Nov. 24, 1970 L. A. JOHNSON ET AL 3,542,942

HIGH VOLTAGE CABLE TERMINATION

Filed Sept. 25, 1969

FIG. 1

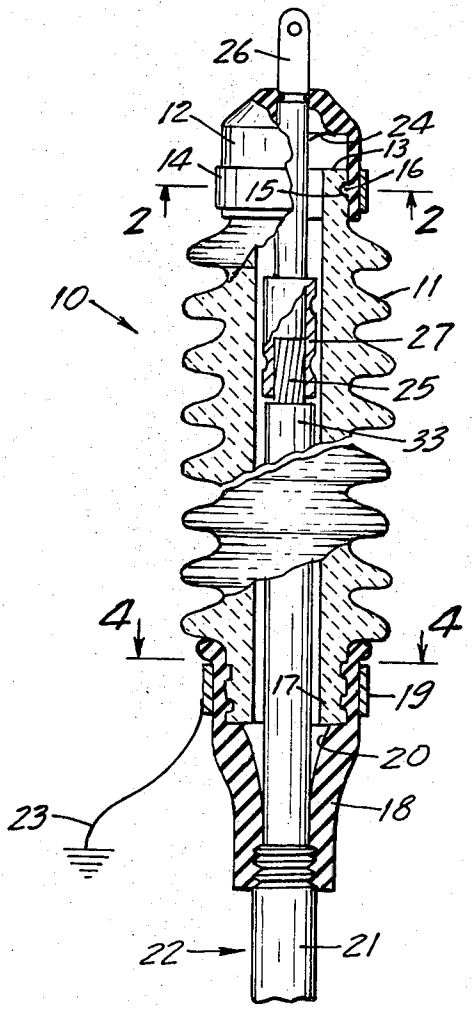


FIG. 2

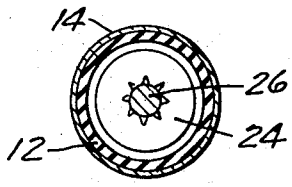


FIG. 3

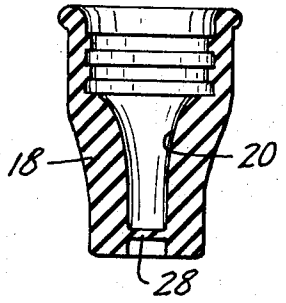
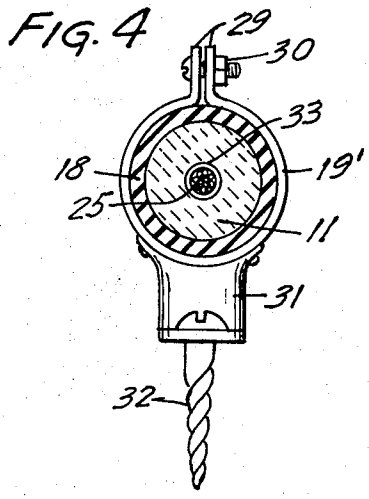


FIG. 4



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HIGH VOLTAGE CABLE TERMINATION

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7 Claims

ABSTRACT OF THE DISCLOSURE

An effective outdoor terminal of simple and economical structure for high voltage electrical cables, consisting of an elongate porcelain tube with close-fitting conical semiconductive rubbery end caps encircled by conductive flashover bands, the whole being provided with a filling of an insulating grease.

This invention relates to terminators for high voltage electrical cable having a conductive sheath. The terminator combines a highly insulative and track-resistant elongate ceramic tube forming the body of the device with semiconductive elastic end caps for axially supporting the tube on the conductor. The device therefore combines high insulative qualities with ease of assembly and application, and with economy of construction.

In the drawing,

FIG. 1 is a view in elevation and largely in cross section of a preferred form of terminator as applied to a high voltage cable end,

FIG. 2 is a section taken at line 2—2 of FIG. 1,

FIG. 3 is a vertical section of the lower end cap of the device of FIG. 1 prior to installation, and

FIG. 4 is a section taken approximately at line 4—4 of FIG. 1 of a portion of a structure similar to that of FIG. 1 but including an alternative form of encircling band and support.

The terminator **10** of FIG. 1 includes an insulative externally annularly corrugated and grooved elongate porcelain ceramic tube **11** serving as the body of the device. Semiconductive rubbery cap **12** fits over the upper end of the body **11** and around the constricted neck portion **13**, being held in place both by its natural resiliency and by an encircling metal retaining band **14**, the latter serving also as a flashover band to prevent localized concentration within the semiconductive cap of any excessive voltages. The neck **13** is externally grooved to form a narrow annular groove **15**, and the cap **12** is preferably correspondingly annularly internally ridged, the ridge **16** fitting within the groove **15**. A similar groove and ridge construction is illustrated at the small end of the cap **12**. "Nordel" conductive ethylene-propylene terpolymer is an effective material of construction for such caps.

The lower end of the body **11** similarly terminates in a doubly annularly grooved neck **17** over which is applied a conical semiconductive elastic cap **18** of Nordel conductive polymer held in place by a retaining ring **19**. The inner surface **20** of the thickened lower portion of the cone **18** has a stress cone configuration and is grounded to the conductive sheath **21** of the cable **22** and preferably also through the ring **19** to an external ground **23** as shown.

The interior of the structure is preferably partially filled with a thixotropic insulating grease, in a quantity sufficient substantially to fill all voids remaining after insertion of a cable end. Although such greases do not ordinarily flow under normal ambient and handling conditions, it is usually desirable to seal the ends of the terminator structure prior to installation, to prevent both loss of grease and entry of dirt or other contamination. Ordinarily removable plub seals may be used, but the incorporation within the cap members of puncturable diaphragm retaining elements offers a number of advantages and is preferred. The diaphragms retain the grease under all ordinary conditions during storage and handling prior to installation, but are easily punctured and displaced by insertion of the conductor elements. A residual portion of such a diaphragm is shown in FIGS. 1 and 2 as fragment **24**.

The typical installation of FIG. 1 shows the cable **22** from which a terminal portion of insulation **33** has been removed to expose the conductor **25**. Permanent contact with a terminally pierced connector element **26** is made through an intermediate compression or crimping sleeve **27**, and the assembly is then pushed into and through the terminator **10** as shown. The end cap **18** fits tightly about and provides conductive contact with the sheath **21**, and the cap **12** similarly fits tightly about the element **26**. The grease contained within the assembly serves to fill most of the voids otherwise present and to assure water resistant connections at both ends. The conductor **25** and element **26** are firmly held at the axis of the tube **11** and of the entire structure.

FIG. 3 shows the structure of the lower cap **18** prior to assembly on the tube **11** and cable **21**, and in particular illustrates the location of diaphragm **28**. This item is inset slightly from the smaller extremity of the cap for convenience in inserting the conductor **26**, but sufficiently away from the surface **20** of the stress cone area to avoid undesirable electrical effects at that area.

Where the band **19** is shown as a continuous band in FIGS. 1 and 2, and must therefore be driven over the cap **12**, the band **19'** encircling the cap **18** is illustrated in FIG. 4 to be in the form of an adjustable clamp member having outturned ends **29** secured together by means of a bolt **30**. Additionally, the ring **19'** is supported on a bracket member **31** which may be attached to a pole or other supporting structure, e.g., by screw **32**.

What is claimed is as follows:

1. A high voltage cable terminator assembly comprising an insulative exteriorly annularly corrugated and glazed elongate ceramic tube having at each end a generally conical semiconductive rubbery cap having a larger end, encircling the end of said tube and being in turn encircled with a metal retaining band, and an open smaller end for fitting closely about a high voltage line component.

2. The assembly of claim **1** containing a quantity of thixotropic insulative grease.

3. The assembly of claim **2** including a grease-retaining diaphragm within each of said end caps.

4. The assembly of claim **1** wherein the one of said end caps which is to be placed over the cable-end has a stress cone configuration.

5. The assembly of claim **4** wherein the metal band

encircling the cap having the stress cone configuration serves as a component of a supporting bracket for said terminator.

6. The assembly of claim 4 in position on a terminal of a high voltage cable enclosed within a conductive sheath, wherein the cap having the stress cone configuration is disposed over the cable sheath and the band encircling said cap is grounded.

7. The assembly of claim 6 wherein said band serves as a component of a supporting bracket.

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U.S. Cl. X.R.

174—76, 77, 80, 140