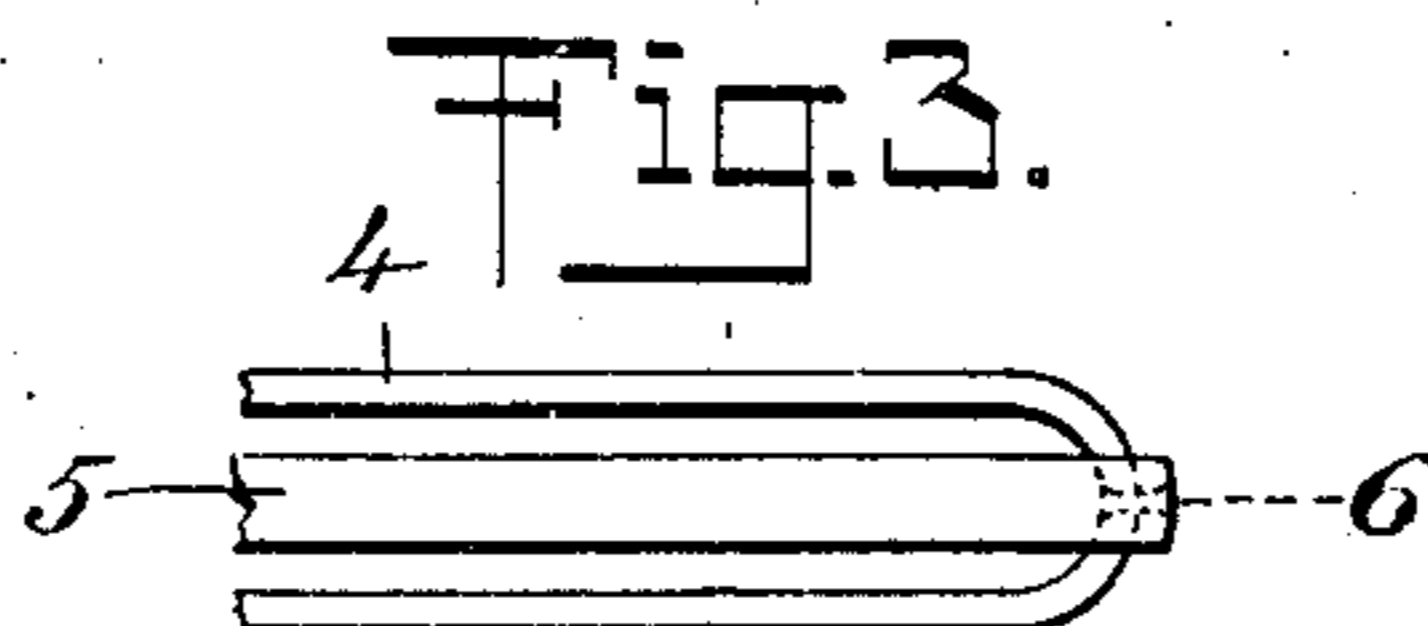
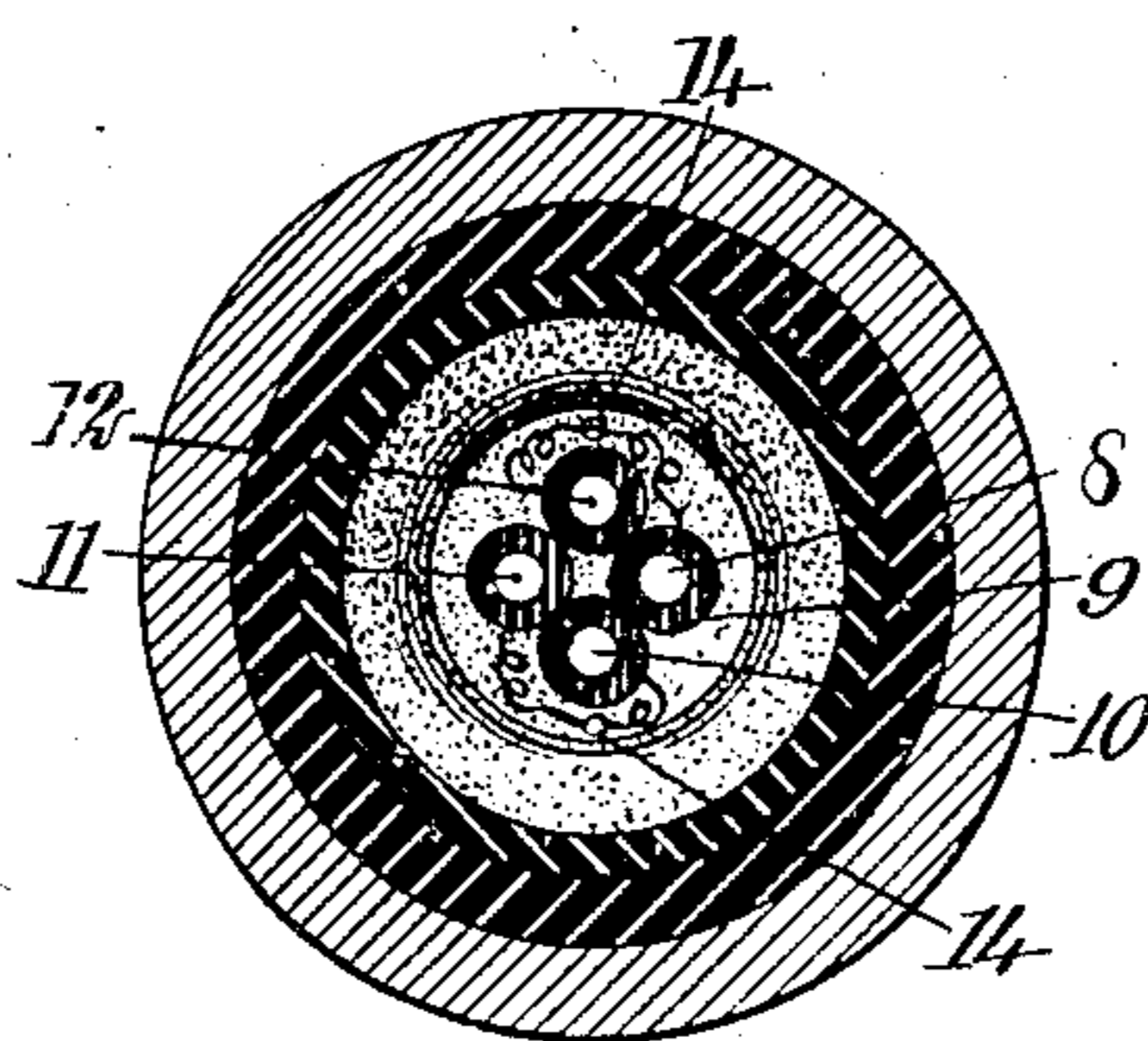
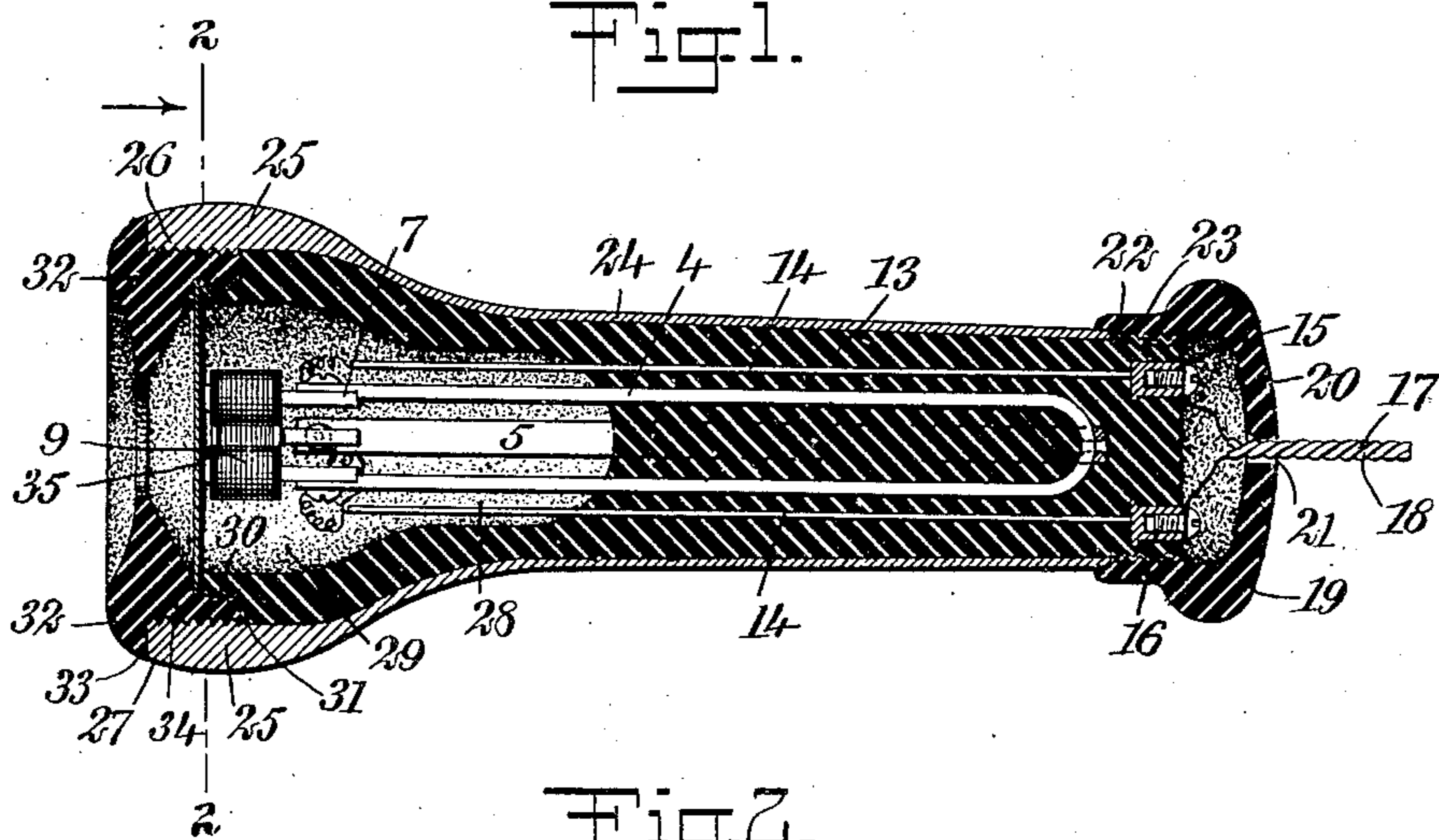
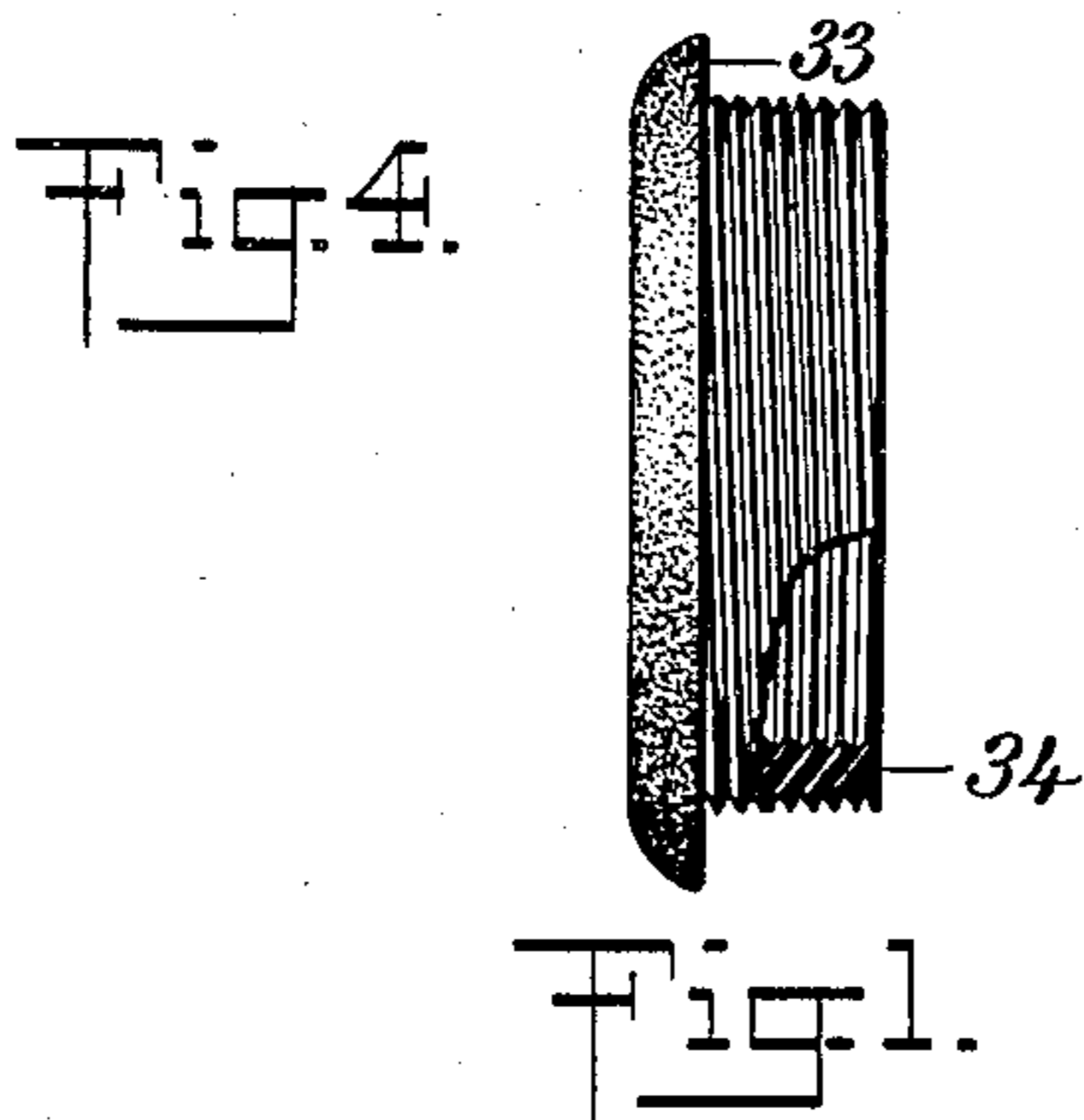


No. 884,235.

PATENTED APR. 7, 1908.

L. STEINBERGER.
RECEIVER FOR TELEPHONES.
APPLICATION FILED FEB. 18, 1907.



WITNESSES:

William P. Goebel.
Walton Harrison.

INVENTOR

Louis Steinberger
BY *Mum & Co*

ATTORNEYS

UNITED STATES PATENT OFFICE.

LOUIS STEINBERGER, OF NEW YORK, N. Y.

RECEIVER FOR TELEPHONES.

No. 884,235.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed February 18, 1907. Serial No. 357,881.

To all whom it may concern:

Be it known that I, LOUIS STEINBERGER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Receiver for Telephones, of which the following is a full, clear, and exact description.

My invention relates to receivers for telephones, my several objects being as follows:

I. To provide the receiver with a self-locking cap which can not ordinarily be moved without taking the receiver apart;

II. To provide the receiver with resonating chambers of peculiar conformity for the purpose of improving the acoustic qualities of the sounds;

III. To distribute the magnets to better advantage relatively to the center of the vibratory diaphragm of the receiver;

IV. To provide the receiver with a compound magnet of approved construction for drawing the diaphragm;

V. To provide a receiver casing of such conformity as to reduce the danger of breaking the receiver cap.

VI. To hold the receiver casing in position by the locking member which serves also as a guide for the conductors, and VII to embed a portion of the magnets and wires with a core of insulating material.

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 central longitudinal section through a receiver made in accordance with my invention; Fig. 2 is a vertical section upon the line 2—2 of Fig. 1 looking in the direction of the arrow, and showing the position of the resonance chamber, the electromagnets mounted therein, and a portion of the self-locking cap and parts connected therewith; Fig. 3 is a fragmentary elevation of the compound magnet showing how it is built up of single magnets connected together. Fig. 4 is a side elevation partly broken away, and showing the cap threaded both internally and externally.

Two permanent magnets 4, 5, of the so-called "horseshoe type", are connected together by a rivet 6 and thus formed into a compound magnet. A number of pole pieces 7, corresponding to the number of magnet poles, are mounted upon the latter,

the several pole pieces being provided with a rounded portion 8, 10, 11, 12, these portions being encircled by cylindrical spools 9 of magnet wire. The compound magnet is partially embedded within a core 13 of insulating material, preferably "Electrose." Also embedded within this material are electrodes 14 provided at one end with binding posts 15, 16. Conducting wires are shown at 17, 18. A locking member is shown at 19 and is provided with a compartment 20 and with a centrally disposed aperture 21. This locking member is mounted upon a threaded portion 22 of the core 13 and at this end is threaded internally at 23. A metallic case 24 is provided with an enlarged and thickened portion 25, the latter being provided at 26 with a thread. This enlarged and thickened portion 25 is rounded off at 27. In other words, the general diameter of the portion 25 is less at the point 27 than is the general equatorial diameter of this portion. The core 13 is provided with a resonating chamber 28 having an enlarged portion 29, the portion 28 being rounded at one of its ends, and at its other merging into the portion 29. The core 13 is provided at one of its ends with an annular portion 30 integral therewith and threaded externally. Adjacent to this threaded annular portion the core 13 is also provided with an annular shoulder 31. The thread of the portion 30 is of a different pitch than the thread 26, for a purpose hereinafter stated. A cap 32, of insulating material, is provided with an annular shoulder 33 adapted to abut against the annular shoulder 27 of the metallic portion 25. The fit of the cap relatively to the shoulder 27 is such that when the cap is firmly in position, there is no noticeable seam between these two parts. The cap 32 is provided with an annular portion 34 threaded both externally and internally. Its external thread fits into the thread 26, while its internal thread fits the thread 30. Since, however, the external and internal threads of the annular portion 34 of the cap, are of different pitch, any effort to turn the cap causes it to lock relatively to these portions, provided both of them are in engagement with it. The diaphragm is shown at 35 and is of a diameter approximating the internal diameter of the annular portion 34.

The several parts above described are assembled as follows: During the process of manufacture the compound magnet is mount-

ed within the core 13, being embedded centrally therein. The resonating chamber is also formed at the time when the core is made. The pole pieces of the spools are put on afterward. Suppose, now, we have a core complete with its permanent and its electro magnets. We rest the diaphragm 35 upon the large end of the core and then screw the cap 32 into position. The annular portion 34 of the cap now encircles the thread portion 30 of the core and also engages the annular shoulder 31, so that the annular edge of the diaphragm is clamped firmly between the cap 32 and a part of the core 13. The metallic casing 24 is now slipped over the core 13 from the smaller end thereof and is turned so that the threaded portion 26 of the core is fitted into the corresponding threaded portion of the cap 32. The rotation of the casing is continued until the shoulder 27 jams firmly against the shoulder 33 of the cap. The locking member 19 is now screwed upon the smaller end of the core and brought into firm engagement with the small end of the casing 24. The wires 17, 18 having been previously connected with the binding posts 15, 16 and threaded through the aperture 21, the tightening of the locking member 19 leaves the telephone receiver complete and ready for use. It will now be found that a person is unable to remove the cap 32 by merely turning it relatively to other parts. This is because, owing to the differential pitch of the threads disposed internally and externally of the cap, the instant the latter begins to turn, the locking action above described ensues, and it is therefore impossible, under the circumstances, to remove, or even to displace, the cap. In order to remove the cap the locking member 19 is unscrewed and slipped to the right, according to Fig. 1. The casing 24 is next unscrewed and moved also to the right. The cap 32 may now be readily unscrewed from its fastenings and removed in like manner as any other cap used upon a receiver. My purpose in giving the thickened portion 25 of the casing 24 a smaller diameter at the point 27 than at other points, is to cause the receiver to strike upon the rounded portion 27 in case the receiver is caused to swing laterally and to strike an obstruction, such as a wall. In other words, according to the view shown in Fig. 1, the portion 25 is extended a little toward the left and is slightly rounded at its end so that, if the receiver should swing and strike an obstacle, the force should be received upon the portion 25 rather than upon the cap 32.

As will be understood from Figs. 1 and 2, the pole pieces 8, 11 are of opposite polarity; the pole pieces 10, 12 are also of opposite polarity. Acting, however, upon a soft iron diaphragm, or other non-polarized diaphragm, the magnets, independently of their

polarity, will all pull in the same direction. Hence, the attraction of the diaphragm by a group of magnets is equivalent to the combined pulling power of all of the magnets. The electromagnets are equidistant from the center of the diaphragm and may be considered as approximating a circle concentric to the center of the diaphragm. Owing to this arrangement it is not necessary to flatten the poles of the electromagnets, and they may readily be made cylindrical, as shown.

I have found that it is practicable to make the resonating chamber 28 of such length, measured from the diaphragm to the most remote part of the resonance chamber, that the sounds, when made by the diaphragm and reflected from the bottom of the resonance chamber, are reinforced upon again reaching the diaphragm. In other words, the shape of the resonance chamber serves to correctly focus the sounds upon the diaphragm and, as nearly as practicable, upon the center thereof. The enlarged portion 29 of the resonance chamber acts in the manner of a mouth piece in guiding the sound toward the rear end of the chamber. In using this resonance chamber the quality of the tones of a voice is greatly improved and the loudness of the sounds is increased. The quantity of wire required in the spools is less than would be the case if the pole pieces and spools were flattened.

I do not limit myself to any particular materials to be used in the construction of this receiver, neither do I limit myself to the shape or form of any part or to any combination of parts, except as such is determined by the language of my claims.

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

1. A telephone receiver comprising a core provided with an annular threaded portion integral therewith, a diaphragm having an annular edge disposed adjacent to said annular threaded portion, a cap screwed upon said threaded portion and encircling said diaphragm, and a casing partially encircling said core and said cap for the purpose of preventing relative movement therebetween.

2. The combination with a core provided with a thread, a cap provided with a thread engaging said thread of said core, said cap being provided with a second thread having a pitch different from said first-mentioned thread of said cap, and a casing provided with a thread mating said second-mentioned thread of said cap.

3. A telephone receiver, comprising an outer casing of metal, a core of insulating material mounted within said casing, said core of insulating material being provided with a resonating chamber, said resonating chamber having a substantially cylindrical portion of larger diameter, and a substan-

tionally cylindrical portion of smaller diameter, said portions merging together, said smaller portion being provided with a concave end for the purpose of concentrating and reflecting sound waves, magnetic mechanism mounted within said portion of larger diameter, a diaphragm disposed adjacent to said magnetic mechanism, and means for holding said diaphragm in position.

10 4. The combination of a hollow casing provided at one of its ends with a thread disposed internally thereof, a core of insulating material provided with a neck having a thread disposed externally thereof, said
15 thread of said neck being of a different pitch from said thread of said casing, and a cap of insulating material provided internally with a thread mating said thread of said neck, and said cap being provided externally with a
20 thread mating said thread of said casing.

5. In a telephone receiver, the combina-

tion of a metallic casing provided internally at one of its ends with a thread, a core of insulating material mounted within said metallic casing and provided with a neck, said 25 neck having upon its exterior a thread, said neck being shorter than the threaded portion of said casing, a cap of insulating material provided externally with a thread mating said thread of said casing and provided in- 30 ternally with a thread mating said thread of said neck, and means coacting with said cap for preventing relative movement between said casing and said core.

In testimony whereof I have signed my 35 name to this specification in the presence of two subscribing witnesses.

LOUIS STEINBERGER.

Witnesses:

WALTON HARRISON,
EVERARD B. MARSHALL.