No. 897,716. PATENTED SEPT. 1, 1908.

J. T. CURTIS.

TRANSMITTER.

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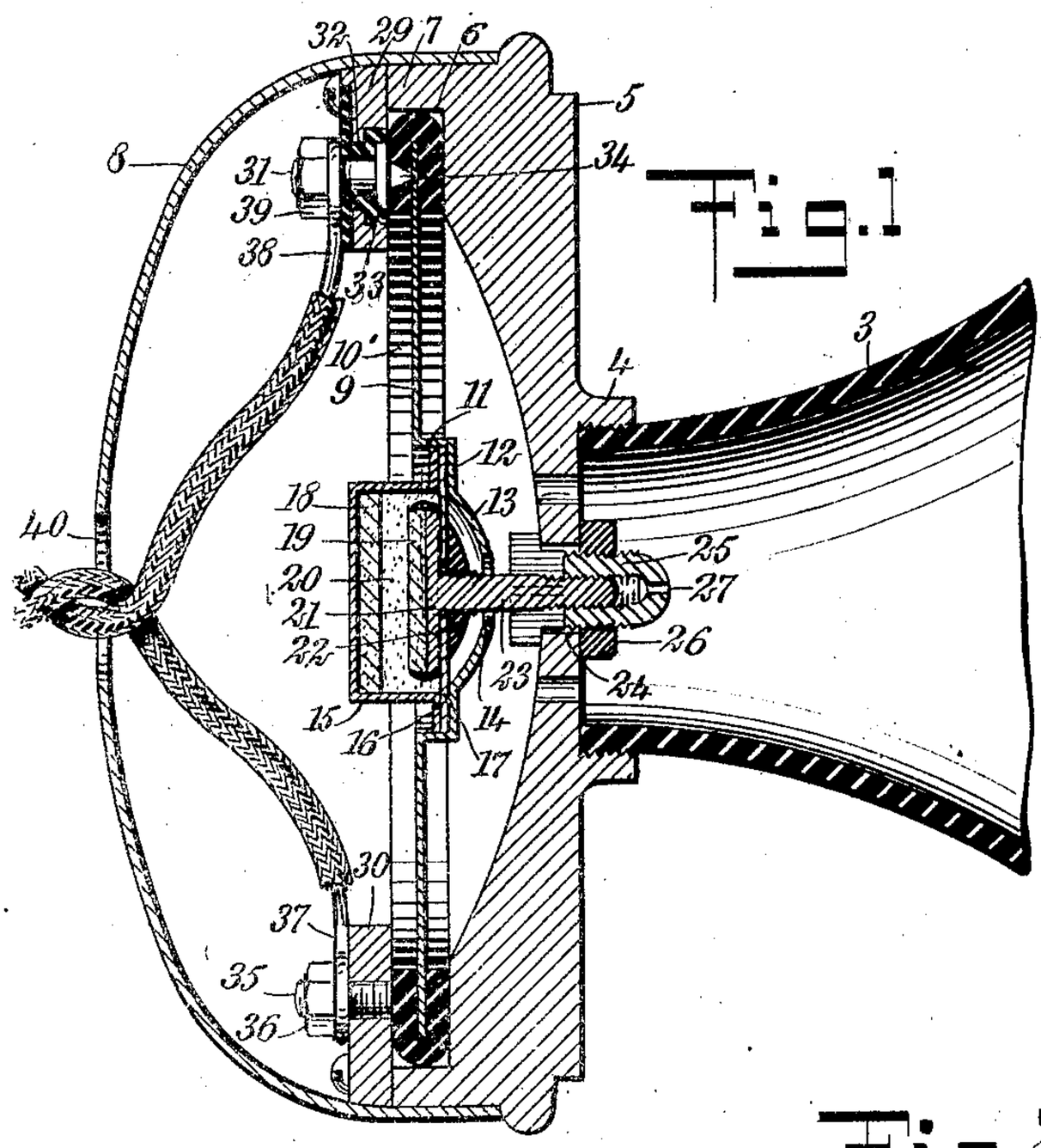

Fig. 1

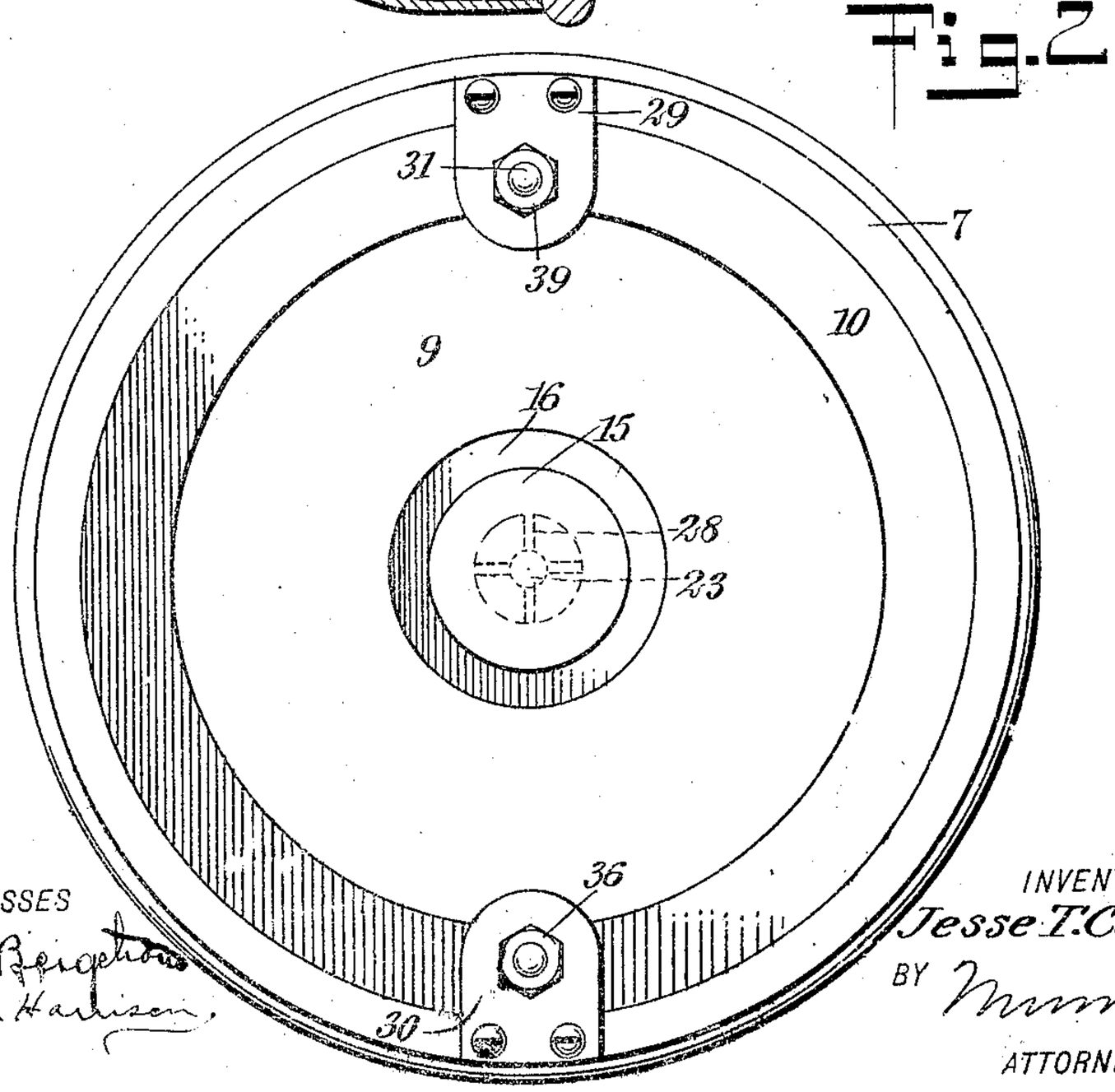

Fig. 2

WITNESSES

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JESSE TEMPLE CURTIS, OF BEMENT, ILLINOIS.

TRANSMITTER.

No. 897,716. Specification of Letters Patent. Patented Sept. 1, 1908.

Application filed March 25, 1907. Serial No. 364,300.

To all whom it may concern:

Be it known that I, JESSE TEMPLE CURTIS, a citizen of the United States, and a resident of Bement, in the county of Piatt and State of Illinois, have invented a new and Improved Transmitter, of which the following is a full, clear, and exact description.

My invention relates to transmitters, my object being to improve the construction and action as hereinafter explained.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an enlarged vertical section through a transmitter equipped with my several improvements; and Fig. 2 is a rear view of the transmitter, the casing being removed.

The mouth piece is shown at 3 and screws into an annular bead 4 integral with the circular frame 5. An annular groove 6 is sunken into the rear side of this circular frame so as to leave an annular wall 7. A substantially hemispherical casing 8 fits around this wall 7 and protects the internal portions of the mechanism.

The diaphragm is shown at 9 and its peripheral edge is held in position by a ring 10 of resilient material, preferably soft rubber. This diaphragm is provided with a sunken portion 11 having a flat bottom 12, the latter being provided with a concave portion 13, and disposed centrally of this concave portion is an aperture 14. The diaphragm is made of metal. A metallic cup 15 having a general cylindrical form is provided with an annular flange 16 integral therewith. A mica diaphragm 17 of circular form is disposed within the sunken portion 11 of the diaphragm 9 and has its outer edges clamped intermediate of the bottom 12 and flange 16. The back electrode which moves with the diaphragm is shown at 18 and is preferably of carbon. The front electrode 19 is stationary and is also preferably of carbon. Intermediate of the electrodes is a space 20 filled with granulated carbon. A metallic disk 21 is engaged by the diaphragm 17 and supports the front electrode 19. The cup 15 is mounted upon the diaphragm 9 by forcing the outer edges of the annular flange 16 into close engagement with the sunken portion 11 of the diaphragm. In other words, the flange 16 is sprung into the sunken portion and holds firmly therein by its pressure. A stem 23 is threaded externally and is fitted with a revoluble nut 22, which clamps the diaphragm 17 against the disk 21. A metallic clamping ring 22^a holds the front electrode 19 upon the disk 21. The stem 23 projects loosely through the aperture 14.

The frame 5 is provided with a central aperture 24 through which the stem 23 extends. An adjusting nut 25 is made hollow and is threaded both internally and externally, as will be understood from Fig. 1. Fitted exteriorly upon this adjusting nut 25 is a jam nut 26, threaded internally to fit the same. The adjusting nut 25 is provided with a slot 27 into which a screw driver may be inserted for the purpose of turning the adjusting nut 25. By aid of a screw driver inserted within the slot 27, the adjusting nut 25 can be held stationary while the jam nut 26 is turned in either direction. The adjusting nut 25 is enlarged at one of its ends, and is provided with slots 28 crossing each other. This gives it a certain amount of resilience and prevents it binding unduly upon the stem 23. By loosening the jam nut 26 and turning the adjusting nut 25, the stem 23 can be drawn toward the right or forced toward the left, as the case may be, according to Fig. 1, and thus the relative distance of the front electrode 19 and back electrode 18 can be varied at will. In consequence of this, the diaphragm 9 may be tightened or loosened to any desired extent, and the amount of play between the front electrode 19 and the diaphragm 9 may be also controlled at will. Disposed respectively at the top and bottom of the transmitter are lugs 29, 30. I preferably employ only two of these lugs, as shown, but do not limit myself to this particular number.

A screw bolt 31 is encircled by a sleeve 32 of insulating material and protected thereby from contact with the lug 29 through which this screw bolt extends. A tap 33 of metal is mounted rigidly upon the screw bolt 31 and is sunken within the sleeve 32 of insulating material. The screw bolt 31 terminates in a conical point 34 which engages the diaphragm 9 and affords a means of completing the circuit therethrough. A screw bolt 35 is secured rigidly to the lug 30 and a threaded nut 36 encircles this screw and is movable relatively thereto. A wire 37 is connected with the lug 30 by aid of the bolt 35 and nut 36, these two parts serving as a binding post.

Another wire 38 is connected by the nut 39 with the screw bolt 31, this nut and bolt serving as a binding post. The wire 38 is thus in electrical communication with the diaphragm 9, while the wire 37 is in electrical contact with the electrode 19.

My purpose in providing the bolt 31 with the tap 33 is to prevent the bolt from being thrown outwardly when the nut 39 is tightened. Whenever this nut is tightened, not only is the wire 38 secured firmly but the tap 33 is forced toward the center of the lug 29. The conoidal portion 34 of the bolt 31 has a very small point engaging the diaphragm 9 directly, this form being preferable because it affords a reasonable certainty that the electrical communication will be in every instance established.

The semi-circular casing 8 is provided with an aperture 40 through which the wires 37, 38, properly insulated as shown, may be passed out. It will be noted that neither of the electrodes 18 or 19 is revoluble; also that the electrode 19 is completely controllable as to distance from the mouth-piece by aid of movements of the adjusting nut 25. Inasmuch as the central portion of the mica diaphragm 17 is normally stationary (being locked against the disk 21 by the nut 22), the peripheral or outer edge of the mica diaphragm 17 is the only part thereof capable of moving. Hence, when the diaphragm 9 vibrates, the carbon granules within the space 20 are subjected to varying degrees of compression by virtue of the fact that the outer edges of the diaphragm 17 can bend relatively to the central portion of this diaphragm.

The construction above described presents quite a number of advantages. The fact that the cup 15 is merely sprung into position avoids the necessity for soldering, brazing or electro-plating, riveting or using screws. I have found that by using only two lugs 29, 30, so as to bind upon the diaphragm 9 at only two points in the circle represented by its outer edge, the sounds are greatly improved. This result I attribute to the fact that the limitation placed upon movements of the diaphragm is reduced to a minimum and so distributed as to greatly lessen the interference phenomena always present to a greater or lesser extent in the diaphragm.

In the transmitter above described there is perfection of design, simplicity of parts, cheapness of construction, ease of adjustment and durability. The diaphragm 9 is in contact with the stationary electrode 19, only through the medium of the flexible mica diaphragm 17. The transmitter contains no springs whatever.

I find that with the construction above described packing of the carbon granules is much less apt to occur than is the case with other constructions. In fact, in my improved transmitter it is very difficult to cause packing to take place, and even when the carbon is packed, the transmitter is restored to normal condition by merely speaking into it. I attribute this effect largely to the use of the stationary front electrode in connection with the diaphragm having tension upon its outer edge at two points only.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a transmitter, the combination of a vibratory diaphragm provided with a sunken portion, a cup mounted within said sunken portion and adhering thereto by its pressure thereupon, a second diaphragm engaging said sunken portion and also engaging said cup, means for adjusting the tension of said second-mentioned diaphragm, and mechanism mounted within said cup and controllable by pressure for varying an electric current.

2. In a transmitter, the combination of a vibratory diaphragm provided with a sunken portion in which is mounted a cup, a second diaphragm engaging said sunken portion and also engaging said cup, an electrode secured to the central portion of said second diaphragm and having a threaded stem passing through an opening in the said sunken portion of said vibratory diaphragm.

3. In a transmitter, the combination of a frame, a vibratory diaphragm provided with a sunken portion in which is mounted a cup, a second diaphragm engaging said sunken portion and also engaging said cup, and an electrode secured to the central portion of said second diaphragm and having a threaded stem passing through an opening in the said sunken portion of said vibratory diaphragm and secured to said frame.

4. In a transmitter, the combination of a frame provided with a groove, a diaphragm mounted within a ring, said ring being disposed within said groove, a lug mounted upon said frame and overlapping a portion of said ring, a sleeve of insulating material mounted within said lug, a stem of conducting material extending through said sleeve and said lug, a tap secured rigidly upon said stem to prevent relative movement thereof, and a revoluble nut threaded upon said stem for the purpose of causing the same to act as a binding post.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JESSE TEMPLE CURTIS.

Witnesses:
LOU L. HAYS,
EDGAR S. BODMAN.