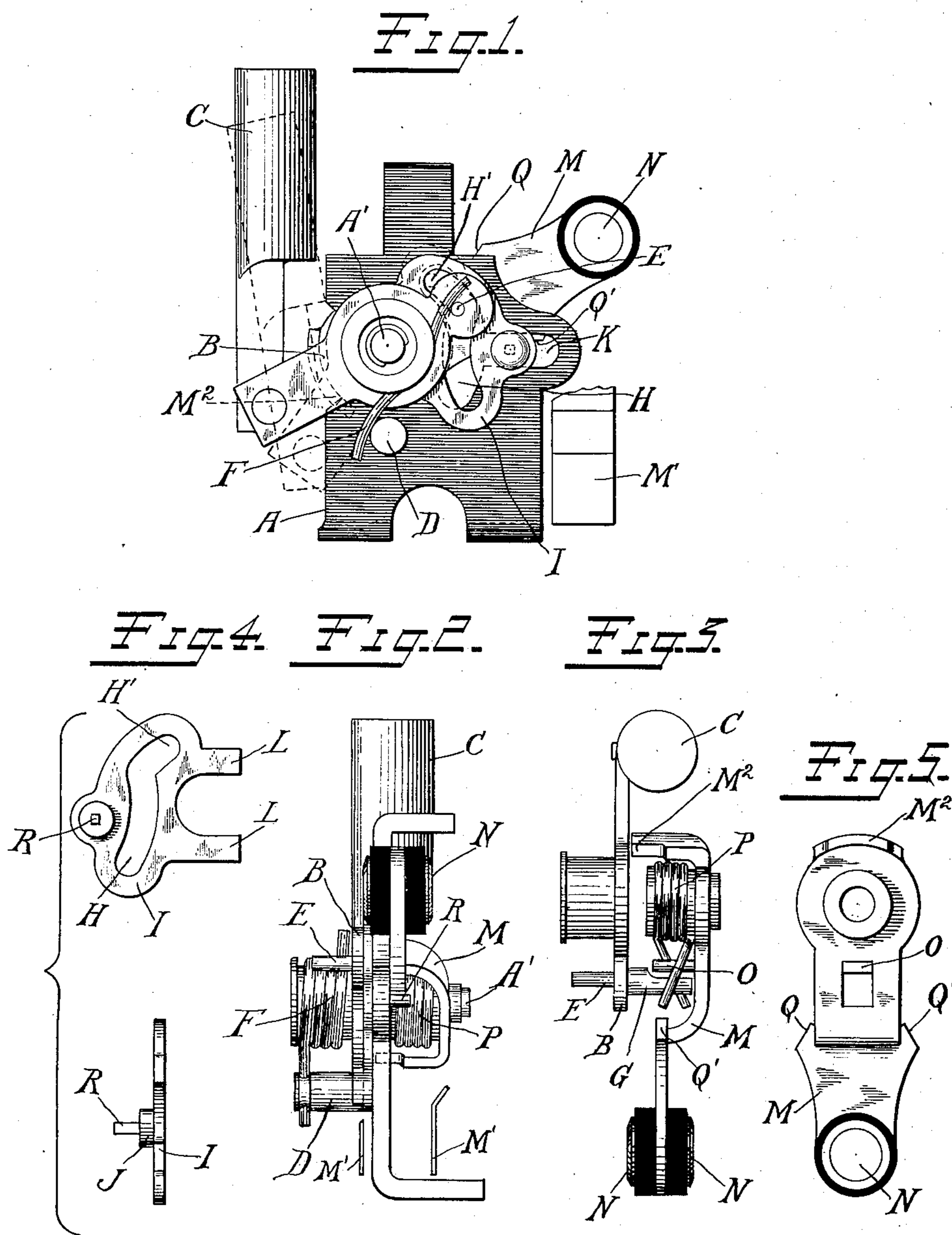


G. W. HART.  
ELECTRIC SWITCH.  
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938,664.

Patented Nov. 2, 1909.



Witnesses:  
Fred. M. Dannenfelser.  
Chas. M. Pease

Inventor  
G. W. Hart.  
By his Attorneys  
Barrett, Brownell & Mitchell

# UNITED STATES PATENT OFFICE.

GERALD W. HART, OF WEST HARTFORD, CONNECTICUT, ASSIGNOR TO THE HART MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

## ELECTRIC SWITCH.

938,664.

Specification of Letters Patent.

Patented Nov. 2, 1909.

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*To all whom it may concern:*

Be it known that I, GERALD W. HART, a citizen of the United States, residing at West Hartford, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Electric Switches, of which the following is a full, clear, and exact description.

My invention relates to improvements in electric switches, and more particularly to double throw switches such as are used for controlling lights in closets and the like, the switch being thrown so as to close the circuit when the door is opened and so as to break the circuit when the door is closed.

The purpose of my invention is to provide novel means whereby less accuracy will be required in installing the switch, and no injury will be done if, on account of warping or shrinking of the woodwork, the relations of the switch and the door become slightly changed in the course of time.

Heretofore, many switches have been injured because the actuating member had to be thrown to its extreme position in order to release the switch arm, the result being that if the switch were not installed exactly in a given position, or the door were not so related as to throw the actuating member exactly the predetermined amount, either the switch arm could not be thrown, or the pressure on the switch mechanism after the switch arm was thrown would be so great as to injure the switch mechanism. In my device, I provide means whereby there is lost motion, permitting the actuating member to be moved quite a little beyond the end of its necessary stroke without producing any result, the switch arm having been released before the actuating member reaches its greatest possible throw.

The following is a description of a switch apparatus embodying my invention, reference being had to the accompanying drawings, in which,

Figure 1 is a side elevation of the actuating parts of the switch embodying my invention. Fig. 2 is a front elevation of the parts. Fig. 3 shows a plan view of the actuating member, the switch arm and the connecting spring in operative relations. Fig. 4 shows a side and end elevation of the sliding detent, and, Fig. 5 is a side elevation of the switch arm.

Referring more particularly to the draw-

ings, A is the support for the actuating mechanism adapted to be mounted on a suitable base.

B is the actuating member of the switch mounted on the shaft A' carried by the support. To the actuating member a push-button C is pivoted. The support has a pin D and the actuating member has a pin E, against which bear the ends of a retracting spring F.

The actuating member is shown in Fig. 1 in the position in which it is when the button C is pressed and the spring F tends to return it and raise the button C, and will do so whenever it is released by the opening of the door or the like. The actuating member B also carries a pin G, the rounded portion of which lies within an opening H in a sliding detent I, this sliding detent having a boss J lying within a slot K in the support A, and having two arms L which embrace the shaft A' carried by the support A and on which the actuating member is mounted. A movement of the actuating member while its pin G is in the lower part of the slot H causes the sliding detent to move forward and back. When the actuating member is moved so that its pin is in the portion H' of the slot, a movement of the actuating member does not produce any movement of the sliding detent, since this portion H' is then concentric, or substantially concentric, with the axis of revolution of the actuating member.

Mounted upon the shaft carried by the support is a switch arm M carrying contact surfaces N and a pin or lug O. Mounted upon the hub of the switch member is a spring P, whose ends embrace the outer end of the pin G and also the pin O so as to connect the actuating member and the switch arm together with a yielding spring connection, operative in both directions. The switch arm has stop-shoulders Q—Q', with which a pin R, carried by the sliding detent I, engages and disengages so as to restrain the switch arm until the spring P is put under tension, and then release it so that it will be driven by said spring so as to make and break the circuit with a quick snap action.

The operation of the device is as follows: With the parts shown as in Fig. 1, the door of the closet is supposed to be closed. When the door is opened, the spring F, which is stronger than the spring P, moves the button

C to extended position, carrying the actuating member around so that the pin G is moved to the bottom of the slot H, a circular slot in the support A permitting such movement. The first movement of the actuating member results in a slight forward movement of the slide I, moving the pin R into the path of the stop-shoulder Q, thus restraining the movement of the switch arm M. A further movement of the actuating member with its pin G puts the spring P under tension and finally moves the slide I backward so that the pin R is withdrawn from the path of the stop-shoulder Q. The spring P being then under tension throws the switch arm M around so as to make contact with the circuit terminals M', completing the circuit.

When the door is closed, the push-button C is pushed down into the position shown in Fig. 1. This rotates the actuating member and moves the pin G within the slot H. The first movement causes the slide I to move forward until the pin R lies in the path of the stop-shoulder Q'. A further movement puts the spring P under tension, and a further movement withdraws the slide I so that the pin R is removed from the path of the stop-shoulder Q'. This permits the spring P to throw the switch-arm M upward to its extreme position, thus breaking the circuit. If the parts are installed so that at any time the throw of the push-button C is not exactly that which is necessary to release the switch-arm M, but is somewhat greater, the pin G travels in the concentric portion H' of the slot in the slide I without producing any movement of the slide. The excess movement of the push-button C therefore does not in any way injure or strain the switch mechanism, or result in other damage.

The lower portion of the slot H in the slide I is never concentric with the axis of revolution of the actuating member and is shown as presenting a convex surface to the axis of the actuating member, thereby resulting in a quicker movement thereof into and out of the path of the stop-shoulders Q—Q' on the switch-arm, it being advantageous to have the movement quick at that time and immaterial how slow the movement is after sufficient engagement has once been made.

The rear end M<sup>2</sup> of the switch arm engages the support at the end of the throw in either direction and acts as a stop to limit the movement of the switch arm.

The mechanism operates with certainty and precision and the danger of damage above referred to is eliminated.

What I claim is:

1. In a switch, the combination of a sup-

port, an actuating member, a switch arm, said actuating member and switch arm being mounted upon the same axis on said support, a spring connecting said actuating member and switch arm, a sliding detent member normally restraining said switch arm, one of said members having an opening and the other a pin traveling in said opening, said opening having an idle portion concentric with, and an active portion not concentric with the axis of said actuating member, the concentric portion being an end portion of the opening, said pin traveling in both portions.

2. In a switch, the combination of a support, an actuating member, a switch arm, said actuating member and switch arm being mounted upon the same axis on said support, a spring connecting said actuating member and switch arm, a sliding detent member normally restraining said switch arm, said detent member having an opening, said opening having an idle portion concentric with and an active portion not concentric with the axis of said actuating member, said actuating member having a pin traveling in said opening.

3. In a switch, the combination of a support, an actuating member, a switch arm, said actuating member and switch arm being mounted upon the same axis on said support, a spring connecting said actuating member and switch arm, a sliding detent member normally restraining said switch arm, one of said members having an opening and the other a pin traveling in said opening, said opening having an idle portion concentric with and an active portion not concentric with the axis of said actuating member, a push button for moving said actuating member in one direction, and a retracting spring for said actuating member.

4. In a switch, the combination of a support, an actuating member, a switch arm, said actuating member and switch arm being mounted upon the same axis on said support, a spring connecting said actuating member and switch arm, a sliding detent member normally restraining said switch arm, one of said members having an opening and the other a pin traveling in said opening, said opening having an idle portion concentric with and an active portion presenting a convex outline to the axis of the actuating member, a push button for moving said actuating member in one direction, and a retracting spring for said actuating member.

GERALD W. HART.

Witnesses:

M. H. GLYNN,  
J. T. CLARKE.