

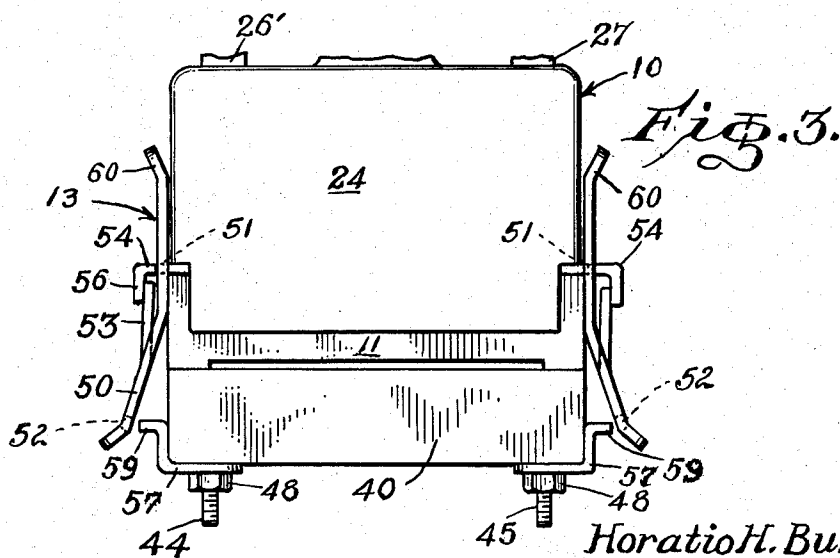
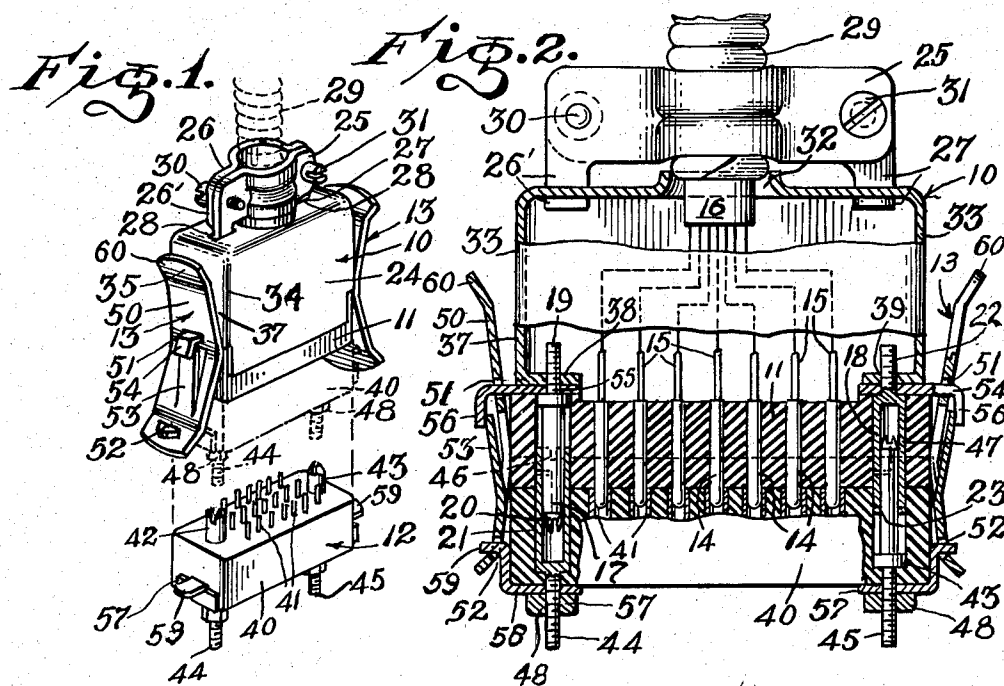
Aug. 21, 1956

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2,760,174

LOCKING MECHANISM FOR ELECTRICAL CONNECTORS

Filed Aug. 13, 1954



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LOCKING MECHANISM FOR ELECTRICAL CONNECTORS

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Application August 13, 1954, Serial No. 449,749

2 Claims. (Cl. 339-91)

This invention relates to electrical connectors and more particularly to a locking mechanism for releasably securing electrical connector parts together.

It is an object of the present invention to provide a releasable locking mechanism for electrical connector terminal parts which is attached to a connector hood and will permit the connector parts to have sufficient lateral relative displacement to maintain electrical contact between elements but will lock the connector parts against longitudinal separation.

Another object of the present invention is to provide a hood construction for electrical connector parts with a flexible, releasable locking attachment which will permit relative lateral shifting of the connector elements while maintaining electrical engagement and also prevent parting of the connector elements despite continued vibration of the parts and axial tension.

Still another object of the present invention is to provide a laterally displaceable hood construction with a releasable locking mechanism which will not restrict lateral relative shifting of the component connector elements but which will prevent separation of the connector parts.

A further object of the present invention is to provide a quick release locking attachment for electrical connectors which will assure connector engagement and electrical contact in the locked position.

Another object of the present invention is to provide a spring releasable locking device for electrical connectors which will automatically lock the component elements in electrical engagement as the connector parts are fitted together.

Other objects of the present invention are to provide a spring releasable locking mechanism for maintaining engagement of connector parts which is of simple construction, inexpensive to manufacture, has a minimum number of parts, easy to assemble upon a connector hood, permits floating lateral movement of the connector parts while the parts are maintained in locked engagement, light in weight, has simplicity of design, convenient to use and efficient in operation.

For other objects and a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of separable connectors made according to the present invention and shown in both a disengaged position and in an engaged position;

Fig. 2 is an enlarged vertical partial sectional view illustrating the releasable locking mechanism in the locked position, and the interior of the connector elements;

Fig. 3 is an enlarged exterior vertical view of the connector hood and insulating body and the detachable connector parts shown with the releasable locking mechanism in the released position.

Referring now more in particular to the drawings, there is illustrated in Fig. 1 an electrical connector comprising

broadly a hood member 10 housing an insulating connector body 11 which is detachable from a base connector element 12 by operation of the spring releasable locking mechanism 13 which is positioned at each side of the hood member 10. The insulating body 11 contained within the hood member 10 includes a plurality of male terminals 14 secured within the insulating body by conventional means. The inner ends of the male terminals have hollow ends 15 for receiving therein the individual wires of multi-wire cable 16. Insulating body 11 also has contained therein polarizing male and female terminals 17 and 18 which extend axially through the body 11. The male terminal 17 has a threaded shank 19 and a tapered outer end 20 with a slot 21 therein adapted to receive a screw driver for effecting the connection of the connector part with the hood 10. The female connector terminal part 18 has a threaded shank 22 and the outer end is slotted at 23 to receive a screw driver for effecting the connection of this terminal also with the hood member 10. The hood member 10 is formed of a shell member 24 and clamping cable parts 25 and 26 which engage the end of the hood through clamp projections 26' and 27 which pass through apertures 28, which apertures are in diagonally opposite corners in the end of the hood for receiving the projections 26' and 27. The projections upon extending through the openings 28 of the closed end of the hood are bent over as indicated in Fig. 2. The clamp parts 25 and 26 are secured together about a cable 29 by screws 30 and 31. An opening 32 is provided in the end of the shell member 24 for the purpose of receiving the cable 16.

The ends 33 of the hood member 24 are struck out and bent under to receive the insulating block 11. The sides of the hood member will thus extend partially over the sides of the insulating member 11, not only to retain the insulating block in position within the hood but also to guide the same during any lateral shifting movement of the connector parts. The respective ends of the hood 24 are thus provided with parallel slits 34 whereby to provide a flexible tongue member 37 with a turned-in end 38 having a threaded opening 39 therein to receive the threaded shanks of the terminal members 17 and 18. Accordingly, the tongue members may be sprung laterally affording lateral displacement and alignment of the insulating body 11 within the shell member 24 and with a base connector part 40.

The base connector part 40, similar in construction to the insulating body 11, is provided with a plurality of female terminals 41 which will receive the male terminals 15 therein upon engagement of the connector parts. In addition to the female terminals 41, the base connector carries polarizing female and male terminals 42 and 43, respectively, which will be in cooperative sliding engagement with the terminals 17 and 18, respectively. The female connector 42 and male connector 43 terminal parts have threaded shanks 44 and 45 and slots 46 and 47 respectively, said slots being provided for receiving a screw driver therein for effecting the connection of these terminals with a fastening nut 48 which will engage the end of the threaded shanks through the base connector part 40.

In order to positively maintain the connector parts in constant electrical engagement despite vibrations, axial tensions and lateral relative shifting of the parts, the spring releasable locking mechanisms 13 are provided. The locking mechanism 13 comprises an arcuate metallic flat blank strip 50 having longitudinally selectively spaced apertures 51 and 52 and a knockout portion forming a tongue member 53 that engages a lug 54 and that is resilient so as to nominally urge the strip 50 toward its locking position. 54 is securely retained on the inwardly turned tongue 38 and 39 of the opposed hood

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slit sidewalls through hole 55 provided on the inner portion of each lug. The projecting portion 56 of each lug 54 is bent downwardly and passed through the aperture 51 in each strip 50 prior to assembling the components in the hood member 10. The inward end of the bent portion 56 will engage with the free end of the tongue 53 to provide the requisite resilience to the strip 50 to bias same inwardly as well as to permit lateral shifting of the connector parts when in operative engagement relative to the shell member 24.

Locking lugs 57, each having a connector attaching hole 58 therein, are securely retained against the end of the base connector part 40 by the fastening bolts 48 positioned on the threaded shanks 44 and 45 of the respective polarizing terminal posts. The locking lugs 57 are bent around the base connector corner and made to extend upwardly and project outwardly at 59 to become engaged within the locking aperture 52 located adjacent the lower end of the strip 50. It should be apparent that the insulating bodies carry the parts of the locking mechanism free of the hood and that the hood need not be a part of the assembly.

In operation, the base connector 40 may be anchored to a wall or panel or may be made freely movable at the end of an electrical cable and the hooded assembly 10 will be made to cooperatively engage with the base connector 40. As the insulating body 11 having terminals 17 and 18, is aligned with base connector polarizing terminals 42 and 43, the conductor terminals 15 and 41 will be engaged as the connector parts are slidably moved toward one another. Upon forcing the hood 10 toward the bottom position against the base connector 40, the arcuate spring latch strip 50 will be pivoted outwardly on the lug 56 initially upon contacting the projection 58 on the locking lug 56.

Upon reaching the bottoming position, when the body 11 contacts the top of the base connector 40, the projection 59 enters the aperture 52 to automatically lock the parts in operative engagement, as clearly shown in Fig. 2. In order to separate the component parts from each other, merely depress the release lever thumb and finger grip portion 60 of the strip to disengage the locking aperture 52 from the projection 58 and the two component parts may be pulled apart for separation.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. An electrical connector assembly comprising a first connector part, a hood member open at one end to receive said connector part therein, said hood member

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having opposing sides cut away from its open end to permit the relative shifting movement of the connector part relative thereto and providing side extensions to guide the connector part during any lateral shifting movement thereof, each of said ends being slit and providing a tongue member to be flexed inwardly and outwardly of the hood member, said tongue member being adapted to receive fastening means on the connector part, said hood member having an opening removed from its closed end for receiving a cable therein, a base connector part for cooperative engagement with said first connector part, and spring releasable locking means for retaining the base connector part adjacent the first connector part and movable laterally on said tongue member, said spring releasable locking means comprising an arcuate latch member having spaced apertures and a centrally disposed projecting spring member, said latch member being pivotally connected to the tongue member of said hood member through one aperture and being free to move laterally with said tongue member, and a locking lug fixed on said base connector to cooperatively engage with another aperture in said latch member.

2. In combination, insulating separable connector parts having a plurality of inter-engageable connector terminals therein, a hood member open at one end for receiving one of said connector parts and having a pair of opposing walls slit longitudinally and a pair of guide walls, said slit walls being sufficiently flexible to permit lateral connector movement, said connector being guided in lateral movement by said guide walls, releasable locking means pivotally connected to said opposing slit walls and normally urging one of said means inwardly, locking lugs projecting from the other connector part for locking engagement with the inwardly extending end of said locking means to prevent separation of the connector parts, said locking means comprising opposing flat arcuate strip members each of which having spaced apertures therein and a resilient knockout tongue portion lying between the apertures, strip retaining lugs mounted on the ends of said hood slit walls to pivotally support the strip members through one of their apertures and to engage with the end of the knockout tongue portion to normally urge one end of the strip member inwardly toward its locking position.

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