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3,426,320

ELECTRICAL CONNECTOR RECEPTACLE

Filed Sept. 30, 1966

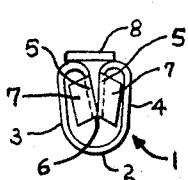


Fig. 2

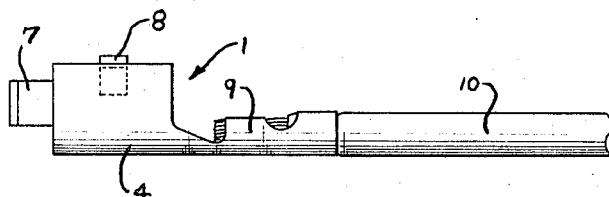


Fig. 1

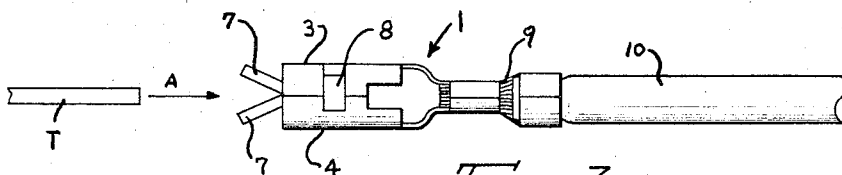


Fig. 3

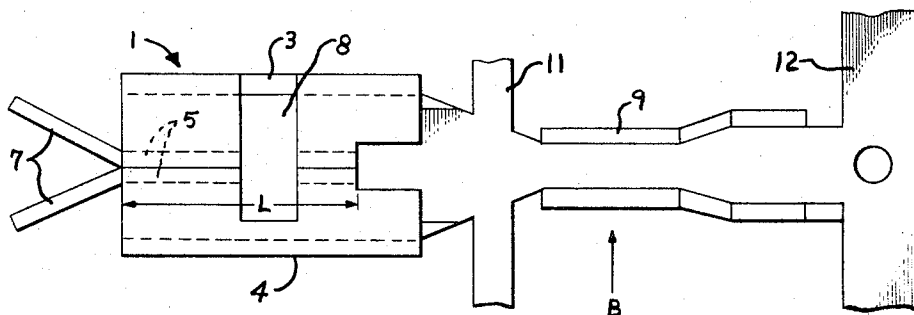


Fig. 5

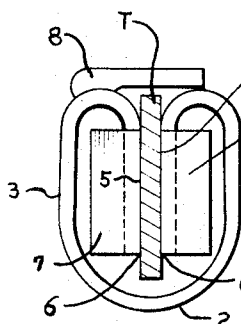


Fig. 4

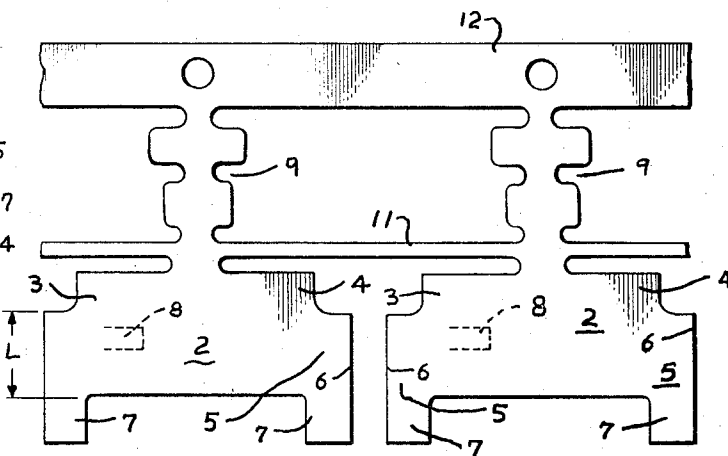


Fig. 6

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ELECTRICAL CONNECTOR RECEPTACLE

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ABSTRACT OF THE DISCLOSURE

An electrical connector receptacle comprises contact springs which are re-entrant extensions of side walls of a U-shaped member. Projections of the contact springs extend outwardly from an insertion end of the contact springs to guide a tab between the contact springs. A tongue is stamped out from a side wall and assists in keeping the tab between the contact springs.

This invention relates to an electrical connector receptacle and is particularly directed towards a U-section tab receptacle with the re-entrant portions forming contact springs.

A receptacle for a flat electrical tab may comprise an elongated body having a pair of internal contact springs arranged to engage opposite faces of the tab when inserted into the body, so that the tab is gripped resiliently between the contact springs. It may be desirable under some circumstances for the force required to disconnect the tab from the receptacle not to be substantially less than that required to mate the tab with the receptacle. It is also desirable that the forces required to respectively mate the tab with the receptacle and to disconnect the tab from the receptacle should remain substantially constant after repeated insertion and withdrawal of the tab.

According to the invention, the body is of essentially U-shaped cross-section, the arms of the U having, as seen in cross-section through the body, re-entrant extensions which lie between the arms and have free longitudinal edges directed towards the bight of the U, to form the contact springs, the extensions having tab-guiding projections providing a mouth through which the tab can be inserted in the axial direction of the body so that the tab is guided between the contact springs formed by the extensions.

The body preferably has at least one tongue disposed opposite the bight of the U to restrain movement of the tab outwardly of the bight of the U. The tongue or tongues may conveniently be stamped out from one of the arms of the U.

The free longitudinal edges of the contact springs are preferably in resilient engagement with one another in the unmated condition of the receptacle.

The relative dimensioning of the receptacle and the tab may be such that when the tab has been fully inserted into the receptacle the contact springs lie parallel to the tab, to provide desirably large electrical contact between the contact springs and the tab. The forces required for insertion and withdrawal of the tab can be predetermined by regulating the length of the contact springs which are engaged by the tab.

The receptacle may readily be made by rolling a single sheet metal blank and may include a ferrule portion for crimping to an electrical lead. A series of such receptacles may be readily produced in strip form for use with an automatic or semi-automatic crimping machine, by rolling a single strip-shaped metal blank.

It is therefore, an object of the present invention to provide an electrical connector receptacle which is of U-shape cross-section for receiving a tab member.

Another object of the present invention is to provide

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an electrical connector receptacle with re-entrant extensions which form the tab-contact springs.

A further object of the present invention is to provide an electrical connector with extensions which have tab-guiding projections therein.

Still another object is to provide an electrical connector receptacle where in the relative dimensions of the receptacle and tab are such that when the tab is fully inserted into the receptacle the contact springs formed by the extensions lie parallel to the tab.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described a preferred embodiment of the invention; it is to be understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention, but is given for purposes of illustration in order that others skilled in the art may more fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of the particular use.

In the drawings:

FIGURE 1 is a side elevational view of an electrical receptacle crimped to an electrical lead;

FIGURE 2 is an end view of the receptacle illustrated in FIGURE 1;

FIGURE 3 is a plan view of FIGURE 1 and shows a flat electrical tab positioned for insertion into the receptacle;

FIGURE 4 is an enlarged view similar to that of FIGURE 2 but showing the tab in position in the receptacle;

FIGURE 5 is an enlarged plan view of the receptacle in its uncrimped state and forming part of a strip of similar receptacles which are not shown; and

FIGURE 6 is a plan view of part of a blank for forming the strip.

The receptacle comprises an essentially U-section body 1 having a bight 2 and arms 3 and 4. The arms 3 and 4 are extended inwardly of the body 1 to form re-entrant portions 5 which lie between the arms 3 and 4 and which form contact springs for engaging opposite faces of a flat electrical tab T (FIGURE 3) to be inserted into the receptacle. As shown in FIGURE 2, the portions 5 have free longitudinal edges 6 essentially parallel to the bight 2 and which engage each other centrally of the body 1. Each portion 5 has a tab-guiding projection 7 projecting axially outwardly of the body 1. The projections 7 diverge axially outwardly of the body 1 (as best seen in FIGURE 3) to form a tab-guiding mouth. A tongue 8 stamped out from the arm 3 lies on the opposite side of the body 1 to the bight 2 and partially spans the arms 3 and 4. If required more than one tongue 8 may be provided, e.g. there may be one tongue 8 at each end of the body 1. The opposite end of the body 1 to that from which the projections 7 extend, has integrally formed therewith a crimping ferrule 9 having portions crimped respectively to the electrically conductive core and the insulation of an insulated lead 10.

To mate the tab and the receptacle, the tab T is inserted in the direction of the arrow A in FIGURE 3 into the mouth formed by the projections 7 and is guided thereby between the portions 5 so that these portions are displaced resiliently by the tab outwardly of the body 1 to lie parallel thereto as shown in FIGURE 4 when the tab has been fully inserted into the receptacle. The tongue 8 and the bight 2 cooperate to limit movement of the tab 6 in its own plane relative to the receptacle.

The force required to mate the tab with the receptacle will in general exceed the force required to withdraw the

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tab from the receptacle by between about ten and thirty percent.

By virtue of the projections 7 the tab may be misaligned relative to the longitudinal center line of the receptacle prior to insertion of the tab, by about ten percent on either side of the center line.

As shown in FIGURE 5, the receptacle may be formed as part of a strip of identical receptacles (only one of the receptacles is shown in FIGURE 5), being joined to the next adjacent receptacles of the strip by carrier strips 11 and 12. Such a strip may be fed in the direction of the arrow B into a machine for crimping the ferrule portion 9 of each receptacle to a lead and shearing the carrier strips from the receptacles.

FIGURE 6 shows part of a blank from which the receptacles of such a strip may be rolled. In FIGURE 6 parts of the blank to be formed into corresponding parts of the receptacles bear corresponding reference numerals. The dimension L in FIGURES 3 and 5 corresponds to the length of the contact springs formed by the portions 5. This dimension may readily be varied by suitably cutting the blank to predetermine the tab insertion and withdrawal forces.

Changes in construction will occur to those skilled in the art and various apparently different modifications and embodiments may be made without departing from the scope of the invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only. The actual scope of the invention is intended to be defined in the following claims when viewed in their proper perspective against the prior art.

What is claimed is:

1. An electrical connector receptacle comprising an elongated body having a pair of internal contact springs arranged to resiliently grip opposite faces of a mating tab when inserted into the said elongated body, the body being U-shaped in cross-section with a smoothly-curved bight and having arms provided with substantially flat tab re-entrant extensions thereon which lie between the arms and converge towards the bight along at least part of their length, said extensions have free longitudinal edges directed towards the bight thereof, said bight causing said arms to be normally contiguous at the free edges to form the contact springs, the extensions having tab-guiding projections providing a mouth through which the tab can be inserted in an axial direction of the body so that the tab is guided between the contact springs formed by the extensions.

2. An electrical connector receptacle as claimed in claim 1 wherein the body has at least one tongue member disposed opposite the bight of the U-shape to restrain movement of the tab outwardly of the bight.

3. An electrical connector receptacle as claimed in claim 2 wherein the tongue member is an integral member extending outwardly from one of the arms.

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4. An electrical connector receptacle as claimed in claim 1 wherein the relative dimensioning of the receptacle and the tab are such that when the tab member has been fully inserted into the receptacle, the contact springs formed by the extensions lie parallel to the tab.

5. An electrical connector receptacle as claimed in claim 1 wherein the free longitudinal edges extend essentially parallel to the bight of the U-shaped body.

6. An electrical connector comprising an elongated body having arms connected together by a section defining a U-shape configuration with said section being a smoothly-curved bight, substantially flat re-entrant extensions extending outwardly from said arms and disposed between said arms, said extensions converging towards said bight with free ends thereof being in engagement and directed toward said bight thereby providing contact springs to define a contact-engaging area therebetween, and portions of said extensions extending outwardly from one end of said body thereby providing contact-guiding means to guide a contact member into said contact-engaging area.

7. An electrical connector receptacle comprising an elongated body having arms connected together by a section defining a U-shape configuration with said section being a smoothly-curved bight, substantially flat re-entrant extensions extending outwardly from said arms and disposed between said arms, said extensions converging towards said bight along at least part of their length and having free ends terminating adjacent said bight, said bight causing said extensions to be normally contiguous at a point of maximum convergence thereby providing contact springs to define a contact-engaging area therebetween, and portions of said extensions extending outwardly from one end of said body thereby providing contact-guiding means to guide a contact member into said contact-engaging area.

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