

No. 850,870.

PATENTED APR. 16, 1907.

R. H. MANSON.
ELECTRICAL SWITCH.
APPLICATION FILED MAY 9, 1904.

Fig. 1.

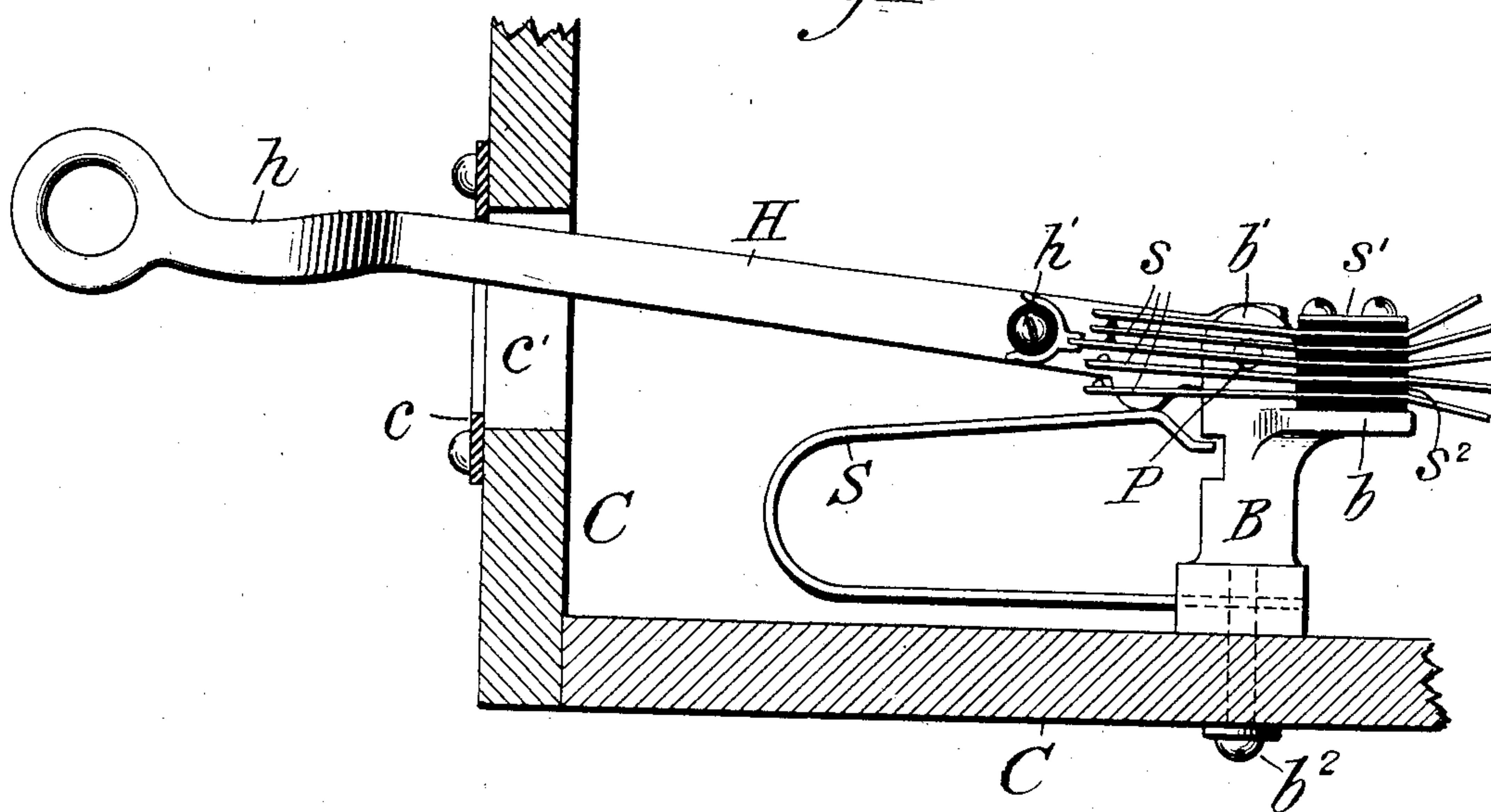
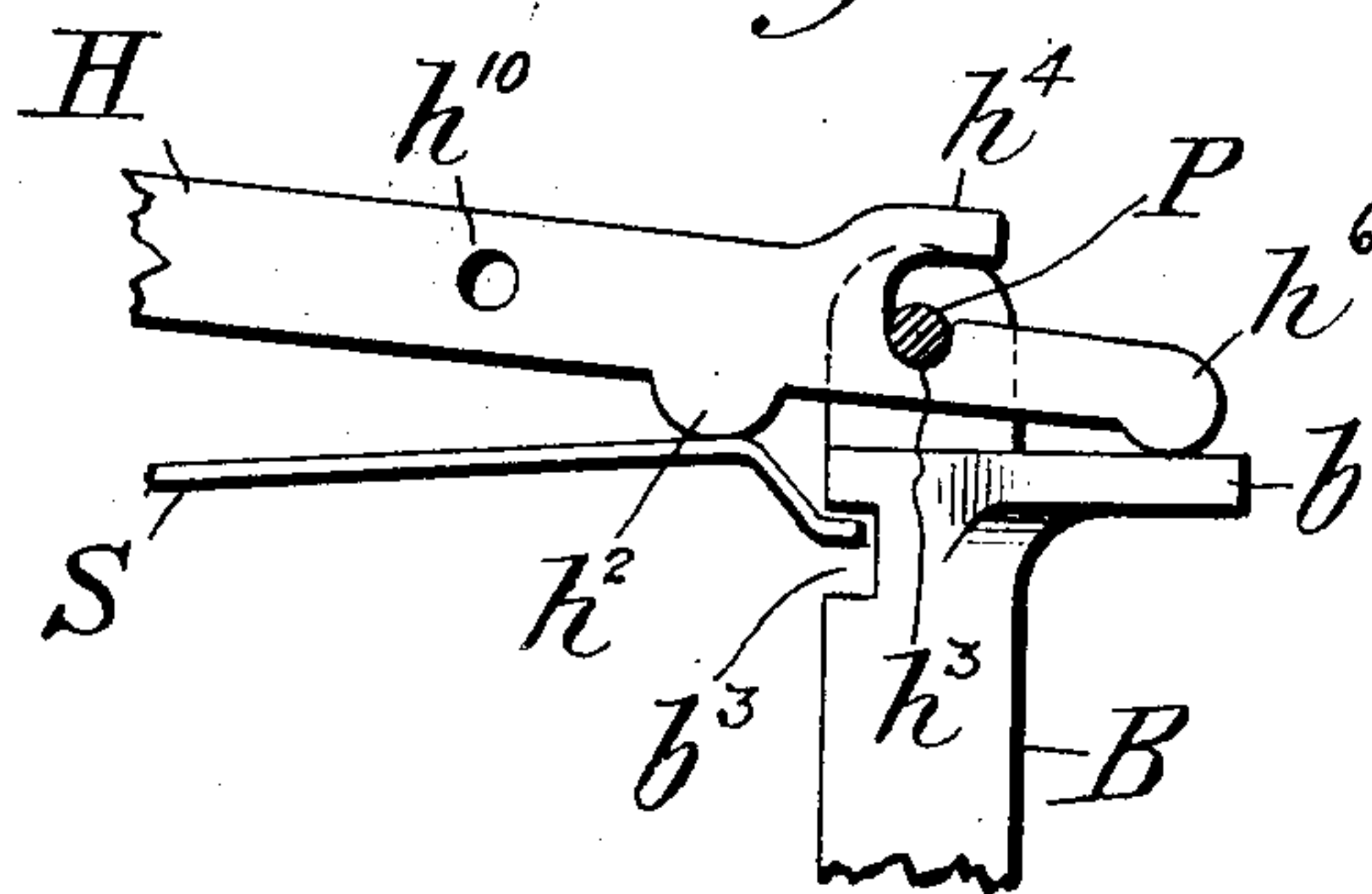


Fig. 2.



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ELECTRICAL SWITCH.

No. 850,870.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed May 9, 1904. Serial No. 207,004.

To all whom it may concern:

Be it known that I, RAY H. MANSON, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Electrical Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to electrical switches, and particularly to those having a group of contacts or other operative parts whose condition or relation may be changed by the manipulation of a handle or similar device.

In most cases the operative parts are mounted as a unit within a suitable casing, and the handle or other actuating element projects from the casing. The projection of this element from the casing as well as the mode of its insertion and removal and of the assembling of the switch are frequently productive of embarrassment not only to the designers, but to those who are afterward called upon to assemble and to handle, pack, and unpack the complete pieces of apparatus.

The form of switch in which my invention is shown and described as embodied for the purpose of this application is that used in connection with subscribers' telephone outfits, and particularly with so-called "wall sets." Its mode of adaptation to other forms will be apparent to those skilled in the art without specific description.

My invention has for its object the design of a switch in which the actuating element, whether a handle, as used in many forms of switch, or a hook-lever, as used in telephone sets, may readily be detached from and attached to the operative parts of the switch without otherwise disturbing their relations or arrangement. In order to attain my object, I provide a fixed pivot for the actuating element or lever, which serves as a fulcrum and with which the lever engages by means of a notch or recess. Between the point of application of power and the fulcrum of the lever I provide a yielding retaining device acting to maintain the lever in engagement with its fulcrum and in a direction opposed to that of the operating power. As long as this yielding device retains its resilience the switch will operate without danger of displacing the lever, while the latter may be detached from the fulcrum at any time by suit-

able compression of the yielding device. The points of application of power and of the opposing yielding device may be shifted with respect to the fulcrum according to the order to which the lever belongs. The extent of movement of the lever is immaterial as long as the retaining pressure follows throughout the amplitude of movement to maintain the engagement of the lever and fulcrum. The "yielding device," as I have called it, may be reduced to a latch engaging the pivot or fulcrum, in which case it is not essential that it should exert pressure directly in opposition to the power so long as it retains the lever in engagement with its pivot.

In the telephone-switch hereinafter described the actuating element is the hook-lever. Its fulcrum is the ordinary pivot-post on the switch-base, and the yielding device is the actuating-spring which tends to throw up the lever when the telephone-receiver is removed from the hook. By employing the actuating-spring as the retaining device it is given a double function and the parts are reduced to the utmost simplicity, no change being required as a matter of fact, except the cutting out of one side of the pivot-bearing in the lever to form a notch.

By means of my invention the embarrassments to which I have referred are entirely obviated. The opening in the casing through which the operating-lever must extend can be made small and inconspicuous, and the lever may be removed except when the instrument is actually in use, whereby an annoying external projection is disposed of, packing-cases may be made smaller, and the risk of damage to an instrument in handling or during shipment is considerably lessened.

My invention is illustrated in the accompanying drawings, wherein the same letters of reference indicate the same parts throughout, and wherein—

Figure 1 is a side view of a telephone hook-switch embodying the invention inclosed in a casing, part of which is shown in section. Fig. 2 is a side view of the upper part of the base and the end of the lever in Fig. 1, the parts being removed to show the notch in the lever and the manner of its engagement with the pivot-post.

In the drawings I represent a standard type of telephone hook-switch C in a box or casing, upon which is mounted the base or

support B, secured to the bottom of the casing by the screw b^2 . Upon the upper part of the base cheek-pieces b' are formed, between which lies the lever H, journaled upon the pivot-pin P. The lever extends out through an opening c' in the side of the casing, covered by an escutcheon-plate c , and carries upon its outer end the usual bifurcated hook h . Formed upon one side of the base B is a flange or transverse shelf b , upon which are mounted the contact-springs s , insulated from each other by the interposed slips of hard rubber or like material s^2 and confined by the overlying double washer s' and a pair of suitable screws passing down and into the flange b .

The hook-lever H has upon its lower side a curved projection h^2 , upon which bears the upper arm of a strong bent spring S, the upper end of which lies within and is limited in its movement by the recess b^3 in the base, while its lower end is secured across the base. This spring S tends to exert a strong and constant upward pressure upon the lever H at the point h^2 , which, it will be observed, lies between the pivot P and the working or power end of the lever. Fig. 2 shows particularly the mode of engagement of the lever with the pivot. The end of the lever is bifurcated, having a linear extension h^2 , an upward curved extension h^4 , and a notch h^3 lying between them. This is placed in position from the left, the extension h^2 being passed under the pivot and slid back over the flange b , the spring S being at the same time held down. As the lever moves back the post P will finally engage in the opening under the extension h^4 , and the spring S being then released the parts will all assume the positions shown in Fig. 2, with the pivot P lying in the notch h^3 , in which it is retained by the upward pressure of the spring S. It is essential to the proper retention of the parts in this position that a suitable stop shall be provided to limit the movement of the lever H. This stop may be simply the escutcheon-plate, the length of whose slot determines the length of travel of the lever; but in the present case I do not depend upon the escutcheon, preferring to have a more positive stop on the base. This enables me to assemble my switch outside of the casing and without reference thereto, if necessary or desirable. The stop so provided consists merely of the transverse portion of the flange b , upon which the extension h^2 bears when the hook is "up." The end of the spring S descending to the bottom of the recess b^3 similarly limits the movement when the hook is "down."

In assembling this type of hook for operation the base, with its springs S and s , is secured in place, and the lever H is passed in through the opening c' , either with or without the insulated stud h' , screwed or riveted into the hole h^{10} in the lever. This stud as the

lever moves to the right takes into the bifurcated end of the middle one of the springs s , whereby movement is communicated to the springs from the lever. As already described, the end of the lever then passes from the spring S and onto the pivot until the latter snaps into the notch.

In order to remove the lever in the form of switch shown, it is necessary only to depress the spring S either directly or by pressing down on the lever H, when the latter may be withdrawn without disturbing the other parts of the switch.

It will be apparent to those skilled in the art that sundry changes may be made in details and the mode of arrangement without departing from the spirit of the invention. All other changes embodying the spirit of my invention are contemplated by me, and I consider them within the scope and purview of my claims.

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

1. An electrical switch comprising a base, contact members thereon, a pivot or fulcrum, an operating member detachably secured to said pivot or fulcrum, a yielding pressure device normally maintaining said member in operative relation with the fulcrum, and a shoulder on the base for limiting the movement of said pressure device when the operating member has been removed.

2. In an electrical switch, the combination with a base, a rearward extension thereon, of a pivot or fulcrum on said base, an operating member pivoted thereto, movable contact members actuated by said operating member, a limited pressure device normally maintaining said operating member in operative position, and an extension carried by the operating member and cooperating with the base extension for limiting its movement.

3. In an electrical switch, the combination with a base, a rearward extension thereon, of a pivot or fulcrum on said base, an operating member pivoted thereto, movable contact members actuated by said operating member, a limited pressure device normally maintaining said operating member in operative position, and a linear arm integral with said operating member adapted to limit the movement thereof by engagement with the base extension.

4. In an electrical switch, the combination with a base, of a shelf integral therewith, circuit-changing springs mounted on said shelf, an operating member, a stationary pivot on the base therefor, a pressure device normally maintaining said operating member in engagement with the pivot and an arm integral with said operating member adapted to engage the shelf to limit the movement thereof.

5. In an electrical switch, the combination with a closed casing, of a base or support

therein, a shelf carried thereby, circuit-changing springs removably secured on said shelf, a stationary pivot on said base, an operating member removably engaging said pivot, a pressure device normally tending to keep said operating member in engagement with the pivot, and a rearwardly-extending linear arm adapted to limit the upward movement of said operating member, said operating member adapted to be removed from its pivot without entering the casing.

6. In an electrical switch comprising a frame having a longitudinal member and a transverse flange formed thereon, an operating-lever independent of the circuit and notched near one end, a pivot-post on the longitudinal member having its pivot lying in said notch, and a spring secured upon the longitudinal member and extending so as to exert pressure on the lever on the side opposite the notch whereby the lever is held normally raised in operative engagement with the pivot-post.

7. An electrical switch comprising a longitudinal member and a transverse flange formed thereon, an operating-lever independent of the circuit and notched near one end on its upper side, a pivot-post on the longitudinal member having its pivot lying in the notch of said lever, and a spring secured to said longitudinal member and extending up

and engaging the lever on its under side and exerting pressure thereon forward of the pivot-post whereby the lever is held with its forward end raised and the notch in operative engagement with the pivot-post.

8. An electrical switch comprising a casing and an escutcheon-plate secured thereto and forming upper and lower stops, a base having a transverse flange integral therewith, an operating-lever extending through said escutcheon-plate and having a notch on its outside near one end, a pivot-post on said base engaging the notch of said operating-lever, a spring secured to the base and extending up to the under side of said lever between the pivot-post and the escutcheon-plate whereby the lever is normally held in engagement with the pivot-post and the upper stop of the escutcheon-plate, contact-springs mounted on said transverse flange, means forming an operative connection between the lever and said springs, and means independent of the escutcheon-plate for limiting upward movement of said lever.

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

RAY H. MANSON.

Witnesses:

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