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"A CONNECTING DEVICE"

This invention relates to a connecting device comprising a plurality of terminal members, the members being of the type which permit insulated conductors to be connected thereto without the use of screws, solder or other fixing media and without the need to strip the insulation material from the conductors before making a connection.

Various forms of terminal member are known in the art. German Published Specification OS 2142850 shows an electrical connector in which one or several insulated conductors can be connected to a terminal element and German Patent Specification 1765584 shows another form of connector incorporating a terminal element having two slots each formed by two contact arms which are resilient and which are constructed so as to be able to remove the insulation material.

These known connecting devices are expensive to manufacture and require considerable space because of the spacing required between the elements.

German Published Specification OS 2338056 shows a V-shaped terminal element comprising two slots, one of the slots acting to retain the insulated conductor and the sides of the other slot engaging the conductor to make the connection. Both slots are of different design. A drawback of this form of connector is the excessive space required when it is incorporated into a terminal strip.

German Published specification OS 3021798 shows a V-shaped terminal element which is designed as a double terminal element, each arm of the element being able to effect a connection to an insulated conductor. A drawback of this construction is the fact that the conductors have to be connected simultaneously to the element. The spacing of the conductors is twice the

wall thickness of the resilient material employed in the construction of the element.

The object of the present invention is to provide a connecting device in an improved form.

5 According to the invention a connecting device for connecting together two or more insulated conductors which when connected are disposed in parallel side by side relationship, the connecting device comprising a terminal element formed from resilient electrically
10 conductive sheet material, the terminal element having at least two interconnected terminal members disposed in side by side relationship each terminal member including a slotted web portion, the slotted web portions of the members forming the terminal element
15 being disposed in parallel relationship to each other and at substantially 45° to the axes of the conductors, the slots defined by said slotted web portion having enlarged mouths and edges which as an insulated conductor is forced therein, penetrate the insulation
20 material and effect electrical connection with the conductor, each terminal member including minor web portions integral with the slotted web portion and extending in the direction of the axes of the conductors, a minor web portion of one terminal member
25 being aligned with a minor web portion of an adjacent terminal member whereby the minimum spacing between adjacent conductors is equal to the thickness of the sheet material forming the terminal element, one minor web portion of each terminal member being extended to
30 define a guide surface to guide the insertion of a conductor into the slot of the terminal member.

Examples of a connecting device in accordance with the invention will now be described with reference to the

accompanying drawings, in which:

Figure 1 is a fragmentary view of a terminal strip incorporating terminal elements, the latter comprising two terminal members;

5 Figure 2 is a cross-sectional view of the strip shown in Figure 1;

Figure 3 is a perspective view of a terminal element having two terminal members;

10 Figure 4 is a plan view of the terminal element shown in Figure 3;

Figure 5 is a perspective view showing part of a terminal element having more than two terminal members;

Figure 6 is a plan view of the terminal element shown in Figure 5;

Figure 7 is a perspective view of the terminal element utilized in the terminal strip of Figures 1 and 2; and

5 Figure 8 is a view similar to Figure 7 showing a modification.

Referring to Figures 1 and 2 of the drawings terminal elements 1 are arranged to be located within an elongated housing 12 formed from electrical insulating material. Two rows of terminal elements are provided in the housing and the latter has a plurality of spaced openings 12A into which in use, can be inserted test plugs or arrestor assemblies. Each terminal element comprises two terminal members 8A, 8B and a further view of the element is seen in Figure 7.

Each terminal member as shown in the drawings, defines a slotted web 3, the webs 3 of the members forming a terminal element being disposed in spaced parallel relationship and at approximately 45° to the axes of the conductors and the longitudinal axis of the housing. The webs 3 are provided with slots 2 for the reception of the conductors, the slots being constructed so that the edges of the slots will penetrate the insulation surrounding a conductor to form an electrical connection with the conductor. The terminal members are constructed from thin resilient material which is of course electrically conductive.

Conductors 16, 16A when inserted into the slots 2, will lie substantially parallel to each other as seen in Figure 1 and will be spaced apart by approximately the thickness of minor web portions 7 defined by the terminal members, there being so-called minor web portions on each member integral with and at the opposite edges of the slotted web 3.

The slotted webs 3 of the terminal members are extended upwardly to define portions 7A which partly extend over enlarged entrances or mouths to the slots 2 respectively. The portions 7A act to assist the location of conductors in the slots.

The terminal members forming a terminal element are interconnected by a connecting member 9 which is bent to U-shaped form. The form of element as shown in Figure 3, can provide an electrical connection between a pair of conductors but without the test facilities mentioned above. The actual form of terminal member used in the strip shown in Figure 1 is seen in Figure 7 and it will be observed that the web of the connecting member 9 is provided with a downwardly extending portion 10 which is then bent transversely and then upwardly to form a blade 10A which is terminated in a contact portion 11. When assembled in the housing the contact portions 11 of terminal elements which are oppositely disposed in the housing effect electrical connection.

In the arrangement shown in Figure 8 a flange of the connecting member 9 is provided with a downwardly extending portion 13 having an upwardly extending open ended slot. The slot is adapted to receive a separate component 14 which defines a blade 14A and a contact portion 15. The housing is constructed so as to define a recess for the separate component 14 which is assembled to the downwardly extending portion 13 during the assembly of the strip.

Figures 5 and 6 show how it is possible to form a terminal element having more than two terminal members if so required. The connection or disconnection of conductors to the individual terminal members 8A, 8B,

8C, 8D can take place without disturbing the conductors connected to adjacent members. In this embodiment it will again be seen that the slotted webs 3 of the terminal members are disposed substantially parallel to each other and are at an angle to the longitudinal axis of the housing and to the axes of the conductors, of 45°.

By the arrangements described the space requirement for the terminal elements is considerably reduced as compared with the known arrangements. Two adjacent conductors are held in spaced relationship only by the thickness of the material forming the terminal element. Furthermore, a conductor can be connected to and be disconnected from a terminal member forming part of the element without affecting a conductor held by another terminal member.



CLAIMS:

1. A connecting device for connecting together two or more insulated conductors which when connected are disposed in parallel side by side relationship, the
5 connecting device comprising a terminal element formed from resilient electrically conductive sheet material, the terminal element having at least two interconnected terminal members disposed in side by side relationship each terminal member including a slotted web portion,
10 the slotted web portions of the members forming the terminal element being disposed in parallel relationship to each other and at substantially 45° to the axes of the conductors, the slots defined by said slotted web portion having enlarged mouths and edges
15 which as an insulated conductor is forced therein, penetrate the insulation material and effect electrical connection with the conductor, each terminal member including minor web portions integral with the slotted web portion and extending in the direction of the axes
20 of the conductors, a minor web portion of one terminal member being aligned with a minor web portion of an adjacent terminal member whereby the minimum spacing between adjacent conductors is equal to the thickness of the sheet material forming the terminal element, one
25 minor web portion of each terminal member being extended to define a guide surface to guide the insertion of a conductor into the slot of the terminal member.

2. A device according to Claim 1 in which adjacent
30 terminal members are interconnected by integral connecting members of U-form.

(31)



3. A device according to Claim 3 including a blade formed to define a contact portion, extending from the connecting member, said contact portion effecting electrical connection with a contact portion of a further connecting device when two such devices are mounted in a housing.

4. A device according to Claim 3 in which said blade is formed integrally with the connecting member.

5. A device according to Claim 3 in which said blade is located within a recess in the housing and the blade and the connecting member are adapted to be connected together during assembly of the device in the housing.

6. A connecting device substantially as hereinbefore described with reference to the accompanying drawings.
