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A. L. LANGSTON ET AL
MULTIPLE CONTACT CONNECTOR

2,183,651

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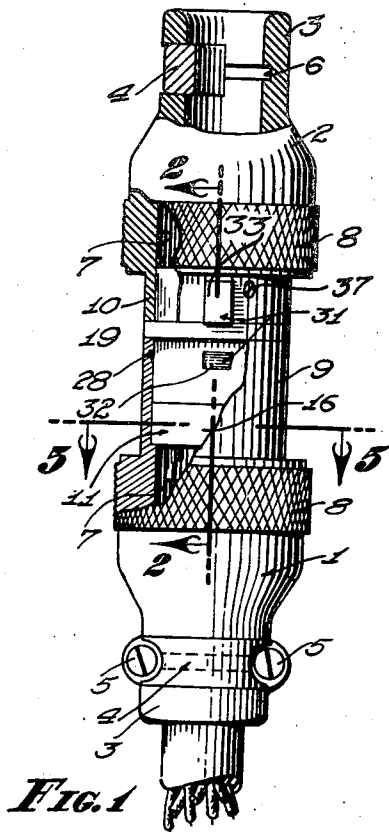


FIG. 1

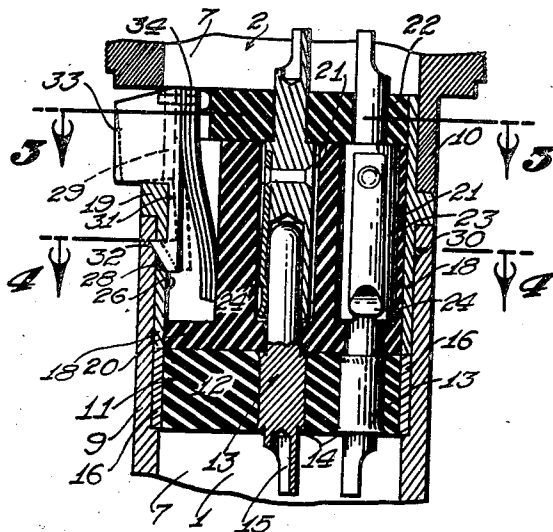


FIG. 2

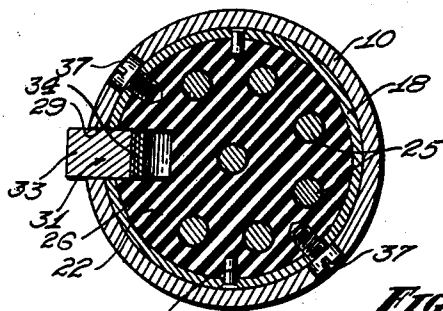


FIG. 3

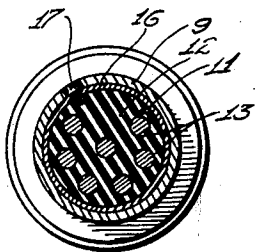


FIG. 5

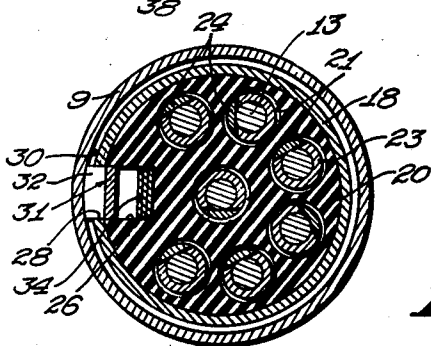


FIG. 4

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MULTIPLE CONTACT CONNECTOR

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2 Claims. (Cl. 173—328)

This invention relates to multiple contact connectors, more particularly to connectors for electric cables having more than two wires, and the objects of this invention are:

First, to provide a multiple contact connector which is capable of withstanding extremely rough use whether or not the parts are connected or separated;

Second, to provide a connector of this class wherein telescoping metallic shell and housing means and latch therefor form a mechanical connection between the cables and minimise strains on the wires or conductors of the cables;

Third, to provide a connector of this class, which is so arranged that a maximum number of terminals may be incorporated in a connector of a given size;

Fourth, to provide a connector of this class wherein the insulation elements are completely housed and protected when the plug is connected, and are exposed only at the axial extremity of the connector when disconnected, the insulation elements being at all times completely protected against damage by a metallic shield;

Fifth, to provide a connector of this class wherein screws and other securing means likely to work loose are reduced to a minimum, and wherein all inserts molded into the insulation are eliminated; and

Sixth, to provide a connector of this class which incorporates a novel latch mechanism and mounting therefor which is so arranged that the latch is particularly well protected against accidental engagement, although easily accessible when desired.

With the above and other objects in view as may appear hereinafter, reference is made to the drawing in which:

Figure 1 is an elevational view of the connector as it appears when joined with parts and portions broken away and in section.

Figure 2 is an enlarged fragmentary longitudinal sectional view taken through 2—2 of Fig. 1.

Figure 3 is an enlarged transverse sectional view thereof through 3—3 of Fig. 2.

Figure 4 is another enlarged transverse sectional view thereof through 4—4 of Fig. 2, and Figure 5 is a transverse sectional view through 5—5 of Fig. 1.

Two similar housings 1 and 2 are provided. Each housing comprises a constricted outer end 3 which receives a cable C. Said constricted end is provided with a semi-circular slot in which fits an arcuate clamp member 4. The extremities of the slot and clamp are provided with registering

bosses which receive screws 5. Opposite from the slot, each cable receiving end 3 is provided with a channel 6 into which the cable is pressed when the clamp is tightened whereby the cable is firmly held without injury to the wires therein.

The intermediate portion of each housing forms a chamber 7 which receives the several wires contained in the cable. Exteriorly of the chamber each housing is provided with an enlarged knurled grip 8.

At their adjacent ends the housings 1 and 2 are reduced externally to form sleeve portions 9 and 10 respectively, which house the terminal elements of the connector.

The longer sleeve portion 9 of housing 1 receives a male connecting structure 11 comprising a disk shaped insulating member 12 which is pierced by a plurality of contact pins 13 which are provided with enlarged central portions adapted to be wedged at their extremities as indicated by 14, to secure the contact pins rigidly in the insulating disk. The inner end of each contact pin 13 is provided with a socket 15 adapted to be soldered to a bared wire of the attached cable. The insulating disk is molded or pressed into a metal ring 16 coaxial with the disk. The metal ring 16 is positioned against a small shoulder formed within the shell 9 and when so positioned the extremities of the pins 13 are approximately flush with the extremity of the shell and protected thereby. One or more set screws 17 are adapted to screw radially into the metal ring 16 through the sleeve 9 as shown in Fig. 5. Even though a large number of contact pins are mounted in an insulation disc of relatively small diameter, ample space exists for the radially extending set screws. Also, as the metal ring 16 itself is screw-threaded to receive the set screws, no screw receiving inserts or the like need be molded in the insulation disk.

The shorter sleeve 10 of the housing 2 receives one end of a metal shell 18 equal in diameter to the ring 16. The shell 18 is provided with a flange 19 intermediate its ends which abuts the end of the housing 2. Molded or pressed into the shell 18 and occupying the major portion of its length is an insulation plug 20. The plug 20 is provided with a plurality of axially directed terminal chambers 21 which are constricted at their ends disposed at the extended end of the plug and shell. The plug is covered at its inner end by an insulation plate 22 which fits within the shell 19. Said shell is provided with apertures therethrough which are in alinement with the chambers 21 and are slightly smaller.

Each chamber is adapted to receive a terminal socket member 23 which is larger than the apertures in the insulation plate 22 and the constricted outer end of the chamber so that the socket member is rotatably mounted but axially restrained therein. The outer end of each terminal socket member is provided with a socket, one side of which is cut away and covered by a spring clip 24. The other end of each terminal socket member is constricted to form a stem 25 which extends through the corresponding aperture in the insulation plate 22 and adapted to be connected to a wire of the attached cable.

The extended portion of the shell 18 is adapted to fit within the sleeve 9, as shown in Fig. 1, and the several terminal socket members are arranged in axial alignment with the terminal pins 13 so as to receive them when the parts of the contactor are connected.

In order to lock the two housings with the terminal sockets and pins engaged, a latch mechanism is provided. For this purpose the plug 20 is provided with an axially directed recess 26 at one side and the insulation plate 22 is correspondingly notched. The end of the shell 18 which fits within the sleeve 9 is provided with a rectangular aperture 28 which is in registry with the recess 26. Also in registry with the recess 26 is a slot 29 formed in the portion of the shell within the sleeve 10 and also in the overlying portion of said sleeve itself. The sleeve 9 is provided with an annular latch receiving channel 30 which crosses the aperture 28.

The recess 26 receives a latch member 31 in the form of a small strip of material with an outwardly extending catch lug 32 which fits in the aperture 28 and engages the channel 30 as shown in Figs. 2 and 4. The latch member 31 is provided with a handle 33 which extends radially outwardly through the slots 29. Attached, as by a rivet, below the handle 33 is a laminated leaf spring 34 which extends forwardly within the recess 26. The forward end of the spring 34 turns downwardly to bear against the bottom of the recess 26 and forms a fulcrum for the latch member.

The assembly, including the plug 20, shell 18 and insulating plate 22 is held in place with the flange 19 abutting the extremity of the housing 2 by means of set screws 37 which extend radially inwardly through the sleeve 10 as shown in Fig. 3. Separate securing pins 38 may be used to retain the insulating plate within the shell 18 to facilitate handling of the shell and parts therein during assembling, but when once assembled, the set screws 37 are sufficient.

The metal ring 16 and shell 18 are of primary importance in the connector herein described. They perform two functions, one to eliminate axially extending securing means between the plug 20 and insulation plate 22, and thereby reserve the entire section of the plug for terminals and the latch, and another to provide an adequate means into which the set screws may be

secured in such manner that they do not work loose. In this respect it should be noted that without the metal ring 16 or shell 18, small insert nuts would have to be molded in the insulation parts. Such small inserts tend to work loose, particularly if the set screws are tightened too much, with the result that a connector so constructed tends to work apart in use.

It should be noted that the terminal socket members 23 are revolubly mounted in their chambers 21. In connecting these members to the conductors of the cable, particularly when there are a large number, the conductors become twisted, but the socket members are free to rotate and relieve these strains.

We claim:

1. A cable connector for multiple conductor cables, comprising: a body of insulation material having a plurality of terminal receiving chambers and a latch receiving recess; terminals fitting in said chambers; a housing enclosing an end of said body and incorporating a reinforcing shell closely fitting and supporting said body throughout its length, there being a guard flange at the base end of said shell; a catch member set in said latch receiving recess and including a thumb button and catch element; said shell having openings therein to receive said thumb button and catch element, the thumb button being positioned adjacent to and partially protected by said flange and the catch element being positioned outwardly therefrom; and a coaxing terminal receiving housing including a portion adapted to telescope over said shell and having an internal groove to receive said catch element.

2. A connector for multiple conductor cables comprising: a pin terminal assembly including a plurality of pin terminals; a disk shaped body of insulating material and a metal reinforcing band around said body; a socket terminal assembly including a plurality of socket terminals, a body element of insulating material loosely receiving said terminals, and a metallic reinforcing sleeve around said body element; a cap housing fitting partially over said reinforcing sleeve and enclosing the end of a multiple conductor cable; a second cap housing embracing said reinforcing band and enclosing the end of a second multiple conductor cable, said second housing adapted to extend over said reinforcing sleeve complementarily to said first housing; said cap housings being provided with guard flanges; and a latch member fitting within said body element including a thumb button and catch element; and sleeve having an opening adjacent one of said guard flanges for receiving said thumb button, and a second opening adapted to be covered by said second cap housing and to receive said catch element; said second cap housing having a latch channel adapted to cooperate with said catch element.

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