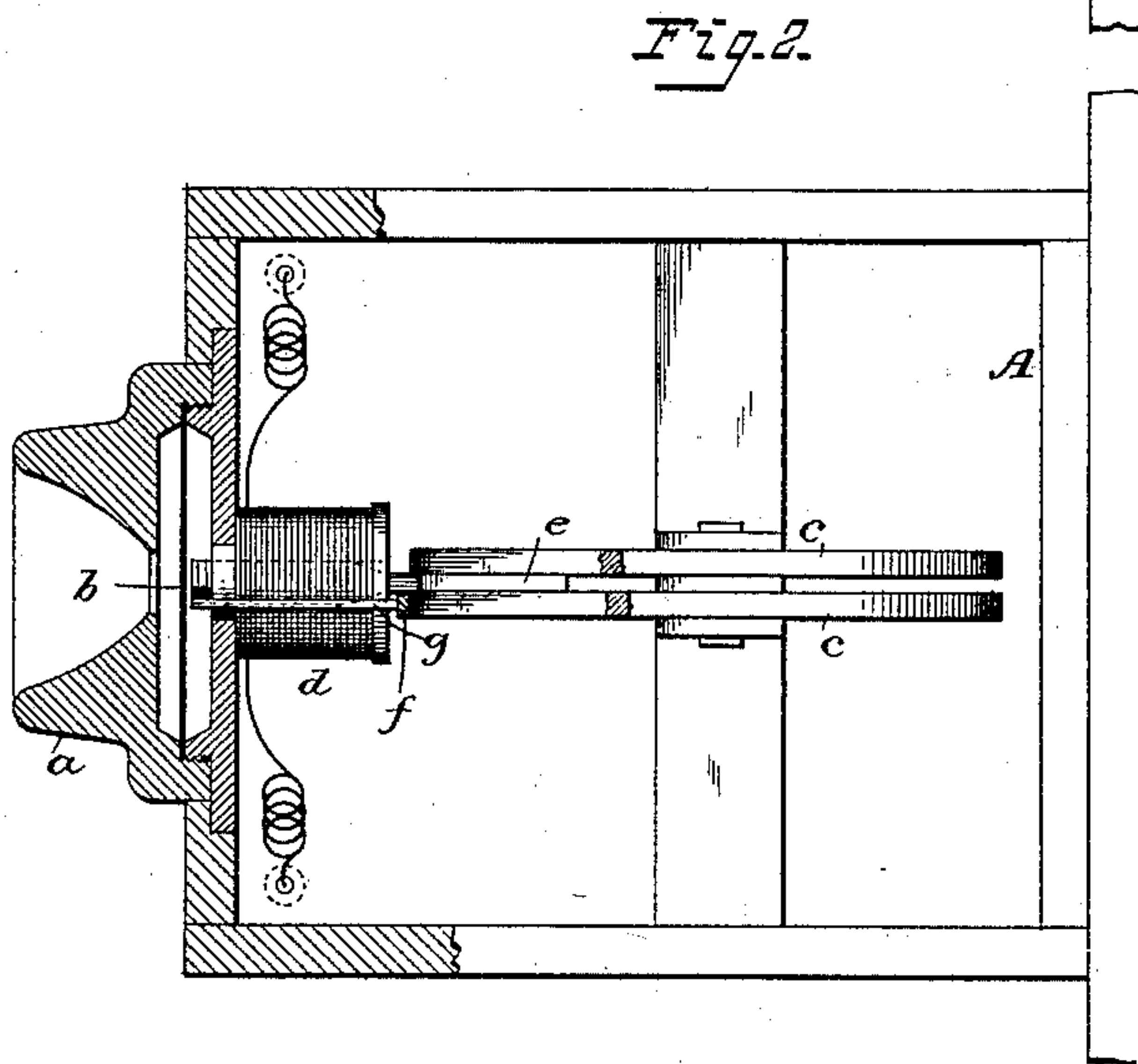
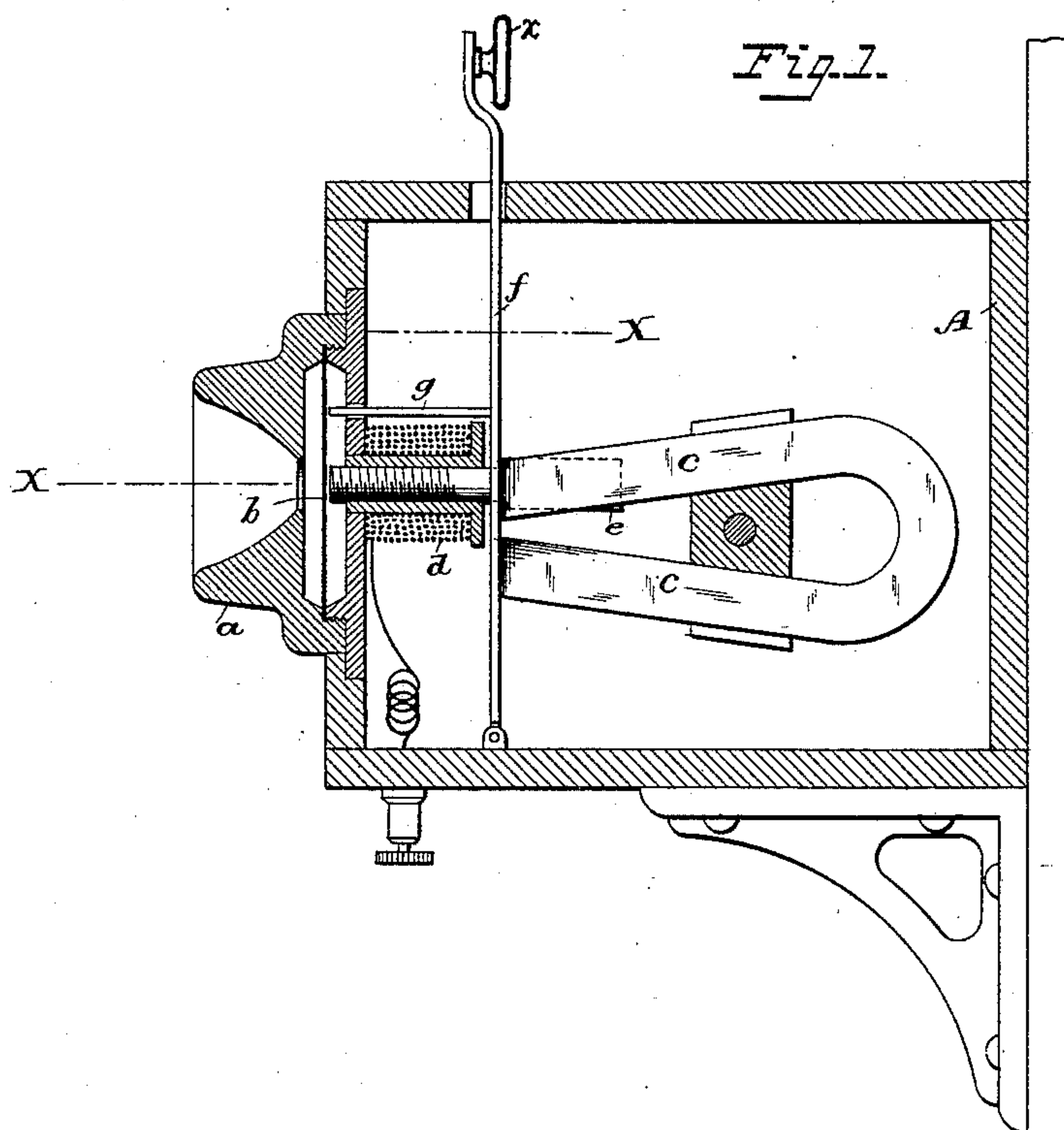


(No Model.)

N. F. PALMER.
TELEPHONE AND TELEGRAPH.

No. 358,939.

Patented Mar. 8, 1887.



Attest:
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TELEPHONE AND TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 358,939, dated March 8, 1887.

Application filed September 24, 1885. Serial No. 177,984. (No model.)

To all whom it may concern:

Be it known that I, NOYES F. PALMER, of Jamaica, Queens county, State of New York, have invented a new and Improved Combined Magneto Telephone and Telegraph, of which the following specification is a full, clear, and exact description.

The invention consists in the various features of construction hereinafter more fully pointed out.

In the accompanying drawings, Figure 1 represents a vertical central section of the sending-instrument, and Fig. 2 a horizontal section on line *xx*, Fig. 1.

In any suitable case, A, having an ordinary mouth-piece, *a*, is mounted a diaphragm, *b*, in the usual way. Secured in the box or case is a magnet, *c*, shown as a U-shaped or horseshoe permanent magnet, having a polar extension, *e*, preferably of soft iron, upon which is mounted the usual coil or helix of fine insulated wire *d*, connected to the line-wire, and this core and helix are arranged opposite the diaphragm and in adjustable relation thereto. The magnet may be a simple or a compound one, as desired. I have obtained good results with the compound magnet shown in Fig. 2, in which two ordinary horseshoe-magnets are used. The polar extension *e* may be of any well-known construction—as a mere prolongation of the pole of the magnet; but a convenient form is shown in Fig. 2, wherein the end of the extension is fitted between the like poles of the compound magnet and secured in contact therewith.

The construction thus far described furnishes a magneto-telephone instrument which may be used as a transmitter or receiver with good effects.

Pivotaly supported within the case is a rod or bar, *f*, one end of which extends outside the case and is provided with a suitable button, *x*, by means of which it may be vibrated. This rod or bar is supported so as to normally rest upon the opposite pole-faces of the magnet or of one of the elements of a compound magnet, and it thus acts to some extent as a keeper for the magnet.

The rod or bar may be provided with an arm, *g*, the free end of which normally rests immediately out of contact with the diaphragm *b*.

Such being the preferred construction of my

device, the operation will be readily understood by those skilled in the art.

It is evident that when the instruments are properly connected by line-wires they will operate as ordinary magneto-telephones of similar construction in transmitting and receiving articulate speech.

When it is desired to use the instruments as transmitters and receivers of telegraphic signals, the button upon the rod or bar *f* is operated as is usual in telegraphic keys, and the rod is alternately lifted away from the face of the magnets and brought into contact therewith at various intervals, and when the arm *g* is used it is alternately brought into contact with and moved away from the diaphragm. The movement of the bar or rod *f* toward and from the magnet correspondingly increases and decreases the strength of the magnetism in the core of the helix, and thus the variations of the line-current are caused to operate the distant receiving-instrument.

If the keeper is in such proportions to the magnets or one of them as to completely close the magnetic circuit, the variations on the line will be more powerful, as at one position substantially the full force of the magnet is exerted upon the core and in the other the whole magnetic force is absorbed by the keeper. Further than this effect due to the mere variation of the magnetic inductor, there are a certain amount of vibrations caused by the mechanical movement of the keeper into and out of contact with the magnet, which vibrations effect the diaphragm and react upon the magnetic current in the helix and line. I have found such an arrangement to operate successfully; but when stronger and more decided effects are desired I make use of the rod or arm *g*, which, coming in contact with the diaphragm, contributes in augmenting the vibration, which in turn reacts upon the coil and augments the variations already caused in the line-current.

It will thus be seen that by this simple construction I produce an instrument which may be used advantageously as a speaking-telephone or as a telegraph-instrument without change and at the wish of the operator.

What I claim is—

1. The combination, with a telephone having a diaphragm, magnet, and coil, of a vi-

brating rod arranged as a keeper to the magnet, and adapted to be moved away from and toward the magnet, substantially as described.

2. The combination, with a telephone having a diaphragm, magnet, and coil, of a vibrating magnetic rod normally in contact with the magnet, and an arm carried by the rod arranged to make contact with the diaphragm, substantially as described.

10 3. The combination, in a combined telephone and telegraph instrument, of a diaphragm, a

magnet having a polar extension, a helix or coil on said extension, a pivoted bar of magnetic material arranged to make and break contact with the poles of the magnet, and an arm arranged to make contact with the diaphragm, substantially as described. 15

NOYES F. PALMER.

Witnesses:

F. V. BRIESEN,
ROBT. H. ROY.