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L. W. McOMBER

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FUSE HOLDER

Filed July 9, 1920

Fig. 1.

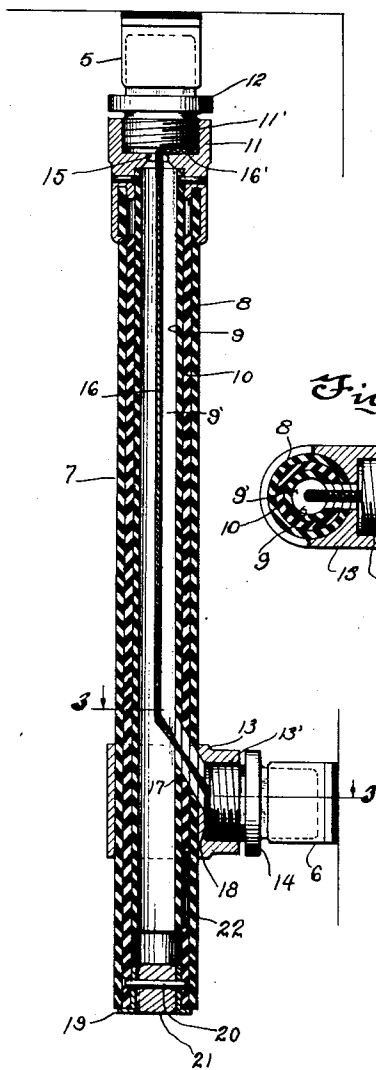


Fig. 2.

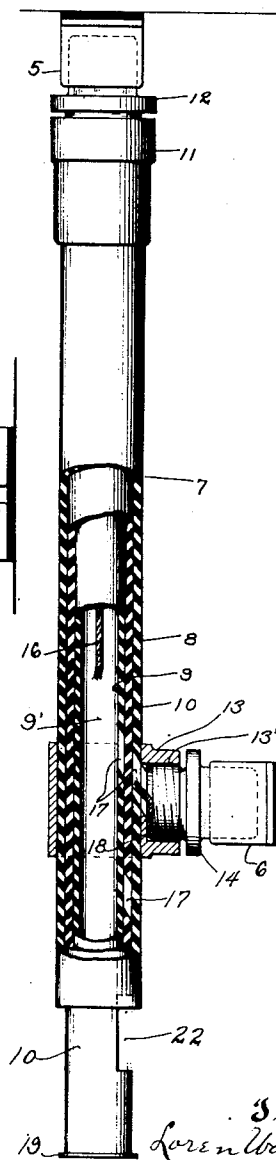
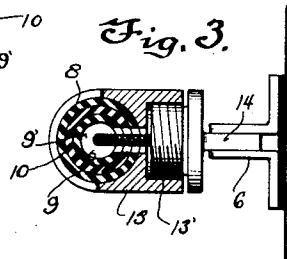


Fig. 3.



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LOREN WALLACE McOMBER, OF SOUTH MILWAUKEE, WISCONSIN, ASSIGNOR TO LINE MATERIAL COMPANY, OF SOUTH MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

FUSE HOLDER.

Application filed July 9, 1920. Serial No. 394,970.

To all whom it may concern:

Be it known that I, LOREN WALLACE McOMBER, a citizen of the United States, and resident of South Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Fuse Holders, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in fuse holders, more particularly adapted for high voltage heavy current circuits.

High tension fuses upon burning create a gas which burns and carries the arc from one terminal end to the other. This is very objectionable and oftentimes dangerous and desirable to eliminate.

It is one of the objects of the present invention to overcome the before mentioned objectionable feature and provide a fuse holder in which the circuit is positively broken when the fuse link is ruptured.

A further object of the invention is to provide a fuse holder which interposes an insulating means between the ends of the fuse link when ruptured which will effectively prevent the reformation of an arc between the fuse link ends.

A further object of the invention is to provide a fuse holder in which the liability of the arc destroying the holder is practically eliminated or to a large extent reduced.

A further object of the invention is to provide a fuse holder which is efficient in operation, is strong and durable and is well adapted for the purpose described.

With the above and other objects in view, the invention consists of the improved fuse holder and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a vertical sectional view of the improved fuse holder showing a fuse link mounted therein;

Fig. 2 is a side view thereof, partly broken away, showing the fuse link disrupted and a

portion of the holder in position to visibly indicate the disruption; and

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1.

Referring to the drawing, the numerals 5 and 6 indicate, respectively, the upper and lower clips of the terminals to which the improved fuse holder or cartridge is connected. The fuse holder comprises an outer tube 8, an inner tube 9 spaced therefrom and a telescoping tube 10 interposed between the first mentioned tubes. The inner and outer tubes are securely fastened at their upper ends in any desirable manner to an end member 11 having an upper threaded socket portion 11' for receiving the threaded end of the terminal connector 12 which removably enters the terminal clip 5 before mentioned. A terminal collar member 13 surrounding the lower portion of the outer tube is also provided with an outwardly extending threaded socket portion 13' for receiving the threaded end of the side terminal connector 14 which removably enters the terminal clip 6, also before mentioned. All of the tubes are formed of suitable insulating material such as fiber. The end member 11 is formed with a comparatively small opening 15 tapered on its lower side to facilitate threading the fuse link 16 there-through to clamp the angularly bent end portion 16' thereof between the said end member and the threaded end portion of the connector member 12 as shown in Fig. 1. Said connector member firmly holds the fuse link in position and forms an electrical connection therewith and also closes the upper end member opening 15 to prevent the escape of the gases generated by the blowing of the fuse.

An opening 17 extending through the telescoping tubes 8, 9 and 10 at an upward or oblique angle from the socket 13' to the bore 9' of the inner tube 9 permits the lower end portion of the fuse to extend through said opening and its angled end 18 to be clamped between the side collar member 13 and the side connector member 14. Said clamping connection also forms an electrical connection between the lower fuse end and

the connector member 14. The angularity of the opening provides for the easy threading of the fuse link therethrough when the tubes are in closed position.

5 The inner tube 9 is of less length than the outer tube 8 and an annular flanged reinforcing thimble 19 extends into the lower end of the intermediate tube 10 and is secured thereto by a transverse pin 20. The
10 pin 20 also holds a plug 21 which closes the lower end of the tube 10. The annular flange of said thimble is of larger diameter than the tube 10 and it serves as a stop to limit the position of said tube with respect
15 to the other tubes so that the angularly extending openings 17 will aline when the tube 10 is in its closed position.

The tube 10 a short distance above the thimble 19 is provided with a gas discharge
20 side opening 22 to permit the escape of the arc generated gases therethrough when said tube 10 is forced downwardly to a position so that its side opening will be open to the atmosphere as shown in Fig. 2.

25 In order to localize the rupture of the fuse link upon the passage of excess current therethrough, the portion of the fuse link which extends through the openings 17 is of restricted cross section or may be otherwise
30 formed to cause the disruption at this point. The outward movement of the intermediate tube is limited by the enclosing case (not shown) in which the fuse holder is usually placed. The terminal clips 5 and 6 are
35 wired to a source of current supply in any manner desired not necessary to show nor describe.

In operation the parts are arranged as shown in Fig. 1, and upon the rupture of
40 the fuse link at the point within the openings 17 the pressure of the gases formed by the arc of the rupture will force the intermediate tube 10 downward to the position shown in Fig. 2 so that the openings 17 will
45 be out of alinement and the upper portion of the tube 10 will close the opening 17 in the tubes 8 and 9 and cut through and insulate the arc between the ends of the fuse link and form a barrier therebetween. As
50 the openings 17 are out of alinement and the path therethrough and between the tubes is so tortuous, the arc cannot follow the path and is stopped without damage to the holder and the generated gases will pass out of the
55 holder through the bottom opening in the intermediate tube.

To reload the holder it is only necessary to remove from the clips, unscrew the terminal connectors and remove the ruptured
60 fuse link and push the tubes to alined position and then replace new link and screw the terminal connectors in place to clamp the link in place. The holder may then be snapped into place in the clips and will
65 again perform its function.

While the drawing shows, and the specification describes but one form of the device, it is to be understood that the invention contemplates other forms and shapes within the scope of the claims.

What I claim as my invention is:

1. A fuse holder, comprising an outer and an inner tube spaced apart and closed at one end and having registering side openings, a
70 tube interposed between the inner and outer tube and having a side opening in register with the other side openings when said tube is in its inner position, spaced terminals adjacent one end and the side openings of the
75 tubes, and a fuse link connected to the end terminal and extending longitudinally into the tubes and through the side openings and connected to the side terminal, the gas
80 pressure produced by the volatilization of said link upon the passage of excess current therethrough causing relative movement of
85 said tubes to interrupt the circuit between said terminals by the breaking of the alinement of the openings.

2. A fuse holder, comprising an outer and
90 an inner tube spaced apart and having registering side openings, a tube telescoping the inner and outer tubes and having a side opening in register with the other side
95 openings when said tube is in its inner position, an end connector mounted on the end portions of the outer and inner tubes, a side connector mounted on the side portion of the outer tube and covering its side
100 opening, and a fuse link connected to the end connector and extending longitudinally into the inner tube and through the side openings of said tubes and connected to
105 the side connector, the gas pressure produced by the passage of excess current through said link causing relative movement between said tubes to first interrupt
any circuit between the connectors and then interpose a barrier between the connectors.

3. A fuse holder, comprising an outer
110 and an inner tube spaced apart and having registering side openings, an end member mounted on the end portions of said tubes, a collar member mounted on the outer tube adjacent the side opening, terminal con-
115 nectors connected to the end and side members and having means for connection with line terminals, and a fuse link connected to the end terminal member and extending
120 longitudinally into the inner tube and through the side openings and connected to the side terminal member, the gas pressure produced by the passage of excess current
125 through said link causing relative movement between said tubes to first interrupt any circuit between the connectors and then interpose a barrier between said connectors.

4. A fuse holder, comprising a pair of spaced tubes constituting a fuse space, a
130 third tube telescopingly engaging the spaced

tubes, said tubes having alined openings through their side walls, fuse link connector means mounted on one portion of the pair of tubes and on the side of the outer tube adjacent the side opening, and a fuse link extending longitudinally into the tubes and through the side openings and connected at its opposite ends to the fuse link connector means, said link being adapted to fuse upon the passage of excess current therethrough thereby creating a gas pressure within the fuse space which will move the tubes relative to each other to first interrupt any circuit between the severed ends of the fuse link and then interpose a barrier between said connectors.

5. A fuse holder, comprising a pair of spaced tubes constituting a fuse space, a third tube telescopingly engaging the spaced tubes, said tubes having alined openings

through their side walls, one of said tubes having a gas discharge side opening which is opened by the relative movement of said tubes, fuse link connector means mounted on one portion of the pair of tubes and on the side of the outer tube adjacent the side opening, and a fuse link extending longitudinally into the tubes and through the side openings and connected at its opposite ends to the fuse link connector means, said link being adapted to fuse upon the passage of excess current therethrough thereby creating a gas pressure within the fuse space which will move the tubes relative to each other to first interrupt any circuit between the severed ends of the fuse link and then interpose a barrier between said connectors.

In testimony whereof, I affix my signature.

LOREN WALLACE McOMBER.