ELECTRICAL CONNECTOR CAP

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Fig. 1

Fig. 3

Fig. 2

Fig. 4

Fig. 5

Fig. 6

Fig. 7

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ELECTRICAL CONNECTER CAP

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This invention relates to electrical connecting devices, and has particular reference to electrical connector caps.

One object of the invention is to provide a device of the character described having improved means for securing lead wires to contact elements without requiring the usual individual screws.

Another object of the invention is the provision of a device of the nature set forth having a single improved means for reliably securing the lead wires to the contact elements, and with the latter desirably constituting a finger grip or handle portion to effect the engagement.

Another object of the invention is to furnish a device of the character alluded to wherein the contact leads can be rapidly, and with practically a single motion, secured to the contact elements, even by those who are mechanically unskilled, and without the usual difficulty of short circuiting due to stray wires.

A further object is the provision of a device of the type mentioned which is relatively inexpensive to manufacture, neat, compact, reliable, durable, and efficient in operation, and particularly rapid in assembling, especially on a quantity production scale.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated in the annexed drawings, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Fig. 1 is an enlarged view in side elevation, with parts removed, showing a device embodying the invention.

Fig. 2 is a top plan view thereof with a part removed.

Fig. 3 is a top plan view of the device but showing the same in initial lead securing position.

Fig. 4 is a view in vertical section taken on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmental sectional view in elevation of the device taken on the line 5—5 of Fig. 3, showing in dot dash lines a lead bent into clamped position.

Fig. 6 is a view corresponding to that of Fig. 5, but showing the contact element advanced and clamping the lead.

Fig. 7 is a vertical sectional view of the pronged plug portion in removed position.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Referring in detail to the drawing, 10 denotes a device embodying the invention and representative of any device for connecting leads to contact portions, but here illustratively shown as being in the nature of an electrical connector cap.

The device 10 may comprise insulator means 15 having contact elements or prongs 11 to which the lead wires 12 of a conductor cord 13 may be individually connected. Said insulator means may comprise a plurality of members, preferably two in number, for clampingly or wedgingly securing the lead wires to the respective prongs.

Certain advantages in assembling are obtained by making the members movable relative to each other to cause releasable clamping of the leads. The movability may be in one or more directions, suitable guide means for the leads may desirably be provided, and, if preferred, the lead wires may suffer a bend in being clamped so as to better withstand a pull that might accidentally be exerted upon the extending length of the electrical cord.

For example, the device 10 may have an axial bore or passage 15 centrally communicating with an open circular recess 16 which may define an annular seat or shoulder 17, bounded by an annular flange or skirt 18. Intercommunicating the passage 15 with the shoulder 17 are any suitably arranged angularly spaced openings or passages such as 19, which terminate closely adjacent to the entrance 20 of the passage 15, and extend into the surface of the shoulder 17.

The device 10 may include a second member such as a plug 21 adapted to be secured to the shell 14, for instance, in the upper end of the axial passage 15, the lower end of which may receive the electrical cord 13. Instead of a merely rotatable connection, a cam or threaded engagement may be provided as shown at 22, to permit the plug 21 to be screwed into the shell 14 upon a suitable small angular movement, with...
a relatively large axial motion. When screwed tight, the plug 21 may clear the leads 12, so as to avoid cutting the insulation thereon.

The plug 21 may comprise a headed portion 23 adapted to be received within the recess 16 and being desirably sufficiently smaller in diameter than the said recess to bear the shoulder 11. If preferred, a recessing seat 24 may be formed at the base of the recess 16 to partially receive the headed portion 23. In the latter there may be suitably secured the prongs 11, and contact portions 25 may be provided therefor actuable by the plug 21 and extending in any desired direction, preferably laterally. For instance, each prong 11 and its contact portion 25 may be a one piece member. While the same may be variously secured to the plug 21, it is herein shown as connected thereto by embedment in course of molding the plug, with the prongs projecting in the general direction of the axis thereof and the contact portions projecting at an angle to said axis.

To assure ample latitude for interengagement of the leads 12 with the contact portions 25, the latter may be elongated according to an arcuate form, as particularly indicated by the portions 26a. Hence ample allowance is afforded for variations in the thickness of the lead wires 12. The threads 22 are, of course, in a predetermined relation to the passages 19 to assure proper functioning of the contact portions 25 with respect to the seat 17 for clamping the leads 12 therewith.

To increase the power of the clamping action on the leads 12, and to render such action effective for a particularly small angular motion of the plug 21, the seat 17 may comprise cam or wedging ridges as shown in Fig. 6. If desired, the cam 26 may be radially serrated as indicated at 27. The contact portions may be correspondingly serrated as shown at 28.

The operation of the device 10 will now be briefly described. The operator pushes the exposed leads 12 through the passages 18 simultaneously, until the leads project as shown in Fig. 4. Then the operator applies the plug 21 and imparts an angular movement thereto, causing the contact portions 25 to strike the projecting portions of the leads 12 to bend and flatten the same downward upon the seat 17, over which the contact portions ride, and finally causing said leads to be clamped between the contact portions and the seat, with good electrical contact with the former. For convenience, the operator may hold the shell 14 in one hand, and may manipulate the plug 21 by grasping the prongs 11 in the other hand. In this manner, the device 10 may be assembled, with practically a single motion so that the assembling is rendered especially advantageous in quantity production, as by electrical fixture concerns. The assembling is also especially easy for those who are mechanically unskilled, since there is no need for any wire to be carefully wound around any screws nor any manipulation of a screw driver required. In fact, with conventional connector caps, the wires must be manipulated about the screws inside of the caps; with this invention, when the plug 21 is removed there is full and free access to the wires, and in fact, no handling thereof is necessary, because the contact portions 25 bend and clamp the wires. Also due to the ample radial spacing between the wires, there is no possibility of accidental short circuiting, as by stray wires, if any reasonable care is used. The bend in each wire or lead as at 29, in Fig. 6, helps to secure the same against any pull that may be accidentally exerted on the extending lead line. The securement may be further aided by the comparatively rigid character of the metal of the contact portions 25, which may, however, be slightly yielding if desired. Where the leads 12 consist of very fine wires, cutting thereof is avoided, because the contact portions rather sharply approach the seat 17 so that only a very small angular movement is necessary to complete the clamping of the leads.

I claim:
1. An electrical connector fitting including a first member having a pair of spaced passages extending in the general axial direction of the member and terminating in a seating means at an end of the first member, a second member having spaced contact prongs fixed thereon, said members having threaded means for axially interconnecting the same in response to a relative angular movement therewith, each prong having a contact portion which, in initial assembly relation, is angularly spaced relative to the adjacent end of the co-operating passage and axially spaced relative to the seating means at the adjacent end of the cooperating passage, to permit bared conductor wires to be passed through said passages to freely project beyond said seating means and said prongs being adapted to move across and beyond the adjacent ends of said passages and into contact with the seating means upon relative angular movement between the members in one direction, said contact portions thus bending the projecting wire ends over the seating means to clamp the wire ends, the threaded means being so coordinated with the contact portions and the seating means as to cause the contact portions to clamp the wire ends in relatively close proximity to the said passages, whereby the wires can be operatively secured to the connector without disassembling the latter.
2. An electrical connector fitting including a shell member having a chamber having a seating means at the base thereof and angularly spaced passages having their inner ends at the seating means, a one piece plug member having spaced electrical contact prongs fixed thereon, said members having a thread axially interengaging the members for adjustable relative axial and angular motion between the members with the plug member positioned in the said chamber, the plug portion affording free spaces adapted to confront said passages, the contact prongs having inner contact portions confronting the seating means at the inner ends of said passages, whereby relative axial and angular movement between the members cause the contact portions to move about the axis of said members to bend over and clamp the bare ends of conductor wires threaded through said passages into said spaces, the said thread serving to hold the members axially tight to maintain the said contacts spaced on the wire ends.
3. An electrical connector fitting according to claim 1, wherein the said contact portions of the prongs are slightly yeldable relative to the second member to cause a gradually increasing clamping action on the conductor wires.

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