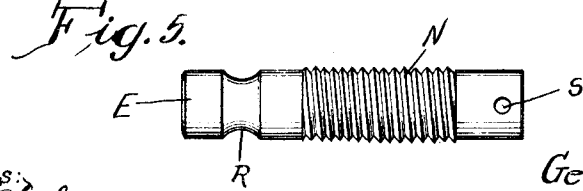
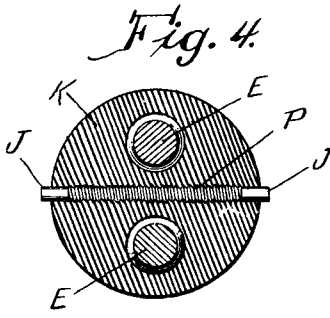
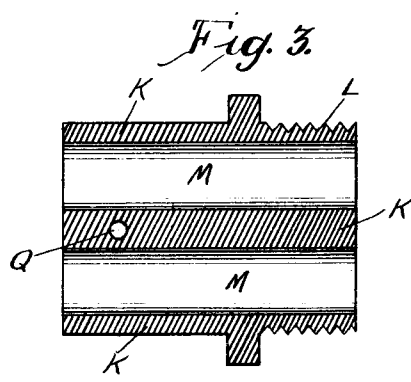
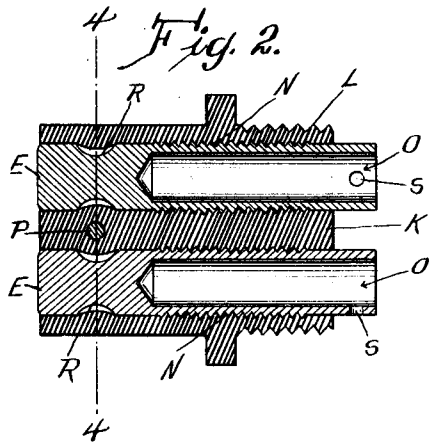
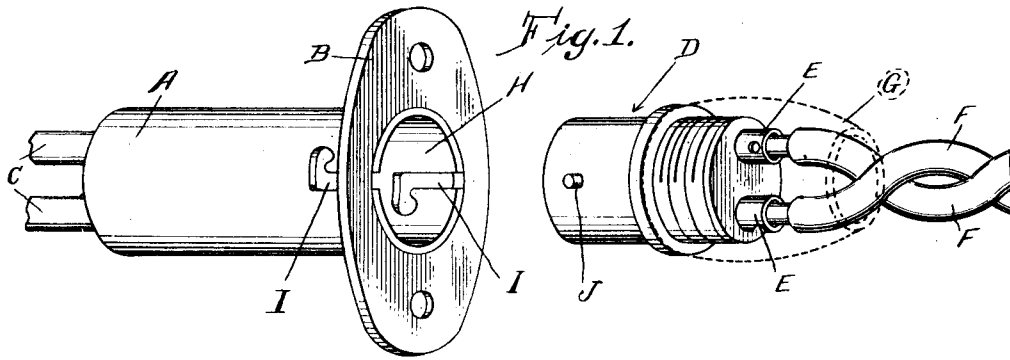


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ATTACHMENT PLUG.  
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1,026,269.

Patented May 14, 1912.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORGE C. KNAUFF, OF CHICAGO, ILLINOIS.

## ATTACHMENT-PLUG.

1,026,269.

Specification of Letters Patent.

Patented May 14, 1912.

Application filed November 20, 1911. Serial No. 661,375.

*To all whom it may concern:*

Be it known that I, GEORGE C. KNAUFF, a citizen of the United States, residing at the city of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Attachment-Plugs, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to carriers or supports for wire terminals, such as the attachment plugs for connecting and disconnecting a circuit from a socket or receptacle. In constructing devices of this class, it has heretofore been customary to fasten the wire-carrying terminals in place with screws inserted transversely in the terminals and to depend on a tight driving fit for holding the anchoring element in its proper position. I have found that the use of such transverse screws weakens the body of the plug and sometimes leads to a grounding between the head of the screw and the metal casing of the socket into which the plug is inserted, particularly in the case of miniature plugs, such as are used in connection with automobile lighting circuits. I have also found that even where the retaining prongs or pins were tightly wedged in place originally, the continued jarring of the vehicle on which such devices are used, would loosen these pins, so that they would either prevent the plugs from being inserted; or from being withdrawn, if already in the corresponding sockets.

The object of my invention is to provide a simple construction whereby the contact parts, as well as the anchoring element by which the whole plug is locked in the socket or receptacle, are firmly held in the body of the plug without the need of screws or other auxiliary fastenings. I attain this object by the construction shown in the accompanying drawing, in which—

Figure 1. is a perspective view showing an attachment plug embodying my invention, together with the receptacle as commonly used with such attachment plugs. Fig. 2. is a vertical section through the finished plug. Fig. 3. is a similar section through the insulating body of the plug before the metal parts have been united with the same. Fig. 4. is a section along the lines 4—4 in Fig. 2.

Fig. 5. is an elevation of one of the terminals of the plug.

In the drawing, A is a receptacle or wall-socket having a flange B for securing the same to a wall or dash board, this receptacle being connected to a circuit by wires C C.

D is a plug carrying terminals E E for wires F F leading to a lamp or other current consuming device. The cover G, screwed to one end of this plug D, prevents contact between outside objects and the terminals E E as exposed at their junctures with the wires. This cover also forms a handle by which the plug may be grasped while being inserted into the opening H of the receptacle A, or while being withdrawn from the same. The casing of the receptacle A has slots I I adapted to guide and retain prongs J J projecting from the sides of the body of the plug D, so as to lock this plug in the position in which the terminals E E contact with terminals of the wires C C.

The body of the plug D is made of an insulating cylinder K, composed of some material which may be simultaneously softened and expanded and which will contract in hardening. For this purpose I preferably use genuine hard rubber which can be thus softened and expanded by being immersed in steam or in water heated nearly to its boiling point, and which will contract and harden when withdrawn from the influence of the steam or hot water. This body D preferably has one end threaded at L to fit threads of the cover G. Perforations M M are bored through the body K parallel to its axis, these perforations being equal in diameter to the cylindrical ends of the terminals E E. Each terminal E has enlargements, preferably in the form of a raised thread N on its middle portion and a bore O at one end for receiving the tip of a wire. The plug K also has a transverse perforation Q bored through it, this being of the same diameter as the ends J J of the retaining element P, which element P preferably likewise has a raised thread upon it for the greater portion of its length. Each terminal E has a groove R reducing the diameter at the point which will come opposite the perforation Q when the parts are assembled. Both the terminal E and the retaining element P are preferably made of brass, but may be of any material not affect-

ed by the influences used for softening and expanding the body K.

In assembling the parts, I soak the body K in hot water at a temperature of about 5 200 degrees F., thereby softening and expanding the same. I then insert the terminals E E into the perforations M M by a rotary and gradually advancing motion just as if they were screws, in doing which the 10 threads on E E form corresponding threads in the softened walls of the perforations M M. The method which I use for inserting the insertible parts is described more fully in my copending application for a 15 process of uniting materials, Serial #683058, filed March 11, 1912. Then I similarly screw the retaining element P into the perforation Q, letting it form a corresponding thread in the softened walls of Q. On 20 allowing the assembled parts to cool, the body K contracts and the portions adjoining the inserted metal parts E E and P, shrink tightly against same. Owing to the large amount of surface offered by the 25 threads, it is practically impossible afterward to move the inserted parts, either by steady jarring, or by any twisting or pressure likely to occur in practice. Moreover, the grooves in the terminals E allow the 30 body portion intervening between these terminals along the line 4-4 to expand into the same, thus preserving a thicker wall of insulating material between these terminals and the pin P, than would be possible if 35 there were no grooves in the surface of the terminals. If the wires F F are to be soldered to the terminals E E, I preferably provide perforations S S in the hollow ends of the same, through which the surplus sol- 40 der can flow freely.

What I claim as new and desire to cover by Letters Patent is:

1. An electric contact-carrier including an insulating body made of a material adapted 45 to be simultaneously softened and expanded, and to contract while hardening; a current-carrier made of a material unaffected by the influence required to soften and expand the aforesaid body; a perforation in the said 50 body for receiving the said current-carrier; and enlargements on the said current-carrier which would prevent the same from being slipped through the said perforation while the said body is in its normal condi- 55 tion; the said enlargements being adapted to repress the walls of the perforation when inserted in the said perforation when the body has been softened and expanded, and to engage with the said walls when the body 60 contracts in hardening, whereby the said current-carrier is united in fixed relation with the said insulating body.

2. An electric contact-carrier including an insulating body made of a material adapted 65 to be simultaneously softened and expanded,

and to contract while hardening; an anchoring element made of a material unaffected by the influence required to soften and expand the aforesaid body; a perforation in the said body for receiving the said anchoring 70 element; and enlargements on the said anchoring element which would prevent the same from being slipped through the said perforation while the said body is in its normal condition; the said enlargements being 75 adapted to repress the walls of the perforation when inserted in the said perforation when the body has been softened and expanded, and to engage with the said walls when the body contracts in hardening, 80 whereby the said anchoring element is united in fixed relation with the said insulating body.

3. In an attachment plug, an insulating body made of a material adapted to be si- 85 multaneously softened and expanded, and to contract while hardening; wire terminals made of material unaffected by the influence used to soften and expand the aforesaid body; perforations in the said body for re- 90 ceiving the said wire-terminals; and an anchoring member inserted through the said insulating body transversely to the said wire-terminals; the said wire terminals being reduced in section at the portions adja- 95 cent to the said anchoring member; the said anchoring member being inserted in the transverse perforation after the said wire terminals have been inserted and while the material of the insulating body is in the 100 softened and expanded state; the said anchoring member having enlargements upon it adapted to expand the walls of the perforation in the softened body inserted in the same, whereby the material adjoining the 105 said anchoring member is expanded into the recesses formed by the adjacent reduction in size of the wire terminals.

4. In a device of the class described, a body made of a material adapted to expand 110 when subjected to a softening influence, and to contract and harden when removed from the said softening influence; in combination with current carrying members made of material unaffected by the said softening in- 115 fluence; perforations in the said body for receiving the said members; the said members having raised threads, whereby they are adapted to impress threads into the material of the said body member when in- 120 serted in the said body while the same is in the softened state.

5. In a device of the class described, an insulating body made of a material adapted 125 to expand when subjected to a softening influence, and to contract and harden when removed from the said softening influence; contact members carried by the said body; a casing which the said body is adapted to enter; a slot in the said casing leading to a 130

seat; and an anchoring element projecting from the said body; the said anchoring element being adapted to be guided by the said body to the said seat for anchoring the said  
 5 body to the said casing; the said anchoring element being rigidly united to the said body by the pressure due to the contraction of the said body after the said element has been inserted in the same while the said body  
 10 was in the softened and expanded state.

6. In a device of the class described, an insulating body made of a material adapted to expand when subjected to a softening influence, and to contract and harden when  
 15 removed from the said softening influence; a perforation in the said body; and a mem-

ber made of material not affected by the said softening influence and adapted to be inserted in the said perforation while the said body is in the softened and expanded  
 20 condition; the said member being rigidly united to the said body by the pressure due to the contraction of the said body after the softening influence has been removed.

In witness whereof, I have hereunto set  
 my hand, this 14th day of November A. D.  
 1911, in the presence of two subscribing witnesses.

GEORGE C. KNAUFF:

Witnesses:

ALBERT SCHEIBLE,  
 CHARLES O. SHERVEY.