W. E. McCORMICK.

TRANSMITTER.

APPLICATION FILED JUNE 19, 1905.

947,395.

Patented Jan. 25, 1910.

Fig. 1.

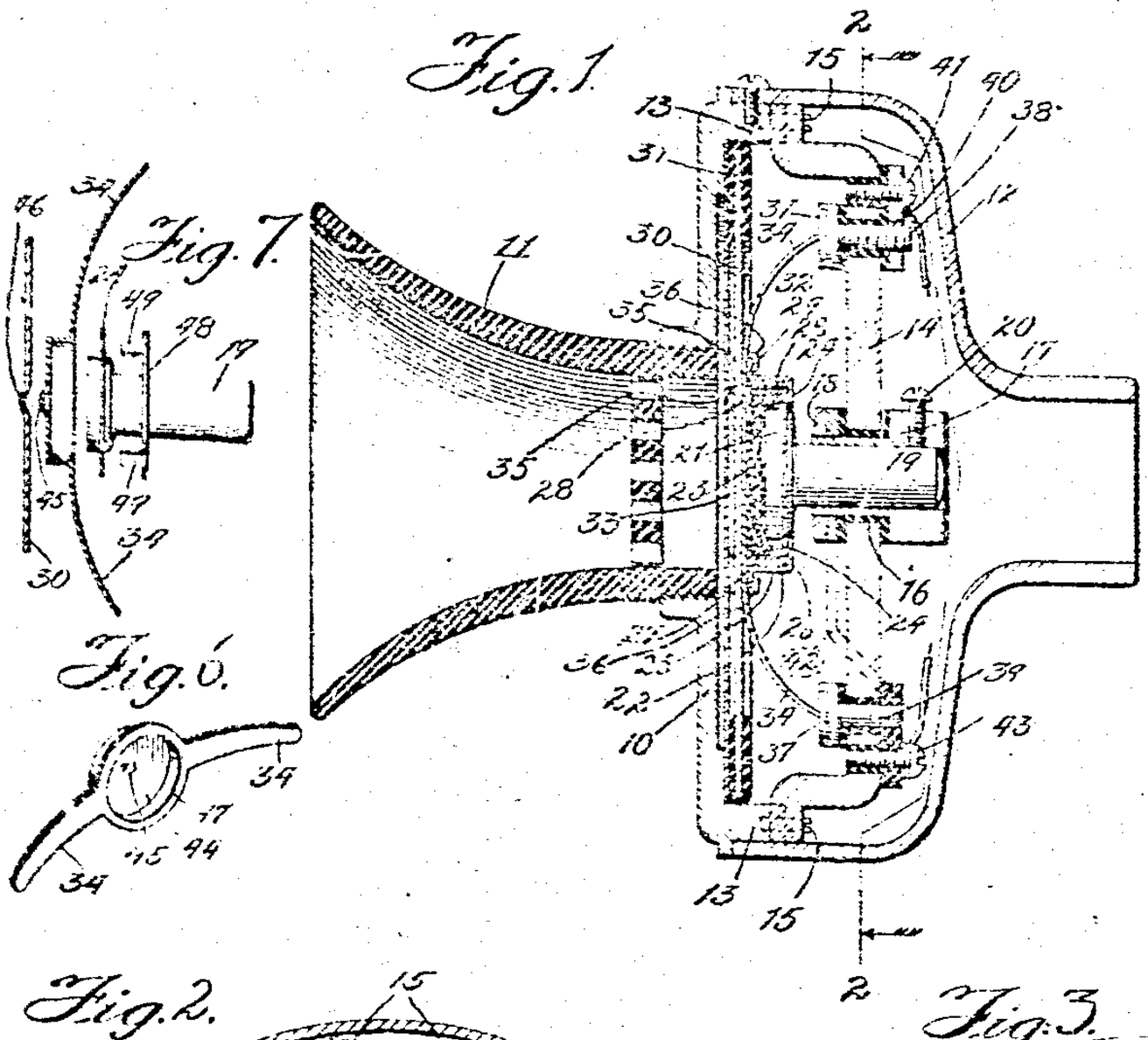


Fig. 5.

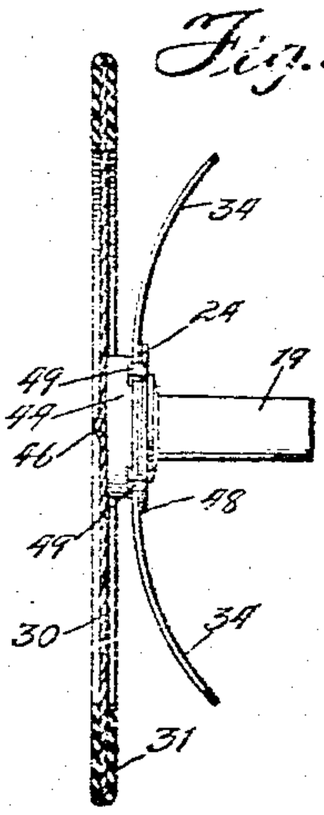


Fig. 7.

Fig. 6.

Fig. 2.

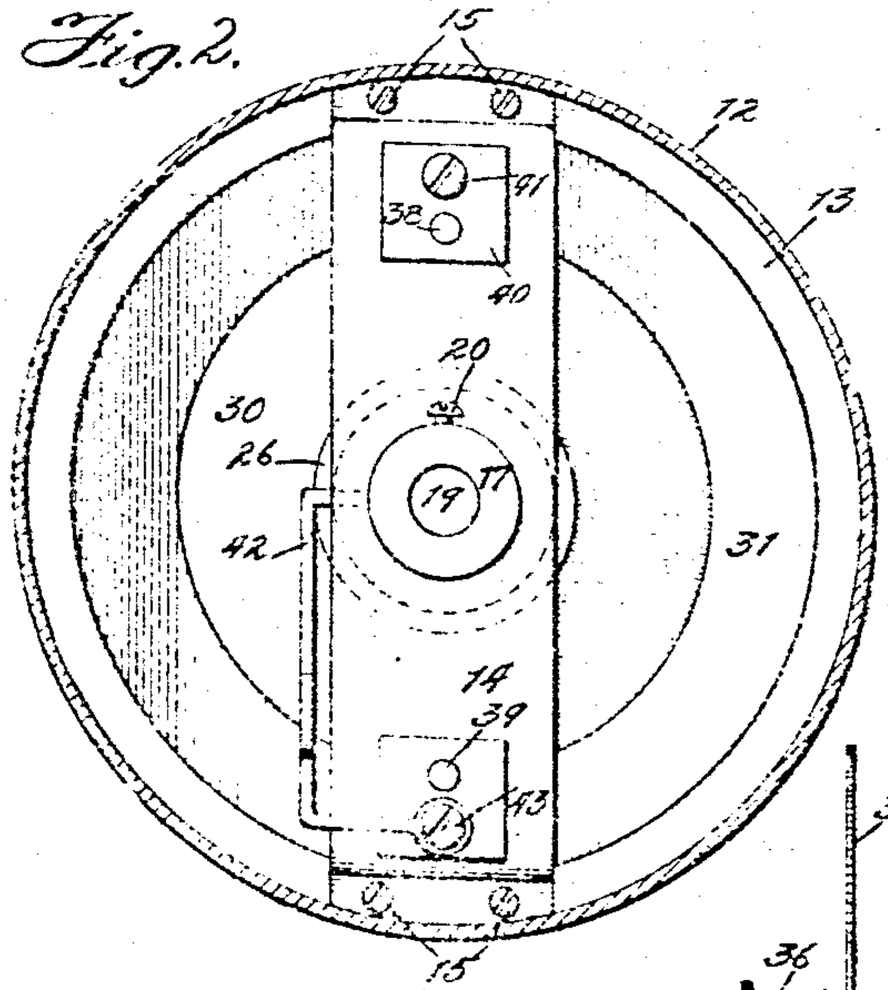
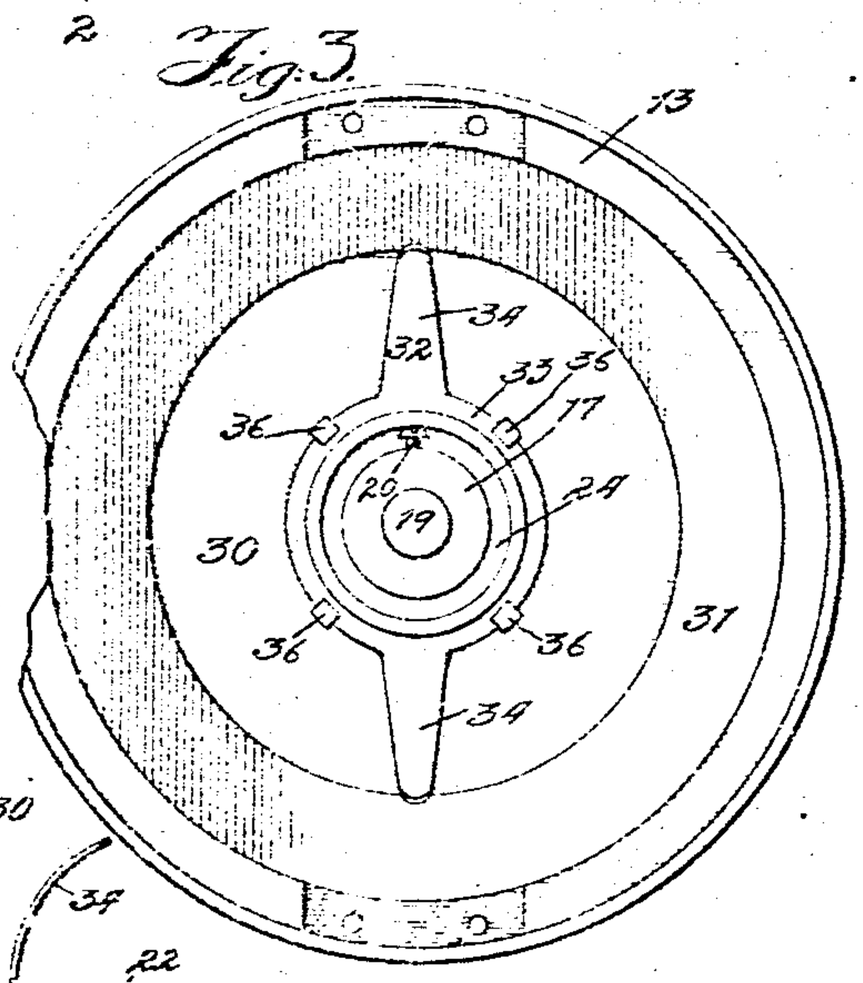


Fig. 3.



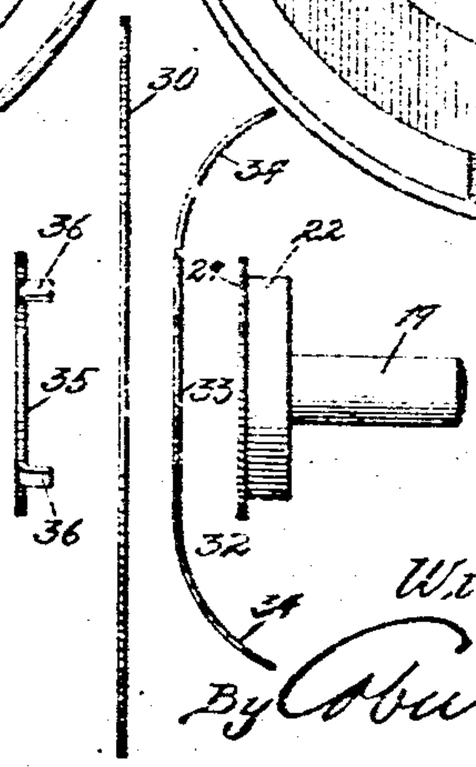


Fig. 4.

Witnesses:

Inventor:
William E. McCormick
By Coburn & McRoberts
Their Attys

UNITED STATES PATENT OFFICE.

WILLIAM E. McCORMICK, OF CHICAGO, ILLINOIS, ASSIGNOR TO INTERNATIONAL TELEPHONE MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TRANSMITTER.

947,395. Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed June 19, 1905. Serial No. 265,839.

To all whom it may concern:

Be it known that I, WILLIAM E. McCORMICK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Transmitters, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in telephone transmitters of that character in which carbon or other resistance-varying substance is located between the two electrodes with which the line connections are in circuit.

The invention consists of the combinations and arrangements of parts hereinafter particularly described and then pointed out in the appended claims.

Referring to the accompanying drawings—Figure 1 is a sectional elevation of a transmitter embodying my invention; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a rear elevation with the cap and bridge removed; Fig. 4 is a detail side elevation of the diaphragm, damping spring, carbon cup and the securing device therefor in disassembled relation; Fig. 5 is a side view partially in elevation showing a modification of the invention; Fig. 6 is a perspective view of the modified form of damping spring; and Fig. 7 is a sectional view of the construction illustrated in Fig. 5 with the parts separated.

Referring to the drawings, 10 indicates the usual frame which may be of any suitable form and is provided with the usual mouth piece 11. An inclosing case or cap 12 of suitable form is secured in any preferred manner to a rearward annular flange 13 of the frame 10. A support or bridge 14 is secured as by screws 15 to the flange 13 at opposite points and is provided with an opening 16 intermediate its ends in which is located a bushing 17 which may be insulated from the bridge 14 as shown. A nut 18 screwing upon the front threaded end of the bushing 17 serves to secure the latter in position, although it is obvious that the bushing may be secured in place by heading over its front end. A post 19 extends into the bushing 17 and is adapted to be held in adjusted position, in the usual manner of such devices, by a set screw 20. This post 19 carries an electrode 21 which preferably is gold plated and is located or projects into the cup 22 containing granular carbon or other resistance varying substance 23, and is insulated from such cup by the supplemental diaphragm 24 of mica or other suitable material which may be secured to the electrode 21 in any suitable manner. The cup 22 may be of any suitable construction, and in the construction illustrated in Figs. 1 and 4, it comprises a body 25 having at its end adjacent the electrode 21 an inwardly extending annular flange 26 between which and a ring 27 the mica diaphragm 24 is clamped. The ring 27 is adapted to frictionally engage the cup and may have an internal insulating strip of paper or other material, as at 28, insulating the carbon 23 from the cup. The band 25 is provided at the end opposite the flange 26 with an outwardly extending flange 29, the purpose of which will be hereinafter explained.

Between the cup 22 and the diaphragm 30, which is seated in the depression in the frame 10 formed by the flange 13 and provided with the usual insulating and damping ring 31, the damping device 32 is located. This damping device is so constructed that in addition to providing one of the electrodes of the transmitter it is arranged to effectually prevent excessive vibration of the diaphragm while at the same time the instrument is rendered exceedingly sensitive, and uniformity of vibration, that is to say the vibration of the diaphragm as a unit, is insured. This damping device may be made of sheet metal, such as steel, of suitable elasticity or resiliency, and in the present embodiment of the invention it comprises a flat central or body portion 33, which is in contact with the diaphragm 30. The area of the body portion 33 of the damping device is at least as large as the opening of the cup 22 so as to entirely close the same and prevent spilling of the carbon; this central portion forms the other electrode of the transmitter and is preferably gold plated for that purpose. The damping device is provided with a plurality of spring arms 34, two of such arms being shown in the present embodiment of the invention. These arms 34 extend toward the rear of the transmitter

and are preferably curved as shown and react against the bridge 14, as hereinafter explained.

In order to hold the damping device 32, which for convenience I shall call the "damping spring," in intimate contact with the cup so as to avoid any separation of the parts and consequent sifting out or wasting of the carbon, I may provide a ring 35 which is located on the outer face of the receiving diaphragm 30 and is provided with a plurality of fingers 36 which pass through suitable apertures in the said diaphragm and are adapted to be bent over against the flange 29 of the carbon-cup so as to secure the latter firmly against the damping spring which it will be seen closes the outer end of the cup. By this means the damping spring is not only fixed directly to the diaphragm, but the diaphragm, damping spring and carbon cup are united and securely fastened together.

The ends of the spring arms 34 of the damping spring are seated in cavities 37 formed in the heads of posts 38 and 39 which pass through and are insulated from the bridge 14. By reason of the engagement of the ends of the arms with the cavities the damping spring is maintained in proper position and prevented from turning on its axis. The post 38 screws into a conducting plate 40 on the bridge 14 and which is provided with a binding post 41 to which one of the connecting wires is adapted to be connected, the plate 40, as well as the binding post 41 being insulated from the bridge as shown. A connection 42, which is clamped on the bushing 17 and is insulated from the bridge, leads from such bushing to a binding post 43 suitably insulated from the bridge 14 and to which the other wire of the circuit is connected. The binding post 43 and post 39 are suitably insulated from each other.

From the foregoing it will be seen that the circuit is completed by way of the binding post 41 to the post 38 through the damping spring 32 which forms one electrode, and by means of the granular carbon, the electrode 21, post 19, bushing 17 and conductor 42 to the other binding post 43.

The damping spring by reason of its central engagement of the diaphragm exerts uniform pressure upon such diaphragm throughout its area so as not only to prevent undue vibration of the diaphragm but also to insure the requisite amplitude of vibration.

If desired the carbon containing cup may be formed in the damping spring and not made as a separate part therefrom. For example, as shown in Figs. 5 and 6 the damping spring, which is provided with spring arms similar to those shown in the construction heretofore described, has in its body portion a cup 44. This cup 44 may be provided with a boss 45 adapted to seat in a depression 46 in the diaphragm 30, as shown in Fig. 5. The mica diaphragm 24 is in this arrangement fastened to a flange 47 of the cup 44 by a ring 48 provided with fingers 49 adapted to be bent over into engagement with the flange 47. Otherwise the construction may be the same as that shown in Fig. 1.

Having described my invention what I claim is—

1. In a telephone transmitter, the combination with a diaphragm and a bridge, of a damping spring engaging the diaphragm substantially centrally thereof and having a plurality of arms reacting against the bridge, and a resistance-varying medium containing-cup on the spring.

2. In a telephone transmitter, the combination with a diaphragm, a bridge, and a pair of posts carried by the bridge and provided with cavities, of a damping spring comprising a body portion engaging the diaphragm at the center thereof and a pair of spring arms the ends of which are seated in the cavities of the posts.

3. In a telephone transmitter, a diaphragm, a resistance-varying medium and a damping spring constituting one of the electrodes for the resistance-varying medium.

4. In a transmitter, the combination with a frame having a bridge, of a diaphragm, a carbon-cup having an electrode, and a combined damping device and electrode intermediate the diaphragm and cup and reacting against the bridge.

5. In a telephone transmitter, the combination with a diaphragm and a carbon-containing cup, of a pair of opposite electrodes one of which is provided by the damping spring.

6. In a telephone transmitter, the combination with a diaphragm and a carbon containing cup, of a damping device therefor which provides one of the electrodes of the transmitter.

7. In a telephone transmitter, the combination with a diaphragm, a carbon-containing cup, and a pair of electrodes, one of such electrodes consisting of a damping spring for the diaphragm and providing a closure for the cup.

8. In a telephone transmitter, the combination with a diaphragm, a carbon-containing cup having an electrode, a supplemental diaphragm secured to the cup, and a damping spring having a central portion closing the cup and engaging the diaphragm and forming the other electrode.

9. In a telephone transmitter, a diaphragm, a bridge, a damping spring provided with a carbon-containing cup and providing one of the electrodes for such cup and having arms reacting against the bridge, an

electrode carried by the bridge, and a supplemental diaphragm secured to the electrode and to the cup.

10. In a telephone transmitter, the combination with a diaphragm, a bridge having a pair of posts provided with cavities, a carbon-containing cup, an electrode carried by the bridge, a supplemental diaphragm secured to the electrode and to the cup, and a damping spring having a central portion closing the cup and engaging the diaphragm and forming the other electrode, and having a pair of spring arms the ends of which are seated in the cavities of the posts on the bridge.

11. In a telephone transmitter, the combination with a diaphragm, and a carbon-containing cup, of a damping spring, and means for securing the diaphragm, cup and damping spring together independently of the transmitter frame.

12. In a telephone transmitter, the combination with a diaphragm, and a carbon-containing cup having a flange, of a damping spring having a central portion closing the cup and a pair of spring arms, and a retaining ring having fingers passing through the diaphragm and engaging the flange of the cup to secure the cup against the damping spring.

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

WILLIAM E. McCORMICK.

Witnesses:

ARTHUR B. SEIBOLD,

ELIZABETH MOLITOR.