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CONNECTOR FOR ELECTRICAL CONDUCTORS HAVING  
MALE AND FEMALE PARTS TO BE CONNECTED  
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3,177,462

Fig. 1

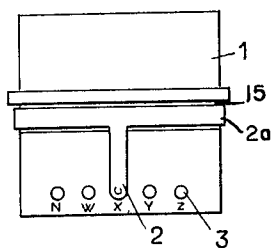


Fig. 2

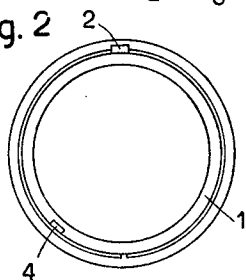


Fig. 3

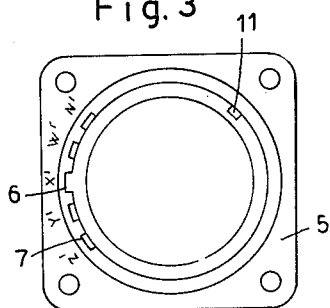


Fig. 4

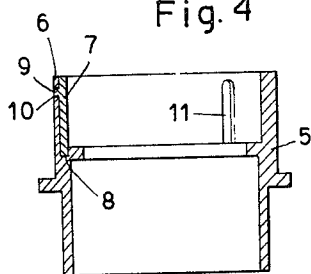


Fig. 5

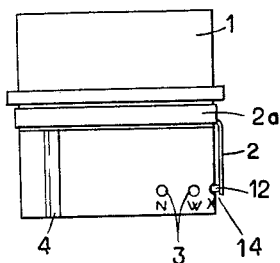


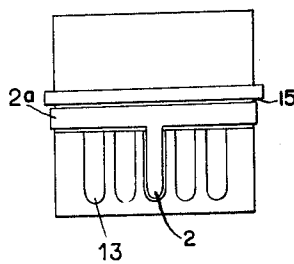
Fig. 6



Fig. 7



Fig. 8



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## CONNECTOR FOR ELECTRICAL CONDUCTORS HAVING MALE AND FEMALE PARTS TO BE CONNECTED

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6 Claims. (Cl. 339—186)

This invention relates to a connector for electrical conductors having male and female parts to be connected.

In principle, the connector includes two cylindrical components with one component being adapted to be inserted into the other component, an insulating body for each component with one body carrying contact sockets and the other body contact pins, and complementary rib and groove means for the components so that when one component is inserted into the other component the rib and groove means constitute a non-adjustable guide means for the two components. With such connectors, it often happens that persons try to connect the male component of one set with the female component of another set and vice versa which is most objectionable and can be very dangerous.

A salient object of this invention is to overcome this objectionable characteristic.

To accomplish the above and other advantageous objects, the invention broadly comprises providing the respective housings with complementary adjustable or settable locking means which will permit the insertion of the proper housing into the other housing and prevent the insertion of the improper housing.

More specifically, the invention includes a locking bar for one housing which can be preset in one of several angular positions, a series of grooves in the other housing corresponding to the several angular positions of said one housing, bar means for blocking all of the grooves but the groove corresponding to the preset position of the locking bar so that said one housing can be inserted into the other housing to permit the pins and sockets of the housings to engage, and if the setting of the locking bar and bar means does not coincide, the locking bar strikes the end of the other housing prior to the engagement of the pins and sockets.

One version of the connector according to this invention is illustrated in the following description and in the appended drawing, in which:

FIG. 1 is a side view of a socket connector part,

FIG. 2 is a bottom view of the socket housing shown in FIG. 1,

FIG. 3 is a top plan view of the pin connector part,

FIG. 4 is a longitudinal sectional view of the pin connector part shown in FIG. 3;

FIG. 5 is a side view of the socket connector part turned 45° from the position shown in FIG. 1;

FIG. 6 is a front view of a blocking bar for use in blocking the locking grooves in the housing of the pin connector part;

FIG. 7 is a side view of the blocking bar, and

FIG. 8 is a side view generally similar to FIG. 1 of a modified socket connector part.

A socket housing 1 of circular configuration and made of any suitable material is adapted to carry an insulating body of rubber or the like and such body is provided with a number of axially arranged connector sockets (not shown). Intermediate the ends of the housing there is formed an external annular groove 15 in which is rotatably mounted a resilient ring 2a. A locking bar or finger 2 is integrally formed with the ring 2a and extends downwardly therefrom. The lower or free end of the bar is provided with an inwardly directed pin 12. A series of spaced apertures 3 are formed in the outside of the hous-

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ing with such apertures defining different angular positions N, W, X, Y and Z, respectively.

With reference to FIGS. 1 and 5, it will be appreciated that by rotating the ring 2a, the locking bar can be aligned with the selected aperture 3 (in FIG. 1, the position X) and by virtue of the resiliency of the bar, the pin 12 will be held in the aperture 3. This arrangement provides an adjustable or settable locking means for the housing means.

In FIGS. 2 and 5, it will be seen that an exterior guide groove 4 is provided for the housing 1 and extends downwardly from the annular groove 15 to the lower end of the housing. The purpose of the groove 4 will later be more fully described.

FIG. 8 discloses a modified form of the socket housing 1 in which in lieu of the apertures 3 and the pin 12, the housing is formed with a series of spaced external grooves 13 and the locking bar 2 is received and held in the selected groove.

As illustrated in FIGS. 3 and 4, a pin housing 5 also of circular configuration is adapted to support an insulating body having a number of axially arranged connector pins which correspond in number to the sockets of the housing 1.

The inner periphery of the housing 5 is provided with a plurality of vertically extending grooves 6 which correspond in number to the apertures 3 and the various angular positions being identified N', W', X', Y' and Z'. Ordinarily, the grooves 6 are blocked or closed by detachable bars or fingers 7. In order to block the groove, it will be noted in FIGS. 4 and 7 that the lower end of the bar is bent as at 7' and that an inwardly directed pin 9 is located adjacent the upper end. The lower end 7' is lodged in a recess 8 and the pin 9 in an aperture 10 located in the upper portion of the groove 6 and by virtue of the resiliency of the bar and the bent end 7', the bar will be retained in the groove. The foregoing arrangement defines an adjustable locking means for the housing 5.

A guide rib 11 projects inwardly of the housing 5 and is adapted to be received in the groove 4 of the housing 1 when one housing is inserted in the other for ensuring the insertion of the same contact pins into the corresponding connector sockets.

It will be appreciated that due to the external similarity between connector parts frequently persons become confused as to the male and female components to be connected, and as a consequence attempt to use the male component with the improper female component and vice versa. This, of course, is highly disadvantageous and may be very dangerous and by reason of the adjustable locking means above described for the housings 1 and 5, such situations are avoided.

In operation, the adjustable locking means of the housings 1 and 5 are set so that when the respective housings are in proper angular relation to the center line, the guide rib 11 can enter the guide groove 4 and the locking bar 2 will be received by the groove 6 which is not blocked or closed by the bars 7. On the other hand, if the housings 1 and 5 are not of the same set and an attempt is made to effect a connection, if the locking bar 2 is set in a position which does not correspond to the open or unblocked groove 6 of the housing 5, end 14 of the bar 2 will stop against a locking bar 7. Preferably the bar 2 has such a length it will prevent a continued insertion of housing 1 into housing 5 prior to the contact socket and pins engaging and the end 14 may be located such a distance from the housing center line that such end can stop against the edge of the housing 5 if one should try to connect the housings in an angular position in which the bar 2 is positioned a small distance outside one of the grooves 6.

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It is to be understood that housing 1 may carry the contact pins and housing 5 the contact sockets, if desired. I claim:

1. In a connector for electrical cables, a socket housing adapted to carry an insulating body provided with contact sockets and a pin housing adapted to carry an insulated body provided with contact pins, a rib on one of said housings, the other housing having a groove therein for receiving said rib when one housing is inserted in the other with said rib and groove constituting a positive guide means for the housings, settable locking means for said housings, said settable locking means including a locking bar for one housing which can be preset in one of several positions with said bar extending axially of its housing, said other housing having several axially extending grooves corresponding to the several positions of said one housing, and means for blocking all of said axially extending grooves but the groove corresponding to the preset position of the locking bar so that said locking bar can enter such groove when one housing is inserted into the other to permit the pins and sockets to engage.

2. The connector as claimed in claim 1 including a ring rotatably mounted in an annular groove in said one housing, said locking bar being integral with said ring and said ring and locking bar being of resilient material.

3. The connector as claimed in claim 2 in which said several positions are defined by circumferentially spaced apertures in said one housing and a pin on the free end of said locking bar is adapted to be inserted into a selected

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one of said apertures for defining the preset position of the locking bar.

4. The connector as claimed in claim 1 including a ring rotatably mounted in an annular groove in said one housing, said locking bar being integral with said ring, said ring and bar being of resilient material, said several positions being defined by circumferentially spaced axially extending grooves in said one housing, and said locking bar having a length and thickness to permit its insertion into a selected one of said grooves for defining the preset position of the locking bar.

5. The connector as claimed in claim 1 in which said blocking means is defined by a resilient bar adapted to be detachably fixed in the groove.

6. The connector as claimed in claim 5 in which said resilient bar is provided with a bent end for engaging a recess in said other housing at the bottom of the groove and a pin adjacent the opposite end of the bar for entering an aperture adjacent the top of the groove whereby the resiliency of the bar fixes the bar in the groove.

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