(No Model.)

E. WESTON.

SAFETY DEVICE FOR ELECTRIC CIRCUITS.

No. 259,614. Patented June 13, 1882.

Fig. 1.

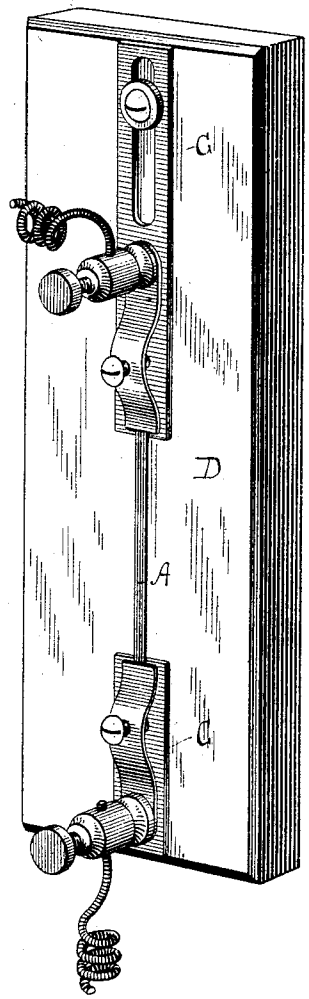
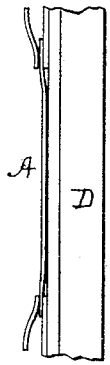


Fig. 2.



Attest:

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by his Attorney,

Parker W. Page.

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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 259,614, dated June 13, 1882.

Application filed January 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Safety Devices for Electric Circuits, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

For preventing an abnormal flow through any circuit or branch thereof of a current which is liable to injure any portions of the electrical devices connected with the circuit it has long been customary to employ a short length of conductor of higher resistance than the remainder of the circuit, which, while readily permitting the passage of a normal current, is fused by an abnormal excess in the flow, and thus interrupts the circuit entirely. For this purpose strips or coils of fine copper, platinum, or other wire have usually been employed; but, as these fuse only at very high temperatures, provision must be made to intercept the globules of molten metal resulting from their fusion, which otherwise might fall upon and ignite the wood-work or other combustible articles in the vicinity.

The object of my present invention is to obviate entirely all danger likely to result from the melted globules of metal, and to provide a safety device which will preclude the possibility of the circuit-wires or any devices connected therewith being heated or otherwise injured by an abnormal excess in the flow of current.

This invention I design using particularly in connection with incandescent lamps in the apartments of a dwelling, store-rooms, or other places where the fusion of the ordinary metals would be likely to be attended with injurious results to wood-work or other combustibles.

To this end the invention consists in the combination, with a main or branch conductor containing devices for utilizing the current, of a strip, wire, or coil of a metal or alloy that will fuse at a temperature below the point of ignition of any of the ordinary combustibles, such as wood, paper, fabrics, and similar substances; and, secondly, in means for the better adaptation of the same to general use.

In the drawings appended, Figure 1 is a view in perspective of a means of applying my invention. Fig. 2 is a side view of a portion of the same slightly modified.

The device illustrated consists of a base, D, upon which are two terminals, C C, for the ends of the line-wires, said terminals being provided with clips for retaining the ends of the fusible conductor A, and one or both being adjustable, as shown. The base D may be attached to the wall or to any other convenient support, and the circuit with which it may be employed may be either the main circuit or any branch thereof. The latter is, however, preferable, as will be well understood.

It is evidently very desirable that the conductor A should possess ductility, as well as the other qualities above mentioned.

I have discovered that an alloy of tin, lead, cadmium, and bismuth, in the proportions hereinafter stated, fulfills all the requisite conditions, and I therefore employ it in rods or strips of proper size, which are easily inserted in the circuit, either by the device above-described or others.

The alloy which I have produced contains of tin, four parts; of lead, two parts; of cadmium, two parts; and of bismuth, one part, by weight. These form an alloy, the specific resistance of which is about seventy times as great as that of copper, and the melting-point of which is about 240° Fahrenheit.

An alloy of the first three elements above mentioned is moderately ductile, and can be rolled, but its fusion-point is as high as 280° or 290° Fahrenheit. The addition of the bismuth, however, lowers the fusion-point.

I would state that the proportionate amount of bismuth may be slightly varied. For instance, if the quantity of bismuth be increased to two parts the fusion-point is lowered, but the ductility and malleability are lessened. The proportions stated I have found produce the best results. When a strip of proper size of this alloy, or any other possessing similar qualities, is included in a circuit with an electric lamp or other device running under normal conditions

it is not sensibly affected. Should the current be increased, as by a short circuit in the lamp, the strip immediately becomes heated and fuses, by this means disrupting the circuit.

In fusing small globules having a temperature of 240° are sometimes formed, but their heat is not sufficient to do any injury. They may be prevented entirely from dropping by forming the fusible conductor in a flat strip and securing it to a strip of wood by varnish or shellac, as shown in Fig. 2. The strip in fusing softens the varnish, which retains the globules.

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

1. The combination, with a circuit or branch thereof, of a safety device which fuses at a temperature below the ignition-point of wood, paper, fabrics, or other like combustibles.

2. The combinanation, with an electrical conductor, of a strip or wire of higher resistance than the said conductor, and which fuses at a temperature lower than the ignition-point of wood, paper, fabrics, or other like combustibles, substantially as set forth.

3. In a safety device for electric circuits, the combination, with a slab of wood, of a strip of fusible metal attached thereto by varnish or similar cement, and binding-posts in contact with the ends of the strip, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 3d day of January, 1882.

EDWARD WESTON.

Witnesses:
W. SCOTT SIMS,
J. P. DENGLER.