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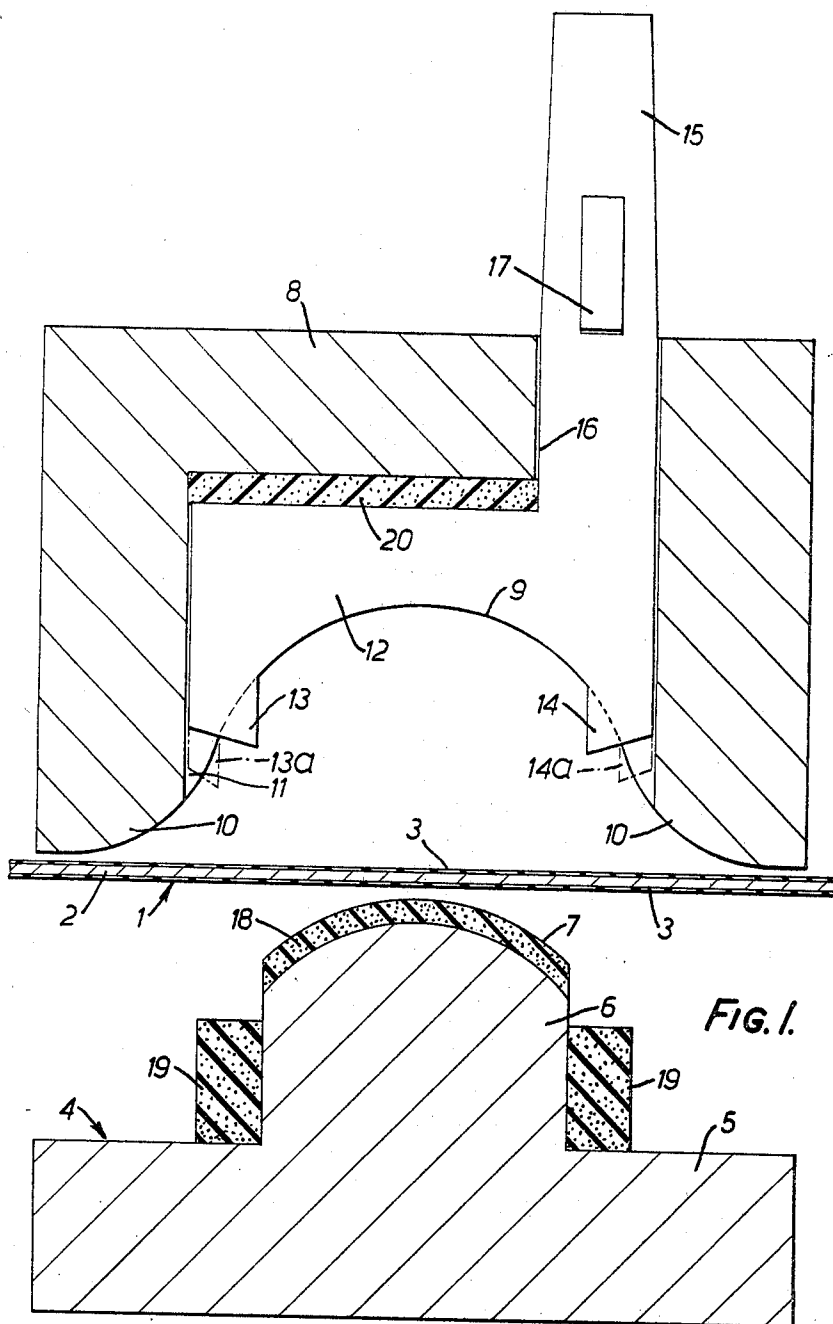
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3,477,059

CONNECTORS FOR LAMINAR ELECTRIC CABLES

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3 Sheets-Sheet 1



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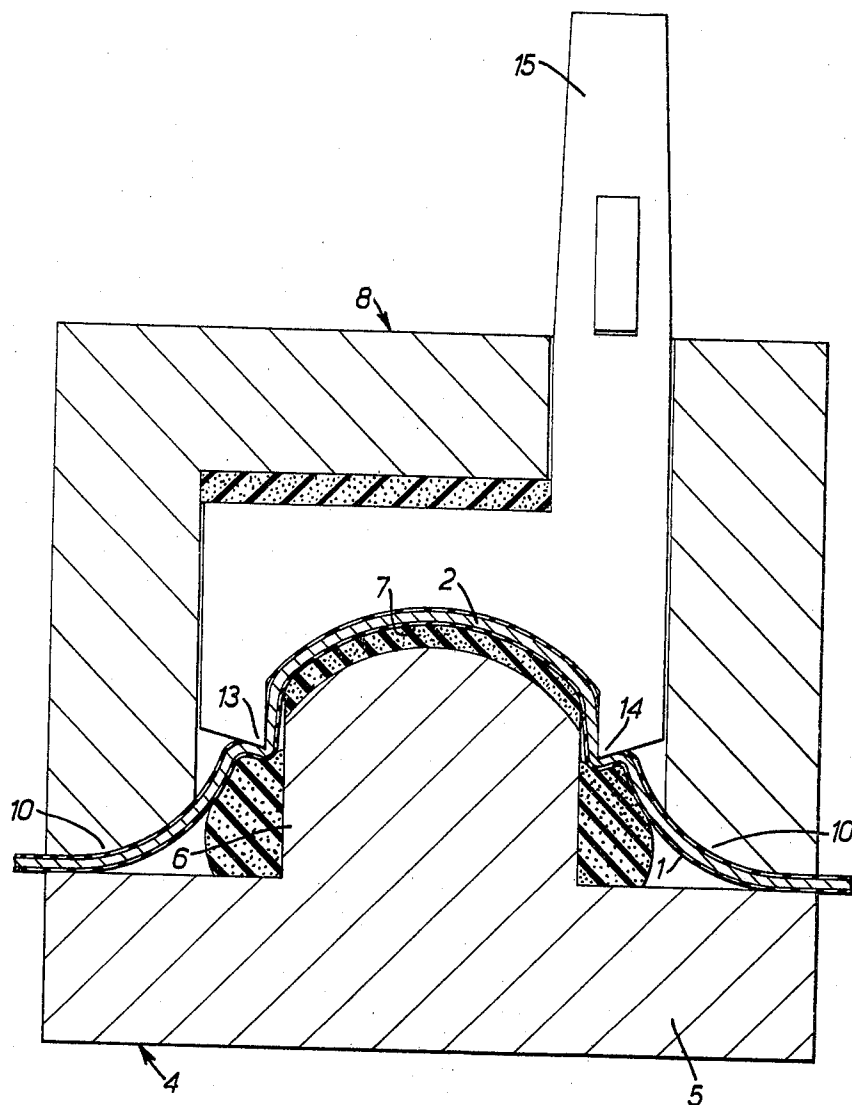


FIG. 2.

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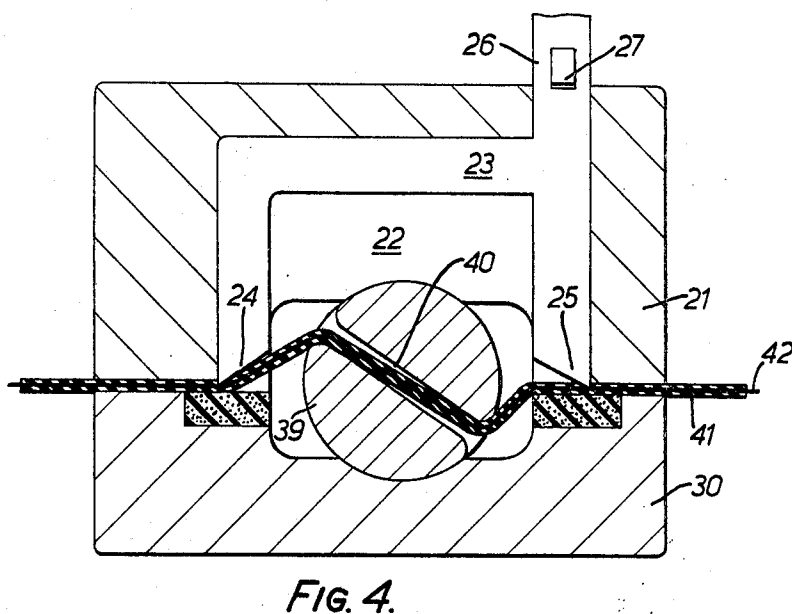
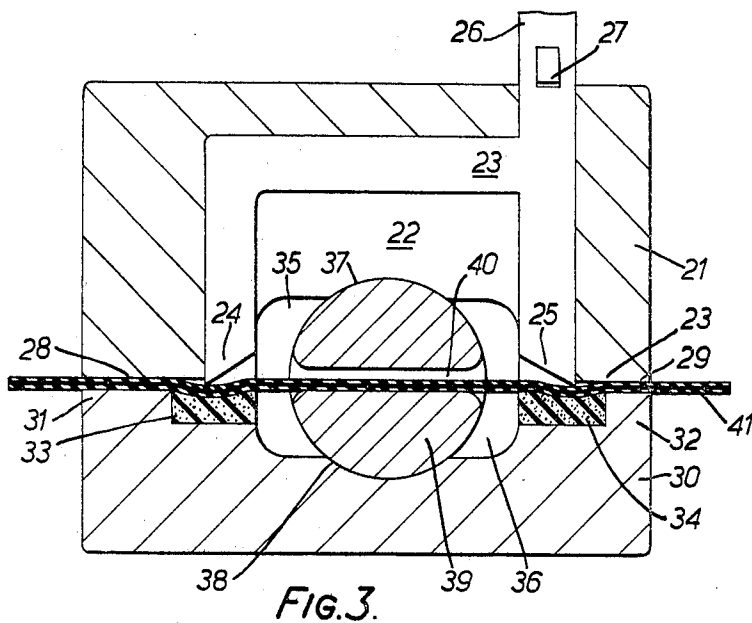
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CONNECTORS FOR LAMINAR ELECTRIC CABLES

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3 Sheets-Sheet 3



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CONNECTORS FOR LAMINAR ELECTRIC CABLES
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9 Claims

ABSTRACT OF THE DISCLOSURE

A device for making connection to a conductor of a laminar cable comprises: a body member having spaced abutment portions and having mounted thereon a contact member with spaced tooth portions protruding beyond a body surface to engage the cable; a base member having support portions positioned to urge the cable against the body abutment portions; and cable bending means situated between the abutment and support portions and producing double flexure of the cable which is thereby drawn inwardly of the device over the tooth portions of the contact member.

This invention relates to improvements in connectors for laminar electric cables and is especially concerned to provide a simple form of connector which ensures good and constant electrical contact between a contact member and a cable conductor.

It is an object of the present invention to provide a connector for a laminar electric cable in which good contact between a conductor of the cable and a contact member is assured.

It is also an object of the invention to provide a connector for a laminar electric cable by which electrical connection may be made to the cable at any point intermediate its ends.

It is a further object of the invention to provide a connector for a laminar electric cable in which the cable is drawn inwardly of the connector to establish electrical connection with a connector member.

Features and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawings, of which:

FIGURE 1 shows a sectional elevation through the two portions of a laminar cable connector and through a cable to which connection is to be made;

FIGURE 2 shows a sectional elevation through the connector of FIGURE 1 assembled upon the cable;

FIGURE 3 shows a sectional elevation through another embodiment of laminar cable connector and through a cable to which connection is to be made; and

FIGURE 4 is a sectional elevation through the connector of FIGURE 3 showing the condition of the device when a connection has been made to the cable.

The cable to which connection is to be made is designated generally in FIGURES 1 and 2 of the drawings by the reference numeral 1. This cable comprises a conductor 2 in the form of a flat strip, enclosed between strips 3 of insulating material bonded to the strip. Usually, though not necessarily, cable 1 will include a plurality of strip conductors 2 extending parallel to one another. The connector by which connection is made to the cable comprises a base member 4 consisting of a flat plate portion 5 from which rises a projection 6 having a radiused top 7.

With base 4 co-operates a body member 8 which is externally of any desired form, such as the rectangular form shown in the drawings, and which presents downwardly as shown in the drawings a smoothly curved central channel or recess of which the central portion 9 is formed to mate with the surface 7 of base 4 and this

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central portion is bounded by outwardly curved lip portions 10. In the lower face of body 8 transversely to the channel there is formed a narrow slot 11 in which is positioned a toothed contact member 12 having opposed teeth. The teeth may be single or a plurality of teeth may be provided at one or both positions. As shown, contact member 12 is provided with teeth 13 and 14 which protrude from slot 11 at positions spaced from portion 9 of body 8 which opposes face 7 of base 4 when the connector is assembled. Additional teeth may be provided at one or both positions. As shown, contact member 12 may be retained in position in slot 11 by a projecting terminal portion 15 which passes through a slot 16 in body member 8 and is provided with a struck-out portion 17 which engages the upper surface of body member 8 to prevent inadvertent withdrawal of the contact member. Other means of securing the contact member in the body member may be used as convenient.

To make connection to the cable, the cable and the two connector portions are first disposed as shown in FIGURE 1. The connector body 8 is then lowered upon the cable which is thus pressed against projection 6 of base 4. When the cable has been somewhat bowed in this manner, teeth 13 and 14 of contact member 12 will encounter the insulation 3 of the cable which they will sever to engage the conductor 2. As shown in FIGURE 2, the shaping and spacing of the teeth 13, 14 in relation to projection 6 may be such as to ensure that conductor 2 of the cable is somewhat stretched over surface 7 of the projection so that the conductor is deformed by the teeth and is held against them elastically. Lips 10 of body 8 press cable 1 against the plate portion 5 of base 4 to prevent external tension on the cable from affecting the engagement of contact teeth 13, 14 with conductor 2.

In alternative constructions which are suitable for use over a wider range of temperatures, reliance upon the elasticity of the cable is avoided. Thus the portion of projection 6 from base member 5 which first engages the cable may be formed wholly or in part of a resilient material. Hatched area 18 in FIGURE 1 shows how a layer of readily compressible material may be superimposed upon a generally rigid projection from the base member. Alternatively or in addition, resilient members 19 may be provided adjacent the base of projection 6 to support those portions of the cable with which the teeth of contact member 12 make engagement. In addition, the contact member may be supported within its slot by a resilient member 20, so that the member as a whole may move against resilient bias.

Conventional means are provided for retaining the two contact members 4 and 8 in position clamped upon cable 1. One such means comprises screws passing through holes in one of members 4, 8 to engage in screw-threaded holes in the other member. Alternative modes of fastening may be employed as may be found desirable or convenient.

Where cable 1 includes more than one conductor 2, then body 8 will include a slot and contact member for each cable conductor to which connection is to be made. In this case adjacent contact members may be respectively turned end for end in order to increase the spacing between terminal members 15. In alternative constructions of body member 8, contact members 12 are held in a moulded body of insulating material being suitably formed, as by peripheral indentation, to prevent their displacement. Obviously other forms and positions of terminal member may be provided for contact members 12.

It is possible to modify the form of base member 4 so as to provide support for cable 1 at those positions where it is engaged by contact teeth 13, 14, but this is not generally necessary.

The device shown in FIGURES 3 and 4 comprises a body member 21 provided with a slot 22 into which is placed a contact member 23 having spaced tooth portions 24, 25 which protrude beyond the lower surface 23 of the body member. Contact member 23 also has a terminal portion 26 which extends through an aperture in body member 21 to protrude outwardly thereof and is provided with a laterally punched-out portion 27 which engages the outer surface of body member 21 to retain contact member 23 in position in slot 22. Body member 21 has spaced abutment portions 28, 29 disposed outwardly with respect to toothed contact portions 24, 25.

Co-operating with body member 21 is a base member 30 having support portions 31, 32 which are aligned with abutment portions 28 and 29 respectively of body member 21. Support portions 31, 32 may be rigid opposite tooth portions 24, 25 of contact member 23, in which case contact member 23 may be resiliently supported as described in relation to FIGURES 1 and 2, or may as shown be provided with resilient members 33, 34 aligned with toothed portions 24, 25. Suitable securing means (not shown) are provided to hold body member 21 and base member 30 together. The facing surfaces of body member 21 and of base member 30 are provided with aligned recesses 35, 36 respectively, having partly cylindrical concave surfaces 37, 38 within which is mounted cylindrical member 39 having an axial slot 40. A laminar cable 41 to which electrical contact is to be made passes between abutment portions 28, 29 of body member 21 and support surfaces 31, 32 of base member 30 and through slot 40 of cylindrical member 37. When the cable has been inserted in the connector device, to facilitate which operation cylindrical member may be bifurcate, slot 40 extending to one end, member 39 is rotated, as shown in FIGURE 4, thus drawing cable 41 inwardly of the connector to cause tooth portions 24, 26 to cut through the cable insulation and make electrical contact with the cable conductor 42, as shown.

Among the advantages offered by the described forms of cable connector are that connection may be made at any point in a length of cable and to only as many conductors as required at the point of connection, while unwanted conductors may be undisturbed. Very secure contact to the cable conductors is made with a connector of a very simple form which is simply and cheaply constructed and which ensures that damage to the cable is avoided.

It will be understood that the embodiments described above represent preferred embodiments of connector device according to the invention.

I claim:

1. A connector device for making electrical connection to a conductor of a laminar cable, comprising in combination:

a body member having spaced abutment portions;
a contact member mounted in said body member, said contact member having spaced tooth portions protruding beyond a surface of said body member to engage said cable;

means mounting said contact member in said body member for movement therein in the direction away from said cable, said mounting means including a resilient member abutting said contact member thereby to provide a resilient bias resisting said movement, said contact member having spaced tooth portions protruding beyond a surface of said body member to engage said cable;

a base member having spaced support portions aligned with said abutment portions of said body member, said support portions acting when said base and body members are assembled together to urge said cable against said abutment portions; and

cable bending means intermediate said abutment and support portions, said cable bending means producing double flexure of said cable intermediate said

portions thereby to draw said cable inwardly of said base and body members over each of said tooth portions of said contact member.

2. The connector device claimed in claim 1 wherein said contact member includes a terminal portion extending outwardly of said body member and is retained in said slot by a resilient tongue protruding laterally of said terminal portion to engage said body member surface.

3. The connector device claimed in claim 1 wherein said tooth portions of said contact member each include a plurality of said teeth.

4. The connector device claimed in claim 1 wherein said body member includes a recess intermediate said tooth portions and said base member includes a projection aligned with said recess whereby on assembly of said base and body members said cable is doubly flexed into said recess.

5. The device as claimed in claim 4 wherein said projection includes a surface layer of readily compressible material.

6. The device as claimed in claim 4 wherein a resilient member aligned with a said tooth portion of said contact member is secured to said base member thereby to urge said cable resiliently against said tooth portion when said base and body members are assembled together.

7. A connector device for making electrical connection to a conductor of a laminar cable, comprising in combination:

a body member having spaced abutment portions and having a semi-cylindrical recess therein intermediate said abutment portions;

a contact member mounted in said body member, said contact member having spaced tooth portions protruding beyond a surface of said body member to engage said cable;

a base member having spaced support portions aligned with said abutment portions of said body member, said support portions acting when said base and body members are assembled together to urge said cable against said abutment portions, said base member also having therein intermediate said support portions a semi-cylindrical recess aligned with said recess in said body member; and

cable bending means intermediate said spaced abutment and support portions, said cable bending means including a slotted cylindrical member positioned within said recesses with said slot embracing said cable, whereby rotation of said cylindrical member about its axis produces said double flexure of said cable to draw said cable inwardly of said base and body members over each of said tooth portions of said contact member.

8. The connector device claimed in claim 7 wherein a resilient member aligned with a said tooth portion of said contact member is secured to said base member thereby to urge said cable resiliently against said tooth portion.

9. The connector device claimed in claim 7 wherein said cylindrical member is bifurcate, thereby to assist entry of said cable into said slot.

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