United States Patent [19]

Johnson et al.

[11] **3,745,512**

[45] **July 10, 1973**

[54] **MULTIPLE CONTACT CONNECTOR**

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[73] Assignee: **AMP Incorporated,** Harrisburg, Pa.

[22] Filed: **May 16, 1968**

[21] Appl. No.: **729,634**

[52] **U.S. Cl.** ..... **339/59 M,** 339/66 M, 339/101, 339/126 R

[51] **Int. Cl.** **H01r 13/52**

[58] **Field of Search** 339/47–49, 59–61, 65, 66, 92, 101, 125, 126, 176, 184, 217

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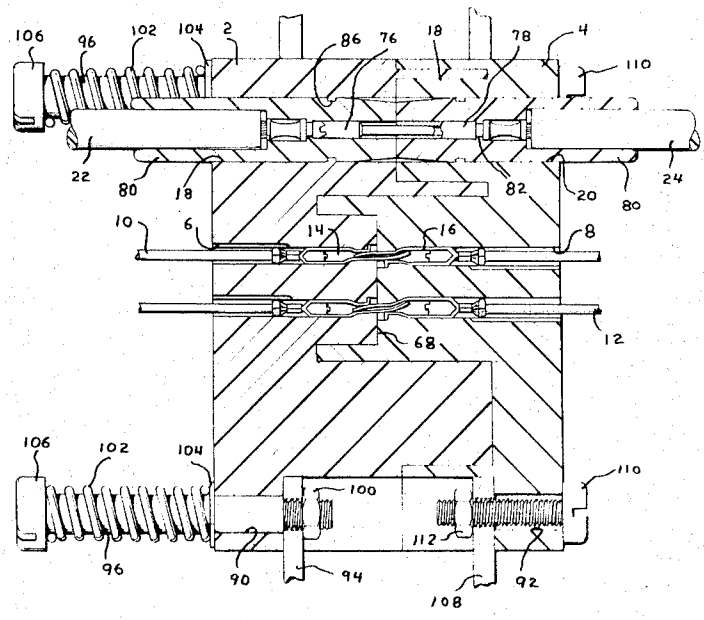
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[57] **ABSTRACT**

The disclosure relates to a polarized connector for high voltage cables. The cables are provided with male and female connector elements which are firmly secured in the connector to permit quick assembly and disassembly. The guides which are used to provide the proper polarization are of greater length than the male connectors in order to insure proper engagement of the connector housing elements before the cable elements are engaged. In one form of the invention low voltage cables are mounted in the center zone of the connector to allow patchwork connections. Connector elements for the low voltage cable connectors are guided into proper engagement by the same guide means used for the high voltage cables.

1 Claim, 10 Drawing Figures



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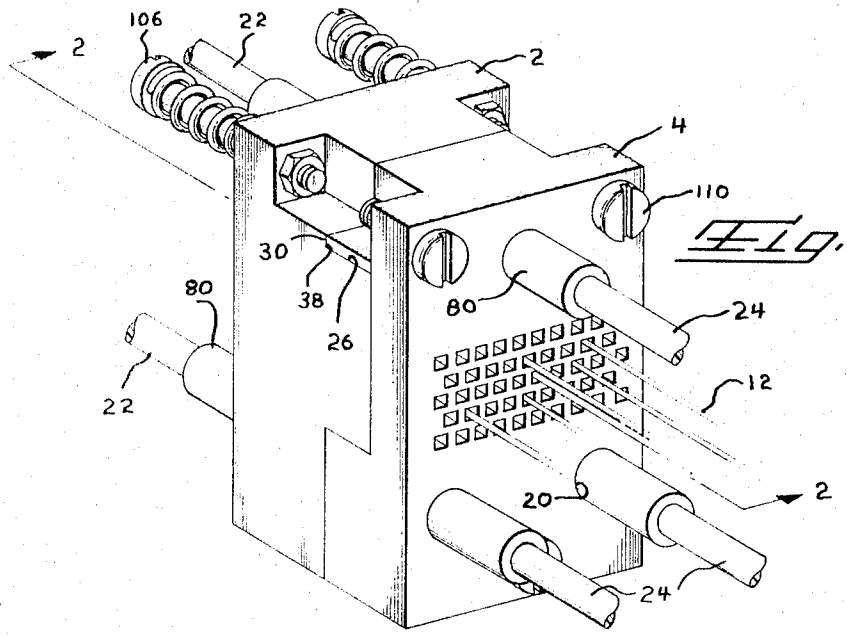


Fig. 1

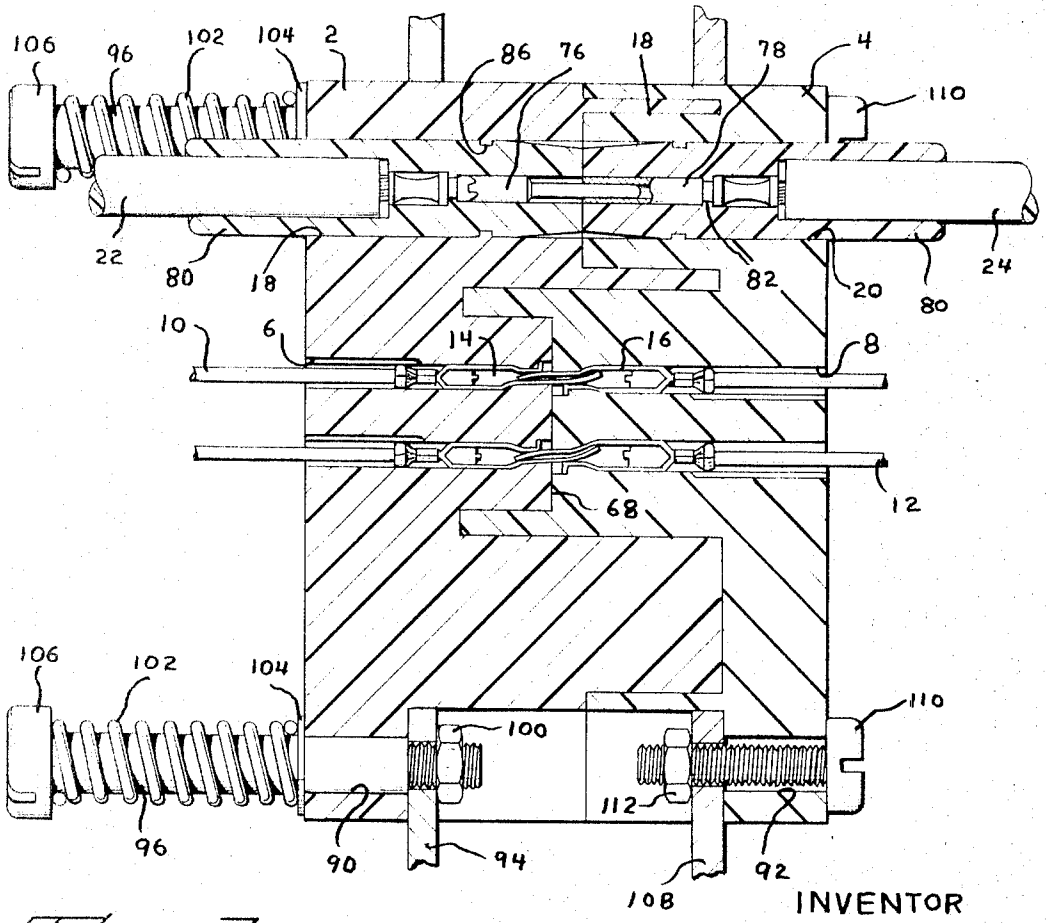


Fig. 2

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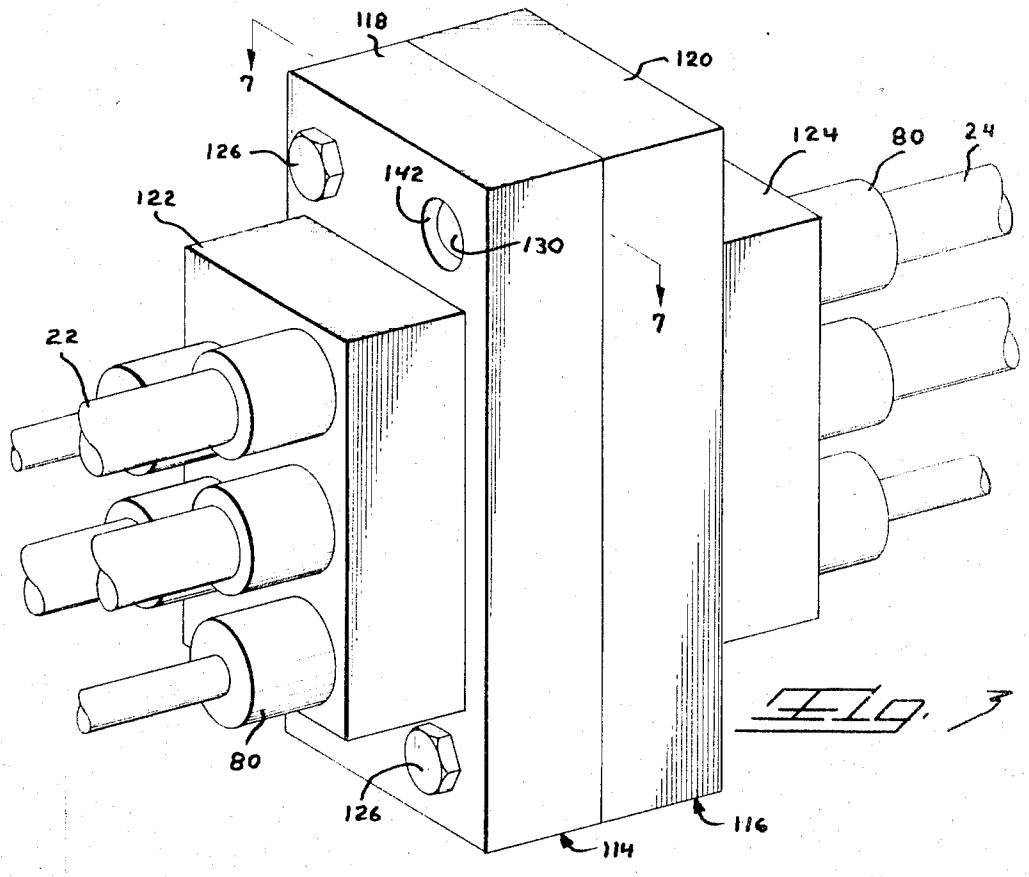
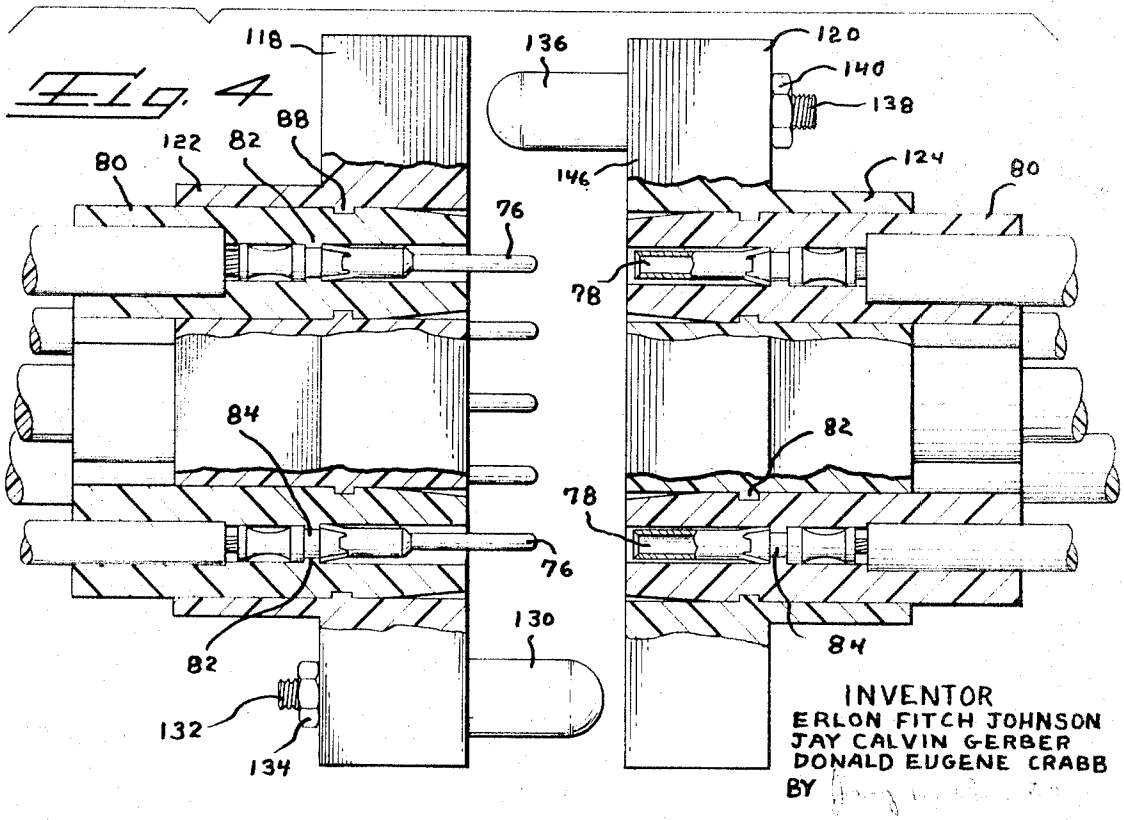


Fig. 3

Fig. 4



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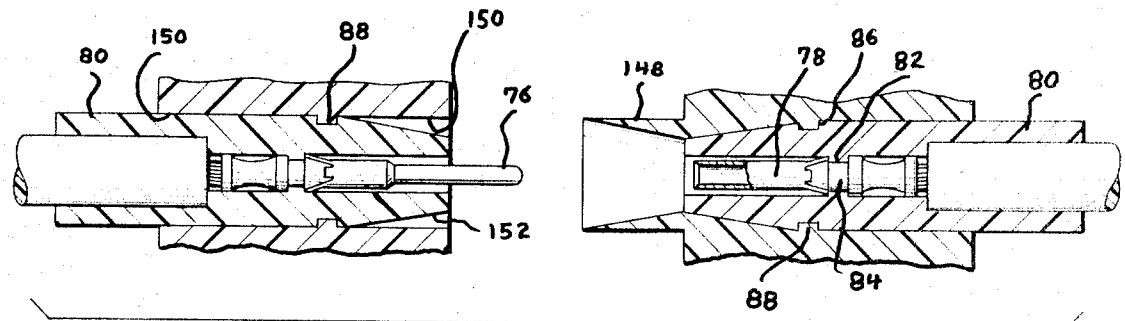


Fig. 5

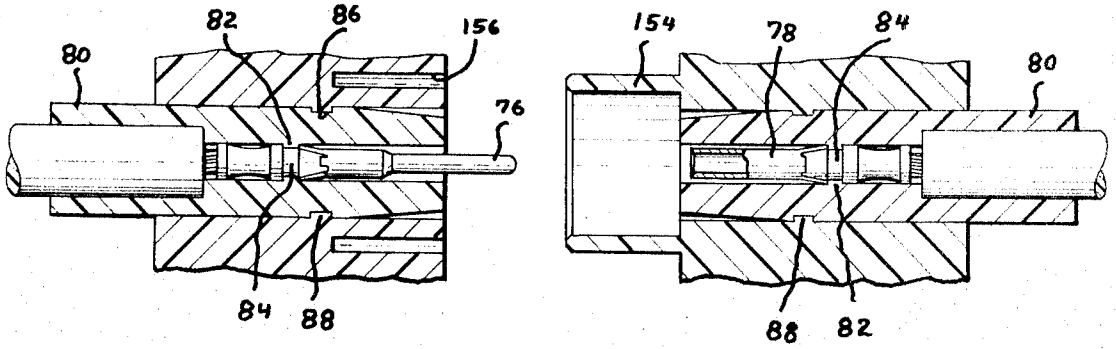


Fig. 6

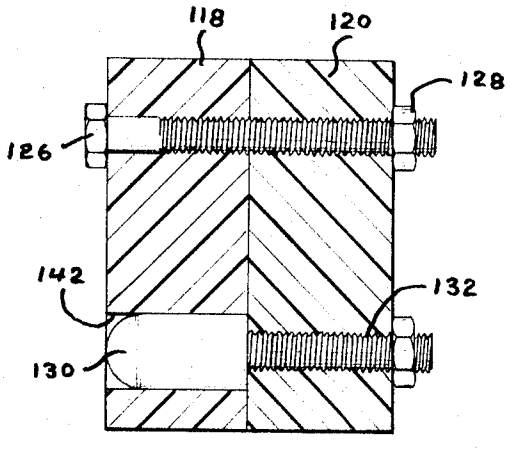


Fig. 7

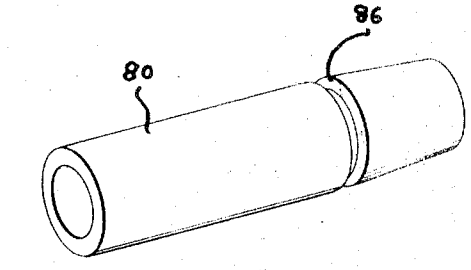


Fig. 8

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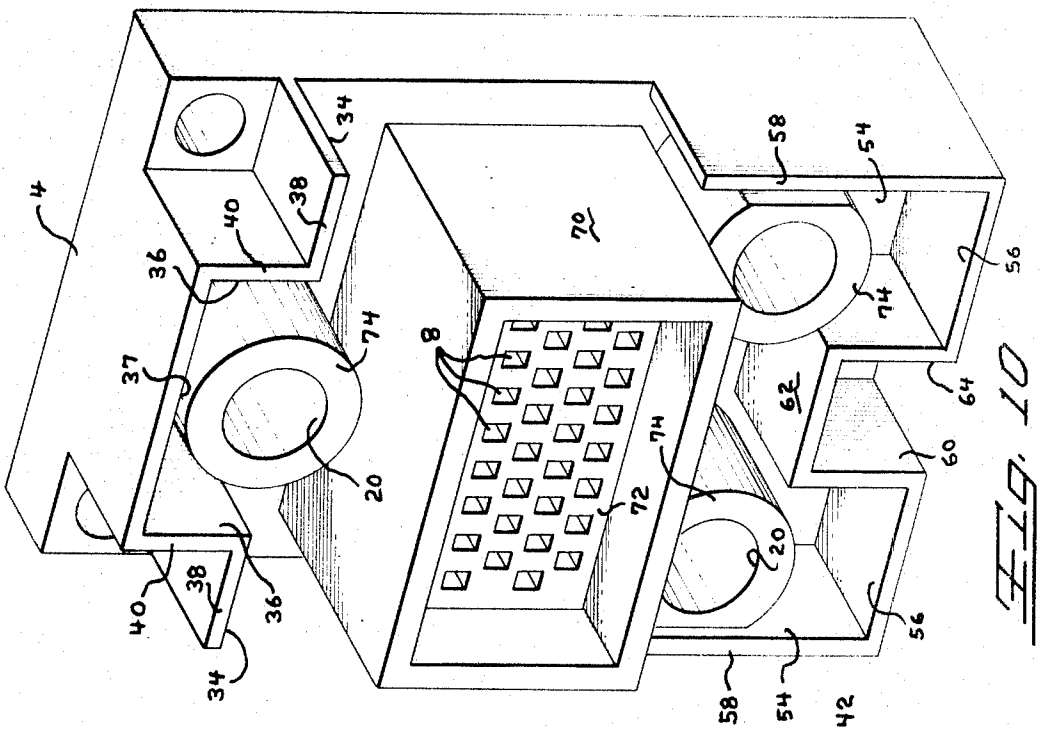


FIG. 10

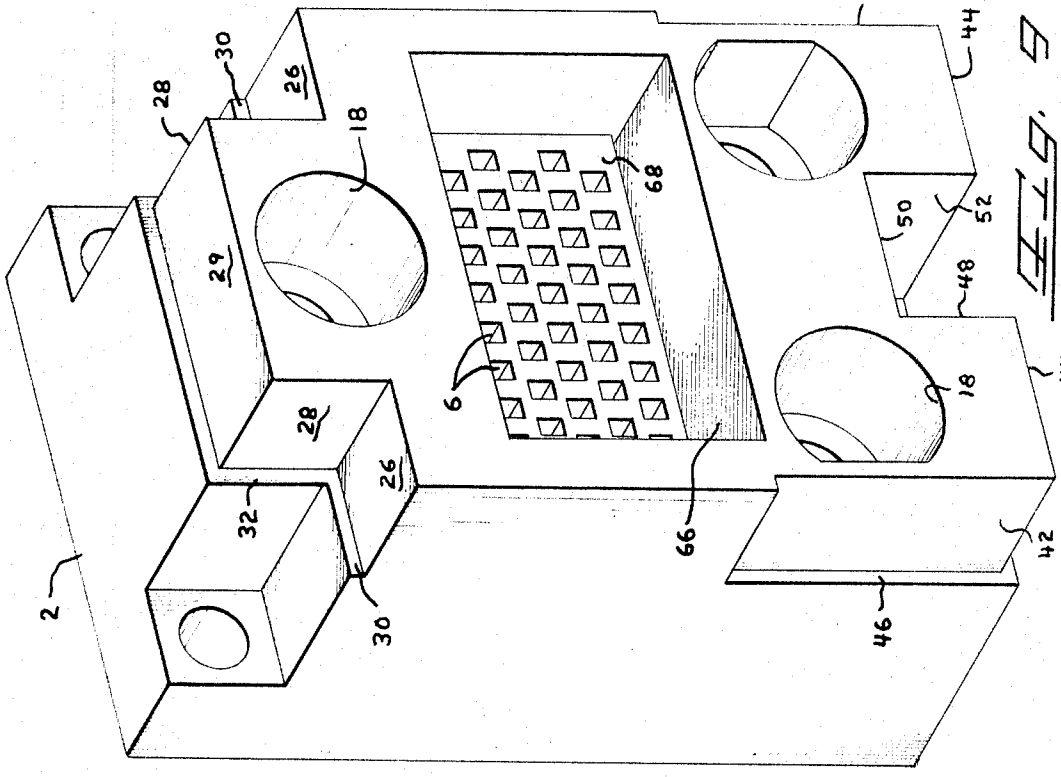


FIG. 9

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MULTIPLE CONTACT CONNECTOR

This invention relates to a polarized connector and more particularly to a connector for high voltage cables.

Patchwork polarized connectors are required to provide firm connections of the cables to the connector elements and to have low assembly and withdrawal forces to allow for quick assembly and withdrawal without accidental separation of the cables from the connector elements.

It is an object of this invention to provide a polarized connector which allows a large selection of patchwork arrangements.

It is a further object of this invention to provide a connector as aforesaid in which each cable is connected to the connector parts in a manner to avoid accidental separation under the forces used to separate the connector parts.

It is a still further object of this invention to provide a connector as aforesaid in which the polarizing elements serve to seal the cable connectors.

These and other objects of the invention will become manifest upon reading the following description in conjunction with the accompanying drawings wherein:

FIG. 1 discloses a perspective view of one form of the invention;

FIG. 2 is a section taken on the line 2—2 of FIG. 1;

FIG. 3 is a perspective view of a second form of the invention;

FIG. 4 is an exploded view of FIG. 3 partly inn section;

FIG. 5 is a view similar to FIG. 4 showing another form of the invention;

FIG. 6 is a view similar to FIG. 4 illustrating another form of the invention;

FIG. 7 is a detail taken along the line 7—7 of FIG. 3;

FIG. 8 is a perspective view of a shroud;

FIG. 9 is a perspective view of the female connector element of FIG. 1; and

FIG. 10 is a perspective view of the male connector element of FIG. 1.

In accordance with one form of the invention the central zones of the connector elements are provided with a multiplicity of openings each provided with a locking projection moulded integral with the elements. The outer zones of the connector elements are provided with a multiplicity of larger openings each provided with a lock projection moulded integral with the elements. A selected number of cables are secured in some or all the center zone openings and are firmly locked in position by the projections. A selected number of larger cables are secured in some or all the openings in the outer zone. The cables in the inner zone are provided with similar connectors which are engaged by the projections. The cables in the outer zone are provided with male and female connectors which are secured in their corresponding elements by an insulating shroud secured to the connectors and elements.

In FIGS. 1, 2, 9 and 10 there is illustrated one form of the invention in which the connector comprises a pair of members 2 and 4 moulded from a plastic. The center zone of each member is formed with a plurality of openings 6, 8 for reception of low voltage cables 10, 12. The cables are interconnected by connectors 14, 16 such as disclosed in U.S. Pat. No. 3,178,669. The outer zone of the members 2 and 4 is formed with a plurality of openings 18, 20 for reception of high voltage cables

22, 24. The members 2 and 4 are formed with male and female configurations on their adjacent faces to provide for interengagement in only a single orientation of the members. Member 2 is formed with surfaces 26, 28, 29, 30, and 32 for engagement with surfaces 34, 36, 37, 38 and 40 respectively of member 4. Member 2 is also provided with surfaces 42, 44, 46, 48, 50 and 52 for engagement with surfaces 54, 56, 58, 60, 62 and 64 respectively of member 4. Member 2 is provided with a well 66 having an island 68 provided with openings 6. Member 4 is provided with a column 70 having a bottom wall 72 provided with the openings 8 and is formed with tubular projections 74. When the members 2 and 4 are properly oriented the column 74 is slidably received in the well to surround the island 66 and with wall 72 in contact with wall 68. The projections 74 fit into openings 18. The interfitting portions 66, 70 and 18, 74 and contact of the surfaces as noted above provide for proper polarization of members 2 and 4 and provide seals around the openings in the center and outer zones where the cable are connected.

The high voltage cables are connected by male and female connector elements 76, 78 and high voltage shrouds 80 of insulating plastic such as Nylon, are fixed on the cables to cover the female portion of the connector and allow a preselected portion of the male member to extend therefrom. The extension is less than the depth of the recesses 18 to provide for sealing the male member from accidental contact and the avoid engagement with the female member until the members are properly oriented.

The shrouds 80 are formed with integral projections 82 for reception into depressions 84 formed in the male and female members. A depression in the form of a circular groove 86 is formed in the outer surface of the shroud for reception of a locking ring 88 formed integral with the members 2 and 4. The elements 76, 78 are assembled with the shroud by flexing the projection 82 as the connector is moved into the shroud. The shroud is mounted in the members 2 and 4 by flexing the projection 86 as the shroud is moved into the member.

Member 2 is formed with openings 90 and member 4 is formed with openings 92 for the reception of fastening elements for mounting the members on a support. In FIG. 2 member 2 is secured to a bulkhead 94 by a bolt 96 having a shoulder 98 drawn against the bulkhead by a nut 100 threadedly mounted on a threaded portion of the bolt. A spring 102 bearing against a washer 104 and reacting against head 106 of the bolt urges the member 2 against the bulkhead. Member 4 is secured to a bulkhead 108 by a threaded fastener 110, 112.

FIGS. 3 and 4 illustrate a form of the invention where a given configuration of high voltage cables are connected. In this form of the invention the connector members 114 and 116 comprise rectangular plates 118, 120 formed with extensions 122, 124. The members are formed of a thermoplastic material and are secured together by bolts 126 having nuts 128 threaded thereon. A plug 130 having a threaded stem 132 is secured to plate 118 by a nut 134. A plug 136 having a threaded stem 138 is secured to plate 120 by a nut 140. Cooperating openings 142 in the plates receive the plugs to form a guide for assembling the members. The guide plugs 130 and 136 extend beyond faces 144, 146 of the plates a greater distance than the extensions of

the male connector **76.** The parts are therefore properly aligned before assembly of connectors **76, 78.**

In the form of the invention illustrated in FIG. **5** the guides comprise a tapered collar **148** for fitting in the opening **150** and against the taper **152** of the shroud.

In the form of the invention illustrated in FIG. **5** the guides comprise cylindrical collars **154** and annular grooves **156.**

What is claimed is:

1. An electrical connector comprising a base member, a plurality of cable receiving openings extending through said member, an elongated contact member in each opening, a shroud covering the contact member and having a depression in its exterior wall remote from the ends thereof for mating with a projection on the interior portion of the wall of the opening, and means for securing the contact member within the shroud comprising a depression in the exterior surface of the contact and a mating projection on the inner wall of the shroud, in which the projection on the wall of each of the openings and the interior wall of the shrouds is flexible for ready assembly of the connectors and shrouds and within the respective openings.

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