

No. 696,180.

Patented Mar. 25, 1902.

N. MARSHALL.
ELECTRIC SWITCH.

(Application filed Mar. 18, 1901.)

(No Model.)

FIG. 1.

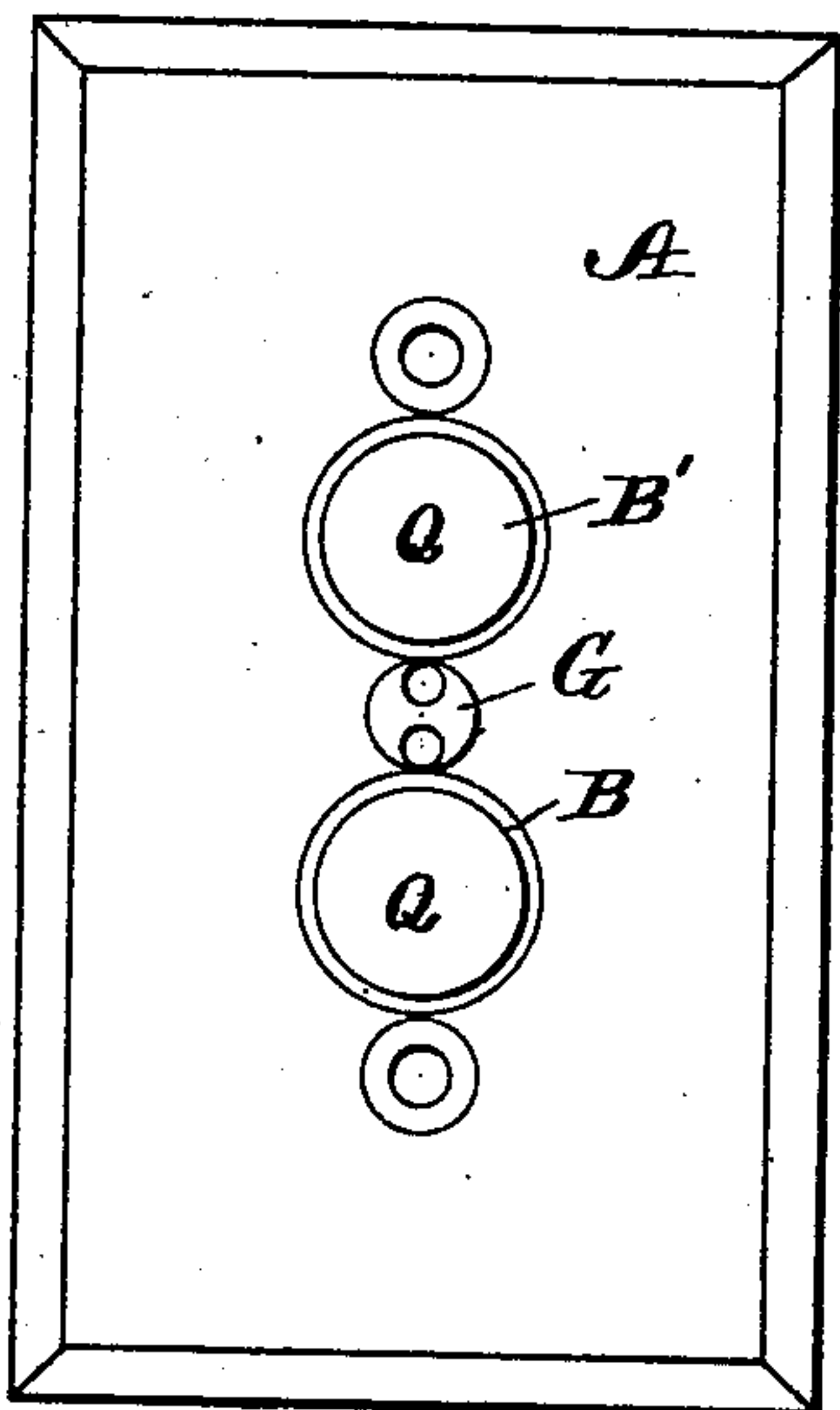


FIG. 2.

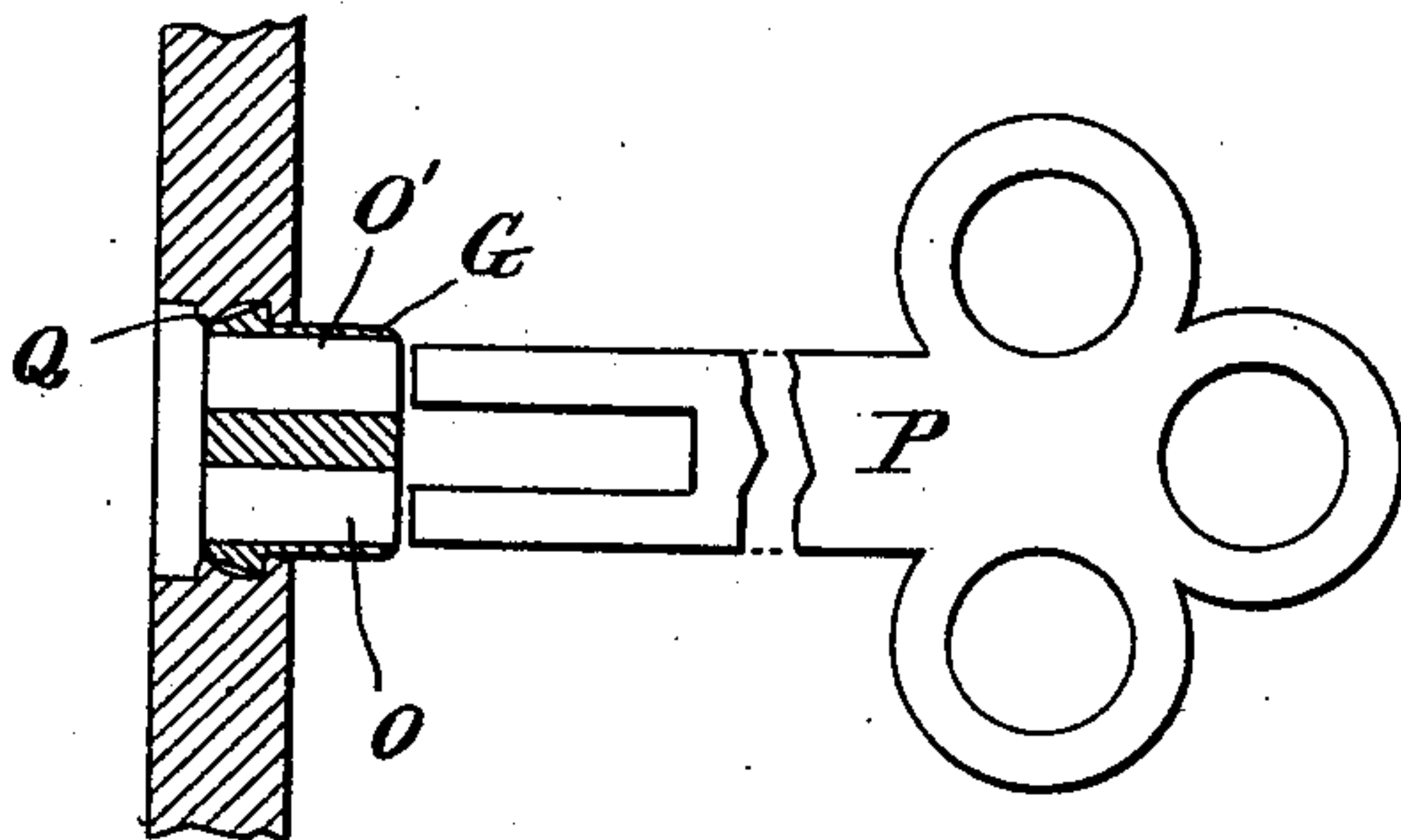


FIG. 4.

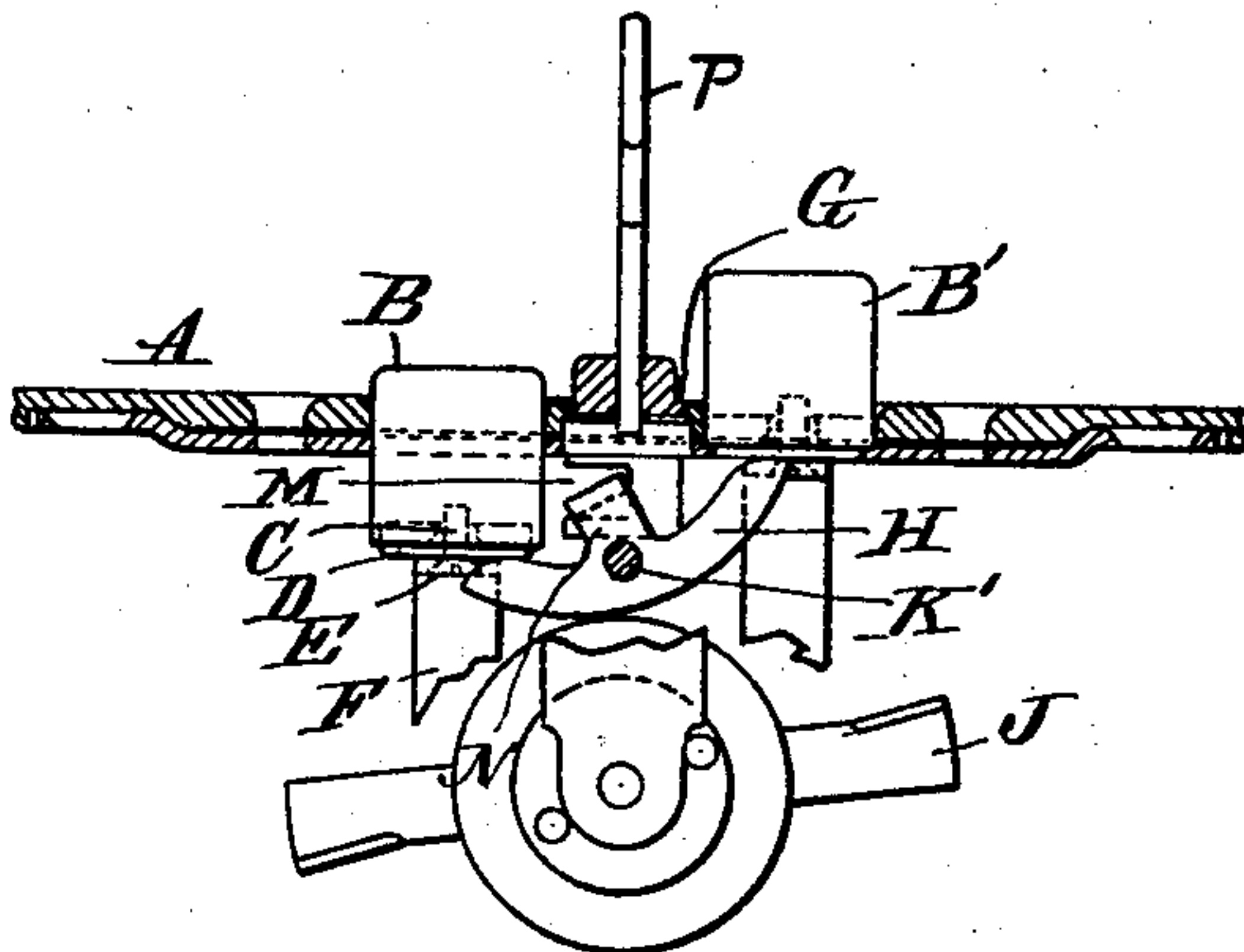


FIG. 3.

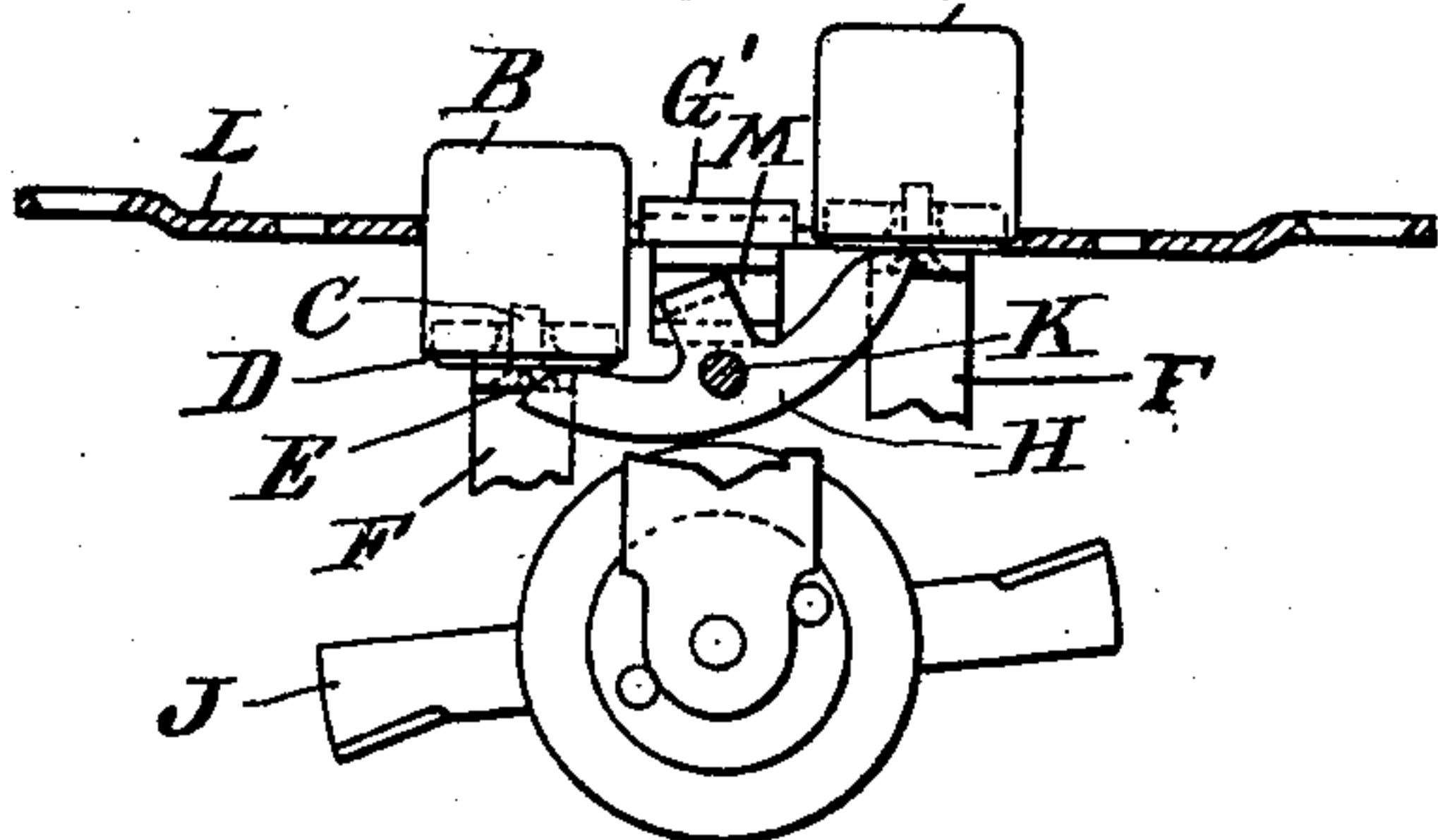


FIG. 5.

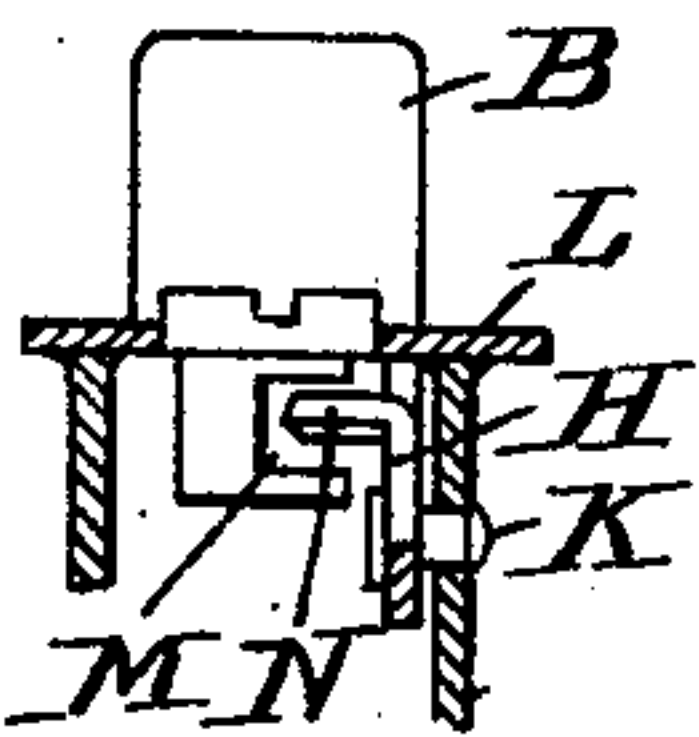


FIG. 6.

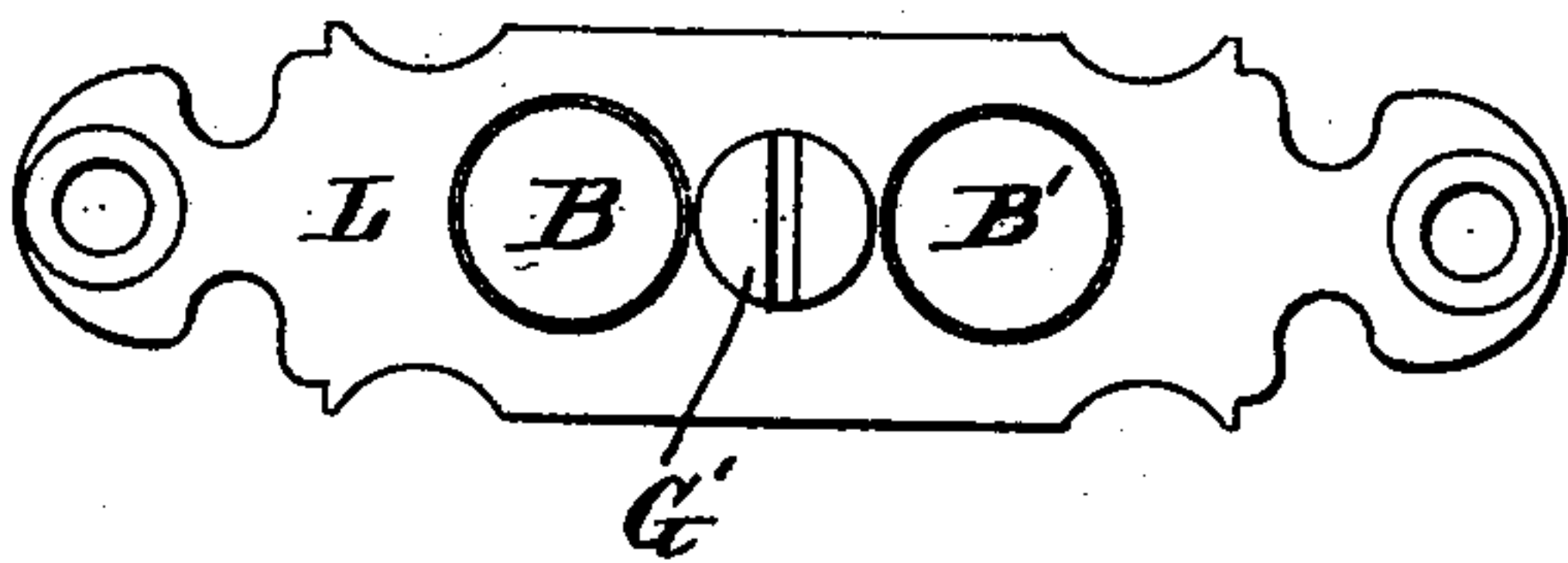


FIG. 7.

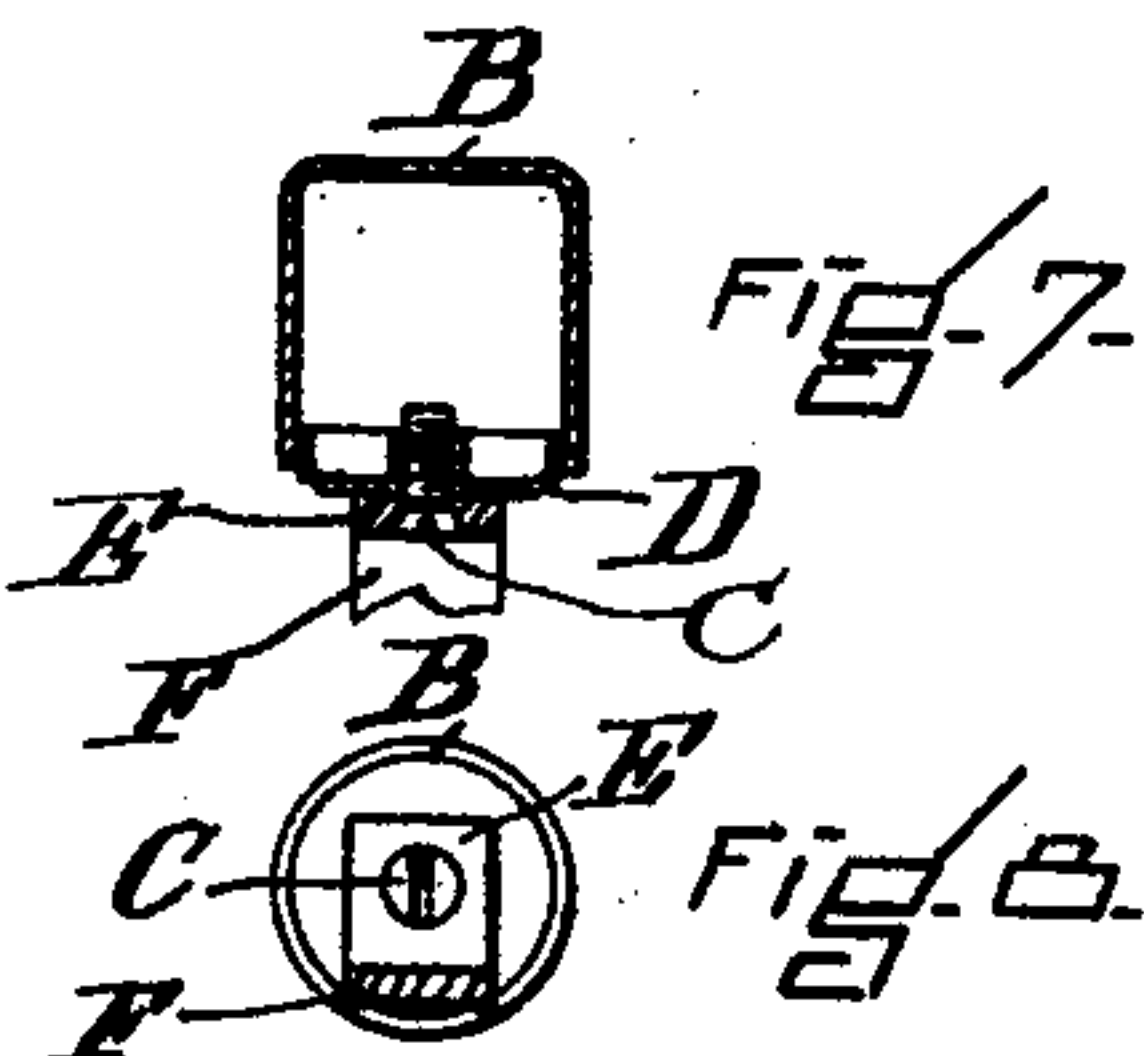


FIG. 8.

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NORMAN MARSHALL, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO MARSHALL-SANDERS COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 696,180, dated March 25, 1902.

Application filed March 18, 1901. Serial No. 51,801. (No model.)

To all whom it may concern:

Be it known that I, NORMAN MARSHALL, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

The invention relates to electric switches; and its object is to provide an electric switch which may be readily operated by authorized persons and which may be put into such condition that its operation by unauthorized persons is prevented. This is accomplished by the employment, in connection with the usual parts and mechanism of a switch, of a locking means which may be operated by a key in the possession of an authorized person and when so operated will prevent the movement or operation of the switch by unauthorized persons. I prefer to so construct the locking means that it may be adjusted by the action of the key to hold the switch in either of two positions or may be adjusted so that operation of the switch will not be interfered with in case it is desired to leave the switch in condition to be operated by persons having no key.

The features of invention may be embodied in various forms of switches, the key-controlled locking mechanism being modified to suit the varied conditions.

In explaining the invention more fully I will refer to a simple and efficient construction of locking mechanism adapted to cooperate with the parts of push-button switches and which embodies certain features of invention in addition to the broad features above referred to. This mechanism comprises a rocker-arm the ends of which engage or are connected with the reciprocating arms which operate the switch mechanism, so that the rocker-arm is rocked by the movement of either arm in operating the switch, and a key-controlled stop for holding the rocking arm from movement.

In the accompanying drawings, in which I have shown this mechanism and so much of a push-button switch as is necessary to show

the cooperation between said mechanism and the mechanism of the switch, Figure 1 is a plan view of the face-plate of a push-button switch, showing the face of the locking mechanism. Fig. 2 is an enlarged sectional view through the tumbler of the locking mechanism, showing a key adapted to fit the form of tumbler shown. Fig. 3 is a side elevation of the locking mechanism with the face-plate and tumbler removed, the mechanism being in position not to interfere with the operation of the switch. Fig. 4 is a similar view including the face-plate and tumbler and with the locking mechanism in position to prevent the operation of the switch. Fig. 5 is an end view looking toward the right in Fig. 3. Fig. 6 is a plan view of a part of the switch-supporting frame, showing the top of the locking-stud. Fig. 7 is a sectional view through one of the push-buttons, and Fig. 8 is a bottom view of the button and the arm to which it is secured.

The various parts of the switch are supported upon the usual frame L, having a front plate for securing the same in place, and the face-plate A is arranged to fit over the frame in the usual manner, the plate being perforated for the passage of the push-buttons B B', by which the switch mechanism is operated.

The buttons B B' are of a simple and inexpensive construction, being formed of two cups of sheet metal, one fitting within the other and secured together in any suitable manner, as by soldering, brazing, or by frictional engagement. As shown in Figs. 7 and 8, the cup or shell B, of metal, closely fits over the shallow cup D, the parts being firmly held together by friction or by soldering or brazing. The cup D is drawn up in its center, as at E, and is screw-threaded to receive the screw C, by which the button is secured to the arm F of the switch. By this construction a cheap, light, and strong button is provided suitable for use in connection with push-button switches.

The contact-bar of the switch, which is operated through the push-buttons, is indicated at J, and the reciprocating arms, to which the

buttons are secured, are indicated at F, while the remaining well-known parts of the switch are omitted from the drawings. The operation of this class of switch is well understood, the button B being pushed in and the button B' being projected when the parts of the switch are to be moved into a certain position—into position to complete a circuit, for instance—and the push-button B' being pushed in and the button B projected when the parts are to be moved into another position—into position to break a circuit, for instance.

The locking mechanism shown is constructed to prevent the operation of the switch when in either of two positions—that is, when the button B is in its inner position or when the button B' is in its inner position. This locking mechanism consists of a rocker-arm H, one end of which engages the button B and the other end of which engages the button B', and a stud G', constructed to form a stop for preventing the movement of arm H and to be operated by a key. The rocker-arm is pivoted to the frame L at K and is provided with an ear or projection N for co-operating with the stop or locking-stud G'. The stud G' is mounted to turn in the front plate of the frame L and is cut away or slotted at M, so that the bottom of the slot or flat face of the stud forms a stop for engaging the projection N on the rocker-arm when the stud is turned into the proper position. The parts are so arranged that when the stud G' is in the position indicated in Fig. 3, with the engaging face of the stud parallel with the plane of arm H, the projection N may move across said face or through the slot M when the switch is operated and the operation of the switch will not be prevented. When the stud is turned into the position shown in Fig. 4 or through an angle of ninety degrees, the engaging face of the stud is brought into the path of the projection N and prevents the movement of the arm H, and consequently prevents the operation of the switch. With this form of stop the projection N should extend to or beyond the center of the stud G', so that any pressure exerted by the projection N against the engaging surface of the stud will not turn said stud. In case it is desired to lock the switch with the button B' in its inner position, the stud G' should be turned in an opposite direction from that indicated after the button B' has been pushed in.

The stud G' may be turned to lock the switch in either of the two positions referred to or may be turned into the position indicated in Fig. 3 by means of a key P, the form of which is determined by the tumbler G, which is mounted to turn in the face-plate A. The tumbler G is provided with an enlarged part or flange which fits within a recess in the under surface of the plate, being held therein by swaging the plate, as indicated at Q, Fig. 2. In the simple form of the tumbler

and key indicated the tumbler is provided with two holes arranged to register with a slot in the end of the stud G' and the key P is provided with two projections arranged to pass through the holes in the tumbler and engage the slot in the stud, as indicated in Fig. 4. By inserting and turning the key in the proper direction after the switch has been adjusted the operation of the switch may be prevented until the locking mechanism is again operated by the person having the proper key in his possession.

What I claim, and desire to secure by Letters Patent, is—

1. In an electric switch the combination with devices for operating the switch, of a key-controlled locking mechanism for preventing the operation of the switch embodied in and forming part of the switch.

2. In an electric switch the combination with mechanism for operating the switch, of a key-controlled locking mechanism constructed to lock said switch in either of two positions.

3. In an electric switch the combination with reciprocating push-buttons for operating the switch, of a key-controlled locking device for preventing the movement of said push-buttons.

4. In an electric switch the combination with reciprocating push-buttons for operating the switch, of a key-controlled locking device constructed to prevent the movement of said push-buttons when the switch is in either of two positions.

5. In an electric switch the combination with reciprocating devices for operating the switch, of a rocker-arm connected with said devices, and a key-controlled stop for preventing the movement of said arm.

6. In an electric switch the combination with reciprocating devices for operating the switch, of a rocker-arm connected with said devices, a projection on said arm, a key-controlled stud provided with an engaging surface arranged to be moved into or out of the path of said projection by the rotation of said stud.

7. In an electric switch the combination with the switch-operating devices, of a rocker-arm connected to move therewith, a locking-stud for preventing the movement of said arm, and means whereby the stud may be operated by a key.

8. In an electric switch the combination with the push-buttons connected to operate the switch, of a rocker-arm connected with said push-buttons, a projection on said rocker-arm, a stud having a stop-surface arranged to be turned into and out of the path of said projection, means whereby said stud may be turned by a key, and a tumbler for determining the form of the key.

9. A button for a push-button switch comprising two metallic shells fitting one within the other, one of said shells being drawn up

at its center and screw-threaded to receive a securing-screw.

10. A button for a push-button switch comprising a metallic shell or cup B, a cup D fitting within the open end of said shell and having its center drawn up and screw-threaded at E.

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

NORMAN MARSHALL.

Witnesses:

E. M. BAKER,
IRA L. FISH.