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SLEEVE TYPE JOINT PROTECTOR

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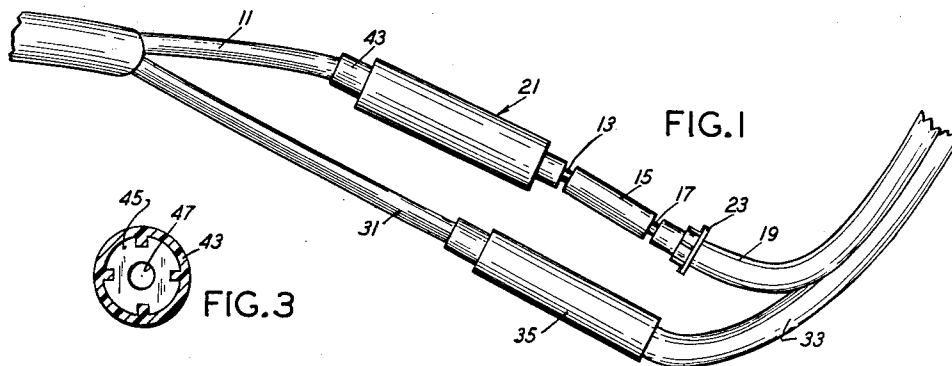
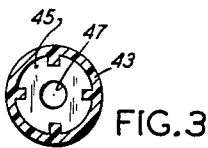
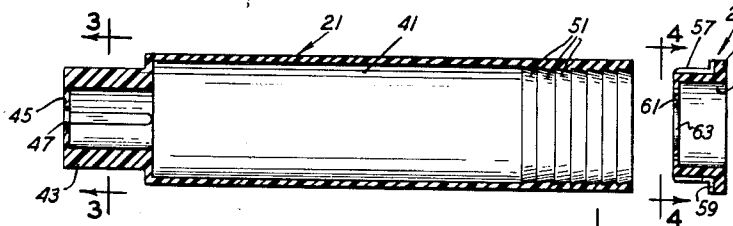
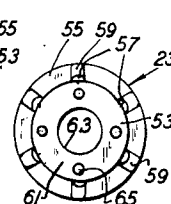
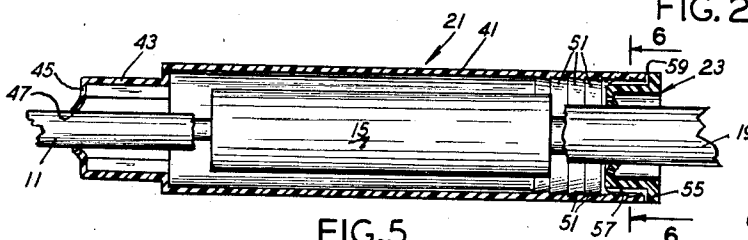
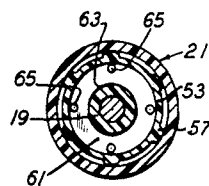
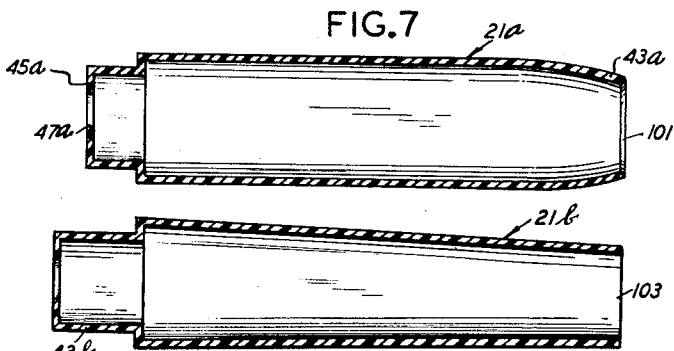


FIG. 8

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## SLEEVE TYPE JOINT PROTECTOR

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1 Claim. (Cl. 174-93)

This invention relates to sleeve type joint protectors for spliced joints in electrical conductors or cables, and particularly to such joints which are arranged in an inclined or vertical position so that one end of the joint is higher than the other. For convenience in description, the term "cable" will be used with reference to any insulated, covered electrical conductor.

A main object of the present invention is to provide a sleeve type joint protector which is designed to fit over a spliced joint in a pair of cables to protect the joint against exposure and yet enable air to circulate over the joint to dry it out in the event it becomes wet.

Another main object of the invention is to provide such a protector which shields the joint from moisture and the elements, and yet enables any moisture that might condense on the joint to drain out or dry out.

A still further object of the invention is to provide such a protector designed to fit different size cable.

Another object of the invention is to provide such a protector comprising two parts, a main part having an upper end designed to fit snugly in sealing relationship on the insulation of one cable and having a lower end provided with drainage means to allow water to drain out of the protector and also to allow air to circulate around the joint.

Another object of the invention is to provide such a protector having both ends designed to fit snugly on the two cables and yet which protector is designed to enable drainage of moisture from within the protector and also to enable circulation of air around the joint.

Various other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 shows a cable assembly including sleeve protectors of the present invention;

Fig. 2 is a longitudinal sectional view of a protector of the invention;

Fig. 3 is a transverse sectional view taken along line 3-3 of Fig. 2;

Fig. 4 is an end view taken in the direction of the arrows 4-4 in Fig. 2;

Fig. 5 is a longitudinal sectional view of the protector shown in Fig. 2 mounted on a pair of cables to protect a compression joint between the cables;

Fig. 6 is a sectional view taken along line 6-6 of Fig. 5;

Fig. 7 is a longitudinal sectional view of a modified protector; and

Fig. 8 is a longitudinal sectional view of a still further modified form of protector.

### General description

Referring to the drawings, and particularly to Fig. 1, a small cable 11 having a bare portion 13 is connected by a compression member 15 to the bare portion 17 of a larger cable 19. A two part sleeve type joint protector is provided for the joint and includes a main elongated tubular member or sleeve 21 and a cap or bottom cover 23. The sleeve 21 in Fig. 1 is disposed in uncovering

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relation to the compression member 15, but is designed to be moved downwardly to frictionally fit on the cap 23 as is best shown in Fig. 5 to protect the joint.

Fig. 1 also shows a second small cable 31 and a second large cable 33 which are connected together by a compression member, not shown, but which is covered by a sleeve type joint protector 35 which is identical to the sleeve 21 of the first mentioned protector. No cap is utilized in this particular arrangement, since in some installations it is possible to get by without using the cap. In other installations, however, particularly where it is very damp, it has been found necessary to use the cap 23.

### Detailed description

The sleeve protector 21, 23 is designed to have the left-hand end of the sleeve 21 disposed at a level above that of the cap 23, and therefore the left-hand end of the sleeve 21 may be called or referred to as the upper end of the sleeve and the opposite end as the lower end, although the sleeve is shown in a horizontal position in Figs. 2 and 5. In use, the sleeve will not be positioned in a horizontal plane but will be disposed in an inclined or vertical position.

The sleeve 21 is molded of a flexible, elastomeric material having a main portion 41 of uniform circular cross section throughout, and a smaller end portion 43 having a flexible end wall 45. This end wall was formed with a central hole 47 of a size smaller than that of the cable 11 so that the edges of the end wall defining the hole 47 fits snugly on the insulation of the cable when the sleeve is arranged in protecting relationship with respect to the compression member 15. The extension of the smaller end of the sleeve to the left or upwardly, assures that the end wall 45 will engage the insulation on the cable 11 rather than the bare portion, in the event that the removal of insulation from the end of the cable is excessive.

The smaller end portion 43 has inwardly projecting longitudinally extending integral lugs which perform a centering function and also stiffen the walls of the small end of the sleeve 21.

As is apparent from Fig. 5, the main portion is substantially larger than the compression member 15 so that an annular space is provided around the compression member so that no water or moisture is trapped in the upper or left-hand end of the protector.

The lower or right-hand end of the sleeve 21 is formed interiorly with a plurality of grooves providing annular ribs 51 for a purpose to be described.

The cap 23 includes a cylindrical portion 53 having a flange 55 at its right-hand end extending outwardly from the cylindrical portion. A plurality of longitudinally extending ribs 57 are integrally formed on the cylindrical portion 53, and these ribs also include radially extending portions 59 to abut against the lower or right-hand end of the sleeve 21 to space such end from the flange 55. This means that when the cap is forced into the right-hand end of the sleeve 21, longitudinally extending spaces are provided between the cylindrical portion 53 of the cap and the inner wall of the sleeve 21. These longitudinally extending spaces communicate with radially extending spaces provided by the spacing of the ends of the sleeve 21 from the flange 55, this being caused by the lugs 59. Thus, water which happens to collect in the sleeve 21 can readily drain out of the protector, and thereafter air can enter to dry out the interior of the protector and also dry out the joints.

The cap 23 has a flexible end wall 61 formed with a central hole 63 of lesser size than the insulation of the cable 19 to provide a snug fit of the end wall on the cable insulation. This snug fit holds the cap 23 in position while the joint between the cables is being formed and

also tends to hold the cap against separation from the sleeve 21 when the cap is forced into the lower or right-hand end of the sleeve. The snug fit of the end wall of the sleeve 21 performs a similar function, and in addition prevents water trickling down the cable 11 from entering the sleeve.

The end wall 61 is also provided with a plurality of drain ports 65 circumferentially spaced around the hole 63 as best shown in Fig. 6, to provide for the exit of water and the exit and ingress of air.

In most installations, it is contemplated that the protector for a joint 15 will provide both a sleeve 21 and a cap 23. However, in some installations, it has been found possible to get along with only the sleeve 21.

With the protector of the present invention, a complete roof has been provided over the compression member 15 to prevent the entrance of water to the compression member. However, the protectors are designed to permit the drainage and drying out of any moisture that might accumulate at the compression connection, whether the protector is installed with or without a self-draining bottom cover or cap 23. Thus the possibility of electrolysis and hydrolysis is essentially eliminated. It is no longer necessary for the user or installer to concern himself as to whether or not the protector is absorbing, leaking or condensing moisture and trapping it. Also, heating of the electrical connection is reduced since cooling air is allowed to circulate between the sleeve and the compression member. Also, the protector will prohibit the inhibitor in the joint from weathering, thus assuring long life. In addition, the protector of the invention will prevent siphoning of water into a meter socket.

It is apparent that the protector of the invention allows for easy installation and will appreciably reduce the cost of properly covering the compression member. As mentioned previously, one size protector will accommodate several sizes of insulated conductors or cables. Also, one size protector will also accommodate several sizes of compression members. In the event that the protector happens to be applied improperly, it will still allow drainage of any water which might leak into the sleeve. While the protector has been shown applied to a solid conductor, it can be applied to bare stranded conductors as well.

Fig. 7 shows a modified form of sleeve 21a which has a reduced portion 43a provided with an end wall 45a formed with an opening 47a. The right or lower end of the sleeve 21a begins to taper near the end thereof to a smaller diameter as shown at 101. This provides

a better fit of the right-hand end of the sleeve on the cable in the event that the cap is not utilized.

Fig. 8 shows a further modified form of the invention in which the sleeve 21b tapers relatively uniformly from its left-hand end to its right-hand end except for the reduced portion 43b. This provides a smaller end 103 for more nearly fitting the size of the cable 19.

Having described the invention in what is considered to be the preferred embodiment thereof, it is desired that it be understood that the invention is not to be limited other than by the provisions of the following claim.

I claim:

A sleeve protector comprising an elongated tubular sleeve member to fit over a compression member which joins the bare portions of a pair of cables, one end of the sleeve member having a snug fit with one of the cables, an end closure having a cylindrical portion frictionally fitting within the other end of the sleeve member, said cylindrical portion having an inwardly extending flexible flange defining an opening, said flange snugly fitting on the second cable, said end closure having an outwardly extending radial portion for disposition next to the end face of said other end of said sleeve member, said cylindrical portion of said end closure having axially extending ribs thereon for engaging the sleeve member and defining a plurality of axially extending channels, the outwardly extending radial portion of said enclosure having radial ribs aligned with the axial ribs and forming radial channels which form continuations of the axial channels whereby water in the interior of the sleeve member may drain through said channels and be discharged from said sleeve member.

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