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INSULATING GUARD

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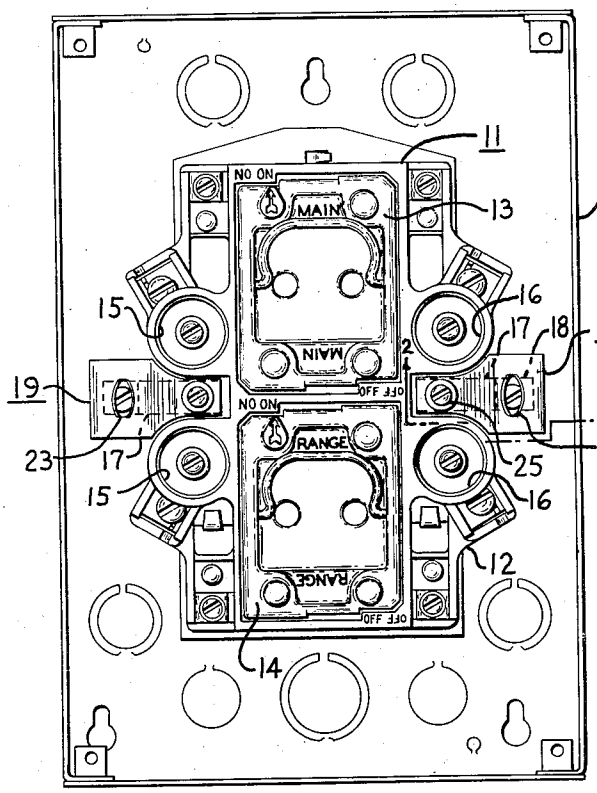


Fig. 1

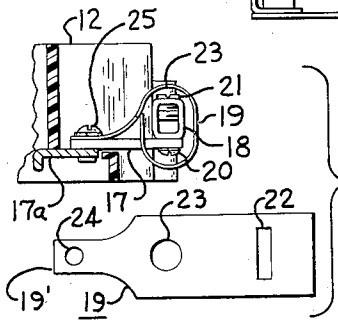


Fig. 2

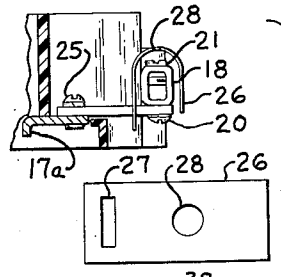


Fig. 3

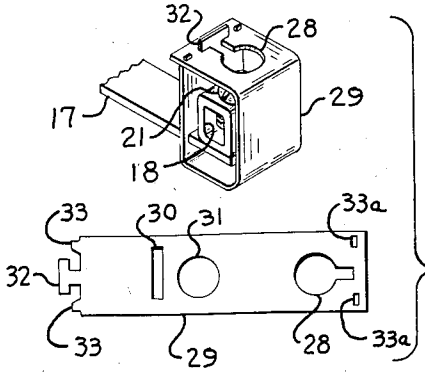


Fig. 4

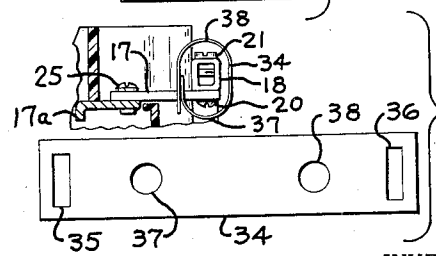


Fig. 5

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INSULATING GUARD

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6 Claims. (Cl. 174—138)

Our invention relates to an insulating guard for insulating exposed conductive portions of an electrical device and, more particularly, to an insulating guard for insulating and protecting exposed terminal portions carried by an electrical device and having a pressure-type connector or solderless lug mounted thereon.

Electrical devices intended for use in residential and industrial buildings in connection with the electrical service equipment are required to be mounted and enclosed in a metallic outer enclosure or box. Electrical connection is made to such devices by means of conductors or cables brought through the side or back wall of such enclosure and thence to terminal means carried by the device. In order to facilitate connection of such cables or wires to the device when mounted in the box, a spacing is provided between the device and the corresponding sides of the side walls of the metallic enclosure, this space customarily being referred to as a "wiring gutter" or wiring space. For safety purposes it is required by regulating authorities that any conducting part projecting from the body of the electrical device into the wiring gutter shall be protected by adequate insulating barriers to prevent the accidental touching of the conductive part by a person's hand, by tools, or by any of the wiring. Accordingly, prior art devices have, for instance, utilized protective barriers made integral with the insulating body of the electrical device. Such integral barriers, being ordinarily of molded insulating material, have been found to be subject to breakage, especially since they are in an area where they are likely to be accidentally struck by a screw driver or other tool used in mounting the device or in making connections thereto. Such integral barriers also increase the cost of the basic device. In addition such integral barriers are rigid and render access to the terminal connector means which they are intended to protect relatively difficult.

One object of our invention is to provide an insulating guard for projecting terminal portions of an electrical device which shall be rugged, effective and not easily damaged.

Another object of our invention is to provide such an insulating guard which is simple in construction and inexpensive to manufacture.

It is a further object of our invention to provide an insulating guard which has a portion thereof readily movable to facilitate access to the terminal connector which it protects and which it shields.

In accordance with our invention in one form, we provide a strip of relatively thin, flexible insulating material having an aperture adjacent one end by which it is fitted over a terminal strap between the body of an electrical device and a terminal connector carried thereon, so that the strip is trapped between the connector and the device body, the strip having an intermediate portion extending over the terminal connector and also shielding the end of the terminal strap, and an aperture in the said intermediate portion affording access to the connector when the strip is in mounted position.

In accordance with another embodiment of our invention, the end of the strip opposite from the first-mentioned end is releasably anchored with respect to the device body.

Further objects and advantages of our invention will become apparent as the following description proceeds and the novel features which characterize our invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of our invention reference may be had to the accompanying drawing in which:

Figure 1 is a view of an electrical device incorporating a protective guard made in accordance with our invention and shown mounted in an outer enclosure.

Figure 2 is a view taken on the line 2—2 of Figure 1 of the protective insulating guard of Figure 1.

Figure 3 is a view similar to Figure 2 of an alternative construction of our invention.

Figure 4 is a view in perspective of another embodiment of our invention.

Figure 5 is a view similar to Figure 2 of a further embodiment of our invention.

Referring now to Figures 1 and 2 of the drawings, we have shown our invention as incorporated in an electrical apparatus comprising a generally rectangular metallic enclosing box 10 having mounted therein an electrical switch of the "fuse-puller" type, indicated generally at 11. The detailed construction of the fuse-puller switch 11 is not critical to the use of the present invention, and will be only briefly described here. The switch 11 comprises a generally rectangular insulating body 12 having two enlarged recesses therein containing removable fuse-carrying caps 13 and 14 and each carrying contacts adapted to make an electric circuit when the cap is inserted and to break the circuit when the cap is removed. The switch 11 further has on opposite sides thereof pairs of sockets 15 and 16 for the reception of "plug" type fuses connected electrically in series with the fuses carried by at least one of the caps 13 and 14. For the purpose of connecting the switch 11 in a circuit, it is provided with oppositely directed terminal straps 17 rigidly connected to a conductive portion 17*a* of the switch 11 by means of screw 25 and having mounted on the outer end thereof a pressure-type or "solderless" terminal connector 18.

The switch 11 is substantially smaller than the interior of the box 10, whereby a peripheral spacing or "wiring gutter" is provided for the purpose of receiving wires or cables for connection to the device and to branch circuits to be protected thereby. The terminal strap 17 projects outwardly from the insulating body 12 of the switch 11 and the connector 18 is positioned in the wiring gutter mentioned.

For the purpose of shielding and protecting the solderless connector 18, we provide an insulating guard indicated generally at 19. As shown particularly in Figure 2, the insulating guard 19 comprises an elongated strip of relatively flexible and tough insulating material, preferably of treated cellulosic material such as "vulcanized fiber."

The solderless connector 18 is retained in place on the terminal strap 17 by means of a screw 20 extending upwardly through the bottom of the strap 17 into a threaded aperture in the bottom wall of the connector 18. The connector 18 also is provided with a clamping screw 21 threadedly engaged in the top wall thereof, whereby a conductor inserted through the open end of the rectangular connector 18 may be clamped against the bottom wall thereof by the clamping screw 21.

The insulating guard 19 is provided with a rectangular aperture 22 at one end thereof, a generally circular aperture 23 intermediate the ends thereof, and a circular aperture 24 at the opposite end thereof.

The assembly of the insulating guard on the terminal

strap 19 is accomplished as follows: Prior to the assembly of the solderless connector 18 on the strap 17, the insulating guard is slid onto the strap 17, the strap extending through the opening 22. The solderless connector is next attached to the strap 17 by means of the screw 20. The opposite end 19' of the insulating guard is then brought around and over the top of the solderless connector 18 and finally clamped or anchored to the electrical device by means of the retaining screw 25. After this initial assembly at the factory, the insulating guard ordinarily need not be disturbed by the user. If it is desired to replace the connector 18, however, it is possible for the user to remove screw 25 and unwrap the strip shield, exposing the connector. In using the device, a conductor is inserted through one of the open ends thereof within the connector 18, and the screw 21 is then clamped down on the conductor by a screw driver inserted through the aperture 23. It will be observed that the insulating guard effectively shields the connector 18 from accidental contact with other wires lying in the wiring gutter.

In Figure 3 we have shown a simplified construction of our invention in which the shield 26 has a rectangular aperture 27 in one end thereof and has the other end thereof bent over the connector 18 and provided with an aperture 28 positioned generally over the top of the connector 18.

In Figure 4 we have shown a further embodiment of our invention in which the shield 29 is provided with a rectangular aperture 30 and an intermediate aperture 31 affording access to a connector-retaining screw 20. The free end of the guard 29 is adapted to be locked to the opposite end by means of a releasable engagement between the T-shaped portion 32 and the portion of the shield adjacent the slotted portion 28' of the aperture 28. In addition, further locking action is obtained by the projections 33 at one end being received in openings 33*a* at the other end.

Figure 5 shows another embodiment of our invention in which the shield 34 is provided with two rectangular apertures 35 and 36 adjacent the ends thereof, and holes 37 and 38 intermediate the retangular apertures. This form is assembled by first bending the shield into a closed loop with the ends overlapping, and with the apertures 37 and 38 in alignment. The looped shield is slid over the strap 17 before the lug 18 is mounted. The lug 18 is then placed within the looped shield on the strap 17 and the screw 20 is inserted therein through the hole 37, fastening the lug to the strap. Access is afforded to the screw 21 through the aperture 38, as in the other forms.

While we have described our invention in a number of preferred embodiments thereof many modifications may be made, and we intend in the following claims to cover all such modifications as fall within the true spirit and scope of our invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, an electrical device having a body of insulating material, an electrical terminal strap mounted on said device and projecting therefrom, a terminal connector mounted on the projecting portion of said terminal strap and including a clamping screw, a guard of insulating material for said terminal connector and said projecting portion of said terminal strap comprising an elongated strip of relatively wide thin flexible insulating material having an aperture at one end thereof through which said terminal strap extends, the said end being located between said insulating body and said terminal connector whereby said end is trapped in place on said strap, said guard having an intermediate portion extending over said terminal connector and over the end of said terminal strap remote from said device, and an aperture in said intermediate portion affording access to the said clamping screw of said terminal connector when said guard is in mounted position.

2. In combination, an electrical device having a body of insulating material an electrical terminal strap portion projecting therefrom, a terminal connector mounted on said projecting portion, a guard of insulating material for said terminal connector comprising an elongated strip of relatively wide thin flexible insulating material having an aperture at one end thereof through which said terminal strap extends, the said end being located adjacent said insulating body and between said insulating body and the terminal connector, the intermediate portion of said strip extending around the end of the terminal strap remote from said device and over the terminal connector, means anchoring the other end of said insulating guard normally stationary with respect to the body of said device, and an aperture in the said intermediate portion of said guard providing access to said connector.

3. A guard of insulating material for insulating and protecting a terminal connector mounted on the projecting end of a terminal strap, comprising a strip of relatively thin flexible insulating material having a first apertured portion fitting over said terminal strap and having an intermediate portion extending around and over said projecting end of said terminal strap and over said terminal connector and an aperture in said intermediate portion of said insulating guard providing access to said terminal connector, and releasable interengaging means for releasably attaching the ends of said insulating guard to each other.

4. A guard of insulating material for insulating and protecting a terminal connector mounted on the projecting end of a terminal strap by releasable fastening means, comprising a strip of relatively thin flexible insulating material having apertured end portions, the said strip being formed to encircle said connector with said strap extending through both of said apertured end portions, and a pair of opposed apertures in the intermediate portion of said strip, one of said apertures affording access to said connector at one side and the other of said apertures affording access to said releasable fastening means at the other.

5. In combination, an electrical device having a body of insulating material, an electrical terminal strap mounted on said device and projecting therefrom, a terminal connector mounted on the projecting portion of said terminal strap and including a clamping screw, a guard of insulating material for said terminal connector and said projecting portion of said terminal strap comprising an elongated strip of relatively wide thin flexible insulating material having an aperture at one end thereof through which said terminal strap extends, the said end being located between said insulating body and said terminal connector whereby said end is trapped in place on said strap, said guard having an intermediate portion extending over said terminal connector and over the end of said terminal strap remote from said device, and an aperture in said intermediate portion affording access to the said clamping screw of said terminal connector when said guard is in mounted position, and means for releasably anchoring the end of said strip opposite said one end with respect to said electrical device.

6. An insulated terminal assembly comprising a conductive terminal strap, a terminal connector including a clamping screw, a mounting screw releasably retaining said connector on said strap, a strip of relatively thin insulating material carried by said strap and encircling said connector, an aperture in said strip affording access to said clamping screw and a second aperture in said strip affording access to said mounting screw when said strip is in mounted position.

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