

No. 688,433.

Patented Dec. 10, 1901.

F. J. ORR.
TELEPHONE RECEIVER.
(Application filed Jan. 12, 1901.)

(No Model.)

Fig.1,

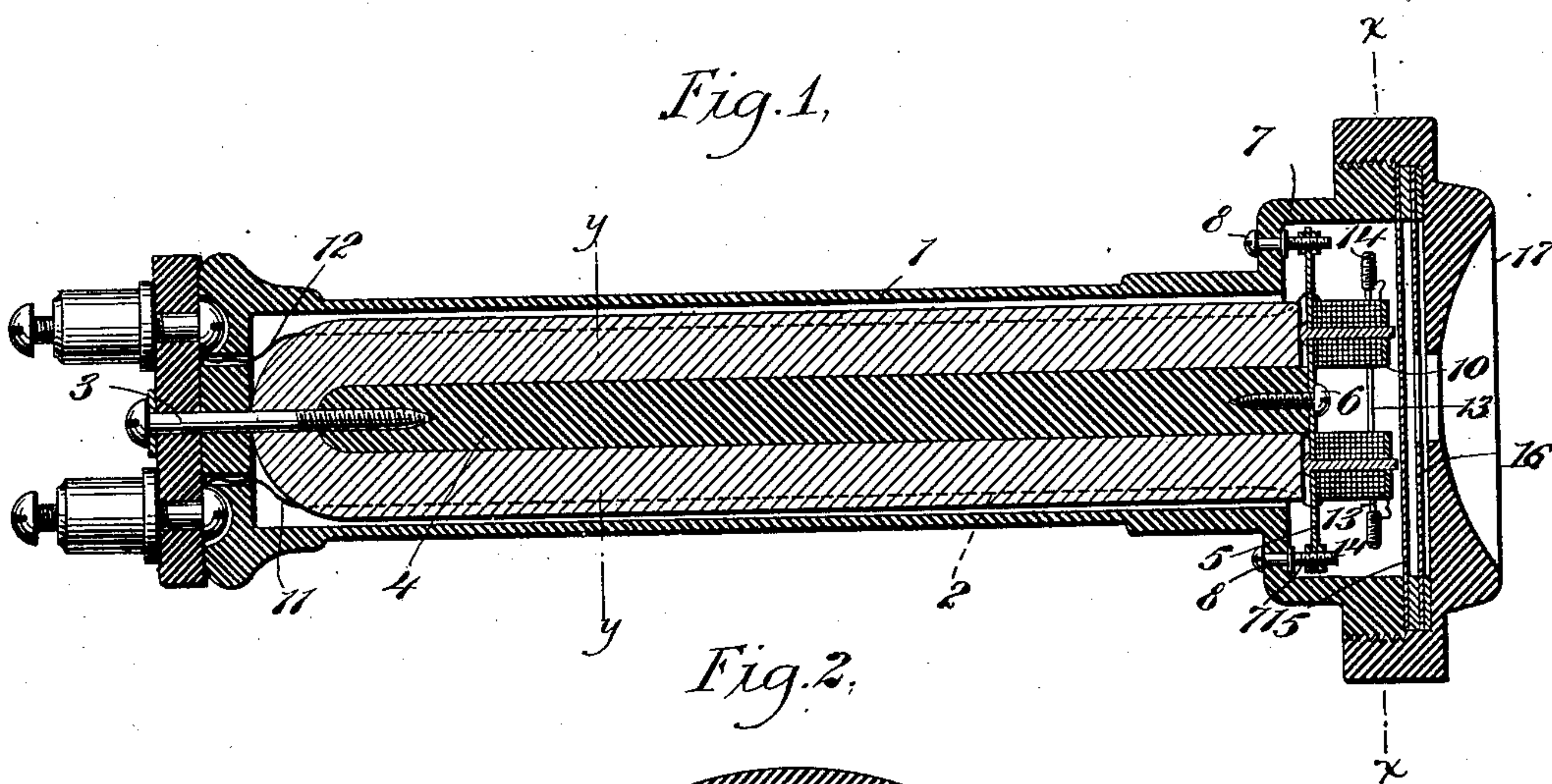


Fig. 2.

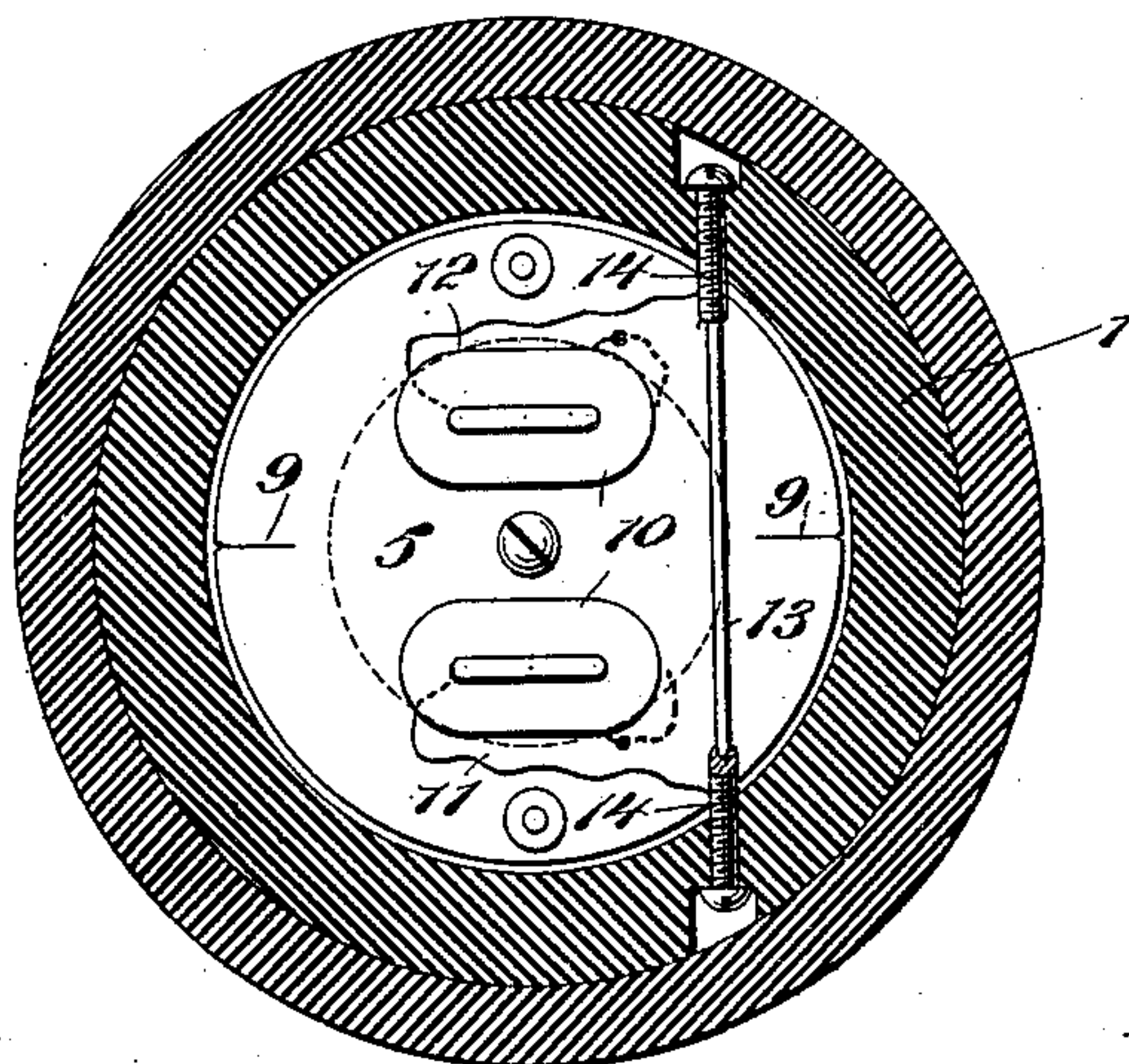


Fig. 4.

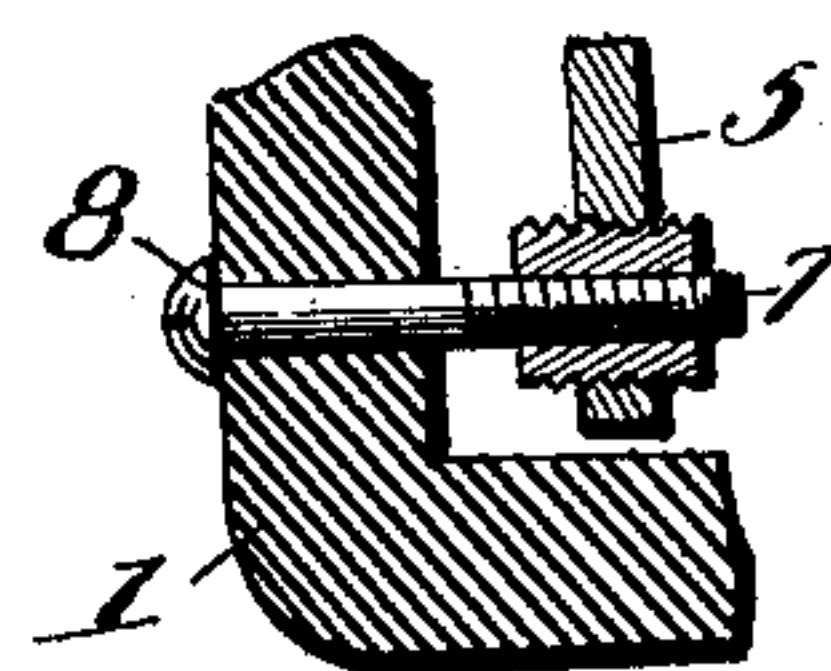
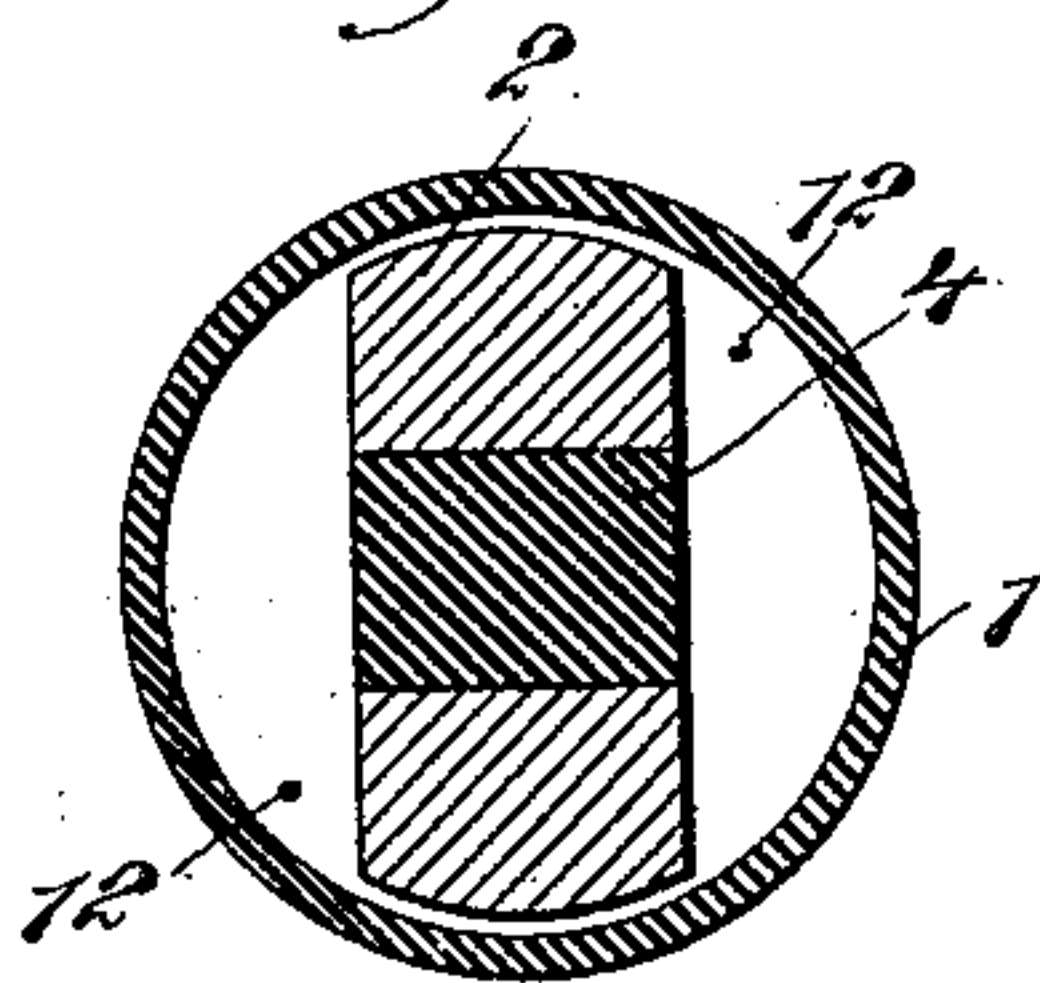


Fig. 3.



WITNESSES:

Edward Thorpe
C. R. Ferguson

INVENTOR

Francis J. Orr

BY

Mumford
ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANCIS J. ORR, OF HOLLAND, NEW YORK.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 688,433, dated December 10, 1901.

Application filed January 12, 1901. Serial No. 42,990. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS J. ORR, a citizen of the United States, and a resident of Holland, in the county of Erie and State of New York, have invented a new and Improved Telephone-Receiver, of which the following is a full, clear, and exact description.

This invention relates to improvements in telephone-receivers; and the object is to provide a receiver so constructed that the sound produced will be very much increased and clearer as compared with the receivers in ordinary use and in which the usual buzzing and roaring are obviated.

I will describe a telephone-receiver embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal section of a receiver embodying my invention. Fig. 2 is a section on the line xx of Fig. 1. Fig. 3 is a section on the line yy of Fig. 1, and Fig. 4 is a sectional detail showing an edge-securing device for the magnet-supporting plate.

Referring to the drawings, 1 designates the receiver-casing, which may be of the usual or any desired shape. Arranged in the barrel portion of the receiver is a permanent magnet 2, which is secured in place by means of a screw 3 passing through the end piece of the casing and into a strip 4 of non-conducting material—such, for instance, as wood or rubber—placed between the members of the permanent magnet. Arranged at the end of the permanent magnet is a plate 5, of suitable vibratory metal—such, for instance, as brass. This plate 5 is secured in position by means of a screw 6 passing through said plate into the end of the strip 4, and it may be held near its outer edge and at a suitable distance apart by means, as here shown, of screws 7, which pass through tapped holes near the edge of the plate, and these screws 7 are made tubular and interiorly threaded to receive fastening-screws 8, which pass through the casing. While I have shown the plate as fastened at two points, it is obvious that it may be fastened at a greater number of points. The object in so fastening the plate near its edge is

to prevent excessive vibration. At a suitable point or points the plate 5 is slitted inward from its periphery, as indicated at 9, the object of these slits being to prevent induction of the plate.

Rigidly secured to the plate 5 are the electromagnets 10. As here shown, the cores of these electromagnets are extended through openings in the plate, shouldered against it, and held or riveted at the inner end, these inner ends being closely impinged against the ends of the permanent magnet 2. I have shown a bipolar receiver or two electromagnets; but it is to be understood that I may employ a single-pole electromagnet. The outer ends of the electromagnet-windings are connected to the lead-wires 11 and 12, while the inner ends of said windings are electrically connected together through a microphone or bridge-piece, consisting of a strip 13, of suitable metal or carbon, and having its ends loosely engaged in depressions formed in the ends of adjusting-screws 14. By thus joining the inner ends of the windings the sound produced is materially increased by the slight vibration of the microphone.

Secured in the casing at the ends of the electromagnets is the ordinary diaphragm 15, and arranged forward of this diaphragm 15 is a ring-like diaphragm 16, of vibratory metal—such, for instance, as iron. The opening through the center of this diaphragm 16 is substantially the same in size as the opening through the earpiece 17, and it will be seen that said diaphragm is spaced slightly from the diaphragm 15 and also spaced from the inner surface of the earpiece.

In operation the inner plate 5, vibrating at every impulse or wave of the human voice, controls or causes a unison of the vibration of the two diaphragms with the plate, and this plate 5 is somewhat heavier or thicker than the diaphragms. The result is that one is able to hear clearly when the vibrations in the ordinary type of receiver are utterly unintelligible.

While I have shown the electromagnets as engaging directly with the ends of the permanent-magnet members, it is to be understood that the plate 5 may be extended across the sides of the permanent-magnet poles and the electromagnet-cores engaging with said

sides, and, further, while I have shown the plate 5 as circular it may be otherwise shaped.

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

1. In a telephone-receiver, a permanent magnet, a metal plate arranged over the poles thereof and secured at its center and at points at its edge, an electromagnet secured to said
10 plate and having its core resting movably against the permanent magnet, and a diaphragm arranged forward of the electromagnet, substantially as specified.

2. In a telephone-receiver, a permanent
15 magnet, a metal plate arranged over the poles thereof so as to vibrate, an electromagnet secured to the said plate and having its core resting movably against the permanent magnet, a main diaphragm arranged forward of the elec-
20 tromagnet, and a centrally-perforated diaphragm arranged forward of the main diaphragm and spaced therefrom, substantially as specified.

3. In a telephone-receiver, a permanent
25 magnet, a metal plate arranged across the poles thereof, the said plate being slitted inward from its periphery, means for clamping the edge of said plate, electromagnets having their cores extended through said plate and
30 bearing upon the poles of the permanent mag-

net, a microphone connecting at the inner end with the inner ends of the electromagnet-windings, a main diaphragm forward of the electromagnets, and a centrally-perforated diaphragm forward of the main dia- 35
phragm and spaced therefrom, substantially as specified.

4. A telephone-receiver, comprising a casing, a permanent magnet secured in the casing, a metal disk or plate extended across the
40 poles of said permanent magnet, means for securing said plate in position, electromagnets having their ends extended through said plate and bearing upon the poles of the permanent magnet, a strip of conducting mate- 45
rial arranged loosely in the casing and connecting the inner ends of the electromagnet-windings, a main diaphragm, an earpiece on the casing, and a centrally-perforated diaphragm arranged between the earpiece and 50
the main diaphragm and spaced therefrom, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS J. ORR.

Witnesses:

HOWARD WINSHIP,

FREDERICK MONTGOMERY.