

Sept. 22, 1931.

J. S. COLDWELL

1,824,657

PLUG CAP FOR SEPARABLE ATTACHMENT PLUGS

Filed April 22, 1927

Fig. 1

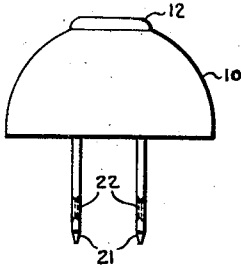


Fig. 2

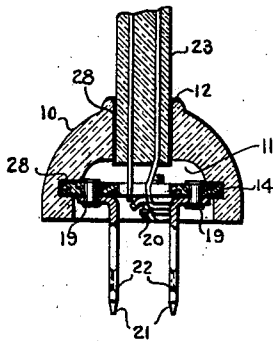


Fig. 3

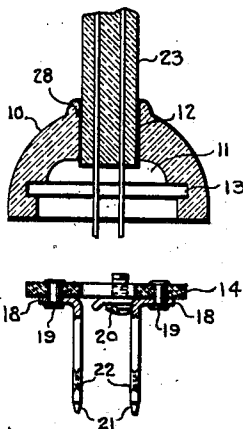


Fig. 4

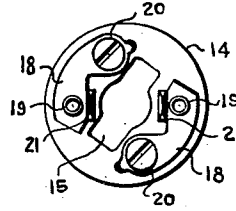


Fig. 5

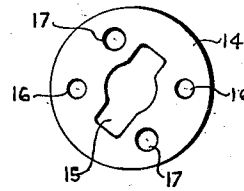
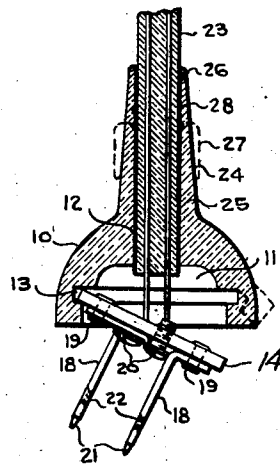


Fig. 6



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TO CUTLER-HAMMER, INC., A CORPORATION OF DELAWARE

PLUG CAP FOR SEPARABLE ATTACHMENT PLUGS

Application filed April 22, 1927. Serial No. 185,703.

This invention relates to improvements in plug caps for separable attachment plugs.

An object of the invention is to provide a contact carrying plug cap of improved and simplified construction.

Another object is to provide a plug cap of the aforementioned character which is capable of withstanding extremely rough usage.

Another object is to provide a plug cap which is particularly adapted for use in conjunction with flexible armored or water-proofed conductor cords.

Another and more specific object is to provide an attachment plug cap which may be preformed of a suitable flexible and resilient material such as soft rubber and thereafter permanently secured to the conductor cord, as by cementing or the like, to provide an improved strain relief connection therebetween.

Another object is to provide a plug cap of the aforementioned character embodying a relatively rigid skeleton base for supporting the plug jacks.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate certain embodiments of the invention which will now be described, it being understood that various changes may be made in the details of construction and arrangement of the parts within the scope of the appended claims.

In the drawings, Figure 1 is a side elevational view of a plug cap constructed in accordance with my invention.

Fig. 2 is a vertical sectional view of the plug cap shown in Fig. 1, and showing the flexible conductor cord secured thereto.

Fig. 3 is a view similar to Fig. 2, but with the jack and terminal supporting skeleton base or disk separated from the cap for purposes of illustration.

Figs. 4 and 5 are plan views of the jack and terminal supporting skeleton base or disk, respectively with and without the jacks and terminals secured thereto; and

Fig. 6 illustrates a modified form of plug cap.

Referring first to Figs. 1 to 5, the numeral 10 designates a relatively thick-walled shell member which preferably comprises relative-

ly soft vulcanized rubber, or a similar flexible and elastic insulating material. Member 10 may be molded in any suitable manner to provide the substantially hemispherical contour, as shown; whereas the exterior thereof may be of any other desired shape. Cap 10 is provided with an interior recess or cavity 11, and the same is likewise provided with a central opening 12 to permit insertion of the flexible conductor cord, as hereinafter more fully described. Said cap is further provided with an internal annular groove 13 adapted to receive an insulating skeleton base or disk 14.

Disk 14 is preferably formed of relatively tough and substantially rigid material such as fiber reinforced "bakelite", and as best illustrated in Figs. 4 and 5 said disk is provided with a substantially elliptical central opening or perforation 15 and pairs of diametrically spaced openings 16 and 17.

Terminal plates 18 are arranged on opposite sides of the opening 15, said plates being permanently secured to disk 14 by means of suitable eyelets or rivets 19 which penetrate the openings 16. Each of said terminal plates is provided with a binding screw 20, the shanks of which register freely with the openings 17. Integrally connected with the terminal plates 18 and extending at right angles therefrom are contact jacks 21 of usual form; said jacks being preferably provided with perforations 22 adjacent the respective ends thereof for cooperation with the contacts of a plug receptacle (not shown).

The disk 14 with the jacks and terminals secured thereto may be assembled with respect to member 10 by first inserting one side of the former into the groove 13 in the latter, as best illustrated in Fig. 6. The lower edge of member 10 is then spread outwardly as shown in dotted lines in Fig. 6 until the disk 14 is entirely positioned within the groove 13, whereupon the member 10 assumes its normal shape to hold said disk against relative longitudinal displacement. In practice the fit of disk 14 within groove 13 is sufficiently tight to prevent relative rotation of said parts under all conditions, although if desired the engaging surfaces of

said parts may be permanently united by application of a suitable rubber cement or like adhesive.

Assuming that it is desired to employ the plug cap in conjunction with the usual type of cord conductors, the latter would be freely insertable through the opening 12 in member 10 and through the opening 15 in disk 14, so that the bared ends thereof may be readily secured to the respective terminal plates by means of the binding screws 20. As aforeindicated, however, the plug cap is particularly adapted for use in conjunction with a waterproof or rubber coated conductor cord of the type shown at 23 in Figs. 2, 3 and at 23' in Fig. 6.

The opening 12 will be of a size to provide a relatively close fit with the cord conductor 23, whereas the engaging surfaces of the cord and cap may be partly or entirely coated either after or before assembly thereof with rubber cement or other suitable adhesive. A positive strain relief between the plug cap and cord is thus provided, whereas the connection between the cap and cord is also rendered watertight or moisture-proof. With this arrangement the cord 23 likewise serves as a handle for manipulating the plug cap.

The modification shown in Fig. 6 is in most respects exactly like that shown in the other figures, but in this form the cap 10¹ is provided with a relatively long hollow projection or nipple 24 the annular wall 25 of which gradually decreases in thickness toward the end 26 thereof. The portion of cord 23¹ to be engaged by the annular wall of opening 12 may be coated with rubber cement or other suitable adhesive prior to assembly of the cord and cap, or said parts may be assembled as shown in Fig. 6 and the relatively thin-walled portion 26 of the projection 24 then rolled backwardly or reflexed upon itself, as illustrated in dotted lines at 27, to permit application of the rubber cement or other adhesive coating. The relatively long projection 24 and the tapered form thereof provides a suitable hand grip for facilitating insertion or withdrawal of the cap with respect to a receptacle, while at the same time insuring against a sharp or angular bend in the cord at the region of connection thereof with the cap. The adhesive coating is shown of exaggerated thickness at 28 in the several figures.

By the arrangement aforedescribed the cap with the contact carrying disk assembled therein may be supplied as a separate article to be attached to a suitable conductor cord by the user, or the cap may be permanently attached at the factory to a suitable length of conductor cord.

While I have shown the skeleton base or disk 14 as of circular form, it will be understood that if desired the same might be made of elliptical, square or other polygonal con-

tour, in which case the periphery of groove 13 would preferably be made of corresponding shape.

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

1. In an attachment plug cap the combination with a cap body formed of relatively soft rubber and having a relatively shallow central cavity and a conductor passage leading to said cavity, of a relatively thin but relatively rigid part arranged within and spanning said cavity in said cap body to form a strut for said body and to be gripped by the latter, and contact blades carried by said relatively rigid part.

2. In an attachment plug cap, the combination with a cap body formed of relatively soft rubber and having an open central recess with a surrounding wall to seat against a complementary plug part, of a relatively thin but relatively rigid part arranged within and spanning said recess in said cap body to form a strut for said body and to be gripped thereby, said surrounding wall of said recess having a supporting ledge for said relatively rigid part to resist withdrawal of the latter, and contact blades carried by said rigid part.

3. In an attachment plug cap, the combination with a cap body formed of relatively soft rubber and having a conductor passage and an open central recess with a surrounding wall to seat against a complementary plug part, said surrounding wall having a communication with said recess an annular groove, of a relatively thin but relatively rigid part spanning said recess in said cap body and projecting into said annular groove in said surrounding wall to be gripped by the latter, and contact blades carried by said rigid part.

4. A separable attachment plug cap comprising a molded soft rubber member having an internal cavity, said member having an internal annular groove extending outwardly beyond said cavity, a substantially rigid insulating plate located within said groove and cemented to the walls of the latter, said member and said plate having openings registering with each other, a rubber covered conductor cord extending into the opening in said member and adapted to closely fit the same, and a coating of rubber cement or similar adhesive interposed between the engaging surfaces of said cord and said member to provide a strain relief connection therebetween.

5. A device of the character described, comprising a molded hollow body member of relatively soft and resilient insulating material, said member having an internal annular groove, a substantially rigid contact carrying disk of insulating material located within said groove and supported by the walls thereof, and a relatively long hollow projection integral with said body member.

6. A device of the character described com-

prising a molded hollow body member of relatively soft and resilient insulating material, said member having an internal annular groove, a substantially rigid contact carrying disk of insulating material located within said groove and supported by the walls thereof, and a relatively long hollow projection integral with said body member, the walls of said projection being of gradually decreasing thickness toward the outer extremity thereof.

7. In a device of the character described, the combination with a hollow molded body member of soft rubber, said body member having an internal groove spaced from the lower edge thereof, of a substantially rigid insulating disk or plate to be forcibly inserted in said groove by distortion of said body member, contacts and terminals carried by said disk, said body member and said disk having registering openings, a projection integral with said body member and having an opening registering with said first mentioned openings, the walls of said projection being of gradually decreasing thickness toward the outer end thereof, and a rubber covered cord conductor adapted to be inserted through the opening in said projection and cemented thereto.

8. In an attachment plug cap, the combination with a hollow bell-shaped body formed of relatively soft rubber, a contact carrying skeleton base formed of a thin plate of relatively hard insulating material, said body having an internal horizontal groove into which said base is forcibly insertable to lock said parts against relative longitudinal movement, means interposed between the peripheral edge of said base and the walls of said groove to positively lock said parts against relative rotary movement, and a rubber covered conductor cord penetrating said body through an opening in the latter and cemented to the walls of said opening.

9. An unbreakable plug cap of the character described, comprising a separately molded hollow body member of relatively soft and resilient insulating material, said body member having a peripheral groove in the inner wall thereof and spaced from the lower edge thereof, a substantially rigid insulating skeleton base or disk to be forcibly inserted in said groove by temporary distortion of said body member whereby said disk and body member are held against relative longitudinal movement, means for positively holding said disk and body member against relative rotary movement, combined contact and terminal members rigidly secured to said disk on the outer surface of the latter, said body member and said disk having registering openings, a relatively long tubular projection integral with said body member and having its bore registering with said first mentioned open-

ings, the walls of said tubular projection being of gradually decreasing thickness toward the outer end thereof, and a rubber covered cord conductor inserted in the opening in said projection and cemented to the walls of said opening whereby said projection serves as a flexible handle for said body member and as a strain relief for said cord conductor.

In witness whereof, I have hereunto subscribed my name.

JOHN S. COLDWELL.

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CERTIFICATE OF CORRECTION.**Patent No. 1,824,657.****Granted September 22, 1931, to****JOHN S. COLDWELL.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 98, claim 3, for the article "a" read in, and line 99, for "grove" read groove; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of December, A. D. 1931.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.