(No Model.)

E. THOMSON.

SWITCH OR TURN-OFF FOR ELECTRIC CIRCUITS.

No. 335,548. Patented Feb. 2, 1886.

Fig. 1.

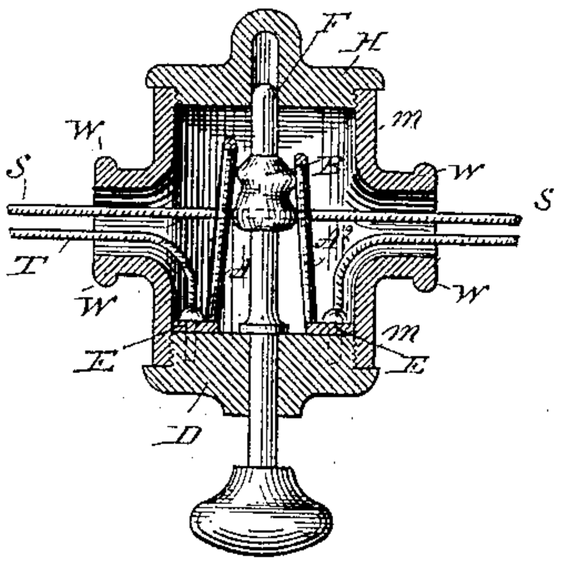


Fig. 2.

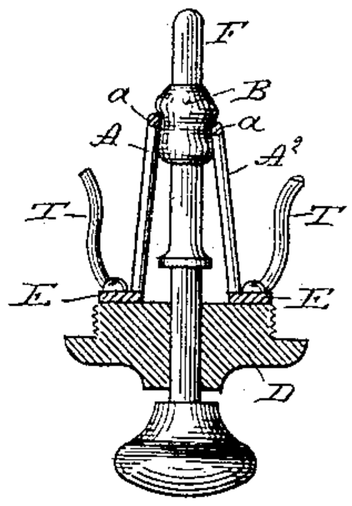


Fig. 3.

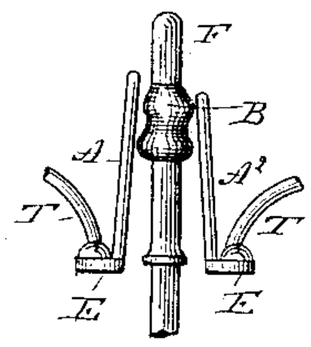


Fig. 4.

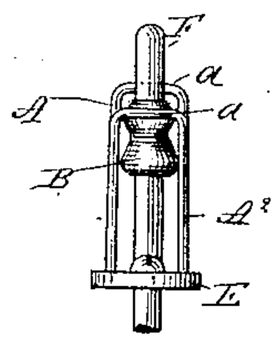


Fig. 5.

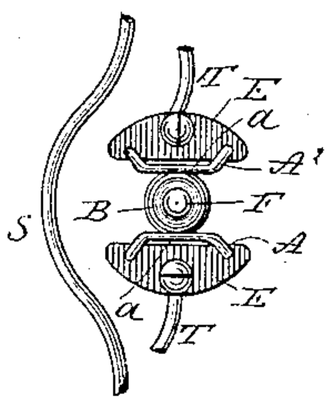


Fig. 6.

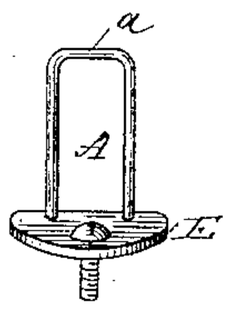


Fig. 7.

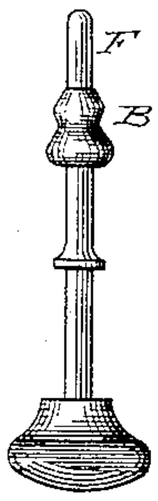
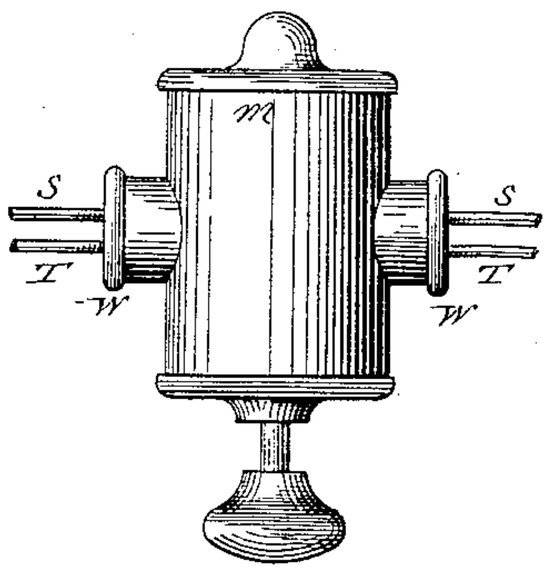


Fig. 8.



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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF LYNN, MASSACHUSETTS.

SWITCH OR TURN-OFF FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 335,548, dated February 2, 1886.

Application filed March 5, 1885. Serial No. 157,840. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Switches or Turn-Offs for Electric Circuits, of which the following is a specification.

My invention relates to electric switches designed more especially for use with incandescent electric lamps, though not limited to such use.

The object of my invention is to provide a simple and cheap device, and at the same time to so construct the same that accidental closure of circuit from pressure upon the operating-button may be prevented.

A further object of my invention is to so form the conduit containing the electric conductors to which the switch is applied as to permit a ready detachment of the parts and easy attachment of the electric conductors to the switch.

My invention consists in the special combinations or arrangements that will be more particularly specified in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a portion of an electric conduit or pipe having a switch constructed in accordance with my invention applied thereto. Fig. 2 is an elevation of the switch detached from the conduit or chamber of the conduit in which the switch normally rests. Fig. 3 shows the parts in position when the electric circuit is open. Fig. 4 is an elevation of the parts, taken on a line at right angles to the line of Fig. 3. Fig. 5 is a plan of the working parts. Fig 6 shows one of the details of construction. Fig. 7 is an elevation of the operating-spindle of the switch. Fig. 8 shows in elevation the section of the conduit in which the switch is contained.

W indicates a portion of a pipe or conduit containing electric conductors S T. The portion W is adapted for insertion between two sections of pipe, and is provided, preferably, with transversely-extending portions *m*, adapted to form a chamber for the working parts of the switch, and to also permit the wires to be got at for attachment to the switch mechanism. The working parts of the switch are mounted in a cap or plug, D, preferably of insulating material, and adapted to close the opening in the lower enlargement *m*. The working parts of the switch consist, essentially, of two springs, A A^2, mounted on the block D, and a vertical spindle, F, substantially parallel with them, which spindle is adapted to be moved in the block D in a vertical line, and carries a piece of conducting material, B, that in one position of the spindle bears against both springs, so as to complete the circuit between them, and in the other position—that is, when depressed to the position shown in Fig. 3—is out of contact with said springs, so that the circuit in which the two springs are placed is then broken. The springs A A^2 are preferably made from a piece of tempered wire of any desired kind, bent to substantially the form shown in Fig. 6, and having its two free ends secured in any suitable way to a plate of metal, E, that is in turn fastened by a screw or screws to the block D. The fastening-screw also serves as a means of attaching the two portions of the wire T, so as to make electric connection from the wire to the spring A or A^2. The springs are given a bias, which tends to make them press toward one another, or against the button or block B, when the same is elevated to the position shown in Fig. 2. The horizontal portion *a* of the wires A A^2 forms the circuit-closing or contact portion of the same. The button B is provided with depressions in its sides, in which the portions *a* of the springs rest when the circuit is closed, and is also provided with an inclined or conical surface upon its head, as shown.

In order to prevent accidental closure of the circuit from one spring to the other when the spindle has been lowered to the position shown in Fig. 3, I so arrange the parts that contact shall be made on one side before it is made upon the other. This may be readily accomplished by making one of the springs higher than the other. By such arrangement an accidental upward movement of the spindle, though sufficient to bring the button B into contact with the shorter of the springs, will not complete the circuit, but a further upward movement of the spindle under positive pressure sufficient to move the button B upward into contact with the second spring, is required before the closure of circuit can be effected.

The depressions in the sides of the button serve to sustain the spindle in circuit-closing position by receiving the portions *a* of springs A A^2. On the opposite side of the conduit from the side to which the switch is applied there is an opening in the transverse section *m*, which is ordinarily closed by a cap, H, preferably of insulating material, which is secured in place by any suitable device. This cap is provided, as shown, with an opening or depression, in which the end of the spindle F moves, and whereby said spindle is guided during operation. On removing the cap access is given to the chamber in which the switch is contained, so as to permit the wires to be connected to the plates E by suitable instruments.

In the normal position of the parts shown in Fig. 1 the circuit of the wires S T and any device in circuit between them is broken because the springs A A^2 are electrically disconnected, being one or both out of contact with B. When, however, the button B is pressed upward by the spindle, so that both springs rest against the same, the break in the wire T is completed, and the circuit thus established.

I do not limit myself to any particular way of making the springs A A^2, but the way described affords a simple and cheap construction. The form of the circuit-closing piece B can also be varied without departing from the invention.

What I claim as my invention is—

1. The combination, in an electric switch, of two bent wires, A A^2, bent as described to have a circuit-closing portion, *a*, and secured at their ends in a suitable support, and an intermediate reciprocating block or piece of metal mounted on a spindle, F, as and for the purpose described.

2. The combination, with the springs A A^2, bent to form two sides or legs and a loop or connecting portion, *a*, of a circuit-closing block, B, having depressions at its sides to receive the portions *a* of the springs.

3. The combination, in an electric switch, of two circuit-closing springs having a bias toward one another, and an intermediate reciprocating contact-piece having a rounded or inclined surface upon its end and depressions in its sides, as and for the purpose described.

4. The combination of two spring-wires, A A^2, of different heights, with the intermediate reciprocating block, B, as and for the purpose described.

5. The combination, with the pipe or conduit having perforated plug or stopper D in its side, of a reciprocating rod or spindle provided with a contact-making enlargement and fitted into and guided by the perforation in said stopper, and the two bent spring-wires A A^2, secured to the plug or stopper and having a bias toward one another in a direction transverse to the line in which the rod reciprocates, as and for the purpose described.

6. In an electric switch, the combination, with the two circuit-closing springs of different heights having a bias toward one another, of a reciprocating circuit-closing piece located between the springs and movable on a line transverse to the line joining said springs.

7. The combination, with a section of pipe or conduit for electric conductors, of an electric switch having its operative and wire-connecting portions all mounted on one side of said section, and an opening over said switch, and the wire-connecting devices on the opposite side of the conduit from that in which the said devices are mounted, so as to permit access for attaching the electric conductors in the pipe without disturbing any portion of the switch.

8. The combination, with a section of conduits for electric conductors having extensions *m m*, of a reciprocating switch-spindle, F, transverse to the axis of the conduit and mounted in a plug or stopper, D, and a plug or stopper, H, in the opposite side of the conduit provided with a guide opening or cavity for the end of the spindle.

9. An electric switch having two sets of circuit closing and breaking surfaces or electrodes connected in series and arranged as described to make contact one set before the other.

10. In an electric switch, the combination, with two circuit-closing springs arranged side by side, of an intermediate reciprocating connecting-piece moving on a line transverse to the line joining said springs and making contact with one spring before it makes connection with the other.

11. A section of conduit for electric conductors having transverse extensions or enlargements *m m*, as described, in combination with an electric switch for the circuit of said conduit mounted in a removable end piece or cover for one extension *m*, and a removable cover for the other extension *m*, whereby access may be had to the switch for making connection thereto.

12. The combination, with an electric conduit having transverse extensions or enlargements *m m*, of a reciprocating switch for the circuit of said conduit mounted on a plug or cover for one extension *m*, and guiding devices for the switch carried by the cover or plug for the opposite extension.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 26th day of February, A. D. 1885.

ELIHU THOMSON.

Witnesses:
W. O. WAKEFIELD,
E. H. KOTFIELD.