

No. 640,873.

Patented Jan. 9, 1900.

L. CAMPBELL.

FIRE ALARM SYSTEM AND APPARATUS.

(Application filed Sept. 26, 1899.)

2 Sheets—Sheet 1.

(No Model.)

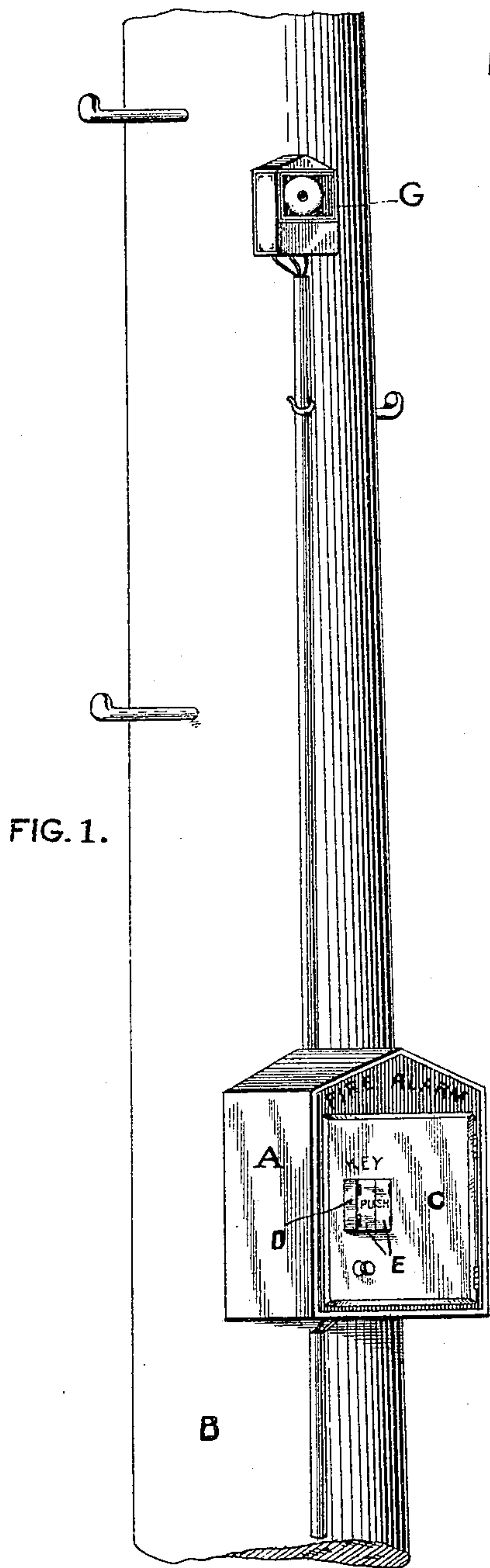


FIG.2.

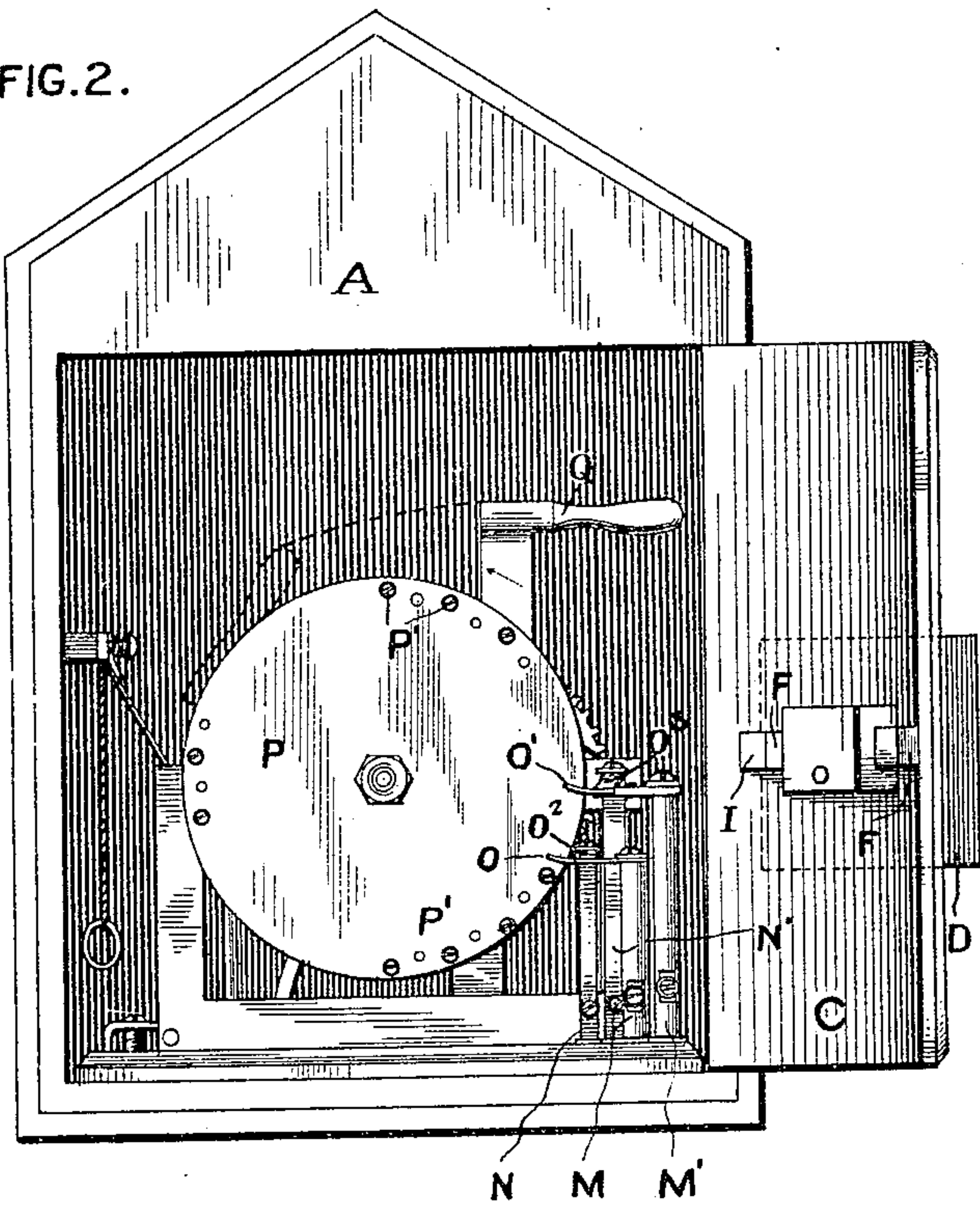
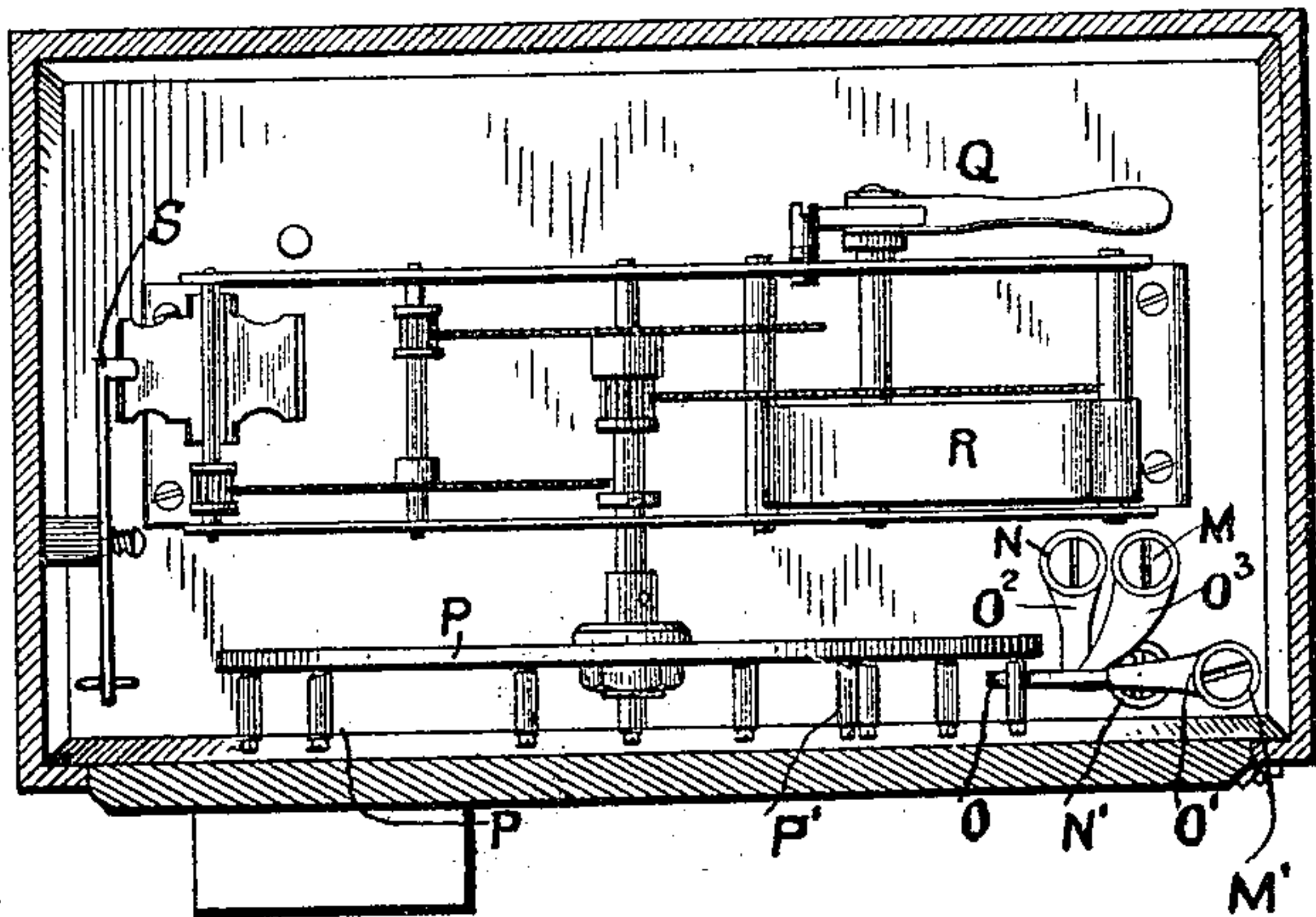


FIG.3.



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FIG. 4.

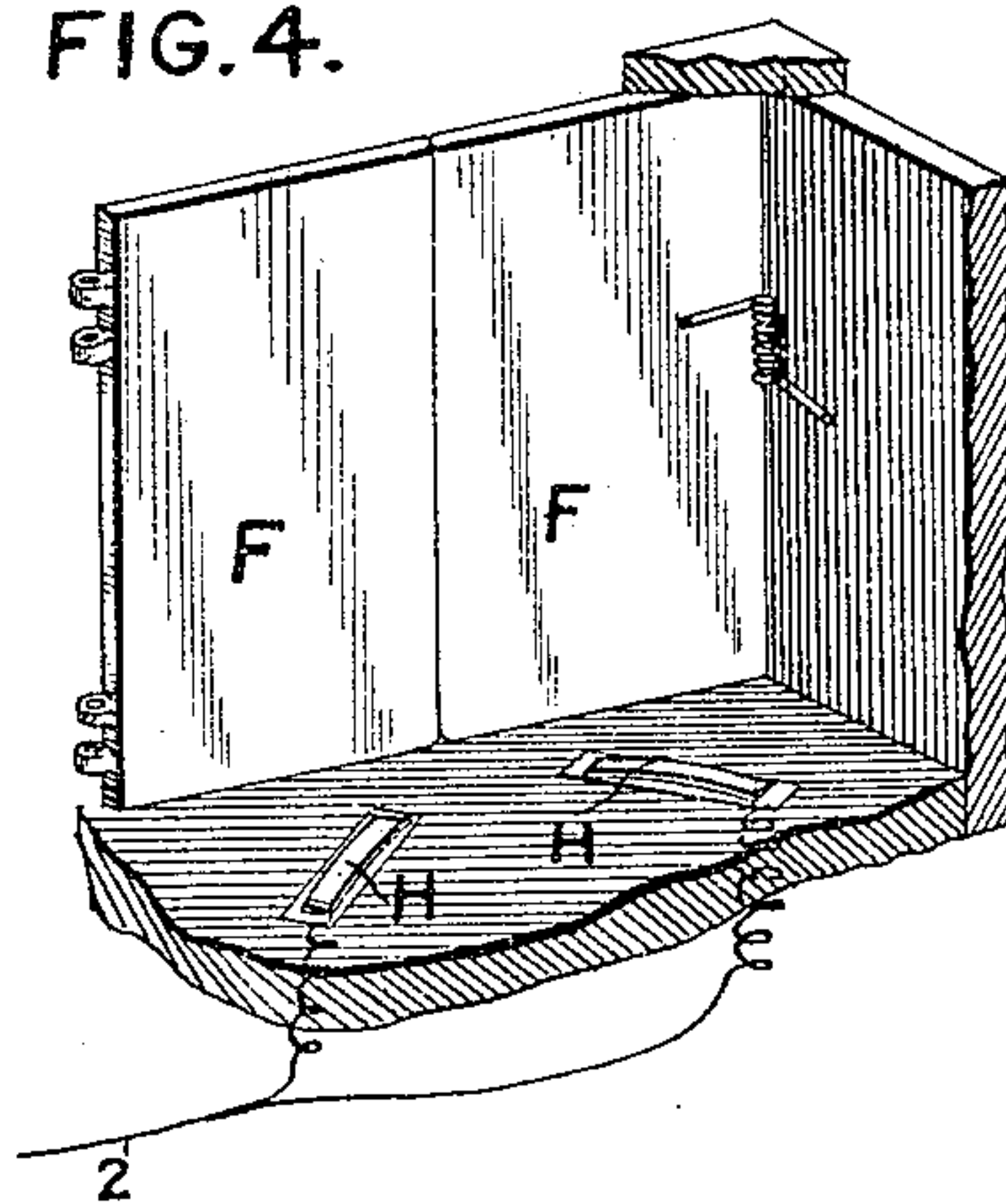


FIG. 5.

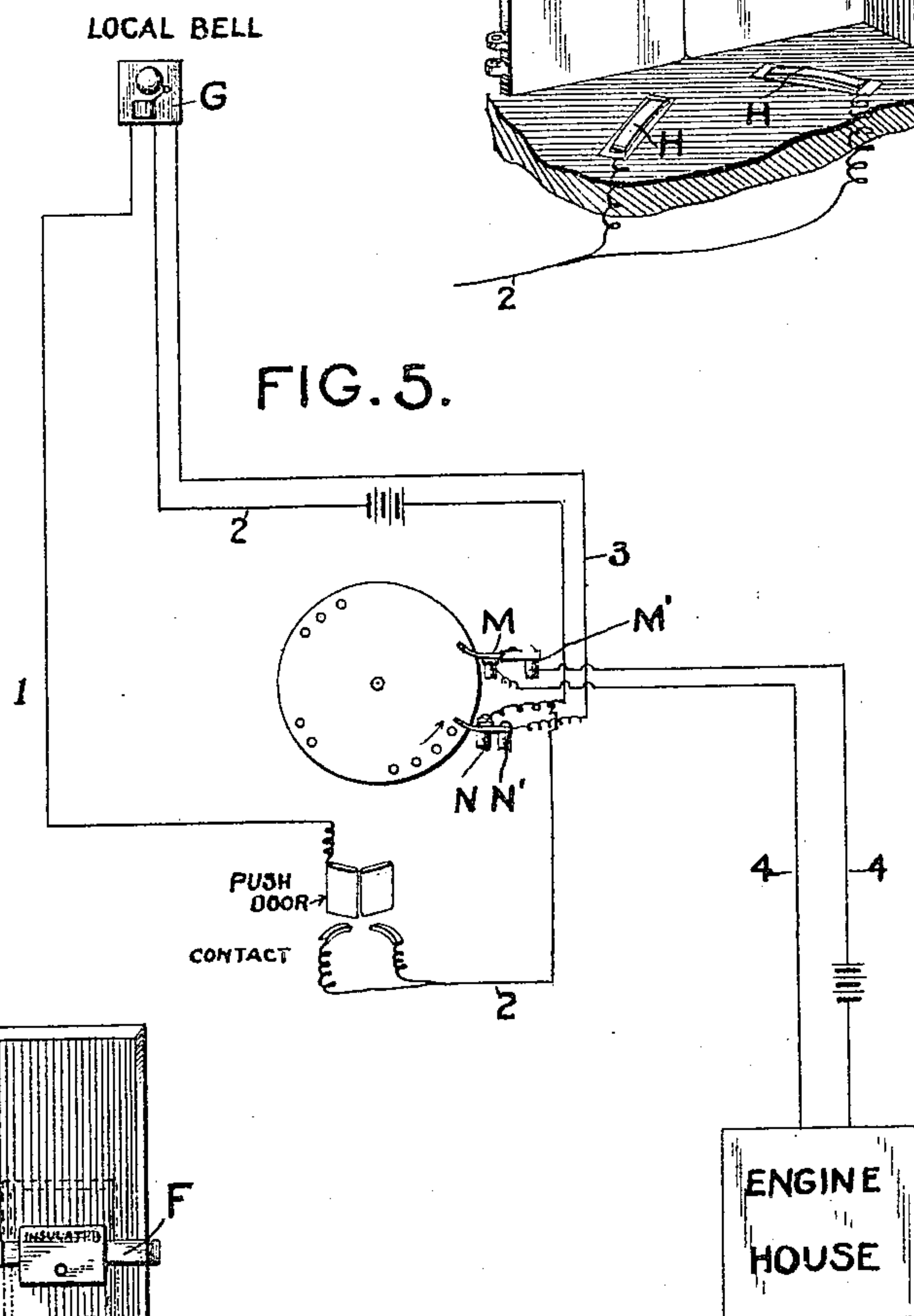


FIG. 6.

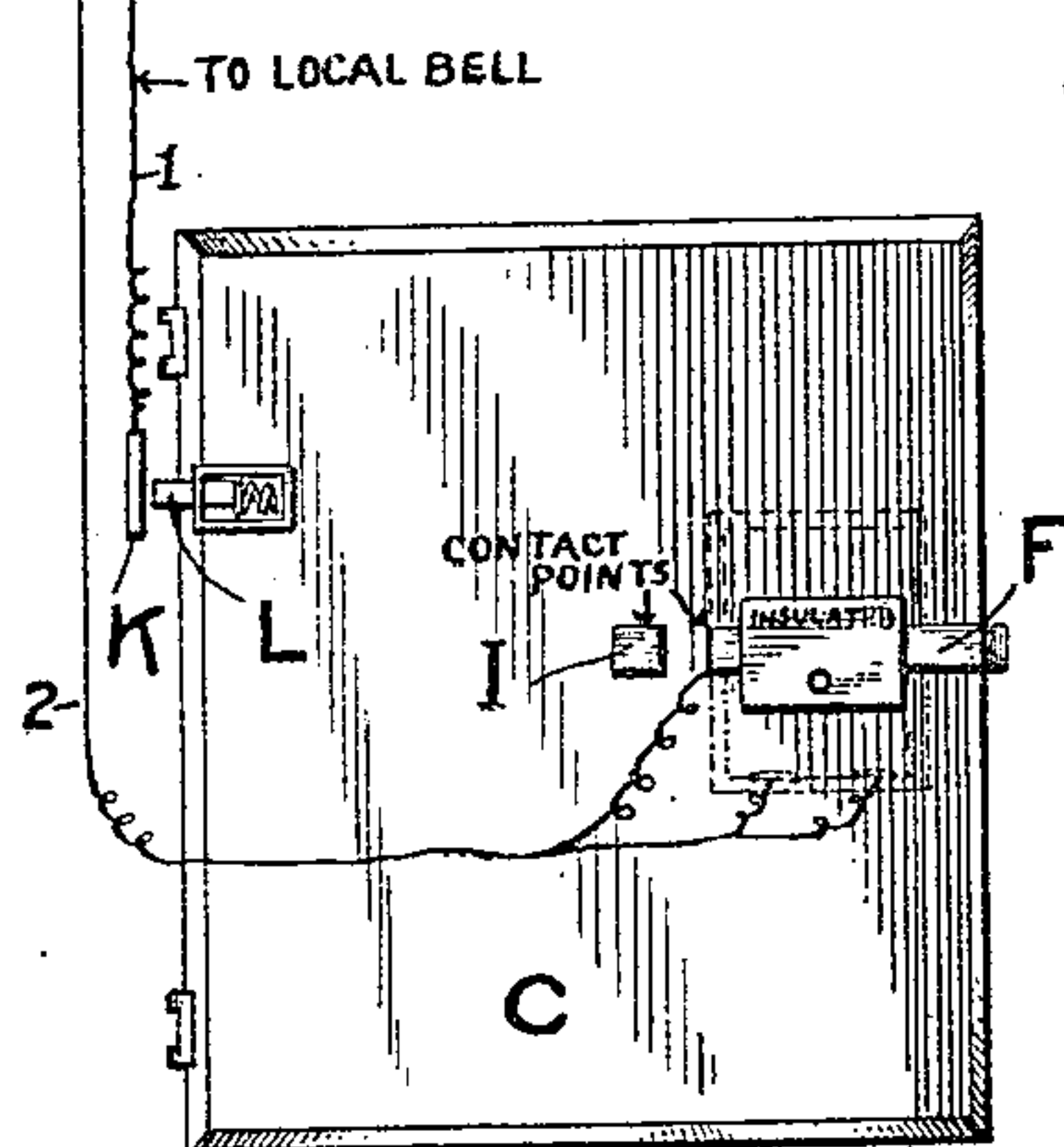
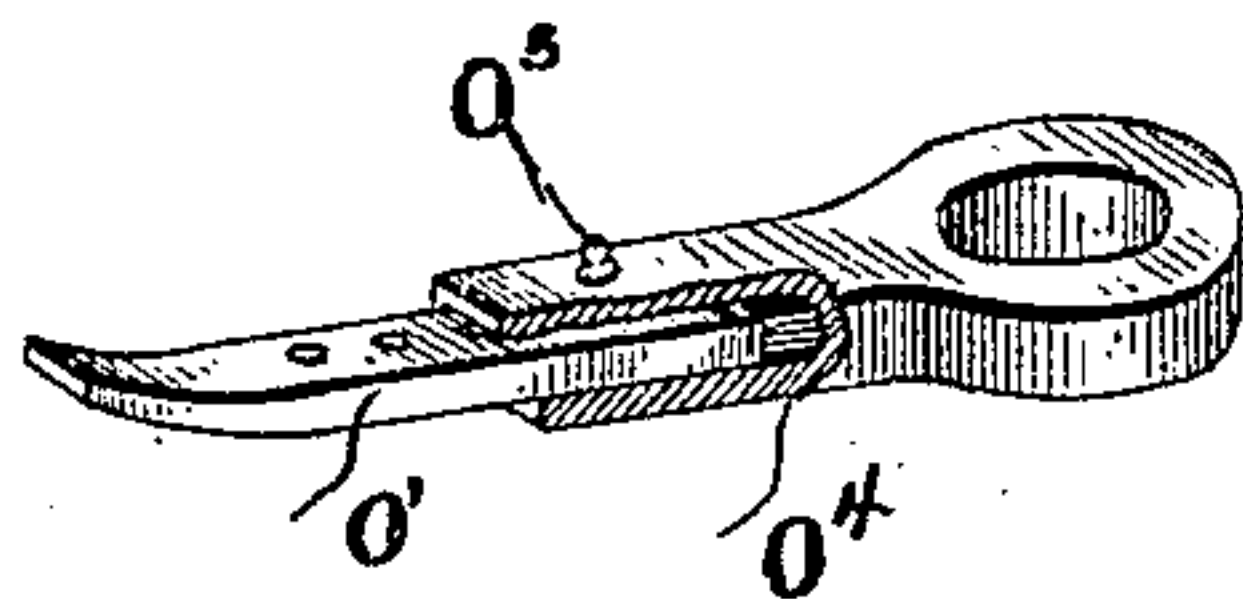


FIG. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

LOUDOUN CAMPBELL, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
OF ONE-HALF TO ROBERT J. THOMAS, OF SAME PLACE.

FIRE-ALARM SYSTEM AND APPARATUS.

SPECIFICATION forming part of Letters Patent No. 640,873, dated January 9, 1900.

Application filed September 26, 1899. Serial No. 731,770. (No model.)

To all whom it may concern:

Be it known that I, LOUDOUN CAMPBELL, a citizen of the United States, residing at the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Fire-Alarm Systems and Apparatus, of which the following is a specification.

My invention relates to improvements in fire-alarm systems and apparatus.

One of the objects of the invention is to provide means for preventing illegal tampering with or sounding of false alarms from any box and which can be readily applied to the alarm-boxes commonly in use.

Another object of the invention is to provide a fire-alarm system in which any box can be disconnected from the main circuit or system and tested without interfering with any other box in the system or sounding an alarm at the headquarters or central station.

With these and other ends in view my invention consists in the peculiar construction and arrangement of parts that will be hereinafter described.

In the accompanying drawings, illustrating one embodiment of my invention, Figure 1 is a perspective view of a fire-alarm box having my improvements applied thereto. Fig. 2 is a view, on an enlarged scale, of the box, the front door being open and the signaling apparatus shown in elevation. Fig. 3 is a plan view of the signaling apparatus. Fig. 4 is a detail view of the supplemental or key-protecting casing. Fig. 5 is a diagrammatic view illustrating the circuits employed in my improved system. Fig. 6 is a detail view of the inner face of the door of the alarm-box. Fig. 7 is a detail of an adjustable terminal of one branch of the main alarm-circuit.

Like letters and numerals of reference designate corresponding parts on the several figures of the drawings, referring to which—

A designates a fire-alarm box which may be of any desired style, that shown being of the form commonly in use. This box, as shown in Fig. 1, is mounted in the ordinary manner upon a pole B and is provided with a hinged front door C, which must be opened before access can be had to the signaling devices contained within the box. I arrange a supplemental casing D about the key, by

means of which the bolt F employed to lock the door C in its closed position is actuated, said casing being formed integral with the door or detachably secured thereto in any suitable manner. This supplemental casing is provided with two doors E E, preferably connected to the side walls of the casing by spring-controlled hinges, so as to normally extend across the front end of said casing, but adapted to yield readily when pressure is applied to their outer faces. It will be understood that before a party can obtain access to the alarm apparatus the doors E E must be opened sufficiently to permit the hand to engage with the key in the casing D, and by properly manipulating it withdraw the bolt F and open the door C. In order that the public may be notified whenever any one is seeking to turn in an alarm, I have provided means whereby upon opening the doors E E of the supplemental key-protecting casing an electric circuit will be closed and a gong or bell G sounded. This local alarm is preferably, as shown in Fig. 1, mounted on the same pole as the alarm-box A and sufficiently far above the same to be inaccessible to a person turning in an alarm, and by means to be hereinafter described the alarm is continuously sounded during the time that the bolt F is being withdrawn and the door C opened.

In the embodiment of the invention herein illustrated one of the wires or branches 2 of an electric circuit, whose battery or cell may be supported either within the alarm-box A or within the casing of the signal G, is connected with two contact-plates H H, supported on, but insulated from, the bottom of the supplemental casing D, one of such plates being arranged in the path of movement of each of the aforesaid doors E of said casing. The other branch or wire 1 of said circuit, which includes the local alarm G, is electrically connected with the door C of the box A when said door is closed, and consequently as both the door C and casing D are commonly and preferably made of metal the doors E E of the supplemental casing form the terminals of this branch of the circuit. When, therefore, said doors are forced inwardly sufficiently far to contact with the plates H H and before the person opening the door can reach the key

within said casing, the circuit above referred to will be completed and the local alarm G sounded. It is desirable that this local alarm should be sounded continuously until the door C has been opened and should then be disconnected, so as not to interfere with the sounding or proper understanding of the alarm. Therefore I preferably connect the bolt F, which is suitably insulated from the door C and from the wall of the box with which it engages when securing said door, with the branch or wire 1 of the above-described local circuit. Therefore, as will be seen by examining Fig. 6, when the bolt F is withdrawn by suitably manipulating the controlling-key within the casing B it will be brought into contact with a lug or stop l on the inner face of the door C, which, as above described, is electrically connected at this time with the branch 1 of the local circuit, and such circuit will thereby be closed and the local alarm continuously sounded, although the operator's hand has been withdrawn from the supplemental casing B and the doors E E thereof returned to their normal position out of contact with the plates H H.

In order that the above-described local circuit may be broken when the door C has been opened sufficiently to permit of the actuation of the signaling device within the box A, it is preferable to connect the wire or branch 1 of the electric circuit with said door in the manner illustrated in Fig. 6—that is, the said wire is connected at its terminal with a plate K, suitably supported on the interior of the box A, and a spring-pressed pin L is suitably secured to the door C in such manner as to contact with said plate K when the door is closed and during more or less of its opening movement. It will be seen that as soon as the door C has been opened sufficiently far to move the pin L out of contact with plate K the local circuit above referred to will be broken and the sounding of the alarm G discontinued.

Any suitable form of alarm-actuating mechanism may be arranged within the box A. In Figs. 2 and 3 I have illustrated, more or less conventionally, a very simple form of apparatus for this purpose. Referring particularly to said figures, M M' are two posts or uprights which are electrically connected with opposite sides of the main fire-alarm circuit 4, and N N' are two similar posts, which are electrically connected with the aforesaid wire 2 and the wire 3, forming a supplemental or secondary local circuit, within which the bell or signal mechanism G is included. O O' O² O³ are contact-fingers projecting laterally from the upper ends of the posts M M' and N N', respectively. The contact-finger O' is, as shown most clearly in Fig. 7, preferably adjustably connected with its supporting-post, it having its rear end inserted into a suitable holder O⁴, carried by said post and detachably held therein at any desired lon-

gitudinally-adjusted position by means of a pin O⁵.

I preferably employ a normally-closed metallic circuit for the main fire-alarm system, and therefore the contact-finger O' normally extends across and bears upon the upper surface of the contact O. The supplemental or secondary local circuit (consisting of the wires 2 3, the battery, and alarm G) is preferably an open circuit, so that the contact-fingers O² O³ are normally separated.

P designates a rotary circuit-breaker, it consisting of a disk provided on one face near its periphery with a series of laterally-projecting pins or studs P', arranged in groups according to the signal assigned to the particular box in which the apparatus is placed. This disk P is connected through suitable gearing with a power-spring R, and a handle lever Q is provided, by means of which said spring can be wound. The spring is held in this position by means of lever S. To send an alarm, the lever S is moved to release the spring, the power of which is sufficient to cause the disk P to make, for example, three complete revolutions, and at each revolution the alarm will be sounded both in the engine-house or headquarters over the circuit 4 and by the local alarm G over the circuit 2 3. To set the alarm, the handle Q is moved in the direction of the arrow in Fig. 2 and the lever S adjusted to retain the spring under tension.

It will be understood that any desired number of alarm-boxes and signaling mechanism can be introduced into or included in the circuit 4 4, only one being shown in Fig. 5 to prevent confusion. By mounting the contact-finger O' in the manner above described it is possible to move it so far into its holder or support O⁴ as to remove its free end from the path of the pin P' without breaking the electric circuit through the contacts O O'. This permits the inspector to readily test the alarm-box, the alarm being given off by the alarm-signal G without being transmitted over the fire-alarm-system circuit 4.

The manner of using and the operation of my improvement may be briefly described as follows: Before an alarm can be turned in the person desiring to sound the alarm must force the doors E E of the supplemental key-protecting casing D open, and thereby close the local circuit 1 2 and sound the alarm G. This local circuit 1 2 will be, as hereinbefore described, maintained closed and the alarm G continuously sounded until the door C has been opened. As the disk P revolves it will be seen that the local circuit 2 3 will be intermittently closed as each pin P' lifts the contact O² against that at O³ and thereby the alarm sounded by the bell G, and as each pin P' lifts the contact O' away from that at O the main circuit 4 will be broken and the alarm sounded on the gong provided in said circuit for that purpose.

It will be noticed that the supplemental casing D and the local alarm controlled by the doors E E thereof can be readily applied to the doors of fire-alarm boxes commonly in use.

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

1. The combination with a fire-alarm box having a door through which access is had to the signal mechanism, of a supplemental door through which access is had to the fastening device of the box-door, and an electric alarm or signal device adapted to be sounded when said supplemental door is opened.

2. The combination with a fire-alarm box, having a door through which access is had to the signal mechanism, of a supplemental door through which access is had to the fastening device of the box-door, an electric alarm or signal device supported above the box, and an electric circuit including said signal device and the supplemental door, whereby when the said door is opened the alarm will be sounded.

3. The combination with a fire-alarm box, of a casing secured to the door of said box and surrounding the devices for actuating the fastening of said door, a door through which access is had to said casing, and an electric alarm or signal device adapted to be sounded when the door of said casing is opened.

4. The combination with a fire-alarm box having a hinged door, of a casing secured to said door and surrounding the key therein, a door for said casing, an electric alarm or signal device adapted to be actuated by the opening of said casing-door, and supplemental means for continuing the sounding of said alarm when the door of the casing is closed, and the door of the box is being opened.

5. The combination with a fire-alarm box, of a casing secured to the door of said box and surrounding the device for actuating the fastening devices thereon, a normally-closed swinging door for said casing, and an electric alarm or signal device having one terminal

of its controlling-circuit connected with said door of the casing and its other terminal connected with an insulated contact within said casing in the path of said door, whereby when the door of the casing is opened to unfasten the door of the box said alarm or signal device will be actuated.

6. The combination with a fire-alarm box, of a casing secured to the door of said box about the lock-controlling devices thereon, a door for closing said casing, an electric alarm or signal device having one terminal of its controlling-circuit connected with the door of the box and with said casing and its other terminal connected with a contact arranged within said casing in the path of the door thereof and with a movable bar or member movable by the lock, and a stud or stop electrically connected with the door of the box and extending into the path of said movable bar.

7. The combination with a fire-alarm box, of an electric signal or alarm arranged adjacent to said box, a circuit, including said local alarm, adapted to be controlled by movement of the door of the box, and a second circuit including said local alarm adapted to be controlled by the alarm apparatus within the box.

8. In a fire-alarm system, the combination with a main electric, normally-closed, alarm-circuit, a local alarm arranged adjacent to each box, and a signal apparatus arranged within the box and including a revoluble circuit-breaker adapted at each revolution to engage with contact-terminals of both the main and local alarm-circuits, one of the terminals of the main alarm-circuit within each box being adjustable whereby it can be moved out of the path of the circuit-breaker without interrupting the circuit in which it is included.

In testimony whereof I affix my signature in presence of two witnesses.

LOUDOUN CAMPBELL.

Witnesses:

ARTHUR L. BRYANT,
J. A. WATSON.