

United States Patent

Langella

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[54] **INSULATOR WITH CONDUCTOR
PIERCING CLAMP FOR INSULATED
CABLE**

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[51] Int. Cl.H01b 17/16

[58] Field of Search174/2, 140 R, 168, 169, 172,
174/145; 24/81 KK, 135 N; 339/95 R, 95 D, 96, 97
R, 263 R, 263 L, 264 L

[56] **References Cited**

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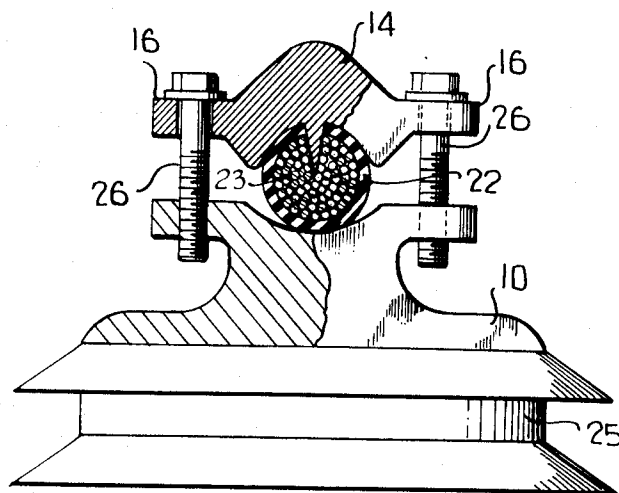
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[57] **ABSTRACT**

A clamp for securing an insulated or covered cable to a pole insulator. The clamp has provision for piercing the insulation of the cable and thereby directly connecting the clamp to the conductor of the cable, averting radio frequency discharges between the conductor and the clamp.

2 Claims, 7 Drawing Figures



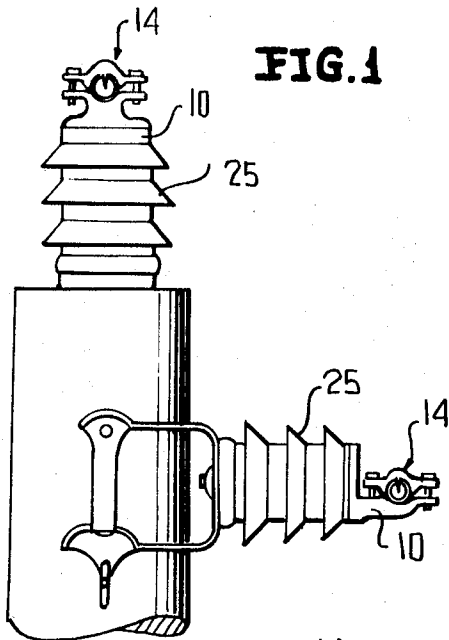


FIG. 1

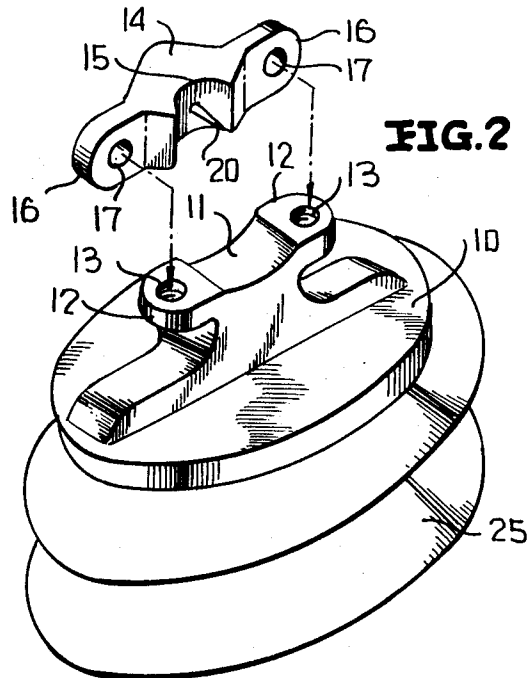


FIG. 2

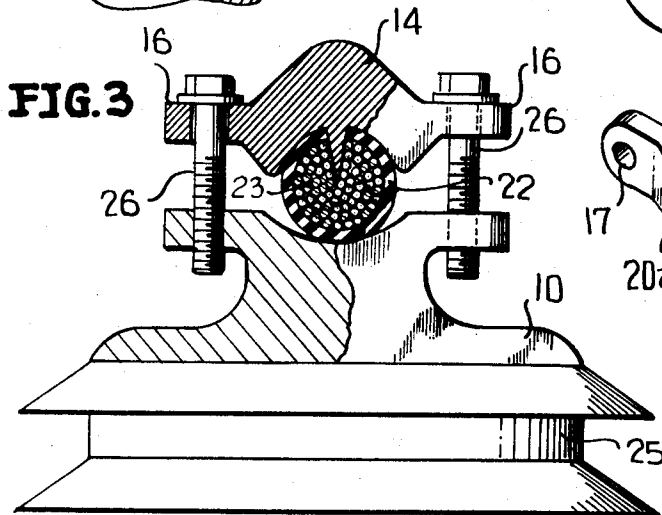


FIG. 3

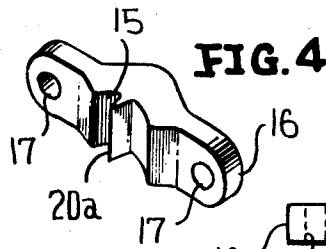


FIG. 4

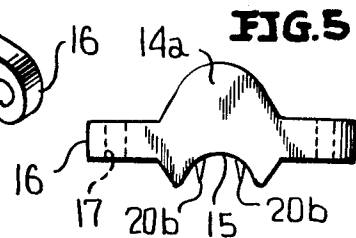


FIG. 5

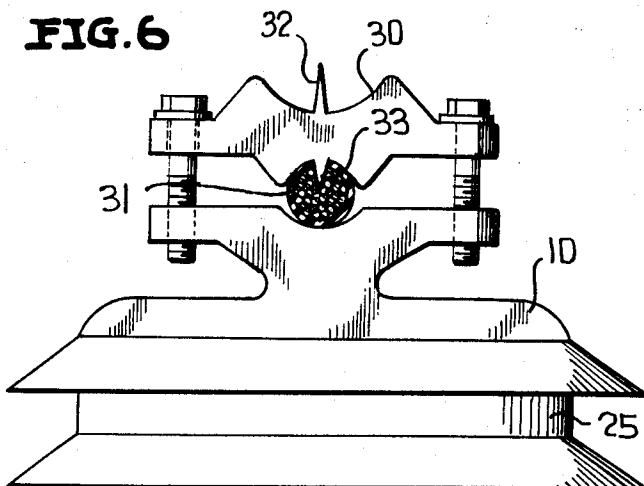


FIG. 6

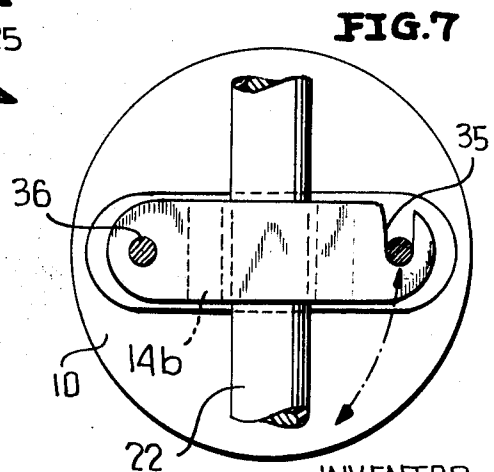


FIG. 7

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INSULATOR WITH CONDUCTOR PIERCING CLAMP FOR INSULATED CABLE

BACKGROUND

It is well known to provide a clamp for an insulated or covered cable with a piercing element which connects the conductor of the cable to the clamp. The clamp is then connected to an external circuit. A typical United States patent showing such a structure is Strock U.S. Pat. No. 3,146,053. The present invention concerns a metallic clamp for clamping an insulated or covered cable to a clamp top or saddle of a pole insulator and penetrating the insulation or covering of the cable to directly connect the clamp to the conductor of the cable. When a clamp secures a covered or insulated cable to a pole insulator, in usual practice, the conductor of the cable taken with the clamp forms a capacitor, across which voltages and arcs can develop when the cable is energized at line voltage. This capacitor, when insulation or covering breaks down, acts like an antenna and radiates an rf signal which produces wide-band radio frequency interference covering the AM, FM, and TV bands. The possibility of generating arcs is removed when the clamp and cable conductor are joined and brought to the same potential. The clamp is not utilized as a connector, as in the prior art; but in the present invention, the clamp performs an extra function, precisely because it is connected electrically to the cable conductor and brought to the same potential as the conductor, i.e., it provides freedom from rf and TV interference.

The piercing clamp further avoids insulation breakdown should lightning strike the line either by direct stroke or by induction.

It is known to bare an insulated cable where it is clamped between a keeper and saddle or clamp top of an insulator to achieve absence of rf and TV interference; but this is a difficult and costly thing to do, especially in the case of large cables. According to the present invention, the act of clamping the cable between the keeper and saddle, in and of itself, achieves the same function as does baring the conductor by stripping the insulation before clamping. To assure that the piercing element or piercing tooth makes firm contact with the conductor, it is relatively long in a sense taken transversely of the saddle. In the case of a stranded cable, the tooth works its way between the strands, producing a wide area contact.

SUMMARY

A system for securing an insulated cable between a clamp consisting of a saddle and a keeper wherein the keeper includes a tooth projecting into the cable into contact with the conductor to eliminate radio and TV interference due to corona discharges between the conductor and the clamp.

DESCRIPTION OF DRAWINGS

FIG. 1 is a view of a clamp according to the invention securing a cable to an insulator;

FIG. 2 is a view in perspective of the clamp consisting of a saddle and keeper, according to the invention, mounted on a pole insulator;

FIG. 3 is a view in transverse section showing the clamped cable;

FIG. 4 is a view in perspective of a keeper having a single wide tooth;

FIG. 5 is a view in side elevation showing a two toothed keeper;

FIG. 6 is an end view, partly in section, generally like the clamp of FIG. 3, but having provision for clamping two cables of different diameters; and

FIG. 7 is a top view primarily of a modification of the system of FIG. 6.

DETAILED DESCRIPTION

In FIGS. 1 to 3, 10 is a metallic saddle or clamp top having a central arcuate cable receptor depression 11 and having two

wings 12 through which extend threaded apertures 13. A metallic keeper 14 is provided with a central cable receptor depression 15 and two wings 16 through which extend apertures 17, mating with the apertures 13. Extending downwardly from the depression 15 is a knife-like tooth 20, thin but strong, which may be elongated in a sense transversely of the width of the keeper, as at 20a of FIG. 4, and a length orthogonally of the depression 15 sufficient to enable piercing the insulation or cover 22 of an insulated or covered cable and making contact with the conductor 23 of the cable.

The saddle or clamp top 10 is secured to or supported by a pole insulator 25, shown broadly in that the precise mode of supporting the saddle is not of the essence of the invention. The insulator assembly may be a trunnion, universal, clamp top, or any other suitable type.

In FIG. 3 is shown the keeper and saddle of FIG. 1, pulled together by means of bolts 26, showing how the tooth 20 extends through the cable insulation and into a stranded conductor. The tooth is capable of displacing some of the strands of the cable and making positive electrical contact with the body of the conductor between the strands so as to form a low-resistance, wide-area connection to the conductor. Solid conductor cable could also be used with satisfactory results. With solid conductors the tooth edge will mate against the conductor surface thereby establishing electrical contact.

The tooth can be integral with the keeper, but may also be bolted thereto or threadedly engaged therewith or affixed in some other suitable manner. The tooth then assists in holding the wire firmly, reducing cable slippage, which is particularly important with large size cables, or in hilly installations, or in exposure to snow, wind, and ice, or tree contact with the cable, or on impact of autos against the cable carrying poles.

The concave cable receptors can be shaped to generally conform to the shape and size of the cable. Any displaced insulation and strands all remain within the clamped confines of the insulating jacket of the cable. Thereby a tight seal is formed at the entry point of the tooth into the cable which is waterproof, preventing entry of moisture into the cable, and thus preventing electrolytic action between the copper of the cable and the material of the clamp which may be aluminum alloy, for example. The clamp, according to the present invention, also prevents deterioration of cable insulation or cover due to lightning which in seeking a path to ground could burn through the insulating jacket of the cable.

Various forms of the present invention are useful. While it is seemingly desirable to provide a form of toothed keeper as in FIG. 6 (32 and 33) having two cable depressions for different size cables, its use might create corona discharges from the unused tooth, 32. This construction could be suitable in installations of generally lower voltages.

FIG. 7 illustrates a form of keeper 14b in which one slot 35 and one circular aperture 36 are provided to accept securing bolts (not shown).

FIG. 4 illustrates a device like that of FIG. 1 in which the tooth 20a extends wholly across the keeper or saddle, and FIG. 5 shows a keeper 14a employing two teeth 20b, both of which pierce the insulation or cover and make contact with the conductor of the cable. The tooth or teeth may be located either in the keeper or the saddle or both, although the illustrations are of teeth secured to the keepers. The teeth may be cast integrally with the keepers or rendered integral by being bolted thereto, or affixed in some other suitable manner.

FIG. 6 shows a device like that of FIG. 1 which is two sided, having provision for two teeth 32, 33, which extend in opposite senses from cable receptor depressions 30, 31, respectively, which are of diverse depths and radii of curvature, to fit cables of different diameters. Correspondingly, the teeth 32, 33 may be of different lengths.

What is claimed is:

1. A clamp for securing an insulated cable to a pole insulator in insulated relation to a pole, said clamp consisting of a rigid metallic one piece saddle secured to said insulator, said saddle having a cable receptor area conforming to the shape

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of a cable, a rigid metallic one piece keeper having at least one cable receptor area conforming arcuately generally to the shape of a cable, said receptor areas being all less than semicircular, each of said keeper and said saddle including wings extending outwardly on either side of said receptor areas and well spaced apart at facing surfaces when a cable is installed, metallic bolt means clamping said keeper wings to said saddle wings, and at least one tooth extending radially of

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one of said cable receptor areas and shaped and sized to pierce the insulation or cover of a cable sufficiently to mate well within the conductor of a cable, said at least one tooth being integral with one of said keeper and saddle.

2. The combination according to claim 1, wherein said at least one cable receptor is two cable receptors having diverse areas designed to conform to cables of diverse diameters.

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