G. H. HART.

ELECTRIC SWITCH.

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1,182,087.

Patented May 9, 1916.

Fig 1

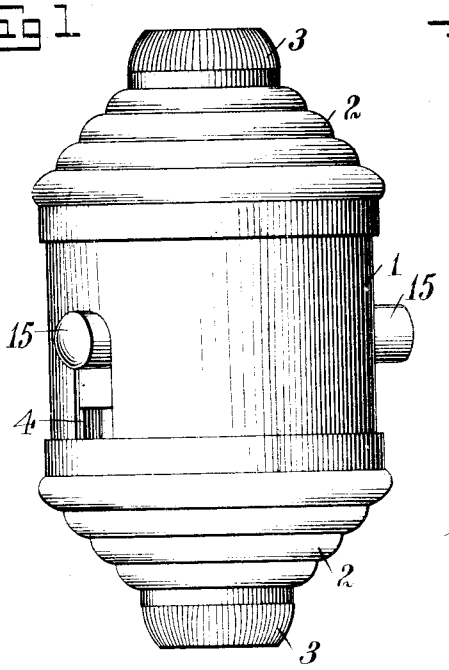


Fig 2

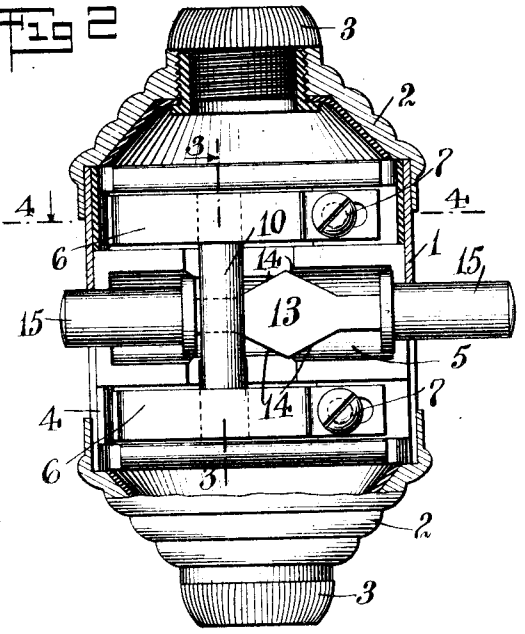


Fig 3

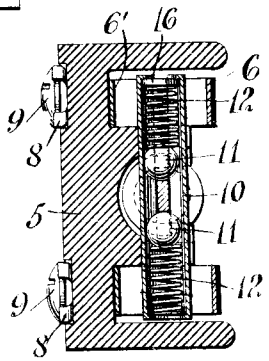


Fig 4

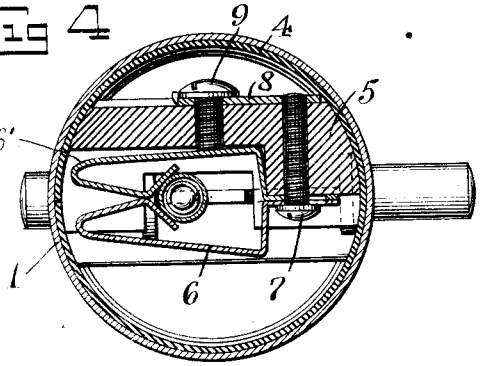


Fig 6

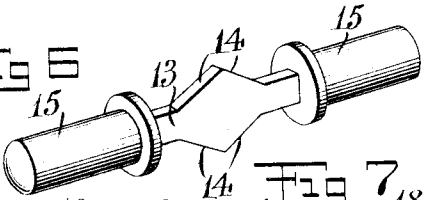


Fig 5

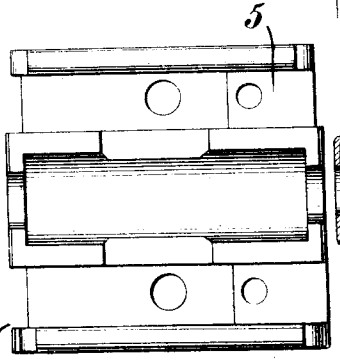
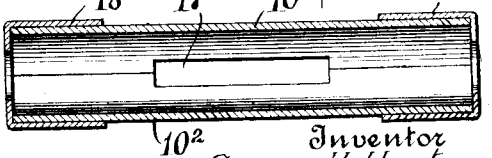


Fig 7



Witnesses:
C. J. Hachenberg
Ida M. Hunziker

Inventor
George H. Hart
By his Attorneys
Bartlett, Brownell & Mitchell.

UNITED STATES PATENT OFFICE.

GEORGE H. HART, OF WEST HARTFORD, CONNECTICUT.

ELECTRIC SWITCH.

1,182,087. Specification of Letters Patent. Patented May 9, 1916.

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To all whom it may concern

Be it known that I, GEORGE H. HART, a citizen of the United States, residing at West Hartford, Hartford county, 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 has for its object to produce a simple and effective switch for controlling an electric circuit.

It also has for its object to produce a switch which is compact in form and of large carrying capacity relatively to its size.

The following is a description of an embodiment of my invention, reference being had to the accompanying drawing, in which—

Figure 1 shows the switch complete in side elevation. Fig. 2 shows the same with half the casing removed. Fig. 3 shows a transverse section of the base of the switch and parts carried thereby, on the line 3—3, Fig. 2. Fig. 4 shows a transverse section on the line 4—4, Fig. 2. Fig. 5 is a detail plan view of the base of the switch. Fig. 6 is a perspective view of the actuating member, and Fig. 7 is a transverse sectional view of a modified form of one of the elements.

Referring more particularly to the drawings, 1 is a cylindrical casing having cap pieces 2—2 provided with bushings 3—3 through which flexible cords constituting the portions of the circuit to be controlled are passed. Within this casing is an insulating lining 4—4, within which is a base 5 of insulating material. This base has secured to it adjacent to its edges two spring contacts each of which is made of two similar spring members 6—6′ held to the base by screws 7. These screws pass through the base and into the terminal plates 8, which are provided with binding screws 9. The base is provided with a recessed portion in which lies a tubular member 10. This tubular member is of metal and thus constitutes a conducting element. Its ends extend so that they lie in the planes of the two contacts 6—6, and when in one position form an electrical connecting path between the two contacts and in moving to the other position break the electrical connection between them. This tubular member 10 carries within it balls 11, which are actuated by springs 12, the springs tending to force the balls toward the center of the tubular member. The springs are held in position by properly upsetting the ends of the tube. The tube is provided with slots which extend parallel to the axis thereof and through these slots extends a flat sheet metal actuator 13 having oppositely sloping cam surfaces 14. The actuator also has permanently secured thereto buttons 15 which are of such size that they will not pass through the longitudinal slots in the tubular member. The tubular member is placed upon the central portion of the actuator and the balls and springs assembled so that the actuator lies between the two balls as shown in Fig. 3. The tubular casing 1 holds the base 5 and actuator 13 in proper position relatively to each other and also forms guides for the actuator in its to and fro movements.

The operation of the switch is as follows: If, with the parts in the position shown in Fig. 2, the right-hand button 15 is pressed, the left-hand cam surfaces 14 force the balls 11 apart against the action of their springs 12 until the summit of the cam surfaces is reached, whereupon the springs force the balls 11 inward causing the tubular member to move quickly to the right with a snap action. With the parts as they were originally, the tubular member 10 electrically connected the contacts 6—6′, and 6—6′. When these contacts are electrically disconnected after the action just described, pressure upon the left-hand button 15 sufficient to throw the actuator to the right, causes the tubular member 10 to be thrown to the left in a similar manner to that above described, so as to again make electrical contact with and connect the spring contacts.

The actuator is preferably formed with its heads 15 molded thereon. In order that this may be done before any other assembling takes place, it is necessary to have the tubular member so constructed that the tubular member and actuator can be assembled after such molding takes place. In order to provide for this, I slit at least one end of the tubular member so that it may be placed about the actuator after the heads 15 have been molded thereon. This construction is shown in Fig. 3 where the slit through which the actuator passes is extended to one end. In order to reinforce that end so as to prevent the parts from being pressed together,

I insert therein a disk or washer 16 before the ends of the tubular member are crimped over.

Another modification of the tubular member where it may be readily assembled with the actuator after the heads 15 have been applied thereto, is shown in Fig. 7. In that construction the tubular member is made in two halves, $10'$—10^2, that is, the tubular member is divided longitudinally throughout its full length. The edges of these halves are cut away in the center so as to form the openings 17 for the actuator. The two parts of this tubular member are held together by ferrules 18 whose inturned edges will hold the springs and balls 11 in place. In assembling this form of tubular member with the actuator, the two parts are placed about the actuator, the balls and springs are filled in and the end caps 18 then applied so as to hold the parts together.

The conducting member 10 is located between the points at which the contacts 6 are secured to the base 5 by the screws 7 and the points at which the conducting member engages said contacts. This is accomplished by bending each contact to one side so as not to interfere with the movement of the conducting member and then bending the end of the contact backward toward the fastening so that it is engaged by the conducting member when in one of its positions. This form of contact has the capacity of readily yielding, the point of engagement with the conducting member being in effect, although not in fact, removed for a considerable distance from the point at which the contact is secured.

As will be evident to those skilled in the art, my invention permits of various modifications in its embodiment without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a switch, the combination of a base, contacts secured thereto, an elongated tubular conducting member for electrically connecting and disconnecting said contacts, said contacts being located in line with opposite ends of said tubular member and said member having slots extending parallel to its axis, a longitudinally movable actuator having oppositely sloping cam surfaces and passing through said slots, the axis of said actuator being at right angles to the axis of said tubular conducting member, and spring actuated means within said tubular member engaging the cam surfaces of said actuator, and a tubular casing for said base having its axis at right angles to the axis of said actuator, and through the sides of which said actuator protrudes said casing constituting a guide for said actuator and holding said actuator and base in proper position relative to each other.

2. In a switch, the combination of a base, contacts secured thereto, an elongated tubular conducting member for electrically connecting and disconnecting said contacts, said contacts being located in line with opposite ends of said tubular member, and said member having slots extending parallel to its axis, a longitudinally movable actuator having oppositely sloping cam surfaces and passing through said slots, the axis of said actuator being at right angles to the axis of said tubular member, and spring actuated means within said tubular member engaging the cam surfaces of said actuator, the portions of said contacts engaged by said tubular conducting member and the portions secured to the base being on opposite sides of said tubular conducting member, said tubular conducting member being located between the points at which said contacts are secured and the points where it engages said contacts.

3. In a switch, the combination of a base, a contact engaging member movable relatively to said base and a contact member secured to said base, the portions of said contact member which are respectively engaged by said contact engaging member and secured to said base being on opposite sides of said contact engaging member.

4. In a switch, the combination of a base, a contact engaging member movable relatively to said base and a contact member secured to said base, the portions of said contact member which are respectively engaged by said contact engaging member and secured to said base being on opposite sides of said contact engaging member, the end of said contact member carrying the portion engaged by said contact engaging member being turned backward toward the portion secured to said base.

GEORGE H. HART.

Witnesses:
HARRY A. HART,
SYLVIA C. MOODY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."