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FUSE HOLDER

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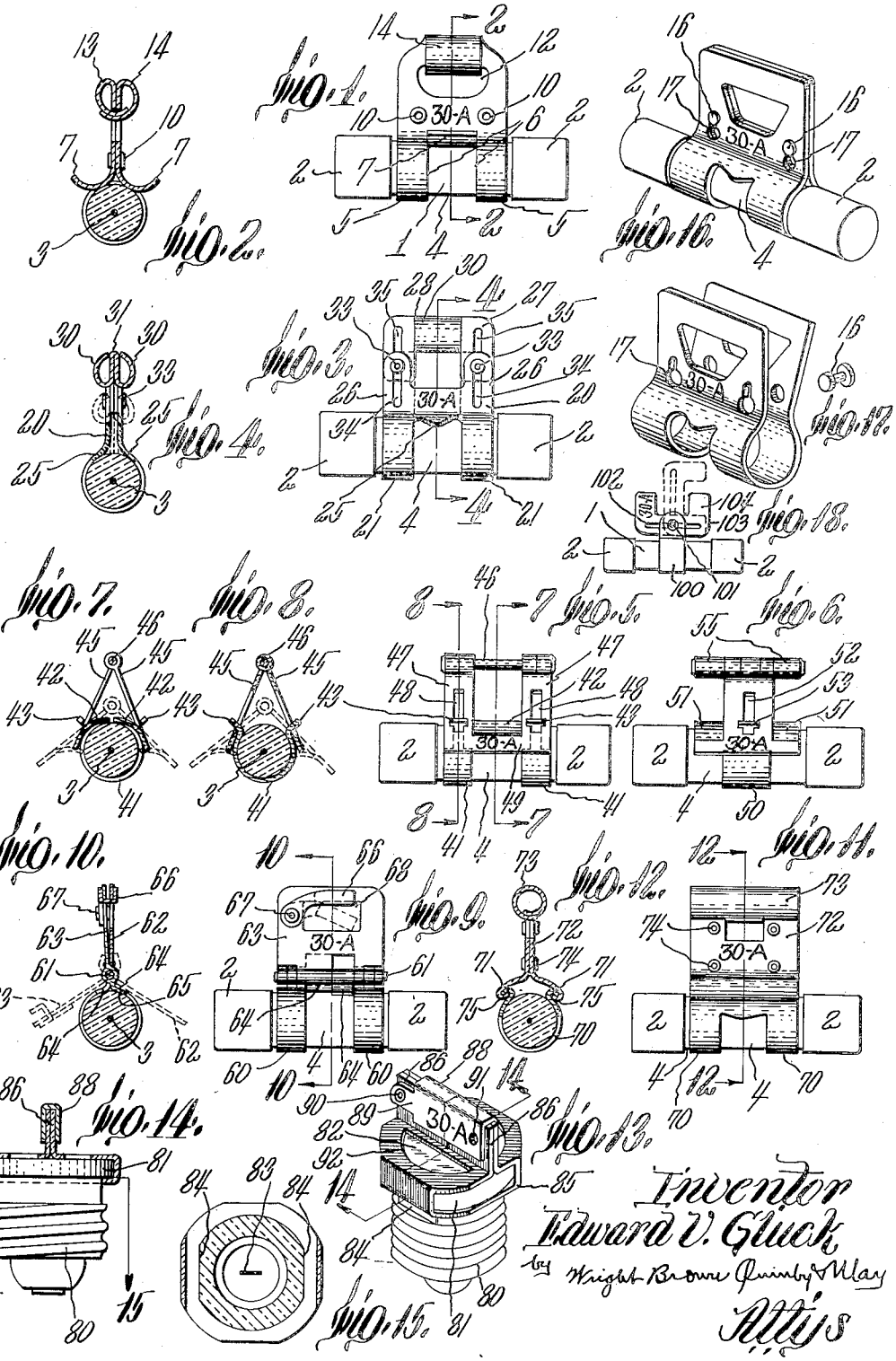

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FUSE HOLDER

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Electric fuses are commonly so mounted that they are not readily accessible for removal or replacement, it being necessary, particularly with fuses of the cartridge type, to exert considerable force to remove them from their retaining clips.

This invention has for an object to provide a device for more or less permanent engagement with a fuse and affording means which may be grasped by the fingers in such a manner that the force necessary to remove or replace a fuse may be more readily applied thereto.

A further object is to provide such a device which will act to protect the fingers of the user against accidental contact with live parts.

A still further object is to provide such a device which will present a relatively smooth convex rounded surface to the fingers.

Still another object is to make possible provision of such a device which may be extended conveniently when the fuse is to be manipulated but which may be collapsed or retracted at other times in order to permit its use in restricted locations, as, for example, in enclosures provided with covers fitting closely over the fuses.

A further object is to provide a device which may be readily and permanently marked with the fuse capacity so that this may be readily determined by inspection at any time even though the fuse may have been in use for an extended period.

A further object is to provide such a device which will permit change of fuses held thereby.

Further objects and advantageous details and combinations will appear from a more complete description of certain embodiments of the invention shown in the accompanying drawing in which—

Figure 1 is a side elevation showing one embodiment of the invention as applied to a fuse of the cartridge type.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 1, but showing an extensible and contractible device.

Figure 4 is a section on line 4—4 of Figure 3.

Figures 5 and 6 are side elevations showing further forms of extensible and contractible devices.

Figures 7 and 8 are sections on the correspondingly numbered section lines of Figure 5.

Figure 9 is a side elevation of another form of the device.

Figure 10 is a section on line 10—10 of Figure 9.

Figure 11 is a side elevation of a still different construction.

Figure 12 is a section on line 12—12 of Figure 11.

Figure 13 is a perspective of a fuse of the plug type showing a device constructed in accordance with the invention applied thereto.

Figure 14 is a view partly in elevation and partly in section on line 14—14 of Figure 13.

Figure 15 is a section on line 15—15 of Figure 14.

Figures 16 and 17 are perspectives showing another manner of detachably securing a holder to a fuse.

Figure 18 is an elevation showing still another form of handle.

Referring first to Figures 1 and 2, at 1 is indicated a fuse of the cartridge type having end terminals 2 of conducting material which are intended to be inserted between the usual fuse clips. Between these end portions 2 the fuse may be of somewhat reduced diameter and is generally composed of a tube 4 of insulating fiberboard within which the fuse link 3 passes between the end caps or terminals 2.

The holder, in accordance with this invention, comprises a strip of sheet material, preferably of insulation, such as fiber or leatherboard, which is wrapped about the fuse tube 4, being shown as provided with portions 5 spaced axially of the tube 4 which have wrapping engagement therewith. These portions 5 are defined at their adjacent edges by cuts 6 which form between them tongues 7. These tongues 7 are shown in Figure 2 as curved away from each other and form finger guards to prevent the fingers from slipping downwardly around the sides of the fuse where they might inadvertently come into contact with heated fuse or live parts. The side portions of the wrapping strip are brought together and there secured as by rivets 10. Above the rivets 10 the two lapping portions of the strip are shown as perforated, as at 12, and the upper extremities 13 and 14 of the strip, narrowed sufficiently to pass therethrough, are then curved outwardly and downwardly with their extremities passed through the perforation 12 in oppositely disposed lapping relation, as shown best in Figure 2, one of these portions as 14 partially enclosing the other. It is usual to cut sheet material of the character used for these holders by the use of dies and this arrangement of the parts 13 and 14 prevents the fingers from contact with the relatively sharp, raw cut edges presenting instead relatively smooth convex,

rounded surfaces for engagement by the fingers.

These portions 13 and 14 together present a convexedly rounded side face of the strip material to the fingers so that sufficient force may be exerted to remove the fuse from its clips without causing discomfort to the operator's fingers which engage the relatively smooth rounded surface presented by the portions 13 and 14.

In some cases it may be undesirable to permit the fuse holder to project permanently outwardly from the fuse to an extent sufficient to make possible its easy grasping by the fingers as in some cases this would interfere with other parts, as, for example, when the fuses are positioned within an enclosure having a cover, which, when closed, lies near to the outer faces of the fuses. Figures 3 and 4, therefore, show a construction somewhat similar to that of Figures 1 and 2, except that provision is made for extending or collapsing the holder so that when extended it may be in position for easy grasping by the fingers and when retracted it will permit the placing of the cover over the fuses.

According to Figures 3 and 4, therefore, the holder comprises two parts consisting of a strip 20 having spaced portions 21 wrapped about the portion 4 of the fuse and preferably with intermediate wing portions 25 which may be either curved downwardly about the fuse portion 4 to aid in gripping the fuse, as shown in Figure 4, or curved away from it to form finger guards as are the portions 7 shown in Figures 1 and 2. The end portions of the wrapping strip are shown as provided with slotted tongues 26 between which are slidably mounted tongues 27 of a handle portion 28, this handle portion 28 being formed of a single piece of sheet material such as fiberboard folded together to form the tongues 27 at opposite ends. The parts 30 between the tongues on each side are shown as rolled up toward the folded edge 31 to form the rounded handle portion which may be grasped by the fingers. The handle part and the wrapping strip are connected together by the loosely placed rivets 33 which pass through the slots 34 and 35 in the tongues 20 and 27, respectively, so as to permit the handle to be pulled outwardly from the wrapping strip as far as permitted by the slots and rivets when it is desired to remove the fuse, and to permit the handle member to be collapsed relative to the strip so as to project to a less distance from the fuse at other times.

Other constructions showing the use of an extensible and retractible handle are shown in Figures 5 to 10 inclusive. Referring to the construction shown in Figures 5, 7 and 8, the holder comprises spaced strips 41 wrapped about the fuse portion. The ends of the strip portions 41 are shown as outwardly turned and formed with T heads as at 43. The handle member comprises a pair of sheet material leaves 45 hinged together on the hinge pin 46 at one end and provided with spaced side portions 47, slotted as at 48, to receive therethrough the portions 43 of the wrapping strips 41, and portions 42 which may be curved in and in contact with the fuse portion 4 within the strips 41. These slots 48 are of such width that the portions 43 may be inserted therethrough after being twisted somewhat so that their heads may pass lengthwise through the slots, whereupon these portions 43 are twisted back so that their heads at their outer ends retain the parts in assembled relation. At their ends remote from the hinge pin 46 the portions 47 may be joined together by the integral spacer piece 49. By pulling upwardly on the pivot pin 46 the handle member may be extended so that the portions 43 will lie in the inner extremities of the slots 48 in which position the holder may be manipulated to withdraw the fuse, but by pressing inwardly on the outer ends of the handle the leaves 45 may be spread and slid inwardly relative to the portions 43 into collapsed condition, as shown in dotted lines in Figures 7 and 8.

In Figure 6 a somewhat modified construction is employed in which in place of the spaced wrapping portions 41, a single wrapping portion 50 is employed, portions of the strip at either side of this wrapping portion being brought over the outer face of the fuse, as shown at 51, similarly to the portions 42 shown in Figures 5, 7 and 8. The leaves of the handle member are then provided with a single slot 52 in each of which is engaged a single T-shaped tongue 53 of the wrapping strip 50 on each side.

For the purpose of facilitating grasping of the leaves in this construction, the pivot pin is shown as extended laterally on either side of the handle strip, preferably being provided with sleeves 55 on these extended portions of substantially the same diameters as the outer faces of the hinge portions of the handle leaves.

In Figures 9 and 10 another construction is shown wherein the handle may be extended or collapsed. Referring to these figures, two fuse wrapping strips 60 are shown, each having its ends brought together in hinge formation to receive a hinge pin 61. Also pivoted on the hinge pin are the two handle leaves 62 and 63. Each of these may have a portion such as 64 extended downwardly and normally having a bearing as at 65 on the portion 4 of the fuse, in which position the two leaves 62 and 63 are extended outwardly in face to face relation. They may be so held by a clamp, which, as shown, comprises a U-shaped piece 66 having one side pivoted as at 67 to the outer face of one of the handle leaves as 63, the remainder of the clamp 66 extending into mating perforations 68 in the two leaves so that when swung outwardly the sides of the clamp member 66 will engage on the outer faces of the two handle leaves above the perforation 68 and hold these leaves together. By swinging the clamp downwardly, as shown by the dotted line position in Figure 9, the two leaves may be unclamped from each other, whereupon they may be folded down into the dotted line position shown in Figure 10. This clamp presents a convex rounded surface to the fingers when pulling the fuse.

In Figures 11 and 12 still another construction is shown in which, however, there is no provision for collapsing the handle. As shown a wrapping strip 70 which partially surrounds the fuse portion 4 has its ends folded back on itself to form the longitudinally extending tongues 71. The handle member comprises a strip 72 folded together on itself to form a rounded hollow finger grip portion 73, the two sides of this member being secured together as by the rivets 74. Beneath the finger grip 73 the material may be cut out to permit the finger to pass beneath inwardly of the grip portion. The free ends of this strip are spread apart and their extreme edges in-turned as at 75 to form portions which may be engaged between the tongues 71 and the body of the strip 70, these parts being assembled by a relative motion thereof lengthwise of the fuse.

In Figures 13 to 15 a holder is shown suitable for application to a fuse of the plug type. The

fuse is indicated as a whole at **80** and is provided with a head **81** supporting a window portion **82** through which the fuse element **83** within the plug may be viewed to determine whether or not the fuse has been blown. Just beneath the head **81** it is shown as provided in its side with one or more flats as **84**. A strip of fiber board or other suitable material indicated at **85** is apertured so that the fuse plug may be passed down therethrough, this aperture having a flat side to mate each of the flats on the fuse, thus to prevent turning of the fuse within the aperture. The strip **85** is then brought up on opposite sides along the outer face of the head **81** and its end portions are then brought together over the upper face of this head, and then bent upwardly in face to face relation as at **86**. These facing portions are then secured together, and for this purpose a U-shaped clamp **88** is shown having an extension **89** pivoted at **90** to one end portion of the strip **85** and constructed to be engaged over both of the portions **86**, as shown in Figures 13 and 14, thus to hold the strip **85** in position in clamping engagement with the fuse. If desired the clamp may be held permanently as by using a second rivet as at **91**. The portion of the strip **85** overlying the window is preferably cut away as shown at **92** so as to permit inspection of the fuse through the window in the usual manner. The clamp **88**, together with the portions **86** of the strip, forms a handle for engagement by the fingers and by which the fuse may be rotated to remove or replace it in its threaded socket as is well known in the art. The use of a holder such as has been described in connection with fuses of the plug type is of particular advantage where the window is composed of mica or the like and where it is held on by a metal ferrule, since the holder may be made of insulating material such as fiberboard, or the like, which will protect the fingers from contact with the metal ferrules which occasionally are subject to electrical potential.

Figures 16 and 17 show a further manner of detachably securing a holder to a fuse by means of headed fasteners **16** engageable in slots **17** in the handle side portion, the fasteners being inserted through the large ends of the slots and then moved into the narrow portion to secure the parts together.

In Figure 18 is shown a further form of collapsible or folding handle. The cartridge fuse **1** is surrounded by the band **100**, the ends of which are secured together as by the rivet **101**. This rivet also passes through a slot **102** of a U-shaped handle member **103**. Normally the handle member **103** lies as shown in full lines in this figure, but by grasping either of the arms **104**, the handle may be pulled outwardly, for example, as shown in the dotted line in this figure, whereupon the outwardly positioned arm acts as a grasping portion to aid in removing the fuse. The fuse amperage may also conveniently be stamped on the handle member as on one or both arms **104**.

In all the constructions hereinbefore described it is an easy matter to mark the capacity of the fuse by impressing suitable characters into the holder material either in the wrapping strip, the handle portion, or the clamp as may be desired, and this may be done before the holder is applied to the fuse so that there is no danger of damaging the fuse in any way by placing such a mark. Heretofore it has been the practice to apply such marks to a cartridge type fuse by applying thereto a sticker having the desired information thereon or by impressing the characters into the metal conductive ends of the fuse. The stickers often become detached in service and there is often sufficient corrosion of the metal end portions to render the impressed markings illegible. By impressing the marking in a part of the holder itself, which is preferably of fiber or leatherboard or similar insulating material, neither of these difficulties is encountered.

From the foregoing description of certain embodiments of this invention, it should be evident to those skilled in the art that various other modifications and changes might be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. A fuse holder, comprising a strip of sheet material having wrapping engagement with a portion of a fuse, and a part carried by said strip and spaced from said fuse and presenting a convex rounded side face of sheet material for engagement by the fingers.

2. A fuse holder, comprising a strip of sheet material for wrapping engagement with a portion of a fuse, and a part of insulating sheet material carried by said strip and having a curved portion forming a convexedly curved finger-engaging surface.

3. A fuse holder, comprising a strip of sheet material for wrapping engagement with a portion of a fuse, and a handle portion movably carried by said strip.

4. A fuse holder, comprising a strip of sheet material for wrapping engagement with a portion of a fuse, and a sheet material handle member having portions for engagement with opposite end portions of said strip.

5. A fuse holder, comprising a strip of sheet material for wrapping engagement with a portion of a fuse, and a sheet material handle member having portions for movable engagement with opposite end portions of said strip.

6. A fuse holder, comprising a strip of sheet material for wrapping engagement with a portion of a fuse, and a sheet material handle member having portions for engagement with opposite end portions of said strip, said handle member presenting a convex rounded face for engagement by the fingers.

7. A fuse holder, comprising a strip of sheet material for wrapping engagement with a portion of a fuse and with its end portions in face to face relation, and a U-shaped keeper pivoted to one of said portions and movable into or out of clamping engagement with the other of said portions.

8. A device of the class described, comprising a strip of sheet material for wrapping engagement with a portion of a fuse and having spaced tongues extending therefrom, and a handle portion slidably engaging said tongues.

9. A device of the class described, comprising a strip of sheet material for wrapping engagement with a portion of a fuse and having spaced tongues extending therefrom, and a handle portion comprising a pair of leaves hinged together at one end and slidably engaging said tongues.

10. In combination with a fuse of the plug type having a head at its outer end and a flat beneath said head, of a strip of sheet material apertured to receive said fuse therethrough beneath said head and having a portion for engaging said flat and preventing turning of said fuse in said aperture, said strip being folded over said head and having its end portions brought together there-

over, and means for securing said end portions together.

11. In combination with a fuse of the plug type having a head provided with a window portion at its outer end and a flat beneath said head, of a strip of sheet material apertured to receive said fuse therethrough beneath said head and having a portion for engaging said flat and preventing turning of said fuse in said aperture, said strip being folded over said head and having its end portions brought together thereover, and means for securing said portions together, said strip being apertured at said window portion to permit inspection of the fuse therethrough.

12. In combination with a fuse of the plug type having a head at its outer end and a flat beneath said head, of a strip of sheet material apertured to receive said fuse therethrough beneath said head and having a portion for engaging said flat and preventing turning of said fuse in said aperture, said strip being folded over said head and having its end portions brought together thereover, and clamping means for detachably securing said end portions together.

13. A fuse holder comprising a part for engagement with a fuse, and a member movably carried by said part to extend therefrom for convenient grasping by the fingers or to be retracted close to said fuse.

14. A fuse holder comprising a part adapted to engage a portion of a fuse, and having portions securable together to retain such engagement, and a part movable with respect to such part portions and acting in at least one position to secure said part portions together.

15. A handle for fuses of the type described comprising, a band of insulating material for encircling the body member of the fuse, the ends of said band bent outwardly from said body member, a handle secured to said ends and extending lengthwise with the body of the fuse, and the handle pivoted to the said ends so that it may be extended from and folded against the body member.

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