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R. I. MARKEY

2,306,821

DISCONNECT PLUG

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2 Sheets-Sheet 2

FIG. 5

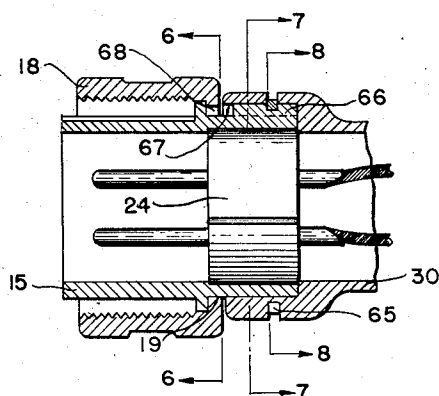


FIG. 6

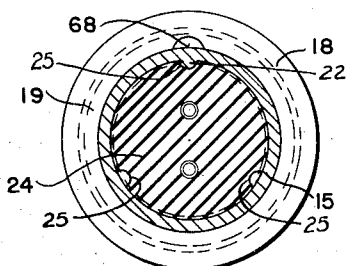


FIG. 7

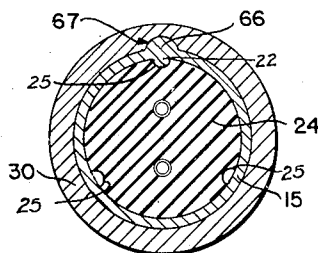


FIG. 6

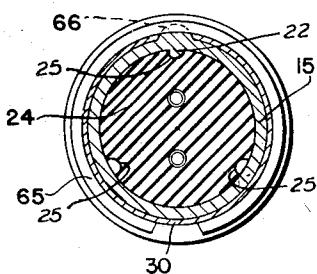
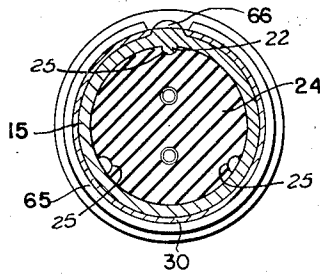


FIG. 9



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DISCONNECT PLUG

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4 Claims. (Cl. 173—328)

The invention relates to disconnect plugs.

Plugs of this type are used when it is desirable to provide a separable connection between two cables each carrying a plurality of electric connecting wires or between one such cable and a stationary member.

The principal object of the present invention is to provide a disconnect plug of extreme simplicity so that it readily lends itself to economies of manufacture and ease of assembly. Another object is to provide a plug in which the possibility of short circuiting will be practically eliminated. Another object is to provide a plug which may be easily and quickly taken apart for inspection purposes.

Other objects and advantages will become apparent as this specification proceeds. Referring to the drawings forming a part thereof:

Fig. 1 is a longitudinal sectional view;

Figs. 2 and 3 are cross-sectional views taken on the lines 2—2 and 3—3, respectively, of Fig. 1;

Fig. 4 is an elevational view partly in section of a slightly modified form.

Fig. 5 is a fragmentary longitudinal section of another modified form; and

Figs. 6, 7, and 8 are cross-sectional views taken on the lines 6—6, 7—7, and 8—8 of Fig. 5; and

Fig. 9 is a cross-sectional view taken on line 8—8 of Fig. 5 with the locking ring moved to the disassembling position.

Referring again to the drawings and particularly to Figs. 1 to 3 the reference numeral 10 designates that part of the disconnect plug which may be secured to a cable or conduit 11. The associated part, indicated generally by the reference numeral 12 might be secured to a wall or switchboard panel or to another cable.

The plug proper 10 comprises a tubular shell 15 having a longitudinally extending groove 16 at what might be termed its open end when assembled with its associated parts. At the end of the groove 16 an annular flange 17 is formed on the shell.

The flange 17 acts as a shoulder to limit the forward movement of a freely rotatable nut 18 which has an inwardly extending flange 19 to co-operate with the flange 17. The nut has knurled portions 21 to facilitate its being rotated. Obviously the nut is positioned on the shell before the other parts of the plug are assembled.

The rear portion of the shell has a longitudinally extending bead 22 on its inside surface and this bead extends inwardly as far as a shoulder 23. An insert 24 of plastic insulating material has a plurality of grooves 25 one of which engages the bead 22. The shoulder 23 acts as a stop to properly position the insert 24 which is a snug fit in the shell and is prevented from any rotation by the bead and groove.

A plurality of contact pins 26 are molded into

the insert 24. Any number of these pins may be used, only two being illustrated for sake of simplicity. The forward ends of the pins extend into the open space defined by the forward part of the shell and co-operate with suitable openings in the member 12, hereinafter described. The rear ends of the pins are secured to electrical connections 27 carried by the cable 11.

A housing 30 is mounted on and secured to the rear end of the shell 15. The housing 30 has an enlargement on its forward end in which is formed a shoulder 31. The shoulder 31 butts up against the rear end of the sleeve 15 and also is in contact with the rear peripheral edge of the insert 24. Thus the insert is positively held against any longitudinal movement by virtue of its being confined between the shoulder 31 on the housing 30 and the shoulder 23 on the shell 15.

Means are provided for securing the housing 30 to the shell 15 so as to prevent any rotational movement between these members. The shell is provided with an aperture 32 and the housing has a notch 33 which intersects an annular groove 34. An open locking ring 35 is sprung into the groove 34 and a toe 36 on one end of the locking ring is entered into the notch 33 and aperture 32. The end of the notch 33 is slanted off as indicated at 37 so as to permit the ready entrance of a suitable tool if it is desired to remove the locking ring for separation of the parts.

The rear end of the housing is enlarged and is exteriorly threaded for the reception of a retaining nut 40. The enlarged end of the housing and the end of the retaining nut form what might be termed a V-shaped opening in which is confined a ring or washer 41 formed of a resilient material. The openings in the end of the nut and the housing are approximately the same diameter as the cable 11 and it will be apparent that as the nut 40 is drawn up the washer 41 will be pressed against the cable with sufficient pressure to prevent any possibility of the cable turning in relation to the housing and at the same time will not harm the cable.

From the foregoing it will be evident that a simple efficient plug has been provided. The parts are economical to manufacture and may be assembled with the greatest of ease. There is no possibility of the parts turning in relation to each other and this is of great importance particularly where the cable and plug are carrying five or six connections such as is often the case. The turning of the cable in relation to the housing or the turning of the housing in relation to the shell will cause short circuits in the electric connections which is both serious and annoying. Another advantage resides in the fact of the plug being adapted to be quickly disassembled for inspection purposes. All one has to do is to loosen the nut 40 and remove the locking ring 35. The

parts may then be slid back on the cable and the electric connections are all exposed.

As illustrated the member 12 comprises a body portion 50 which carries an insert 51 of insulating material. The body portion 50 is exteriorly threaded at 52 for engagement with the threads on the nut 18. A bead 53 is formed on the inner side of the neck part of the body portion and this bead engages the groove 16 when the parts 10 and 12 are being put together. The nut 18 being free to rotate and the parts 10 and 12 being held against rotation, obviously the turning of the nut will draw the parts together.

Referring to Fig. 4, the construction is quite similar to that heretofore described and like parts will bear like reference numerals. In this form the housing 30 may be brazed to member 60 carrying the electrical connections. The locking ring 35 in addition to securing the housing 30 and shell 15 together and preventing rotational movement of these parts in relation to each other functions to prevent the freely rotatable nut 18 from undue rearward movement.

The housing 30 has an annular flange 61 on its forward end which abuts the flange 17 on the shell 15. The shell 15 has an inwardly extending flange 62 on its forward end and the insert 24 is confined between this flange and the shoulder 31 of the shell.

In Figures 5 to 9 similar parts bear similar reference numerals. In this form the locking ring 65 does not have a toe and functions only to prevent longitudinal movement or separation of the shell 15 and housing 30.

In order to prevent rotational movement between the shell and housing the shell is provided with a bead 66 which engages a groove 67 in the housing. To permit of assembly the flange 19 of the nut 18 has a notch 68 cut into it as shown in Figures 5 and 6 and this notch allows the nut to pass over the bead 66.

The locking ring 65 has open ends and is held in position by friction. When it is desired to separate the shell and housing for inspection purposes the locking ring is moved to the position of Fig. 9 so that the bead 66 is between the open ends of the locking ring, in which position the housing may be slid off the shell. The remaining parts being the same as described in connection with Figs. 1, 2 and 3, it is thought no further description is necessary.

Changes in details of construction and arrangements of parts may be made by one skilled in the art and all such changes are to be considered as coming within the spirit of the invention as expressed in the appended claims.

I claim:

1. A disconnect plug having in combination a shell, a freely rotatable nut mounted on said shell, means for preventing longitudinal movement of said nut, a housing having one end thereof embracing said shell at the end opposite that on which the nut is mounted, a shoulder in said housing abutting the end of said shell, positive means for preventing rotation and longitudinal movement of the housing in relation to the shell, an insert carried by the shell, said insert being confined between a shoulder in said shell and the shoulder in said housing when the plug is assembled, and means permitting of

longitudinal movement of the insert when the plug is disassembled but preventing rotation of the insert in relation to the shell when the plug is assembled, said housing inclosing a chamber of substantial size between said insert and the closed end of the housing.

2. A disconnect plug having in combination a shell, a freely rotatable nut mounted on said shell, means for preventing longitudinal movement of said nut, a housing having one end thereof embracing said shell at the end opposite that on which the nut is mounted, a shoulder in said housing abutting the end of said shell, a removable locking ring for securing said shell and said housing together and preventing rotation and longitudinal movement of the housing in relation to the shell, an insert carried by the shell, said insert being confined between a shoulder in said shell and the shoulder in said housing when the plug is assembled, and means permitting of longitudinal movement of the insert when the plug is disassembled but preventing rotation of the insert in relation to the shell when the plug is assembled, said housing inclosing a chamber of substantial size between said insert and the closed end of the housing.

3. A disconnect plug having in combination a shell, a freely rotatable nut mounted on said shell, means for preventing longitudinal movement of said nut, a housing having one end thereof embracing said shell at the end opposite that on which the nut is mounted, a shoulder in said housing abutting the end of said shell, a removable locking ring, a toe on said ring for securing said shell and said housing together and preventing rotation and longitudinal movement of the housing in relation to the shell, an insert carried by the shell, said insert being confined between a shoulder in said shell and the shoulder in said housing when the plug is assembled, and means permitting of longitudinal movement of the insert when the plug is disassembled but preventing rotation of the insert in relation to the shell when the plug is assembled.

4. A disconnect plug having in combination a shell, a freely rotatable nut mounted on said shell, means for preventing longitudinal movement of said nut, a housing having one end thereof embracing said shell at the end opposite that on which the nut is mounted, a shoulder in said housing abutting the end of said shell, a removable locking ring, a toe on said ring for securing said shell and said housing together and preventing rotation and longitudinal movement of the housing in relation to the shell, an annular groove in said housing for the reception of said locking ring, a notch intercepting said groove and into which said toe is entered, said notch permitting of the ready insertion of a suitable tool for removal of the locking ring, an insert carried by the shell, said insert being confined between a shoulder in said shell and the shoulder in said housing when the plug is assembled, and means permitting of longitudinal movement of the insert when the plug is disassembled but preventing rotation of the insert in relation to the shell when the plug is assembled.

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