

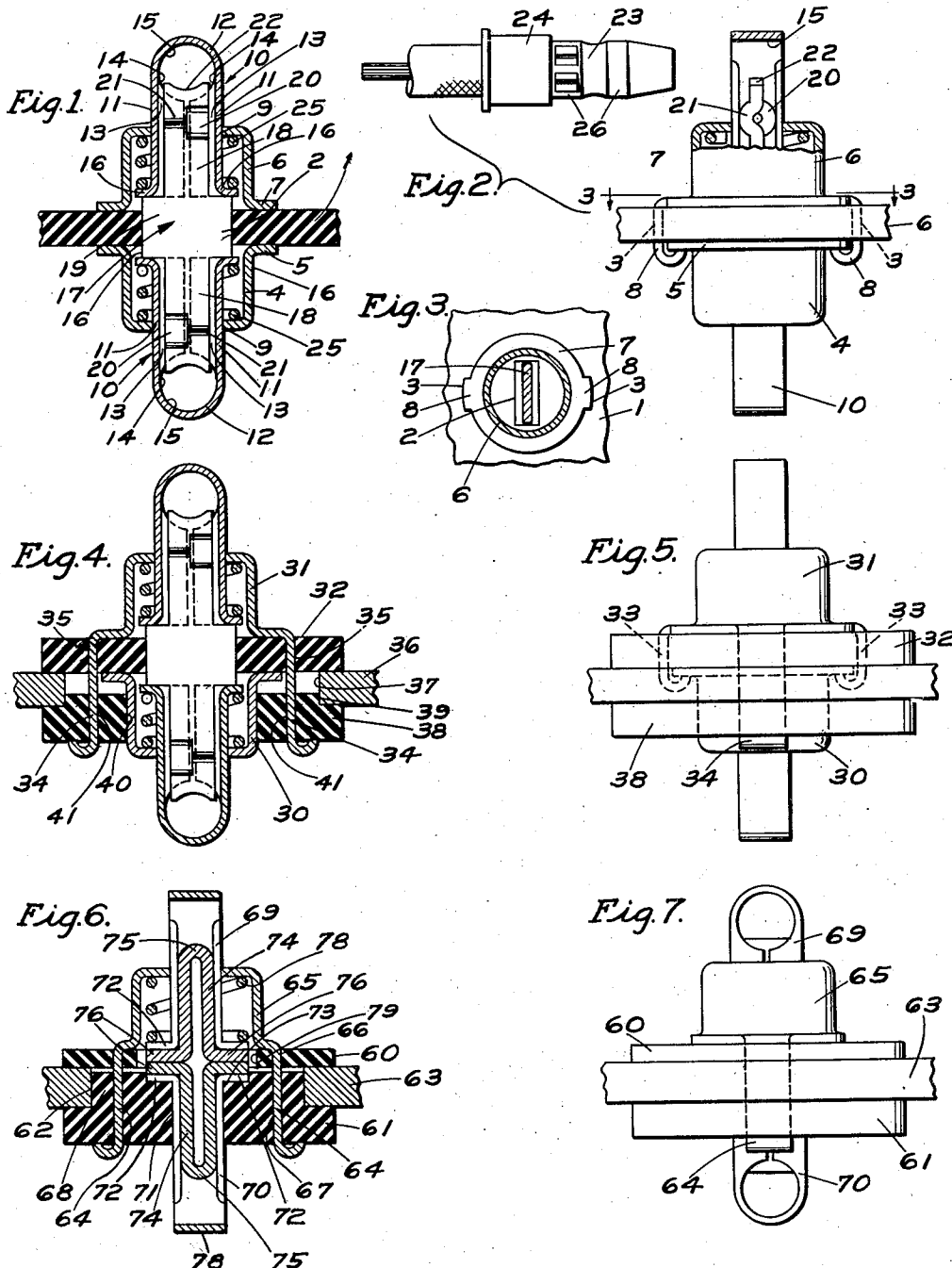
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ELECTRICAL CONNECTION MEANS

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ELECTRICAL CONNECTION MEANS

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This invention relates generally to electrical connection means, and more specifically has to do with means whereby to resiliently retain terminals of the snap type.

One object of the invention is to design and construct a unitary article that is adapted to be mounted on a support whereby a terminal may be plugged into the unit from either side of the support.

More specifically it is contemplated to provide a unit, which includes a plate of insulating material; a shell, carrying terminal receiving means on each side of the plate; insert means extending through the plate and arranged within and cooperating with said receiving means in a manner to retain terminals placed therein; and means for resiliently supporting said insert means and said terminal receiving means with respect to said plate.

Another object of the invention is to provide a unit of the character just referred to, in which one of the shells is provided with means whereby to connect together the parts constituting the unit to the insulating plate, and also means on said shell whereby to connect the unit with respect to a support.

A further object of the invention is to construct an electrical connection means which may be economically manufactured commercially, and one which is durable and efficient electrically and mechanically.

Many other objects of the invention herein shown and described will be apparent after considering the drawing annexed hereto.

Referring to the drawing, there is shown three embodiments of the invention.

Figure 1 is an enlarged upstanding view of the invention, showing parts thereof in section;

Figure 2 is a side view in elevation of Figure 1, partly in section, showing the manner whereby the parts are assembled to a support, and a terminal of a character that is preferably adapted to be inserted in the receiving means;

Figure 3 is a section, on a reduced scale, taken substantially on line 3—3 of Figure 2;

Figure 4 is an upstanding view, partly in section, of a modified form of the invention;

Figure 5 is a side view in elevation of the unit shown in Figure 4;

Figure 6 is an upstanding view in elevation of another modified form of the invention; and

Figure 7 is a side view of the arrangement shown in Figure 6.

Referring to the preferred embodiment of the invention disclosed in Figures 1 through 3, it in-

dicates a plate of insulating material preferably provided with an elongated rectangular slot 2, and an arcuate slot 3 on each side of the slot 2.

Numeral 4 indicates a cylindrical metal shell provided with an annular flange 5 at one extremity thereof, that engages the lower surface of the plate 1; and 6 is also a cylindrical shell which substantially corresponds in shape and size to the shell 4, and one extremity thereof is provided with an annular flange 7 abutting the upper surface of the plate 1, and with a pair of fingers 8, diametrically arranged, which project through the arcuate slots 3 in the plate, and are clinched inwardly over and upon the annular flange 5 of the shell 4 to thereby hold the parts assembled to the plate 1. The other extremity of each of the shells 4 and 6 is provided with a rectangular aperture 9 through which extends terminal receiving means generally designated 10.

Each of the terminal receiving means 10 is made of strip stock, formed to provide a tubular body consisting of a pair of parallel channels 11, joined together by a connecting loop 12. Each of the channels 11 consists of three portions, including the portions 13, and the upper extremity of these portions 13 is preferably of arcuate design as indicated at 14 in order to conform to the curvature of the connecting loop 12, to provide a cylindrical terminal receiving aperture 15, arranged transversely adjacent the outer extremity of each of the receiving means 10. The inner extremity of each of the channels 11 is provided with an outwardly extending flange 16.

As clearly shown, insert means generally designated 17, forms part of the combination, and this insert is provided with upper and lower extremities 18 which extend within the terminal receiving means 10, and intermediate said extremities and joining same is an enlargement 19 which projects through the rectangular aperture 2 in plate 1, and serves as an abutment for the flanges 16 adjacent the inner extremities of the means 10.

Each of the extremities 18 is provided with bosses 20 and 21, which are struck outwardly from the opposite sides of the insert, and these engage the portions 13 of the receiving means 10 in order to center the extremities within said means; and the end of each extremity is also provided with a concave seat 22, adapted to cooperate with the cove 23 in the terminal 24.

A coiled spring 25 encircles each of the terminal receiving means 10, and one end of each spring engages the outer extremity of each shell, and the other end engages the flanges 16 on the receiving means 10, and through the action of

these springs said flanges are forced into abutting relation with the enlargement 19 provided on the insert 17. By this arrangement, the springs 25 maintain the terminal receiving apertures 15 in a predetermined relation with respect to the outer ends of the extremities 18 of the insert; and when a terminal, such as 24, is inserted into one of the terminal receiving apertures 15, the terminal receiving means 10 will be moved outwardly against the action of the spring 20, and when the terminal is properly seated, the spring will force the cove 23 in the terminal against the seat 22 in the insert, the lands 26 on the terminal engaging the connecting loop 12. It is to be here noted that the enlargement 19 on the insert is of such a character that it maintains the terminal receiving means 10 in spaced apart relation, and that the length of each of the extremities 18 is such that seats 22 are arranged in a predetermined relation with respect to the terminal receiving apertures 15.

It is thus evident that a terminal may be inserted into one or both of the terminal receiving apertures 15; that the insert means 17 is common to both apertures; and that the springs not only maintain the parts in a predetermined relation, but function to resiliently support both of the terminal receiving means as well as the insert 17, and this is important since any accidental pull on a conductor to which a terminal is secured, will first move both of the terminal receiving means 10 and the insert, before releasing the terminal, if at all.

Referring to the modification of the invention disclosed in Figures 4 and 5, there is shown substantially the same arrangement as above shown and described, except that the parts are mounted on a plate of insulating material to constitute a unit which in turn may be permanently mounted to a support.

In this modification, the shells, terminal receiving means, insert, and springs are first assembled to a relatively small flat disc of insulating material. The lower and upper cylindrical shells, 30 and 31, as here shown, are preferably secured to a relatively small disc 32 of insulating material by providing continuations or fingers 33 on the shell 31, which are clinched inwardly and over and upon the annular flange provided adjacent the inner extremity of the shell 30, as clearly indicated in Figure 5. The shell 31 is also provided with a pair of elongated continuations or fingers 34, diametrically arranged between the fingers 33, which project through apertures 35 in the disc 32. Said fingers 34 provide means whereby the unit assembled to disc 32 may in turn be permanently secured to a metal support 36. The support 36 is preferably provided with a relatively large aperture 37, and as clearly shown, the disc 32 is arranged over said aperture in abutment with the upper surface of said support, and a disc 38 is arranged to engage the lower surface of the support 36, and in order to prevent any possible shifting of the unit, the washer 38 is provided with a reduced annular portion 39 which snugly fits within the aperture 37.

The insulating washer 38, as here shown, is preferably provided with a relatively large cylindrical aperture 40 through which the shell 30 extends, and also a pair of apertures 41 through which the fingers 34 of the shell 31 extend. These fingers 34 are clinched outwardly over and upon the lower surface of the washer 38, whereby to clamp and hold the unit in fixed relation with

respect to the support 36. Thus, it is evident that an improved electrical connection means is provided, which includes a pair of spaced apart means for resiliently retaining terminals, assembled to a plate of insulating material to constitute a unit, and that the unit may in turn be easily and quickly anchored to a metal support in such a manner that a terminal may be plugged into the unit from either or both sides of said support without permitting the current to pass through the support.

Referring to Figures 6 and 7 of the drawing, there is shown a further modification of the invention, and as herein shown, it will be evident that there are three important factors, which make this modification distinguishable from those above shown and described. More specifically, it is evident that the insert means is of a different character, that one of the cylindrical shells is omitted, and that only one coiled spring is employed whereby to obtain the desired function and result.

In this modification, 60 and 61 indicate a disc and a washer of insulating material, which are clamped over the aperture 62 in the support 63 by means of the offset fingers 64 provided on the shell 65. As clearly shown, the fingers 64 project through slots 66 and 67 in the disc 60 and washer 61, respectively, and through the aperture 62 in the plate 63; and in order to prevent lateral movement of the assembly with respect to the support 63, the washer 61 is provided with a reduced annular portion 68, which is adapted to snugly fit within the aperture 62 in said support.

The upper terminal receiving means 69, and the lower terminal receiving means 70 are of the same character as those above shown and described. The lower terminal receiving means 70 projects through a rectangular aperture 71 provided in the washer 61, and the flanges 72 on the terminal receiving means 70 cooperate with a recess 73 provided adjacent the upper extremity of the washer 61. Thus, one shell has been omitted, and, outward movement of said receiving means 70 is prevented.

As mentioned above, the insert means in this modification of the invention, is of a different character, and as shown, is comprised of two sheet metal members 74. Each of the insert members 74 is folded back upon itself to provide substantially two parallel spaced apart portions, one extremity being formed with a rounded detent portion 75, and the opposite extremity with outwardly extending flanges 76. Each of the insert members 74 is of such a character, that it is centered within each of the terminal receiving means, and the length of each is such that the detent portion 75 is arranged in a predetermined relation with respect to the terminal receiving apertures in the receiving means. It is also to be noted that the flanges 76 provided adjacent the inner extremity of each of the insert members engage each other, and provide abutments that are engaged by the flanges 72 on said receiving means. In lieu of providing two springs, a single coiled spring 78 surrounds the receiving means 69, and is so arranged that the inner end of the spring abuts the flanges 72 on the receiving means 69, and as a result, the flanges 72 and 76 are held in abutting relation, and the flanges 72 on the receiving means 70 are held in the recess 73 provided in the washer 61.

When a terminal is inserted in the terminal receiving aperture of the upper receiving means 69, the insert members 74 remain stationary, and

the receiving means moves outwardly against the action of the spring 78, and when the terminal is properly located, the cove therein is resiliently held against the detent portion 75 of the upper insert member 74. If a terminal is also inserted in the terminal receiving means 70, the means 70 will remain stationary, and both insert members 74 and the upper terminal receiving means 69 will be lifted upwardly against the action of the spring 78, and when the terminal is properly placed, the lower insert member 74, through the agency of the spring, will urge the detent portion 75 thereof into cooperation with the cove in the terminal, and force the lands on the terminal against the connecting loop 78. It will also be evident that a terminal placed in the terminal receiving means 69 will not be released when a terminal is inserted in the terminal receiving means 70, and in fact, two terminals will be held more firmly, than one by reason of the increased pressure exerted by further compressing the single spring 78.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without department from the spirit of the invention; and therefore, I do not wish to be understood as limiting myself to the exact forms, constructions, arrangements, and combination of parts, herein shown and described.

What I claim and desire to secure by Letters Patent is:

1. Electrical connection means including in combination; a pair of bodies having their inner extremities arranged in close proximity to each other; a terminal receiving aperture provided in the outer extremity of each body; a pair of detent means arranged in abutting relation with respect to each other and to the inner extremities of said bodies, and spacing the latter; and resilient means surrounding one of said bodies acting upon said bodies and said detent means whereby to resiliently support and maintain same in said abutting relation, and functioning to retain terminals placed in said terminal receiving apertures.

2. Electrical connection means including in combination, a plate of insulating material provided with an aperture, a shell secured to one side of said plate over said aperture, an aperture provided in said shell and a body projecting there-through, a washer of insulating material secured to the opposite side of said plate and provided with an aperture, another body of the same character as the first projecting through the aperture in said washer, a terminal receiving aperture provided in each body, a considerable distance apart from each other, a pair of detent means arranged in abutting relation with each other and with the inner extremities of said bodies and operatively related to said terminal receiving apertures, and a spring arranged in said shell acting to maintain the parts in a predetermined relation with respect to each other whereby terminals may be snapped into said terminal receiving apertures.

3. Electrical connection means including in combination, a support, a pair of tubular means carried by said support, each tubular means having at one extremity an aperture for receiving a terminal and transverse portions adjacent the other extremity, inflexible means slidably arranged substantially within the confines of said tubular means, a detent provided adjacent each extremity of said inflexible means and abutment

means provided on said inflexible means intermediate said detents, said abutment means being arranged between the transverse portions of said tubular means for normally maintaining said tubular means in spaced apart relation, and resilient means resiliently supporting said tubular means and said inflexible means upon said support and acting to hold said transverse portions in engagement with said abutment means to position said detents in said terminal receiving apertures whereby insertion of a terminal into either of said apertures will cause relative movement between at least one of said tubular means and said inflexible means.

4. Electrical connection means including in combination; a pair of bodies having their inner extremities arranged in close proximity to each other; a terminal receiving aperture provided in the outer extremity of each body; a pair of detent means arranged in abutting relation with respect to each other and to the inner extremities of said bodies, and spacing the latter; and resilient means acting upon said bodies and said detent means whereby to resiliently support and maintain same in said abutting relation, and functioning to retain terminals placed in said terminal receiving apertures.

5. Electrical connection means including in combination, a support, a pair of receptacle means carried by said support, each receptacle means having at one extremity an aperture for receiving a terminal and abutments adjacent the other extremity, inflexible means slidably arranged substantially within the confines of said receptacle means, a detent provided adjacent each extremity of said inflexible means and stop means provided on said inflexible means intermediate said detents, said stop means being arranged between the abutments of said receptacle means for normally maintaining said receptacle means in spaced apart relation, and resilient means resiliently supporting at least one of said receptacle means and said inflexible means upon said support and acting to hold said abutments in engagement with said stop means to position said detents in said terminal receiving apertures whereby insertion of a terminal into either of said apertures will cause relative movement between at least one of said receptacle means and said inflexible means.

6. Electrical connection means including in combination, a support, a shell carried by said support, a pair of receptacle means carried by said support, with one of said receptacle means extending through said shell, each receptacle means having at one extremity an aperture for receiving a terminal and abutments adjacent the other extremity, inflexible means slidably arranged substantially within the confines of said receptacle means, a detent provided adjacent each extremity of said inflexible means and stop means provided on said inflexible means intermediate said detents, said stop means being arranged between the abutments of said receptacle means for normally maintaining said receptacle means in spaced apart relation, and resilient means within said shell resiliently supporting at least one of said receptacle means and said inflexible means upon said support and acting to hold said abutments in engagement with said stop means to position said detents in said terminal receiving apertures whereby insertion of a terminal into either of said apertures will cause relative movement between at least one of said receptacle means and said inflexible means.

7. Electrical connection means including in combination; a pair of receptacles having their inner extremities arranged in close proximity to each other; a terminal receiving aperture provided in each receptacle; a pair of detent means arranged in abutting relation with respect to each other and to the inner extremities of said receptacles, and spacing the latter; and resilient

means surrounding at least one of said receptacles and acting upon said receptacles and said detent means whereby to resiliently support and maintain same in said abutting relation, and functioning to retain terminals placed in said terminal receiving apertures. 5

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