

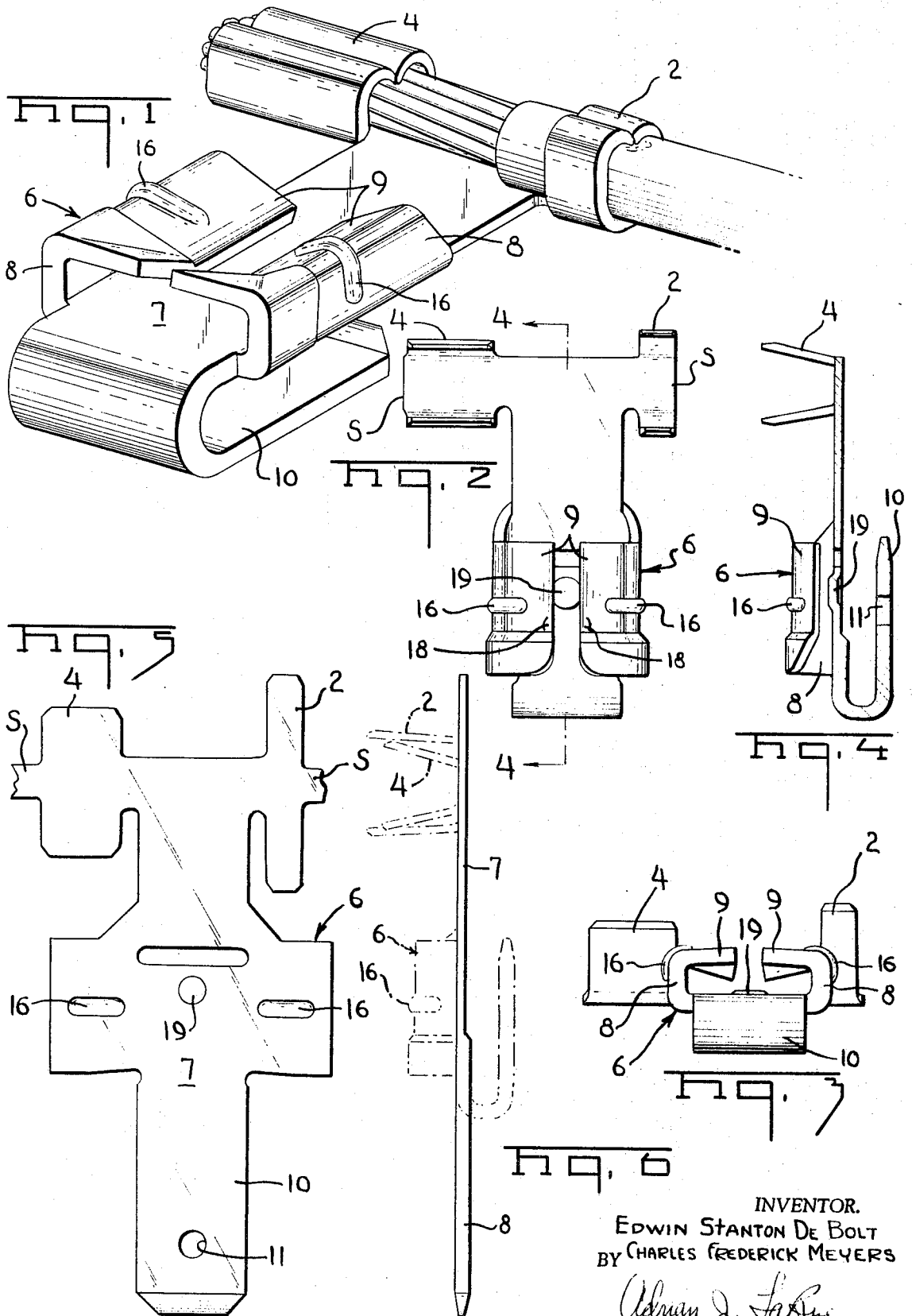
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DETACHABLE ELECTRICAL CONNECTOR MEANS

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DETACHABLE ELECTRICAL CONNECTOR MEANS
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ABSTRACT OF THE DISCLOSURE

A detachable electrical connector which is made from sheet stock in strip form has wire barrels adapted to be swaged onto a bared electrical conductor, receptacle means defining female contact means including curled-in sides, and tab means defining male contact means including a blade continuous from the floor of the connector and formed along a plane adjacent that of the receptacle. The tab is directed toward the rear of the connector. Connectors may be interconnected and stacked in modular form, or they may receive other conventional tabs or receptacles which are secured to conductors. Stock material from which the connector is made is of two thicknesses so that the barrels are thin and deformable, most of the receptacle is thin and flexible, and the tab and the forward part of the receptacle are thick and sturdy. Transition of metal thickness is disposed at a suitable place on the receptacle so as to provide additional strength at the lead-in end of the receptacle. The receptacle has further strengthening means thereon to prevent it from overflexing due to repeated insertions and withdrawals of a tab.

This invention generally relates to detachable electrical connector means, and particularly relates to improvement means for providing substantially greater mechanical strength and rigidity means in one portion of a connector while providing weaker deformable means in another portion of the connector.

Detachables electrical connectors of the receptacle and blade type are generally made from stampings of flat sheet metal of constant thickness and formed to their final shape. In these cases, the blade or tab which constitutes the male connector, is generally made of thick stock, and the receptacle, which constitutes the female connector, is generally made of thinner stock. Also, the conductor-receiving ferrules or barrels, when adapted to be swaged onto their respective conductors, are generally made of thin stock so as to render them deformable.

It is an object of the invention to provide an improved electrical connector for use in wire connections.

Another object is to provide an electrical connector which is formed from a length of strip conductive material and shaped to provide multiple connections.

Another object of the invention is to provide electrical connector members which are formed from lengths of strip conductive material and shaped so as to be readily connected to and retained in similar connector members.

Another object is to provide connectors as described above having blade means of thick material, and receptacle means and wire-receiving means of thin material.

Another object is the provision of means in the receptacle to further strengthen the blade-receiving means and subsequently enhance the electrical/mechanical connections between blades and receptacles.

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

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taken in conjunction with the drawings in which there is shown and described an illustrative 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 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 a particular use.

These and other objects will become apparent when the description of a preferred form of the invention is read in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of a connector in accordance with this invention;

FIG. 2 is a top plan view of the connector;

FIG. 3 is a front elevational view of the connector;

FIG. 4 is a view taken along lines 4—4 of FIG. 2;

FIG. 5 is a top plan view of a metal stamping from which the connector is formed; and

FIG. 6 is a right-hand end view of FIG. 5.

Referring now to FIGS. 1 and 2, a connector according to this invention comprises a one piece member which is blanked out and formed from a pre-milled strip of metal and includes a wire insulation support barrel 2, a wire conductor barrel 4, a tab receptacle portion 6 and a contact tab 10. Barrels 2 and 4 are similar in shape, and are disposed in back-to-back relationship along the axis of strip 5 which connects adjacent connectors together in strip form. Barrels 2 and 4 are adapted to be swaged onto an electrical conductor, as shown and described in U.S. Pat. No. 3,123,431 which is assigned to the present assignee.

The receptacle portion 6 comprises a floor or web 7, sides 8 extending outwardly from edges of web 7 and tab-engaging members 9 extending inwardly towards each other and towards web 7 so as to overlie web 7. Web 7 extends outwardly from the rear of receptacle portion 6 as a transition between receptacle portion 6 and barrels 2 and 4. Web 7 also extends outwardly from the entrance or insertion end of receptacle portion 6 and is bent back underneath web 7 to provide a contact tab 10.

Referring to FIGS. 4 and 6, the strip of metal from which a connector is formed is provided in two thicknesses, the thinner most portion has wire barrels 2 and 4 and part of the major portion of receptacle 6 thereon, while the thicker most portion has the tab 10 and the remainder of the receptacle 6 thereon. The transition from thin to thick material takes place at the forward end of receptacle 6 where it insertably receives a mating tab. This arrangement provides a receptacle which is substantially thin so as to properly flex when receiving a mating tab, but which is substantially thick at its forward or lead-in end to provide support against over-flexing of receptacle 6. Thus, the thin part of the receptacle has sufficient springability whereas the thick part of the receptacle provides strength thereto for long-lasting operation. Since the tab is of thick material like the thick part of the receptacle, then the tab is, of course, strong to the point that it is not easily bendable thereby preventing the tab from being bent back and forth whereby it is broken off from the receptacle. Barrels 2 and 4 are therefore substantially thin so as to be easily deformable by swaging, and tab 10 is thick for strength and support.

Referring to FIGS. 2, 3, and 4 outwardly directed ribs 16 are provided directly behind and in spaced relationship to the lead-in end of receptacle 6. Ribs 16 also constitute support means to prevent receptacle 6 from overflexing during insertion and withdrawal of a mating tab.

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Downwardly-disposed indents 18 are disposed in members 9 in the space between the lead-in end of receptacle 6 and ribs 16. This arrangement provides an interference and enhances the mechanical and electrical qualities in a connection between receptacle 6 and a mating tab.

The entrance to receptacle 6 is formed such that the thick parts of members 9 are beveled to facilitate the insertion of a tab within the receptacle. The part of web 7 extending outwardly from the entrance of the receptacle defines a guide means to guide the tab into the receptacle. A dimple 19 is provided in web 7 to mate with a hole in the tab to increase the retention force between the receptacle and tab. Tab 10 is provided with hole 11 to mate with a dimple of a mating receptacle.

In operation, connectors may be severed from strip S and swaged onto conductor wires by suitable hand crimping tools, or they may be fed into automatic swaging presses in strip form where they are separately swaged to conductors and subsequently severed from the strip S. The tab 10 of one connector may be inserted into the receptacle 6 of a similar connector and so on. This arrangement is especially suitable when several conductors are to be commoned. Alternately, connectors comprising tabs alone (not shown) may be inserted into receptacle 6; or connectors comprising receptacles alone (not shown) may be secured to tabs 10.

It should therefore be understood that repeated insertion and withdrawal of thick tabs 10 into thin receptacles 6 will not overflex the receptacles and cause failure of mechanical/electrical connections therebetween because of the thicker part of the receptacles at the insertion ends thereof. It should be noted that other electrical connectors, configurations of which are not shown herein, may utilize the principles of this invention without departing from the scope thereof.

It will therefore be understood that the aforementioned and other desirable objectives have been achieved; however, it should be emphasized that the particular embodiment of the invention which is shown and described herein is merely intended as illustrative and not as restrictive of the invention.

The invention is claimed in accordance with the following:

1. An electrical connector comprising a receptacle and a tab, said receptacle including a web, sides and tab-engaging members overlying said web, said tab being a continuation of said web and being bent back along said web of said receptacle for substantially the length thereof, and a portion of said web being of thinner material than the remainder of said receptacle and the remainder of said web including said tab, thereby providing strength to said receptacle, said web portion, and said tab.

2. An electrical connector according to claim 1 wherein said web extends beyond said receptacle at a rear end thereof to define a transition provided with conductor-engaging barrel means for connection with an electrical conductor.

3. An electrical connector according to claim 1 wherein said web in forming said tab provides a part extending outwardly from an entrance of said receptacle with said part defining guide means to guide a contact member into said receptacle.

4. An electrical connector according to claim 1 wherein said tab-engaging members at an entrance to said receptacle include beveled sections having the same thickness as said tab to facilitate insertion of a contact member

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into said receptacle and to add strength and rigidity to said receptacle.

5. An electrical connector according to claim 4 wherein the receptacle in the thinner part thereof includes ribs to strengthen this thinner part.

6. An electrical connector according to claim 5 wherein said tab is disposed in a parallel manner along said web.

7. An electrical connector formed from a one-piece blank having two thicknesses and comprising wire barrel means, receptacle means, and tab means, said receptacle means including a web, sides integral with said web and extending away therefrom, and tab-engaging members integral with said sides, extending away therefrom, and overlying and extending toward said web, said web extending outwardly of a rear end of said receptacle means and inter-connecting said receptacle means and said wire barrel means, said web extending outwardly of an entrance to said receptacle and being bent back beneath said receptacle, said tab means substantially comprising the portion of said web beneath said receptacle, the first of said two thicknesses comprising said wire barrel means, a major portion of said receptacle means, and the interconnecting web portion therebetween, the second of said two thickness comprising the remaining portion of said receptacle and the remaining portion of said web which includes said tab means, said second thickness being substantially thicker than said first thickness thereby providing increased strength to said receptacle and tab means.

8. An electrical connector as set forth in claim 7 wherein said remaining portion of said receptacle means includes beveled sections of said tab-engaging members to facilitate insertion of a contact member into said receptacle.

9. An electrical connector as set forth in claim 8 wherein said major portion of said receptacle means has ribs formed therein for strengthening said receptacle means and an indent to aid in retention of said contact member, and wherein said tab-engaging means has indents formed at the free edges thereof adjacent the said second thickness, said indents providing an interference fit between said receptacle and said contact member thereby enhancing the mechanical and electrical qualities in a connection therebetween.

10. An electrical connector as set forth in claim 9 wherein said wire barrel means includes an insulation support barrel and a conductor barrel, said barrels being spaced apart a distance greater than the width of said interconnecting web portion.

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