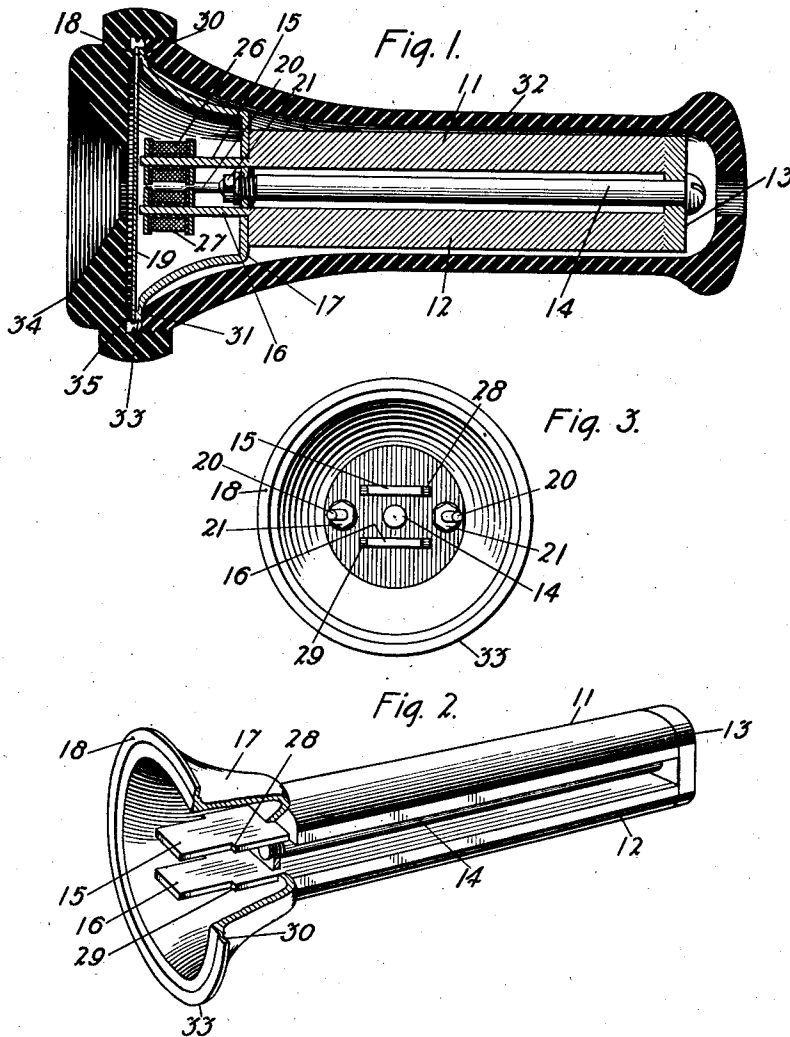


E. B. CRAFT & J. N. REYNOLDS.
 TELEPHONE RECEIVER.
 APPLICATION FILED JAN. 2, 1912.

1,062,082.

Patented May 20, 1913.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD B. CRAFT, OF HACKENSACK, NEW JERSEY, AND JOHN N. REYNOLDS, OF GREENWICH, CONNECTICUT, ASSIGNORS TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

TELEPHONE-RECEIVER.

1,062,082.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed January 2, 1912. Serial No. 668,829.

To all whom it may concern:

Be it known that we, EDWARD B. CRAFT and JOHN N. REYNOLDS, citizens of the United States, residing at Hackensack, in the county of Bergen and State of New Jersey, and at Greenwich, in the county of Fairfield and State of Connecticut, respectively, have invented a certain new and useful Improvement in Telephone-Receivers, of which the following is a full, clear, concise, and exact description.

This invention relates to telephone receivers, more particularly to telephone receivers of the bipolar type in which the magnet coils are inclosed in a cup, forming therewith a structure in which the relation of the parts is maintained constant.

An object of this invention is to provide a magnet system for a telephone receiver, in which the various elements are made of straight bar stock, electrically welded together, thereby eliminating the trouble due to warping when the magnet system is made of stock bent to shape, and the trouble due to a plurality of joints when the magnet system is composed of straight bar stock bolted or riveted together.

Another object of this invention is to provide a cup in combination with the magnet system, the cup acting as a spacing piece for the free ends of the magnet, the cup and the magnet being held together in such relation that the adjustment between the diaphragm and the ends of the magnet poles is maintained constant under all conditions of service.

In the drawings—Figure 1 is a sectional view of a receiver, showing the parts assembled, and the means for clamping the cup to the magnet system; Fig. 2 is a detail perspective view of the magnet system; Fig. 3 is a front view of the magnet system and the inclosing cup.

Referring to the figures, the bar magnets 11 and 12 are made of straight bar stock and are electrically welded to the heel piece 13. Through the center of the heel piece 13 passes the threaded clamping bolt 14. A cup 17, of non-magnetic material, and provided with rectangular slots through which the pole pieces 15 and 16 pass, is securely clamped to the bar magnets 11 and 12 by the threaded clamping bolt 14. The pole pieces 15 and 16 are electrically welded to

the bar magnets 11 and 12, and extend through the slots in the cup, said slots properly spacing said pole pieces. Upon the free ends of the pole pieces 15 and 16 are secured the coils 26 and 27, the coils resting upon the shoulders 28 and 29 formed on the pole pieces. A shoulder 30 on the under side of the flange 33 of the cup 17 fits over the inner edge 31 of the receiver casing 32, thereby insuring the holding of the cup 17 and its attached magnets 11 and 12 centrally within the casing 32. Upon the face of the flange 33 is an annular ring 18 to which is clamped the diaphragm 19. The cup and its attachments are clamped in place by means of the earpiece 34 which is provided with the annular ring 35, said ring pressing upon the edge of the diaphragm 19, thereby holding said diaphragm and cup 17 in place. Connectors 20, passing through perforations in the cup, and clamped thereto by nuts 21, are provided for making connection with the coils 26.

It will be seen that the magnets and their attached pole pieces and coils are supported within the shell or casing entirely by the cup 17; that any changes in the dimensions of the cup due to changes in temperature, whereby the distance between the ends of the pole pieces and the diaphragm might be changed, are compensated by an equal change in the length of the pole pieces, with the result that the air gap between the diaphragm and the pole pieces is kept constant in length. Further, the electric welding of the heel piece and the pole pieces to the magnets renders the magnetic circuit complete, the only break or high resistance point for the passage of the magnetic flux being the air gap between the diaphragm and the pole pieces. The previous forms of magnetic paths of similar character lacked the efficiency of the present device, in that the riveting or clamping of the magnets, heel piece and pole pieces together did not give an unbroken metallic path such as is obtained by this construction.

We claim:—

1. In a magnet system for telephone receivers, a permanently magnetized steel bar and a soft iron pole-piece welded thereto.
2. In a magnet system for telephone receivers, a soft iron pole-piece and a hardened steel bar welded together end to end.

3. In a telephone receiver, in combination
a magnet system comprising two straight
bar sections, a heel piece therefor welded
thereto at one end, a cup having slots
5 therein and abutting against the bar sections,
pole pieces welded to the bar sections
at the end remote from the heel piece and
passing through the slots in the cup, and
means passing through the heel piece for
10 clamping the cup to the bar sections.

4. In a telephone receiver, the combination
of a magnet comprising bars and a heel
piece welded together, a cup, pole pieces
welded to said bars and extending through
15 perforations in said cup, non-magnetic
clamping means for clamping said cup to
said magnet bars on said pole pieces, and a
diaphragm clamped to said cup in position
to be acted upon by said pole pieces.

20 5. In a telephone receiver, in combination
a magnet system comprising bars and
a heel piece welded together, pole pieces for
said bars welded thereto at the end remote
from the heel piece, a cup having perfora-

tions fitting over said pole pieces and abut- 25
ting against the magnet bars, a threaded bolt
passing through a perforation in the heel
piece and through a threaded hole in the
cup, whereby the cup is clamped to the mag-
net system and in fixed relation thereto. 30

6. A magnet system for a telephone re-
ceiver comprising a horseshoe magnet hav-
ing its heel piece and pole pieces welded
thereto, of a spacing plate for the pole
pieces comprising a cup having perforations 35
spaced apart, a threaded perforation in said
cup centrally located with respect to said
pole pieces, a threaded bolt passing through
the heel piece and threading into said cup,
whereby the cup is clamped in fixed relation 40
to the pole pieces.

In witness whereof, we hereunto subscribe
our names this 29th day of Dec. A. D., 1911.

EDWARD B. CRAFT.
JOHN N. REYNOLDS.

Witnesses:

IRVING MACDONALD,
W. F. HOFFMAN.