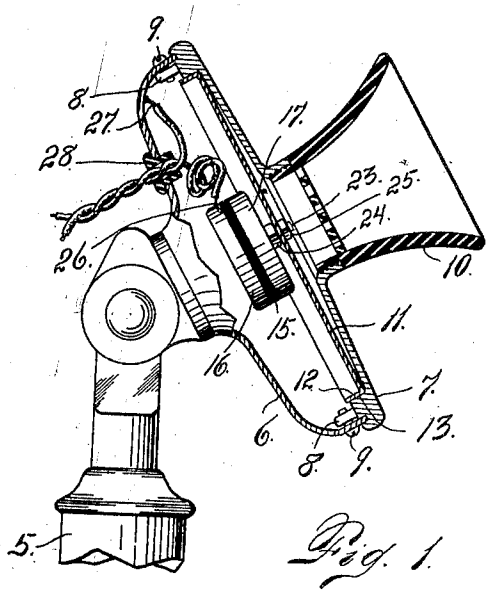


Fig. 1.

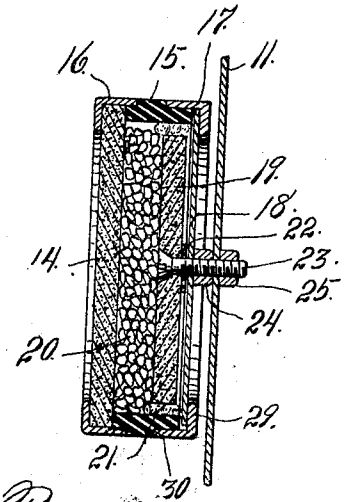


Fig 2

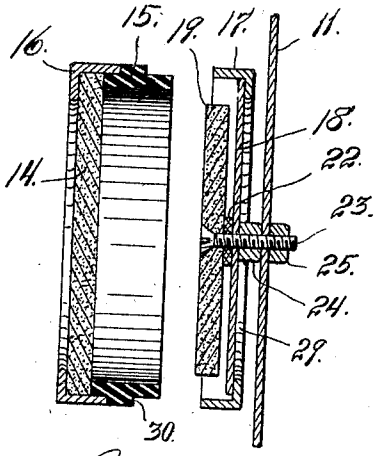


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

JAIRUS COLLINS, OF QUAKER CITY, OHIO, ASSIGNOR OF ONE-HALF TO W. K. COLLINS, OF CRIPPLE CREEK, COLORADO.

TELEPHONE-TRANSMITTER.

1,067,718. Specification of Letters Patent. Patented July 15, 1913.

Application filed October 21, 1912. Serial No. 726,928.

To all whom it may concern:

Be it known that I, JAIRUS COLLINS, a citizen of the United States, residing at Quaker City, county of Guernsey, and State of Ohio, have invented certain new and useful Improvements in Telephone-Transmitters; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in telephone transmitters.

One object is to so form the vibratory diaphragm as to permit its being quickly assembled and disassembled, providing an even tension upon the entire circumference, and doing away with the usual soft rubber cushioning band.

Another object of my invention is to provide a transmitter of the type in which both electrodes and their correlated parts are supported entirely upon the diaphragm, and in which the casing containing the electrodes is supported upon the diaphragm only by a flexible insulation plate which forms the front cover of the casing, the front electrode being rigidly supported with respect to the diaphragm. In my construction, a rear electrode is maintained practically stationary by the force of inertia, while the front electrode, being attached rigidly to the vibrating diaphragm, receives all of the vibrations of the latter, and transmits them to the resistance varying medium.

In the drawing: Figure 1 is a side view, partly in section, showing the general arrangement of my invention. Fig. 2 is a diametric cross section through the transmitter proper, and a portion of the diaphragm, the parts being shown in magnified proportions for the sake of clearness. Fig. 3 is a view similar to Fig. 2 but showing one portion of the transmitter separate from the other portion, and the resistance varying medium removed.

The same reference characters indicate the same parts in each of the views.

I have illustrated my invention as applied to the transmitter of a desk set, 5 being the upright of such a set. The rear portion 6 of the transmitter is formed of metal, as usual, the face-plate 7 being formed also of metal, and attached to the rear portion 6 by means of lugs 8 and screws 9, as shown, or by any other suitable means. Into the face-plate is threaded a mouth-piece 10 of the ordinary type. The vibratory diaphragm 11 is of metal or other suitable material, and is bent forwardly at its periphery to form a continuous flange 12 extending entirely around the diaphragm, which flange is adapted to tightly engage against an inner shoulder 13 formed upon the back of the face-plate 7 and extending entirely around the same. This means of securing the diaphragm to the face-plate forms an important feature of my invention, as the parts may be readily assembled or disassembled merely by the use of slight pressure upon one or the other side of the diaphragm, and the use of the customary soft rubber cushioning pad is avoided.

The resistance varying medium, preferably carbon granules, is inclosed within a case of drum shape, of which the back electrode 14 may be utilized to form the rear closure. The cylindrical portion of the casing is composed of a ring 15 of hard rubber or other insulating material, the electrode 14 and ring 15 being securely fastened together by an annular metal member 16. A similar metal member 17 surrounds the ring 15 upon the other side and holds loosely in place the insulation plate 18, which I prefer to make of hard rubber, but for which mica is suitable. The front electrode 19 is of a diameter slightly less than the inside diameter of the ring 15, thus preventing any friction between the two parts when the device is in use. Carbon granules 20 are placed between the electrodes 14 and 19, and nearly fill the space between these two elements. In order to prevent these granules from crowding into the annular space between the electrode 19 and the ring 15, and between the electrode 19 and the plate 18, thus preventing the proper operation of the device, I place cotton fiber 21 in said annular space. However, I do not wish to limit myself to the use of cotton fiber for this purpose, as it will be readily understood that any fluffy packing material which will

not form an appreciable resistance to the movement of the parts upon each other, will be satisfactory. It is advisable that a space be left between the plate 18 and the electrode 19, and for this purpose I locate a washer 22 centrally between said parts.

A screw-bolt 23 is passed through openings in the electrode 19, washer 22, insulation plate 18, and diaphragm 11, a nut 24 being screwed thereon to hold the parts 19, 22 and 18 in fixed relation, and a nut 25 is utilized to hold the bolt 23 and the casing carried by it upon the diaphragm 11.

Suitable electrical connections are made by the attachment of one wire 26 to the metallic member 16 in contact with the back electrode, and by the attachment of another wire 27 to the rear portion 6 of the transmitter, the current being conducted from this point through the metallic members 6, 7, and 11, and through the screw-bolt 23 to the front electrode 19. An insulation bushing 28 protects the wires from possible damage and consequent short-circuit through contact with the sharp edges of the hole in the rear portion 6 of the transmitter.

Particular attention is called to the fact that the plate 18 is smaller in diameter than the inside diameter of the annular member 17, and also that it is thinner than the space between the rubber ring 15 and the substantially vertical portion 29 of the annular member 17, when said annular member is forced up firmly against the shoulder 30 of the rubber ring 15. By reason of this construction, that part of the casing which includes the back electrode 14, ring 15 and annular members 16 and 17, hangs loosely from the upper edge of the insulation plate 18, permitting this plate 18 to move back and forth within the casing in response to the vibrations of the diaphragm 11, while the casing, (including that part shown at the left in Fig. 3 and the annular member 17), remains practically stationary, due to the fact that the inertia of the comparatively heavy casing overcomes the tendency of the latter to move with the motion of the plate 18 in response to the vibrations of the diaphragm. I, therefore, have a substantially fixed electrode 14 upon one side of the carbon granules, and an electrode 19 upon the other side of the granules vibrating with the diaphragm 11. This motion acts upon the granules to vary the resistance of the latter, causing variations in the intensity of the current passed through the granules, thus electrically transmitting sound, as will be well understood by those skilled in the art.

I claim:

1. In a telephone transmitter, a diaphragm, an insulation plate and a front electrode, both supported centrally upon said diaphragm, a casing including a back electrode, said casing being hung loosely from said insulation plate, and a resistance varying medium located within said casing between the electrodes.

2. In a telephone transmitter, an insulation ring, a back electrode securely fastened to said ring upon one side the periphery of the latter, a vibratory diaphragm, an insulation plate and a front electrode, both supported centrally upon said diaphragm, an annular member clamped upon said insulation ring on the side opposite said back electrode, said annular member having an in-turned flange loosely engaging said insulation plate, the latter being of a diameter slightly less than the inner diameter of said annular member whereby the said annular member, with the insulation ring and back electrode, hangs loosely upon said plate, and a resistance varying medium located within said insulation ring between the electrodes.

3. In a telephone transmitter, an insulation ring, a back electrode securely fastened to said ring upon one side of the periphery of the latter, a vibratory diaphragm, an insulation plate, a front electrode of a diameter less than the inside diameter of said ring, said insulation plate and front electrode being both supported centrally upon said diaphragm, an annular member clamped upon said insulation ring on the side opposite said back electrode, said annular member having an in-turned flange loosely engaging the said insulation plate, the latter being of a diameter slightly less than the inner diameter of said annular member whereby said annular member, with the insulation ring and back electrode, hangs loosely upon said plate, soft packing arranged within the annular space between said ring and front electrode, and a resistance varying medium located within said insulation ring between the electrodes.

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

JAIRUS COLLINS.

Witnesses:
EUGENE BENSON,
W. D. BORTON.