

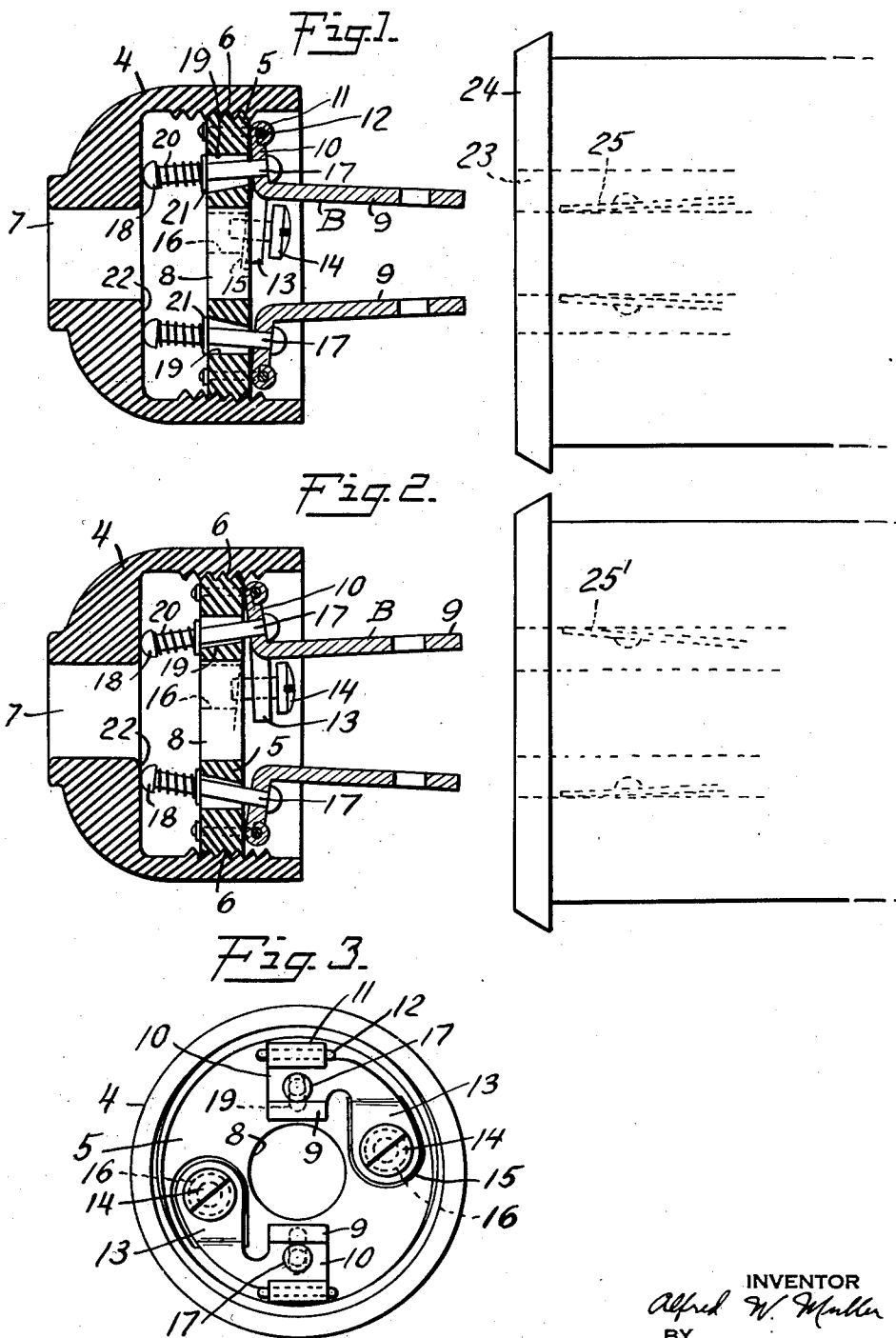
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ELECTRIC ATTACHMENT PLUG

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ELECTRIC ATTACHMENT PLUG

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10 Claims. (Cl. 173—361)

This invention relates to electric attachment plugs and more particularly concerns an improved plug construction incorporating means for obtaining a firm connection between the plug and the socket or other electrical fixture to which it is attached.

Attachment plugs of the push connection type for use in connecting current-conducting cords to wall or other socket fixtures are customarily provided with substantially parallel contact blades or prongs which respectively engage spring terminal conductors or clips disposed in openings in the socket or other plug receiving fixture. The socket clips frequently become bent, worn or otherwise displaced to such an extent that a satisfactory electrical contact between the plug contact blades and these clips cannot be obtained. Even though the electrical contact may be satisfactory, the displacement of the socket clips frequently weakens the frictional engagement with the plug blades to such an extent that the plug falls or is accidentally withdrawn from the socket.

In accordance with the present invention, it is proposed to provide an improved attachment plug of the push connection type incorporating an improved means for moving the contact blades into firm gripping engagement with the socket clips or terminals whereby a good electrical connection is insured and accidental removal of the plug from the socket is prevented.

In general, the above and other objects of the invention are carried out by providing a plug including a contact blade supporting member which is adjustably movable with respect to the cap or some other exposed part of the plug, and further providing means responsive to relative movement between the cap and the blade support for moving the contact blades laterally relative to each other into firm gripping relation with the contact clips of a socket. The blade moving means is preferably so constructed that opposite relative movements between the cap and blade support respectively result in movement of the socket clip engaging portions of the plug contact blades toward and away from each other. With this arrangement, the plug blades can be releasably anchored in firm gripping contact with socket clips which engage either the outer or the inner surfaces of the blades.

A threaded connection is preferably employed between the blade carrying member and the plug cap or other exposed operating part of the device so that the blades may be moved to their clip gripping or releasing positions by merely turning

the cap, the blade support being held stationary by the engagement of the contact blades in the socket openings.

The invention will be best understood by reference to the accompanying drawing in which one embodiment thereof has been illustrated. In the drawing;

Figure 1 is a sectional view of an attachment plug embodying the invention together with a diagrammatic representation of one conventional form of socket fixture with which the improved plug may be used;

Figure 2 is a sectional view, similar to Figure 1, showing the improved plug with its blades in a different adjusted position and illustrating a different form of conventional socket fixture; and Figure 3 is an inner end view of the plug shown in Figures 1 and 2.

Referring to the drawing, the plug there illustrated comprising a cap portion 4 and a blade supporting member 5 disposed within and adjustably movable with respect to the cap. The cap 4 and blade support 5 are preferably formed of a suitable electrical insulating material. To facilitate the adjustment of the improved plug, it is generally preferred to provide for relative rotary movement between the cap and the blade support and to this end, a threaded engagement 6 is provided between the inner wall of the cap 4 and the peripheral edge of the support 5, as shown.

The cap 4 is provided with the usual central opening 7 for the reception of an electrical cord, and a cooperating central cord opening 8 is provided in the blade support 5.

Two blade members B, of identical construction, are carried by the blade support 5, it being understood that more than two such members may be provided if required by the nature of the circuits passing through the plug. Each blade member B is formed of electrically conductive metal and includes a contact blade 9 and an angularly disposed base member 10 terminating in a loop 11 or other means providing an opening for the reception of a pivot rod. Each blade member B is pivotally connected to the support 5 by a rod 12 passing through the loop 11 and having its ends riveted or otherwise suitably fixed in openings through the support 5, as shown. An off-set terminal portion 13 is formed integral with or suitably secured to the base portion 10, and a terminal screw 14 threadedly engages an opening therein in the usual manner. The screw carrying end of the terminal portion 13 may be disposed at an angle

to the base portion 10, if desired, and a recess 15 may be provided in the face of the support 5 for the reception of this terminal end, as shown. An opening 16 is provided in the support 5 for the reception of the end of each terminal screw 14.

An operating rod 17 is expanded, riveted or otherwise fixed to the base portion 10 of each blade member B and extends rearwardly through an opening 19 in the support 5, terminating in a rounded head 18. The opening 19 preferably diverges toward the inner or rearward surface of the support 6 to permit lateral movement of the rod 17 as the blade member moves about its pivotal support. A coil spring 20 is disposed about each operating rod 17 and is compressed between the head 18 thereof and a washer 21 surrounding the rod and bearing against the inner face of the support 5. The rounded ends 20 18 of the operating rods 17 bear against a shoulder 22 formed within the end of the cap 4, as shown in Figures 1 and 2.

With the described construction, it will be apparent that relative movement between the cap 25 4 and the blade support 5 causes lateral movement of the contact blades 9 relative to each other. Thus, as the cap 4 is rotated in a direction to move rearwardly with respect to the support 5, the springs 20 draw the rods 17 inwardly through the openings 19 and thus turn the blade members B about the pivot rods 12 in a direction to move the blades 9 toward each other. Forward movement of the cap 4 on the support 5 pushes the rods 17 forward and causes lateral separation of the blades 9, as shown in Figure 2.

The described construction permits a firm mechanical and electrical connection between the plug and the socket or other cooperating device 40 even though the terminal clips of the socket are worn, bent or otherwise displaced. In using the plug, the cap 4 is first turned to such a position relative to the support 5 that the contact blades 9 are substantially parallel. The blades 9 are then inserted into the blade openings 23 of a conventional socket or outlet fixture 24, in which openings the terminal clips 25 are disposed. After thus inserting the blades 9, the cap 4 is moved relative to the blade support 5 in such a manner 50 that the blades 9 are moved laterally into firm gripping engagement with the terminal clips 25.

If, as illustrated in Figure 1, the terminal clips 25 are of the type which engage the opposite inner surfaces of the blades 9, the cap 4 is unscrewed after insertion of the blades, and the blades 9 are moved together by the action of the springs 20 into tightly gripping engagement with the clips 25. When the terminal clips are of the type which engage the outer surfaces of the contact blades 9, as shown at 25' in Figure 2, the cap 4 is screwed down on the support 5 after insertion of the blades, and the blades are thus spread laterally into firm engagement with the clips. The improved plug may be readily released from the cooperating socket or outlet fixture 65 by turning the cap 4 in such a direction as to move the blades 9 laterally away from the cooperating terminal clips.

Although the invention has been described in connection with a single embodiment thereof, it should be understood that the construction may vary considerably from that disclosed without departing from the scope of the invention as defined in the appended claims. Thus, for example, the improved blade moving means may be

applied to one only of a pair of plug contact blades, and various changes may be made in the mechanism employed to translate relative movement between the plug cap and blade support to the movable contact blades.

I claim:

1. In an attachment plug, a blade support, a pair of angular contact blades, each of said blades having one angular portion thereof lying adjacent to said blade support, and the other angular portion extending outwardly therefrom and adapted to make contact with a cooperating member, the angular portion of each of said blades lying adjacent the blade support being pivotally connected thereto adjacent its free end, a cap having a base and a flange at least partially enclosing said blade support, cooperating means on the inside of said cap and the outside of said blade support for permitting movement of said cap with respect to said blade support, and means actuable by the base of said cap and responsive to relative movement between said cap and said blade support for adjustably moving said blades relative to each other about said pivotal connecting means.

2. In an attachment plug, a disk-like blade support, a pair of spaced contact blades movably mounted on said support and extending outwardly therefrom for insertion into an electrical socket, a cap rotatably mounted on the exterior of said blade support and at least partially enclosing the same, and means responsive to relative movement between said cap and said support for moving said blades into different relative positions with respect to one another.

3. In an attachment plug, a pair of spaced contact blades, an element supporting said blades, said blades extending outwardly from said supporting element for insertion into an electrical socket, a cap having a base and a flange which at least partially encloses said blade-supporting element, the inside of said flange having a threaded connection with the outside of said blade-supporting element to permit relative movement between said cap and said blade-supporting element, and means actuated by the base of said cap and responsive to relative movement between said cap and said blade-supporting element for moving said blades into differently spaced positions with respect to one another.

4. In an attachment plug, a pair of spaced contact blades, an element supporting said blades, said blades extending outwardly from said supporting element for insertion into an electrical socket, a cap having a base and a flange which at least partially encloses said blade-supporting element, the flange of said cap being rotatably connected to said blade-supporting element to permit relative movement between said cap and said blade-supporting element, and means actuated by the base of said cap and responsive to relative movement between said cap and said blade-supporting element for moving said blades into differently spaced positions with respect to one another.

5. In an attachment plug, a cap having a base and a flange, a blade support within said cap and extending transversely thereacross, cooperating means on the exterior of said blade support and the inside of the flange of the cap for rotatably connecting said blade support and said cap, a pair of spaced contact blades on said blade support, said blades extending outwardly from said blade support for insertion into an electrical socket, and means actuable by the base of said

cap and responsive to relative movement between said cap and said blade support for moving said blades into different positions with respect to one another.

5 6. In an attachment plug, a cap having a base and a flange, a blade support within said cap and extending transversely thereacross, cooperating means on the exterior of said blade support and the inside of the flange of the cap for rotat-
10 ably connecting said blade support and said cap, a pair of spaced contact blades on said blade support, and means actuatable by the base of said cap extending through said blade support and responsive to relative movement between
15 said cap and said blade support for moving said blades into different positions with respect to one another.

7. In an attachment plug, a pair of spaced elongated contact blades, a blade support, means
20 pivotally connecting said blades to said support adjacent one end of said blades, a cap having a base and a flange at least partially enclosing, and threadedly connected to said blade support to
25 render the cap movable with respect to said blade support, operating means connected to said blades and engaging the base of said cap for transmitting relative movement between said cap and said support to said blades, and spring means
30 connected to said operating means for maintaining said operating means in engagement with said cap.

8. In an attachment plug, a pair of spaced elongated contact blades, a blade support, means
35 pivotally connecting said blades to said support adjacent one end of said blades, a cap having a base and a flange at least partially enclosing, and threadedly connected to said blade support to

render the cap movable with respect to said blade support, operating means connected to said blades and extending through said support into engagement with the internal surface of the base
5 of said cap for moving said blades about said pivotal connecting means upon movement of said cap relative to said support, and spring means interposed between said support and said operating means for maintaining said operating
10 means in engagement with the base of said cap.

9. In an attachment plug, an exteriorly-threaded, disc-like blade support, a pair of spaced contact blades movably mounted on said support and extending outwardly therefrom for inser-
15 tion into an electrical socket, a cap at least partially enclosing said blade support and threaded onto the exterior threads of said blade support, and means responsive to relative movement be-
20 tween said cap and said support for moving said blades into different relative positions with respect to each other.

10. In an attachment plug, an exteriorly-threaded, disc-like blade support, a pair of spaced contact blades movably mounted on said support and extending outwardly therefrom for inser-
25 tion into an electrical socket, a cap at least partially enclosing said blade support and threaded onto the exterior threads of said blade support, and means responsive to relative movement be-
30 tween said cap and said support for moving said blades into different relative positions with respect to each other, said cap having a central opening through which an electrical cord may
35 be passed to make electrical connections with said blades.

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