

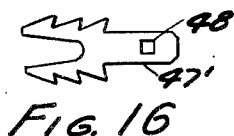
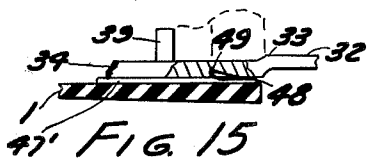
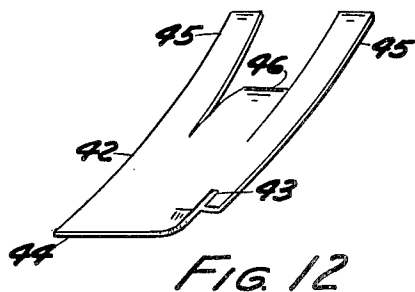
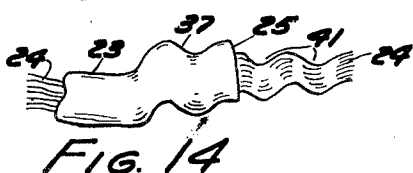
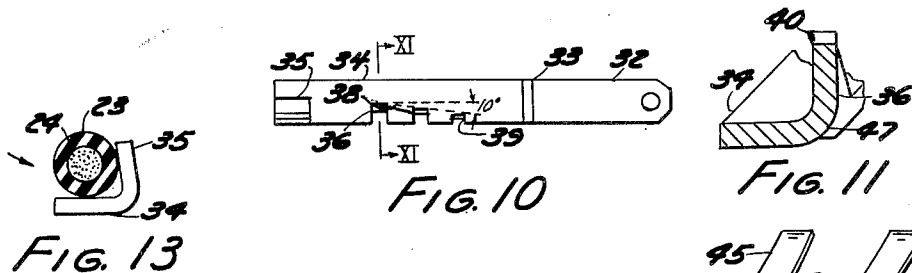
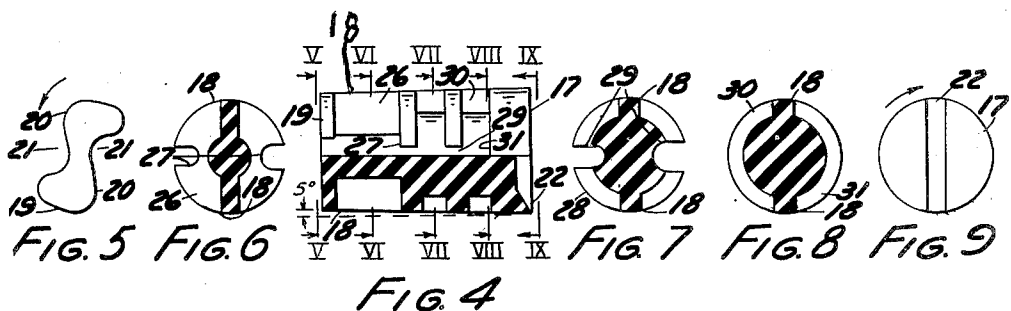
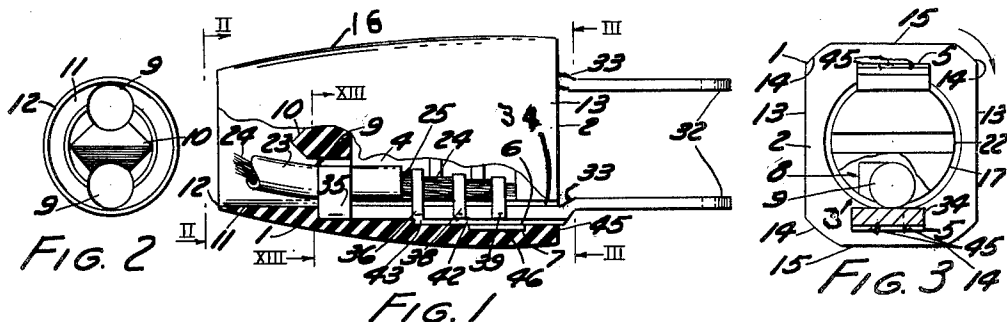
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W. H. COOK

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PRONGED PLUG WITH ROTATABLE CORE HAVING CORD
INSULATION AND CONDUCTOR ANCHORAGE MEANS

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Inventor
William H. Cook

Attorney

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PRONGED PLUG WITH ROTATABLE CORE
HAVING CORD INSULATION AND CON-
DUCTOR ANCHORAGE MEANS

William H. Cook, Toledo, Ohio

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6 Claims. (Cl. 173—361)

1

This invention relates to efficient anchoring of insulation-covered electric conductors at electric terminals.

This invention has utility when incorporated in electric terminal carrying fittings, more particularly of the prong type. Between an insulation housing or shell and a relatively angularly shiftable plug seated therein to lock a terminal or terminals, there is, for each conductor or lead-in wire, a course along a multiple restriction way of the plug past terminal projections or fingers located in the way enlargements at the restrictions. Upon shifting of the plug relatively to the shell, the seat restrictions or interruptions and fingers oppositely coact upon a course-directed lead-in wire to kink-grip the insulation jacket or cover and crimp the wire strands effectively holding the assembly in tight electric conductive relation.

Referring to the drawings:

Fig. 1 is a side elevation, with parts broken away, of an embodiment of the invention in a two-prong type of electric fitting:

Fig. 2 is an end elevation, or view looking from the line II—II at the left of Fig. 1, showing the conductor lead entrance end of the fitting;

Fig. 3 is an opposite end elevation from that of Fig. 2, being a view looking from the line III—III, a portion of the plug and one terminal being broken away;

Fig. 4 is an upper half side elevation and lower half medial longitudinal section of the insulation plug housed by and angularly shiftable in the shell of the fitting unit of Fig. 1;

Fig. 5 is an end elevation looking from the line V—V, Fig. 4, being the portion of the plug at the lead-in entrance;

Fig. 6 is a section on the line VI—VI, Fig. 4, being at the way enlargement adapted to receive and limit thereto the jacketed portion of the lead-in wires;

Fig. 7 is a section on the line VII—VII, Fig. 4, at the next succeeding enlargement, of minor dimension to that of the enlargement shown at Fig. 6, and being adapted to have the unjacketed wire strands directed therethru;

Fig. 8 is a section on the line VIII—VIII, Fig. 4, at the inner limit or end enlargement of the way, and of approximately similar dimension to the enlargement shown in Fig. 7, and in which the stranded wire has its thrust-in limit along the course of the plug;

Fig. 9 is an opposite end elevation or from the line IX—IX, Fig. 4, to that shown in Fig. 5, and showing the coin-receiving-edge seat for plug

2

actuation, shown as 90° clockwise to gripping position from the showing in Fig. 3;

Fig. 10 is a side elevation of a terminal prong adapted to be seated in the insulation shell of Fig. 1;

Fig. 11 is an enlarged view in section and perspective from the line XI—XI, Fig. 10, showing a seat to be engaged by a spring lock strip;

Fig. 12 is an enlarged view in perspective of terminal spring lock strip, adapted to anchor a prong with the shell;

Fig. 13 is a section on the line XIII—XIII, Fig. 1, of jacketed stranded lead-in wires at the kink receiving entrance therefor;

Fig. 14 is a fragmentary view of a kinked and crimped lead-in wire as acted upon by the fitting of Fig. 1;

Fig. 15 is a largely broken away view of a different type of locking strip from that shown in Figs. 1, 12; and

Fig. 16 is a plan view of the strip of Fig. 15.

The housing

A housing or shell 1 of insulation, has at its larger end 2 an opening 3 to a cylindrical chamber 4 with diametrically disposed channels or ways 5 therealong. Spaced from the end 2, each seat or way 5 has a narrow ledge or shoulder 6 to a slightly deeper portion 7. As an inner end to the way 5 there is a seat 8 providing clearance at two sides of a circular opening 9 in a wall having on its opposite side from the chamber 4, a wedge or V-guide or spreader rib 10 at the inner end of a cylindrical throat 11 from smaller end 12 remote from the end 2. From the end 2 the housing or shell 1 has major parallel sides 13 connected by rounded corners 14 to minor parallel sides 15, which sides merge into a conical portion 16 toward the end 12.

The plug

Adapted to be seated in the chamber 4 and flush with the end 2, is an insulation plug having a head 17 with diametrical ribs 18 therefrom to a base 19 having squeeze-effecting sides 20 for receiving way portions 21 initially in register with the housing wall openings 9 as coin notch 22 in the plug head 17 lies parallel to the sides 15 in extending between the sides 13 of the housing 1 (Fig. 3).

An electric conductor lead-in is shown with an insulation covering or jacket 23 about stranded wires 24. End 25 of the insulation covering 23 in its thrusting thru the openings 9 as directed by the wedge 10, is thru the way portions 21 into

clearance or enlargement 26 in the plug to a notch restriction 27 (Fig. 6). The less diameter stranded wires 24 pass on thru the restriction 27, across a first minor clearance or enlargement 28 to pass thru a restriction 29 (Fig. 7) into a second

The terminal

The terminal is shown comprising a prong portion 32 having an inward offset 33, say approximating half its metal thickness, with a straight extension 34 adapted to extend along in a seat 5 to an end flange or finger 35 to register in the seat 8 in proximity to the opening 9 in the complementary or outer insulation section or housing 1. Spaced from the finger 35 along the extension 34 of the terminal a distance slightly less than the thickness of the base 19 plus the length along the insulation plug of the clearance 26, is a second somewhat minor finger 36, integral with the extension 34. The position of this second finger 36 is such that in the clearance 26 it will ride not quite to the restriction 27, and thus be free upon angular shifting of the plug 17 in the housing 1, to have the restriction 27 pinch the strands 24, while at the same time the wedge faces 20 are crowding the lead-in wire insulation covering 23 and acting in a shearing or transverse course as to the openings 9 in establishing an ogee-like kink 37 (Fig. 14).

In proximity to the restriction 29 from the clearance 28 (Figs. 4, 10), and in proximity to the wall 31 in the clearance 30, fingers 38, 39, integral with the terminal extension 34, coast somewhat progressively in a pitch line of say 10°, and each with a slightly skew corner 40 the more firmly to bite against the stranded wire 25 in effecting further kinks 41 (Fig. 14). There may be slight circumferential clearance for the plug as to the inner wall of the housing forming the chamber 4. From the head 17, the plug may have a taper along the ribs 18 up to 5°.

The lead-in gripping action is such that initial angular shifting of the plug as to the shell 1, takes hold of the somewhat compressible insulation covering 23 as held by the opening 9 and the squeeze acts thru the seat sides 20 for the plug end 19 at the ways 21.

This gripping action upon the lead-in conductor insulation is positive. Accordingly, it takes away all tension or pulling strains from being local to the wire strands. The transverse distortions or cross-wise twistings, acting upon the wire strands in the sequence by the fingers 36, 38, 39, in opposition to the restrictions 27, 29, establish first major pulling away from the wall 31 by the finger 36, with the fingers 38, 39, coasting as follow-ups against rupturing the strands, while establishing electrical-conductor contact-maintaining relations for the strands with the terminal.

Terminal locking

A bronze shim or spring metal strip 42 is provided with an offset claw 43 at its inner end 44. Remote from the end 44, the strip 42 has a pair of marginal spring arms 45, spaced by a considerably shorter oppositely deflected spring torque 46 (Fig. 12).

Before placing the terminals 32, 34, in the housing 1, convenient assembly may be effected by locating the strips to have the claws 43 ride in a seat 47 (Fig. 11) at each finger 36. The terminals, as thus spaced by the plug, may be thrust

thru the opening 3 into the chamber 4, to ride as to the terminals along the seats 5 for the tongues 46 to engage back of the shoulders 6. The spring action of the tongue 46 and of the arms 45, take up any lost motion or play clearance for the terminals between the insulation members 1, 17. The terminals are thus positively locked against any shifting, and the offsets 33 anchor the plug in the shell, with the plug relative movement confined to angular shifting, say in a range up to 90° for locking lead-in conductors. Reverse turning of the plug may release the lead-in wires for replacement or substitution.

A marginally jagged strip 47' (Fig. 16) may be snagged with the sides of the way 5 against pull-out, and an offset 48 from the strip 47 be lodged in a recess 49 (Fig. 15) in a terminal extension 34. This is an alternative terminal locking disclosure.

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

1. An electric fitting including an insulation cylindrical plug having in lineal succession a series of circumferentially extending groove sections spaced by a plurality of ribs, an adjacent pair of said ribs having a notch of one aligned with a notch of the other to form parallel to the axis of the plug a way across the spacing groove between the ribs for insertion of a lead-in conductor.

2. An electric fitting comprising an insulation housing section having a chamber open at one side and a cord opening leading into said chamber, an insulation plug section relatively rotatable in said chamber, a terminal seated in said housing and connected to one of said sections and having a plurality of spaced laterally projecting fingers, a plurality of ribs on the other of said sections and relatively movable between said fingers, and a channel extending across said ribs and having an open end which in one position aligns with said cord opening, whereby the relative movement of said sections crimps a wire when inserted through said cord opening into said channel.

3. An electric fitting according to claim 2 wherein said plug section includes a slotted end exposed in the open side of said chamber, whereby said plug section may be rotated with respect to said housing section.

4. An electric fitting comprising an insulation housing section having a chamber open at one side and a cord opening leading into said chamber, an insulation plug section relatively shiftable in said chamber, and a terminal seated in said chamber and connected to one of said sections and having a plurality of spaced laterally projecting fingers, the other of said sections having a plurality of ribs relatively movable between said fingers, with a channel extending across said ribs, said channel having an open end which in one position aligns with said cord opening, whereby the relative movement of said sections crimps a wire when inserted through said cord opening into said chamber.

5. An electric fitting according to claim 4 wherein said terminal is connected to said housing section, and said ribs are on said plug section.

6. An electric fitting comprising an insulation housing section having a chamber open at one side and a pair of cord openings leading into said chamber, an insulation plug section relatively shiftable in said chamber, and a pair of terminals seated in said chamber adjacent said pair

of openings and connected to one of said sections, each terminal having a plurality of spaced laterally projecting fingers, the other of said sections having a plurality of ribs relatively movable between said fingers with a pair of channels extending across said ribs, said channels each having an open end which in one position of said sections aligns with one of said cord openings, whereby the relative movement of said sections crimps each wire of a pair when inserted through said cord openings into said channel.

WILLIAM H. COOK.

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