ABSTRACT OF THE DISCLOSURE

An electrical connector for a strip cable comprises a first body member having a recess formed by mutually inclined walls. A contact member has a serrated portion projecting beyond a wall of the recess. A conductor of the cable is held in engagement with the contact member by a second body member with external serrated surface formed for interlocking resilient engagement with the serrated contact member portion.

This invention relates to a device for retaining electrical conductors in mutual contact and to electrical connectors which are particularly though not exclusively suitable for use with multiple laminar conductors, that is to say, conductors in the form of flexible metal strips applied to or enclosed between strips of flexible insulating material. Connectors according to the invention may be used to make connections between two multiple conductors of this type, or to make connection between such a multiple conductor and a like plurality of conductors of another form.

Thus it is an object of one aspect of the present invention to provide an improved device for retaining electrical conductors in mutual contact.

It is a further object of the invention to provide a device for retaining conductors of multiple laminar conductors in mutual contact.

It is an additional object of the invention to provide a simple connector capable of making electrical contact to individual conductors in a laminar array of conductors.

It is a further object of this aspect of the invention to provide an electrical connector device having desirable properties of ease of and economy in manufacture.

In one aspect, the invention provides a device for retaining electrical conductors in mutual contact. This device comprises a first member having an inwardly tapering recess of which the sides are serrated. The device further comprises a second conductor having an external form tapering in like manner to said recess and having serrations mating with those of said second member when said further member is inserted in said recess. The said serrations resist the withdrawal of the further member from the recess. One at least of the members is formed of an elastically resilient material.

In another aspect, the invention provides an electrical connector device comprising a first member of insulating material having opposed internal surfaces defining a recess and mutually inclined at a predetermined angle. The device also comprises a second member of insulating material having opposed external surfaces mutually inclined at said predetermined angle. One of said insulating members carries one or more contact members each having a serrated edge protruding from an inclined surface of that insulating member. The surfaces of the other of such insulating member is provided with serrations engaging with those of said contact member to resist disengagement of the members.

Features and advantages of devices in accordance with the invention will be best understood from the following description taken in conjunction with the drawings, comprising FIGS. 1 to 1, of which:

FIG. 1 is a perspective view of a portion of a multiple laminar conductor prepared for connection;

FIG. 2 represents two conductors, prepared as in FIG. 1, positioned for joining together;

FIG. 3 represents a body portion of a device according to the invention for retaining electrical conductors in mutual contact;

FIG. 4 represents an insert portion of the device of FIG. 3;

FIG. 5 shows two multiple laminar conductors joined by the device of which the components are shown in FIGS. 3 and 4;

FIG. 6 shows a cross-section through one embodiment of electrical connector in accordance with the invention;

FIG. 7 shows a cross-section through another embodiment of electrical connector in accordance with the invention;

FIG. 8 is an isometric view of another device in accordance with the invention for retaining electrical conductors in mutual contact;

FIG. 9 is a plan view of another device (as FIG. 8); and

FIG. 10 is a sectional view of the device of FIG. 9.

The drawings show a multiple laminar conductor 1 shown in this case by way of example only as consisting of six conductors 2 of strip form enclosed between bands 3, 4 of insulating material which are adhesive or otherwise secured together. To prepare such a laminar conductor for connection by means of a connector according to the invention a portion of the upper insulating strip 3 is removed at the end of the conductor as denoted by reference 5, leaving the conductors exposed as shown. Preparatory to making the connection, the ends of two multiple conductors A and B are thus prepared and disposed face-to-face with the metal strips in alignment as shown by FIG. 2. The metal strips of the two multiple conductors are thus in contact.

The device shown by FIGS. 3 and 4 comprises a body member 6 of insulating material (FIG. 3) and an insert member 7 also preferably but not essentially of insulating material. The body member 6 has a longitudinal notch 8 of which the sides are serrated preferably so as to have alternately downwardly sloping longer flanks 9 and short flanks 10 which may be parallel to the bottom 11 of the notch or may slope slightly upwards. The directions upwards and downwards will be understood as applying only to the device as shown in the drawing and not as introducing any positional limitation. Insert member 7 (FIG. 4) has serrated outer faces of like form to the faces bounding notch 8 in body member 6.

To make a connection, conductors A and B, prepared and positioned as described in relation to FIG. 2, are placed in the notch 8 of body 6 and insert 7 is forced downwardly into the notch by appropriate pressure until a firm condition is attained. It will be obvious that the resilient deformation of one or both members 6, 7 of the connector is advantageous in ensuring a continuing firm engagement of the multiple conductors. To this end the two connector portions may conveniently be moulded in a suitable nylon.

The shape, size and number of the serrations in the sides of notch 8 and on the faces of insert 7 will be chosen to ensure a strong grip on conductors of varying thickness. Assembly of the two connector portions may be effected by pressure applied by means of a lever or screw-
action press of simple form, either portable or fixed as may be convenient. The connector described above in relation to the drawing may be modified so as to provide for the connection of metallic strips in a multiple laminar conductor to metal contact members, possibly provided with serrated edges for engaging the laminar conductors, as shown in FIGS. 6 and 7. In FIG. 6 a connector body is longitudinally sectioned at 16. The connector body 17 is formed from one piece. A slot formed in body 15 accepts a contact member 17 having serrated limbs of which the serrated edges are exposed at the inner surfaces of the notch and protrude slightly above the notch surfaces. Contact member 17 is also provided with a terminal portion 18 protruding through a hole formed in the body member. This terminal portion is shown broken away but may in practice have any desired form for co-operation with known connecting means. Thus terminal portion 18 may be formed to provide a solder spilt or bucket, or arranged for further deformation to make a crimped contact. Other forms of terminal portion may be used where a welded, wire wrapped or spring contact connection is to be made.

A further short limb 22 of contact member 17 passes through body member 15 and is deformed as shown to fix the contact member in position in its slot. Other means of securing the contact member in its slot may be used where desired. FIG. 7 differs from FIG. 6 in that the connector body is formed from two pieces, each of which is provided with a bore 36 to receive conductors 37 which are to be retained in mutual contact. Bore 36 is intersected by an inwardly tapering and serrated circular rec 38 into which fits a tapered and serrated circuit plug 39. Reccess 38 may be provided as shown with a central cylindrical depression 40 into which fits a cylindrical protrusion 41 on the end of plug 39. Depression 40 and protrusion 41 may however be omitted. The conductors are inserted into bore 36 with their ends slightly tapered inwardly. A slot formed in body member 35 is provided with a bore 36 and plug 39 are advantageously constructed as a unit, being connected by an integrally moulded strap 42.

I claim:

1. In an electrical connector for a strip cable comprising first and second insulating body members, said first body member including a recess defined by opposed surfaces mutually inclined to a predetermined angle, a contact member seated in said first body member adjacent said recess, said contact member having a plurality of surface portions for engagement with a conductor of said cable and said second body member being resilient and having external surfaces mutually inclined at said predetermined angle and spaced to engage said cable conductors against said contact member portions when said first insulating member and conductor are inserted in said recess, the improvement wherein:

said contact member portions form serrations having alternate longer edges sloping inwardly and downwardly of said recess and shorter edges sloping inwardly and upwardly of said recess, said alternate edges meeting in apices projecting inwardly of said recess beyond at least one of said inclined surfaces of said first body member; and

said external surfaces of said second body member have formed therein serrations mateable in self-locking resilient inter-engagement with said serrations of said contact member whereby a conductor of a strip cable positioned between said body members is held in engagement with said serrated portion of said contact member by a matingly serrated portion of said second body member.

2. The improvement as set forth in claim 1 wherein portions of said contact member project beyond each of said opposed surfaces of said one body member.

3. The improvement as set forth in claim 1 wherein said contact member portions project beyond only one of said opposed surfaces of said one body member and said other inclined surface includes serrations formed for self-locking inter-engagement with said serrations on a mating surface of said second body member.

4. The improvement as set forth in claim 2 wherein said contact member has spaced parts each providing serrated contact member portions extending beyond a respective one of said opposed first body member surfaces.

5. The improvement as set forth in claim 1 wherein a plurality of said contact members are provided at spaced apart positions in said recess for engagement with individual conductors of said cable.

6. The improvement as set forth in claim 5 wherein each said contact member has spaced parts each providing serrated contact member portions extending beyond a respective one of said opposed first body member surfaces.

7. The improvement as set forth in claim 2 wherein said contact member is generally of H form, said first body member having slots therein to receive adjacent limbs of said contact member, said contact member having a limb portion extending through a said slot beyond said body member, said contact member being retained in said body member by deformation of said limb portion.

8. The improvement as set forth in claim 6 wherein said contact member is generally of H form, said first
body member having slots therein to receive adjacent limbs of said contact member, said contact member having a limb portion extending through a said slot beyond said body member, said contact member being retained in said body member by deformation of said limb portion.

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