A. AKIN.

FUSE.

APPLICATION FILED MAY 10, 1911.

1,011,896.

Patented Dec. 19, 1911.

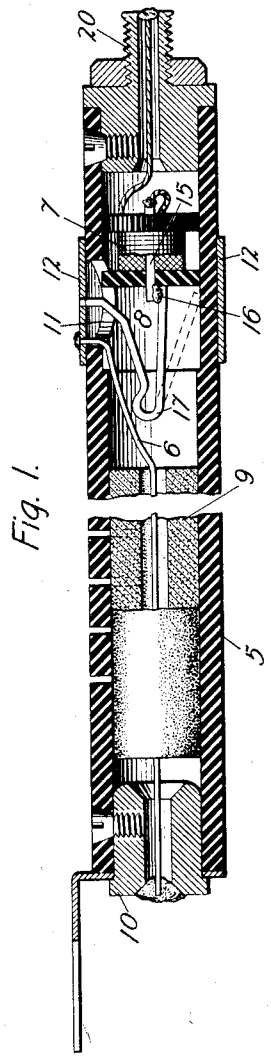

Fig. 1.

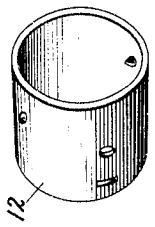

Fig. 3.

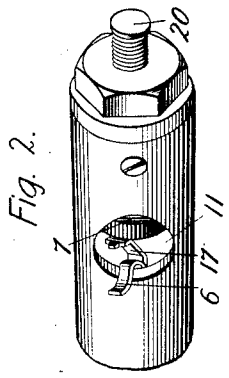

Fig. 2.

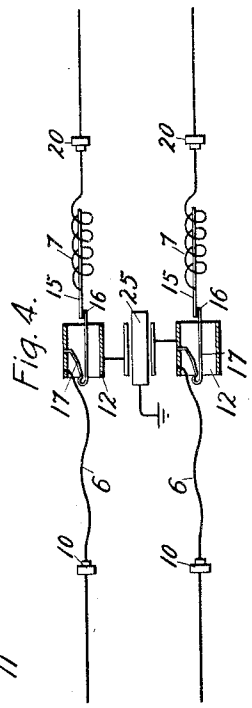

Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

ALLISON AKIN, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

FUSE.

1,011,896. Specification of Letters Patent. **Patented Dec. 19, 1911.**

Application filed May 10, 1911. Serial No. 626,276.

To all whom it may concern:

Be it known that I, ALLISON AKIN, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Fuses, of which the following is a full, clear, concise, and exact description.

This invention relates to a protective device for use in telephone or like circuits, which device embraces a fuse for protection against overload currents and a heat coil arrangement for protection against "sneak" currents or currents which, although not strong enough to blow the fuse, will, if long continued, cause injury to the apparatus connected with the line.

The object of this invention is to provide an improved device of this character which will be sure in its operation, cheap to manufacture and in which the various parts may be easily replaced.

One feature of this invention relates to the arrangement of the heat coil for insuring a positive separation of the circuit breaking members of the heat coil when said members are disengaged.

Other features of the invention are the details of construction and arrangement of the various parts of the protector.

In the drawings—Figure 1 is a longitudinal sectional view of a protector embodying my invention; Fig. 2 is a detail perspective of one end of the device; Fig. 3 is a perspective view of a ring used in connection with the protector; Fig. 4 is a circuit diagram including a protective device made in accordance with my invention.

In said drawings 5 designates a fiber or hard rubber tube or cartridge containing a fuse 6, a heat coil embracing a spool 7 and a spring circuit breaker 8. The fuse 6 is inclosed in a sleeve 9 of non-combustible material such as asbestos and is connected at one end to a terminal 10 secured to one end of the tube 5. At its other end said fuse extends through an opening 11 in the side of the tube 5 and is connected with a plate 12 which in the present instance is a ring surrounding and secured to said tube. The end of the fuse 6 connecting with the plate 12 is made fast thereto by passing said end through a hole in said plate and applying a drop of solder thereto.

Passing through the heat coil spool 7 is a heat conducting member 15 constituting one terminal of the heat coil, to one end of which is secured by fusible alloy 16 one end of a bowed spring 17. The other end of said spring 17 is attached to the plate 12 and said spring is normally held under compression between said plate 12 and heat conducting terminal 15. The other terminal of the heat coil is attached to a terminal binding post 20 secured to the end of the tube 5. The end of the spring 17 in contact with the plate 12 engages an opening therein and is secured thereto by soldering. When the heat coil operates the fusible alloy 16 is fused and the end of the spring 17 attached to the terminal member 15 thereby is released and is forced away therefrom and into contact with the inner wall of the tube 5, as indicated by the dotted lines in Fig. 1 of the drawings. The ring 12 is secured to the tube 5 by punching the metal of said ring into the body of said tube.

As shown in Fig. 4 the ring plate 12 is grounded through a lightning arrester 25 and the fuse and heat coil are adapted to open the circuit upon opposite sides of the plate 12. As will be seen from this construction either the fuse or the heat coil may be removed from the tube 5 without disturbing the other, it being necessary only to loosen the end of the fuse 6 or the heat coil spring 8 from the ring and remove the adjacent terminal in order to remove either of the parts. This makes possible the replacing of either the heat coil or the fuse in case one is operated and the other is not.

I claim:

1. In a protective device, a tube of insulating material provided with an opening through its side wall, a metal plate secured to said tube adjacent to said opening, a heat coil in said tube and a spring member secured to one terminal of said heat coil by fusible material, the other end of said spring bearing against said metal plate.

2. In a protective device, a tube of insulating material provided with an opening through its side wall, a metal ring surrounding said tube adjacent to said opening, a heat coil adapted to be inserted into said tube and a compressible spring having one end attached to one terminal of said heat coil by fusible material, the other end of said spring being secured to said metal ring.

3. In a protective device, a tube formed

of insulating material and provided with an opening through its side wall, a metal ring surrounding a portion of said tube and covering said opening, a line fuse connected at one end to said metal ring, a heat coil adapted to be inserted into said tube, a circuit opening member connecting one terminal of said heat coil with said metal plate, and line terminals removably secured to the ends of said tube and connected respectively with the outer end of said fuse and the other terminal of said heat coil.

4. In a protective device, a tube of insulating material provided with an opening through its side wall, a metal ring surrounding said tube adjacent to said opening, said ring being provided with openings therethrough, a line fuse located in said tube and having one end connected with said ring through one of the openings therein, a heat coil located in said tube, a spring member connected at one end to one terminal of said heat coil, the other end of said spring member being secured to said metal ring through the other opening therein, and line terminals removably secured to the ends of said tube and connected respectively with the outer end of said fuse and the other terminal of said heat coil.

5. In a protective device, a tube of insulating material, a metal plate secured thereto, a fuse electrically connected at one end with said plate, a heat coil in said tube, a circuit opening member normally electrically connecting one terminal of said heat coil with said plate, and line terminals secured to the ends of said tube and connected respectively with the outer end of said fuse and the other terminal of said heat coil.

In witness whereof, I, hereunto subscribe my name this 9th day of May, A. D., 1911.

ALLISON AKIN.

Witnesses:

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