

C. E. SCHULTZE.
ELECTRIC SWITCH.
APPLICATION FILED MAR. 8, 1915.

1,194,243.

Patented Aug. 8, 1916.

FIG. II

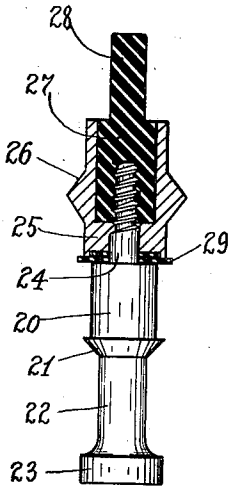
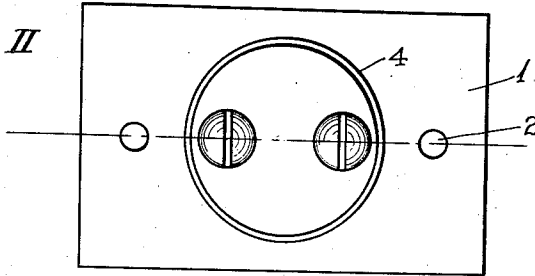


FIG. V

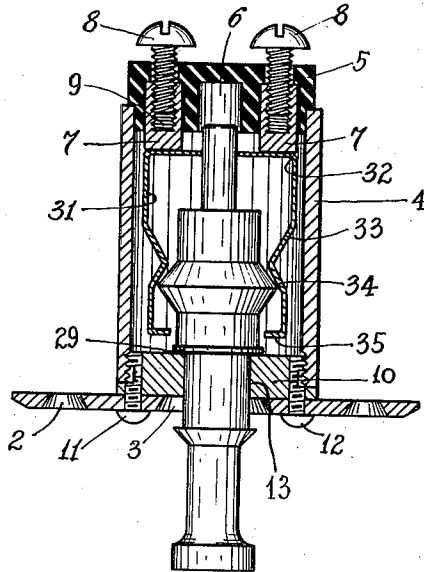


FIG. III

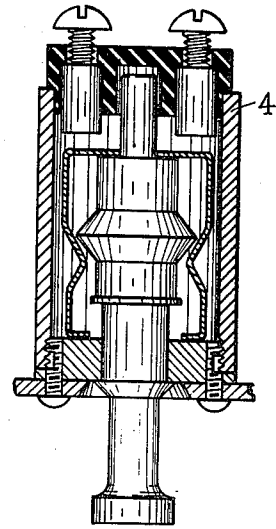


FIG. IV

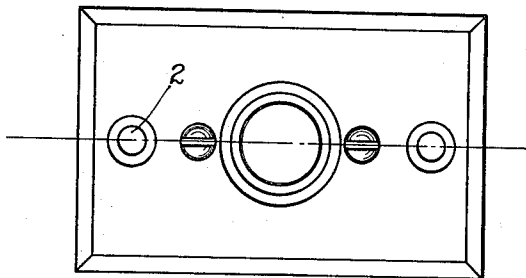


FIG. I

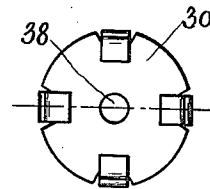


FIG. VI

Charles E. Schultze, Inventor

Witnesses

Carney Hartley
Elizabeth Stark

By

Mason Fenwick Lawrence

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES E. SCHULTZE, OF DENVER, COLORADO.

ELECTRIC SWITCH.

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To all whom it may concern:

Be it known that I, CHARLES E. SCHULTZE, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Electric Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electric switches, and more especially to those which have a longitudinally reciprocating snap; and the object of the same is to produce a switch of this character wherein the moving parts can be withdrawn by taking out two screws, and wherein the circuit closer is held by spring force against the terminals when the switch is closed. These objects are carried out by the construction hereinafter described and claimed and as shown in the drawings wherein:

Figure 1 is a front elevation and Fig. 2 a rear elevation of the switch complete. Fig. 3 is a horizontal section with the parts in position to close the switch, and Fig. 4 a similar section with the switch open. Fig. 5 is a horizontal section of the plunger. Fig. 6 is a front elevation of the cage-like circuit closer.

In the drawings the base plate 1 has holes 2 for screws (not shown) by which it is secured to the wall or other support for the entire device, between these holes two others for screws yet to be described, and between the last two holes a large hole 3 for the plunger. The casing 4 is preferably cylindrical, and may be of metal. Into its rear end is fastened an insulating plug 5 having a socket 6 at its center and other sockets at opposite sides of the central socket for terminals 7 which are of metal and project slightly beyond the inner face of the plug, these terminals being preferably held in place by screws 8 passed inward from the back of the plug and screwing into threaded sockets 9 in the rear ends of the terminals; and the screws 8 serve as binding posts to which are attached the wires which are to be connected. The front end of the tubular casing 4 is also closed by a plug 10 which may be of any suitable material and is provided with a central hole 13 co-axial with the hole 3 in the face plate, and screws 11 and 12 pass through the latter and into the

plug 10, or more accurately speaking, into the line between the plug 10 and the casing 4 so that these screws hold those parts connected and also hold them against the back of the face plate. It follows that when the main screws in the holes 2 are removed, the entire device can be withdrawn from the wall or other support; but when the screws 11 and 12 are removed in addition to the others, the face plate comes off and leaves the casing in the wall.

The plunger is best seen in section in Fig. 5. Its body 20 fits slidably through the holes 13 and 3, forward of the latter it has a shoulder 21 to prevent the plunger from being pushed in too far, forward of this shoulder is a shank 22, and at the front end of the shank is a knob 23. The plunger may well be made in parts, those already described constituting one part and possibly carrying a screw 24 projecting beyond the rear end of the body. The second part 25 stands in rear of the first part and carries an annular double-faced cam 26. The third part 27 may be of hard rubber or some good insulating material, its body mounted within the second part and engaged by the screw to hold all parts together, and its rear end reduced and projecting beyond the second part in an insulated pin 28. The second part 25 is larger than the body 20 of the first part to produce a shoulder facing forward and against this shoulder may be held an insulating washer, as at 29. A plunger as thus constructed can have its parts readily separated for cleaning, repair and substitution. The largest diameter of the cam 26 should be somewhat smaller than the interior diameter of the casing, and the pin 28 should be of a size to fit slidably within the socket 6.

The circuit closer is a cage-like member preferably stamped from sheet brass or other good conductor of electricity. It comprises a disk-like center or body 30, from whose edge project four arms 31 which are formed in the shape of narrow tongues or straps and can be produced at the same motion of the die which cuts out the body. Each arm is bent at 32 in a right angle, and extends thence forward from the body for a slight distance, is deflected inward at 33 and thence outward at 34 into what might be called a "hump", thence it is carried forward a short distance farther, and finally it is bent sharply inward into a foot 35. The

group of arms connected by the rear or body plate 30 therefore constitutes what might be called a cage, and the length of the same is somewhat less than the distance between the terminals 7 and the plug 10, while the circumference of the cage is somewhat less than the interior circumference of the casing 4. The body is pierced with a central hole 38 in which is slidably mounted the pin 28 of the plunger.

The parts are assembled as best seen in Figs. 3 and 4, the switch being closed in the former view and opened in the latter. To open the switch the operator grasps the knob 23 and presses it rearward. This causes the cam 26 to move over the outer inclines 34 of the humps on the several arms which latter are therefore spread apart slightly, and as soon as the high point of the cam has passed the high points of the humps the contractile tendency of the arms will cause their inner inclines 33 to travel down the front face of the cam with the result that the plunger will automatically move to the rear to the limit of its stroke and the cage will simultaneously and automatically move to the front. In doing so its body 30 comes out of contact with the terminals 7 and its feet 35 come into contact with the plug 10 so the parts now stand as seen in Fig. 4. To close the switch the operator grasps the knob and pulls it forward. The above-described operation is now reversed, or in other words the cam 26 moves forward between the humps and the latter cause the cage to snap backward within the casing so that its body contacts with the terminals 7, while the plunger snaps forward within the casing until the shoulder or its washer 29 strikes the rear face of the plug 10. In either the open or closed position of the switch the normal inward tendency of the arms causes their humps to engage one side or the other of the cam, whereby the parts are held in this position against dislocation.

To separate the parts of this improved switch as for inspection, cleansing, repair, or substitution, all screws are removed from the front plate and the plunger drawn forcibly forward. Its shoulder or washer 29 then brings the plug 10 out of the casing, and the cam 26 engages the inturned feet 35 and brings out the cage with the plunger. The cage can then be drawn off the plunger at will and repaired or replaced. Meanwhile the interior of the casing is open for inspection and cleaning, and the inner ends of the terminals 7 may be scraped. Or, if the main screws only are removed, a forcible pull on the plunger draws the entire device out of the wall because the screws 11 and 12 cause the casing and the parts attached thereto to come off with the plunger and the plug 10. But if the wires were loose behind the screws 8, the entire device could come

out of its socket in the wall without injuring them, and afterward the wires could be detached and the parts at the rear end of the device cleaned or repaired, and the switch then re-inserted in its socket.

What I claim is:

1. In an electric switch, the combination with a tubular casing, and a pair of terminals in its rear end; of a plunger slidable along the axis of the casing and having within the same a two-faced cam, and a disk-like plate having a central hole loosely embracing the plunger and peripheral spring arms extending forward within the casing and each having two inward projections adapted to be engaged by the cam on the plunger.

2. In an electric switch, the combination with a tubular casing, a plug in its front end having a central hole, an insulated plug in its rear end having a central socket, and a pair of terminals extending through this plug; of a plunger slidable through said hole and having its rear end slidably mounted in said socket, a disk-like plate having a central hole loosely embracing the rear end of said plunger and peripheral spring arms extending forward within the casing and each having an inward hump, and a two-faced cam on the plunger adapted to be forced through the humps when the plunger is reciprocated.

3. In an electric switch, the combination with a tubular casing, a plug in its front end having a central hole, an insulated plug in its rear end having a central socket, and a pair of terminals carried by this plug; of a plunger slidable through said hole and having a pin in its rear end slidably mounted in said socket, a disk-like plate having a central hole loosely embracing the pin of said plunger and peripheral spring arms extending forward within the casing and each inclined inward and thence outward, carried farther forward, and terminating in inwardly directed feet, and a two-faced cam on the plunger adapted to be forced past said inclines by the reciprocation of the plunger.

4. In an electric switch, the combination with a tubular casing, a removable plug in its front end having a central hole, and a pair of terminals carried by its rear end; of a plunger slidable through said hole, a disk-like plate having a central hole loosely embracing the plunger and peripheral spring arms extending forward within the casing and each inclined inward and thence outward, carried farther forward, and terminating in inwardly directed feet, and a two-faced cam on the plunger adapted to be forced past said incline by the reciprocation of the plunger and to engage said feet when the plunger is withdrawn from the casing.

5. In an electric switch, the combination

with a tubular casing, a plug in its front end having a central hole, a face plate having a hole registering with that in the plug, and screws passing through the face plate 5 and partly into the plug and casing; of terminals in the rear end of the casing, a plunger movably mounted through the holes in the face plate and front plug, a two-faced cam on the plunger within the casing, a circuit closing plate loosely mounted on the 10 plunger, and spring arms projecting from said plate and having humps engaged by said cam when the plunger is reciprocated and feet engaged by the cam when the plunger is withdrawn from the casing. 15

6. In an electric switch, the combination with a face plate having a central hole, a cylindrical casing, a plug in the rear end of the latter having a central socket, and terminals at opposite sides of said socket; of a 20 plunger slidably mounted through said hole and having a two-faced cam, an insulated pin projecting from the rear end of the plunger and slidably mounted in said socket, 25 a circuit closing plate having a hole loosely surrounding said pin, and spring arms projecting forward from said plate and having humps engaged by said cam when the plunger is reciprocated.

30 7. In an electric switch, the combination with a tubular casing having spaced terminals at its rear end, and an insulation plug removably mounted in its front end and

provided with a central hole; of a plunger whose body is slidably mounted through said 35 hole and has shoulders at both sides of the plug spaced to permit the body to move therethrough, the plunger having a two-faced cam in rear of the rearmost shoulder, and a circuit-closing element movably 40 mounted on the rear end of the plug and having spring arms projecting forward alongside such plug and within the casing and provided with humps engaged by said 45 cam when the plunger is reciprocated and feet at their front ends engaged by said cam when the plunger is withdrawn from the casing.

8. In an electric switch, the combination with a tubular casing, spaced terminals at 50 its end, and a plunger slidable along the casing and having a two-faced cam; of a metallic circuit-closing cage comprising a plate slidably mounted on the rear end of the 55 plunger and a plurality of spring arms integrally carried by and projecting forward from the plate, each arm having an inward projection adapted to be engaged by said cam when the plunger is reciprocated.

In testimony whereof I affix my signature in presence of two witnesses. 60

CHARLES E. SCHULTZE.

Witnesses:

FRANK D. TAGGART,
CARLE WHITEHEAD.