W. W. DEAN.

TELEPHONE TRANSMITTER.

APPLICATION FILED JUNE 12, 1916.

1,277,875.

Patented Sept. 3, 1918.

Fig. 1

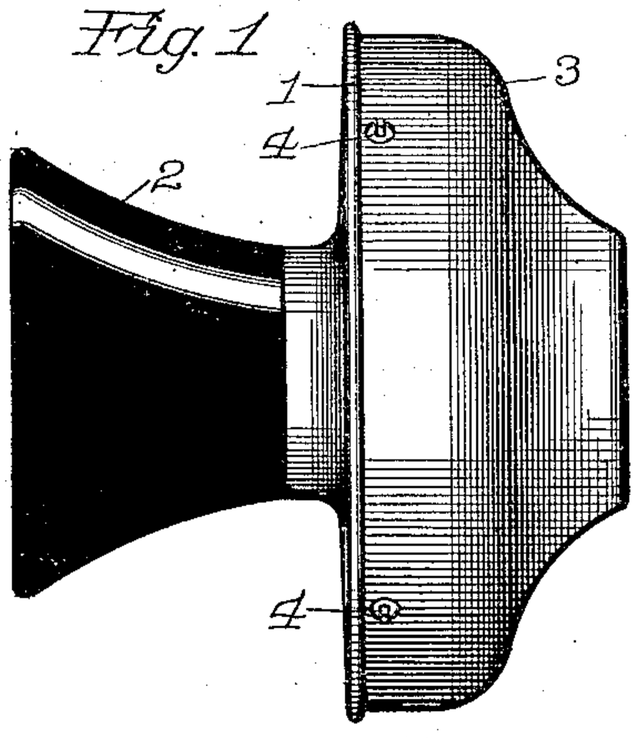


Fig. 2

Fig. 3

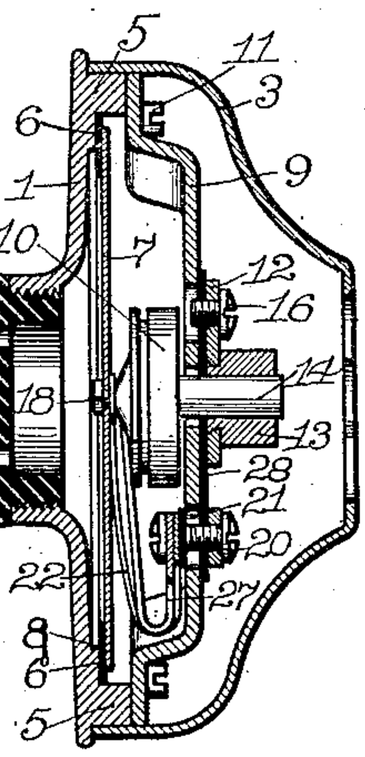
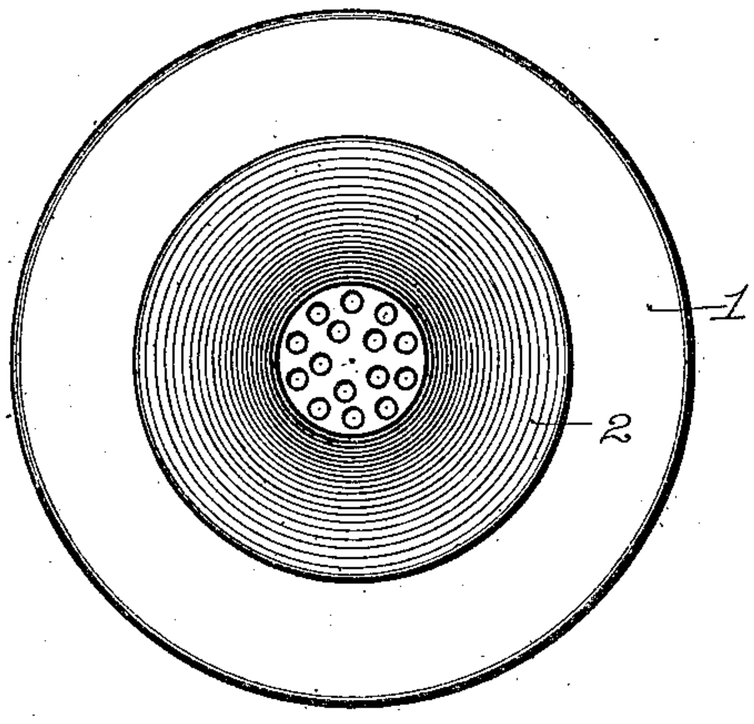


Fig. 4



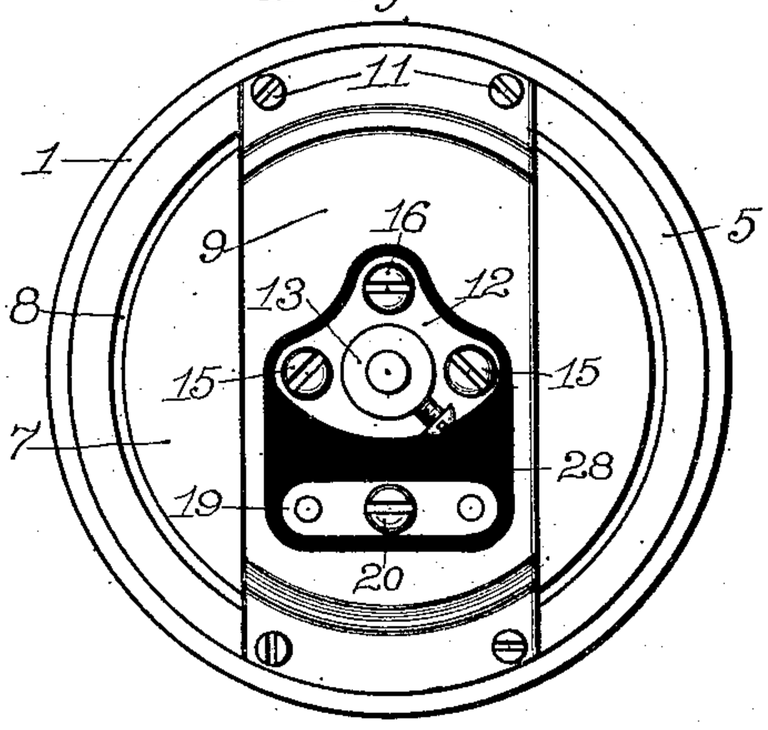


Fig. 5

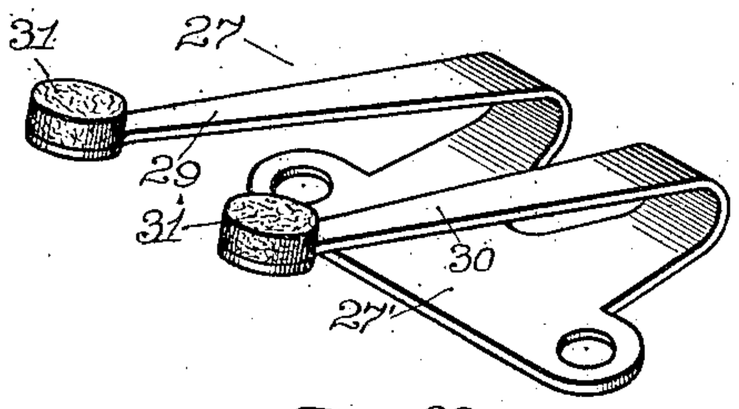


Fig. 6

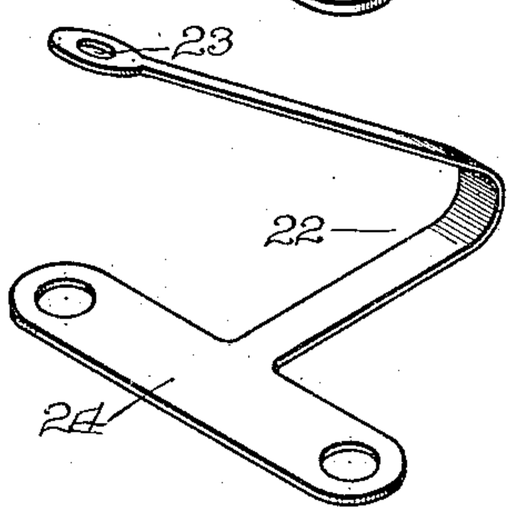
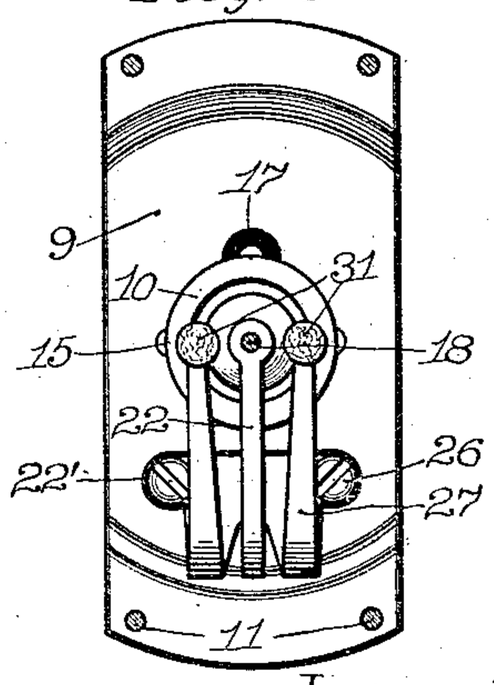


Fig. 7



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UNITED STATES PATENT OFFICE.

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TELEPHONE-TRANSMITTER.

1,277,875. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed June 12, 1916. Serial No. 103,090.

To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Telephone-Transmitters, 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.

My invention relates to telephone transmitters.

The practice in telephony has become largely fixed or standardized and the necessary parts of apparatus such as transmitters, etc., have also become largely standard with respect to general mechanical and electrical dimensions. It has therefore become possible to place the manufacture of the same under the principle of large scale production and to reduce very materially the cost of the individual instruments. This has aided materially in placing the telephone at the disposal of greater numbers of people and has made the telephone generally more popular.

The opportunities for improvements in quality or efficiency of the output or for reducing cost of manufacture as by decreasing the cost of assembling or employing less material without impairing the quality or efficiency, are small indeed, but such improvements are highly valuable.

The present invention aims to provide a construction in which economy of material and low cost of production are obtained without sacrificing operating qualities or efficiency.

This is secured by a suitable proportioning and distribution of the parts and of the material in such a manner as to perform the essential function with a minimum of structure.

I shall now describe one embodiment of my invention in connection with the drawings, in which—

Figure 1 is a side elevation of a transmitter placed in the shell and provided with a suitable mouthpiece;

Fig. 2 is a front elevation;

Fig. 3 is a vertical cross section taken through the back ridge;

Fig. 4 is a rear elevation of the transmitter with the shell removed;

Fig. 5 is a sectional view showing the back bridge in front elevation;

Fig. 6 is an isometric view of the tensioning spring; and

Fig. 7 is a similar view of the connection to the front electrode.

The transmitter which I have shown comprises the front plate 1, which is provided, as is customary, with the hard rubber mouthpiece 2 and is connected to the shell or cover 3 by suitable screws 4 shown in Fig. 1. The front plate 1 is provided with a rearwardly extending flange 5 around the outside of which the shell 3 is disposed. A suitable shoulder 6 lies within the flange 5 and forms a suitable seat for the diaphragm 7. The diaphragm 7 is preferably constructed of aluminum and the front face thereof which is exposed to the mouthpiece 2 is given several coats of rubber paint. An insulating ring 8 of varnished linen insulates the diaphragm 7 from the front plate 1. A back bridge member 9 which is offset at its central portion in order to provide room for the granular carbon button 10 has its outer end clamped flat against the edge of the flange 5 by means of suitable screws 11. A generally triangular plate 12 is mounted upon but insulated from the back bridge member 9 and is provided with a suitable hollow stud or boss 13 which receives the stem 14 of the granular carbon button 10. The triangular plate 12 is secured to the back bridge member 9 by means of the screws 15 which are provided with suitable insulating collars and washers to prevent grounding of the plate 12 upon the bridge 9. A suitable terminal screw 16 is mounted upon the plate 12 and has its inner end projecting into an aperture 17 in the back bridge member 9. The granular carbon button 10 has an attaching stud 18 connected to the front electrode. This stud is secured to the diaphragm 7 so that the front electrode will be operated by movement of the diaphragm. The rear electrode of the carbon granular button 10 being rigidly secured in the cup and held by the stem 14 upon the back bridge member 9 forms the other electrode of the familiar solid-back type of construction.

An insulated terminal member 19 is mounted upon the back bridge member 9 and is provided with a suitable terminal screw 20 which projects upon its opposite side into the cavity or aperture 21 in the

back bridge member. This terminal member 19 is connected by means of the T-shaped spring 22 shown in Fig. 7 to the front electrode of the button 10. The spring 22 is formed of very light thin gage metal forming merely a conducting ribbon. This spring is depended upon solely for forming an electrical connection between the front electrode and the terminal member 19 and is not relied upon for tensioning the diaphragm 7. A suitable aperture 23 is provided in the end of the spring 22 for the stud 18 which connects the front electrode to the diaphragm 7. This spring 22 is bowed or recurved, as shown in Fig. 3, in order to give a maximum of freedom of movement. The inner end of the spring is provided with laterally extending portions which are apertured for receiving the screws 26. A suitable plate of insulation 22′ lies between the spring 22 and the front of the bridge member 9. Upon the opposite side of the bridge a single sheet of insulating material 28 lies under the terminal member 19 and the triangular plate which forms the other terminal of the circuit.

Suitable tensioning of the diaphragm 7 is secured by means of a recurved spring member 27 shown in Fig. 6. This spring member comprises a base portion 27′ which is provided with suitable apertures registering with the openings in the member 24 of the spring 22 so as to be held by means of the screws 26, and a pair of spring arms 29 and 30 provided at their outer extremities with felt pads 31. The spring member 27 is so proportioned as to bring the pads 31 upon a substantially diametrical line on each side of the central stud 18 on the diaphragm. Due to the offset construction of the back bridge member 9 it is impossible to secure a relatively long length of straight spring for tensioning the diaphragm 7 and the provision of the recurved or hairpin type of tensioning spring permits of the employment of a relatively great length of spring metal within a short space. By employing the recurved metal strip 22, great freedom of operation is secured and at the same time no additional fastening means is necessary for insuring good contact between the electrode and the terminal.

The instrument above described is capable of manufacture with a minimum number of operations. It is capable of ready assembly with a uniformity in the adjustment of the product inasmuch as the parts are self adjusting. In assembling the instrument, the back bridge and springs are assembled together into a unit construction; the granular carbon button of standard type is also of unit construction. The diaphragm is secured to the front electrode with the contact strip 22 connected therebetween, the stem 14 being loosely held in the boss 13, the screws 11 are then secured to fasten the back bridge member 9 against the flange 5 while the diaphragm 7 is forced against the front plate 1. This causes the tensioning spring member 27 to adjust itself to the proper position and tension and thereafter the set screw in the boss 13 may be tightened up and the transmitter is assembled. It is seen that no adjustment is necessary during assembling as the parts are so constructed and proportioned as to assume their proper position and relation automatically.

What I claim is:

1. In combination a front plate, a back bridge secured to said front plate, a transmitter shell secured to the front plate and inclosing said back bridge, a diaphragm resting against said front plate, a U-shaped tension or damping spring having one leg projecting inwardly toward the center of said back bridge and secured thereto and the other leg projecting inwardly and resting against said diaphragm and insulating means for said damping spring.

2. In combination a front plate, a back bridge member secured to said front plate, a diaphragm resting against said front plate, a U-shaped tension or damping spring having one leg secured to said back bridge upon its under side and adjacent to the middle thereof, the other leg being bifurcated and having its end adapted to lie substantially diametrically of the center of the diaphragm, said ends being located adjacent the center of the diaphragm.

3. In combination a front plate having a rearwardly projecting flange of short length, an offset or U-shaped back bridge member secured to said flange, a diaphragm resting against said front plate, a U-shaped tensioning or damping spring having one leg secured to the under side of said back bridge near its middle portion, the other leg being bifurcated and having its ends adapted to lie substantially diametrically of the center of the diaphragm, said ends having felt pads between them and the diaphragm.

4. In combination a front plate, a diaphragm back of said front plate, said front plate having a short circular flange upon the rear side thereof, a back bridge clamped against said flange, said back bridge being offset to provide additional space between the same and said diaphragm, a granular carbon button between said back bridge and said diaphragm, a terminal plate secured to but insulated from said back bridge, the stem of said button being secured to said plate, a terminal member mounted upon said back bridge but insulated therefrom, a single piece of insulation lying between said back bridge and the terminal member and plate, a U-shaped tensioning or damping spring having one leg thereof secured to said ter-

minal member by a pair of screws, the other leg of said spring being bifurcated and having the ends thereof disposed to engage the diaphragm at points diametrically opposite to but adjacent to the center.

5. In combination a front plate, a diaphragm back of said front plate, said front plate having a short circular flange upon the rear side thereof, a back bridge clamped against said flange, said back bridge being offset to provide additional space between the same and said diaphragm, a granular carbon button between said back bridge and said diaphragm, a terminal plate secured to but insulated from said back bridge, the stem of said button being secured to said plate, a terminal member mounted upon said back bridge but insulated therefrom, a single piece of insulation lying between said back bridge and the terminal member and plate, a U-shaped tensioning or damping spring having one leg thereof secured to said terminal member by a pair of screws, the other leg of said spring being bifurcated and having the ends thereof disposed to engage the diaphragm at points diametrically opposite to but adjacent to the center, and a connecting strip of thin sheet metal having a U-shape, one leg thereof having a wide end and being adapted to be substantially coextensive with the adjacent leg of the damping spring and to be secured to the terminal member by the same screws, the other leg being connected to the front electrode of the button and lying between the bifurcated ends of said spring.

In witness whereof, I hereunto subscribe my name this 8 day of June, A. D. 1916.

WILLIAM W. DEAN.