(No Model.)

J. S. ADAMS.

ELECTRICAL SWITCH.

No. 391,351. Patented Oct. 16, 1888.

Fig. 1.

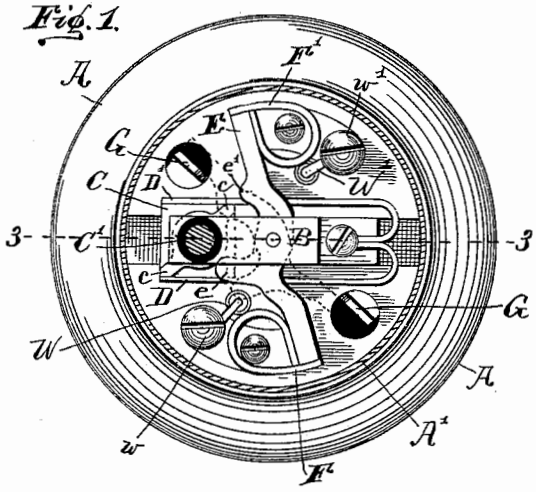


Fig. 2.

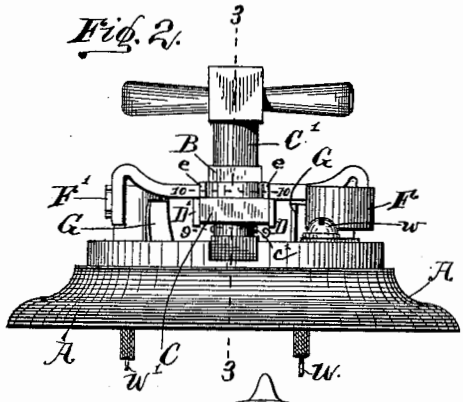


Fig. 3.

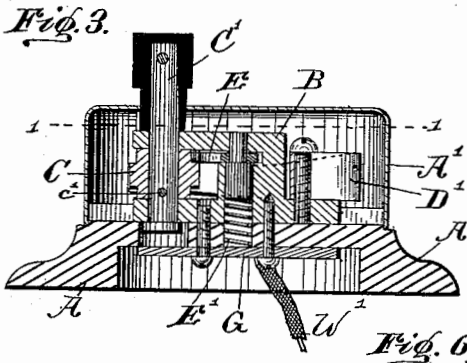


Fig. 4.

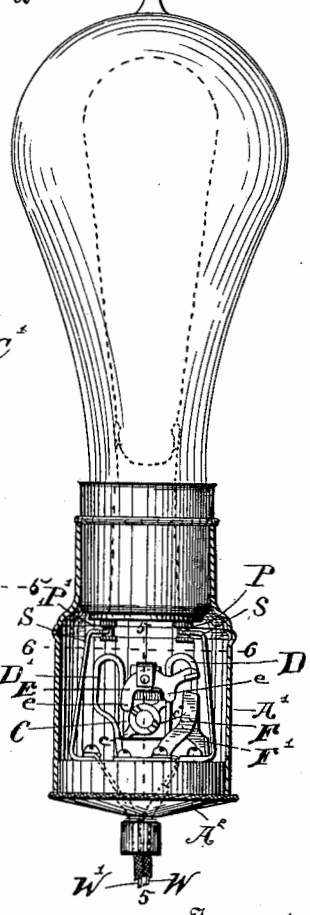


Fig. 10.

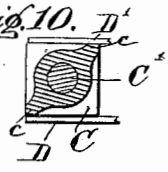


Fig. 6.

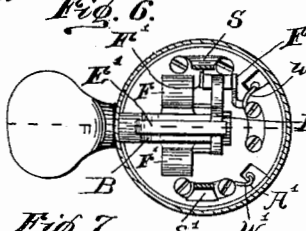


Fig. 5.

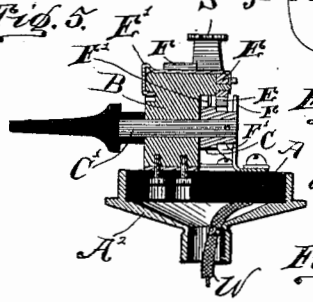


Fig. 7.

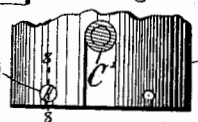


Fig. 8.

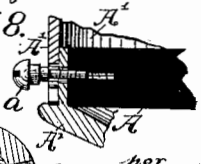
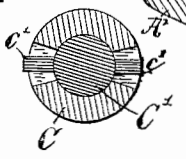


Fig. 9.



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per Chas. W. Bradford,
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UNITED STATES PATENT OFFICE.

JOHN S. ADAMS, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE JENNEY ELECTRIC COMPANY, OF INDIANA.

ELECTRICAL SWITCH.

SPECIFICATION forming part of Letters Patent No. 391,351, dated October 16, 1888

Application filed April 13, 1888. Serial No. 270,533. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. ADAMS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Electrical Switches, of which the following is a specification.

My said invention relates to that class of switches which are principally used to turn the current on and off from electrical lamps; and it consists in certain improvements whereby such a switch is rendered more certain and efficient in its operation and durable in its construction, all as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a horizontal sectional view of that variety of switch commonly known as a "wall-switch," looking downwardly from the dotted line 1 1 in Fig. 3; Fig. 2, a front elevation with the casing which surrounds the working parts omitted; Fig. 3, a central vertical sectional view looking upwardly from the dotted line 3 3 in Fig. 1, and to the left from a similar line in Fig. 2; Fig. 4, an elevation (the casing being in section) of an incandescent electric lamp, showing a modification of my improved switch applied directly thereto; Fig. 5, a central vertical sectional view of the working parts thereof, looking toward the left from the dotted line 5 5 in Fig. 4 and upwardly from a similar line in Fig. 6; Fig. 6, a horizontal sectional view looking downwardly from the dotted line 6 6 in Fig. 5; Fig. 7, a detail elevation showing how the casing is secured to the base; Fig. 8, a detail sectional view on an enlarged scale on the dotted line 8 8 in Fig. 7; Fig. 9, a detail sectional view of the hub and shaft of the cam-block, on an enlarged scale, looking upwardly from the dotted line 9 9 in Fig. 2, illustrating more clearly than the other views how the "lost motion" between said shaft and said hub is provided for; and Fig. 10, a detail sectional view looking downwardly from the dotted line 10 10 in Fig. 2, more distinctly showing the form of the cam-block.

All those portions shaded solid black (except those alongside the buffers G in Fig. 1) represent parts which I prefer to construct of hard rubber.

In said drawings, the portions marked A represent the base of the switch; B, a frame secured on said base, in which the working parts of the switch are mounted; C, a cam-block for operating the switch-bar; D D', springs for holding said cam-block to its operative position; E, the switch-bar; F F', contact springs or points with which the switch-bar comes in contact when the circuit is established; and G, buffers, against which the ends of the switch-bar will strike and by which the movement of said bar will be stopped as it is turned, so as to break the circuit.

In the construction shown in Figs. 4, 5, and 6 the buffers G are omitted, (the construction and size of the operating-cam being such that they are unnecessary,) and in said figures there are also shown the contact-springs S S', which lead up to and engage with contact-points P P' on the lamp proper, and which, when the lamp is turned on, form part of the electrical circuit. In each case fragments of the incoming and outgoing line-wires W W' are also shown.

The base A may be any non-conducting substance. In ordinary wall-switches—such as are shown in Figs. 1, 2, and 3—wood is commonly employed; but in the smaller construction shown in the other figures hard rubber is preferred, and in each case the construction is such that the frame and other parts of the switch can be conveniently mounted thereon. A casing, A', should be provided to inclose the working parts.

The frame B is preferably a single piece of metal, and in it is mounted the shaft to the cam-block C. The switch-bar E is also mounted in or upon said frame, and the springs D D' may also be secured thereto.

The cam-block C has two cam-points, *c*, which, as said block is turned, come in contact with corresponding cam-points, *e e'*, on the switch-bar E, and thus operate said switch-bar. It has a square portion which fits between the ends of the springs D and D', which thus hold it to operated position in either direction. The form of this cam-block is most plainly shown in Fig. 10. The shaft C' of this cam-block passes through it loosely, but is

prevented from completely rotating therein by the transverse pin c', which extends through the end of said shaft and into a space considerably greater in size cut transversely across the end of said cam-block, (see particularly Figs. 4 and 9,) and thus sufficient lost motion is provided, so that when the cam-block is so far turned that one of the corners of the square portion thereof has passed the center the springs D and D′ will operate to turn said cam-block the remainder of a quarter-revolution, and thus insure that the switch shall be fully operated, notwithstanding that the operator may fail to turn it sufficiently.

By my improved construction of cam-block I am enabled to turn the switch either continuously in either direction or back and forth with precisely the same result—*i. e.*, at each quarter-turn of said cam-block the switch will be thrown so as to "make" or "break" the circuit. There is therefore no danger in using this switch of turning it in the wrong direction or breaking or disarranging the parts by operating it, which, as will be readily understood, is a great advantage.

The springs D and D′ are secured firmly in position, preferably to a portion of the frame B, sufficiently distant from that in which the cam-block is mounted to give sufficient length to the springs to enable them to operate efficiently, and they extend to alongside the cam-block C and bear with considerable force against the sides of its square portion, thus holding said cam-block quite firmly to position, except when turned by force being applied to its shaft. There being two of these springs, one upon each side, no additional friction between the cam-block and its shaft is thereby caused.

The switch-bar E is formed to extend, when the circuit is established, from one contact-point to the other, and to come firmly into engagement with said contact springs or points. It has two cam-points, e and e', with which the corresponding cam-points c on the cam-block C come in contact as said cam-block is turned, and said switch-bar is thereby forced from one position to the other. A spring, E′, is provided by which the switch-bar is held with some force against that portion of the frame B upon which it rests, and the friction thus caused is sufficient to prevent said switch-bar from moving, except when forced by the cam-block, as hereinbefore described. The switch-bar is shown in the position it occupies when in contact with the contact springs or points in Figs. 1, 2, and 3, and in that it occupies when out of such contact in Figs. 4, 5, and 6. The latter position is also shown by means of dotted lines in Fig. 1.

The contact springs or points F F′, while shown as of a somewhat peculiar construction, may be any springs or points suitable for the purpose, and therefore need not be further described herein. The incoming and outgoing line-wires W and W′ are respectively secured thereto, either in the manner shown, by binding-screws w and w' or by means of regular binding-posts, as may be desired, the construction shown being preferable in small switches, while the binding-posts would be superior in large ones.

The buffers G, as shown, are the ends of a strip of metal which extends across underneath the switch and up through holes in the base to points alongside the positions the ends of the switch-bar will reach when the circuit is broken, and serve simply as stops for said switch-bar. When formed as shown, the body or central portion of this strip serves as a washer for the heads of the screws which pass through the base and secure the frame thereon, as shown most plainly in Fig. 3.

In the construction shown in Figs. 4 to 8, inclusive, where the handle to the shaft of the cam-block extends out through the side of the casing, it is desirable that a means be provided whereby the casing can be readily taken off without entirely removing the screws (which connect the casing and base together) from the holes into which they are inserted. The construction which I have devised to meet this requirement is illustrated in Figs. 7 and 8, in which the casing is shown as slotted from the screw-holes out to the edge, and as provided with a slot to receive the shank of the handle. The screws a are provided with an enlarged portion just below the head, and the screw-holes in the casing are just large enough to receive this enlarged portion, while the slots extending from said holes to the edge are only large enough to permit the body of the screws to pass. By this construction, as will be readily seen, after the screws are backed out the distance of the thickness of the casing said casing can be readily slipped off, while when the screws are driven entirely in the casing is as securely held as if the slots extending from the screw-holes to the edge did not exist. A second shoulder may also be provided, as shown in Fig. 8, and the metal bottom A^2 to the base A thus enabled to be similarly removed from said base.

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

1. The combination, in an electrical switch, of a pivoted switch-bar having two cam-points, a cam-block having corresponding cam-points and a square portion, and springs resting against the sides of said square portion, substantially as set forth.

2. The combination, in an electrical switch, with a switch-bar having two cam-points, of a cam-block having also two points and a square portion and arranged alongside said switch-bar, and springs extending alongside and bearing against two opposite sides of said square portion, substantially as and for the purposes set forth.

3. The combination, in an electrical switch, of a cam-block embodying in a single struct-

ure a cam and a square portion, a switch-bar operated by said cam, and a spring engaging with said square portion.

4. The combination, in an electrical switch, of the frame B, the switch-bar E, mounted therein, and a spring, E′, whereby said switch-bar is held in frictional contact with said frame, and thus kept from moving except when purposely actuated, substantially as set forth.

5. The combination, in an electrical switch, of the contact-points, the switch-bar, a cam-block for operating said switch-bar, springs for holding said cam-block to operative position, and buffers for stopping the movement of the switch-bar when the circuit is broken, said buffers being the upturned ends of a single bar extended across the switch, substantially as set forth.

6. The combination, with an electrical switch, of a base thereto, a casing or surrounding portion, and screws for securing said casing or surrounding portion to said base, said casing or surrounding portion having slots extending from the screw-holes to the edge of a less width than the diameter of said screw-holes, and said screws having an enlarged portion below the head of substantially the same size as said screw-holes, whereby the casing is enabled to be removed by backing the screws slightly, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 9th day of April, A. D. 1888.

JOHN S. ADAMS. [L. S.]

Witnesses:
C. BRADFORD,
F. W. WOOD.