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W. H. COOK

2,618,680

AUTOMATIC WIRING CONNECTION

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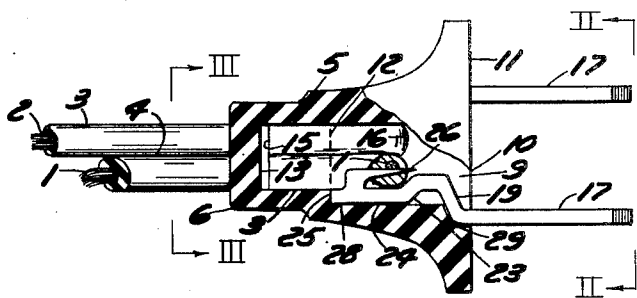


FIG. 1

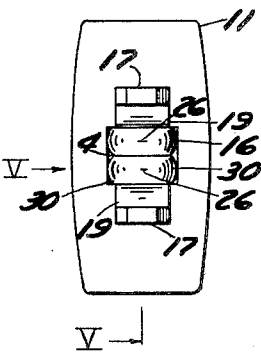


FIG. 2

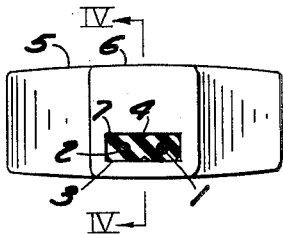


FIG. 3

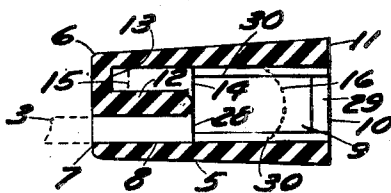


FIG. 4

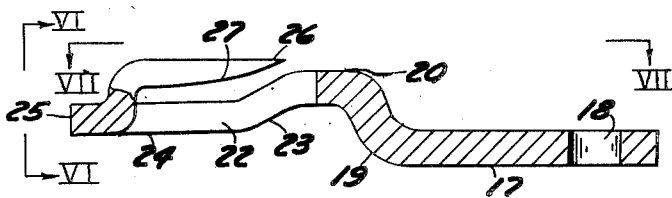


FIG. 5

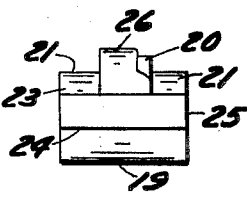


FIG. 6

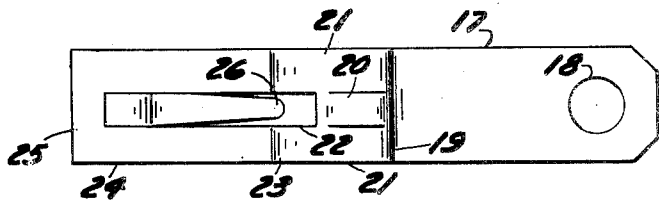


FIG. 7

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UNITED STATES PATENT OFFICE

2,618,680

AUTOMATIC WIRING CONNECTION

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5 Claims. (Cl. 173-361)

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This invention relates to electric terminal connection means, especially between a conductor line take-off and a socket.

This invention has utility when incorporated in a two-prong type of electric fitting in which there is a one-piece insulation housing and the prong-providing terminals have fixed therewith electric wire insulation penetrating points against which a bend of the insulated wire may be pulled, not only to effect the terminal connection to the stranded wire covered by the insulation, but simultaneously to lock effectively the insulated wire in the insulation housing of the fitting.

Referring to the drawings:

Fig. 1 is a side elevation, on an enlarged scale, and with parts broken away to show the lead-in connection of an insulated wire pair as connected in a two-prong electric fitting;

Fig. 2 is an end elevation, or looking from the right of Fig. 1, line II—II;

Fig. 3 is an end elevation looking from the line III—III at the left of Fig. 1;

Fig. 4 is a section thru the insulation housing, on the line IV—IV, Fig. 3;

Fig. 5 is a still further enlarged view, in section on the line V—V, Fig. 2 of the terminal only;

Fig. 6 is an end elevation of the terminal from the line VI—VI, at the left of Fig. 5; and

Fig. 7 is a plan view of the terminal, looking down on the showing in Fig. 5, line VII—VII.

Wire strands 1, 2, are in insulation 3 having a re-entrant or minor thickness central tearable bond 4 therebetween.

One-piece housing 5 of insulation is shown with a minor overall dimension end 6 having an entrance port 7 with a straight way 8 therefrom to a chamber portion 9 to an opening 10 at the insulation housing 5 member end 11 remote from and parallel to the port 7. A medial wall or partition 12 along the way 8 is from an end closure 13 for a pocket 14 in the housing 5. The wire strand pair carrying insulation 3 as inserted in the port 7 may be to an extent to protrude thru the opening 10. The operator may then direct end 15 of such insulated wire thru the opening 10 and the chamber 9 to enter the pocket 14 on the side of the partition 12 away from the way 8, and accordingly to the pocket bottom or end closure 13, remote from the insulation wire bend 16.

Prong 17 has near its outer end an opening 18. This brass or electrical conductor terminal from its straight prong 17 has an offset 19 to a medial rib 20 flanked by a pair of short flat portions 21. The rib 20 ends at a slot 22. There is

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a minor reverse offset 23 from the portions 21 to a straight portion 24 along the slot 22 to an end 25. From the slot 22 and approximately parallel to the portion 24, altho outwardly offset therefrom slightly beyond the portions 21 and even outward from the rib 20, is an insulation-penetration-operable point 26 having taper 27 on its side portion toward the slot 22.

Somewhat toward the end 6 of the housing 5, near the inner end of the partition 12, is ledge end or shoulder 28 as the inner end or bottom of the chamber 9. Adjacent the end 11, there is from the opening 10 an inward notch or recess 29 into which the terminal offset 19 may lodge as the terminal end 25 abuts the shoulder 28. The pair of prong-providing electrical terminals may thus be frictionally fixed with the housing 5, and clear of the way 8 and the pocket 16 snugly fitting in seats outwardly from intermediate widened portion 30 of the chamber 9.

The unit housing insulation 5 is preferably a rigid body, say of plastic. The production dimension relation between the integral body 5 with the pair of parallel seats along the opposite sides of the chamber 9 is such that there is snug frictionally locking of the terminal portions 24 with the terminal ends 25 at the shoulders 28 and the offsets 19 in the recesses 29. This thrust-in assembly is not sufficient to fracture the unit 5. At the terminal portions 24 there is no encroachment whatsoever on alignment extended course from the way 8 or from the pocket 14 as thru the chamber 9 toward the end opening 10. Considering the direction of insertion for a conductor lead wire pair entering the port 7, there may be a very slight reduction in the course clearance by the offsets 23. Any out-of-straight direction for the rubber covered or elastic jacketed strands of lead wire tends to distort or widen its form. Therefrom it follows that in shifting the wire in the chamber 9 away from alignment with the way 8 toward the plane of the partition 12, locates such shifting in proximity to the points 26. Accompanying such shifting with a crowding toward the points 26 effects impaling penetration of the points thru the insulation jackets 3 to ride between strands 1 for one of the points 26 and between strands 2 for the other point 26. The thrusting down of the kinked or shifted portion may be sufficient for the tips of the points 26 to be exposed toward the end 11 as in the chamber 9. It is to be noted that under the foregoing outlined practice, there is no occasion to strip or bare the strands 1 or 2 in effecting the electrical circuit conductor connection between the lead

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conductor and the terminal in the fitting. There is thereby total avoidance of short-circuiting or electric current leakage in the fitting. The insulation 3 as good outside the fitting retains such efficiency to and at the terminals.

The time-saving factor hereunder does not stop with elimination of occasion for stripping or baring portions of the wire strands for direct engagement with the terminal to be connected thereto. Instead of lack of uniformity arising from attempting, say by pushing an element thru the opening 10 to crowd the wire toward a point 26, there is developed hereunder a more speedy and uniformly accurate as well as effective method, series of steps or process.

The one having the fitting comprising the housing 5 and the terminal pair seated therein, has only to thrust thru the port 7, the pair of stranded wires 1, 2, having the insulation jacket 3. This thrusting is along the way 8, thru the chamber 9 to protrude sufficiently that the end 15 may be bowed back into the opening 10 to be directed thru the chamber 9 into the pocket 14. A bend or kink 16 is thus formed, which initially may be outward from the opening 10. With this bowing of the wire end 15 toward the pocket 14 as the second step, the third step may be for the one to grasp the housing 5 with one hand and with the other hand pull the stranded wire pair at the portion thereof protruding from the port 7, away from such port. This operation at once draws the bend 16 thru the opening 10 and into the chamber 9. The kink or bend 16 has increased the overall width of the pair so that in riding into the chamber 9 there is crowding in the sliding along the faces 21 of the terminal, with supplemental squeezing by the ribs 20 in directing the bend 16 for firm holding to impinge on the points 26. The continuation of the third step pulling causes the points 26 to penetrate the insulation 3 and ride into the strands 1, 2, and therepast for the point tips to protrude from the opposite side of the insulation 3. The taper 27 and the slot 22 provide clearance for this electrical connection anchorage. The bend 16 approach to the partition 12 is a positive anchoring of the lead wire insulation with the fitting and does not place a physical strain on the wire at the points 26. In the event there be occasion to disconnect the wires, considerable inward thrust is required toward the port 7.

What is claimed and it is desired to secure by Letters Patent is:

1. An electric connector fitting comprising an insulation housing having a chamber therein, an entrance way into said chamber for a conductor lead wire, a pocket opening into said chamber parallel and adjacent to said way and spaced from said way less than the width of said way, and a terminal in said chamber having a con-

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ductor piercing point in said chamber parallel with said pocket and said way and spaced between them, said point being directed parallel to and away from said pocket.

2. An electric connector fitting comprising an insulation housing having a chamber therein and having a pair of adjacent laterally spaced independent ports opening into said chamber at least one of which ports extends through said housing, said spacing between said ports being less than twice the width of a port, a terminal in said chamber having a conductor piercing point in said chamber directed away from and between the openings of said ports into said chamber, whereby a wire introduced into the one of said ports extending through said housing and bent back in said chamber into the other of said ports is pierced by said point when said wire in the one of said ports is pulled in a direction out of said chamber.

3. A fitting according to claim 2 wherein said ports are spaced by a partition portion of said housing of less thickness than the width of one of said ports.

4. A fitting according to claim 2 including projecting means on said terminal adjacent said point for guiding a wire into piercing position by said point.

5. An electric connector fitting comprising an insulation housing having a chamber therein and two laterally spaced independent ports in said housing opening in said chamber for an insulation spaced pair of conductor lead wires at least one of said ports extending through said housing, said spacing between said ports being less than twice the width of a port, a pair of spaced terminals in said chamber each having a conductor piercing point in said chamber directed away from and between the openings of said ports into said chamber, whereby a spaced pair of wires introduced into the one port extending through said housing and bent back in said chamber into the other port has each wire thereof pierced by one of said points when said pair of wires is pulled in a direction out of said chamber.

WILLIAM H. COOK.

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