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2,600,188

SPADE CONNECTOR

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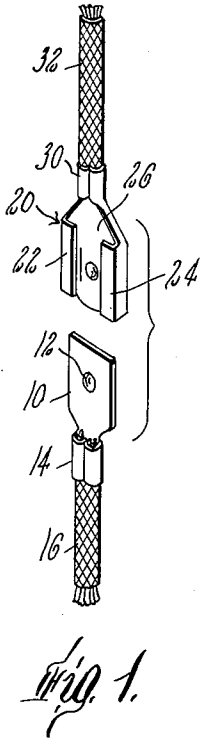


Fig. 1.

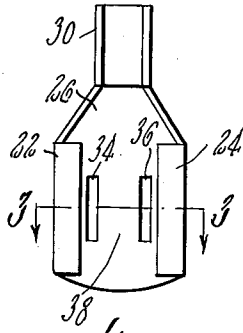


Fig. 2.

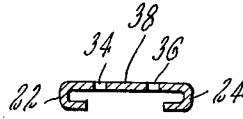


Fig. 3.

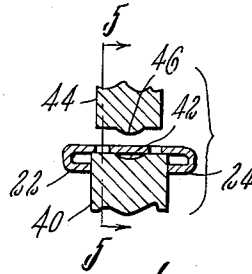


Fig. 4.

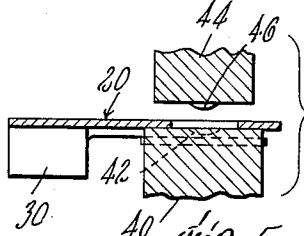


Fig. 5.

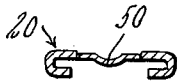


Fig. 6.

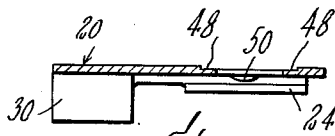


Fig. 7.

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UNITED STATES PATENT OFFICE

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SPADE CONNECTOR

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2 Claims. (Cl. 173-363)

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This invention relates to electric connectors consisting of two members adapted to be secured to the ends of wires or other conductors which are to be electrically connected. These members are constructed so that they can be pushed together into mutual engagement so as to make a good electrical connection which can readily be broken and remade as desired.

For a satisfactory connector, it is necessary that the construction be such that substantial face areas of the members are firmly pressed together when the members are assembled, even after the connection has been made and broken a considerable number of times. For economic reasons, it is necessary that the members be capable of being made at low cost. These objectives are realized in the connector which is hereinafter described and which is illustrated on the drawing, of which:

Figure 1 is a perspective view of two parts of an electric connector mounted on wires for use;

Figure 2 is a plan view of the female member of the connector shown in Figure 1, in partially completed form;

Figure 3 is a section on line 3-3 of Figure 2;

Figure 4 is a sectional view of the partly completed member shown in Figure 3, together with an anvil and die for swaging the member;

Figure 5 is a section on the line 5-5 of Figure 4;

Figure 6 is a section of the member after it has been swaged by the die; and

Figure 7 is a longitudinal section of the completed member.

In the connector shown in Figure 1, the male member 10 is of a well-known form consisting of a flat tongue of sheet metal having a central indentation 12 in each face. The tongue has an extension 14 which is curled around the stripped end portion of the wire 16 and is pressed to grip such end portion.

Cooperating with the member 10 is a female member 20 which is preferably made of a single piece of sheet metal. The sheet metal is preferably copper or a copper-containing alloy, such as half-hard brass or half-hard bronze (as these alloys are known in the art), these alloys being sufficiently malleable to be capable of being sharply bent without cracking. Suitably shaped blanks are stamped from a sheet or strip of such material and side flanges 22 and 24 are bent up and inward from the margins of a plane floor portion 26 to overhang portions of the floor 26 so that the side margins of the male member 10 can be snugly fitted between the overhanging

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flanges and the floor of the member 20. A suitable extension 30 at an end of the floor 26 is shaped into channel form so as to be ready to be crimped around the stripped end of a wire 32 to grip it as indicated in Figure 1.

In the floor 26 are cut two parallel slots 34 and 36 which are of substantial width and are located in a portion which is not overhung by the flanges 22 and 24. In the example shown in Figure 2, the width of the floor portion 38 between the two slots is between four and five times the width of each slot.

The partially finished blank is then placed upon a suitable anvil 40 which has a rectangular top face with a central dimple or depression 42. The width of the anvil 40 is slightly greater than the distance between the mutually remote side edges of the slots 34 and 36, and the length of the anvil is substantially greater than that of the slots 34 or 36, as indicated in Figure 5.

A die 44 is caused to strike the portion of the floor 26 which is supported by the anvil 40. This die has a rectangular face with a width equal to the distance between the mutually remote edges of the slots 34 and 36, as indicated in Figure 4, and a length somewhat greater than the length of the slots but less than the length of the anvil face. The die 44 has also a boss 46 which is complementary to the dimple 42. The die is caused to strike the floor of the connector member with a considerable force so that the blow flattens the central portion 38 of the floor to about two-thirds of the stock thickness of the metal sheet. In thus being swaged, this portion of the floor is spread out laterally in the process of being thinned so that the slots are virtually closed to narrow slits. Areas at the ends of the slots 34 and 36, which are struck by the die 44, are similarly flattened. This swaging operation serves to harden the metal thus flattened and to impart to it a greatly increased resilience. In other words, the elastic limit of the swaged metal is considerably increased. In terms of function, this means that if the original metal between the slots is deformed by being sprung repeatedly away from its normal plane position by the insertion and withdrawal of a complementary member 10, it soon fails to return fully to its normal position. After the metal in this area has been swaged, it returns to its normal position after a very large number of similar displacements. The areas 48 at the ends of the slots add to this resilience by increasing the length of the swaged area.

In the swaging operation, the boss 46 coop-

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erates with the dimple 42 to form a corresponding boss 50 which rises from the floor portion 38 between the slots 34 and 36. This boss is adapted to be received in one of the recesses 12 in the male member when the latter is assembled with the member 20 so as to hold the members more firmly secured together but to permit the members to be separated when sufficient force is used to pull them apart.

I claim:

1. A member of an electric connector having a plane floor with a pair of parallel longitudinally extending slots therethrough, the portions of the floor between the slots and near the ends thereof being thinner and more resilient than the remainder of the floor.

2. A member of an electric connector having a plane floor with two parallel, longitudinally extending slots therethrough and overhanging side flanges, the portion of the floor between the

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slots being thinner, harder and more resilient than adjacent portions of the floor, and a central boss projecting up from the floor portion between the slots.

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