

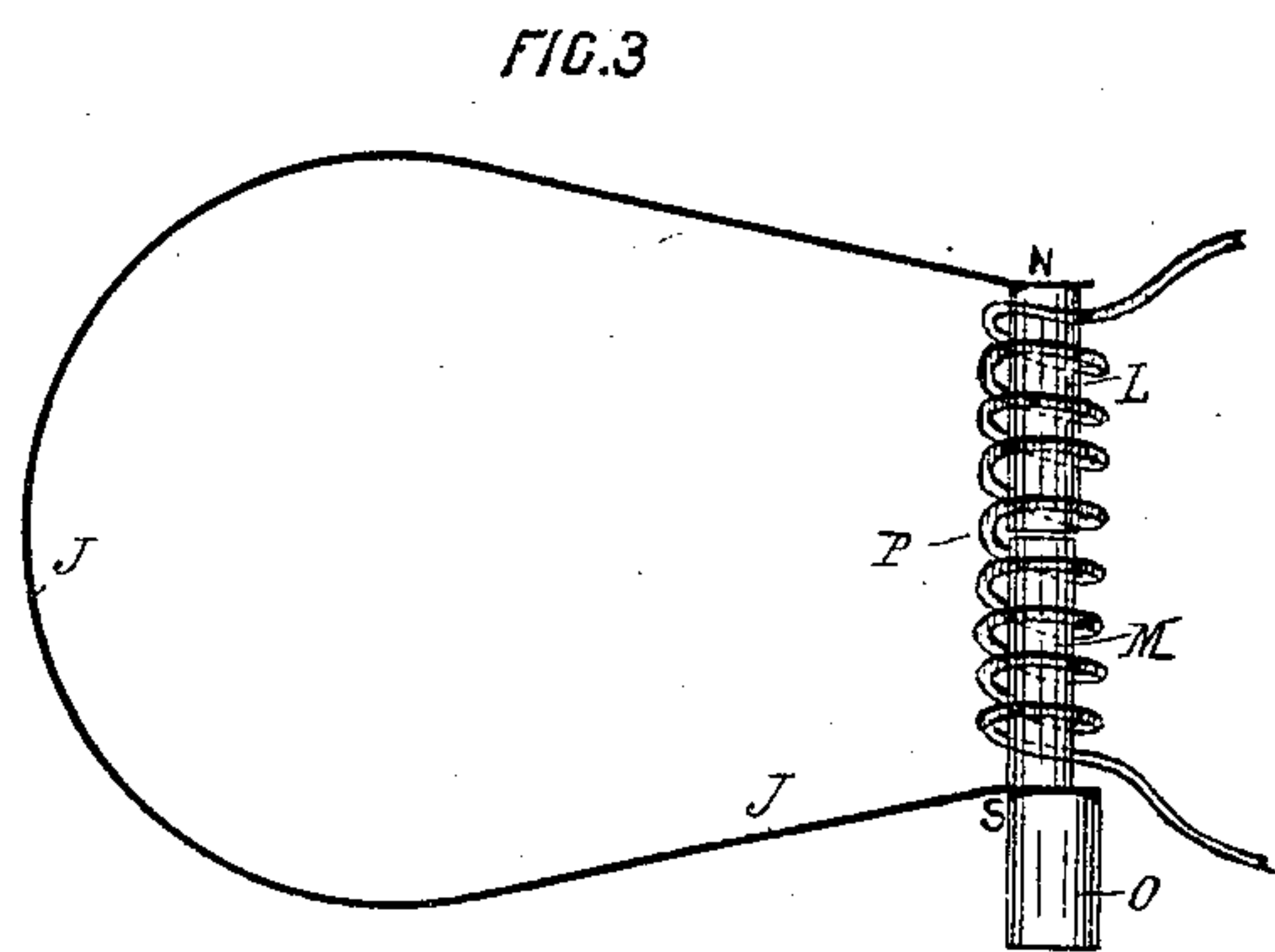
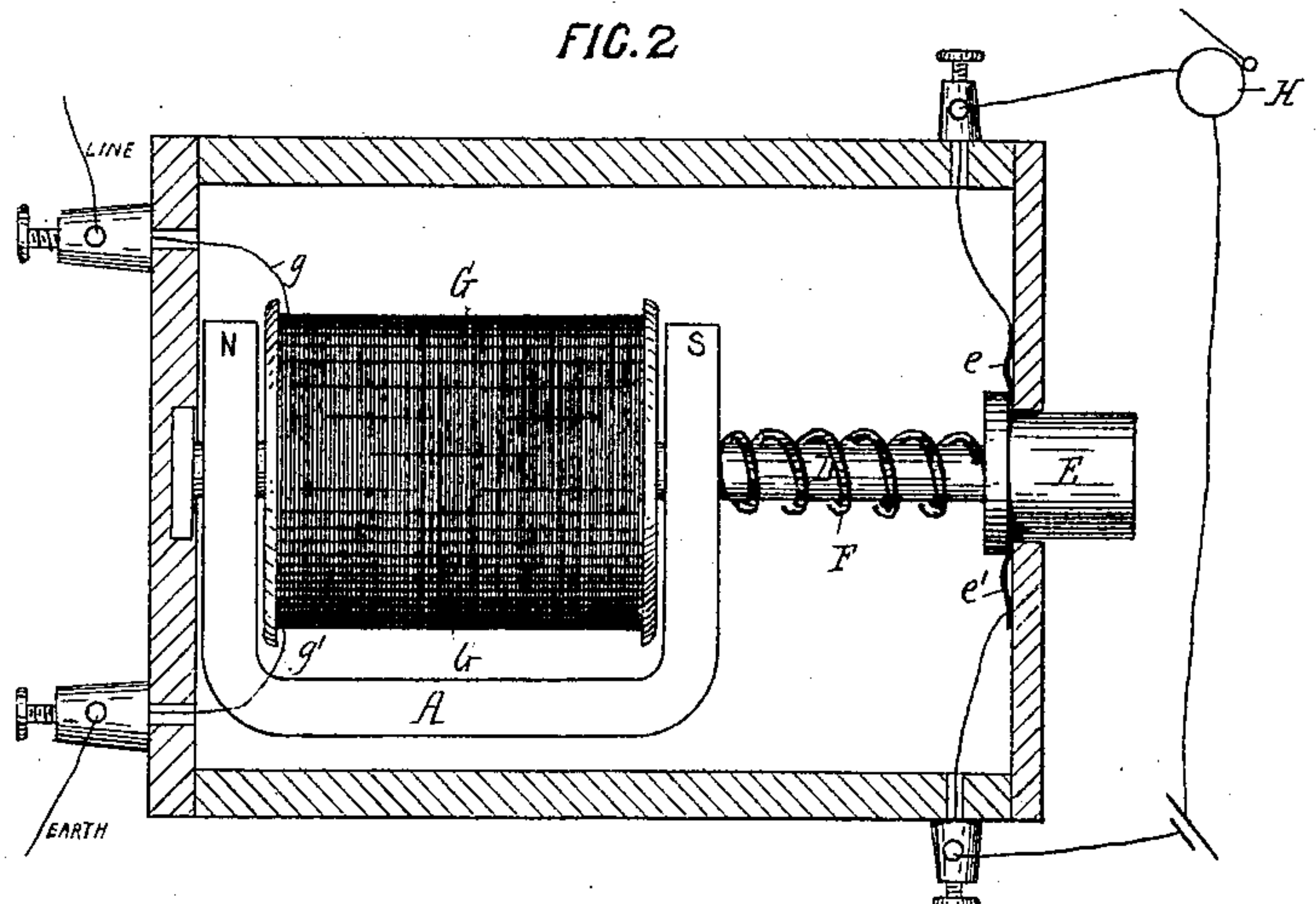
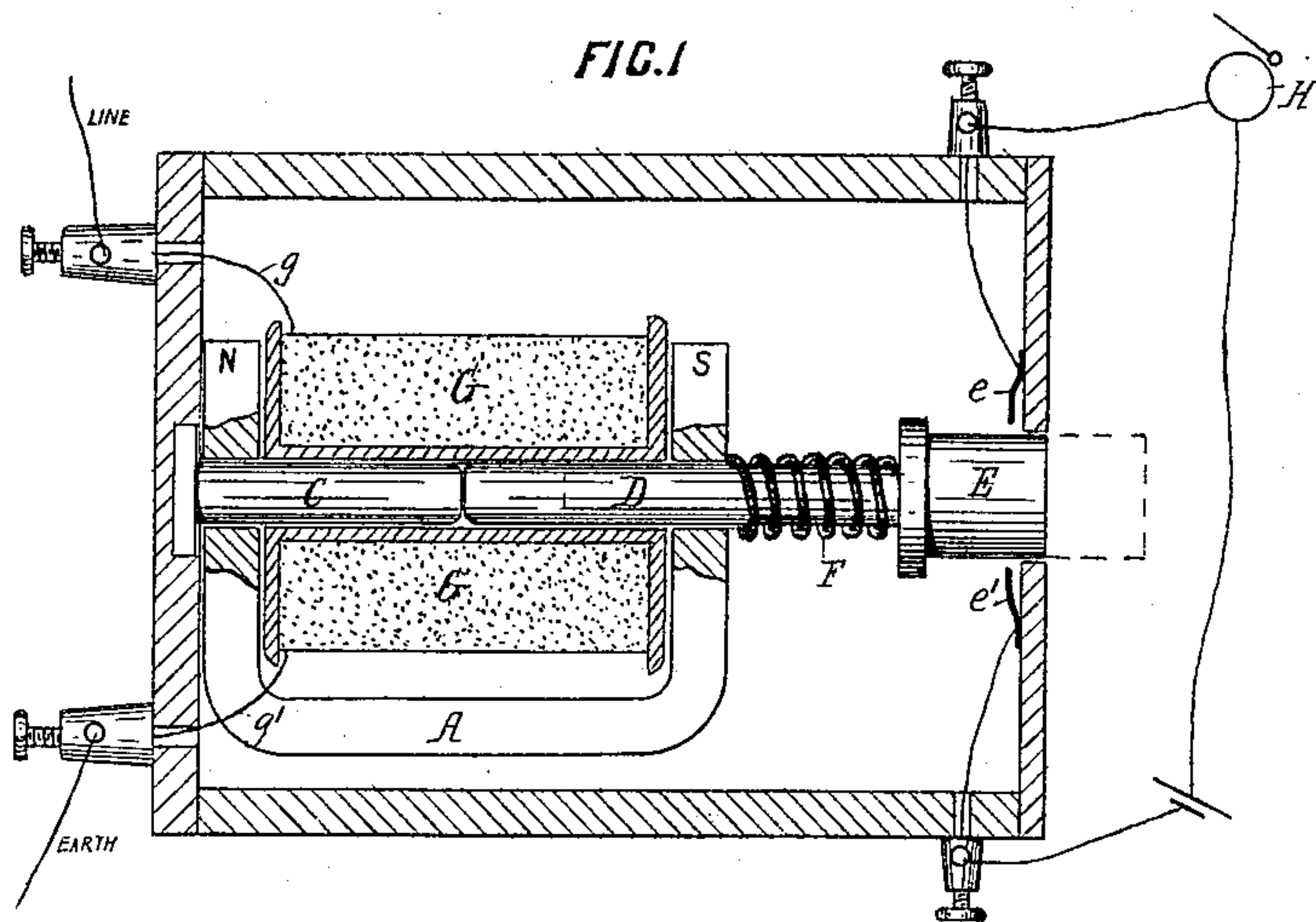
No. 613,778.

Patented Nov. 8, 1898.

P. RABBIDGE.  
INDICATOR SIGNAL.

(Application filed Feb. 1, 1897.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

PARNELL RABBIDGE, OF SYDNEY, NEW SOUTH WALES.

## INDICATOR-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 613,778, dated November 8, 1898.

Application filed February 1, 1897. Serial No. 621,473. (No model.)

*To all whom it may concern:*

Be it known that I, PARNELL RABBIDGE, a subject of the Queen of Great Britain and Ireland, and a resident of Sydney, in the county of Cumberland, Colony of New South Wales, have invented a certain new and useful improved appliance to be used as an indicator, signal, or relay in connection with telephone-switchboards and other analogous apparatus, of which the following is a specification.

The main object of this invention is the construction of an appliance simple in its parts and easy to work and which is intended to supersede the shutter-indicator that is ordinarily used with telephone-switchboards. The invention may also be used for other purposes, but I propose to describe it merely as an indicator.

The invention comprises, preferably, an ordinary horseshoe permanent magnet the poles of which are provided with transverse pieces of soft iron. To one of the poles of the permanent magnet the projecting piece of soft iron is made fast, while the projecting piece of soft iron at the other pole is capable of itself sliding longitudinally but transversely through the pole. This sliding piece is provided with a button or other indicator at its outer extremity, and between the button and the pole of the magnet is a helical spring in compression. The projecting pieces of soft iron serve as a core to an electric coil, and when the apparatus is in its normal position the magnetism of the permanent magnet will be communicated to the two pieces of soft iron that form the core of the coil; but the pieces of soft iron may be demagnetized by passing a current in a certain direction through the coil, in which case the spring, not meeting with magnetic resistance, will be enabled to force the button out, and this button will be the indicator or signal instead of the shutter which is at present commonly used. As the button-indicator projects it will come in contact with contact-pieces, causing a circuit to be completed through a bell or other sonorous signal.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of the entire apparatus. Fig. 2 is a side elevation of the same, the box that contains the apparatus alone being in section. Fig. 3 is a diagram

illustrating the simplest form in which the apparatus can be constructed.

A is the permanent magnet, the poles of which are marked upon the magnet with the letters N S. Projecting through the poles of the magnet are small soft-iron shafts C and D, the shaft C being made fast to the pole N of the permanent magnet A, while the shaft D is capable of sliding longitudinally through the pole S of the magnet. The shafts C and D together form a soft-iron armature to the permanent magnet. The shaft D carries at its outer extremity a button E, which forms the visible signal. Between the button E and the pole S of the magnet A is a coil-spring F in compression. The shafts C and D act as a core to an electric coil G, which is connected by wires  $g g'$  to terminals in connection with the line and earth. Within the case that contains the apparatus and so arranged that the flange of the button E can strike them are contact-pieces  $e e'$ , which when the metallic flange strikes them, as shown in Fig. 2, will complete an electric circuit through the bell H, and thus give a sonorous signal at H, as well as a visible signal at E.

The shaft D is held in position by the magnetism of the permanent magnet; but on a current being passed in a certain direction through the coil G the soft-iron shafts C and D will be demagnetized and the coil-spring F, meeting with no resistance, will force the shaft D and the button E outward to the position shown in Fig. 2. The button requires merely to be pushed in by the finger until D is again in contact with C, and it will be maintained in that position, owing to the permanent magnetism of A.

Fig. 3 shows the very simplest arrangement, in diagrammatic form, of the appliance. J is the permanent magnet, which is composed of a piece of thin flat steel that is bent into the shape of a horseshoe and the poles N S of which are provided with soft-iron cross-pieces L M, the piece M being provided with a projection O beyond the magnet, which projection O will serve as the button. The electric coil P is shown only in the conventional manner. As before, the magnetism of the permanent magnet J will hold the parts L M in contact with one another, while when a current is passed through the coil P the soft-



iron parts L M will be demagnetized and the natural resilience of the spring J will force out the button O, thereby giving the visible signal.

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

1. The combination with a permanent magnet, of a soft-iron armature therefor consisting of two parts, one of which is attached to one pole of the magnet and the other being adapted to slide through the other pole of the magnet toward and away from the fixed part, a button carried by the outer end of the movable part of the armature, an electric coil around the two parts of the armature and adapted to demagnetize the latter, the said armature parts acting as a core for the said coil, and means for forcing the movable part of the armature outwardly when the latter is demagnetized, as and for the purpose specified.

2. A permanent magnet in combination with a soft-iron armature, that is divided into two parts, one part being attached to one pole of

the permanent magnet, while the other part shall be able to slide through, or upon the other pole, the outer extremity of the sliding part being formed as an indicator-button, such button being provided with a metallic flange, an electrical coil that surrounds the two parts of the soft-iron armature, and which is for the purpose of demagnetizing such soft-iron armature, means, such as a spring, for forcing outward the button when the part of the armature to which it is attached is released from magnetic contact with the fixed part of the armature, metallic contact-pieces that are connected with an electric circuit through a bell or other sonorous signal, which circuit shall be completed when the button is forced outward by the spring and the metallic flange of the button makes contact with the contact-pieces, as herein set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

PARNELL RABBIDGE.

Witnesses:

MANFIELD NEWTON,  
JAS. T. HUNTER.