Sept. 29, 1942. A. M. DRAVING 2,296,839

DUPLEX PLUG-IN SOCKET DEVICE

Filed Dec. 30, 1939

Fig. 1.

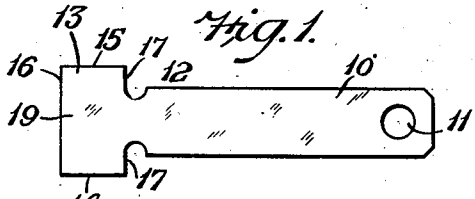


Fig. 2.

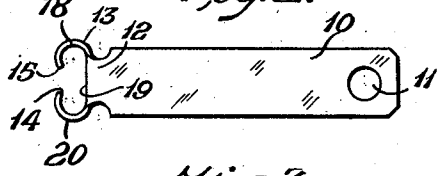


Fig. 4.

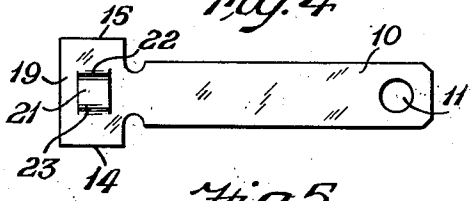


Fig. 3.

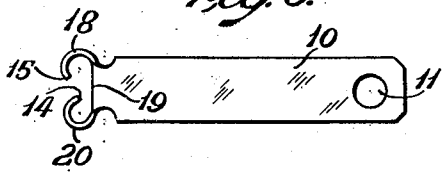


Fig. 5.

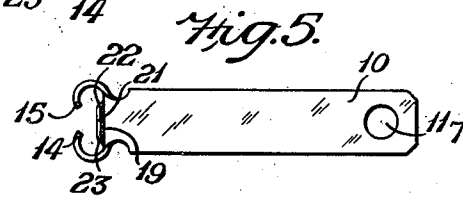


Fig. 6.

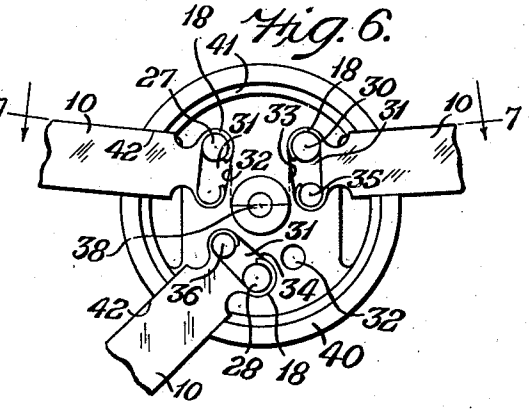


Fig. 7.

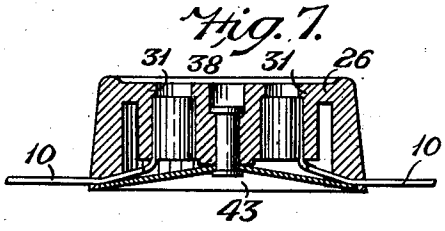


Fig. 8.

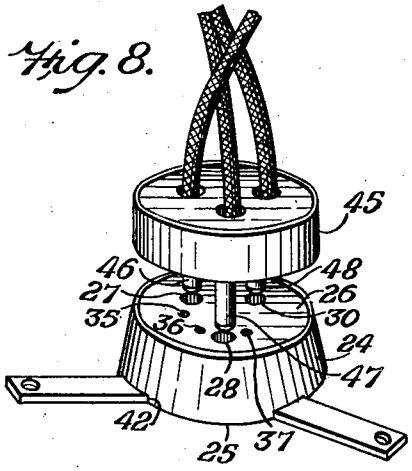
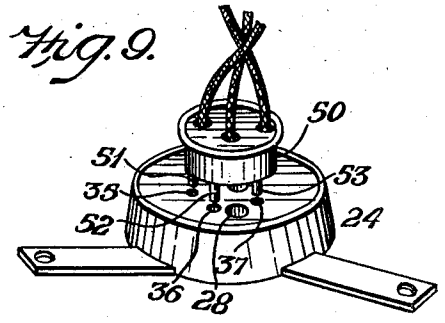


Fig. 9.



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DUPLEX PLUG-IN SOCKET DEVICE

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Application December 30, 1939, Serial No. 311,791

2 Claims. (Cl. 173—328)

This invention relates to duplex plug-in socket devices.

While it is not broadly new in the art to provide socket devices with contacts so arranged as operatively to receive a plurality of different plug-in devices in alternative selection, yet in the past so far as is known, such multi-duty socket devices have had independent and distinct female contact elements for each of the prongs of the plug-in devices. This both complicates and increases the cost of the socket devices.

It is among the objects of this invention: to provide a simplified contact having two separate prong receiving portions; to provide a socket with two prong apertures in combination with a single female contact element having portions operatively associated with each aperture to receive and to establish firm electrical contact with a male prong in either opening; to provide an electrical contact device arranged for the creation of an electrical contact with prongs inserted therein in alternative laterally spaced positions; to provide a contact element for sockets arranged to establish intimate electrical contact with either of two prongs of different diameters; to provide a socket element with two different aperture patterns with female contact elements mounted on the socket overlapping selected apertures from both patterns whereby two plug-in devices having prongs arranged in different patterns may alternatively be associated operatively with the socket with the prongs in the related apertures of the two patterns electrically engaging a common contact in the socket; to provide a socket device arranged to receive in alternation two plug-in devices having prongs and different pattern arrangements; to provide a socket device with a single female contact arrangement so disposed in the socket as alternatively to receive and establish electrical engagement with prongs of different sizes or positions; to provide multi-duty sockets for plural plug-in devices which may be comprised either of a single or multiple molding or of suitably punched or apertured laminated sheets or combinations of moldings and laminated sheets; to improve contacts for socket devices; to provide a socket device which shall incorporate in a single unit the practical and effective functions of two alternatively used sockets of forms heretofore in general use; to provide a socket device in which the number of operatively possible positions in which electrical contact may be established with an inserted prong exceeds the number of separate and distinct prong receiving contact elements; and many other objects will become more apparent as the description proceeds.

In the accompanying drawing forming part of this description:

Fig. 1 represents a plan of a blank from which a female contact, according to one phase of the invention, may be formed.

Figs. 2 and 3 represent respectively the identical double ended female contact formed from the blank of Fig. 1 and arranged to receive prong contacts of the same diameter but of different positioning, and of a further form of female contact in which the contact-making portions are arranged for the reception of contact prongs of different diameters as well as of different locations.

Fig. 4 represents a plan of a modified form of blank.

Fig. 5 represents a plan of the bent-up contact as formed from the blank of Fig. 4.

Fig. 6 represents a bottom plan of an illustrative form of socket device with the contact of Fig. 3 disposed therein.

Fig. 7 represents a transverse vertical section through the molded socket device of Fig. 6 showing the disposition of the contacts in the socket.

Fig. 8 represents a perspective of the completed socket according to this invention with a form of plug-in device having one triangular pattern of large prongs operatively aligned with the socket preparatory to engagement therewith.

Fig. 9 represents a similar perspective of the socket of Fig. 8 with a secondary plug-in device having a modified triangular pattern of smaller diametered prongs in operative juxtaposition thereto.

Referring to Fig. 1, the generally T shaped blank shown comprises the shank 10, having the suitable soldering aperture 11 at one end and at the other connecting through the restricted neck 12 with the cross piece 13 having a central panel portion 19 substantially aligned with the shank 10. The cross piece 13 has side edges 14 and 15 generally normal to the end edge 16 and the rear edges 17 of the cross piece of the blank. Although the blank of Fig. 1 is shown as being substantially symmetrical it is contemplated that it may be assymetrical so that the portion of the cross piece 13 terminating in the side edge 15 may be longer than the complemental portion ending in the side edge 14, especially for the construction of the contact of Fig. 3. It will be understood that the end portion or cross piece has the side edges curled up with relation to

the central panel 19 to form semi-cylindrical side arms terminating in the respective edges 15 and 14 which latter are brought into close but spaced adjacency to each other and to the backing portion comprised of the panel 19 and which when bent so that the backing portion 19 is perpendicular to the shank 10, describes a pair of substantially semi-cylindrical prong embracing members 18 and 20 the axes of which are normal to the tail 10. The construction of Fig. 3 is almost exactly like that of Fig. 2 and the parts bear similar reference characters with the major distinction being that the prong embracing portion 18 is of greater diameter than the prong embracing portion 20. As noted this may be as an incident to the assymetry of the cross piece of Fig. 1 or as shown in Fig. 3 by reason of the further bend imparted to the portion 20 whereby the edge 14 becomes closer to the backing portion 19 than edge 15 of the contact portion 18.

The blank of Fig. 4 may be almost exactly like that of Fig. 1 except for the upwardly bent or punched median device 21, of such width and general location as may be desired, but in any case by reason of its side terminals 22 and 23 coacts with the respective edges 15 and 14 to more nearly circumscribe the prong receiving space so as to enhance the frictional relation of the prong to the female contact, as will be evident from the disclosure of Fig. 5. It will be seen that the raised portion 21 of Fig. 4 can be created by a single die stamping operation and that it may take many forms, such as by merely being a tongue separated from the portion 19 on three sides instead of on two as shown, or it may comprise a plurality of spaced tongues or protuberances as by causing the rounded side portions 22 and 23 to be reentrant to form a pair of parallel spaced protuberances or the like (not shown).

As shown in Fig. 8 the molded base 24 having the slight taper illustrated, comprises a bottom face 25 and a smaller upper face 26. The upper face is provided with a plurality (illustratively three) large prong receiving apertures respectively 27, 28 and 30 which pass through a thin shelled wall 31 into the generally laterally extending through apertures 32, 33 and 34 each of which is of such size as to receive the contact making portions of the contact of Fig. 3 illustratively. The latter being inserted from the bottom are limited in their upward motion by the shoulder formed by the thin shelled upper wall 31. The through aperture 33 communicates with a smaller aperture 35, extending through the thin upper wall 31 in predeterminedly spaced relation to the larger opening 30. Similarly the through aperture 34 communicates with a smaller aperture 36. If desired the aperture 32 could also be provided with a smaller port or aperture, but in the particular device illustrated this is not necessary so that preferably this is left blind. To establish a third smaller aperture of a predetermined triangular series an individual through small bore or opening 37 is provided close to the large opening 28.

The lower surface of the lower portion of the molded base 24 is suitably apertured for lightness and economy of material and has a control-screw or rivet receiving bore or aperture 38 and the lower surface or base comprises an outer rim 40 with an inner recessed base surface 41 extending through the rim 40 in slots 42. The contacts such as those of Figs 3 or 5 or the like are inserted in the respective through apertures 32, 33 and 34, with the soldering tails or terminal members 10 extending outwardly through the slots 42 and each is held in place by a fibre plug or washer 43 engaging the recessface 41 and the lower surfaces of the tails 10 to make a tight completely closed bottom of the socket. The plug is held tightly in position either by a suitable screw or the like or by means of a rivet extending into the opening 38.

It is a feature of importance that the assembled socket be tightly closed at the bottom in order that the socket may be associated with the cells of a dry battery and anchored in place by suitable pitch or tar surrounding at least the bottom part of the socket.

In the use of the invention it will be assumed that as shown in Fig. 8 a form of plug-in device 45 is provided having the three enlarged contact making prongs 46, 47 and 48. As shown in Figs. 6 and 8 it will be apparent that the triangular disposition of the prongs and of the enlarged prong apertures 27, 28 and 30 is such that there is only one position of adjustment in which the respective prongs can enter the respective enlarged prong apertures in their pattern arrangement, so that the circuit-making is predetermined and as the prongs pass downwardly through the respective apertures they enter and are embraced by the enlarged ends 18 of the respective compound contacts as will be clear. Referring to Fig. 9 a secondary plug-in device 50 is shown having the three prong elements 51, 52 and 53, of which illustratively prong 53 is inert. It will be apparent that the secondary plug-in device can be associated with the socket with the prongs 51 and 52 in the respective apertures 35 and 36 for circuit making purposes while prong 53 enters the blind or insulated aperture 37 to complete the pattern. The prongs 51 and 52 engage the respective small ends 20 of the contacts in an embraced relation and it will be apparent that the contacts cannot yield more than an inappreciable amount between the dished fibre disk at the bottom and the shoulder formed by the thin upper wall 31.

I claim as my invention:

1. A socket for plug-in devices comprising a molded mounting support having at least one pair of spaced apertures in one face permitting the entry of a prong of a plug-in device in two laterally spaced parallel positions, the mounting support having at least one single recess in the other face and communicating with and common to said pair of face apertures and separated therefrom by a thin web of facing material forming an internal shoulder, a contact mounted on the support and having integral spaced curved arm portions curving toward each other from a common backing portion and forming a pair of prong-receiving channels having substantially parallel spaced axes and arranged to have sliding engagement in the recesses to abut the shoulder with the axes of the respective channels extending substantially normal to said first mentioned face and with the respective channels in substantial registration with the respective spaced apertures, said portions arranged to be engaged and to form electrical contact with prongs selectively inserted in either of said spaced apertures, and means preventing the contact from being pushed out of the recess.

2. A socket for plug-in devices comprising a molded mounting support having at least one pair of spaced apertures in one face permitting the entry of a prong of a plug-in device in two laterally spaced parallel positions, the mounting support having at least one single recess in the

other face and communicating with and common to said pair of face apertures and separated therefrom by a thin web of facing material forming an internal shoulder, a contact mounted on the support and having integral spaced curved arm portions curving toward each other from a common backing portion and forming a pair of prong-receiving channels having substantially parallel spaced axes and arranged to have sliding engagement in the recesses to abut the shoulder with the axes of the respective channels extending substantially normal to said first mentioned face and with the respective channels in substantial registration with the respective spaced apertures, said portions arranged to be engaged and to form electrical contact with prongs selectively inserted in either of said spaced apertures, said mounting support comprising a base, the said other face of which has an axial support and a concentric skirt portion longer than the support disposed respectively on opposite sides of the recess, and an insulating disc engaging the axial support and bridging between the skirt and support and underlying the contact to prevent the contact from being pushed out of the aperture, and means anchoring the disc and the axial support together.

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