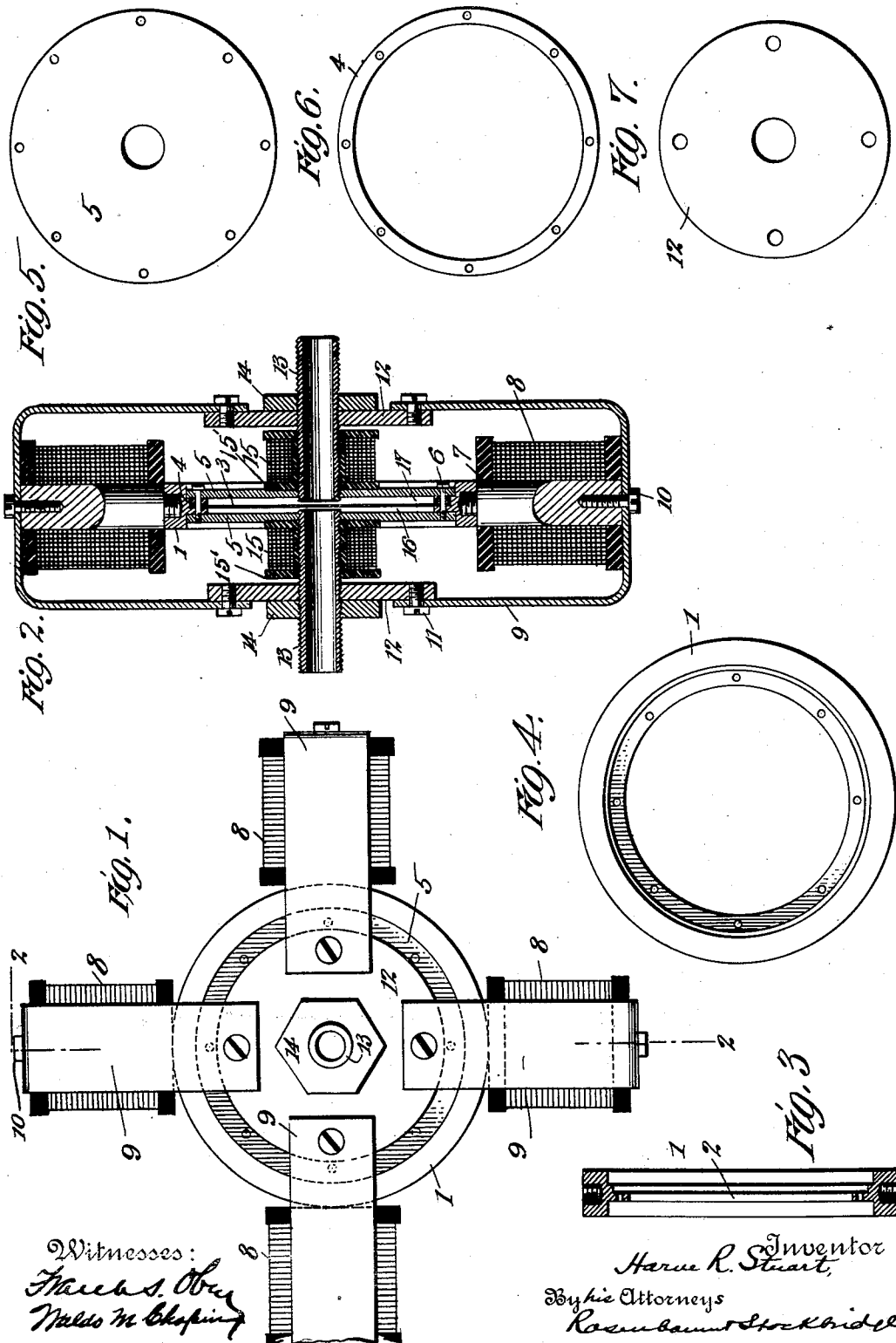


H. R. STUART.
 TELEPHONE RECEIVER.
 APPLICATION FILED MAR. 21, 1908.

988,044.

Patented Mar. 28, 1911.



Witnesses:
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UNITED STATES PATENT OFFICE.

HARVE R. STUART, OF WHEELING, WEST VIRGINIA.

TELEPHONE-RECEIVER.

988,044.

Specification of Letters Patent.

Patented Mar. 28, 1911.

Application filed March 21, 1908. Serial No. 422,398.

To all whom it may concern:

Be it known that I, HARVE R. STUART, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Telephone-
Receivers, of which the following is a full, clear, and exact description:

My invention relates to telephone receivers for use in ordinary telephone circuits, and also in connection with telegraphones, and has for its object the combining of the magnetic and mechanical elements of a receiver in such a way as to produce a device which will respond to small or feeble currents and will produce strong acoustic effects, and my invention consists in the features hereinafter set forth and claimed.

Reference is hereby made to the accompanying drawing in which the same reference numerals are used to designate the corresponding parts in the several views of which,

Figure 1 is a side elevation of a receiver constructed in accordance with my invention. Fig. 2 is a section on the line 2-2 of Fig. 1. Figs. 3, 4, 5, 6 and 7 are detail views of certain of the elements of construction.

The receiver shown comprises a supporting ring 1 of magnetic material such as iron or steel, which is provided with an inwardly extending flange 2 which forms a seat for the iron or steel diaphragm 3. A ring 4 of magnetic material is placed upon the diaphragm 3, as shown in Fig. 2, and the members 1, 3 and 4 are held together by means of disks 5 of brass or other non-magnetic material, said disks being seated within the ring 1 as shown, and clamped in position by the screws 6 suitably spaced around the circumference of the said disks.

The periphery of the ring 1 is drilled and tapped for the securing of the cores 7 of four magnets which may be either permanent or electro-magnets, but which are shown as electro-magnets having energizing coils 8. These magnets also comprise U-shaped arms or yokes 9, which may be of wrought iron and which are secured at their centers to the cores 7 by screws 10, and at their ends by screws 11 to a pair of wrought iron disks 12. The magnetic circuits of the four magnets are completed by tubular pole pieces 13 which are threaded within the disks 5 and 12 and locked in position by nuts 14, thus providing for the ready ad-

justment of said pole pieces toward and away from the diaphragm. These pole pieces are of like polarity, and are arranged in axial alinement with each other, their inner ends being adjacent the center of the diaphragm 3.

There are a pair of coils 15 disposed upon bases 15' surrounding the pole pieces 13 through which the voice currents are allowed to flow, and which are so wound that a current in one direction will weaken the magnetic field of one of the pole pieces 13, at the same time strengthening the field of the other pole piece, whereby the diaphragm or armature will be moved toward the latter pole piece; when the current is reversed, the diaphragm will be moved toward the other pole piece.

It will be noted that the ring 1 and plates 5 together with the diaphragm 3, form a pair of resonance chambers 16 and 17; and that the pole pieces 13 act as sound conducting tubes forming outlets for the said resonance chambers 16 and 17, said tubes being adapted to be connected to ear pieces, megaphones, or listening devices. Another advantage of the tubular form of the pole pieces 13 is that they are of greater diameter than solid pole pieces of the same cross sectional area. This increased diameter enlarges the circumference of the circle within which a given number of lines of force enter the diaphragm and therefore decreases its magnetic reluctance and gives a greater total induction in the magnetic circuit.

Having now described my invention, what I claim, is:

1. In a receiver, the combination of the tube 13, the disk 12, the ring 1, and one or more magnets for magnetizing the ring and tube with opposite polarity.

2. In a receiver, the combination of the ring 1 of magnetic material, the disks 12, and U-shaped members 9 magnetically connected at their centers to said ring and at their ends to said disks.

3. In a receiver, the combination of the supporting ring 1, a plurality of cores 7 extending radially from the exterior thereof, a pair of tubes 13 in axial alinement with each other, and means for connecting said cores and tubes in a plurality of magnetic circuits.

4. In a receiver, the combination of the supporting ring 1, the diaphragm 3 secured thereto, and a plurality of magnets extend-

ing radially from the exterior of said ring and provided with common poles of like polarity adjacent opposite faces of the movable portion of said diaphragm.

5 5. In a receiver, the combination of the supporting ring 1, diaphragm 3, and securing plate 5, forming a resonance chamber, a tube 13 forming an outlet for said cham-

ber, and means for oppositely polarizing said ring and tube. 10

In witness whereof, I subscribe my signature, in the presence of two witnesses.

HARVE R. STUART.

Witnesses:

FRANK S. OBER,
WALDO M. CHAPIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
