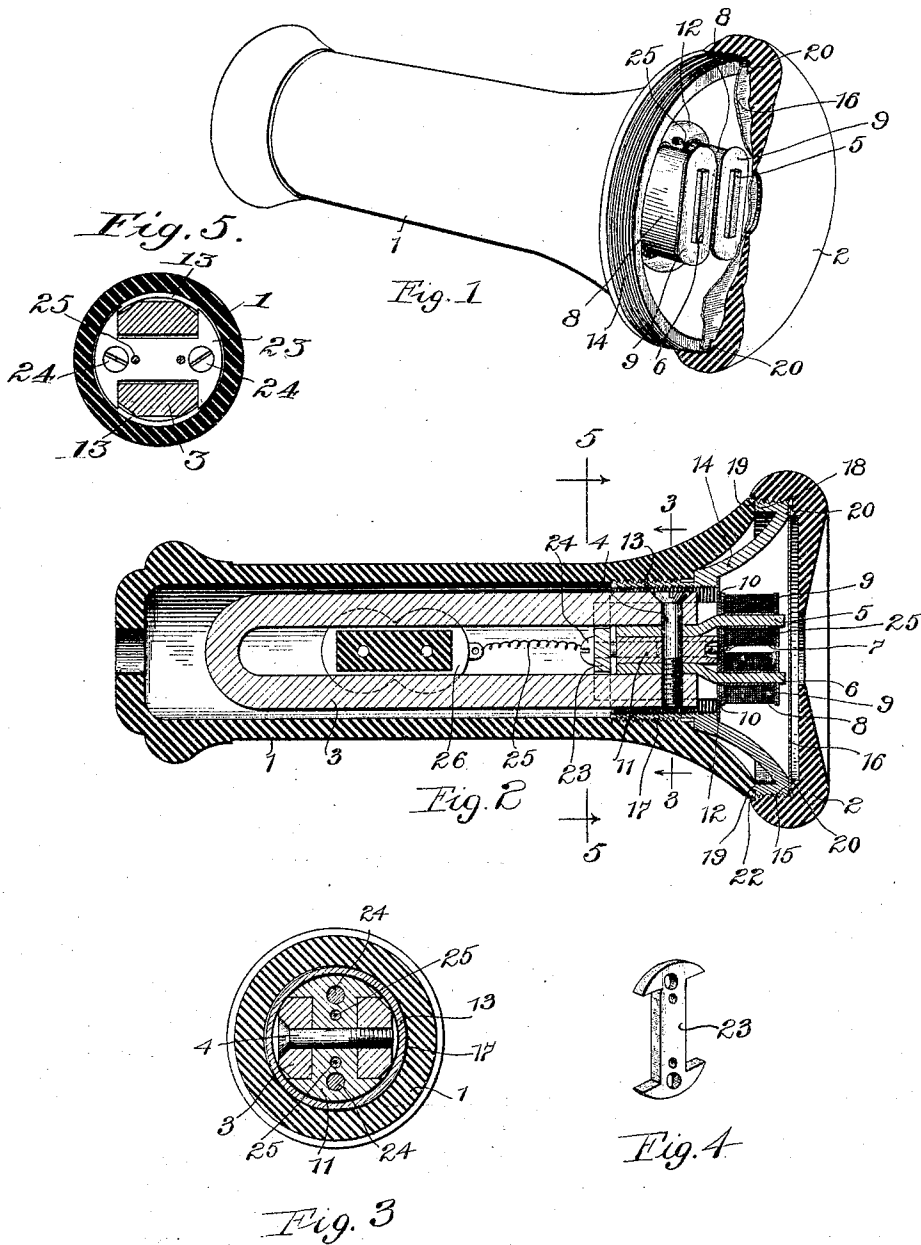


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PATENTED FEB. 21, 1905.

W. KAISLING.
TELEPHONE RECEIVER.
APPLICATION FILED FEB. 19, 1903.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 783,283, dated February 21, 1905.

Application filed February 19, 1903. Serial No. 144,087.

To all whom it may concern:

Be it known that I, WILLIAM KAISLING, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephone - Receivers, 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-receivers, and particularly to the means for adjusting the relative disposition between the diaphragm and the electromagnet-cores of such receivers. In telephone-receivers it is desirable that means be provided whereby the distance between the diaphragm and the ends of the electromagnet-poles may be adjusted. It is also desirable that the adjustment when once perfected shall be accurately and absolutely maintained. The expansion of different materials due to changes in temperature varies. In order that the expansion and contraction between the electromagnet-poles and the diaphragm be uniform, it has been found desirable to make the adjustable and adjusting parts of telephone-receivers entirely of metal, as distinguished from receivers of the prior art, in which hard rubber or other suitable insulating material has formed a part of the means of support intervening between the diaphragm and the electromagnet-poles. There has heretofore been a serious objection to such receivers provided with metallic adjustable parts in that such parts have been exposed on the outside of the receiver. If for any reason an electrical connection is established between the telephonic circuits and the metal parts of the telephone-receiver, a person in using such a receiver has been more or less liable to electrical shocks, which sometimes have been of a serious nature.

It is the object of my invention to provide a telephone-receiver in which the adjusting and adjustable parts shall be entirely of metal and which at the same time shall be entirely covered and protected by suitable insulating material.

Furthermore, my invention provides a receiver of great simplicity of construction and of improved durability and mechanical and electrical efficiency.

My invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view illustrating the preferred embodiment of my invention. Fig. 2 is a central longitudinal cross-sectional view of the same. Fig. 3 is a cross-sectional view taken on line 3 3 of Fig. 2. Fig. 4 is a view of a locking member employed in the preferred embodiment of my invention. Fig. 5 is a cross-sectional view taken on line 5 5 of Fig. 2.

I have illustrated a receiver-case comprising a hand portion 1 and an earpiece 2, both preferably formed of hard rubber. The interior of the hand portion is hollow to receive the permanent horseshoe-magnet 3. To this horseshoe permanent magnet are fastened, by means of the screw 4, the soft-iron cores 5 and 6, upon which are wound electromagnet-coils 7 and 8, retained between spool ends 9 and 10. There is clamped between the soft-iron cores a screw-threaded adjusting-piece 11 of H-shaped cross-section. A thin disk 12 is interposed between the adjusting-piece 11 and the electromagnet-coils to form a partition between the chamber containing the electromagnet-coils and that containing the horseshoe permanent magnet. The parts 11 and 12 are preferably formed of brass or other non-magnetic material. The adjusting-piece 11 is screw-threaded into the cylindrical portion 13 of a bell-shaped diaphragm-supporter 14, to the face 15 of which the diaphragm 16 is clamped, as will hereinafter be more fully explained. The exterior of the cylindrical portion 13 of the diaphragm-supporter is screw-threaded within the handle portion 1, as shown at 17. A shoulder 18 upon the diaphragm-supporter rests upon a shoulder 19 of the handle portion 1 to maintain a permanent relative disposition between the handle portion and the diaphragm-supporter. The diaphragm is held in contact with the face 15 of the dia-

phragm-supporter by means of the shoulder 20 of the earpiece 2, the earpiece being screw-threaded over the flanged end of the bell-shaped diaphragm - supporter. The diaphragm, it will be seen, is clamped between the diaphragm-supporter, which is preferably formed of brass or other non-magnetic metal, and the shoulder of the earpiece. The parts are so proportioned that the edge of the earpiece projects over the edge 22 of the handle portion 1, whereby the metal parts of the receiver are entirely incased and inclosed by the hard-rubber casing. In order that the electromagnet-poles may be adjustable with respect to the diaphragm, the adjusting-piece 11 is screw-threaded within the cylindrical portion 13 of the diaphragm-supporter. By removing the diaphragm-supporter and the other metal parts of the transmitter from the hard-rubber casing the diaphragm-supporter and the adjusting-piece 11 may be relatively rotated to adjust the distance between the electromagnet-poles and the diaphragm. In order to lock the parts in position as adjusted, the H-shaped locking-piece 23 is provided. This locking-piece is slightly longer than the width of the adjusting-piece 11, and its circular ends overlap the rear edge of the cylindrical portion 13. This edge extends slightly beyond the rear end of the adjusting-piece 11, and when proper adjustment is obtained between the adjusting-piece and the cylindrical portion 13 to bring the pole-faces in the proper position before the diaphragm the screws 24, which before adjustment have been loosened, are turned to draw the locking-piece toward the adjusting-piece 11. As the ends of this locking-piece, however, engage the rear edge of the cylindrical portion 13 the tendency will be to produce great friction between the threads of the adjusting-piece and the diaphragm-supporter, and these two parts will therefore be locked against movement until the screws 24 are again loosened for further adjustment. Openings are provided through the disk 12, the adjusting-piece 11, and the locking-piece 23 to accommodate the conductors 25, leading from the electromagnet-coils to the insulated terminals 26, which are clamped to the permanent magnet, as shown, and to which the conductors of a receiver-cord may be attached.

It will thus be seen that my invention provides means whereby the common means of support for the diaphragm and the electromagnet-cores is entirely of metal. This prevents any relative movement between the electromagnet-cores and the diaphragm due to variations in the temperature of the receiver. Furthermore, I have provided means whereby the metallic parts of the receiver are entirely inclosed within a receiver-casing of hard rubber, whereby a receiver of neat and pleasing appearance is provided and at the same time one whose mechanical and electrical efficiency is superior to that of receivers of the prior art.

While I have herein shown and described the preferred embodiment of my invention and one modification thereof, it will be apparent that many modifications might equally well be employed. I do not, therefore, wish to limit myself to the precise disclosure herein set forth; but,

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

1. In a telephone-receiver, the combination with a diaphragm, of a metal diaphragm-supporting member, an adjusting member 11 screw-threaded to the lower end of said supporting member whereby said members may be relatively adjusted, a magnet supported by said adjusting member, and a locking member 23 connected with the lower end of said adjusting member and engaging said supporting member whereby said members are locked in adjustment, substantially as described.

2. In a telephone-receiver, the combination with a diaphragm, of a metal diaphragm-supporting member, an earpiece of insulating material having screw-threaded engagement with said diaphragm-supporting member whereby said diaphragm is retained in contact with the face of said supporting member, an adjusting member 11 screw-threaded into the lower end of said supporting member, whereby said members may be relatively adjusted, a magnet supported by said adjusting member, and a locking member 23 connected with the lower end of said adjusting member and engaging said supporting member whereby said members are locked in adjustment, substantially as described.

3. In a telephone-receiver, the combination with a diaphragm, of a metal diaphragm-supporting member, an adjusting member 11 screw-threaded to the lower end of said supporting member whereby said members may be relatively adjusted, a magnet supported by said adjusting member, a locking member 23 connected with the lower end of said adjusting member and engaging said supporting member whereby said members are locked in adjustment, and an inclosing casing of insulating material entirely surrounding said members and said magnet, substantially as described.

4. In a telephone-receiver, the combination with a diaphragm, of a metal diaphragm-supporting member, an earpiece of insulating material having screw-threaded engagement with said diaphragm-supporting member whereby said diaphragm is retained in contact with the face of said supporting member, an adjusting member 11 screw-threaded into the lower end of said supporting member, whereby said members may be relatively adjusted, a magnet supported by said adjusting member, a locking member 23 connected with the lower end of said adjusting member and engaging said supporting member, whereby said members are locked in adjustment, and a han-

dle portion of insulating material forming with said earpiece a casing which entirely incloses the metal parts of said receiver, said handle having screw-threaded engagement
5 with the outside of the lower end of said diaphragm-supporting member, substantially as described.

5. In a telephone-receiver, the combination
10 with a permanent horseshoe-magnet, of cores attached to the poles thereof, electromagnet-coils on said cores, a screw-threaded adjusting member 11 attached to said cores and said magnet, a diaphragm-supporting member
15 threading at its lower end over said adjusting member, a locking member 23 engaging the lower end of said diaphragm-supporting member and connected with said adjusting member
20 for locking said members after adjustment thereof, an earpiece of insulating material having screw-threaded engagement with said diaphragm-supporting member, a diaphragm clamped between said earpiece and said supporting member, and a handle portion of insulating material extending from said ear-

piece and entirely surrounding said adjusting member and said magnet, said handle portion having screw-threaded engagement with the outside of the lower end of the diaphragm-supporting member, substantially as described. 25

6. In a telephone-receiver, the combination 30 with a diaphragm, of a metal diaphragm-supporting member, an adjusting member 11 screw-threaded into the lower end of said supporting member, whereby said members may be relatively adjusted, a magnet supported by 35 said adjusting member, a locking member 23 engaging at its edge with the lower end of the supporting member, and screws connecting the central portion of the locking member with the adjusting member, tightening of said 40 screws causing said adjusting member to be locked with respect to the supporting member.

In witness whereof I hereunto subscribe my name this 16th day of February, A. D. 1903.

WILLIAM KAISLING.

Witnesses:

CHARLES A. BROWN,
CHARLES J. SCHMIDT.