

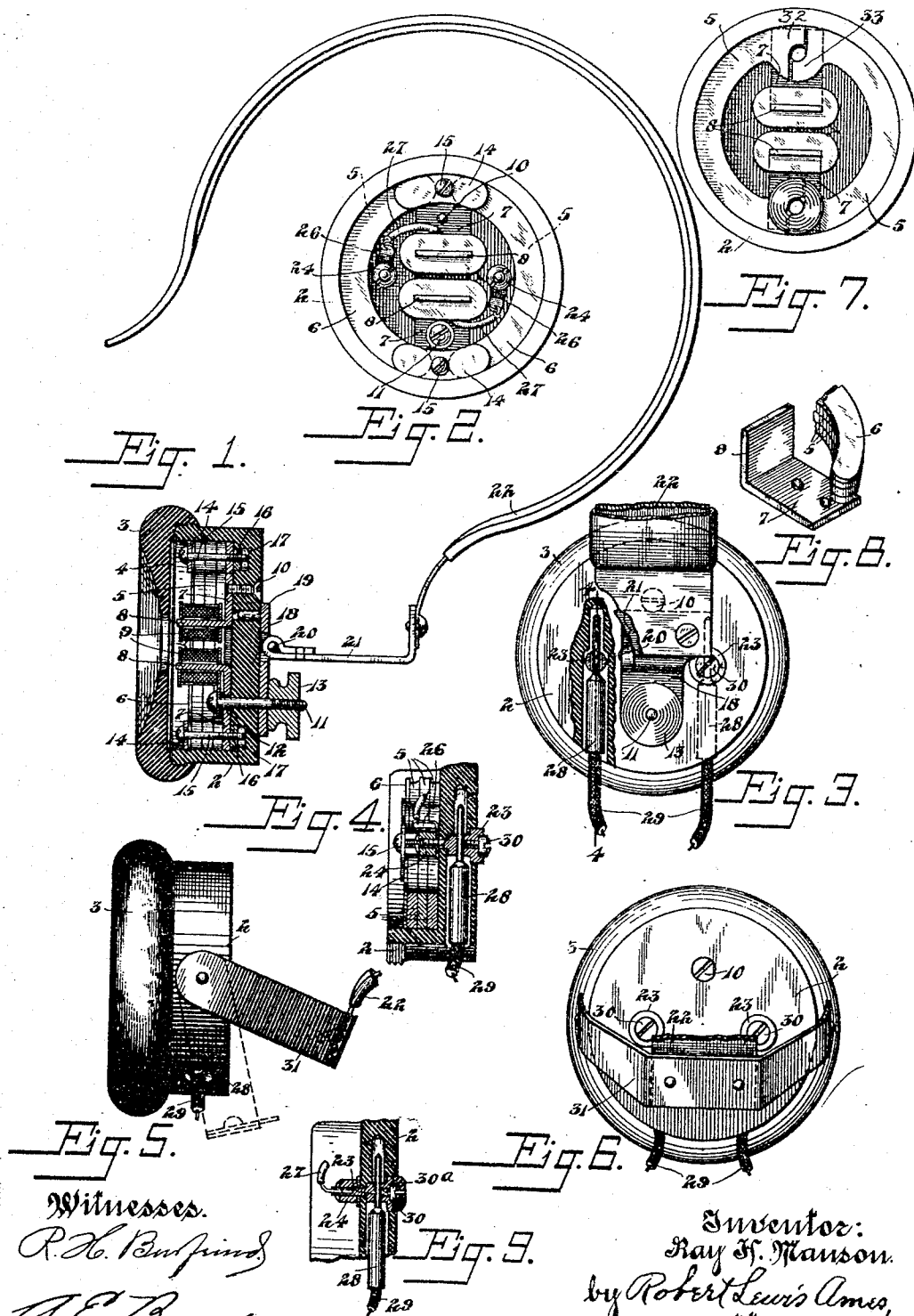
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No. 769,658.

PATENTED SEPT. 6, 1904.

R. H. MANSON.
TELEPHONE RECEIVER.
APPLICATION FILED AUG. 3, 1903.

NO MODEL.



Witnesses.
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UNITED STATES PATENT OFFICE.

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TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 769,658, dated September 6, 1904.

Application filed August 3, 1903. Serial No. 168,002. (No model.)

To all whom it may concern:

Be it known that I, RAY H. MANSON, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Telephone-Receivers, of which the following is a specification.

My invention relates to telephone-receivers of the so-called "watchcase" type and preferably such as are used as head-receivers for telephone-switchboard operators.

It is one object of my invention to provide a receiver of this type with inclosed binding-posts arranged in such manner that the receiver-cord terminals when connected with said binding-posts are inclosed within the insulating-shell of the receiver, whereby they are prevented from being short-circuited by other parts of the receiver or other objects or from coming into contact with the person of the switchboard operator when supporting the same by hand.

Another object is to provide such inclosed and protected binding-posts with means for operating the same from the exterior of the receiver-casing, whereby in order to connect the receiver in the electrical circuit in which it is intended to be used it is unnecessary to take the receiver apart or to disturb its adjustment in any manner.

An additional object is to provide the permanent magnet of the receiver with suitable supporting means between the pole-pieces, whereby it is not loosened by shocks, jars, or rough handling of the receiver; and still further objects are to provide a more substantial construction throughout than is common in receivers of this type.

To the accomplishment of these objects and such others as may hereinafter appear I provide the parts and combinations of parts hereinafter described, and particularly set forth in the appended claims, reference being had to the accompanying drawings, in which the same reference characters are used throughout to designate like parts, and in which—

Figure 1 is a sectional view through a re-

ceiver embodying my improvements. Fig. 2 is a face view of the receiver with the ear-piece or cap and the diaphragm removed. Fig. 3 is a rear face view of the receiver with parts broken away to show the connection of one of the receiver-cord tips with the binding-post. Fig. 4 is a sectional view on the line 4-4 of Fig. 3. Fig. 5 is a side view of the instrument in which the head-band is secured thereto by a different form of hinge than in Figs. 1 and 3. Fig. 6 is a rear view of the receiver provided with the latter form of head-band fastening. Fig. 7 is a view showing a modified form of the ends of the permanent-magnet pieces. Fig. 8 is a perspective view of one of the pole-pieces of the permanent magnet and showing the ends of the magnet strips or pieces resting thereon, and Fig. 9 is a detail view showing the binding-post and screw entirely insulated and the magnet-conductor soldered into the end of the post.

The shallow shell or casing 2 of the receiver, which is of insulating material, preferably hard rubber, is provided with exterior threads at its forward end, upon which is screwed the cap or earpiece 3, preferably of the same material and serving to clamp the diaphragm 4 against the forward end of the shell 2 and to protect the same, as well as to present a neat and pleasing appearance. The permanent magnet of the receiver is placed within the hollow shell or casing 2 and consists of a plurality of semicircular strips or pieces of steel or other suitable material, each of which is permanently magnetized, said pieces being placed one upon another and fitting along the inner periphery of the casing, with their ends terminating over the portions 7 of the pole-pieces, as more clearly shown in Fig. 8. The said pole-pieces are bent intermediate their ends, also as shown in Fig. 8, the portions 7 thereof passing beneath the adjacent ends of the two sides of the permanent magnet and the parts 8 extending into proximity with the diaphragm 5 of the instrument and carrying the magnet coils or spools 9. For the sake of a better finish and appearance I place a thin black japanned strip 6 of metal over the said

pieces 5, said strip being of the same form as the pieces 5. Suitable grooves are provided in the inner face of the shell or casing 2 to receive the portion 7 of these pole-pieces. One of the pole-pieces is secured in place within the shell by means of a screw 10, threaded through the bottom of the shell and into the pole-piece, while the other pole-piece in this form of the invention is held in place by a bolt or screw 11, that passes through a suitable insulating-bushing 12 in said pole-piece and through the securing-plate of the head-band hinge, as hereinafter explained, and is provided with a milled or thumb nut 13 upon the exterior of the casing. With a different form of head-band this pole-piece might be secured in place by the same means as the other. A clamping-plate 14 is placed over and outside the ends of the pieces 5, and a screw 15 is passed therethrough and between the said ends of the permanent magnets and thence through the end 7 of the pole-piece and is threaded into a nut 16, that is fitted into a suitable depression 17, formed in the material of the casing. The nut 16 is irregular in outline and is prevented from turning by the walls of the depression 17, so that the screw 15 may be tightened therein to clamp the plate 14, the permanent-magnet pieces and the end 7 of the pole-piece together. In the ordinary instruments of this type the pole-pieces are supported upon the flat inner face of the shell, and since only the ends of the permanent-magnet strips rest upon said pole-pieces they are otherwise unsupported throughout their length, and any jar or shock of the instrument causes great strain upon the said clamping means and tends to loosen the connection, as well as to shake them out of position. In this arrangement, however, the said magnet-strips are supported between their ends by the material of the shell, and such sudden jars or shocks do not cause unusual strain upon the clamping means and do not tend to shake the magnets out of place. As before stated, the bolt 11 passes through the bottom of the shell and serves to clamp in place the plate 18, to which the head-band 22 is pivoted, a steady-pin 19 upon said plate entering a suitable aperture in the shell. Upon a pin 20, carried by the plate 18, the member 21 is pivoted or hinged, and to the outer end of this plate the head-band 22 of usual form and construction is secured.

In order to connect the magnet-coils 9 in the electric circuit in which the instrument is to be used, suitable binding-posts 23 are provided upon each side of the head-band hinge, said binding-posts being provided with enlarged outer ends fitting into suitably-formed apertures in the shell and with a threaded stem upon their inner ends, to which the nuts 24 are secured. Suitable metallic washers are placed beneath the nuts 24 and are provided with integral projections 26, to which

the terminal conductors 27 of the magnet-coils are secured. When the nuts 24 are tightened, the binding-posts are secured in position and the electric circuit of the coils 9 thereto is completed. These binding-posts are provided with transverse apertures in the portion passing through the back of the shell that are adapted to receive the metallic tips of the receiver-cords. These apertures are in line with corresponding apertures formed in the rear wall or bottom of the casing and which are of sufficient dimensions to receive the metal tips 28 of the receiver-cords 29. The reduced end of the tip is adapted to be inserted in the transverse aperture in the binding-post, and a screw 30 in the outer end of the post is adapted to clamp the tip in place within the same and to form a good electrical connection therewith.

It will be observed that the binding-screws 30 are operated from the exterior of the casing and that to connect or disconnect the receiver-cord tips it is unnecessary to open the shell or disturb the adjustment of the instrument in any way. The location of these binding-posts is such that the metallic tips of the receiver-cord when connected with said binding-posts are entirely inclosed within the insulating-shell of the receiver and are thereby prevented from coming into contact with the operator's person or other objects. It is common for operators to ease the head by dropping the head-band back and supporting the receiver in the hand. The hand is thus liable to come into contact with the cord-tips if they project, and they are also liable to be pressed into contact with the side of the face or the neck of the operator, whereby great danger of electric shocks exists.

It will be noticed that the hinge-plate 18 of the head-band, as well as the bolt 11 and nut 13, is entirely insulated from the electric circuit or working parts of the receiver, so that no shocks can be received therefrom. In order to further insulate the binding-posts, I may use the arrangement shown in Fig. 9, in which the binding-posts proper do not project beyond the outer face of the shell, and the binding-screws 30 are provided with an insulating-cap 30*, secured thereto in any desired manner, which fits closely within the aperture formed in the shell 2 to accommodate the enlarged end of the binding-post. A suitable slot is formed centrally of said cap 30* to permit the insertion of a screw-driver to manipulate the binding-screw 30. In this arrangement, as well as in the former arrangement, it will be observed that there are no projecting parts to catch in the hair of the operator, a common objection in prior forms of receivers where exterior binding-posts are employed or where the terminals of the receiver-cord project beyond the edge of the receiver. In Fig. 9 I also show the magnet-conductor 27 soldered directly into an

aperture formed in the inner end of the binding-post, whereby, although the binding-post may become loosened, a good electrical connection is still maintained. Another common

5 method of hinging head-bands of receivers of this type to the casing is that shown in Figs. 5 and 6 and consists in employing a light metal yoke 31, pivoted to the outer edges of the receiver shell or casing. It has also been
10 common heretofore to so locate the binding-posts of the receiver that merely the reduced ends of the receiver-cord tips were inserted into the shell, thus leaving the enlarged rear portions of the metal tips projecting. With
15 this arrangement of binding-posts the type of head-band shown in Figs. 5 and 6 was adapted when dropped down into the position shown in dotted lines to engage the receiver-cord tips and short-circuit them, thus cutting the
20 receiver entirely out of the circuit in which it was intended to be used. This short-circuiting occurred more often at times when the operators removed the head-bands from their heads and held the instruments to their
25 ears with their hands. With the arrangement of the binding-posts and inclosed tips described herein such short-circuiting of the binding-posts by means of the ordinary head-band is prevented.

30 In Fig. 7 I show an arrangement in which a more secure fastening of the ends of the permanent magnets may be secured than that shown in Fig. 2 and in which a greater surface contact between the pole-pieces and the
35 magnet-pieces is secured. In this form the ends of the permanent magnets are provided with projections 32 and 33, which extend beyond the center line of the fastened screw into corresponding recesses formed in the op-
40 posite ends of the magnet-bars, so that the tendency of the magnet-pieces to buckle or twist out from beneath the clamping-plate 14 is strongly resisted. It will be observed that in this form only a single form of punch and
45 die is required to make the magnet-pieces 5, since all pieces are constructed alike.

I claim—

1. The combination with a receiver having a shallow insulating-shell, a permanent magnet
50 and cooperating parts within the shell, and interior binding-posts carried by the shell and extending through independent openings in the rear wall thereof, of receiver-cord tips connected with said posts, said posts being so
55 located that the said tips do not project beyond the edge of the shell far enough to engage extraneous objects, substantially as described.

2. The combination with a receiver having a shallow insulating-shell, a permanent magnet and cooperating parts within the shell, and
60 interior binding-posts extending through the rear wall of the shell so as to be accessible without opening the shell, of metallic receiver-cord tips connected with said binding-posts

through intersecting openings and inclosed their full length by the said shell, substantially as described.

3. The combination with a receiver having a shallow insulating-shell, of a permanent
70 magnet and cooperating parts carried within the shell, and binding-posts for the receiver extending through independent openings in the rear wall of the shell, of receiver-cord tips, and means for connecting said receiver-cord tips with said binding-posts so that they
75 shall be inclosed practically their full length by the shell, substantially as described.

4. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts within the shell, interior binding-
80 posts for said receiver with which the receiver-cord terminals are adapted to be connected, clamping devices carried by the binding-posts and operable from the exterior of the shell, whereby said cords may be
85 connected with the receiver or disconnected therefrom without opening the shell, substantially as described.

5. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts within the shell, interior binding-
90 posts carried by the shell, metallic receiver-cord terminals connected to said posts and inclosed by the shell their full length, and means for operating said binding-posts from the exterior of the shell so that the receiver
95 may be connected with the said cords or disconnected therefrom without opening the shell, substantially as described.

6. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts carried within the shell, binding-
100 posts inserted in the rear wall of the shell and suitably connected with the magnet-coils within the shell, said posts having apertures in line with other apertures in said rear wall, the latter apertures being designed to receive the receiver-cord terminals and to inclose
105 them when they are connected with the said posts, and binding-screws inserted in the outer ends of said posts and adapted to be operated from the exterior of the shell to bind the said
110 terminals in the posts, substantially as described.

7. In a telephone-receiver, the combination with a shallow insulating-shell, of a circular
120 permanent magnet composed of two semi-circular parts fitting within the shell and attached at their adjacent ends to pole-pieces, and magnet-coils located upon said pole-pieces and suitably connected in the circuit of the
125 receiver, said permanent magnet parts being each supported substantially throughout that portion of its length lying between the said pole-pieces, substantially as described.

8. In a telephone-receiver, the combination 130

with a shallow insulating-shell, of a permanent magnet comprising semicircular bars fitting around within the shell and along both sides, pole-pieces overlapping the adjacent ends of said bars to which they are secured, the adjacent ends of said bars having interengaging projections and recesses, substantially as described.

9. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts within the shell, interior binding-posts extending through the rear wall of the shell and embedded therein approximately their full length, with which the receiver-cord terminals are adapted to be connected, said posts having their outer ends protected by insulation, so as to present no obstruction on the exterior of the shell, substantially as described.

10. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts within the shell, interior binding-posts embedded in the shell approximately their full length and adapted to receive the receiver-cord terminals, the exterior parts of the binding-posts being each separately covered by insulation, substantially as described.

11. In a telephone-receiver of the class described, the combination with an insulating-shell and a permanent magnet and cooperating parts within the shell, binding-posts inserted through independent openings in the rear wall of the shell and suitably connected within the shell to the magnet-coils, each of said posts having an aperture in line with another aperture in the rear wall of the shell, this latter aperture being designed to receive and inclose or protect the receiver-terminal, a binding-screw inserted in the end of each binding-post, and insulating means covering the outer ends of the binding-posts and the binding-screws therein.

12. In a telephone-receiver, the combination with an insulating-shell and a permanent magnet and cooperating parts within the shell, binding-posts inserted in independent openings in the rear wall of the shell and suitably connected with the magnet-coils within the shell, each of these posts being adapted to close the opening in which it is inserted and each post being provided with an aperture for connection to a receiver-cord, the shell being provided with openings for the receiver-terminals, and the binding-screw inserted in the head of each of the binding-posts.

13. In a telephone-receiver, the combination with an insulating-shell, of a permanent magnet comprising semicircular bars fitting around within the shell and along both sides, pole-pieces overlapping the adjacent ends of said bars, and means for detachably clamp-

ing the overlapping ends to the pole-pieces, substantially as described.

14. The combination with a watchcase-receiver having a shallow insulating-shell, a permanent magnet and cooperating parts within the shell, said shell having a comparatively thick rear wall, binding-posts extending through openings in the rear wall of the shell, said rear wall having openings leading from the edge of the shell and intersecting the openings of said binding-posts, a receiver-cord having conductors provided with metallic tips, said tips being inserted in said intersecting openings, and connecting with said binding-posts, the said tips when connected with said posts being inclosed by the material of the shell.

15. In a watchcase telephone-receiver, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts carried within the shell, said shell having a thick rear wall, binding-posts inserted in the rear wall of the shell and suitably connected with the magnet-coils within the shell, said posts having apertures in line with other intersecting apertures in said rear wall, a receiver-cord provided with comparatively long and rigid metallic tips, said tips being inserted through said intersecting apertures and into the apertures of the posts and when so connected with the posts to be inclosed and protected by the shell, and binding-screws inserted in the outer ends of said posts and operated from the exterior of the shell to bind the said tips in the posts.

16. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts within the shell, binding-posts inserted through independent openings in the rear wall of the shell, the magnet-coil conductors being soldered to the inner ends of said posts within the shell, each of said posts having a transverse aperture in line with another intersecting aperture in the rear wall of the shell, this latter aperture being designed to inclose and protect the receiver-cord tips, a binding-screw inserted in the end of each binding-post and operated from the exterior of the shell.

17. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a permanent magnet and cooperating parts within the shell, interior binding-posts embedded in and extending through the rear wall of the shell with which the receiver-cord tips are designed to be connected, binding-screws in the outer ends of said posts, and operated from the exterior of the shell, the outer ends of said posts as well as said screws presenting no obstruction on the rear exterior face of the shell to catch into extraneous objects.

18. In a telephone-receiver of the class de-

scribed, the combination with a shallow insulating-shell, of a permanent magnet and co-operating parts within the shell, interior binding-posts embedded in and extending through the rear wall of the shell with which the receiver-cord tips are adapted to be connected, binding-screws in the outer ends of said posts and operated from the exterior of the shell, the outer ends of said posts fitting closely the apertures in the shell in which they are placed and the binding-screws fitting closely into countersunk apertures in the ends of said posts, whereby no obstructions are presented upon the exterior of the shell to catch into extraneous objects.

19. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a magnet and co-operating parts within the shell, binding-posts embedded in the rear wall of the shell, lateral passages in said rear wall intersecting the binding-posts, receiver-cord terminals inclosed in said passages, a head-band pivotally connected to said shell and insulated from the electric circuit of the receiver.

20. In a telephone-receiver of the class described, the combination with a shallow insulating-shell, of a circular permanent magnet composed of two semicircular parts fitting within the shell and clamped at their adjacent ends to the co-operating pole-pieces, magnet-coils located upon said pole-pieces and suitably connected within the circuit of the receiver, said permanent-magnet parts being each supported throughout that portion of its length lying between said pole-pieces by the material of the shell.

21. In a telephone-receiver, the combination with a shallow insulating-shell, of a permanent magnet comprising semicircular bars fitting around within the shell and upon both sides, pole-pieces overlapping the adjacent ends of the bars, and means to clamp said adjacent ends to the pole-pieces, the said adjacent

ends of said bars having projections extending beyond the center line of the said clamping means.

22. In a telephone-receiver, the combination of an insulating-shell, a permanent magnet and co-operating parts within the shell, interior binding-posts carried by the shell, a receiver-cord having metallic terminals connected to said binding-posts and inclosed by the shell, and means for operating said binding-posts from the exterior of the shell, so that the receiver may be connected with the said terminals or disconnected therefrom without opening the shell.

23. In a telephone-receiver, the combination of a shallow insulating-shell, a permanent magnet and co-operating parts within the shell, interior binding-posts carried by the shell and accessible from the exterior of the shell, a receiver-cord having metallic terminals connected to said binding-posts and inclosed by the shell, a yoke carrying a head-band and being pivoted to said shell, for the purposes set forth.

24. In a telephone-receiver, the combination of an insulating-shell, a permanent magnet and co-operating parts within the shell, interior binding-posts carried by the shell, receiver-cords having their metallic terminals inclosed throughout their length by the shell and connected to said interior binding-posts, a yoke having the ends of its arms pivoted to the exterior of the shell at a point above the points where said metallic terminals enter the body of the shell, so that when said yokes swing down it will not strike against said metallic terminals, and a head-band attached to said yoke.

Signed by me at Chicago, county of Cook, State of Illinois, this 30th day of July, 1903.

RAY H. MANSON.

Witnesses:

GAZELLE BEDFORD

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