

[54] **WATERPROOF ELECTRICAL CONNECTOR**

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339/208, 209, 205, 94, 36, 242, 19

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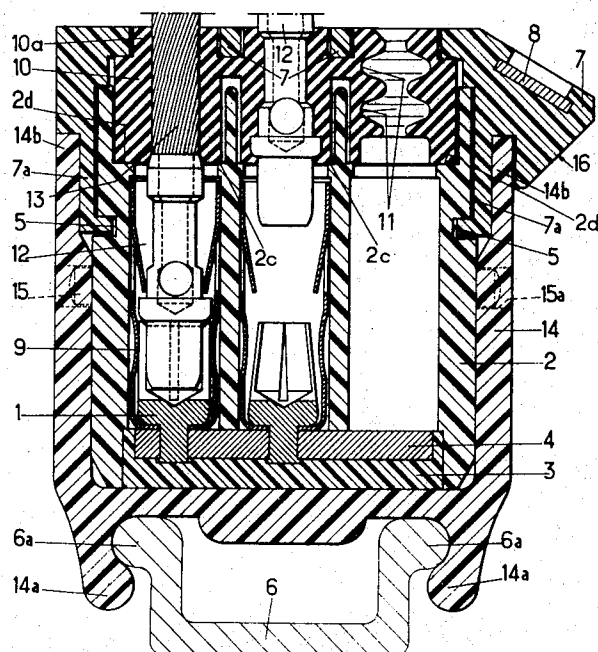
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ABSTRACT

Waterproof electrical connector comprises a contact-supporting inner cup, a cover snap-fastened onto the inner cup and through which conductors are admitted to said inner cup, and an outer cup snap-fastened to the inner cup which prevents separation of said inner cup and cover.

6 Claims, 2 Drawing Figures



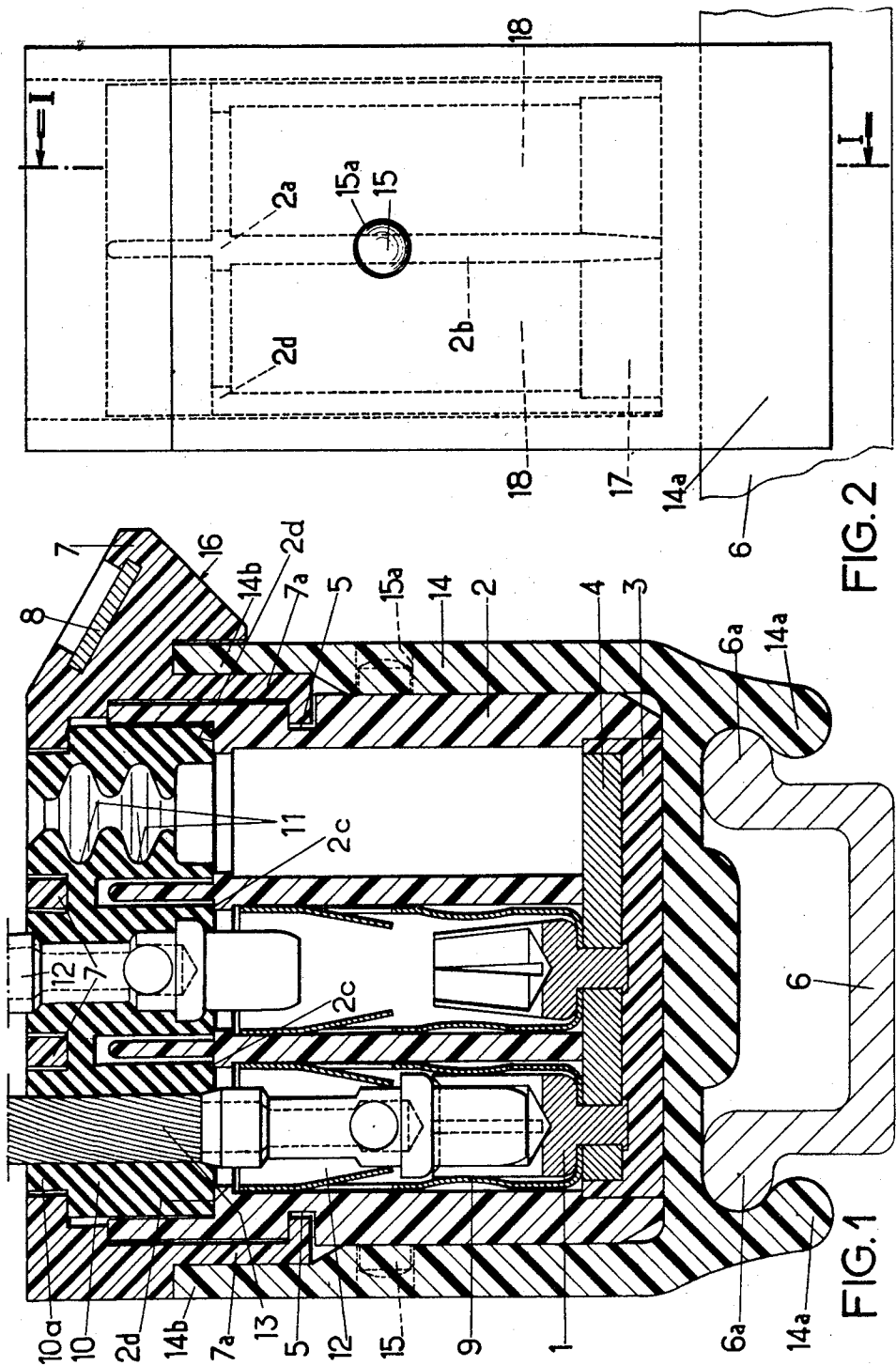


FIG. 2

FIG. 1

WATERPROOF ELECTRICAL CONNECTOR

SUMMARY OF THE INVENTION

French Patent 1,565,673 of Mar. 21, 1968, describes a new type of contact particularly adapted for use in waterproof connectors, which comprises a resilient sealing member located near its upper end and provided with holes for admitting conductors. These holes have transversely grooved walls adapted to provide the necessary sealing contact.

It is the object of the present invention to provide a new type of module adapted to be equipped with contacts of this type and characterized by the fact that its different constituent components snap onto each other, thus considerably reducing the time required to assemble the various components. The lower part of the casing of this module is provided in a conventional manner with snap-fastening projections of the type currently used on terminal supports and the supports for cable mounts, which projections are adapted to cooperate with external longitudinal ridges on conventional metallic mounting rails.

The characteristics of the present invention will be better understood from a reading of the following description of one embodiment of the waterproof, snap-fastening connector according to the invention, which embodiment is given purely by way of illustration and example, with reference to the accompanying drawings, on which:

FIG. 1 is a transverse sectional view of a module in accordance with the invention taken along the line I—I of FIG. 2 through the diametral planes of three of the six contacts positioned in two parallel rows with which said module is equipped; and

FIG. 2 is a lateral elevational view of the module shown in FIG. 1.

FIG. 1 shows that the female parts 1 of said contacts are mounted inside a contact-supporting cup 2 closed at its lower end by a sealing compound 3 and supporting a connecting shunt 4 permitting a plurality of combinations of connections between the conductors leading to the various contacts.

The contact support 2 is provided with partitions 2a shown on FIG. 1 which insulate and seal the individual seats of the various contacts.

A partition of the same type, perpendicular to the partitions 2a, is shown at 2b on FIG. 2.

The outer wall of the contact support 2 is provided, about midway of its length, with recesses 5 parallel to the connecting rail 6, and which permit a cover 7 to be snapped thereonto in a conventional manner. This cover is provided with recesses for receiving labels 8.

The resilient female contacts are biased by retaining clips 9 when they cooperate with the male contacts.

The cover 7 has a central recess which receives an elastic sealing member 10 pierced by six holes for admitting conductors, which holes have a corrugated profile as shown at 11 at the right of FIG. 1.

It will be seen, however, that after insertion of the male member 12 and the conductor 13 attached to this male member, the walls of the holes of the passage straighten out and the corrugations therein are crushed.

The sealing member 10 has recesses adapted to receive the upper end of the sealing partitions 2a and 2b and bears at 2c and 2d against the contact-supporting body 2.

The upper part of the sealing member 10 has six projections 10a received in seats provided for that purpose in the upper part of the cover 7. The assembly comprising the contact carrying member and the cover 7 is snapped into a lower cup 14 equipped in a conventional manner with lower projections 14a adapted to cooperate with external longitudinal ribs 6a on the rail 6. The snap fitting bosses which make it possible for the contact-supporting cup 2 to cooperate with the box 14 are shown at 15.

It should be noted that when the bosses 15 are seated in recesses 15a in the cup 14, the upper part 14b of this cup urges the lower parts of the two tongues 7a of the cover 7 into the notches 5 in the contact-supporting cup 2 so that, if pressure is applied to the top of the cover 7 in the direction of the arrow 16 shown on FIG. 1, the cover 7 cannot come unsnapped from the contact-supporting body 2, and the cup 14, which remains attached to the two other components 2 and 7, is detached at 14a from the rail 6. It is easy to understand that the sealing member 10 is compressed in the seat provided therefor inside the contact-supporting cup 2 and the cover 7 from the moment at which these two members are snapped together by engagement of the tongues 7a in the notches 5.

It is thus practically impossible, in normal use, to take the assembly apart accidentally, even though it may be very rapidly and easily mounted. This conserves its perfect sealing properties and, despite the fact that the components are snapped together, the assembly may be replaced or removed as a unit with the same facility as in the case of the terminal supports or cable mounts conventionally used to connect two electrical conductors.

FIG. 2 shows the seat 17 for the shunt 4, the sealing compound 3, and the recesses 18 provided to receive the contacts but, in the example in question, only two rows of contacts, or six contacts in all, are shown.

It will of course be appreciated that the embodiment which has just been described may be modified as to detail and certain components thereof replaced by their mechanical equivalents, without thereby departing from the basic principles of the invention.

What is claimed is:

1. Fluid-tight electrical connector comprising in combination:

an inner cup member having a bottom and side walls defining a chamber holding a plurality of internal electrical contacts and shunt means connecting at least some of said contacts,

a cover member provided with apertures for admitting electrical conductors and means for making sealing contact with said conductors when received in said apertures,

interfitting snap-fastening means on said inner cup and cover member for attaching said cover member to said cup member,

an outer cup member dimensioned to receive said inner cup member,

interengaging snap-fastening means on said inner and outer cup members for holding said cup members together when said inner cup member is received in said outer cup member, and

locking means on said outer cup member positioned to block separation of the interfitting snap-fastening means on said inner cup and cover member,

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when said inner cup member is received in said outer cup member with said cover member in place thereon.

2. Connector as claimed in claim 1 in which said means for making sealing contact with said conductors is a block of elastic material having portions received in the apertures of said cover member and encircling said conductors, said block being compressed between said inner cup member and cover member when interfitting snap-fastening means are interengaged.

3. Connector as claimed in claim 1 in which said interfitting snap-fastening means comprise notches in the outer surface of the wall of the inner cup member, and flexible arms having hooked ends carried by said cover member so that said hooked ends engage in said notches, said locking means comprises portions of said outer cup member overlying said hooked arms when

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said inner and outer cup members and cover are snapped together.

4. Connector as claimed in claim 1 in which said outer cup member is provided at its bottom with opposed downwardly extending resilient projections adapted to grip therebetween a supporting rail.

5. Connector as claimed in claim 4 in which said cover comprises a lateral projection having a lower surface inclined with respect to the outer wall of said outer cup member, whereby the exertion of pressure on said lower surface serves to separate said cup members and cover as a unit from said rail.

6. Connector as claimed in claim 5 in which said lateral projection has a groove receiving one end of a locking means, and slots for receiving a label.

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