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[56]

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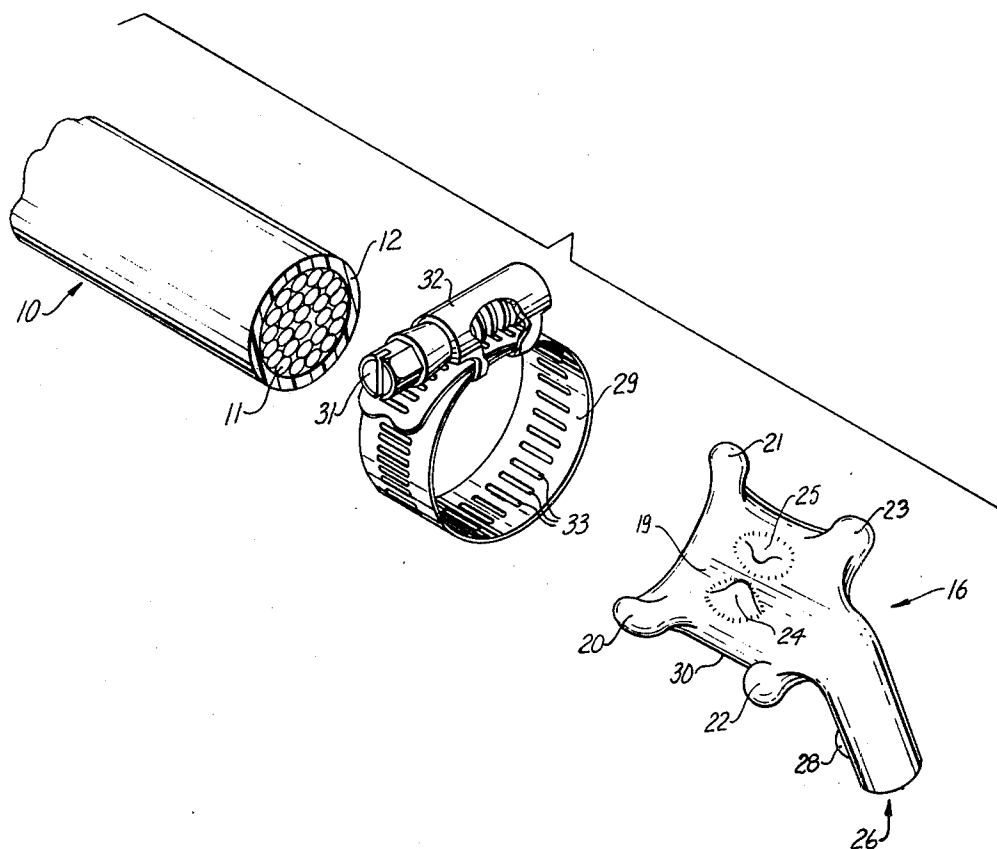
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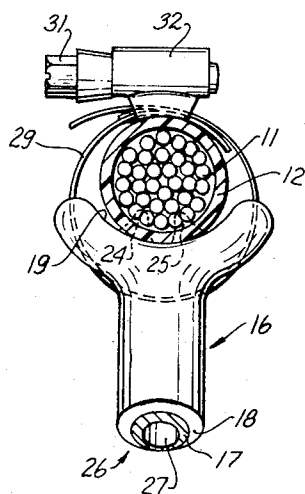
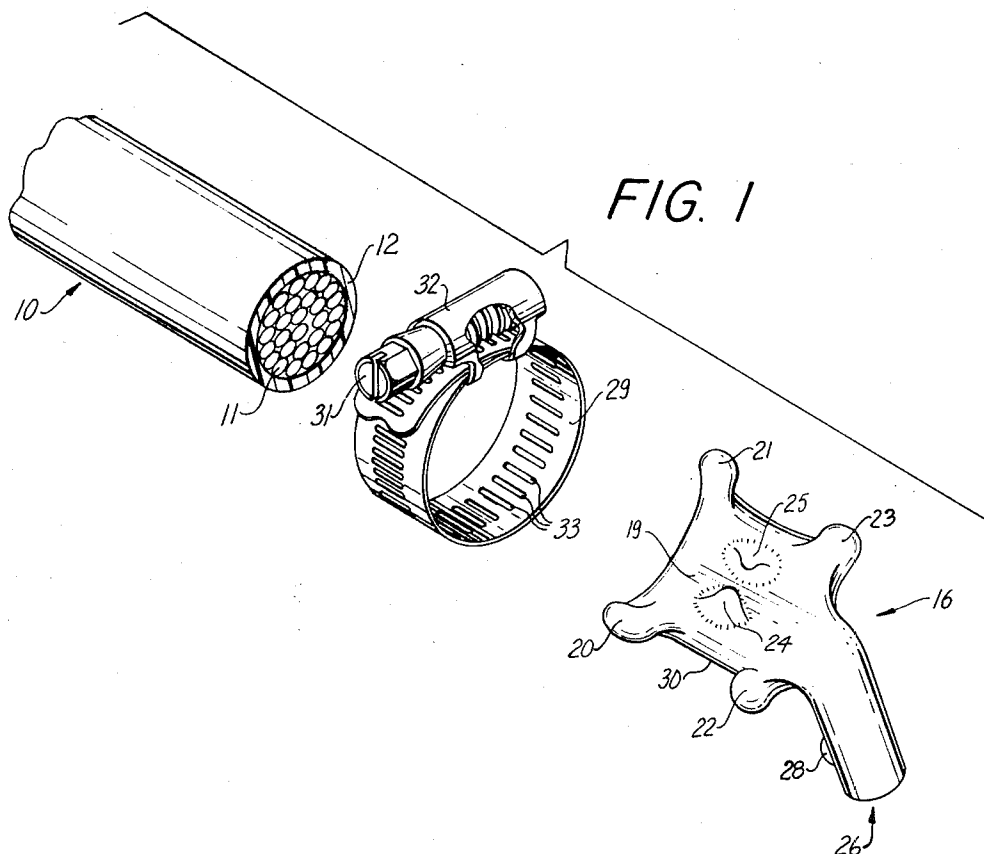
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[54] **UNDERGROUND CABLE TAP CONNECTOR**
7 Claims, 4 Drawing Figs.

[52] U.S. Cl. **339/97R,**
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[51] Int. Cl. **H01r 7/04**
[50] Field of Search. **339/95-**
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ABSTRACT: A tap for connecting a line to a cable in an underground application without removing the insulation from the cable and which will provide a moistureproof seal at the point of connection of the tap to the cable.





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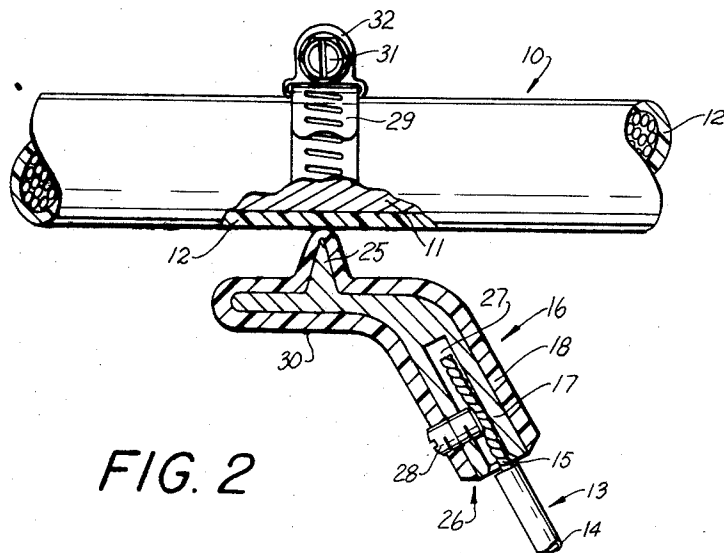


FIG. 2

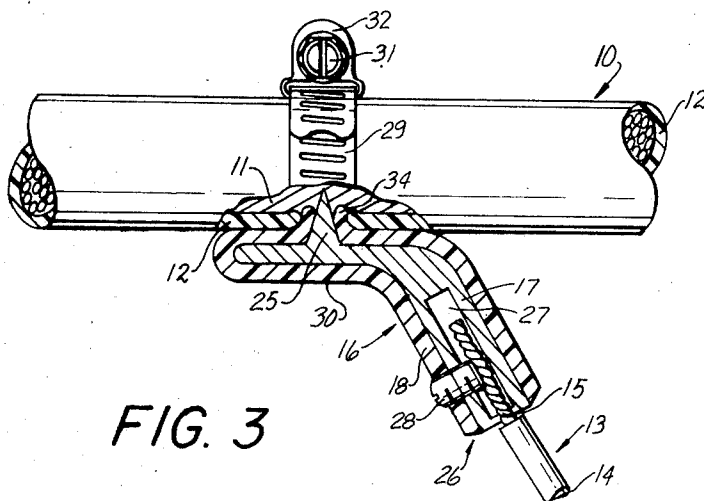


FIG. 3

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UNDERGROUND CABLE TAP CONNECTOR

BACKGROUND OF THE INVENTION

It has become highly desirable to bury electrical transmission cables underground. ASsemblies for such underground applications, whether they be connectors or taps, must be specifically designed with this underground use in view. In "direct burial" applications where the connection of electrical wires and the tap is made and left without benefit of enclosure in a vault, the connector or tap used must be moistureproof and provide its own sealing.

SUMMARY OF THE INVENTION

A tap for connecting a line to a cable in which the tap includes an electrically conducting body portion, a piercing point formed on the body portion, an insulation coating covering the tap, pressure means for pressing the cable and tap together and the piercing point through the insulation coating and the insulation of the cable to provide a firm mechanical and electrical connection between the cable and the tap with the insulation coating of the tap surrounding the piercing point embedded thereby in the insulation of the cable and a cavity formed in the body portion for receiving an end of the line.

DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, FIG. 1 is a perspective exploded view of a tap construction in accordance with this invention, a cable to which the tap is to be connected and the clamp pressure means used;

FIG. 2 is a sectional view of the tap shown in FIG. 1 about to be applied to the cable with portions of the cable and clamp cut away;

FIG. 3 is a view similar to FIG. 2 with the tap applied to the cable; and

FIG. 4 is an end view of the tap applied to the cable in the manner shown in FIG. 3 with the cable shown in section.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The cable which is to be tapped is indicated in the FIGS. by the numeral 10 and consists of electrically conducting strands 11 covered by insulation 12. The insulation is of the type commonly used in underground installations such as rubber, plastics and paper.

The tap line is indicated in the FIGS. by the numeral 13 and includes its own insulation 14 around conductor 15.

The tap is indicated by the numeral 16 and consists of a body portion 17 formed of an electrically conductive material covered by an insulation coating 18. The tap has an arcuate first surface 19 and gripping members 20, 21, 22 and 23 projecting from the tap substantially in the arc of the first surface. Two piercing points 24 and 25 respectively are formed on the first surface projecting radially away therefrom in the same plane. A neck 26 of said tap projects at an angle from the plane of the first surface and a cylindrical cavity 27 is formed therein to receive the bared conductor 15 at the end of tap line 13 which is fastened therein by screw 28.

A pressure means is provided by a hose clamp consisting of strap 29 embracing second surface 30 of tap 16 on the opposite side of first surface 19 and screw 31 in housing 32 attached to the strap. The projections 20, 21, 22 and 23 form a saddle for strap 29.

In use, the tap 16 is placed with points 25 and 26, which initially have insulation covering, adjacent the insulation of cable 10 at the point where the connection or tap is to be made. The strap 29 is wrapped around surface 30 and the cable with the end of the strap inserted within housing 32 of the clamp means. The strap is provided with a series of openings or slots 33 throughout its length within which the threads of screw 31 can project so that upon turning of screw 31 the diameter of

the circle of the strap is decreased pressing the cable 10 and tap 16 together and the piercing points 24 and 25 through the insulation coating 18 and the insulation 12 of the cable to provide a firm mechanical and electrical connection between the cable and the tap since the piercing points become embedded in the conducting members 11 of the cable as the first surface 19 embraces the cable surface. The insulation 18 is of any suitable material which flows under pressure and through which the points can pierce such as rubber, plastics, paper, plastisol or other elastomer and as the piercing points project through the insulation 18 and the first surface is pressed against the cable insulation, the insulating coating of the tap surrounding the piercing points becomes embedded in the insulation of the cable such as indicated by the numeral 34 in FIG. 3, to provide a firm moistureproof seal at the point of electrical engagement of the tap and the cable. This has been accomplished without stripping or baring any portion of the cable prior to the making of the connection. In other words, as the points pierce, a sealing gasket is created which embeds in the insulation 12 of the cable.

The tap line can then be inserted within cavity 27 and maintained therein by fastening of screw 28 and a suitable insulation for moisture provided such as the utilization of a heat shrink tube or through use of tape.

Under certain applications it may be found desirable to apply the tap line prior to making the connection of tap and cable.

Although the invention has been described in terms of a single tap line, it is clear that the unit could be multiple and provision made in the body of the tap through the utilization of additional cavities in the body to receive the ends of additional tap lines.

Thus among others, the several objects of the invention are achieved obviously. Numerous changes might be resorted to without departing from the spirit of the invention.

I claim:

1. A tap for connecting a line to a cable in which said tap includes an electrically conducting body portion, a piercing point formed on said body portion, an insulation coating covering said tap, pressure means for pressing said cable and said tap together and said piercing point through said insulation coating and the insulation of said cable to provide a firm mechanical and electrical connection between said cable and said tap with the insulation coating of said tap surrounding said piercing point embedded thereby in the insulation of said cable, and a cavity formed in said body portion for receiving an end of said line.

2. A tap for connecting a line to a cable in accordance with claim 1 in which a first surface of said body portion is arcuate to embrace said cable and said piercing point is provided thereon.

3. A tap for connecting a line to a cable in accordance with claim 2 in which gripping members project from said tap substantially in the arc of said first surface.

4. A tap for connecting a line to a cable in accordance with claim 3 in which two piercing points are formed on said first surface projecting radially away therefrom in the same plane.

5. A tap for connecting a line to a cable in accordance with claim 2 in which a second surface is provided on said tap on the opposite side thereof as said first surface and said pressure means includes a circular strap provided to surround said tap and said cable and embrace said second surface and means are provided to decrease the diameter of the circle of said strap.

6. A tap for connecting a line to a cable in accordance with claim 5 in which gripping members project from said tap substantially in the arc of said first surface forming a saddle for said strap.

7. A tap for connecting a line to a cable in accordance with claim 6 in which a neck of said body portion projects at an angle from the plane of said first surface and said cavity is formed therein.