June 17, 1924. 1,498,146

R. B. BENJAMIN

ATTACHMENT PLUG AND CAP

Filed May 19, 1919 2 Sheets-Sheet 1

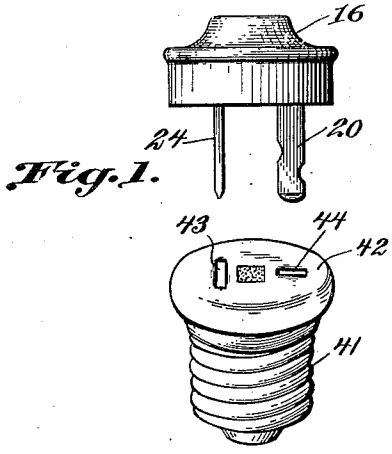


Fig. 1.

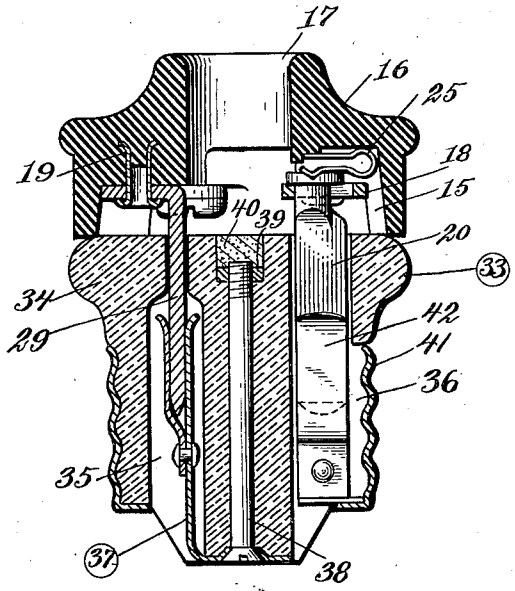


Fig. 2.

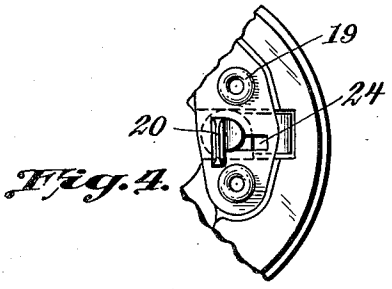


Fig. 4.

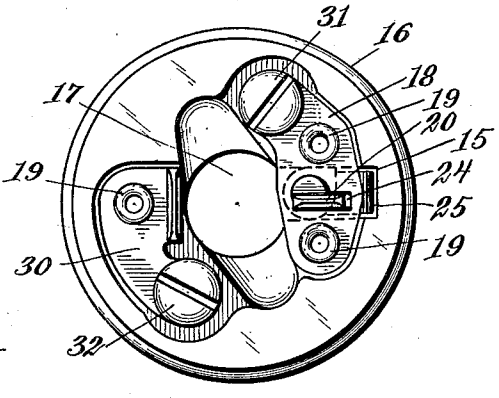


Fig. 3.

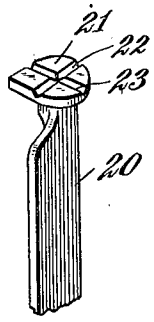


Fig. 6.

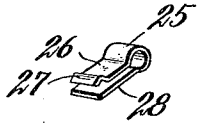


Fig. 5.

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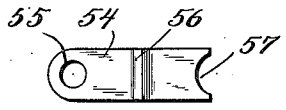


Fig. 9.

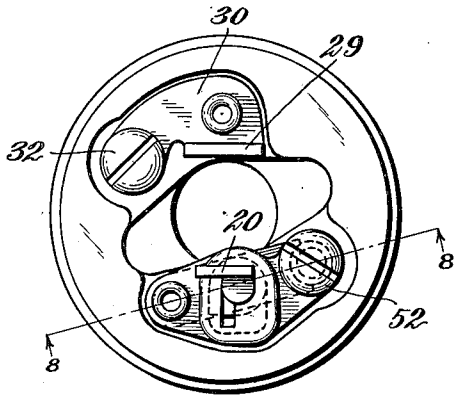


Fig. 7.

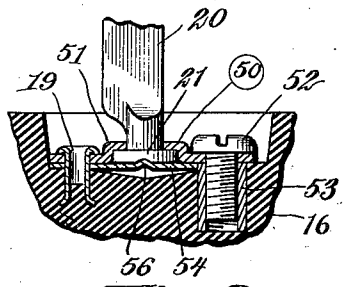


Fig. 8.

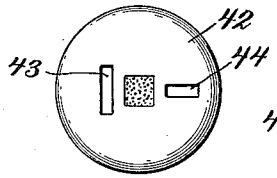


Fig. 13.

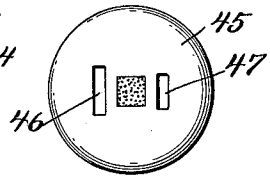


Fig. 14.

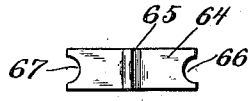


Fig. 12.

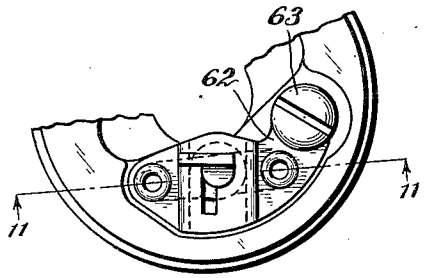


Fig. 10.

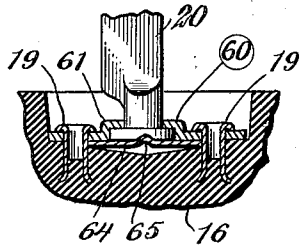


Fig. 11.

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UNITED STATES PATENT OFFICE.

REUBEN B. BENJAMIN, OF CHICAGO, ILLINOIS, ASSIGNOR TO BENJAMIN ELECTRIC MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ATTACHMENT PLUG AND CAP.

Application filed May 19, 1919. Serial No. 298,239.

To all whom it may concern:

Be it known that I, REUBEN B. BENJAMIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Attachment Plugs and Caps, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to attachment plugs and caps and more particularly to an improved form of polarized attachment plug and to a cap provided with an improved form of adjustable contact blade.

One of the objects of this invention resides in the production of an improved polarized attachment plug in which the apertures in the face of the plug for admitting the contact blades of the cap are positioned at right angles.

Another object of this invention resides in a cap fitted with improved means for swiveling or moving one of the contact blades.

A further object of the invention consists in the production of improved means for impositively locking the movable contact blade of the cap.

An additional object consists in the production of a cap provided with a movable contact blade and a stationary contact blade which are designed for use with various forms of plug receptacles, but confined to a definite polarization when thus used.

Other objects of the invention will become apparent from the following description and the appended claims.

For the purpose of description, several embodiments of the invention are illustrated in the accompanying drawings in which—

Figure 1 is a view in side elevation of the improved form of cap together with the receptacle shown in perspective;

Fig. 2 is a vertical section of the cap and plug illustrated in Figure 1, interconnected in operating position;

Fig. 3 is a plan view of the face of the cap carrying the contact blades;

Fig. 4 is a fragmentary plan view similar to Fig. 3 with the movable or swivel blade shown in the opposite position to that shown in Fig. 3;

Fig. 5 is a view in perspective of the spring utilized for impositively locking the swivel blade in its operating positions;

Fig. 6 is a perspective view of the swivel blade;

Fig. 7 is a plan view of another form of cap looking at the face of the cap carrying the contact blades;

Fig. 8 is a section taken on the plane, indicated by the line 8—8 of Figure 7, looking in the direction of the arrows.

Fig. 9 is a plan view of the spring utilized in the embodiment shown in Figs. 7 and 8 for impositively locking the swivel blade in its operative positions.

Fig. 10 is a fragmentary plan view of another form of the cap showing another method for impositively locking the movable blade in its operative positions.

Fig. 11 is a section taken on the plane, indicated by the line 11—11 of Fig. 10, looking in the direction of the arrows.

Fig. 12 illustrates the spring utilized in the embodiments shown in Figs. 10 and 11, for impositively locking the blade in its operative positions; and

Figs. 13 and 14 are plan views of the faces of two forms of polarized receptacles, Fig. 13 being a plan view of the receptacle illustrated in perspective in Fig. 1, and Fig. 14 being a view of a similar receptacle, but with the cap blade admitting slots arranged in parallel position.

The several forms of swivel blades herein illustrated and described, are all shown in connection with a polarized cap but it will be obvious that the improved construction for impositively locking the swivel blade illustrated and described is not limited to a polarized cap but may be used with any type and form of cap. Polarization of the cap in the embodiments herein illustrated is accomplished by using one wide slot and one narrow slot in the receptacle and fitting the cap which co-operates with the receptacles with one wide blade and one narrow blade. It will be evident that caps and receptacles thus designed can only be interconnected in one manner; that is, with the wide blade of the cap inserted in the wide slot of the receptacle and the narrow blade of the cap in the narrow slot of the receptacle. In the receptacles here shown, this method of po-

larization is applied to receptacles fitted with parallel slots as well as slots which are positioned at right angles, and the co-operating cap which is used with these receptacles is fitted with an immovable wide blade and a movable or swivel narrow blade. The wide slots in the receptacles used in this combination because of the immovable characteristics of the wide blade used in the cap, is therefore, given the same position in both receptacles, and the narrow slot in one receptacle is placed at right angles to the wide slot, and in the other receptacle is parallel to the wide slot. In both receptacles the distance between the outer edge of the wide slot and the inner edge of the narrow slot is the same.

Referring now to Figs. 1 to 6, illustrating one embodiment of this invention, it will be observed that a cap 16 composed of any suitable insulating material, is provided with a central aperture 17, through which the wires which are to be connected with the blades, are admitted to the cap. The cap is fitted with a depression 15, in which are mounted conducting plates 18 and 30 which are secured to the base 16, by means of eyelets such as 19, embedded in the insulating compound of the base 16. The plate 18 which is associated with a movable blade 20, is secured to the cap base 16, by means of two eyelets 19. The movable blade 20, as illustrated in Fig. 6, is equipped with a foot 21, the lower face of which is fitted with V shaped slots 22 and 23 which cross one another, substantially at right angles.

The plate 18, is fitted with an aperture 24, through which the contacting surface of the plate 20 is extended, and which retains the foot 21, of the blade in position under the conducting plate 18. Positioned under the foot 21 of the contact blade 20, in the movable cap as illustrated in Fig. 2, is a looped spring 25. This looped spring as illustrated in perspective in Fig. 5, has the forward end of one of its arms 26, equipped with a V shaped notch 27, the other forwardly extending arm being straight and flat. The spring 25 and blade 20 are retained in their co-operating positions as illustrated in Fig. 2, with the spring in compression by the conducting plate 18, which is held in position by the rivets 19, which secure it to the insulating cap 16. The spring 25, is so positioned beneath the foot 21 of the blade 20, that the V shaped notch 27 thereof will ride in the V shaped grooves 22 and 23 in the foot of the plate when the blade is turned into proper position, so as to align this V shaped notch with the grooves in the blade. The foot 21 of the blade 20 is pear shaped, and this shape of the foot in combination with the side walls of the depression 15 serve to limit the angular movement of the blade. The side walls of the depression 15 serve as stops to limit this turning movement of the blade 20, the edges of the foot extending back from the apex contacting with one of the side walls when the blade is moved into either one of its operating positions. This is clearly illustrated by the broken line indicative of the foot of the blade in Figs. 3 and 4.

It will be evident that due to the resilience of the spring 25, the V shaped notch in the spring will snap into the slots in the foot of the blade and impositively lock the blade in the position it assumes when the V shaped notch in the spring aligns with the slots cut in the foot of the blade. Likewise, due to the V shaped construction of the notch in the spring and the slots in the foot of the blade, it will be evident that if a positive turning force or torque is exerted on the blade, the notch of the spring will slide out of the slots in the foot of the blade and right on the lower face or surface of said foot. When the spring is thus pressed out of its position in the notches in the foot of the blade, it is placed under an additional compression which together with the compressive force normally maintained in said spring will give said spring a determined and positive snap action when it snaps into the slots cut in the foot of the blade.

The stationary blade 29, of the cap is formed integral with a binding plate 30 which is secured to the insulating cap base by means of rivets such as 19, as hereinbefore described in connection with the conducting plate 18. The conducting plates 18 and 30 are provided with terminal screws 31 and 32, respectively, which serve to secure the circuit wires to said conducting plates and through them to the contact blades 20 and 29.

The receptacle member 33, consists of a base of insulating material 34, provided with apertures 35 and 36. The aperture 36 carries the center contact 37 of the receptacle member, said center contact being secured to the base by means of a screw 38, the threaded end of which is screwed into a plate 39, embedded in the base 34 and covered with an insulating compound 40. The threaded shell contact of the fuse receptacle 41, is connected to a suitable contact spring 42, which co-operates with the swivel blade 20. The apertures 35 and 36 in the base 34 terminate in the top face 42, of the receptacle member in narrow slots 43 and 44 of a size which will just conveniently admit the contact blades 29 and 20 of the cap.

The top face 42 of the receptacle member, shown in Figs. 1 and 13, will accommodate the cap with the adjustable blade 20 turned to the position shown in Figs. 1, 2 and 3.

When the adjustable blade 20 is moved into its alternate position, as illustrated in Fig. 4, the position of the blades of the cap is such as to co-operate with the receptacle member, having its slots arranged as shown in Fig. 14. As shown in this figure, the top face 45 of this receptacle member, is fitted with parallel slots 46 and 47, 46 co-operating with the wide blade 29 of the cap and slot 47 with the narrow swivel blade 20 of the cap.

The connections to the spring contacts in the fuse receptacle are identical, whether the plate admitting slots are positioned as shown in Fig. 13 or Fig. 14; that is, the center contact of the receptacle member has its spring contacts which co-operate with the blade positioned beneath the wide slots 43 and 46 in Figs. 13 and 14 respectively, and the threaded shell contact of the receptacle member has its spring contact which co-operates with the blade 20, positioned under the slots 44 and 47, of Figures 13 and 14 respectively. In view of this similarity of connection irrespective of the arrangements of the slots in the face of the receptacle member, it follows, inasmuch as the cap can only be inserted into the receptacle in one manner, that is with the wide blade in wide slots, that the cap and receptacle are properly polarized.

Figures 7, 8 and 9 show another method for impositively locking the swivel blade in its operative positions. In this construction, a conducting bar 50 is provided with an upset portion 51, forming a depression in which the foot 21 of the blade rests, the lower face of the foot of the blade being substantially in the same plane as the lower surface of the conducting bar 50. The conducting bar 50 is secured to the insulating cap 16 by means of an eyelet such as 19 embedded in the insulating base and by means of a wire connecting screw 52, which in this case, functions to serve the double purpose of connecting the wire to the conducting plate 50 as well as securing one end of the conducting plate 50 to the insulating base. The screw 52, is secured in position by being screwed into a metallic sleeve 53, embedded in the insulation of the cap 16, the sleeve being internally threaded to receive the threads of the screw 52. The wide blade 29 of this cap is connected to the conducting plate 30 provided with a binding screw 32 identical in form to that shown and described in connection with Figs. 1, 2 and 3 inclusive.

The swivel blade 20 is held in its operative positions by means of a leaf spring 54 which is secured under the conducting plate 50 by means of the eyelet 19. This spring 54 is illustrated in Fig. 9 and is provided at one end with an aperture 55 through which the eyelet 19 is fitted. The other end of the leaf spring 54, is semi-circular in shape as shown at 57, so that this end of the spring will loosely fit about the sleeve 53. The spring 54 at substantially the middle thereof is fitted with a V shaped notch 56. The insulating cap 16 is cut out so as to present a sloping surface to the lower face of the spring 54, sloping from the ends of the spring toward the center underneath the V shaped notch 56. The spring is therefore supported at either end with the center portion thereof freely suspended and capable of movement. Consequently, when the blade 20 is turned the V shaped slots cut in the foot of the blade will move away from the V shaped notch 56 of the spring and force the middle portion of said spring downwardly into the depression provided for such movement under the spring as hereinbefore described. When the blade is turned so that either of the grooves 21 or 22 come into alignment with the notch 56 of the spring, it will be evident that due to the compression of said spring it will snap into position in either of said notches with which it is aligned and impositively lock the blade 20 in either one of these positions. When the blade is locked in either one of these positions, the cap is adapted to be used in connection with either one of the receptacle members, the faces of which are illustrated in Figs. 13 and 14.

Figs. 10 and 11 illustrate another embodiment which may be used for impositively locking the swivel blade. In this embodiment, the conducting plate 60 is fitted as was the conducting plate 50 with a depression 61 to receive the foot of the swivel blade 20. The conducting plate 60 is secured to the insulating cap 16 by means of two eyelets such as 19 and is also provided with an extending portion 62, in which is secured the terminal screw 63. The spring 64 for impositively locking the blade in this embodiment is illustrated in Fig. 12, and comprises a V shaped notch 65, at its substantially middle portion, and the semi-circular shaped ends 66 and 67. The ends 66 and 67 are shaped so as to fit around the eyelets 19 which hold the conducting plate 60 in place, the spring being placed under said conducting plate and under the foot of the blade 20. The cap is fitted with sloping surfaces underneath the spring 64 so that the spring will be supported at its ends and suspended at the center, the same as the spring 50 is in connection with Figs. 7 to 9 inclusive. Consequently when the blade 20 is turned, the spring 64 will function the same as the spring 50. Further description of the actual operation of the spring in this embodiment in connection with the swivel blade seems unnecessary.

It will now be evident from the foregoing description that caps constructed in accord-

ance with the teachings of this invention are composed of a minimum number of simple parts in which the movable or swivel blade can be turned manually, by exercising a torque sufficient to depress the spring utilized to lock the blade, into its operative positions, and that when the blade is turned into its operative positions, the spring will function to impositively lock the blade in these positions. This impositive locking of the blade in the operative positions will prevent accidental displacement of the blade from these positions and also permits ready adjustment of the blade in either of these positions, whenever it is desired, without the use of tools of any kind whatsoever. A cap of the type herein described can also be used as a polarized cap, in view of the use of the wide and narrow blade, with polarized receptacles of the kind illustrated in Figs. 13 and 14, the cap being readily convertible for use with either of the receptacles by the simple manual operation of turning the movable blade.

Obviously this invention is not limited to the specific embodiments thereof herein illustrated and described, but is capable of other applications and many variations within its spirit and scope as set forth in the following claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is—

1. A cap for an attachment plug comprising a base, a contact blade adjustably swiveled thereon about an axis extending longitudinally of the blade, and spring latch means for holding said blade in adjusted position.

2. A cap for an attachment plug comprising a binding plate having a circular opening therethrough, and a contact blade having a circular shank portion fitting snugly and adjustably swiveled in said opening.

3. A cap for an attachment plug comprising a binding plate having an opening therethrough, a contact blade having a shank portion extending into and adjustably swiveled in said opening, and a head portion underneath said binding plate, and a spring latch bearing on said head portion for holding said blade in adjusted position.

4. A cap for an attachment plug comprising a binding plate having an opening therethrough, a contact blade having a shank portion extending into and adjustably swiveled in said opening, and a head portion underneath said binding plate, and a leaf spring latch bearing on said head portion for holding said blade in adjusted position.

5. A cap for an attachment plug comprising a binding plate having an opening therethrough, a contact blade having a shank portion extending into and adjustably swiveled in said opening, and a head portion underneath said binding plate, and a U-shaped leaf spring latch bearing on said head portion for holding said blade in adjusted position.

In witness whereof, I have hereunto subscribed my name.

REUBEN B. BENJAMIN.