

No. 660,340.

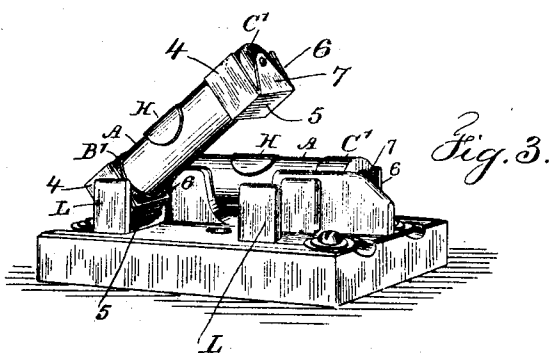
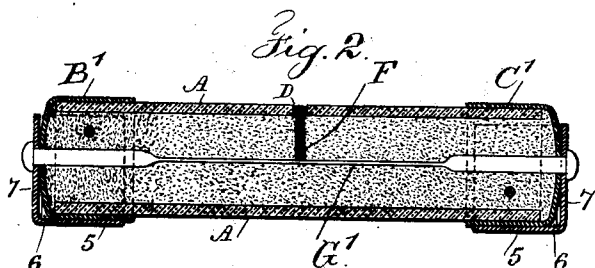
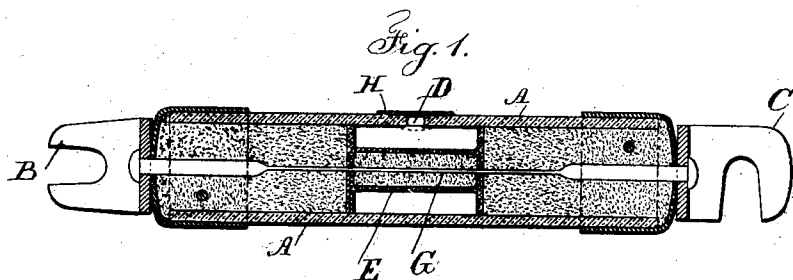
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SAFETY CUT-OUT FOR ELECTRIC CIRCUITS.

(Application filed July 10, 1899.)

(No Model.)



Witnesses

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SAFETY CUT-OUT FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 660,340, dated October 23, 1900.

Application filed July 10, 1899. Serial No. 723,279. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH SACHS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented an Improvement in Safety Cut-Outs for Electric Circuits, of which the following is a specification.

The object of the present invention is to facilitate the discovery from the outside of the cut-outs of any one that has been disrupted by the excess of electric current resulting from overloading the circuit or from short-circuiting upon the line or local circuit containing the lamps, motors, or other translating devices.

In the present invention the fusible strip or cut-out is connected to the terminals at or near the ends of the case, and when there is an excess of current such fusible strip or cut-out is melted or ruptured, and the present invention relates to the combination, with the conductors and cut-out, of a tubular surrounding case constructed with reference to the disruption or blowing out of the fuse being visually apparent on the outside of the case. With this object in view the tubular casing has one or more openings through the side, at which the condition of the cut-out can be instantly ascertained, the fusible conductor being adjacent to an opening in such case, and when the fusible conductor is melted or disrupted that fact is visually appreciable by simply inspecting the casing at or near the hole through the same. For this purpose the casing at or near the middle thereof is provided with a hole made therethrough, at which the condition of the safety-fuse is always visually apparent, and when the safety-fuse has been disrupted an inspection of the case at or near the hole therein instantly shows the fact of the disruption of the safety-fuse, either by the absence of the fuse or the discoloration of the case or by injury or ejection of a filling.

In my present invention the safety-fuse is within a tubular case having a non-conducting material filling the whole or larger portion of the case and rectangular spring-conductors at the ends, so as to be able to use rigid contacts into which the safety-fuse and rectangular spring-terminals are inserted.

In the drawings, Figure 1 is a longitudinal section representing one form of my improve-

ment. Fig. 2 is a similar view of the safety-fuse in a slightly-modified form; and Fig. 3 is a perspective view illustrating two of the safety-fuses upon the cut-out base to which the circuit-wires are brought.

The casing A is tubular and preferably of vulcanized fiber, and the same is provided with a non-conducting material filling the whole or greater part of the casing, and at the ends thereof are connection-terminals for the line-circuit. These connections may be of any desired character, and they are to be secured to the fusible strip adjacent to the metal ends or caps covering the tubular casing and confining the filling.

In Fig. 1 the connections are represented in the form of plates B C, that are notched for connection with the circuit-clamps, and in Fig. 2 the metal ends B' C' are adapted to pass into any suitable clips to which the circuit-wires are connected. This feature, however, does not form a necessary element of the present invention, as the connections to the circuit-wires may be varied.

In Figs. 2 and 3 the metallic clips are of rectangular and a peculiar construction, so that the metallic ends of the case can be easily received into the same.

The metallic conductors forming the terminals of this safety cut-out are connected by a fusible strip of suitable length, the size of which is adapted to the capacity of the cut-out, so that when the electric current is in excess such fusible strip will be disrupted. In Fig. 1 I have shown this metallic strip G as partially surrounded by a small tube E, which, and the filling, is easily broken when there is an excess of current to injure the safety-fuse, and the hole at D in the case A will allow the attendant to observe any injury to the safety-fuse, and in Fig. 2 a piece of thread or cord is represented at F, the same being of such material that it will be burned or discolored when the fusible strip G' is melted or otherwise destroyed.

In Fig. 1 I have represented a piece of thin paper H as over the hole D, so that the same will be torn, burned, or discolored by the destruction of the fusible strip G, and in Fig. 2 the combustible fuse F passes to or through the hole in the casing A, so that the burning or disruption of the fuse will be visible upon

the outside of the casing A. The hole is shown substantially in the middle of the case and in line with the portion of the conductor that is disrupted, and the fact that the safety-fuse has been injured by an excess of current is immediately noticeable at this hole in the case by the discoloration or injury resulting from the heat or pressure as the safety-fuse is disrupted.

The rectangular metallic ends to the fuse-case (illustrated in Figs. 2 and 3) are advantageously made of sheet metal notched and folded to form three faces 4 5 6, that are at right angles to each other, and an end piece 7, having a connection to the conductor within the case.

It will be observed that the metallic ends are adapted to go down into rigid holders L upon the base, to which the conductors are permanently connected, and the rectangular metallic ends to the fuse-case being of sheet metal folded are adapted to spring, so as to obtain and maintain the proper electric contacts and at the same time allow for the fuse and case being removed easily from the stationary clips.

It will be apparent that by this improvement the safety cut-out can be inserted between and be frictionally held by the rigid clips with great facility, so as to complete the electric circuit, or the same can be removed with facility in case the fuse-wire is injured by excessive current, after which another can be rapidly inserted to take its place, and screws or other attaching devices are dispensed with.

The important feature of this invention consists in the fusible strip in substantially the middle of the case and the hole in the case covered by a strip of paper or similar material at H, which material being injured by the disrupting of the safety-fuse within becomes an easily-observed exterior indication of the destruction of the safety-fuse.

I claim as my invention—

1. The combination in a safety-fuse for electric devices with the fuse-wire, of a tubular casing entirely surrounding and inclosing such fuse-wire and having an opening through the side of such casing, and means connected with said opening for effecting a discoloration of the walls of the opening for visually indicating the disrupted condition of the fuse-wire, substantially as set forth.

2. The combination in a safety-fuse for electric devices with the fuse-wire, of a tubular casing entirely surrounding and inclosing such fuse-wire and having an opening through the side of such casing, and means connected with said opening adapted to be disrupted for thus visually indicating the condition of the fuse-wire, and a means for closing the ends of the tubular casing so that the disruption of the fuse-wire will be manifested at the opening in the side of the casing, substantially as set forth.

3. The combination in a safety-fuse for elec-

tric devices with the fuse-wire, of a tubular casing entirely surrounding and inclosing such fuse-wire and having an opening through the side of such casing, and means connected with said opening for effecting a discoloration of the walls of the opening for visually indicating the disrupted condition of the fuse-wire, and a filling material inside the tubular casing and between the fuse-wire and the inner walls thereof, substantially as set forth.

4. The combination in a safety-fuse for electric devices with the fuse-wire, of a tubular casing entirely surrounding and inclosing such fuse-wire and having an opening through the side of the casing, and a covering to said opening upon the outer surface of the tubular casing arranged to be disrupted by and with the disruption of the fuse-wire, so that said disruption may be visually indicated, substantially as set forth.

5. The combination in a safety-fuse for electric devices with the fuse-wire, of a tubular casing entirely surrounding and inclosing such fuse-wire and having an opening through the side of the casing, and means connected with the said opening for visually indicating the disrupted condition of the fuse-wire, means for closing the ends of the casing and holding the fuse-wire in a permanently-fixed position, terminals projecting from the fuse-wire through the ends of the casing, and flat contact-blades connected thereto on each side of the casing at or near the ends, but not projecting beyond the ends of the casing, and stationary clips and an insulating-base on which the same are mounted for receiving the said flat blades, substantially as specified.

6. The combination in a safety-fuse for electric devices with the fuse-wire, of a tubular casing entirely surrounding and inclosing such fuse-wire and having an opening through the side of such casing, and means connected with said opening for visually indicating the disrupted condition of the fuse-wire, closed ends for said casing which engage and hold the fuse-wire in approximately a central position, and parallel flat contact-blades on each side of the casing at or near the respective closed ends to which the fuse-wire is connected, substantially as set forth.

7. The combination in a safety cut-out with a base and rigid holders secured thereon and conductors extending therefrom, of a tubular case, a fusible strip passing longitudinally therethrough and a non-conducting filling material within the case, end caps to the said case and sheet-metal ends to the said caps each formed from pieces having three faces at right angles and an end piece connected to the caps and adapted to spring into engagement with the rigid holders of the base and to be removable therefrom, substantially as set forth.

8. The combination in a safety cut-out with a base and rigid holders secured thereon and conductors extending therefrom, of a tubular case, a fusible strip passing longitudinally

therethrough and a non-conducting filling material within the case, end closures to the said case and sheet-metal ends to said closures forming flat spring-blades at each side of the casing adapted to spring into engagement with the rigid holders of the base and to be removable therefrom, substantially as set forth.

9. A safety-fuse having a metallic strip adapted to be disrupted by an excess of electric current, in combination with a tubular inclosing casing having a hole through the side at about the middle of its length and a filling material entirely surrounding the fusible strip, and ends or caps covering and secured to the casing and confining the filling material and a material closing the mouth of said hole that is disrupted with the fusible strip so as to give a visual surface indication that the safety-fuse has been destroyed, substantially as set forth.

10. A safety-fuse having a metallic strip adapted to be disrupted by an excess of electric current, in combination with a tubular inclosing casing having a hole through the side at about the middle of its length and a filling material surrounding the fusible strip but not entirely filling the central portion of the case, and ends or caps covering and secured to the casing and confining the filling material and a material closing the mouth of said hole that is disrupted with the fusible strip so as to give a visual surface indication that the safety-fuse has been destroyed, and devices secured to the ends of the fusible strip and adapted for connection with circuit-engaging devices, substantially as set forth.

11. The combination with a fusible conduc-

tor, of a surrounding casing and end closures therefor, terminals to the conductor at or near the ends of the casing, flat blades on each side of the casing at or near the ends and stationary clips adapted to receive the flat blades and a base for holding the same, substantially as specified.

12. The combination with a fusible conductor, of the surrounding casing and the end closures therefor, terminals to the conductor at or near the ends of the casing, flat blades at each side of the casing at or near but not projecting beyond the ends and stationary clips and a base for holding the same, substantially as specified.

13. The combination with a fusible conductor, of the surrounding casing and means for closing the ends of the casing, flat blade-contacts on each side of the casing at or near but not projecting beyond the ends thereof electrically connected to the respective ends of the fusible conductor, and stationary clips into which the flat blades are received, and a base for holding the same, substantially as specified.

14. The combination with a fusible conductor, of the surrounding casing, flat contact-blades on each side of the casing at or near but not projecting beyond the ends thereof electrically connected to the respective ends of the fusible conductor and stationary clips into which the flat blades are received and a base for holding the same, substantially as specified.

Signed by me this 23d day of June, 1899.

JOSEPH SACHS.

Witnesses:

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E. B. HATCH.