

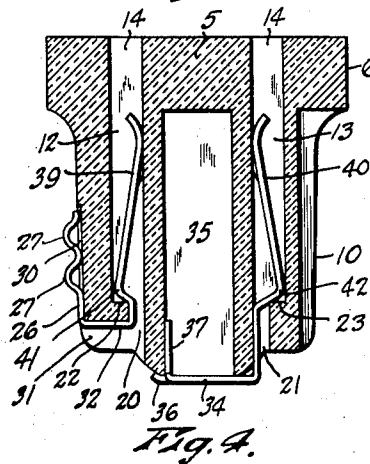
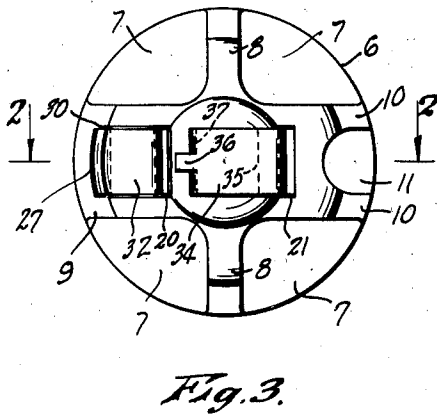
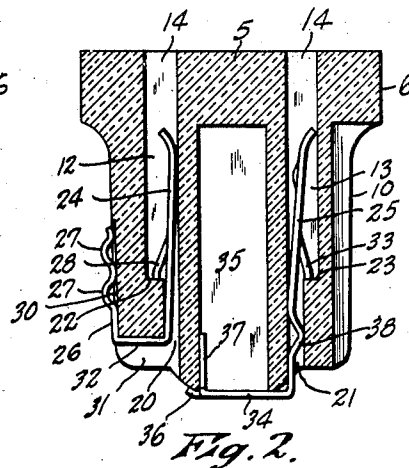
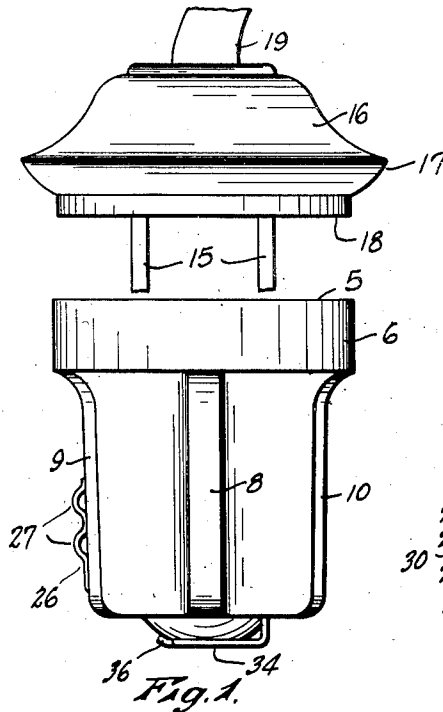
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SEPARABLE ATTACHMENT PLUG

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SEPARABLE ATTACHMENT PLUG

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This invention relates to an attachment plug for connecting electrical devices to a lamp or similar socket. It has for an object to provide a plug of this character which is of extremely simple construction and involves a minimum number of parts, and which has improved means for mounting the contacts in the insulating body member which do not require any screws or rivets or the molding of any inserts in the body.

It is also an object of the invention to provide a construction and arrangement in which the contacts are mounted in the body by merely forcing them into proper position and they will be retained thereby by the resilient action of the contacts cooperating with shoulders in the body.

With the foregoing and other objects in view, the invention consists in certain novel features of construction, combinations and arrangements of parts as will be more fully disclosed in connection with the accompanying drawing. In this drawing,

Fig. 1 is a side elevation of the plug and a cap for use therewith.

Fig. 2 is a longitudinal section substantially on line 2—2 of Fig. 3 but showing the contacts in side elevation.

Fig. 3 is an end elevation looking toward the bottom of Fig. 1, and

Fig. 4 is a longitudinal section similar to Fig. 2 but showing a slightly different arrangement of the means for securing the contacts in the body, the contacts being shown in side elevation.

The plug illustrated comprises a body member 5 of insulating material. This may be any suitable type of material but is preferably a molded phenolic condensation product, such as bakelite or similar material. This body has a flange 6 at its outer end, the surface of which may be knurled or ribbed to facilitate screwing it into or removing it from the socket. The portion of the body which is inserted in the socket is preferably provided with longitudinal recesses 7 to make the body lighter in weight and reduce the amount of material required. These recesses provide ribs 8, 9 and 10 extending longitudinally of the body with their outer

edges curved substantially in the arc of a circle, so as to fit into a socket. The rib 10 may also have a longitudinal recess 11 to still further reduce the amount of material required. The body has a pair of spaced longitudinal passages 12 and 13 extending there-through, these passages being located in the ribs 9, 10, and these passages open at their opposite ends through the opposite ends of the body. The openings 14 in the outer end of the body form entrance slots for the contact blades 15 of any suitable type of attachment plug cap 16. The cap 16 illustrated is preferably made of the same material as the body and has a circumferential rib 17 spaced somewhat from the inner end 18 of the cap so that when the cap is in position there is a space provided between the rib and the end wall of the plug, or between the rib and the surface of the wall if inserted in a flush receptacle, to provide space for insertion of the thumb and fingers to provide a sufficient grip for easy withdrawal of the plug from the socket or receptacle, it being understood, of course, that the contacts 15 are electrically connected to the flexible leads 19 from the attachment to be operated.

The inner ends of the passages 12 and 13 are somewhat narrow than the main portion of these passages, as shown at 20 and 21 respectively, to provide in one wall of each of the passages a shoulder 22 and 23 spaced inwardly somewhat from the inner end of the body. Mounted in the passage 12 is a spring contact 24 and in the passage 13 is a spring contact 25 to engage the blade contacts 15 when they are inserted in the slots 14 and form electrical connection therewith in the usual manner. These contacts are made of resilient metal and may be formed from flat sheet metal. The inner end of the contact 24 has an extension passing out the inner end 20 of the passage 12 and is folded over against the outer side of the body and the rib 9, as indicated at 26, in Fig. 2. This portion is provided with transverse ribs 27 spaced to correspond with the threads of the screw shell contact of a lamp or other socket. This folded over portion may have these ribs for its entire length or they may be provided only ad-

jacent the free end thereof, as indicated in the drawing. If provided only adjacent its free end a less number of rotations is required for the plug in screwing it into the socket. The body of the contact 24 is cut and the metal forced laterally to form a spring lug 28, the free end of which forms a shoulder to engage the shoulder 22 and retain the contact in the body. In mounting this contact all that is necessary is to insert its inner end in the entrance 20 of the passage 12 and force it into the position of Fig. 2. The spring lug 28 will yield inwardly until its free end passes the shoulder 22 when the free end of the lug will spring outwardly to engage this shoulder and effectively retain the contact in proper position in the body. The outer side surface of the rib 9 is preferably provided with a longitudinal recess or groove 30 to receive the outer threaded portion 26 of the contact to prevent its being forced laterally out of position by engagement with the screw shell contact of the socket when the plug is rotated relatively to the socket. The end of the body may also be provided with a radially extending recess 31 to receive the connecting portion 32 of the contact to assist in retaining the contact in position in the body and also to space it from the inner end thereof.

The other contact 25 also has a spring lug 33 which is cut from the contact and forced laterally therefrom to provide a shoulder at its free end to engage the shoulder 23 and retain this contact in the passage 13. This contact has an extension passing through the inlet 21 which is folded over against the end of the plug to provide a central contact 34 to engage the central contact in a lamp or other socket. To still further reduce the amount of material required in the body it is provided with a longitudinal pocket 35 extending from the inner end thereof and this portion 34 of the contact 25 extends over the open end of this pocket. There is, therefore, no solid material back of this contact and it may, therefore, yield inwardly providing a central yieldable spring contact. The free end, however, is supported by a lug 36 cut and extending outwardly therefrom to rest on the end of the body on the opposite side of the pocket 35 from the entrance 21. To still further assist in retaining the contact in position the free end 37 thereof is bent inwardly substantially parallel with the body of the contact 25 and extends into the rectangular pocket 35 and engages the opposite wall thereof. This preferably is substantially the same width as the pocket 35 and effectively holds the contact against turning movements in the body and to more effectively hold this contact in position. This contact may be crimped, as shown at 28, in the portion in the passage 21 so as to engage the opposite walls thereof. This contact 25 is also made of resilient sheet metal and is formed to shape

before inserting in the body. It is mounted by merely inserting its free end in the entrance passage 21 and forcing it inwardly with the opposite end 37 inserted into the open end of the pocket 35. During this action the lug 33 yields inwardly until the free end thereof passes the shoulder 23 when the free end of this lug will spring outwardly to engage the shoulder and effectively retain the contact in the body.

In Fig. 4 I have shown a slightly different construction although the operation of mounting the contacts is the same. In this construction I have shown the shoulders 22 and 23 somewhat nearer the inner end of the body. This is not necessary as they may be located in the same relative positions, as shown in Fig. 2. The contacts 39 and 40, however, corresponding to the contacts 24 and 25 of the first form, instead of being cut to provide the spring lugs 28 and 33 are merely transversely crimped or bent laterally at 41 and 42 respectively to provide shoulders which engage the shoulders 22 and 23 to retain these contacts in the body. These contacts are mounted the same way as the contacts in the first form by merely inserting the free ends in the entrance passages 20 and 21 and forcing them inwardly as far as they will go. The contacts yield or straighten out somewhat to permit the crimped portions 41 and 42 to pass through the narrower portions 21 and 22 of the longitudinal passages until they pass by the shoulders 22 and 23 when they spring outwardly, as shown in Fig. 4, and cooperate with these shoulders to effectively retain the contacts in the body.

When the plug is screwed into a lamp or similar socket the edges of the ribs 10 will engage the edges of the screw threads in the screw shell contact in the socket and retain the contact ribs 27 in engagement with the threads of this contact to form the proper electrical connection and also retain the plug in the socket, it being understood that the ribs 27 are portions of a thread corresponding with the thread of the socket so that the plug will screw into the socket in the usual manner. The body may be substantially straight but is preferably somewhat tapered so as to be somewhat smaller at its inner end to facilitate its insertion into the socket and also to insure proper engagement of the contacts when the plug is screwed into the socket. It will be apparent that the plug is extremely simple in construction involving only three elements, the insulating body and the two contacts. These two contacts are formed to shape and are mounted in the body by merely forcing them into position from the inner end of the plug body, and they are retained by coaction of the shoulders on the contacts and in the longitudinal passages in the body. There are, therefore, no rivets or screws to be applied in assembling the contacts, and

there are no inserts in this plug to be molded in the body, thus greatly reducing the cost of manufacture and assembling. The contacts are, however, effectively retained in proper position in the body.

Having thus set forth the nature of my invention, what I claim is:

1. In an attachment plug, a body member of insulating material having spaced longitudinal passages therethrough forming entrance slots for the blade contacts of an attachment plug cap in its outer end, a pair of spring contacts in said passages, one of said contacts having an extension projecting through the inner end of its passage where it is folded over to provide a laterally extending portion engaging the lower edge of the plug and a portion substantially parallel to the main portion of the contact and in line therewith and disposed against the outer wall of the plug, said portion against the outer wall of the plug provided with ribs to screw into a screw shell contact in a socket, the other spring contact having an extension folded over the inner end of the body to form a central contact, and said spring contacts and the walls of the passages being provided with cooperating shoulders to retain the contacts in the passages.

2. In an attachment plug, a body member of insulating material having spaced passages extending longitudinally therethrough, one wall of each passage having a shoulder spaced inwardly from the inner end of the body, said plug having a radially extending groove leading from the inner end of one of said passages to the outer wall of the plug spring contacts in said passages extending from the inner ends thereof to provide a central and a side contact to engage the contacts of a socket, said side contact including a portion extending through said groove whereby the contact is held against movement relative to the plug and said spring contacts having shoulders cooperating with the shoulders in the passages to retain the contacts in said passage.

3. In an attachment plug, a body member of insulating material having a central pocket extending longitudinally inward from its inner end, said body being also provided with longitudinal passages extending there-through on opposite sides of said pocket, a spring contact in one of said passages having an extension projecting from the inner end of the body and folded over on the outer wall thereof, a second spring contact in the other passage having an extension over the open end of the pocket to form a central spring contact, and cooperating shoulders on the first spring contacts and the walls of the passages to retain the contacts in said passages.

4. In an attachment plug, a body member of insulating material comprising a grip-

ping flange and a cross-shaped portion projecting at right angles therefrom, forming longitudinal ribs with their outer edges on a circle of a diameter substantially the same as the internal diameter of the socket in which the plug is to be used, an opposing pair of ribs of said cross-shaped portion having a pair of spaced passages extending longitudinally in the body and opening through the opposite ends thereof, resilient metal contacts in said passages having integral extensions at the inner end of the body providing side and central contacts to engage corresponding contacts in a socket, said contacts being of strips of metal of substantially uniform width, and cooperating shoulders on the contacts and the body forming the means of retaining the contacts in the body.

5. In an attachment plug, a body member of insulating material having spaced passages extending longitudinally therethrough, said passages at their inner ends being restricted to provide shoulders spaced inwardly from the inner end of the body, a pair of contacts of strips of resilient metal in said passages capable of being inserted one in each passage from the inner end thereof, each contact having a laterally extending shoulder intermediate its ends, each contact being capable of yielding when inserted in the restricted portion of its passage to permit its shoulder to pass over that of the passage and engage the same to retain the contact in the passage, and said contacts having integral lateral extensions at their inner ends forming a central and a side contact to engage corresponding contacts in a socket, said extensions forming means to limit the distance the contacts can be inserted in the passages.

6. In an attachment plug, a body member of insulating material having a pair of spaced longitudinal passages therein and opening through the opposite ends thereof, said body also having a pocket extending longitudinally inward from its inner end between the passages, a spring contact in one passage having an extension at its inner end on the outside of the body to form a side contact, and a spring contact in the other passage having an extension over the entrance to said pocket to provide a central yieldable contact.

7. In an attachment plug, a body member of insulating material having a gripping flange at one end and longitudinal recesses extending inwardly therefrom providing spaced longitudinal ribs, said body being also provided with a pair of spaced longitudinally extending passages opening through the outer end to form entrance slots for contact blades, a receptacle contact in one of said passages having a threaded extension on one of said ribs to engage one side of the threaded shell in a socket, the other of said spaced ribs adapted to engage said shell to retain said side contact in engagement therewith,

and a second receptacle contact in the other passage and having an extension at the inner end of the body providing a central contact.

8. In an attachment plug, a body member
5 of insulating material having a pair of spaced longitudinal passages therein and opening through the opposite ends thereof, said body also having a pocket extending longitudinally inward from its inner end between the pas-
10 sages, a spring contact in one passage having an extension at its inner end on the outside of the body to form a side contact, and a spring contact in the other passage having an extension over the entrance to said pocket
15 to provide a central yieldable contact, said latter extension having a portion projecting into the pocket and also having a lug resting on the end of the body on the opposite side of the pocket from the second spring contact.
20 In testimony whereof I affix my signature.

HARVEY HUBBELL, Jr.

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