

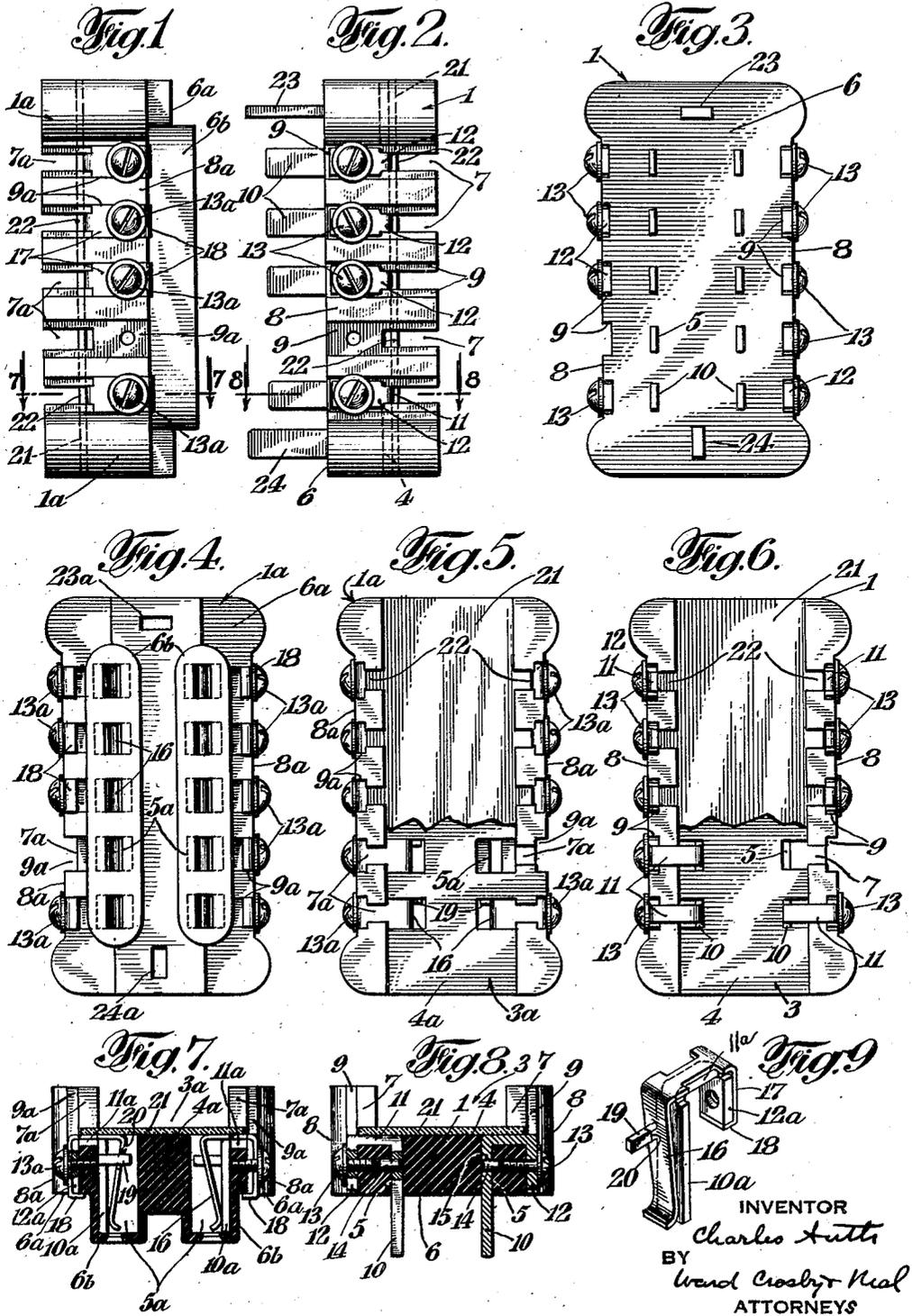
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ELECTRICAL CONNECTER

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ELECTRICAL CONNECTER

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The invention relates to electrical connectors, more particularly of the general type disclosed in prior patent to Richardson No. 1,639,310, dated August 16, 1927, entitled "Electrical connecting unit". The present invention aims primarily to simplify and improve connectors of the above type in respect to the construction of the insulating block and contact members employed. Contact members of the construction described in said prior patent are expensive to construct and have to be moulded in position in the insulating block, whereas connectors constructed in accordance with the present invention may be shaped up out of stock strips of brass or similar metal, and may be inserted and fixed in proper position in the insulating block after the latter is completed.

Further objects and advantages of the invention will be in part obvious and in part specifically pointed out in the description hereinafter contained which, taken in conjunction with the accompanying drawing, discloses a preferred embodiment of the invention; such embodiment, however, is to be considered as merely illustrative of its principles. In the drawing—

Figs. 1 and 2 are side views respectively of female and male connector elements constructed in accordance with the invention.

Figs. 3 and 4 are plan views looking toward the front faces respectively of said male and female connector elements.

Figs. 5 and 6 are plan views looking toward the rear faces respectively of said female and male connector elements.

Figs. 7 and 8 are cross sectional views taken respectively on line 7—7 of Fig. 1 and 8—8 of Fig. 2 looking in the direction of the arrows.

Fig. 9 is a perspective view showing detached a preferred form of the female contact member adapted to be used in connection with the invention.

The invention is disclosed as applied to the male and female elements of a connector of the strain detachable type, such elements preferably having certain different specific features of construction, although in many respects similar. Referring first to Figs. 2, 3, 6 and 8, which show the male or plug element of the connector, the invention is disclosed as applied to a connector having an insulating block 1, preferably of moulded "bakelite" and which preferably is provided with a trough 3 extending along its rear face 4, the trough being for the purpose of receiving a multi-strand electrical cable, the several conductors of which are to be connected to

different contact members as hereinafter described.

In Figs. 2, 5 and 6, one of the contact members is omitted in order to make more clear the construction of the insulating block. The insulating block is provided with a series of recesses 5 extending through the block from its front face 6, to another face thereof, preferably the rear face 4 above described, and if the trough 3 be employed, corresponding recesses 7 are preferably provided, leading from the trough 3 above described, to the side faces 8 of the insulating block 1. Grooves 9 may also be provided in the side faces 8, running in a direction parallel to the recesses 5 above described.

Contact members are then provided which have their engaging portions 10 (by which I mean their parts which make contact with the female contact members as hereinafter described) slidably received within the recesses 5 above described, the construction being such that the contact members may be slipped into proper position after the insulating block 1 has been completed. The terminal portions of the contact members 10 may be then secured to the block 1 to hold the contact members in proper position. In the specific form of the invention which is illustrated the contact members are of U-shape, the base 11 of each contact member seating against the bottom of a recess 7, and the remaining side 12 of the U being received in a groove 9 above described. The contact members may thus be pushed into proper position in the base block, from the rear face 4 thereof, and may be held in position by binding screws 13, which pass through the sides 12 of such members and into the insulating block. I prefer also to employ small pins 14 (Fig. 8) which are forced through the holes 15 in the sides 10 of the contact members by screws 13, to hold the contact members in position when such screws are removed. The friction between the contact members and the insulating block 1 will also assist (or may be in itself sufficient) to hold the contacts in operative position after insertion in the recesses.

Thus the contact members may be inserted after the moulding or shaping of the base block is completed, and it will be noted that the contact members are of a shape which may be easily obtained by bending up rectangular stock.

The female connector element as shown in Figs. 1, 4, 5 and 7, also has an insulating block 1a, provided with a trough 3a, extending along its rear face 4a, similar to the parts 1, 3 and 4 pre-

viously described. The insulating block is provided with a series of recesses 5a similar to recesses 5 above described, but preferably of greater width, to accommodate the female contact member construction hereinafter described. The front face 6a of the female connector is preferably provided with raised portions 6b (Figs. 4 and 7) into which the recesses 5a extend for the reception of the engaging portions 10 of the male contacts above described. The female connector may also be provided with recesses 7a, and grooves 9a in the side faces 8a of the insulating block, similar to the parts 7 and 9 described above in connection with the male connector.

The preferred form of female contact member (shown detached in Fig. 9) consists of two parts, one of which may be made up from a strip of brass or the like to form an engaging portion 10a, a base 11a, and a remaining side 12a, similar to the parts 10, 11 and 12 above described, and similarly received within the recesses 5a, except that the engaging portions 10a are wholly contained within such recesses.

The remaining part of the female contact member consists of a spring metal strip shaped to nest over the parts 10a, 11a and 12a previously described, the side 16 of this spring metal piece being adapted to hold the engaging portion 10 of the male contact member firmly against the part 10a of the female contact member, when the male contact member is forced between parts 10a and 16.

The remaining side 17 of the spring contact member above described, which overlies the member 12a, is preferably provided with a heel 18, which extends across the end of the part 12a, thus enabling the female contact pieces to be assembled by sidewise movement and preventing them from separating by endwise movement after they have been assembled. A lug 19 is preferably provided in the part 10a and is received within a notch 20 in the part 16 when the two contact pieces are assembled as above described, to lock the two pieces securely together, after which they may be pushed into proper position with respect to the insulating block 1a. When this is done, the heel 18 may lock against the insulating block as shown in Fig. 7, and binding screws 13a may be employed similar to the parts 13 above described.

Both the male and female connectors are preferably provided with insulating cover plates 21 (Figs. 7 and 8) which fit into troughs 3 and 3a to overlie the rear portions of the contact members and are preferably provided with projections 22 (Figs. 5 and 6) which extend into the recesses 7 and 7a. The cover plates may be readily pried loose whenever desired. The male connector may also be provided with dowel pins 23 and 24 (Figs. 2 and 3) adapted to fit in corresponding recesses 23a and 24a (Fig. 4), to insure that the proper male and female contact members are engaged when the male connector is plugged in.

While a specific form of the invention has been described, it should be understood that many changes may be made therein without departing from its principles as set forth in the appended claims.

I claim:

1. An electrical connector of the class described having a trough extending along its rear face and a row of recesses leading from points spaced along said trough to a side face, said connector including an insulating block having a row of recesses extending from its front to its rear face, a row of

contact members having engaging portions received in said last mentioned recesses and also having terminal portions extending angularly from said engaging portions near the rear of said block, said terminal portions also extending along said side face respectively near said first mentioned recesses, and binding screws extending through said contact members at the side face of said block.

2. An electrical connector of the class described including an insulating block having a trough extending along its rear face and a row of recesses leading from points spaced along said trough to a side face, said block also having a row of grooves extending along said side face and recesses extending from its front face to its rear face, and a row of U-shaped contact members having their sides slidably received respectively in said last mentioned recesses and said grooves, and the bases of said U-shaped contact members being received in said first mentioned recesses.

3. An electrical connector including an insulating block having a recess therein extending from its rear to its front face, a U-shaped contact member having one side of the U slidably received in said recess and the other side of the U exposed at a side face of said block, and an auxiliary U-shaped spring contact member nested with respect to said first mentioned contact member, said spring contact member having a heel extending across one end of the first mentioned contact member and engaging a shoulder on said block.

4. An electrical connector of the class described including an insulating block having a trough extending along its rear face and a row of recesses leading from points spaced along said trough to a side face, said block also having a row of recesses leading from its rear to its front face, a row of contact members having their engaging portions slidably received in said last mentioned recesses, said contact members also having terminal portions extending through said first mentioned recesses to said side face of the block, and an insulating cover-plate located in said trough and overlying said terminal portions of the contact members.

5. An electrical connector of the class described including an insulating block, said connector having a trough extending along its rear face and a row of recesses leading from points spaced along said trough to a side face, said insulating block having a row of recesses extending rearwardly from its front face to points respectively adjacent said first mentioned recesses, a row of angle-shaped contact members insertable in said last mentioned recesses in a direction toward the front face of the connector, said contact members each having one of its legs received in one of said last mentioned recesses, and its remaining leg constituting a terminal portion exposed on said side face of the connector near one of said first mentioned recesses, means being provided to hold said contact members in operative position with respect to said block.

6. An electrical connector of the class described including an insulating block, said connector having a trough extending along its rear face and a row of recesses leading from points spaced along said trough to a side face, said insulating block having a row of recesses extending rearwardly from its front face to points respectively adjacent said first mentioned recesses, a row of U-shaped contact members insertable in said last

mentioned recesses in a direction toward the front face of the connector, said contact members each having one of its legs constituting an engaging portion received in one of said last mentioned recesses, and its remaining leg constituting a terminal portion exposed on said side face of the connector near one of said first mentioned recesses, its bight extending through one of said first mentioned recesses, means being provided to hold said contact members in operative position with respect to said block.

7. An electrical connector of the class described including an insulating block, said connector having a trough extending along its rear face and a row of projections defining recesses leading from points spaced along said trough to a side face, said projections extending from a point below the channel of said trough, said insulating block having a row of recesses extending rearwardly from its front face into said channel at points in alignment with said first mentioned recesses, a row of U-shaped contact members insertable in said last mentioned recesses in a direction toward the front face of the connector, said contact members each having one of its legs constituting an engaging portion received in one of said last mentioned recesses, and its remaining leg constituting a terminal portion exposed on said side face of the connector near one of said first mentioned recesses, its bight extending through one of said first mentioned recesses and lying below the plane of the bottom of said channel, means being provided to hold said contact members in operative position with respect to said block.

8. An electrical connector of the class described

including an insulating block, said connector having a channel extending along its rear face, one side of which comprises spaced projections defining a row of recesses leading from points spaced along said channel to a side face, said side face being provided with grooves adjacent said first mentioned recesses, said insulating block having a row of recesses extending rearwardly from its front face into said channel to points respectively adjacent said first mentioned recesses, a row of U-shaped contact members insertable in said last mentioned recesses in a direction toward the front face of the connector, said contact members each having one of its legs constituting an engaging portion received in one of said last mentioned recesses, its bight portion received in the portion of one of the first recesses below the plane of said channel, and its remaining leg received in a groove in said side face, constituting a terminal portion exposed on said side face of the connector, means being provided to hold said contact members in operative position with respect to said block.

9. A contact assembly comprising an inner substantially rigid U-shaped element and an outer substantially U-shaped spring contact making element in which said inner element is nested, and a shoulder on the end of the terminal leg of said spring contact element engaging over and beyond the end of the terminal leg of the inner element and adapted to be held in locked engagement therewith by a terminal screw passing through said outer element and having a screw threaded engagement with said inner element.

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