

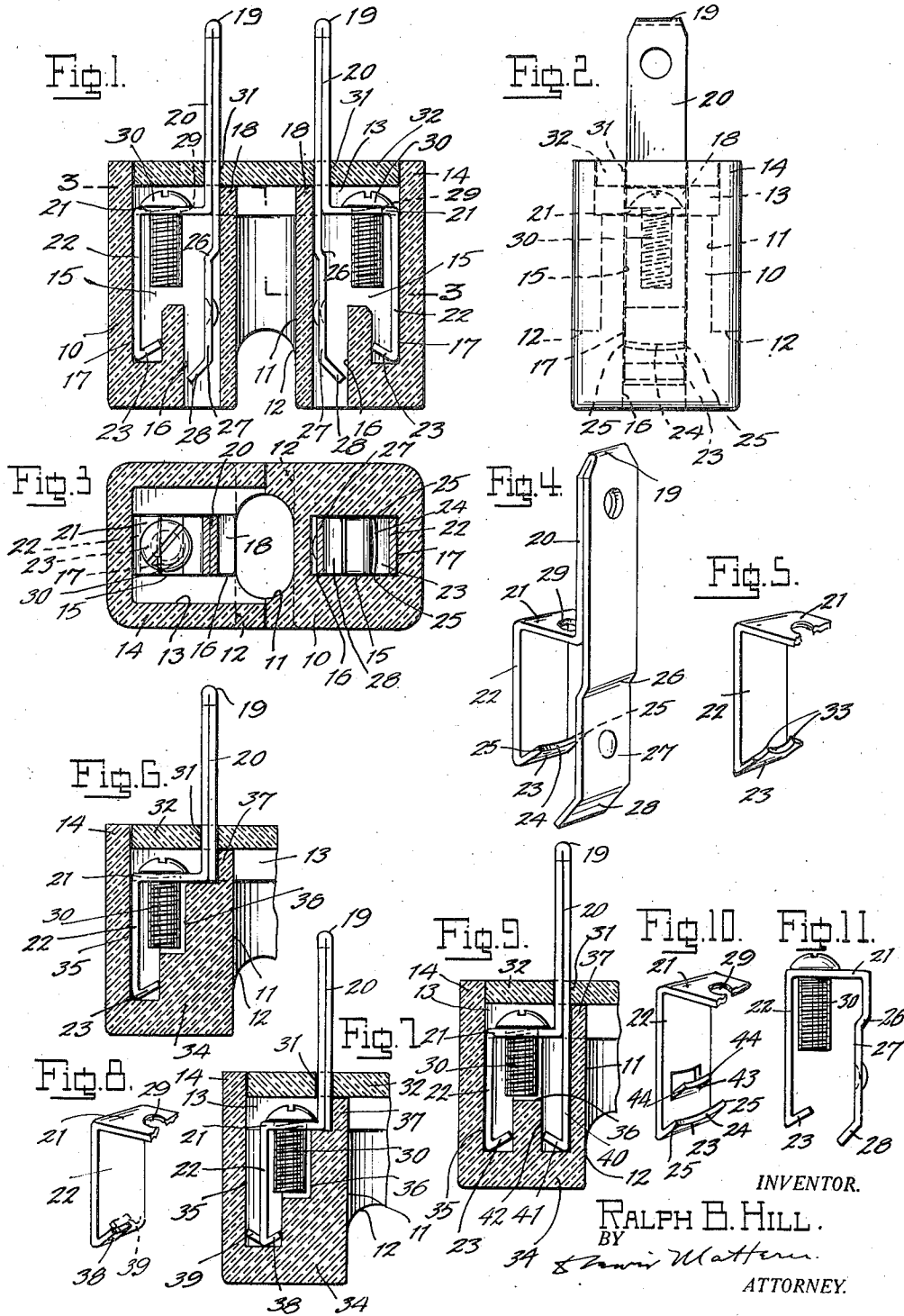
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ELECTRICAL PLUG DEVICE

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ELECTRICAL PLUG DEVICE

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The present invention relates to improvements in electrical plug devices, and has for an object to provide a plug unit of inexpensive and reliable construction, and which may be securely fixed in a housing without the use of screws or other extraneous fastening devices, and without the necessity of molding the same into the housing during the molding of the latter. A further object is to provide a plug unit, of this character which may be blanked and formed from flat strip stock.

With the above and other objects in view, embodiments of the invention are shown in the accompanying drawing and these embodiments will be hereinafter more fully described with reference thereto and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a vertical sectional view of an electrical plug device according to one embodiment of the invention.

Fig. 2 is a side elevation thereof.

Fig. 3 is a horizontal sectional view, taken along the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the plug unit employed.

Fig. 5 is a fragmentary perspective view of a modified form of plug unit.

Fig. 6 is a vertical sectional view of an electrical plug device, partially broken away, and showing a modification of the invention.

Fig. 7 is a similar view showing another modification.

Fig. 8 is a fragmentary perspective view of the plug unit illustrated in Fig. 7.

Fig. 9 is a view similar to Fig. 6 and showing a further modification.

Fig. 10 is a fragmentary perspective view of a still further modified form of plug unit.

Fig. 11 is a side elevation of another modification.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing, and more particularly to Figs. 1 to 6 thereof, the embodiment of the invention shown therein comprises a pair of identical plug devices, presently to be more fully described, and which are arranged in an insulating block 10 formed of hard rubber, phenol compound, or other suitable material. A central lead wire passage 11 communicates at its lower end with a transverse passage 12 and at its upper end with a widened rectangular lead wire receiving space or socket 13, surrounded by an upstanding wall

portion 14 of the block. At each side of the central passage 11 there is provided a pocket 15 of rectangular form having vertical side walls, and a passage 16 extending from the pocket to the base of the block, the inner wall of this passage being a continuation of the inner wall of the pocket. A downwardly extending recess 17 is formed in continuation of the outer wall of the pocket, its inner wall being vertical and parallel to said outer wall. The inner wall of the pockets 15 project upwardly, as at 18, into the widened lead wire receiving space 13.

The plug and resilient contact device or unit may be formed from a single piece or strip of suitable metal, bent upon itself, as at 19, to form a double thickness substantially rigid plugging portion 20 the outer leg of which is bent outwardly as at 21, and downwardly as at 22, the lower end being bent inwardly and upwardly as at 23 preferably at an angle of less than 45° and having its edge arcuately cut, as at 24, to provide sharp tooth-like corners 25.

The inner leg is provided with an offset bend 26 at a point below the bend of the portion 21, and a single thickness resilient contact portion 27 extends below said bend 26, being diagonally bent at its lower end, as at 28, to facilitate entry of a plug.

The pockets 15 are of such width that the side walls align the plug and resilient contact units vertically. The end portion 23 is forced tightly into the pocket 17 under slight compression so that its tooth like corners bite into the inner vertical wall, the angle of said portion 23 being such that upward pull on the plug and resilient contact unit causes the tooth-like corners to bite into said inner wall more firmly thus effectually retaining the unit in place.

The portion 21 is provided with a tapped hole 29 engaged by a screw 30 which serves as a binding post for securing the end of a lead wire to the unit, the lead wire extending in the space 13 at the side of the wall portion 18 and downwardly through the passage 11 from which it may be extended transversely through the passage 12. If desired the screws 29 may be removed or dispensed with and the end of the lead wire secured by soldering to the portion 21.

The plugging portions 20 of the two plug and resilient contact units are snugly engaged in slots 31 of a cover plate or washer 32 of insulating material fitted within the wall 14 of the block to close the space 13.

In Fig. 5 I have illustrated a modification in

which the edge of the portion 23 is cut to provide a pair of toothed projections 33.

In the modification shown in Fig. 6 the inner leg of the plug unit terminates in flush relation with the under surface of the portion 21. The insulating housing 34 is provided at each side with a pocket 35 for receiving the portion 22, and provided in its inner wall with a recess 36 in which the shank of the screw 30 is disposed. An upwardly projecting flange 37 similar to the projection 18 of the first embodiment is provided at each side at the upper end of the central passage 11.

The modification shown in Figs. 7 and 8 is substantially similar to that shown in Fig. 6, the portion 22 being disposed centrally of the pocket 35, however, and being provided at its lower end with angular retaining portions 38 and 39 bent in opposite directions and having tooth-like corners 40 formed upon their edges adapted to bite into the inner and outer side walls of the pocket 35.

In Fig. 9 I have shown a further modification in which the inner leg of the unit is extended downwardly, as at 40, and is provided at its lower end with an inwardly and upwardly bent angular portion 41 similar to the portion 23 and in opposed relation thereto, and adapted to bite into the wall of a pocket 42 provided in spaced relation to the pocket 35.

In Fig. 10 I have shown a modification in which an angularly bent lug 43 is struck out from the portion 22 in spaced relation above the angularly bent end portion 23, and is provided with tooth-like corners 44. Both the end portions 23 and the leg 43 are adapted to bite into the wall of the housing to retain the plug unit, the biting points of the lug being inwardly spaced with relation to the biting points of the portion 23 because of the narrower width of the plug.

It will be obvious that the modifications shown in perspective in Figs. 5, 8 and 10 may be employed in any of the several arrangements shown in Figs. 1 to 4, 6, 7 and 9.

The retaining means may be combined with a plug and spring contact device as shown in Figs. 1 to 4, with a plug device as shown in Figs. 6, 7 and 9, or with a spring contact device as shown in Fig. 11, this being substantially the same as that shown in Fig. 1, but without the plug portion 20, the spring contact portion 27 being bent downwardly from the portion 21.

I have illustrated and described preferred and satisfactory embodiments of the invention, but it will be obvious that changes may be made

therein within the spirit and scope thereof as disposed in the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In an electrical device, a housing unit of insulating material having a transversely extending lead wire receiving socket, a vertically disposed abutment wall at one end of said unit and a vertically extending cavity at the other end, said cavity having opposed walls one of which opposed walls is non-metallic and in a plane intermediate the other of said opposed walls and said abutment wall, and a metallic plug unit carried in said housing, comprising a single strip of metal bent upon itself for a portion of its length to form a double thickness, relatively thick plug disposed at the end of said socket in abutting relation to said abutment wall and projecting from said housing, a wire attaching portion bent transversely from said plug portion and disposed in said socket, a securing portion bent from said wire attaching portion extending in opposed direction to said plug portion and in a spaced parallel plane with respect thereto, said securing portion being engaged in said cavity in abutting relation with the wall thereof farthest removed from said abutment wall, and an integral yieldable flange portion extending back from the end of said securing portion and disposed diagonally between said securing portion and said intermediate wall of the cavity in a reverse direction to the direction of insertion of said securing portion and having its edge engaging said intermediate non-metallic wall and adapted to oppose retractive movement of said metallic plug unit through wedging of said flange portion between said walls of the cavity to cause said edge to bite into said intermediate non-metallic wall.

2. A metallic plug unit, for insertion in a socket in a housing of insulating material, comprising a single strip of metal bent upon itself for a portion of its length to form a double thickness, relatively thick stiff plug, one leg of said bent strip terminating at the base of said double thickness plug portion and the other leg extending below the base of said double thickness plug portion to constitute a single thickness attaching portion for inserting in said socket of the housing, and an integral prong bent from said single thickness portion projecting diagonally therefrom in a reverse direction to the direction of insertion in said socket and adapted to bite into a wall of said socket to oppose retractive movement of said plug from said socket.

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