

(No Model.)

J. H. ROGERS.
TELEPHONE.

No. 297,166.

Patented Apr. 22, 1884.

Fig. 1.

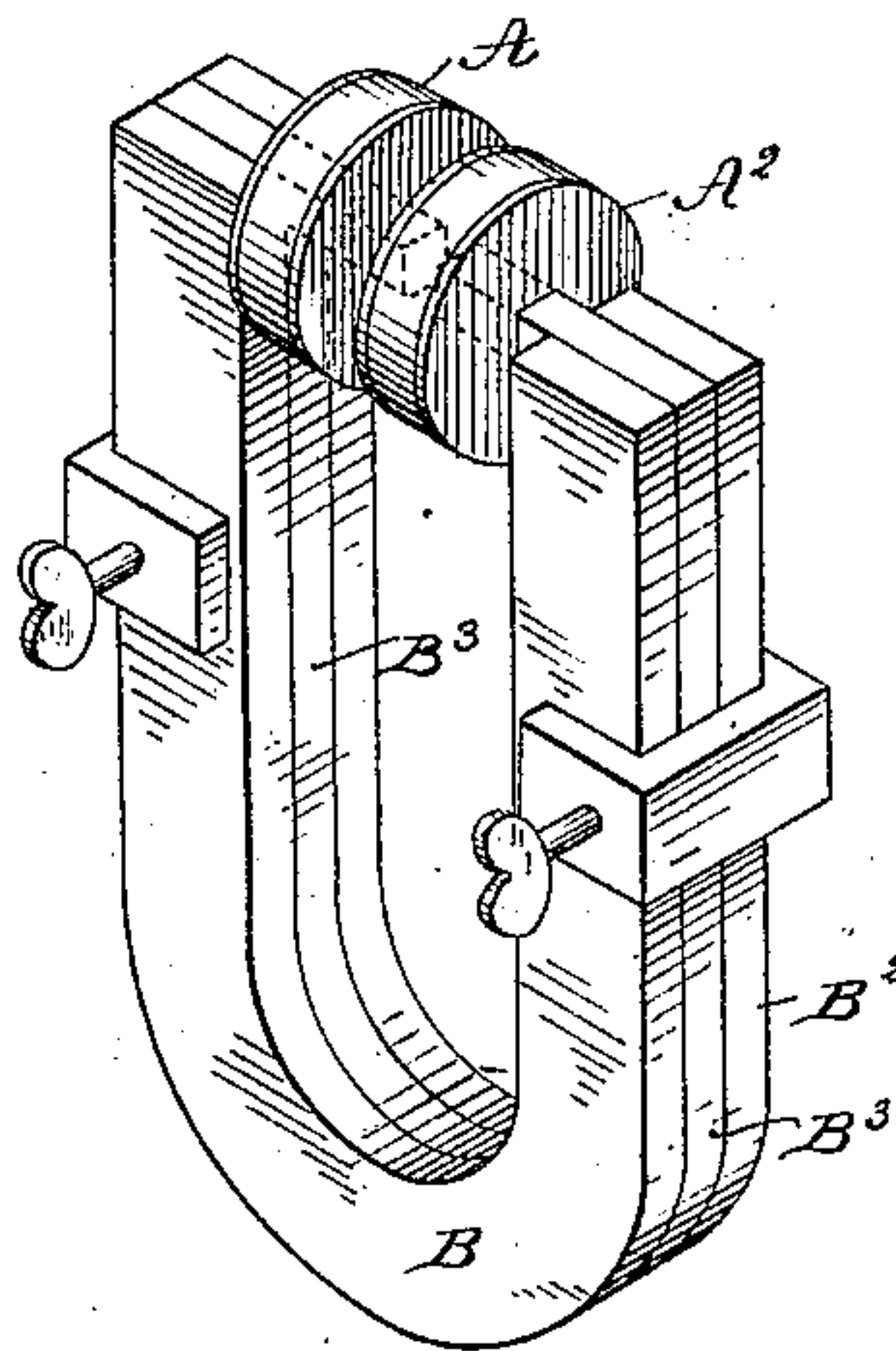


Fig. 2.

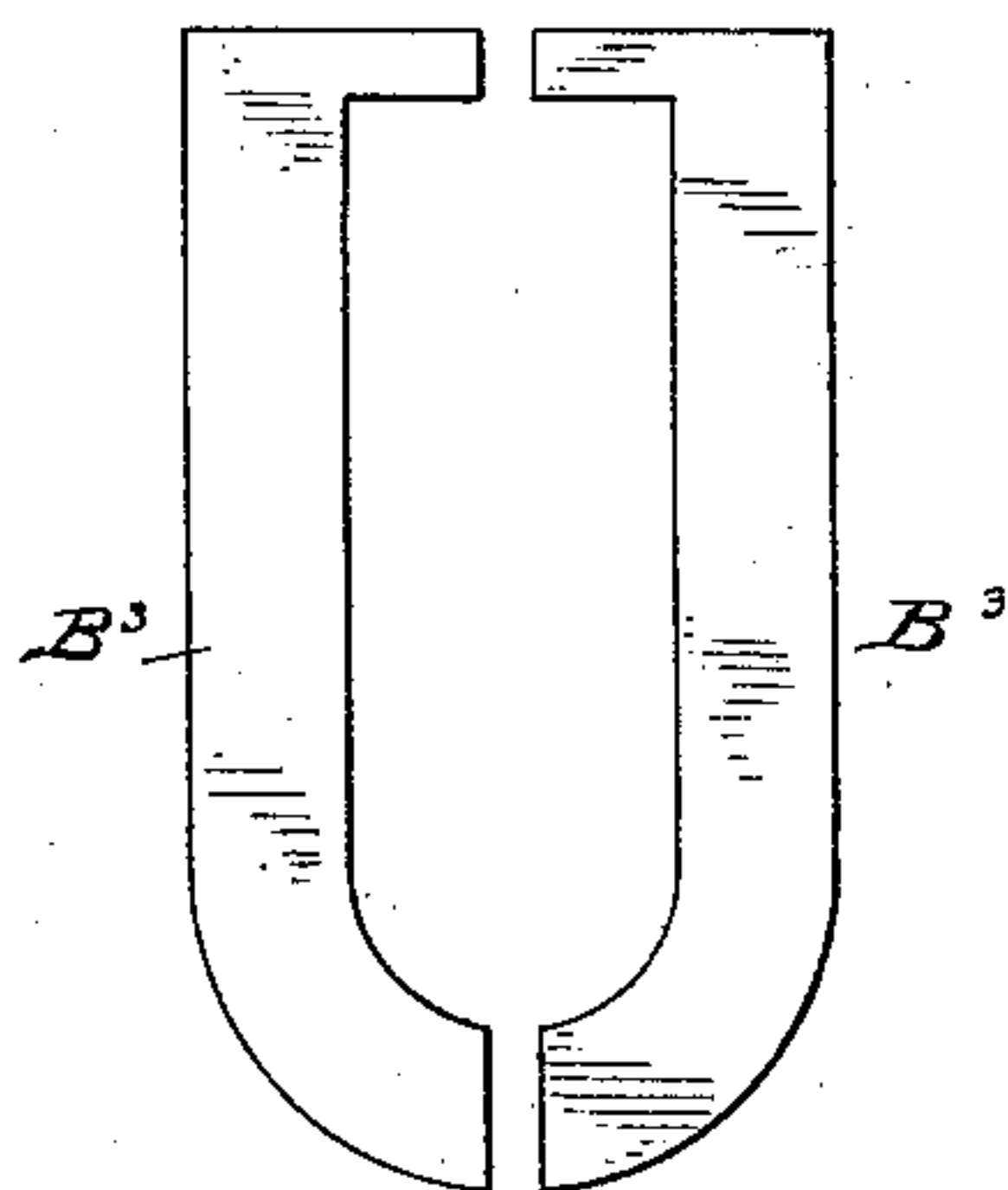


Fig. 3.

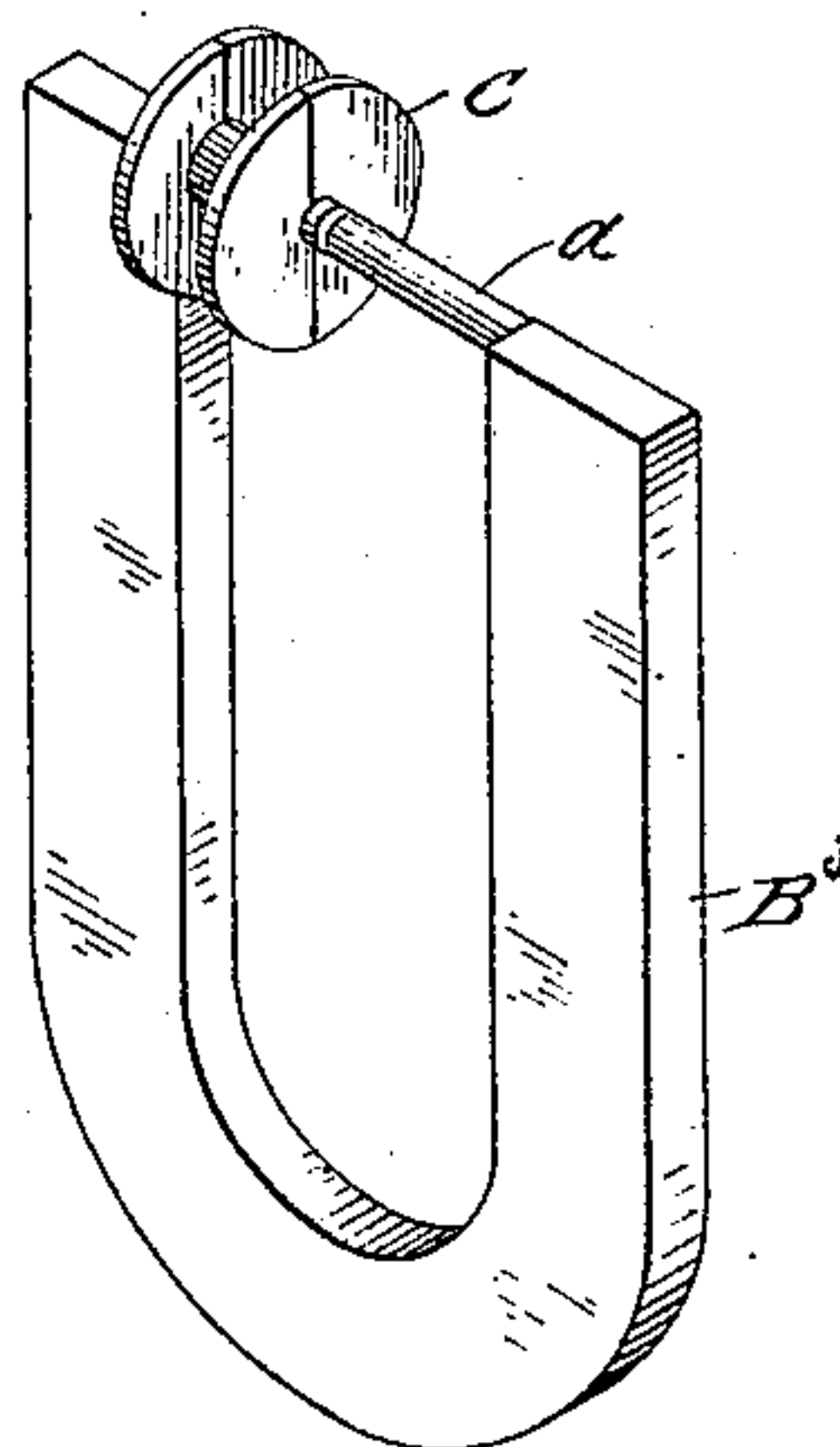
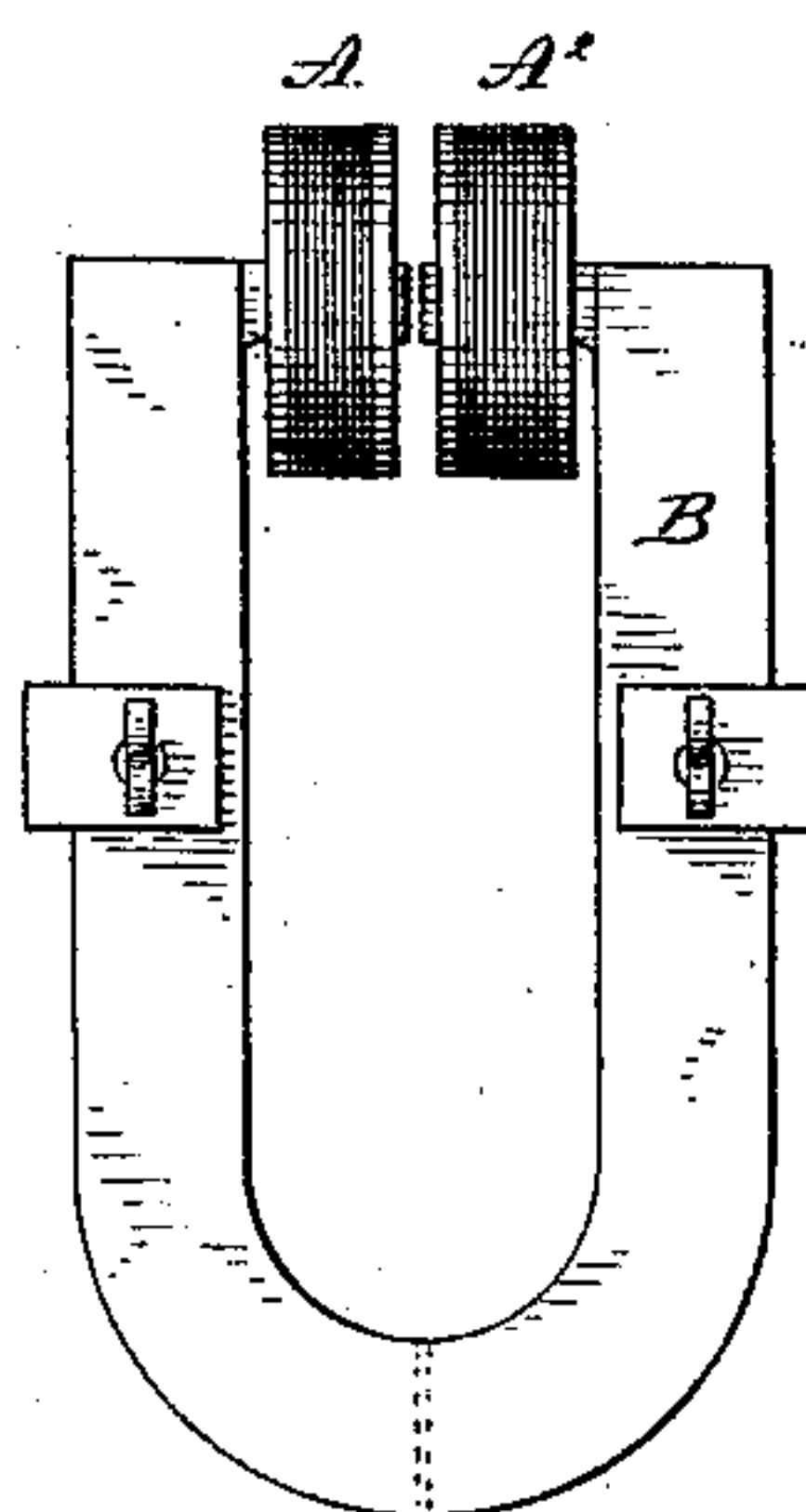


Fig. 4.



Witnesses:

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By his Attorney: H. B. Townsend.

UNITED STATES PATENT OFFICE.

JAMES HARRIS ROGERS, OF NEW YORK, N. Y.

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 297,166, dated April 22, 1884.

Application filed April 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES HARRIS ROGERS, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telephones, of which the following is a specification.

My invention relates to speaking telephone instruments employing an electro-magnet; and it consists in a novel form or construction of instrument, in which the two poles of the magnet are brought into very close proximity with one another and just out of contact, and the sounds are produced by the varying magnetic action between said poles, consequent on the variations of current in the coils of the magnet; or, vice versa, currents are produced in the coils by changes in the magnetic condition of the magnet, consequent upon the action of air waves or vibrations upon the instrument.

The object of my invention is more especially to facilitate the construction of instruments in which the two pole ends or edges of the magnet are brought close together, and to improve the action of the instrument.

In constructing instruments of this kind—viz., that kind in which the two polar ends or edges of the magnet are brought close together—it is very desirable to employ permanent magnets of very hard steel, and likewise to make the permanent magnet or other magnet bearing the coils in a single piece. If, however, the magnet be made in a single piece, the coil of wire applied thereto can be wound thereon only at the expense of much time and care, since the opening between the pole ends is too small to allow a completed bobbin or coil to be slipped into place. It is, moreover, very desirable that the permanent magnet should not be bored or cut, owing to the danger of impairing its strength and permanency, while, besides, it is exceedingly difficult to bore or cut, owing to the extreme hardness of the steel of which such magnets are usually made. By my invention, however, these difficulties are avoided, while at the same time an instrument of great power and sensitiveness is obtained.

In the accompanying drawings, Figure 1 is a perspective view of an instrument embodying my invention. Fig. 2 is a side view of a

construction that may be employed for the portion of the same that is made of soft iron. Fig. 3 is a perspective view illustrating a construction whereby the portion of the instrument that carries the coil, and the two polar ends of which come into close proximity, may be made in a single piece, without, however, detracting from the facility with which the instrument may be constructed. Fig. 4 is a side view of the instrument shown in Fig. 1.

Referring to Fig. 1, B B² indicate two permanent horseshoe-magnets, made of steel in the ordinary way or of the ordinary form, such as may be obtained from importers of electrical and philosophical instruments. These magnets, when well made, are, as is well known, of great hardness and of exceeding magnetic strength and permanency.

B³ is a piece of soft iron clamped between the two magnets B B², and having its polar ends brought into close proximity to one another, as indicated in Fig. 4, and as shown also in my prior Patent No. 269,884.

A A² indicate the magnetizing coils or helices of the instrument, which are here shown as wound on the abutting portions of the piece B³, being applied thereto in any desired manner, although I do not limit myself to this location of the spools, and they may be placed on any portion of the instrument, provided they be properly arranged to impart the desired magnetism to the abutting ends of the magnet. The polar ends of the piece B³ are here shown as square or angular, and in such case it is necessary to wind the coils A A² by hand, if the piece B³ be made in a single piece, as is usual and desirable, in order to get the strongest magnetic effects at its polar ends. In order to facilitate the construction of the instrument, however, the piece B³ may be made in two parts, as indicated in Fig. 2, so that the coils A A² may be wound on spools in the ordinary way in a lathe, which spools are afterward slipped upon the pole ends of the soft-iron piece, the latter being then clamped between the permanent magnets by clamps of any suitable construction. It is extremely desirable that the part, as B³, bearing the coils A A² should not only be in a single piece, but that the construction may be such also that the coils on the magnet may be wound by machine. These ends may be ac-

complished by the novel device illustrated by Fig. 3. The pole ends *a*, or other portion of the magnet, are made cylindrical, so as to permit the rotation upon them of a sectional spool, C, whose center is provided with the usual cylindrical opening. The spool C is divided diametrically, and its halves, after being applied to the pole-piece, are cemented together or secured together in any suitable manner, after which the wire may be wound upon the spool C in the usual way by imparting rotary motion to the spool, which can be readily done by bringing its periphery into contact with a rotating wheel of a lathe or other machine.

It is obvious that any portion of the magnet might be made round, so as to permit the application of the spool to such portion and the rotation of the spool for the purposes of winding the coil thereupon.

It is likewise obvious that the device of Fig. 3 might be employed for permanent magnets where two pole ends are brought into such close proximity as to prevent the coil from being put out of place after it has been wound.

The telephone herein described is used in the ordinary way, and may be placed in a suitable resonant box, as indicated in my prior patent before referred to, or may be connected with or supported by a sounding box or surface in any other well-known way so as to re-enforce the vibrations. The instrument may, however, be used without such aids by placing the ear near the closely-approximating poles, although in general I prefer to employ in connection with its vibratory portion a resonant or re-enforcing surface or cavity.

What I claim as my invention is—

1. In a telephonic instrument, substantially such as described, two or more permanent magnets, and an interposed soft-iron piece clamped between them, and having its two polar ends projecting toward and into very close proximity to one another, but out of contact, substantially as and for the purpose described.

2. The combination, with the permanent magnets B B², of the soft-iron piece B³, clamped between them, and having its two polar ends projecting toward and brought into close proximity with one another, and the coils A A², mounted on the piece B³.

3. The combination, with the permanent horseshoe-magnets B B², of the soft-iron piece B³, made in two or more parts, and coils of wire surrounding said piece B³ at one or more points.

4. In a telephonic instrument the two polar ends or edges of whose magnet project toward and into close proximity with one another, the combination, with such magnet, of a sectional spool applied to a cylindrical portion thereof, whereby the coil of wire for such magnet may be wound upon the spool in the ordinary way.

Signed at New York, in the county of New York and State of New York, this 2d day of April, A. D. 1883.

JAMES HARRIS ROGERS.

Witnesses:

THOS. TOOMEY,
GEO. C. COFFIN.