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CABLE CONNECTER

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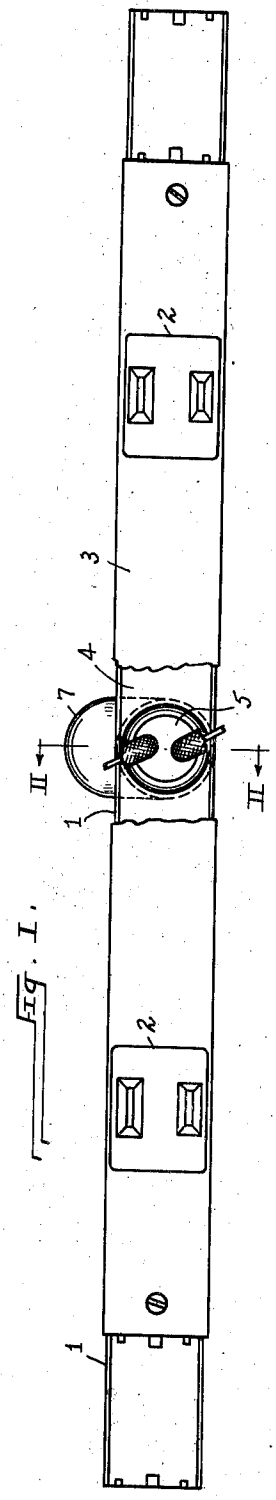


Fig. I.

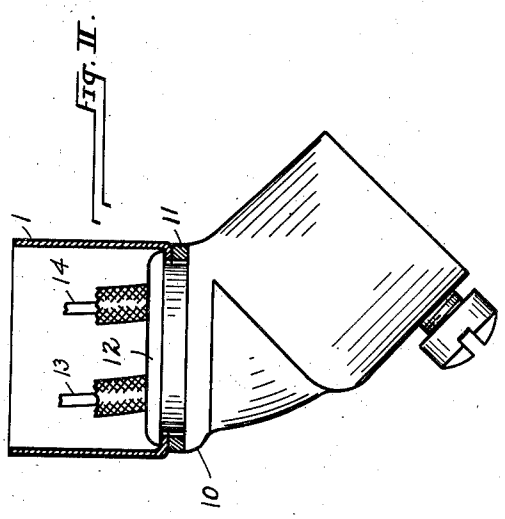


Fig. II.

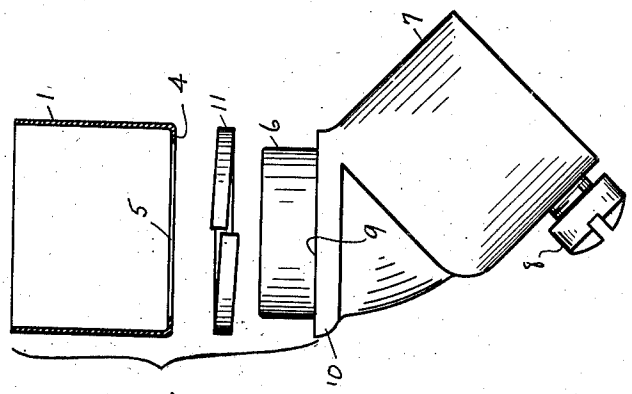


Fig. III.

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## CABLE CONNECTER

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2 Claims. (Cl. 247—28)

This invention relates to a cable connecter for introducing feed wires into the housings of those elongate multiple outlet receptacles known as multiple outlet duct, or "plug-in" strip.

In connecting electrical conductors housed in armored cable to the installed conductors of a multiple outlet duct installation, it is of great importance that electrical grounding continuity be maintained throughout the metallic shell of the system. It is necessary, therefore, so to connect the metallic armor of the cable to the metallic housing of the multiple outlet duct that good electrical contact is established, and is maintained between these elements.

In making feed connection to the interior of a multiple outlet duct by means of feed conductors housed in armored cable, difficulty is experienced in bringing the cable into a position accurately perpendicular to the bottom wall, or floor, of the duct housing. This is because it is impossible to make the cable take short radius bends, and because the length of cable between the point at which it springs from the wall, floor, or ceiling of a building and the point of its attachment to the duct housing is relatively short. It is unusual to find lengths of multiple outlet duct which so fit in the location of the duct installation that the point at which feed entry is to be made is directly in line with the point at which the armored cable springs.

It is the object of our invention to provide a cable connecter for use in making feed connection to multiple outlet duct, which is so formed, and which has such cooperative mounting with the duct that it readily accommodates itself to the direction in which the armored cable lies when it is brought terminally to a point of entry into the multiple outlet duct, and that there is formed between the armored cable and the duct a close grounding contact of such nature that it does not yield to forces tending to loosen the contact and impair grounded continuity during the operation of making feed connection to the duct and the related operation of installing the duct in mounted position.

In the accompanying drawing Fig. I is a plan view of a multiple outlet duct, with the duct cover partially broken away to show the attachment of the cable connecter to the bottom wall of the duct housing.

Fig. II is a view on an enlarged scale taken cross sectionally of the duct housing on the section line II—II of Fig. I.

Fig. III is a view on the scale and section of Fig. II, but showing the multiple outlet duct housing, and the parts of cable connecter in exploded relationship.

Referring to the drawing reference numeral 1 designates the metallic channel element of a metallic multiple outlet duct housing, which contains receptacle elements 2, and to which is fitted a cover element 3. In the bottom wall of the housing, given specifically reference numeral 4, is a circular feed opening 5 through which the electrical feed wires for the duct are introduced, and at which the cable connecter of my invention is mounted.

The cable connecter proper comprises a tubular portion 6 for insertion through and connection with the bottom wall 4 of the duct housing, and a tubular portion 7 extended at an angle to the portion 6. In assembly with the multiple outlet duct housing, as shown in Fig. II, the portion 6 of the cable connecter thus stands in right-angular relation to bottom wall 4 of the duct housing, while the portion 7, further removed from the housing wall, lies in a position to form less than a right angle therewith. In the tubular portion 7 of the cable connecter there is a set-screw 8 for engaging an armored cable inserted terminally into this portion of the connecter.

In making assembly the tubular portion 6 of the cable connecter is inserted through the opening 5 in the bottom wall 4 of the duct housing up to the limit of its projection into the housing. Inward projection of the cable connecter is limited primarily by a squared shoulder 9 formed by a collar 10 integral with the connecter structure and defining the base of the connecter portion 6. A resilient element, such as the split washer 11, is in preparation for assembly placed on this shoulder 9 in a position surrounding the tubular portion 6 of the connecter. To complete the assembly, the washer 11 is forced so firmly against the bottom wall 4 of the housing in a marginal zone exteriorly surrounding the opening 5 that it is compressed between the bottom wall of the housing and the connecter collar 10 upon which it is seated.

While the spring washer 11 is maintained under compression, the inward extension of cable connecter portion 6 is upset, as by hot or cold riveting, to form a collar 12 lying against the interior surface of the bottom wall 4 of the housing in a circular zone marginally surrounding the opening 5 therein. The compression of washer 11 being adequate, no substantial movement of the connecter perpendicular to the bottom wall of the housing is permitted. Because of the resiliency of the washer rotation of the cable con-

necter about an axis perpendicular to the bottom wall of the housing is permitted.

In installation of a junction section of multiple outlet duct equipped with our cable connecter, the junction section is brought into the general region in which it is to be installed. The terminal of the armored cable is then inserted into, and clamped in, the tubular portion 7 of the connecter. This makes a firm grounded continuity between the cable armor and the connecter, while the projecting conductors 13 and 14 housed in the cable are projected through the connecter and into the multiple outlet duct housing.

In bringing the junction section of the duct into installation position, and in reinserting the fished cable into the wall, or other structure, from which it has been drawn, the connecter is turned about its axis, so that its rearward portion 7 extends generally in a direction toward the point from which the armored cable springs. The junction section may thus be brought into installation position without imposing an abrupt bend upon the cable.

During this operation, and during the following mounting and use of the duct, the expanding tendency of the washer 11 maintains firm grounding contact between the collar 12 on the connecter and the bottom wall 4 of the duct housing. As this collar 12 is of one-piece with the tubular portion 6 of the cable connecter turning movement of connecter in opening 5, and the pulls and jars incident to installation, cannot loosen it to render the grounding contact between it and the housing wall less close and secure. It thus presents marked superiority over a nut or other means applied to the cable connecter for securing it in mounted position.

To summarize the functional advantages of our cable connecter, when in assembly with a section of multiple outlet duct, it may turn about an axis perpendicular to the duct, but may not be moved along that axis. The means securing the cable connecter within the duct housing, being of one-piece with the connecter, are not susceptible to loosening. The means which maintain close grounded engagement between the cable connecter and the duct housing are resilient, and provide a continuously exerted force tending to maintain the cable connecter and the duct housing in firm grounding contact with each other.

The cable connecter of our invention has its greatest utility in combination with the elongate housing of a section of multiple outlet duct, or "plug-in" strip. This is for the reason that the mounting of multiple outlet duct usually requires that the introduction of feed wires be through the bottom wall of the housing, and because the form of the duct section increases the difficulty of handling the cable after feed connection has been made. It has, however, a general utility as applied to receptacle housings of any shape.

Structurally our cable connecter is of great simplicity.

It is to be understood that, as herein used, the designation "outlet box" is to be construed generally rather than technically. Thus any structural element of a wiring system defining a space at which connection to the system conductors may be made, or from which conductors may be brought out, is to be considered for the purpose of defining our invention as an outlet box.

We claim as our invention:

1. In combination with an electrical outlet structure comprising a wall having a feed opening therein, a tubular cable connecter having a cable-engaging portion and a portion disposed at an angle to the said cable-engaging portion adapted to enter the feed opening in a wall of the electrical outlet structure, a member formed of one piece with the tubular body of the cable connecter disposed inside the wall of the outlet structure and extended beyond the edges of the said opening therein for preventing removal of the cable connecter from position in said feed opening, a shoulder on said cable connecter lying outwardly of the said electrical outlet structure in the inserted position of the cable connecter, and resilient engaging means between the wall of the outlet structure containing the said feed opening and the said connecter shoulder permitting rotating movement of the cable connecter with respect to the structure wall while maintaining firm electrical contact between the connecter and the said wall.

2. In combination with a receptacle assembly comprising a housing having a feed opening in a wall thereof, a cable connecter in the form of a tubular member having a housing engaging portion adapted to enter the feed opening in a wall of the housing and a cable engaging portion disposed at an angle to the longitudinal axis of the housing engaging portion, spaced peripheral collars on the said tubular member and of one piece therewith on opposite sides of the housing wall in projection of the cable connecter through the said opening therein, and resilient means lying between the housing and one of the said collars and arranged to exert a constant force tending to maintain the other of said collars in firm grounding contact with the wall of the housing.

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