M. H. KING.

EXCESS CURRENT ARRESTER.

APPLICATION FILED DEC. 3, 1919.

1,408,606. Patented Mar. 7, 1922.

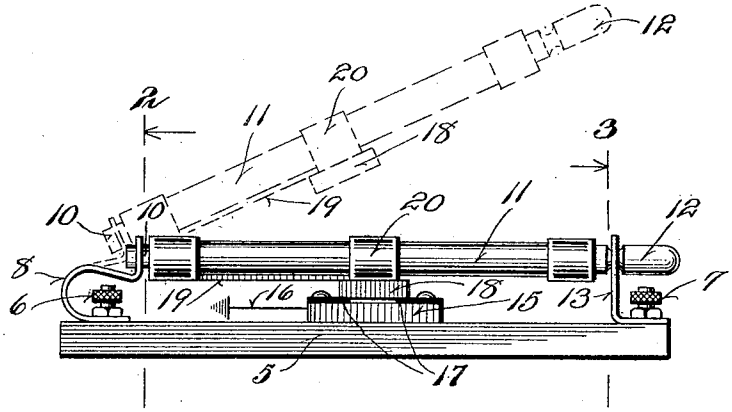


Fig. 1.

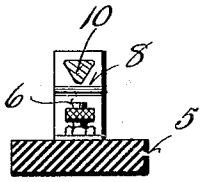


Fig. 2.

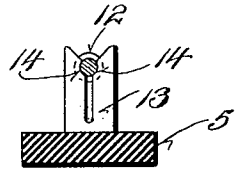


Fig. 3.

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EXCESS-CURRENT ARRESTER.

1,408,606. Specification of Letters Patent. Patented Mar. 7, 1922.

Application filed December 3, 1919. Serial No. 342,086.

To all whom it may concern:

Be it known that I, MATTHEW H. KING, a citizen of the United States, and resident of Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented certain new and useful Improvements in Excess-Current Arresters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in means for preventing transmission of lightning or other high potential charges of electricity through telephone or other circuits, to thus prevent possible damage to mechanisms included in said circuits, the present device being more particularly of that type in which a grounded electrode member is provided, which is separated from a circuit electrode member by an air gap which is adapted to be bridged by a high potential charge of electricity, to thus ground said charge.

It is in general the object of my invention to simplify and otherwise improve the structure and to increase the reliability of operation of devices of this character.

Various air gap arrangements heretofore provided have been open to objection in that through carelessness of the lineman, the electrodes have not been placed in the adjusted positions, hence rendering the arresting device inoperative and leaving the circuit without protection. It is therefore an important object of my invention to provide an arrangement whereby the circuit to be protected cannot be completed except upon properly adjusted operative positions of the air gap electrode members.

A further object resides in the provision of an arresting device of this character which may be associated in a most economical structure with the ordinary fuse of the electric circuit, and wherein one of the air gap electrodes forms a part of the fuse unit.

With the above and other objects and advantages in view, which will be apparent as the description proceeds, my invention resides in the novel features of construction, combination and arrangement of the parts as hereinafter described and defined by the appended claims.

In the accompanying drawing:

Figure 1 is a side elevational view of a fuse and excess current arresting device embodying my invention.

Figure 2 is a transverse sectional view on the line 2—2 of Figure 1.

Figure 3 is a transverse sectional view on the line 3—3 of Figure 1.

Referring now more particularly to the drawings, 5 designates a base plate on which is mounted a pair of spaced binding posts 6 and 7 respectively. A strip of spring metal 8 has one end secured on the binding post 6, the intermediate portion of this strip being longitudinally slotted and curved upwardly about the binding post, the other end of the plate being directed upwardly and provided with a triangular shaped slot adapted to receive the attaching end member 10 and a fuse 11, said attaching member being correspondingly triangular shaped in cross section and the fuse being of conventional nature including a tubular housing having end caps from which project the connecting members of the fuse. The other end connecting member 12 of the fuse is cylindrical in shape and is engageable between a pair of spring arms 13 formed by a longitudinally slotted plate which has one end portion laterally turned and secured on the binding post 7, the arms being resiliently urged together and being provided with opposed recess portions 14 adapted to yieldably hold the end member 12 therebetween. A block 15 of carbon or other conducting material is mounted on the base plate 5 between the binding posts 6 and 7, and this block is provided with a ground connection 16. A pair of spaced mica strips 17 are secured on the upper face of the block and are adapted to be engaged by an electrode block 18 carried by the intermediate portion of the fuse, this block being secured to a conducting strip 19 which has one end welded or otherwise secured to the end member 10 of the fuse whereby current may readily pass from the end member of the fuse to the electrode 18. The other end of the strip 19 is secured to a sleeve member 20 disposed about the body of the fuse.

In the operation of the afore described device, wires of the circuit to be protected are secured to the binding posts 6 and 7.

The current would then pass through the spring strip 8 to the fuse and through the fuse and spring arms of the plate 13 to the other binding post 7, it being noted that the mica strips 17 space the electrode blocks 15 and 18 apart to provide an air gap therebe-

tween to prevent grounding the current through said electrode. Should an excess charge of electricity occur in the circuit due to lightning or other cause, this excess charge will pass through the conducting strip 19 and through the electrode blocks 15 and 18 jumping the air gap between said blocks, the current being thus grounded, at the same time the fuse 11 will blow out in ordinary manner. It is noted that upon inserting the end member 10 of the fuse in the triangle slot of the spring strip 8, and then swinging the fuse toward the base plate, the electrode block 18 flatly will engage on the adjacent mica plate 17 prior to engagement of the fuse end member 12 in the spring arms of the plate 13, and thus when the end member 12 is engaged in the recesses 14 of said arms, the electrode block will be firmly held against both mica plates, to thus determine the proper size of the air gap. Attention is directed to the fact that the upper strip of the triangular opening in the spring strip 8 is positioned horizontally, or upon a plane parallel to the lower flat face of the electrode block 18 when the parts are in their normal assembled position. Hence, when the fuse is coupled to the strip 8, the upper flat face of its triangular shaped end member will form a broad surface of contact, so as to insure an electrical connection between the parts, and in practice the lower stretches of the end member 10 will have slight clearance with respect to its engagement with the slot, but owing to the keyed relation of these parts to the flat contact faces of the blocks 15 and 18, when the parts are assembled in their correct position, an assured firm contact is effected between the mica gap plates 17 and the blocks. Hence when this connection is made, the upward strain upon the end member 10 will insure perfect union between the flat faces of the triangular socket connection.

The fuse 11 constitutes essentially a main circuit closing member, and by securing one of the air gap electrodes to a main circuit closing member, I insure a proper operative relation of the air gap electrode when the circuit closing member is in operative position. It will be further noted that by reason of the irregular or wedged cross sectional shape of the fuse end member 10, it is impossible to mount the fuse in such manner that the air gap electrodes would be in improper relation.

I have thus provided an exceedingly simple and reliable device which will protect a circuit against lightning or other excess charges of electricity, and while I have shown and described a preferred embodiment of my invention, it will be appreciated that various changes and modifications of structure may be employed to meet differing conditions of use and manufacture without departing in any manner from the spirit of my invention. If a series of current arresting devices are to be employed, it is obvious that the requisite number of fuses and associated parts may be employed in conjunction with a single grounded electrode block such as my block 15.

What is claimed is:

A device of the class described comprising a base plate, a pair of spaced attaching elements mounted on the base plate, one of said elements having a triangular opening, the upper stretch of which is approximately horizontal and parallel to the base plate, a fuse member having an attaching means for engagement with the attaching elements, one of said attaching means being a triangular shaped projection adapted to engage the triangular opening of the attaching element, whereby the upper face of the triangular attaching means will form a flat contact connection between the horizontal stretch of the triangular shaped opening of the element mentioned, a conductor strip carried by the fuse member, an electrode block fixed to the fuse member positioned at approximately a right angle to the horizontal face of the triangular opening, and a contact block on the base plate for co-operation with the electrode block when the triangular shaped projection and the triangular opening are properly engaged.

In testimony that I claim the foregoing I have hereunto set my hand at Sheboygan, in the county of Sheboygan and State of Wisconsin.

MATTHEW H. KING.