B. J. GRIGSBY.

ATTACHMENT PLUG.

APPLICATION FILED JAN. 12, 1918.

1,398,228.

Patented Nov. 29, 1921.

2 SHEETS—SHEET 1.

Fig. 1

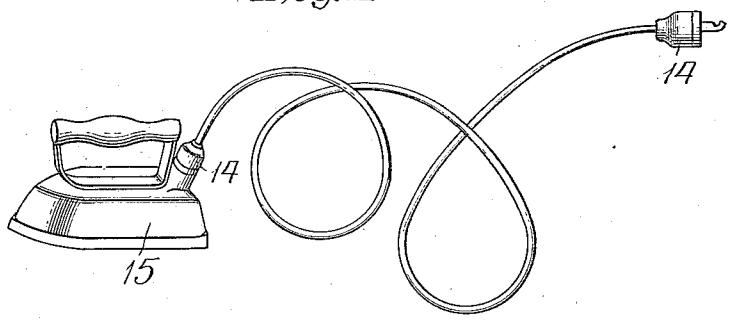


Fig. 2

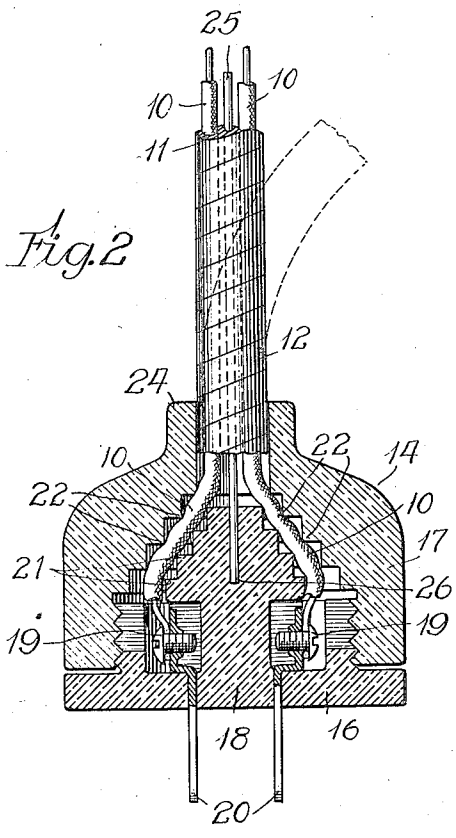
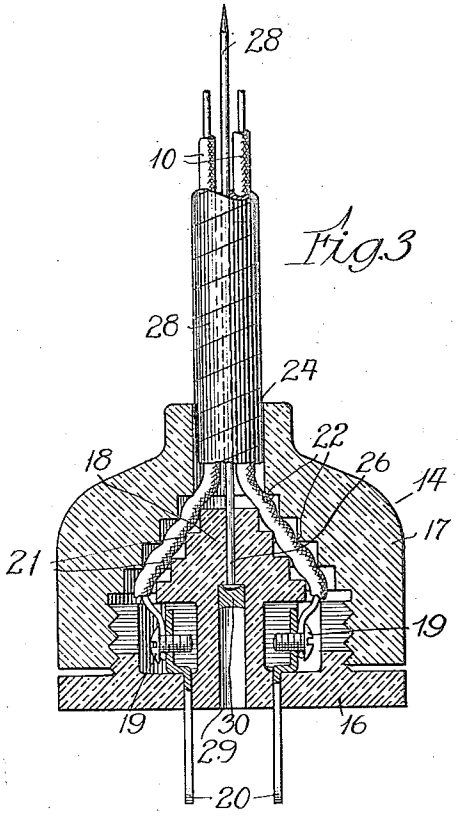


Fig. 3



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2 SHEETS—SHEET 2.

Fig. 4

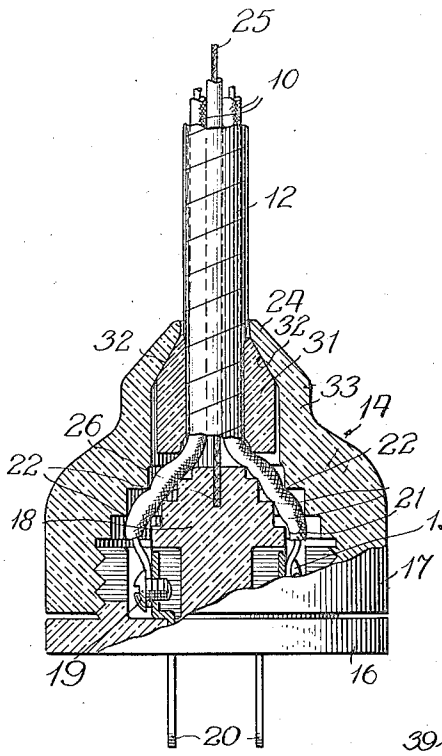


Fig. 5

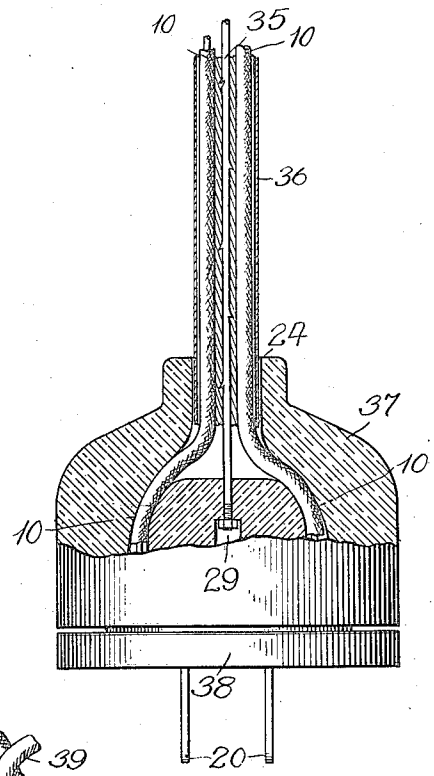
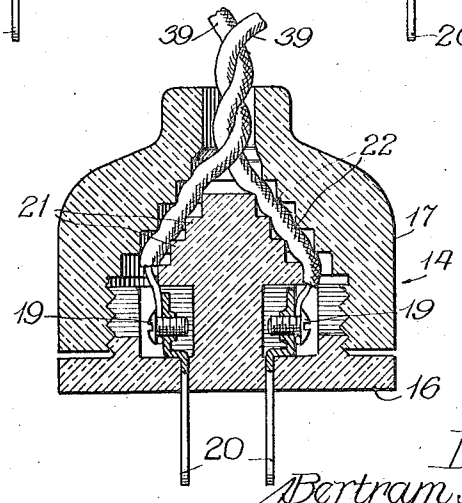


Fig. 6



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UNITED STATES PATENT OFFICE.

BERTRAM J. GRIGSBY, OF CHICAGO, ILLINOIS.

ATTACHMENT-PLUG.

1,398,228. Specification of Letters Patent. Patented Nov. 29, 1921.

Application filed January 12, 1918. Serial No. 211,530.

To all whom it may concern:

Be it known that I, BERTRAM J. GRIGSBY, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Attachment-Plugs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to plug attachments for electrical devices, and the object of the invention is to provide a reliable conductor cord gripping means for connecting the conductor cord to the plug in such a way as to avoid objectionable kinking of the conductor cord at its point of attachment to the plug, and also to avoid transmitting stress, due to a pull on the cord, to the terminals or binding screws of the plug. Another object of the invention is to avoid breaking the cord or its envelop by bending it sharply over the plug at the point where the cord emerges from said plug.

The invention consists in the combination and arrangement shown in the drawings and described in the specification, and is pointed out in the appended claims.

As shown in the drawings:

Figure 1 illustrates the use of my conductor and terminal means with an ordinary electrically heated iron.

Fig. 2 is a sectional view of one type of terminal plug, showing the manner of connecting the cord thereto.

Figs. 3, 4 and 5 are similar sections showing modifications.

Fig. 6 is a like section, showing the adaptation of the invention to another form of conductor cord.

The conductor cord which is illustrated in Figs. 2 to 5, inclusive, is of that type known as reinforced portable cords, embracing two insulated conductors 10—10 which are embedded in an insulating body 11, the whole being preferably wrapped by a tape or braid 12.

14 designates a plug which may be of any approved type and by which the cord may be connected to a portable electrical device, as a sad iron 15. Said plug, as shown in Figs. 2, 3, 4 and 6 inclusive, comprises a base 16 and a cap portion 17, the base 16 having an upstanding central member 18 which extends into the cap and between which member 18 and the wall of the cap the separate conductors 10 of the cord are gripped. Said base is screw threaded to the cap or body portion 17 so as to move the gripping surfaces of the upstanding part 18 toward and from other gripping surfaces on the interior wall of the cap or body 17. The insulating body 11 of the cord is stripped from the conductors within the receptacle or plug 14, and the pair of wires are stripped at their terminals for connection with the usual binder screws 19 which are threaded into the base. Said screws serve also as a means to connect the terminal pins 20 to the base of the well known two-pin attachment plug construction. It will be understood, however, that the plug may have any other desired form of terminal connection.

In accordance with one phase of my invention the upstanding member 18 of the base and the inner wall of the cap 17 are provided with a series of vertically spaced gripping salients 21, 22, respectively. The salients on one of the members preferably lie opposite to the spaces between the salients of the other member so that said salients are out of line or staggered relatively to each other. The said salients preferably extend continuously around the members bearing them.

As herein shown, the salients are formed by a number of stepped shoulders on said members, but may be of other form. When the base 16 is threaded into the cap to an extent to effect a gripping action on the separate conductors 10 said salients are spaced apart a distance less than the diameters of the conductors, so as to pinch into the insulating covers of the conductors. This construction results in a plurality of gripping points spaced along the lengths of the conductors and, by reason of the number of spaced gripping points or areas, it becomes possible to effect a reliable fastening of the conductors to the plug without exerting such acute pinching action against any point as to injure the wire. In constructions where a single gripping area or point is relied upon it has been found that the pressure, and resulting acute pinching of the conductor, is such as to place an objectionable kink or bend in the wire; and when said wire is subjected to frequent pulling stresses this portion of the wire soon breaks. With the construction described, it becomes

possible, not only to increase the effectiveness of the attachment of the cord to the plug or receptacle, but this is accomplished without in any way injuring the wire. Desirably, and in practice the salients closest adjacent to the binding screws 19 are more closely spaced than those near the neck of the outlet, so that the firmest binding stress on the conductors is that nearest the binding screws.

Another phase of the invention resides in reinforcing the cord at the plugs in such a way as to prevent it sharply bending over the edge 24 of the plug, where the cord emerges from the plug, and thus avoiding the tendency of breaking the cord due to such sharp bending when a pulling stress is exerted on the cord at an angle to the axis of the plug.

This latter phase of the invention contemplates the use of a reinforcing medium (Figs. 2, 3, 4 and 5) of some flexibility and resiliency as a metal wire. It may be a round wire, as shown in Fig. 2, or a flat, twisted wire, as shown in Fig. 4. This reinforcing medium lies between the conductors 10 and may be embedded in the cord during the formation of the latter. The reinforcing medium extends well into the plug or receptacle 14 and the upstanding socket 26 to receive the end of the wire, when the constructions shown in Figs. 2 and 4 are followed whereby the wire is anchored to the plug. It will be obvious that the presence of the wire or other reinforcing medium 25 in the cord allows the cord to take a gradual curve over the margin 24, as shown in dotted lines in Fig. 2, and that it will avoid sharp bending of the cord about the margin of the plug or receptacle when a pulling stress is applied to the cord in a direction at an angle to the axis of said plug.

In the construction shown in Fig. 3 the reinforcing wire or rod 28 takes the form of a pin, which is inserted into the cord after the latter is formed. In order to readily insert this pin into the completed cord, a soft core may be molded in the cord in the place occupied by the wire 25, in the construction shown in Figs. 1 and 4, this core being soft enough to permit the wire or pin to be inserted in place. In the construction shown in Figs. 3 and 5 the base 16 is provided with a downwardly opening axial recess 29 through which the pin or wire 28 may be inserted. Said pin or wire is headed and a spot 30 of wax, solder or like material in said recess holds the headed end of the wire or pin in place.

In the construction shown in Fig. 4 the plug is modified so as to include the members of a split or two part, coned gripping sleeve 31, the conical ends of which coact with internal coned or tapered surfaces 32 of the extended neck 33 of the plug. The purpose of the separable gripping sleeve 31 is to bind the tape or braid 12 against the cord so as to avoid stripping of the braid therefrom.

In Fig. 5 the reinforcing wire 35, which prevents sharp bending of the cord 36, is intended to extend throughout the cord length and is adapted to be headed at both plugs, as by a nut threaded to the end of the wire, so as to be utilized to transmit pulling stress on the cord to the plug, and thereby avoid transmitting to the binding screws stresses due to pulls exerted on the cord. In this construction, therefore, the salients may be omitted from the cap 37 and base 38. Moreover, the wire 35 may be barbed, as shown, to effect a more reliable union between the wire and cord envelop.

In Fig. 6 is illustrated the application of my improved cord fastening device to an ordinary two conductor twisted cord. In this construction the gripping salients 21, 22, between which the conductors 39 of the cord are gripped may have the same form as in the construction shown in Figs. 2, 3 and 4, and the parts, therefore, bear like reference characters.

It will be understood that the invention herein disclosed may be adapted in other specific embodiments, structurally differing from those herein shown, and that the invention is not, therefore, limited to the structures shown, except as such structures are hereinafter made the subject of specific claims and as imposed by the prior art.

I claim as my invention:

1. Attachment plugs for electrical devices comprising a terminal receptacle embracing two members of insulating material between which the conductors of the cord are adapted to be confined, said members being provided with opposing gripping salients spaced longitudinally of said cord, and the salients of the two members being formed on respective external and internal tapered portions thereof, with means to force said members toward each other and against said conductors.

2. Attachment plugs for electrical devices comprising a terminal receptacle embracing two members of insulating material between which the conductors of the cord are adapted to be confined, said members being provided with opposing gripping salients spaced longitudinally of said cord, with means to force said members together on the cord, said salients being of variable graduated distances apart.

3. Attachment plugs for electrical devices comprising a terminal receptacle embracing two members between which the conductors of the cord are adapted to be confined, said members being provided with a series of gripping salients spaced longitudinally of said conductors, with means to force one of

said members toward the other, the salients of one member being staggered or offset with respect to the salients of the other member.

4. Attachment plugs for electrical devices comprising a plug embracing a cap and a base threaded thereto and having an upstanding member extending into the cap, said upstanding member and wall of the cap being provided with a series of longitudinally spaced conductor gripping salients.

5. Attachment plugs for electrical devices comprising a terminal receptacle embracing two members between which the conductors of the cord are adapted to be confined, said members being provided with a series of gripping salients spaced longitudinally of said conductors, with means to force one of said members toward the other, binder elements for the conductors, and the gripping salients nearest adjacent to said binder elements spaced more closely than the other gripping salients.

6. Attachment plugs for electrical devices comprising, in combination with a conductor cord, a terminal receptacle embracing two members between which the conductors of the cord are confined, said members being provided with a series of gripping salients spaced longitudinally of said conductors, with means to force one of said members toward the other, said cord being provided with a central reinforcing medium to avoid sharp bending of the cord about the edge of the receptacle.

7. Attachment plugs for electrical devices comprising, in combination with a conductor cord, a terminal receptacle embracing two members between which the conductors of the cord are confined, said members being provided with a series of gripping salients spaced longitudinally of said conductors, with means to force one of said members toward the other, said cord comprising a plurality of conductors embedded in a body of pliable insulation, and a reinforcing medium extending centrally through said body.

8. In combination with a conductor cord, and a terminal receptacle comprising two members between which the cords of the conductor are confined, of a reinforcing member embedded in the cord at said receptacle and extending beyond the receptacle, and means to anchor said reinforcing member to said receptacle.

9. Attachment plugs for electrical devices comprising two members between which the cords of the conductor are adapted to be confined, said members each having a series of axially spaced salients to directly engage the conductors with the salients of one member offset relatively to those of the other member.

10. Attachment plugs for electrical devices comprising two members between which the cords of the conductor are adapted to be confined, each member having a plurality of axially spaced salients to directly engage the conductors, the said salients being formed on gradually enlarging parts of the members.

11. Attachment plugs for electrical devices comprising two members between which the cords of the conductor are adapted to be confined, each member having a series of axially spaced salients to directly engage the conductors, the said salients being of different diameters along the series.

In testimony whereof I claim the foregoing as my invention, I hereunto append my signature in the presence of two witnesses at Chicago, Illinois, this 22nd day of December, 1917.

BERTRAM J. GRIGSBY.

Witnesses:
WILLIAM W. HALL,
MARGARET D. ROBB.