

No. 817,140.

PATENTED APR. 3, 1906.

W. W. DEAN.
TELEPHONE TRANSMITTER.
APPLICATION FILED APR. 3, 1902.

Fig. 1.

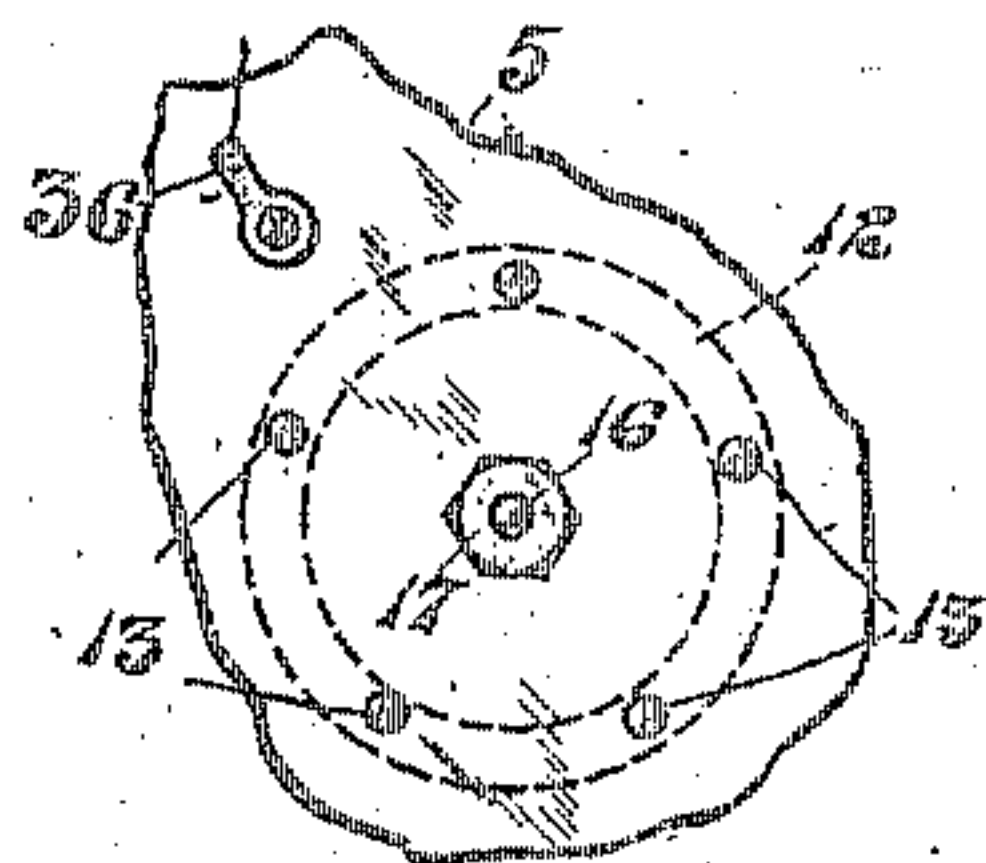
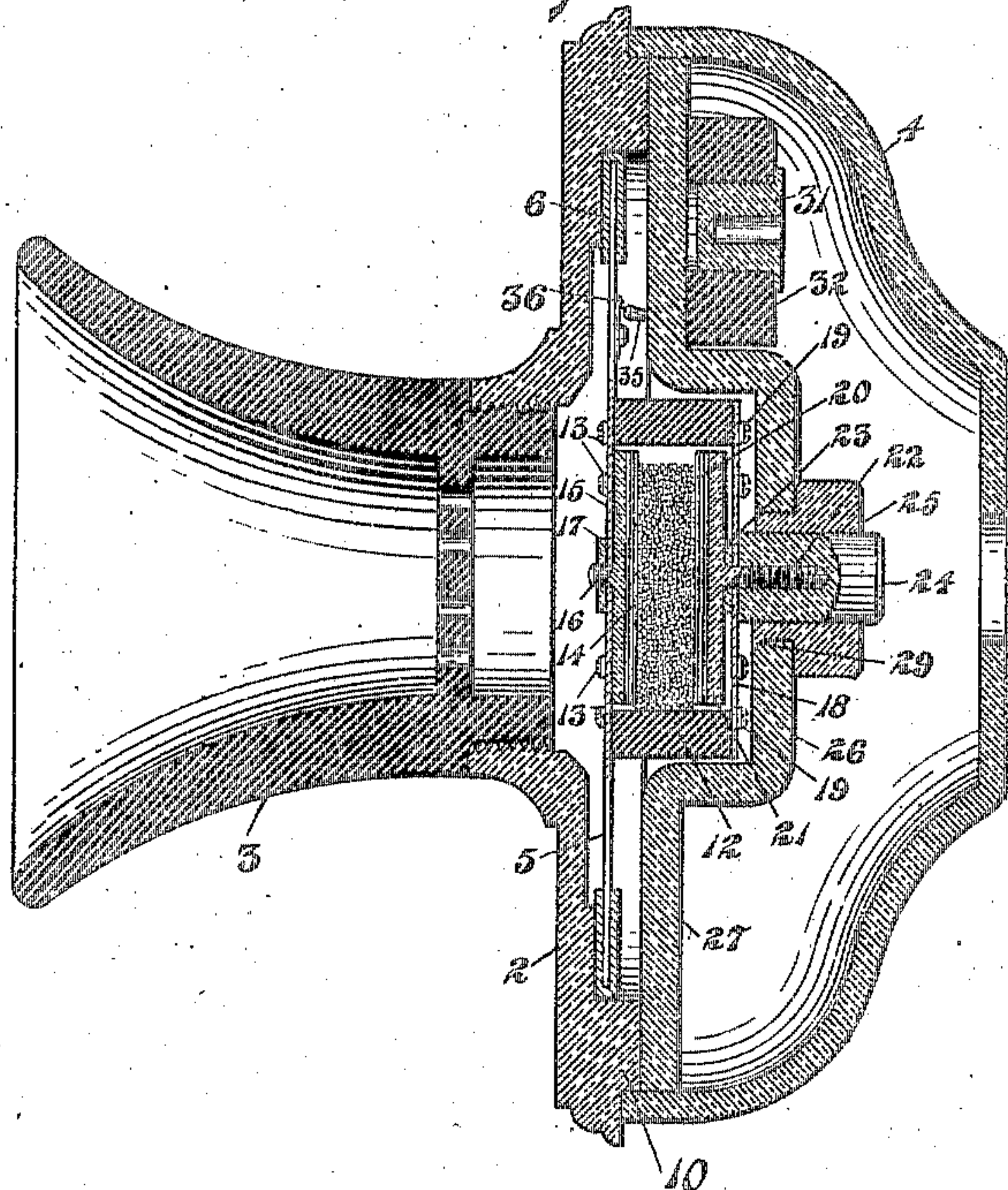


Fig. 4.

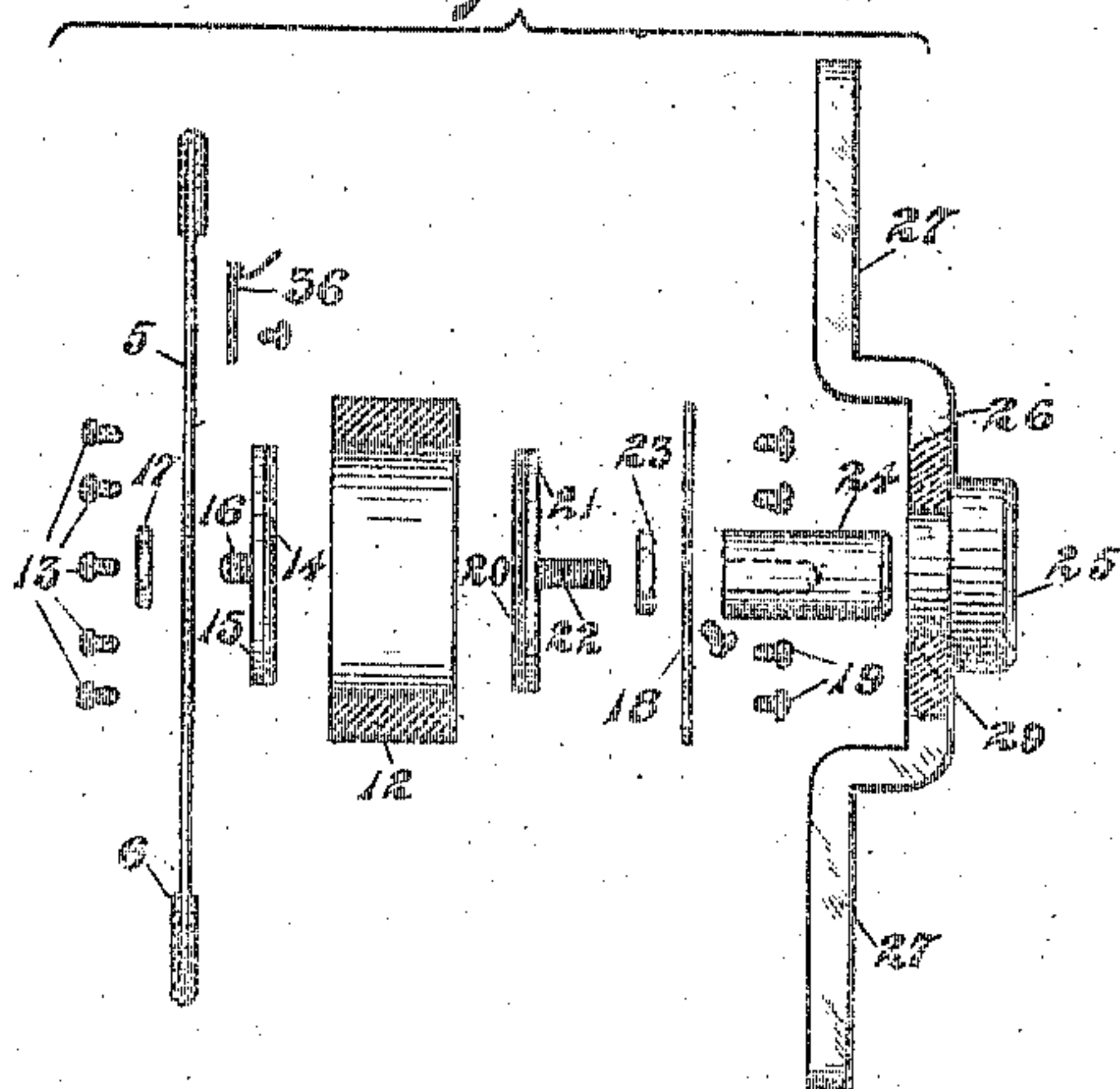
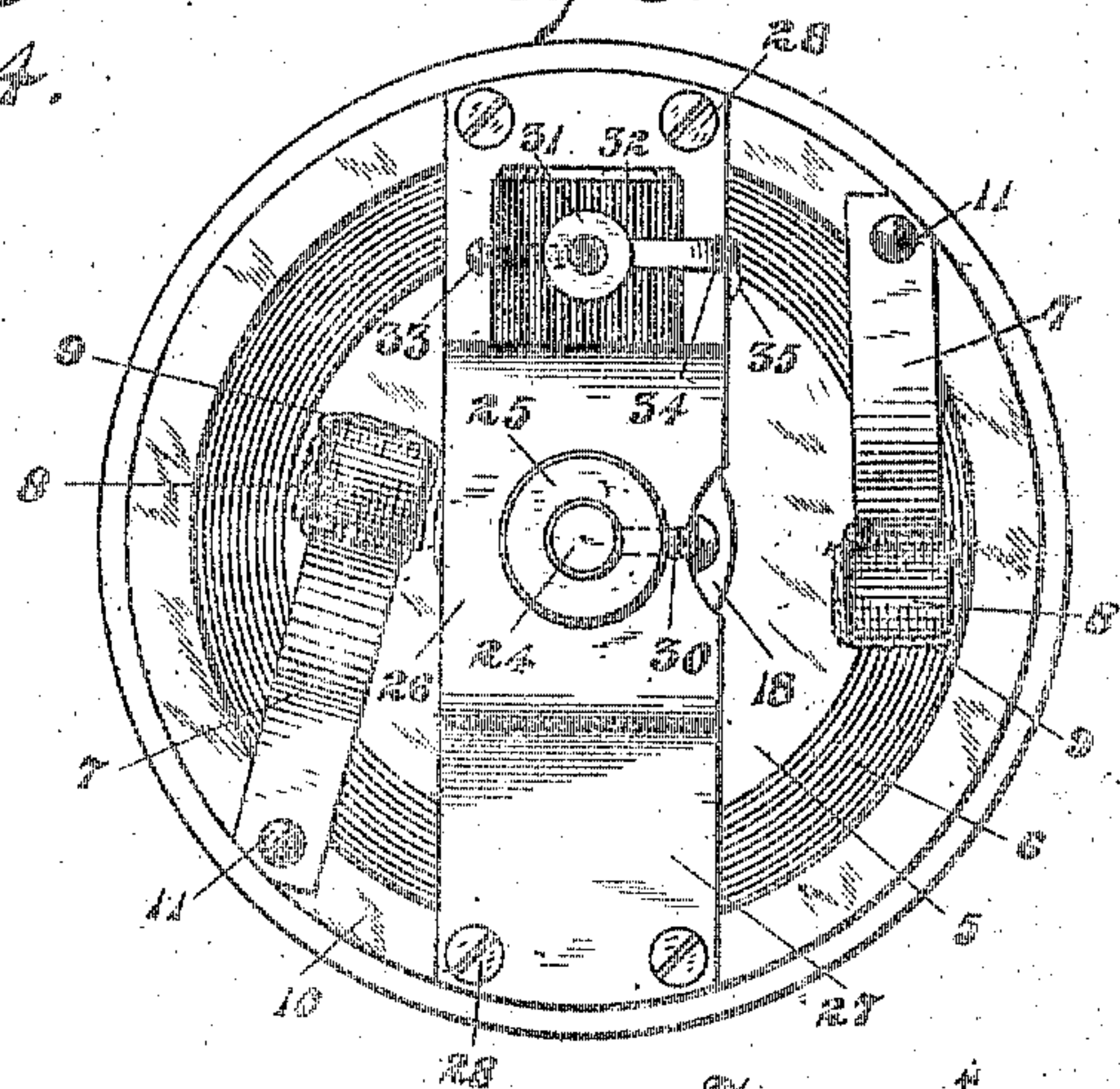


Fig. 2.

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.

No. 817,140.

Specification of Letters Patent.

Patented April 3, 1906.

Original application filed January 27, 1902, Serial No. 91,456. Divided and this application filed April 3, 1902. Serial No. 101,149.

To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Improvement in Telephone-Transmitters, (Case No. 59,) of which the following is a specification.

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

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

The subject-matter of my 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 flexible diaphragm, ring, or flexible wall 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 drawings, forming a part of this specification, in which the same reference characters designate like parts throughout, Figure 1 is a sectional view of the transmitter embodying the invention. Fig. 2 is a view of the detached parts thereof. Fig. 3 is a back view of the same, and Fig. 4 is a detailed view.

A support or front piece 2, of any desired form, carries the usual mouth-piece 3 and is itself 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 their free ends, which bear upon pads of felt or flannel 9, resting against the diaphragm,

their outer ends being secured to the raised rib 10 upon the back face of the front plate 2 by means of suitable screws 11. The left-hand spring 7 (shown in Fig. 3) bears upon the diaphragm 5 away from the packing 6 and serves to dampen the vibration of the diaphragm.

The cup or receptacle forming the chamber of the comminuted material, which is preferably granular carbon, is composed of a hard-rubber ring 12, secured to the rear face of the diaphragm 5 by means of suitable screws 13, passing through the diaphragm and threading into the edge of the ring 12. As many of these screws as are necessary or desirable may be employed. The front electrode comprises a carbon disk 14, secured to a metal plate 15, preferably by electroplating the face of the carbon disk and then soldering the same to the plate 15. This plate is provided with a threaded shank 16, adapted to extend through the aperture centrally located in the diaphragm 5, upon the projecting end of which shank a nut 17 threads to secure the electrode in place.

The supplemental diaphragm or flexible wall or member 18, which is adapted to close the chamber formed within the ring 12, is secured at its periphery to the edge of the ring 12 by means of suitable screws 19, adapted to pass through the diaphragm and to thread into the edge of the ring. This supplemental diaphragm is made of thin flexible sheet metal, but of course may be formed of other suitable material, such as mica. The back electrode is likewise formed of a carbon plate or disk 20, secured to the face of the metal disk 21, provided with a central shank 22, upon which is first threaded a nut 23. The shank is then extended through a central aperture in the supplemental diaphragm 18 and is threaded into a metal block 24. The block 24 secures the electrode firmly in the supplemental diaphragm and projects through an aperture in a second block 25, fixed in the rearwardly-deflected portion 26 of the bridge strip 27, which extends across the back of the front piece of the transmitter and is secured at its ends to the raised rim 10 thereof by means of screws 28. The block 25 is secured in the portion 26 of the bridge-strip by means of its shank, which is upset at one or more points near the periphery of inner end, as

shown at 29, to secure it firmly in place. This may readily be accomplished with a prick-punch or in any other desired way. The set-screw 30 is threaded into the block 25 and serves to secure the block 24 in adjusted position in the block 25. The back electrode is thus adjustably secured and rigidly supported and has a piston-like movement relative to said chamber.

A binding-post 31 is mounted upon an insulating-block 32, secured in any desired way to the upper end of the bridge-piece 27, as shown in Fig. 3. A screw 33 passes through the insulating-block 32 and through one side of the binding-post 31 to secure the latter in position and to bind the end of the circuit wire or conductor within the same. The terminal strip 34 is connected with binding-post 31 in an adjustable manner, and a light wire 35 extends therefrom to a clip 36, Fig. 4, secured to the diaphragm by means of a suitable screw. The circuit of the transmitter will therefore extend from the binding-post 31, through the clip 34, conductor 35, clip 36, diaphragm 5, front electrode 14, the granular carbon which is contained in the chamber formed by the ring and between the two electrodes, thence through the rear electrode, the metal pieces 24 and 25 to the bridge 27. From this point the circuit may be completed through the metallic cup 4 and the transmitter-wire, or a second conductor may be secured to the bridge 27, and lead out the point desired.

In the operation of the device the sound-waves impinge the diaphragm 5 and set the same into vibration, whereby the front electrode is caused to approach and recede from the rear electrode, and thus causes a varying pressure upon the granular carbon, which induces a corresponding variation of the current in the transmitter-circuit. One advantage of locating the chamber on the diaphragm is that the granular carbon is continually disturbed, and is thus kept in a more sensitive condition than where the chamber is mounted in a stationary manner.

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

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

1. A telephone-transmitter comprising a flat main diaphragm, a ring secured to the back of said main diaphragm, a supplemental diaphragm secured to the back of said ring, said ring constituting a medium of non-yielding connection between the two diaphragms, a solid backing and non-yielding connection between said back and the middle portion of said supplemental diaphragm, front and back electrode-surfaces within the chamber pro-

vided between the two diaphragms, the front electrode-surface being movable with the main diaphragm, and the back electrode-surface being stationary and rigidly connected with said backing, and granular carbon interposed between said electrode-surfaces, substantially as described.

2. In a telephone-transmitter, the combination of a body or casing, a flat main diaphragm, a ring secured to the back of said main diaphragm, a supplemental diaphragm, suitable means for securing said supplemental diaphragm to the back of said ring, said ring constituting a medium of non-yielding connection between the two diaphragms, front and back carbon blocks secured respectively to the main and supplemental diaphragms, granular carbon interposed between said carbon blocks, a bridge back of all said diaphragms, and non-yielding connection between said bridge and said supplemental diaphragm, the front carbon block being vibratory with the main diaphragm, and the said back carbon block being stationary or rigid with the said bridge, substantially as described.

3. In a telephone-transmitter, the combination of a body or casing, a flat main diaphragm, a ring secured to the back of said diaphragm, a carbon block secured to said main diaphragm, a supplemental mica diaphragm secured to the back of said ring, the said ring constituting a medium of non-yielding connection between the two diaphragms, a carbon block secured to said supplemental diaphragm, granular carbon interposed between the two carbon blocks, a bridge, and a non-yielding connection between said bridge and said supplemental diaphragm, said first-mentioned carbon block being vibratory with the main diaphragm, and said last-mentioned carbon block being stationary or rigid with the said bridge, substantially as described.

4. A telephone-transmitter comprising a flat main diaphragm, an open non-flexible ring, a flexible auxiliary diaphragm, suitable means for securing the auxiliary diaphragm to one side of the ring to form a cup, the auxiliary diaphragm forming the bottom of the cup, oppositely-arranged electrodes secured to said diaphragms within the cup, granular carbon between the two electrodes, means for securing the main diaphragm to the said cup, and a bridge rigidly connected with the electrode associated with the auxiliary diaphragm, substantially as described.

5. In a telephone-transmitter, the combination of a suitable body or casing, a flat main diaphragm suitably secured to said casing, a hollow member having its open end projecting from the back of said diaphragm, said hollow member being rigid with the diaphragm, a supplemental diaphragm having its marginal portion secured around the perimeter of said member, the said member con-

stituting medium of non-yielding connection
between the two diaphragms, front and back
electrodes, within the chamber provided by
said member and supplemental diaphragm,
5 the central portion of said main diaphragm
constituting the front wall of said chamber,
and the supplemental diaphragm the rear
wall thereof, both electrodes being thereby
adapted to have some movement or vibration
10 relative to the said hollow member, granular
carbon between said electrodes, a bridge back
of said diaphragms, a non-yielding connection

between said bridge and the middle portion
of said supplemental diaphragm, the front
electrode being rigidly connected to and vi- 15
bratory with the main diaphragm, and the
back electrode being stationary or rigid with
said bridge.

Signed by me at Chicago, county of Cook,
State of Illinois, this 1st day of April, 1902. 20

WILLIAM W. DEAN.

Witnesses:

JOHN CROSBY NEELY,
ROBERT LEWIS AMES.