July 27, 1948. F. VON VOIGTLANDER 2,445,981

SELF-ADAPTING CONNECTOR

Filed Feb. 7, 1946

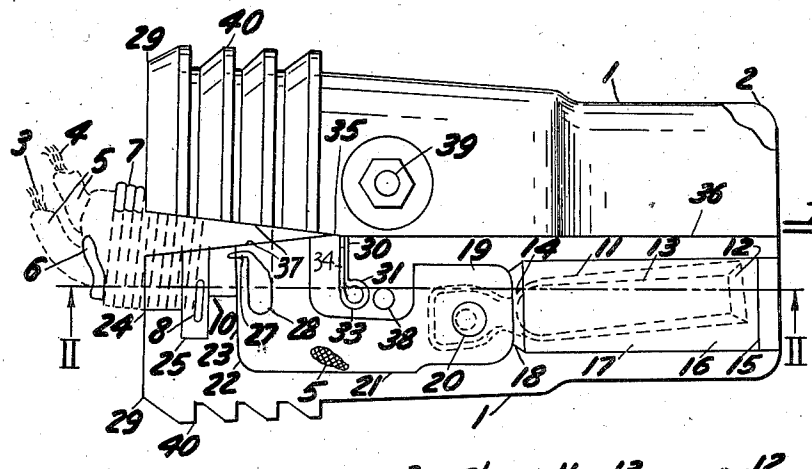


Fig. I

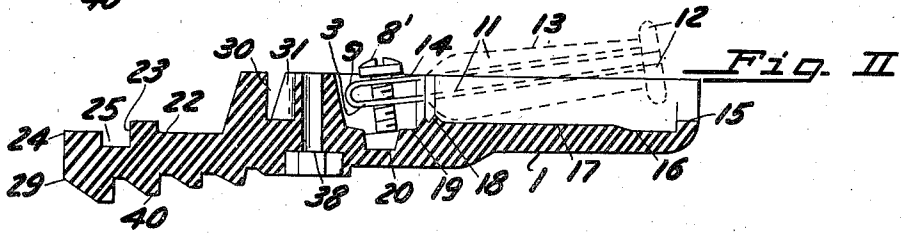


Fig. II

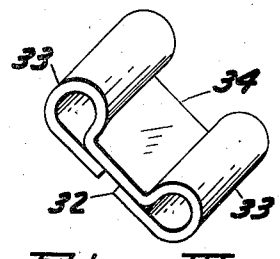


Fig. III

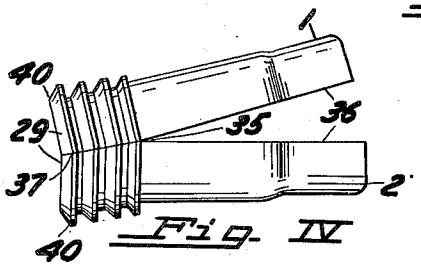
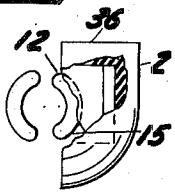


Fig. IV

Fig. V



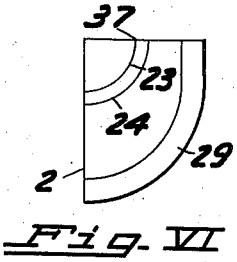


Fig. VI

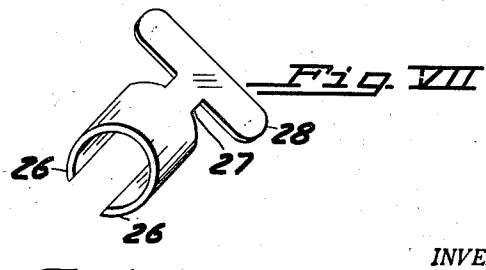


Fig. VII

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SELF-ADAPTING CONNECTOR

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1 Claim. (Cl. 173—332)

1

This invention relates to electrical terminal connectors with range for automatic adaptation to widely diverse types for efficient circuit closing cooperation.

This invention has utility when incorporated in plural socket types of connectors or attachment devices, more particularly with the sockets relatively shiftable to vary the spacing therebetween. Additional alignment or register compensation is cared for in that the socket terminal proper has a float latitude for some lateral movement, even angularly.

Referring to the drawings:

Fig. 1 is a plan view, on an enlarged scale, of an embodiment of the invention in a two-prong receiver electric terminal connection device, with one of the four parts of the unit removed;

Fig. 2 is a section on the line II—II, Fig. 1, looking in the direction of the arrow, of one of the complementary half-seat portions for a socket terminal and lead way thereto;

Fig. 3 is a perspective view, on a still further enlarged scale, of the spring leaf hinge to provide a rocking joint in assembling the relatively movable sockets of a pair in this electric terminal device;

Fig. 4 is a plan view of the unit of Fig. 1, in fully spread or divergent position for the sockets, as contrasting with the converse or reduced spacing position of Fig. 1;

Fig. 5 is an end detail, with parts broken away, of the entrance throat for a prong of one of the socket parts, with socket terminal flare ends in position therewith;

Fig. 6 is a lead-in end elevation of an insulated complementary section entrance quarter; and

Fig. 7 is a perspective view of the strain relief clip, adapted in the assembly in Fig. 1 to act upon the lead-in conductors close to the region of minimum movement as to the insulator housing of the four part unit.

The housing

The insulation housing unit is herein shown as comprised of four parts or sections 1, 2, assembled in pairs, being complementary rights and lefts.

Supply lines to terminals

Electric current supply lines 3, 4, each have insulation 5 which is in a flexible conduit or insulation covering 6 passing thru a laterally yieldable helical wire sleeve 7 with an inner end larger diameter single wrap 8. As protruding therefrom, the covering 6 is removed and the two insulation portions 5 are separated to have the supply conductor wires 3, 4, stripped terminally thereof. This is such that stranded wire 3 may be wrapped about a screw 8' thru a return bend 9 tapped for the screw in thus assembling a socket terminal of opposing complementary relatively yieldable arms or sections 11 having semi-circular flare throat entrance portions 12 with enlarged tapering channels back therefrom as groove ways 13 to a restriction region 14 at the merging of the arms 11 with the spring return bend 9.

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Assembly of the terminals

The respective insulation sections 1, 2, have at the free or connection-effecting end, arc seat portions 15. These preferably are slightly less than 180° in their arc extent of approximately the radius of curvature of the outer flare 12 of the socket terminal to be located just back of the portion 15, at a clearance or seat region 16. This clearance 16 is sufficient for side play or float range of shifting for the flare 12. A slightly more shallow seat 17 extends back therefrom to a slight rim 18 in the region of the terminal restriction 14. The seat 17 is of ample dimension for the arms 11 and their arch sides 13, to not bind in response to flares 12 having wide variety of different types of prongs thrust thereinto.

Back of the rim 18 is a somewhat deeper seat portion 19 with a central well 20. Herein may be located the base return bend 9 with its screw 8 as the line connection of the socket terminal connector. The depth of this seat 19 is such as to permit considerable up and down movement for the return bend 9, while the transverse dimension allows fully non-binding response to any prong shape or distortion which may enter the flare throat 12 at the seat 15. The well 20 precludes any holding of the return bend 9 due to the projection therefrom of the screw 8'.

The insulation covering 5 reposes in a way 21 with an angle portion 22 for register with arc quarter ribs 23, 24. Between the ribs 23, 24, is quarter groove 25 to receive the enlarged diameter final wire wrap 8. The four quarters thus complete envelopment of this wire flex protector 7.

Strain relief clip

Before the four parts are assembled, and at the juncture of the insulation coverings 5 as spread from the enveloping insulation 6, and there wrapped with asbestos paper 10, arc shaped cheeks 26 form a clasp or wrap about the so wrapped portion 6, with a tongue 27 therefrom to a crossbar portion 28 (Fig. VII). The fractional sleeve formed by the portions 26 is located to project

thru the wrap 8 of the wire into the windings 7, with the tongue 27 directed inward from end 29 of the assembly 1, 2. This brings the bar portion 28 in the angle portion 22. Any outpull upon the electric supply lines 3, 4, is transmitted from the grip cheeks 26 to the bar 28 riding against the rib 23.

The hinge spring leaf

Spaced inward from the way portion 22 is a V-channel 30 having one straight wall toward the end 29 and the slightly spreading wall toward the insulation end having the seat 15. Toward the way 21 and short thereof, the channel seat 30 ends in a cylindrical seat or socket 31.

A spring is provided of strip sheet stock with ends 32 toward each other in a common plane from end loops 33 having a connecting web 34 therebetween lying against the leaf ends 32 to be re-inforced thereby.

Assembly of the unit

In the molding of plastic stock into the insulation elements 1, 2, the seat or recess portions require mold draft configuration for core withdrawal. It is essential that an assembly element, especially one combining therewith hinge or flex properties, be positively anchored with the elements with which it is to be associated. By configuring the leaf hinge embracing portion 30 to pinch at its bottom, there is positive preclusion of lost motion wobble, while the cylindrical sockets 13 for the respective loops 33 as half length in each of the opposing sections 1, 2, as complementary, provide efficient and positive end holding means for the spring leaf web 34 as bridging the way across a wide angle juncture 35 between straight portions 36 from the socket throat receiving ends and the portions 37 to the ends 29. The extent of divergence possible for flexing of the spring leaf 34 is determined for closeness as the faces 36 abut (Fig. 1), and for divergence, as the faces 37 abut (Fig. 4). Bolt openings 38 are now in alignment to receive bolts 39. As these nut engaging bolts 39 draw the respective element pairs 1, 2, together, the leaf portion 34 of the spring is snugly seated.

The user may grasp roughened or ribbed portion 40 to effect a registering spread between the socket throat seat portions 15, for thrusting the connector unit toward a prong pair. The relative looseness for the socket terminal, is such that it readily finds itself to slip along the prong, even to a considerable degree of structure departure or even distortion.

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

An adaptable electric connector comprising a pair of terminals, a housing providing a pair of chambers for the terminals, said housing including a first pair of sections each having an open side half chamber, there being seat way means in registry between said sections at a straight way intermediate portion, each section having a cylindrical way portion to which the straight portion extends, a leaf spring having a flat intermediate portion in the straight way portion and an end loop in each cylindrical way portion thereby to hold the two sections assembled with the spring protruding thruout its extent from the way portions, a second pair of housing sections complementary to said first pair with way means to complete enclosure of the protruding portion of the spring and with half chamber portions to register with and complete the chambers in the housing for the terminals, and assembly means in addition to the spring coacting between the first and second pair of housing sections to anchor the spring in the thus completed connector, whereby the two sections completing one chamber may swing on the spring as a hinge in movement relatively to the two sections completing the other chamber; there being conductor lead means into the housing to the terminals, said lead means entering the housing more remote from the chambers than the spring.

FREDERICK VON VOIGTLANDER.

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