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CLIP INSULATOR

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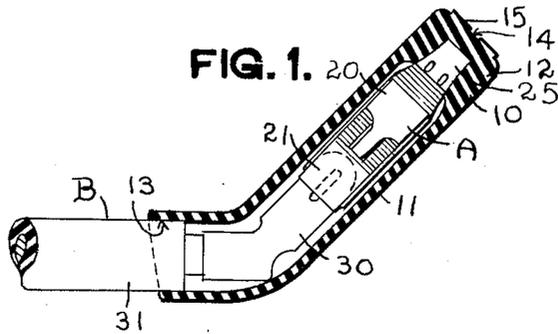


FIG. 2.

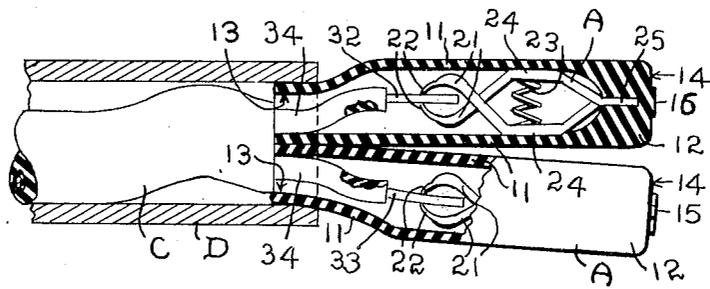


FIG. 3.

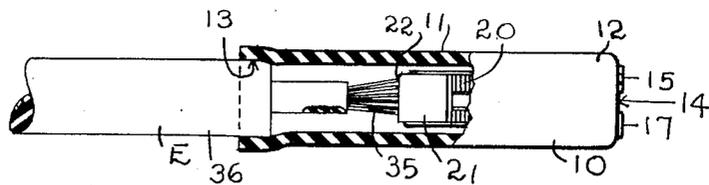
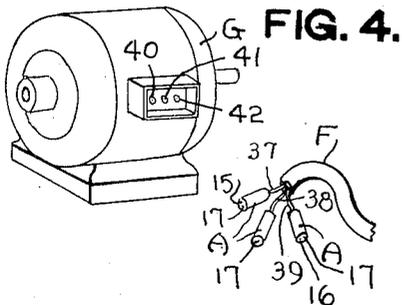


FIG. 6.

FIG. 5.



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CLIP INSULATOR

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3 Claims. (Cl. 173—28)

This invention relates to electrical devices and more particularly to clips for insulating the terminals of electrical conductors.

The principal object of the invention is to provide a clip insulator which is adapted to be placed over the uninsulated portion of a conductor terminal, whether the latter be of a conventional shape or otherwise, and will firmly grip the terminal and surround it in an electrical insulating relationship.

Another object is to provide a clip insulator for conductor terminals which insulator may be held in an insulating position, not only by the clip which forms a part thereof, but by portions of the conductor itself.

Still another important object is to provide clip insulators of the class described, which may be employed in groups, so as to insulate selectively various known terminals, when the latter are temporarily detached from their posts or other connections, so that the terminals will be properly designated and may be reattached to their correct posts.

Another object is to provide a clip insulator of the class described, in which the clip itself is recessed within the insulator but may be easily manipulated by pressure upon the wall of the insulator.

Yet another object is to provide a clip insulator which is adapted to grip and insulate fine stranded wires as readily as it grips and insulates single wire conductors.

Other objects and advantages of the invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawing, forming a part of this specification and in which drawing:—

Figure 1 is a longitudinal section of the novel clip insulator attached to a terminal.

Figure 2 is a longitudinal section and a partial longitudinal section of two of the clips, each attached to a conductor wire.

Figure 3 is a view, partly in longitudinal section, of one of the novel clips attached to a stranded wire conductor.

Figure 4 is a view showing how three of the novel clips may be employed.

Figures 5 and 6 are end views of two of the novel clip insulators.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the letter A may designate the novel clip insulator which is

shown, by way of illustration, attached to a conductor terminal B, two terminals of the conductor C protruding from a conduit D, a stranded terminal E, and to a three-wire conductor F associated with electrical apparatus G.

The novel clip insulator A includes a thimble or sheath 10 of a flexible dielectric material such as soft rubber, having a substantially cylindrical side wall 11, an end wall 12 and a mouth 13 at its end opposite the end wall 12. With this construction, a chamber is provided extending longitudinally of the thimble from its mouth 13 to the end wall 12. It will be noted in Figures 1 and 2 that this end wall 12 is preferably thicker than the wall 11 and that it is closed at its outer face 14 but may be provided on this face 14 with various indicia, such as those indicated at 15, 16, and 17, for a purpose later brought out in detail.

With one end carried by, embedded or molded into the end wall 12, there is provided a suitable clip element, designated generally as 20. This clip element 20 may include a pair of opposite jaws 21 having teeth 22, the jaws being held normally in a closed or biting position, as by an expansion coil spring 23. The jaws are, preferably, of springy metal and include a pair of relatively broad finger pieces 24 upon the under surface of which the coil spring bears. At the ends of the jaws opposite the teeth 22, the former are joined together in any approved manner and the clip element terminates, beyond this point of juncture, in a tongue or anchor 25 which projects into the end wall 12 but terminates well short of its face 14 being, as stated above, embedded or molded therein. As will be seen in Figure 2, the finger pieces 24 are, preferably, close adjacent the cylindrical wall 11, so that pressure upon the outer face of the cylindrical wall 11, at certain points opposite each other, will cause the flexible dielectric material to give and the jaws will, thereupon, open.

A very important feature of this invention is the provision of the clip well recessed within the thimble 10. That is, the teeth 22 and jaws 21 which, of course, face towards the mouth 13, are spaced well inwardly of this mouth, since it would defeat some of the objects of this invention to place the teeth 22 near or flush with the mouth 13 or with the jaws 21 projecting outwardly from the mouth 13. For example, the teeth 22 should be spaced at least one inch inwardly of the mouth 13 and, in many cases, this spacing may be greater for the purposes of the invention.

Now as for the indicia designated at 15, 16, and 17. Preferably, the indicia are molded as a part of the thimble 10 so that the material extends outwardly beyond the face 14. The indicia may be the well known electrical positive and negative symbols as indicated at 15 and 16 respectively, or/and they may be numerals, as designated at 17. For example, the novel clips may be provided in sets of six, numbered from 1 to 6, and, in addition, two of these also may be provided with the positive symbol 15 and two with the negative symbol 16, the remaining two being left without indicia other than numerals, as designated at 17. By placing these indicia in this position and raised as designated, the general thickness of the end wall 12 is increased so that the anchor 25 may extend farther into the wall 12 and yet not work its way outwardly of the face 14.

There are at least two important objects in extending the sheath or thimble 10 well beyond the gripping end of the jaws 21. In the first place, the exposed (unsheathed) end of the conductor is wholly covered or electrically insulated and, in the second place, the cylindrical wall 11 of the thimble aids in holding the thimble in place since it normally grips the sheath portion of the conductor near the exposed end, as shown in Figures 1, 2, and 3, and thus steadies or braces the device.

In Figure 1, which shows a top plan view of the gripping means, the thimble is distorted so that it will insulate the exposed angular portion 30 of the conductor B and will extend about and grip the insulated or sheathed portion 31 of this conductor.

Figure 2, which illustrates a side elevation of the gripping means of the novel clip insulator, discloses two of the same, clipped to the two wire terminals 32 and 33 of the insulated conductor C which latter extends through the conduit D, the free ends of the flexible thimbles 10 being stuffed into the pipe and about the inner insulation layer 34 of the conductor C.

In Figure 3, the fine wire strands 35 of the conductor E are gripped by the gripping means while the thimble, in turn, grips and extends about the insulated sheath 36 of the conductor E.

Figure 4 shows application of three of the novel clip insulators A for temporarily insulating and indicating the terminals 37, 38 and 39 of the conductor F, leading to binding posts 40, 41 and 42 respectively of a piece of electrical apparatus G, such as a motor. In detaching such terminals from their respective binding posts, it is necessary to indicate by some means which is the particular terminal to be reattached to binding post 40, which to be reattached to binding post 41, and which to be reattached to binding post 42 so that, when repairs or the like are made and the electrician is ready to reattach the terminals, he will know, by observing the numerals or symbols at the end of the clip insulator, just where the respective terminals should be reattached. Thus, not only do the clip insulators A insulate the exposed terminals so that damage from fire, short circuit and the like, as well as injury from shock are obviated but the clip terminals also provide the

additional function of indicating to the electrician the particular function of each terminal.

Not only is the novel clip insulator A adapted for gripping a single terminal of considerable gauge, but it will also readily grip stranded wires of small gauge, and permit such wires to be spread in a fan-like formation within the chamber of the clip insulator.

Various changes may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In a terminal insulator, adapted to insulate terminals of fine stranded wires, a sheath of flexible dielectric material having an imperforate end and an open end, and terminal gripping means within said sheath, including a pair of jaws each having teeth at one end of said jaws and an anchor at the opposite end of said jaws, said anchor comprising a substantially flat tongue and being firmly embedded in said material at the imperforate end of said sheath, whereby said clip is rendered substantially immovable longitudinally of said sheath, said teeth and said jaws being spaced well inwardly of said open end, with said teeth nearest said open end.

2. In a terminal insulator, adapted to insulate terminals comprising fine stranded wires, a sheath of flexible dielectric material having a substantially cylindrical side wall, an end wall and a mouth opposite said end wall, said end wall being closed and of greater thickness than said side wall, indicia extending outwardly beyond said end wall, whereby the thickness of portions of said end wall is increased, and terminal gripping means within said sheath including a pair of jaws movable transversely of said sheath each having terminal grippers at one end and an anchor at the opposite end of said jaws, said anchor being firmly embedded in said material at the closed end of said sheath, whereby said clip is rendered substantially immovable longitudinally of said sheath, said grippers and said jaws being spaced well inwardly of said open end with said grippers nearest said open end and said jaws being provided with flattened portions normally in contact with the inner face of said cylindrical side wall.

3. In a spring clip electric insulator for electrical conductors, a thimble having a side wall of stretchable and flexible dielectric material terminating at one end in a mouth and terminating at the other end in an imperforate end wall, said end wall being provided with indicia thereon, facing outwardly, said side wall being stretchable so that it will extend about a conductor greater in circumference than the circumference of said mouth, and electrical conductor terminal gripping means anchored within said thimble against longitudinal movement therein, with said terminal gripping means spaced well inwardly of said mouth, and including jaws provided with teeth facing said mouth and a tongue extending away from said jaws and toward said indicia, said tongue being imbedded within said imperforate end wall.

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