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LOCKING CONNECTOR WITH HOOD ASSEMBLY

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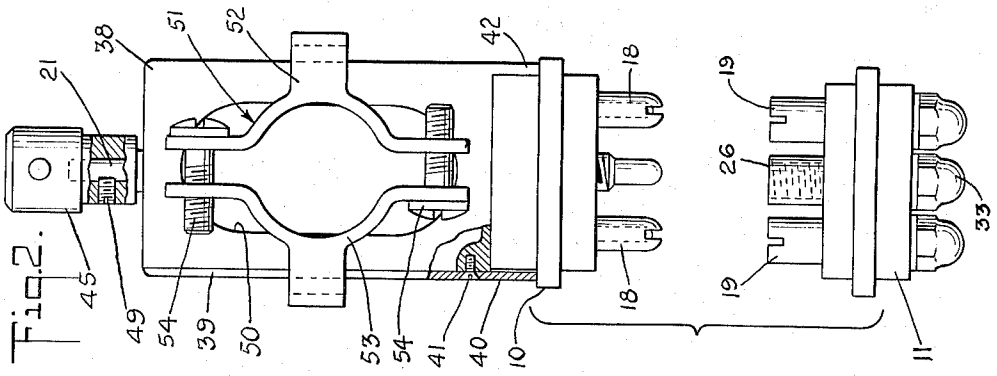



Fig. 2.

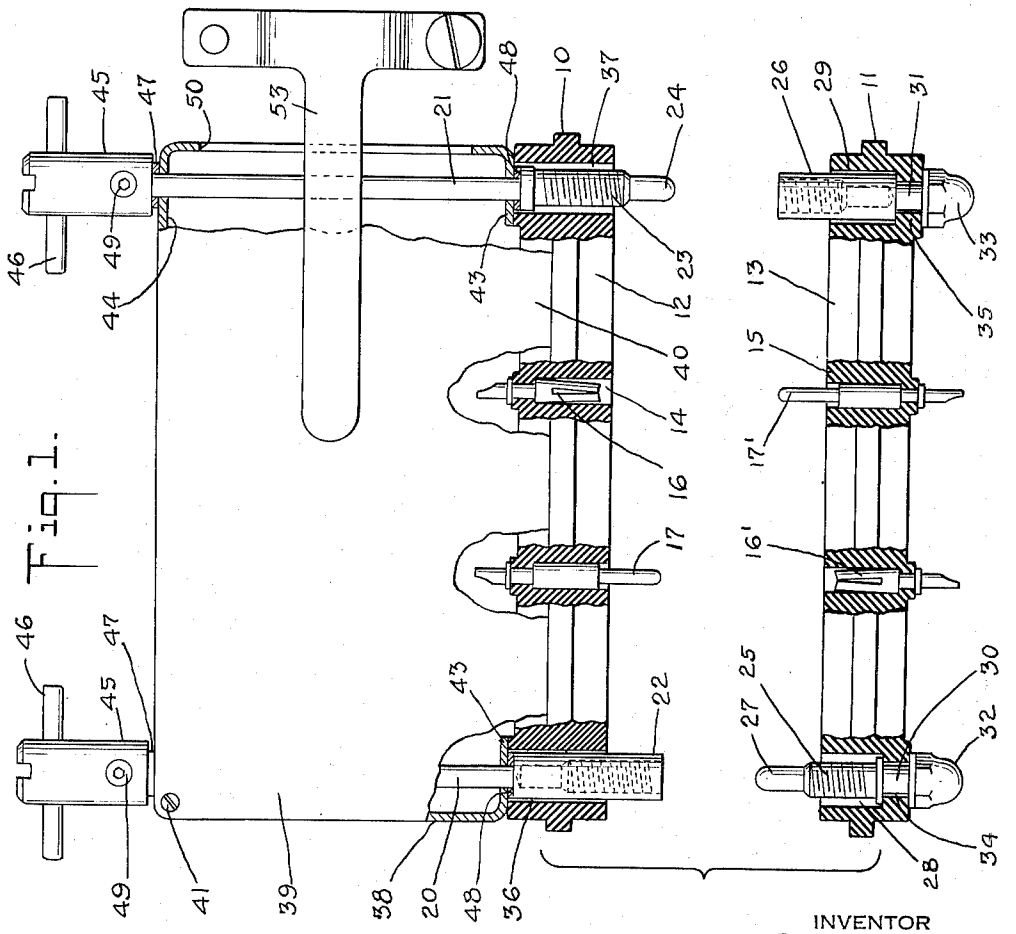



Fig. 1.

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# LOCKING CONNECTOR WITH HOOD ASSEMBLY

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This invention relates to electrical connectors employing a multiplicity of contacts adapted to be brought into electrical connection with each other. More particularly, the invention deals with connectors including a hood assembly on one of the connectors, wherein means is provided for coupling and securing the connectors together and to separate the connectors whenever desired. Still more particularly, the invention deals with a structure of the character described, wherein the hood assembly can be quickly and easily detached with respect to the connector and, wherein, the hood includes a detachable cover plate to give access to the contacts of the connector.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

Fig. 1 is an exploded side view showing a pair of connectors made according to our invention, with parts of the construction broken away and in section and illustrating only part of the contacts employed; and

Fig. 2 is an exploded end view of the structure as seen in Fig. 1, with part of the structure broken away and in section and omitting showing of the contacts of the connectors.

In the drawing, 10 and 11 represent two connectors comprising elongated bodies 12 and 13, respectively, of insulating material, these bodies having, throughout the major portion of the area thereof, inwardly of the ends, sockets, as at 14 and 15, respectively, in which male and female contacts are mounted. In some instances, all of the male contacts are mounted in one connector and the female contacts are mounted in the other connector. On the other hand, in some instances, it is desirable to mount male and female contacts in both connectors, as diagrammatically illustrated in the showing of part only of the contacts in Fig. 1 of the drawing. Female contacts 16, 16' are shown mounted in the connectors 10 and 11 and male contacts 17 and 17' are also shown mounted therein. While only two contacts are illustrated in Fig. 1 of the drawing, it will be understood that connectors of the kind under consideration include large numbers of the contacts usually ranging from twenty to two hundred or more.

In view of the number of contacts employed in connectors of this type and kind and the fact that these contacts have spring engagements with each other, it requires considerable pressure to engage and disengage the connectors and, from this standpoint, we have provided means for manually and positively coupling and uncoupling the connectors, as later described.

End portions of the connectors have male and female alinement members facilitating the alinement of the contacts one with respect to the other; for example, male alinement pins 18 are provided at one end of the connector 10 and the corresponding end of connector 11 has socket members 19 for reception of the pins 18. It will be understood that the other ends of the connectors 10 and 11 will have an opposed arrangement of the male and female members 18 and 19. In other words, the left-hand end of the connectors shown in Fig. 1 will have female members 19 disposed on the connector 10 and male members 18 on the connector 11. These alinement members are old in the art and, for this reason, no attempt is made to show these members in Fig. 1 of the drawing, as our invention is primarily concerned with the means for manually moving the connectors into coupled and uncoupled engagement with respect to each other, which means comprises the rods 20 and 21, note Fig. 1 of the drawing. The rod 20 has, at its lower end, an internally threaded female socket 22; whereas the rod 21 has, at its lower end, a male threaded portion 23 terminating with a reduced guide end 24.

It will also be apparent from a consideration of Fig. 1 of the drawing that the connector 11 has, in alinement with the female socket 22, a male threaded pin 25 cooperating with the socket 22 and at its other end a female threaded socket 26 cooperating with the threaded portion 23. The pin 25 has a reduced guide end 27, similar to the end 24. It is preferred that the threading of all of the parts 22, 23, 25 and 26 be of standard double threading to facilitate quick action in coupling and uncoupling the connectors.

It will appear from a consideration of Fig. 1 of the drawing that the pin 25, as well as the socket 26, have a free mounting in sockets 28 and 29 of the connector 11, the pin and sockets having reduced threaded portions 30 and 31 on which are mounted cap-nuts 32 and 33 to retain the pin and socket in position. The pins 30 and 31 preferably have flattened sides to engage correspondingly formed sockets 34 and 35 to key the pin 25 and socket 26 against rotation in the connector 11. No detailed showing of this keying construction is made as it is well known in the art.

It will also be noted from a consideration of Fig. 1 of the drawing that the socket 22 is freely and rotably mounted in a bore 36 of the connector 10 and the pin threaded portion 23 is correspondingly mounted in a bore 37 of the connector. At 38 is shown a casing or hood which is fixed to the connector 10, the casing being open at one side and this open side is closed by a cover plate 39, the lower end 40 of which overlies one side of the connector 10, as clearly noted in Fig. 2 of the drawing. Screws 41 are employed in corner portions of the cover and casing to secure the cover in position, only part of these screws being shown. The casing 38 has an extension 42, similar to the extension 40, to overlie the other side of the connector 10, as noted in Fig. 2 of the drawing.

The ends of the casing 38 have inwardly extending flanges 43, note Fig. 1, through which the rods 20 and 21 pass. The rods also pass through apertures in the top wall 44 of the casing, as noted, for example, at the right of Fig. 1, and fixed to the protruding ends of the rods 20 and 21 are knobs 45 having fingerpiece cross-rods 46 facilitating manual rotation of the rods. It will be apparent that washers 47 are disposed between the knobs 45 and the top wall 44 of the casing and other washers 48 are disposed between the sockets 22 and the threaded portions 23 and the flanges 43 to facilitate the rotation of the rods in coupling and uncoupling of the connectors. In this operation, the connector 11 is brought into close proximity to the connector 10 by aligning the pins and sockets 18 and 19 and, in this operation, the threaded portion 23 of the rod 21 is brought into engagement with the threaded socket 26 and the socket 23 is brought into engagement with the threaded pin 25 and, in intermittently rotating the knobs 45, the connector 11 is firmly drawn into engagement with the connector 10, the male and female contacts being moved into positive engagement with each other. In the fore-

going operation, no strain is put on the connector **10**. To the contrary, all strain of rods **20**, **21** and the threaded couplings **22** and **23** is taken up by the casing **38**, as clearly noted in Fig. 1 of the drawing. In referring to the free mounting of the male and female coupling members **23**, **22**, **25**, **26** in their respective connector bodies of insulating material **10** and **11**, this free mounting may be descriptively described as an axial floating of the members and, by virtue of the freedom of these members, also are tiltable within limits which facilitates, through the medium of the double threads employed, the free and quick coupling and uncoupling of the connectors.

To separate the connectors, the rods **20** and **21** are reversely rotated and this operation definitely moves the connector **11** out of engagement with the connector **10**.

It will be noted from a consideration of Fig. 2 of the drawing that the knobs **45** are detachably coupled with the rods **20**, **21** by set screws **49**, one of these engagements with the rod **21** being shown in said figure.

One end of the casing **38** has an elongated opening **50**, through which electric wires extending to the contacts **16** and **17** are adapted to pass. These wires also pass through a clamp yoke **51** defined by a yoke part **52** secured to the casing and extending beyond the apertured end wall and a yoke part **53** secured to the cover **39** and arranged in alinement with the yoke part **52**. Screws **54** are employed to draw the yoke parts together in clamping the wires therebetween, as will be apparent.

It will be understood that the male and female alinement members **18** and **19** of the connector **10** engage the casing, or the flanges **43** thereof, in coupling the casing **38** with said connector. It will, thus, be apparent that the casing **38**, together with the pins **20**, **21** and the female and male threaded portions **22**, **23** can be removed from the connector **10** without detachment of said rods.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In devices of the character described, a pair of connectors having a plurality of male and female contacts adapted to be brought into engagement with each other, end portions of the connectors having male and female alinement members for guiding assemblage of the connectors, one connector having a casing fixed to one surface thereof and forming a hood enclosing connections to the contacts of said connector, a pair of rods at end portions of the casing and said connector, one rod having, within the connector, a male threaded member, the other rod having, within the connector, a female threaded member, both threaded members being free for axial floating movement of the connector and projecting beyond the other surface thereof, the other connector having, at end portions thereof, projecting male and female threaded members keyed to and free for axial floating movement in the connector and engaged by the female and male threaded members respectively of said rods in moving the connectors toward and from each other in the operation of coupling and uncoupling said contacts, and said rods having, outwardly of the casing, manually rotatable knobs fixed thereto for rotation of the male and female threaded members of said rods.

2. In devices of the character described, a pair of connectors having a plurality of male and female contacts adapted to be brought into engagement with each other, end portions of the connectors having male and female alinement members for guiding assemblage of the connectors, one connector having a casing fixed to one surface thereof and forming a hood enclosing connections to the contacts of said connector, a pair of rods at end portions of the casing and said connector, one rod having, within the connector, a male threaded member, the other rod having, within the connector, a female threaded member, both threaded members being free for axial floating movement of the connector and projecting beyond the other surface thereof, the other connector having, at end portions thereof, projecting male and female threaded members keyed to and free for axial floating movement in the connector and engaged by the female and male threaded members respectively of said rods in moving the connectors toward and from each other in the operation of coupling and uncoupling said contacts, said rods having, outwardly of the casing, manually rotatable knobs fixed thereto for rotation of the male and female threaded members of said rods, all of said male and female threaded members having double threads facilitating quick coupling and uncoupling of said connectors, and said male and female alinement members projecting sufficiently from said connectors to aline the connectors prior to the coupling engagement of the male and female threaded members one with the other.

3. In electrical connectors of the character described, a pair of elongated connector bodies of insulating material, said bodies having a plurality of electrical contacts arranged through the major portion of the area thereof inwardly of ends of said connectors, ends of both connectors having, at corner portions thereof, male and female alinement members projecting from adjacent surfaces of the connectors sufficiently to aline said connectors prior to engagement of the electrical contacts, the ends of said connectors having, intermediate said alinement members, male and female threaded coupling members axially floating in the respective connectors, the male and female threaded coupling members of one connector being keyed against rotation therein, the male and female threaded coupling members of the other connector being rotatable therein, and the male and female threaded coupling members of both connectors having double threads which, in combination with said axial floating of the members in the connectors, facilitate quick and free coupling and uncoupling of the connectors.

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