May 1, 1945. G. B. BENANDER 2,374,971

ELECTRICAL CONNECTOR

Filed Oct. 15, 1943

Fig. 1.

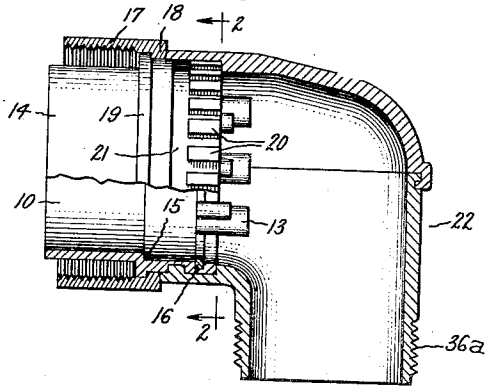


Fig. 2.

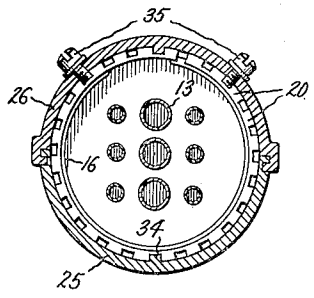
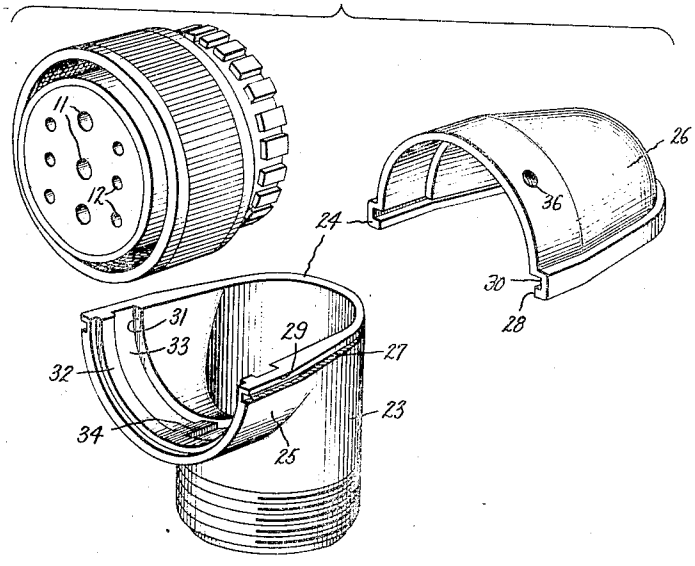


Fig. 3.



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ELECTRICAL CONNECTOR

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Application October 15, 1943, Serial No. 506,345

1 Claim. (Cl. 174—59)

The present invention relates to electrical connectors including male and female connecting members enclosed in a casing for connecting cable or cord sections of an electric wiring system. More specifically the invention relates to the type of connectors which include an elbow casing or casing member.

The object of my invention is to provide an improved construction and arrangement of such connectors in which the elbow casing or casing member may be easily assembled or dismantled in part or in whole for repair or inspection.

For a consideration of what I believe to be novel and my invention, attention is directed to the following description and the claim appended thereto in connection with the accompanying drawing.

In the drawing Fig. 1 illustrates a sectional view of a connector embodying my invention; Fig. 2 is a section along line 2—2 of Fig. 1; and Fig. 3 is an exploded, perspective view of the connector.

The connector comprises an insulating block 10 of molded material with a plurality of terminal contacts, in the present instance including three large-diameter female contacts 11 spaced along a central plane through the cylindrical block 10 and six small-diameter contacts 12 spaced on opposite sides of such central plane. Each terminal contact has an end portion or lug 13 for connection to a wire of an electric system. The opposite end of each terminal contact forms a cylindrical bore for receiving a pin of a male connector member, not shown. The insulating block 10 with the terminal contacts 11, 12 is enclosed in a shell 14 and axially held therein by means of a shoulder 15 formed by the shell 14 and a spring ring 16. In addition the block may be angularly positioned in the shell by suitable tongue and groove connections formed between the block and the shell. An arrangement of this kind is more fully described in my copending application on Electrical connectors, Serial No. 480,348, filed March 24, 1943. The shell 14 is enclosed within a housing including an internally threaded ring 17 with a flange 18 at one end bearing against a collar 19 formed on the housing 14. The ring 17 may serve to secure another housing part such as a split shell member containing a contact block with pins to the contact block 10 described in the aforementioned copending application.

The right-hand end portion of the shell 14 is machined to form a plurality of circumferentially spaced projections or teeth 20 and an annular groove 21. An elbow 22 is connected to the right-hand end of the shell 14. This elbow consists of two intersecting conduits or conduit members 23 and 24 arranged at right angles. The conduit 24 according to my invention is split along a plane through its centerline and perpendicular to the centerline of the conduit 23, thus forming two halves 25 and 26. The half 25 is integrally formed with the conduit 23 and the half 26 is connected to the half 25 by a tongue and groove connection. More specifically, the half 25 has an outer groove 27 for receiving a tongue 28 formed on the adjacent portion of the half 26. From another viewpoint, the half 25 has a flange 29 which may be slid into a groove 30 of the conduit half 26. The left-hand portion of the conduit 24 is cylindrical while the right-hand part is substantially conical, tapering towards the conduit 23. The front portion of the conduit 24 is reduced in thickness, forming an inner shoulder 31 which when assembled on the shell 14 abuts against the face of the projections 20 on the shell. The lower half 25 integral with the conduit 23 has a circumferentially extending projection 32, forming with the shoulder 31 a circumferentially extending groove 33. When assembled the groove 22 accommodates a plurality of the projections 20 and axially positions the elbow. Axially extending projection 34 is formed in the groove 33 adapted to fit into any of the grooves formed between adjacent projections or teeth 20. The projection 34 serves to locate the elbow angularly relative to the shell 14.

During assembly the ring 17 is placed on the shell 14. Thereupon one part of the elbow, including the conduit 23 and the conduit half 25, is attached to the toothed end of the shell 14 in the desired angular position relative to the shell. Thereupon the half 26 is axially slid onto the half 25 and secured in its end position against axial movement by means of two screws 35 threaded into bores 36 on the half 26, which bores are located so that the screws 35 will project into corresponding spaces between the teeth 20.

In an actual installation, as pointed out above, wires of a wiring system are secured to the lugs 13 of the terminal contact. If at any time it is desired to inspect the connection between any terminal and a wire, all that is necessary is to remove the upper conduit half 26. This may be easily done by sliding the half 26 axially away from the ring 17 upon loosening of the screws 35. The free end of the conduit 23 has an outer,

threaded portion 36a for connection to another conduit member or to a packing ring, as described in the aforementioned copending application. Upon removal of such other conduit or packing ring and dismantling of the conduit half 26 the conduit 23 may be dropped downward from the position in Fig. 1 so that the entire end of the contact member becomes accessible for inspection and repair.

Thus, with my invention I have accomplished an improved construction and arrangement of elbow type connectors in which the housing includes an elbow made of two parts of which one part consists of a conduit to which is attached a first portion of another conduit adapted to be joined with a second portion of such other conduit through a tongue and groove connection formed between the two portions and preferably located in a plane through the centerline of the other conduit and at an angle to the centerline of the first mentioned conduit. This angle is preferably the same as the angle formed between the centerlines of the two conduits, that is, in case the two conduits are perpendicular to each other said plane is perpendicular to the centerline of the first mentioned conduit.

Having described the method of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States is:

Electrical connector comprising a contact member having an insulating base with a plurality of contacts, a shell having an outer shoulder and enclosing the contact member, means formed in the shell and on the contact member for positioning the contact member in the shell, a ring surrounding the shell and having a flange engaging the shoulder, an end portion of the shell forming an annular groove and having a plurality of circumferentially spaced projections adjacent the groove, and a housing including said ring and an elbow, said elbow having a first conduit and a second conduit arranged at an angle to the first conduit, the second conduit having two halves joined together in a plane through the centerline of the second conduit and at an angle to the centerline of the first conduit, one of said halves being integral with the first conduit and forming a circumferentially extending inner recess for receiving some of the projections on the shell, and a tongue and groove connection formed between the two halves to secure them together.

GEORGE B. BENANDER.