(No Model.)

J. J. WOOD.

THERMAL CUT-OUT.

No. 423,102. Patented Mar. 11, 1890.

Fig. 1.

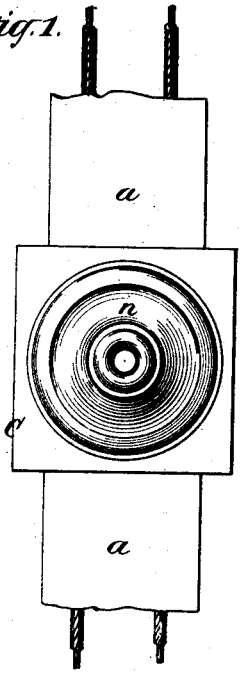


Fig. 2.

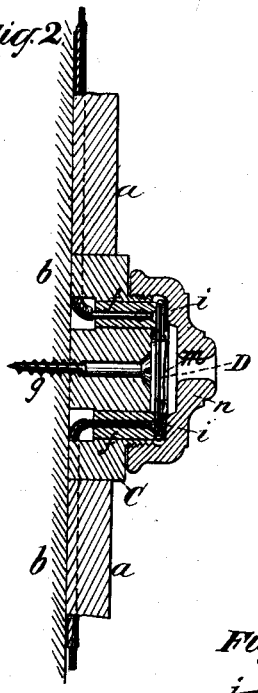


Fig. 3.

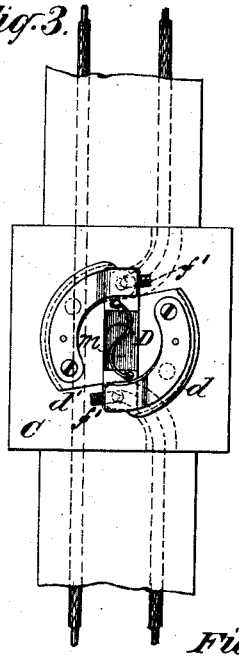


Fig. 8.

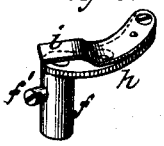


Fig. 5.

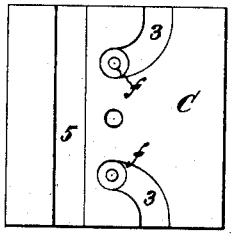


Fig. 4.

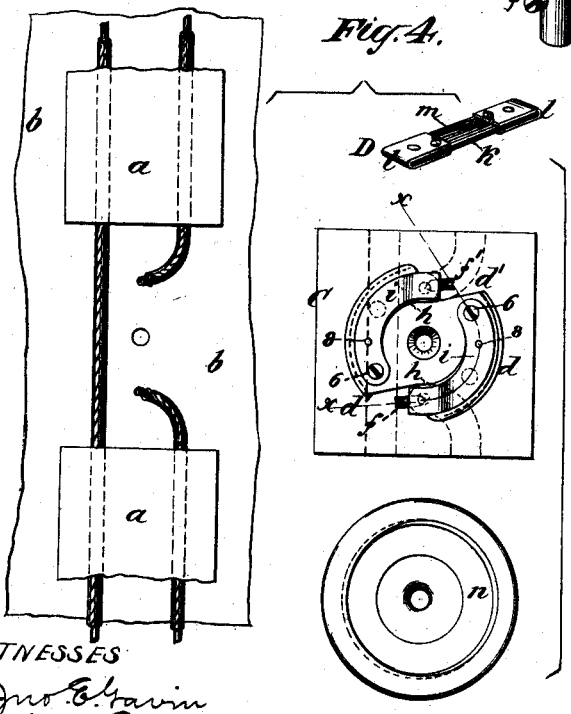


Fig. 6.

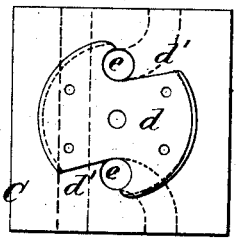
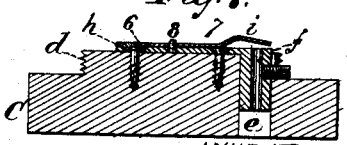


Fig. 7.



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THERMAL CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 423,102, dated March 11, 1890.

Application filed October 21, 1884. Serial No. 146,071. (No model.)

To all whom it may concern:

Be it know that I, JAMES J. WOOD, of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Fusible or Destructible Electrical Cut-Outs, of which the following is a specification.

My invention is designed more especially for incandescent electric-lighting circuits, but may of course be employed for any equivalent purpose; and my improvement aims to secure simplicity, compactness, and neatness of construction, with effective contacts and ease of accessibility of parts, and ease of renewal of the destructible portion.

Prior to my invention the fusible or destructible bridge has either been soldered at its opposite ends to the respective line-conductors, in which case its displacement after the cut-out has acted is difficult and expensive, or it has been connected by separate clamping-screws at its opposite ends, which are troublesome to adjust and form a poor electrical connection with the fusible bridge, which is of lead or an alloy of lead, and hence rapidly oxidizes; or the connection with the fusible bridge has been made by means of terminal contact-springs pressing elastically upon its opposite ends—a method which facilitates the insertion and replacement of the bridge, but is objectionable by reason of making frequently an imperfect contact, causing corrosion of the springs and the heating and consequent weakening thereof.

My invention provides improved means for making connection between the ends of the bridge and the circuit-conductors, whereby by a simple and rapid manipulation both ends of the bridge are pressed into firm and unyielding contact with the respective conducting-terminals.

In carrying out my invention I construct the cut-out with an insulating block or base having a raised screw-threaded boss on its face. In this block are embedded binding-posts, in which the circuit-wires are received, and from the top of the binders segmental seats or curved tongues extend partly around the top of the screw-boss in opposite directions without touching each other.

On the top of the curved seats are fixed contact-springs curved similarly to the seats and terminating at points diametrically opposite on the top of the screw-boss. The fusible strip or bridge, or preferably a bridging-piece carrying the fusible wire, is slipped under the tips of the springs and extends diametrically across the screw-boss from seat to seat, and thus completes the circuit between the binders. This bridging-piece is made of a narrow strip of insulating material bound at each end with metal, and having the fusible wire soldered at each end to the metal bindings, and thus extended across the insulated gap. A screw-cap is finally screwed down over the screw-boss and bears upon the ends of the contact-springs, and thus binds the bridging-piece firmly between the springs and their seats and insures a perfect contact, while at the same time it neatly and securely covers and incloses the parts, leaving them, nevertheless, readily accessible when desired.

In the drawings annexed, Figure 1 is a front elevation of my improved cut-out, and Fig. 2 is a vertical section thereof. Fig. 3 is a front elevation with the screw-cap removed. Fig. 4 shows the several parts separated. Fig. 5 is a view of the under side of the base-block, and Fig. 6 a top view of the same with all the binders and attachments removed. Fig. 7 is a section of the block through one of the binders and its seat and spring on the line x x in Fig. 4. Fig. 8 is a perspective view of one of the binders with its curved seat and spring.

Referring to Figs. 1, 2, and 3, a a indicate the moldings through which the circuit-wires are led, and b indicates the wall or surface on which the moldings are fastened.

C indicates the base-block of the cut-out, which is fastened in a gap between the moldings, and when provided with its screw-cap gives the effect of an ornamental rosette in the moldings. This base-block C is preferably a square block of hard wood having turned on its face a short screw-threaded boss d. This screw-boss d has two deep tangential notches d' d' (see Fig. 6) cut into its periphery on opposite sides, and at the end of each notch a circular hole e is bored clear through the block at points on diametrically-opposite sides of the boss, as well shown in Fig. 6. In these holes e e are inserted the tubular binding-posts f f, which do not reach to the bottom of the block, as

seen in Fig. 7. One of the circuit-wires which pass through the moldings at the location of the base-block is cut, and the ends are stripped, bent up, and fastened in the binders *f f* by the clamp-screws *f'*, which project, as shown, into the notches *d'* in the boss *d*, without, however, projecting beyond the circumference of the boss, as well shown in Figs. 3 and 4.

Referring to Fig. 5, it will be seen that curved grooves 3 3 are formed in the bottom of the base-block leading to the binders *f f*, while a straight groove 5 passes the full length of the block, and by means of these grooves the block is easily fitted over both the wires and connection made between the divided wire and the binders, as will be readily understood from Figs. 1, 3, and 4. A screw *g*, passing through the block at the center of the boss *d*, enables the block to be secured firmly to the wall over the wires and between the ends of the moldings, which, as will be understood, prevent the block turning out of place, while the screw fixes it against outward displacement, and thus renders the fastening very simple and secure.

On the top of each of the binders *f* is fixed a curved flange or contact-seat *h*, which seats are curved concentrically with the circumference of the boss *d* and rest on the top of the same, passing in opposite directions around the top of the boss, as shown best in Figs. 3 and 4, but not extending into contact with each other. Two small wood-screws 6 7 pass through the seats *h* and screw into the top of the boss, and thus secure the seats and their binders *f f* firmly to the block, as will be readily comprehended from Figs. 3, 4, and 7.

On the top of the seats *h* are fixed contact-springs *i*, which are curved to correspond with the seats. These contact-springs are fixed to the outer or free end of the seats by one of the fastening-screws 6, which thus serves the double purpose of holding the seat to the block and the spring to the seat, the springs being countersunk under the head of the screw to fit into the countersink in the seat, as shown in Fig. 7, which renders the electrical and mechanical connection of the parts more perfect. A small pin 8, projecting from the seat into a hole in the contact-spring, prevents the turning of the spring out of place on the seat. The free ends of the springs *i i* are bent with a retiring bend to overlie the seat just over the binders *f*, as shown in Figs. 8 and 7, and constantly tend to spring toward the seat, as will be obvious from the drawings.

Now, referring to Figs. 4, 3, and 2, D indicates the removable bridge, consisting of or carrying the fusible wire or other destructible part of the cut-out, which bridge is preferably constructed of a simple strip or plate *k* of gelatinized fiber or other non-conductor, bound at each end with **U**-shaped metal bindings *l*, riveted to the fiber plate *k*, as well shown in Fig. 4, and across the insulated gap between the bindings is placed the fusible lead wire *m*, preferably disposed in an **S**-shaped curve and soldered at each end to the respective bindings *l*, as fully illustrated in Figs. 4, 3, and 2. The lead wire *m* or other fusible or destructible element is of course proportioned to carry the determined quantity of current suited for the lamp or series of lamps fed by the portion of the circuit with which the cut-out is connected, but will melt when the current exceeds that safe limit, so as to protect the lamp or lamps connected with the cut-out, according to the well-known system now adopted. When, therefore, the wires are connected with the binders, as shown in Figs. 2 and 3, the circuit is completed between the binders by first placing the bridge D diametrically across the boss *d* and slipping its ends in under the contact-springs *i i* upon the seats *h h*, the springs thus pressing the metallic ends of the bridge against the seats and thereby serving to hold the bridge from falling out or becoming in any way displaced; and, second, the screw-cap *n* is applied by being screwed down over the boss *d* until its top finally bears upon the springs *i i* and thus presses the same firmly down against the ends of the bridge, so that the bridge becomes firmly clamped against the seats *h h* and the springs. The electrical contact is thus made doubly effective, for while being a spring-contact previous to the putting on of the cap it becomes an unyielding screw-clamp after the cap is screwed down, and is therefore positive and certain in its character. The screw-cap *n* is perforated at the center for ventilation, to allow any heat generated at the lead wire *m* to become quickly dissipated, and the cap is preferably made of hard wood to match with the block C, but may be made of any other insulating material.

My improved cut-out has the advantages of general simplicity of construction, with neatness and compactness of form, and is easily fitted over and to the wires. The internal parts are effectually concealed and protected when the cap is screwed in place, while remaining easily accessible. But the most important advantage of my invention is that the fusible bridge or destructible part, while being as quickly and easily replaced after fusion as in those cut-outs which rely upon spring-pressure alone to make the circuit-connection with its opposite ends, is even more firmly and closely united with the respective terminals, and makes an even more perfect electric connection therewith than in the case of those cut-outs in which its ends are separately fastened down with clamping-screws, while the connection is made in a small fraction of the time necessary in adjusting and tightening such screws and by much simpler manipulations. To renew a fused cut-out it is only necessary to unscrew the cap, disengage the fused bridge from the springs *i i* by an instantaneous twisting movement and by a similar but opposite twist-

ing movement insert a new bridge under the springs, and screw on the cap again. The screwing on of the cap has no tendency to disarrange the bridge because of the intervention of the springs, which alone are rubbed against by the cap in its rotative movement.

What I claim is—

1. A cut-out consisting of terminal contact-seats connected with the circuit-wires, a separable destructible bridge extending across between said seats with its ends overlying them, and a cap or cover constructed when applied to exert an unyielding pressure against both said ends to press them into firm electrical contact with said seats, substantially as set forth.

2. A cut-out consisting of terminal contact-seats connected with the circuit-wires, a separable destructible bridge extending across between said seats with its ends overlying them, a spring or springs pressing against said bridge to hold it temporarily in place, and a cap or cover constructed when applied to exert an unyielding pressure against said ends to press them into firm electrical contact with said seats.

3. A cut-out consisting of contact-seats, a separable destructible bridge extending across between said seats with its ends resting against them, two contact-springs connected with the respective circuit-wires and arranged to overlie the opposite ends of the bridge and hold them in place upon the seats, and a cap or cover constructed when applied to press said springs toward the seats and thereby to clamp the ends of the bridge unyieldingly between said springs and seats, whereby a firm electrical connection is made with the ends of the bridge.

4. A cut-out consisting of a base-block, a rotative screw-cap engaging said block, two terminal contact-seats constructed for connection with the circuit-wires and mounted on said block on opposite sides of the axis of said cap, two contact-springs arranged over said seats and projecting both in the same rotative direction around said axis, and a separable destructible bridge extending diametrically between said seats with its ends confined beneath said springs, whereby the screwing up of the cap forces the springs unyieldingly against the seats, and the arrangement of the springs prevents any displacement of the bridge due to the rotary movement of the cap.

5. In a cut-out, the combination, with the base-block C, having screw-boss *d*, of the contact-seats *h h*, destructible bridge D, extending across between said seats, and screw-cap *n*, screwing on said boss and binding said bridge upon said seats, substantially as shown and described.

6. In a cut-out, the combination of the base-block with raised screw-boss *d*, contact-seats *h* on said boss, contact-springs *i*, a destructible conducting-bridge fitting between said seats and springs, and a screw-cap *n*, screwing upon said threaded boss and bearing upon said springs to clamp the conductor between the seats and springs, substantially as herein shown and described.

7. In a cut-out, the base-block C, formed with the boss *d*, having notches *d'*, with binders embedded in the block at said notches, in combination with a destructible conductor extended across the boss between the binders, and a cap fitting over said boss, substantially as set forth.

8. A separable destructible bridge for a fusible cut-out, consisting of a fusible wire, an insulating-plate of sufficient rigidity to afford a protecting-support for the wire, and metal clips clamped upon the opposite ends of said insulating-plate and soldered to the opposite ends of the wire, substantially as set forth, whereby the fragile wire is supported by the insulating-plate before being placed in the cut-out, and the end clips form an extended conducting-surface for making a good electric connection with the terminal seats of the cut-out.

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Witnesses:
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CHAS. M. HIGGINS.