

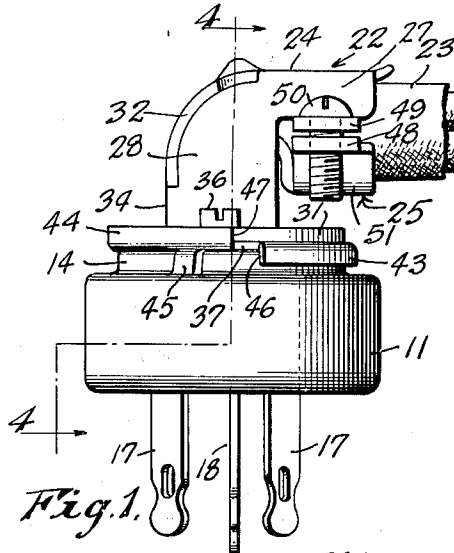
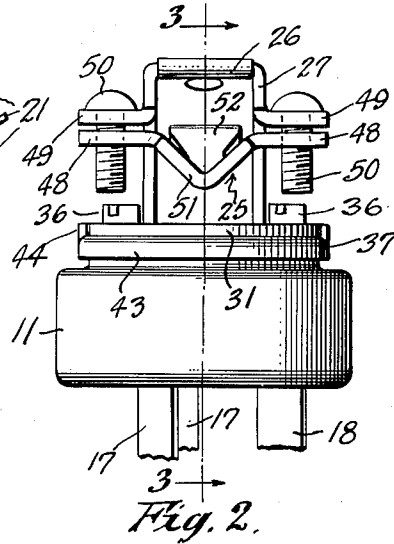
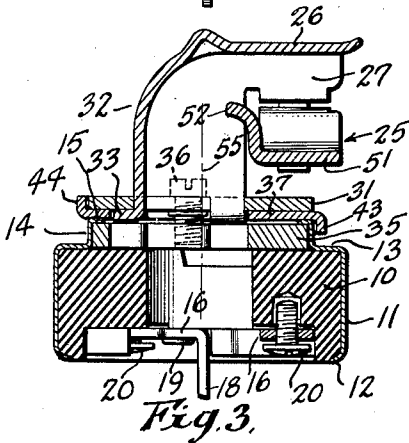
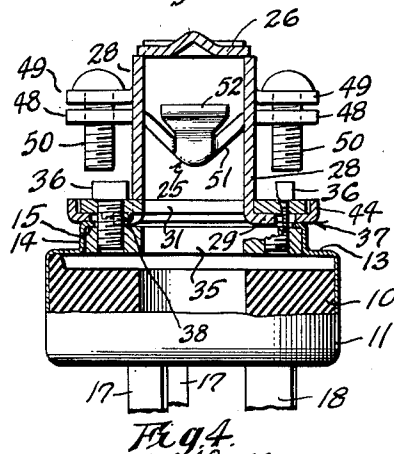
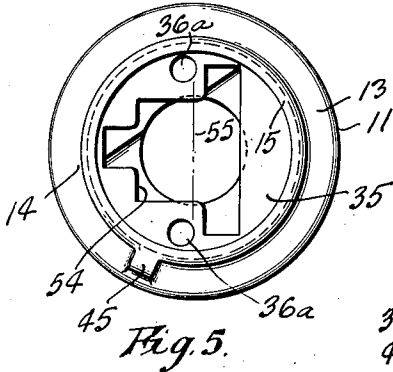
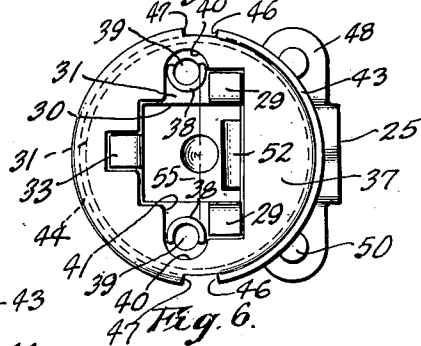
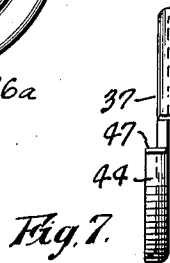
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J. A. SUNDQUIST ET AL

2,326,181

ADJUSTABLE ANGLE CORD GRIP PLUG CAP

Filed March 18, 1942



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ADJUSTABLE ANGLE CORD GRIP PLUG CAP

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11 Claims. (Cl. 173—322)

This invention relates to electrical attachment plug caps, more particularly to such caps having a cord grip to relieve the strain of the conductor wires on the binding-post screws, and has for an object to provide an improved construction whereby an angular cord grip can be readily adjusted to various angles with respect to the body and the contact blades secured thereon.

Another object is to provide a construction in which adjustment of the cord grip may be made through an angle of substantially 360° but which is so constructed that if an adjustment beyond about 180° is desired the wires must be disconnected from the binding screws when making the adjustment so that there will be no danger of damaging the wiring.

A further object is to provide a construction in which the angular grip may be adjusted and then easily and effectively secured in the adjusted position.

A further object is to provide a construction in which practically all of the parts may be stamped and formed from sheet metal of suitable thickness.

With the foregoing and other objects in view, we have devised a construction, a preferred embodiment of which is illustrated in the accompanying drawing forming a part of this specification. It is, however, to be understood the invention is not limited to the exact details and arrangement shown but may involve various changes and modifications within the scope of the invention.

In this drawing:

Fig. 1 is a side elevation of the cap complete;

Fig. 2 is an elevation looking from the right of Fig. 1, a portion of the contact blades being broken away;

Fig. 3 is a vertical section substantially on the line 3—3 of Fig. 2;

Fig. 4 is a similar view substantially on the line 4—4 of Fig. 1;

Fig. 5 is a top plan view of the base or body portion with the cord grip and stop plate removed;

Fig. 6 is a bottom plan view of the cord grip and stop plate removed from the body, and

Fig. 7 is an edge view of the stop plate.

The attachment plug cap shown is a cap for a three-wire system to connect various attachments to an electrical wiring system to secure power for operating them, and is intended for relatively heavy duty in garages, factories and similar locations. The cap comprises a body member 10 of insulating material enclosed in a cover or

casing 11, preferably of sheet metal formed to fit the body and protect the same against damage and breakage. It is turned in to form flanges 12 and 13 at the bottom and top of the body so as to be rigidly held in place, and is extended upwardly at 14 and then inwardly to form a flange 15 spaced above the top wall of the body. On its lower side the body is recessed for mounting the bases 16 of the blade contacts 17 and 18, these contacts being secured to the body by the usual means such as rivets 19 embedded in the material of the body. Each base carries a binding-post screw 20 for connecting the wires 21 to the contact blades. It will be noted that in this particular cap the contact blades are arranged in a certain definite relation and may be polarized with one blade, as 18, longer than the other blades. The cap must therefore always be inserted in the outlet receptacle in the same position relative to this receptacle.

However, as the attachments to be supplied with current from the cap may be in various locations with respect to the outlet, so that the lead cord may extend laterally from the cap in various directions, it is desirable that the cord grip may be turned or directed to different directions or angles about the axis of the cap. In the present case an angular cord grip 22 for the cord 23 carrying the conductors 21 is mounted on the body of the cap to turn about its longitudinal axis so that it may be adjusted to various angles. This grip comprises two members 24 and 25 stamped and formed from sheet metal of suitable gauge or thickness. The main member 24 has a top wall 26 extending laterally at an angle to the axis of the body 10 and on the opposite side edges thereof are side members 27 bent downwardly so that the top section is substantially of inverted U-shape. The sides 27 are extended downwardly at 28 and at their lower edges are provided with lugs 29 which are passed through notches in the side edges of an opening 30 in a circular base plate 31 and folded over against the under side of this plate. Between the walls 28 is an intermediate wing curved to form a wall 32 extending between the side walls 28 and having a lug 33 also extending through a notch in the edge of the opening 30 and folded over on the underside of the plate 31. These lugs 29 and 33 secure the member 24 to the base plate 31. The wall 32 may be notched at the lower part of the opposite side edges thereof to receive lugs 34 on the rear edges of the side members 28 to help retain the parts in proper position. The member 24 is stamped flat from heavy sheet metal, an inter-

mediate wing to form the wall 32 being between the wings to form the side walls 27, 28, and all three wings being integral with the top wall 26. In forming member 24 the intermediate wing is curved to form the wall 32 and the side wings are bent at right angles to the wall 26, making the upper horizontal portion of the member of substantially inverted U-shape in cross section. The wall 32 is of sufficient width so that it overlaps the curved rear edges of sides 23 above the lugs 34, as shown in Fig. 1. The lugs 29 and 33 (see Fig. 6) are narrower than the sides 23 and 32 so that there are shoulders on the lower ends of the members 23 and 32 to rest on top of the base plate 31.

The cord grip or clamp comprising the cord gripping or clamping members 24 and 25 and the base plate 31 is secured to the base 10 by means of a swivel plate or washer 35 mounted between the flange 15 on the cover 11 and the top wall of the insulating body 10 so as to turn relative to the body. The base plate 31 is connected with the swivel plate 35 by screws 36 extending through the plate 31 and threaded into plate 35 and 36a. By tightening up these screws the two plates can be clamped on the flange 15 which extends between the two plates and acts as a holding means to thus hold the cord grip in the position to which it may have been turned about the axis of the body by turning of the plates 31 and 35 relative to the body.

To limit the relative turning movement of the cord grip on the body a stop plate 37 is mounted between plates 31 and 35 resting on the top of the flange 15. The screws 36 pass through this plate, and the base plate 31 has reinforcements 38 about the openings 39 for these screws in the plate 31. The reinforcements and the screws pass through notches 40 at the sides of the eccentric opening 41 in the stop plate 37. The reinforcements 38 lie within the large opening in the flange 15 and are greater in height than thickness of flange 15, so that if the stop plate 37 were omitted these reinforcements would then bear on the top of the swivel plate 35 and prevent the base plate 31 and the swivel plate 35 from clamping the flange 15. Thus without the stop plate 37 the cord clamp 22 could not be prevented from turning relative to the body 11. The lugs 29 and 33 also extend into notches in this opening 41 so that as the base plate 31 is rotated with the clamp the stop plate 37 will be rotated with it. This stop plate has two flange portions 43 and 44 extending laterally from the periphery thereof, and preferably each flange portion 43 and 44 extends throughout substantially one-half of the circumference of the stop plate. These flanges extend in opposite directions from a body of the plate and on the diametrically opposite peripheral portions thereof. This plate may be stamped from sheet metal of suitable thickness and the flange portions bent laterally therefrom. The opposite ends of these flange portions 43 and 44 cooperate with a stop lug 45 struck up from the cover or shell 11 on the side wall 14 into the path of movement of the ends of the flange portions. When the plate 37 is in position it will be seen as these flanges 43 and 44 extend in opposite directions laterally from the plate 37 that when in position on the body one flange, for example 43, will extend downwardly and embrace one side portion of the wall 14, and as the plate rotates the ends 46 of this flange portion may engage the stop 45 to limit turning movements of the plate 37 and the

clamp 22, and as the flange 43 extends for about half the circumference of the plate 37 it will permit turning movements of the clamp 22 to an angle of about 180°. The other flange portion 44 extends upwardly and embraces one side edge of the base plate 31. The plate 37 may be reversed from the position shown in Fig. 1 to bring the other flange portion 44 to the downwardly extending position to have its end walls 47 cooperate with the stop 45 to limit turning movements of the stop plate 37 and the clamp 22, but as the flange 44 is on the opposite peripheral portion of the plate 37 from the flange 43 this will limit turning movements of the grip 22 to the other half of the revolution, or that is approximately the other 180° of the circle from that controlled by the flange 43.

The other member 25 of the cord grip or clamp can also be stamped and formed from sheet metal of suitable thickness. It includes side wings 48 under the similar wings 49 extending laterally from the lower edge of the side walls 27 and is tapped for the clamping screws 50 extending through openings in the wings 49. It has a downwardly extending substantially V-shaped central portion 51 to embrace the lower side of the cord 23. There may extend from the inner edge of this portion 51 an upwardly and backwardly curved lug 52. As the screws 50 are tightened up the cord 23 will be gripped between the portion formed by the walls 26 and 27 and the portion 51. The upwardly turned portion of the lug 52 serves as a stop, preventing the outer casing of the wire from being entered into the clamps too far. This applies particularly to BX or metallic sheathed cable. The backwardly rounded portion of the lug 52 provides a smooth surface for the conductors as they bend downwardly to enter into the cap.

In operation, when it is desirable to adjust the cord grip the screws 36 are loosened, after which the grip and the plate 31, together with the stop plate 37 and swivel plate 35, may be turned relative to the body in either direction through an angle of substantially 180°, this movement being limited by the end walls 46 of the flange 43 engaging stop 45. After the clamp has been shifted to the desired angle or position it is rigidly clamped in this position by tightening up the screws 36. However, as this turning movement is limited to substantially a half-turn or 180°, if it is desired that the angle clamp be located on the other half of the circle, it is necessary to remove the screws 36. This will permit lifting of the clamp and the plate 37 from the base 10 and plate 35, as shown in Figs. 5 and 6. The plate 37 may then be reversed so that the flange 43 will embrace the edge of the plate 31 and the flange 44 will project downwardly from the plate 37. The plate and clamp can then be replaced on the base flange 15, but in order to do so the plate 35 must be turned about a half revolution so that the eccentric opening 54 in this plate lines up with similar openings 41 in the plate 37 and 30 in the plate 31. To insure that this is done the openings for the screws 36 are offset from the diagonal line through the center or axis 55 of the body. The stop plate 37 and the base plate 31 with the clamp are again replaced on the base and the screws 36 inserted. The clamp may then be adjusted by turning it in either direction in the other half or other 180° sector of the circle and adjusted to any angle in this half circle, and then secured in this adjusted position by tightening up the screws 36. It will be understood

that if the stop flange on the stop plate 37 were made very short the plate could be turned through substantially an entire revolution or nearly 360° before the opposite ends of this short flange engage the stop 45. Such a large turning movement, however, might damage the wiring and therefore the arrangement described was devised to prevent this. In other words, as each flange 43 and 44 permits turning of the clamp only about a half revolution or about 180°, if it is desired to adjust the clamp onto the other half of the circle or other 180° sector, it is necessary to remove screws 36, reverse the plate 37, turn the plate 35 about a half revolution to align up the opening therein with the openings in the plates 31 and 37, and then reassemble as above described. However, to do this the lead wires must be disconnected from the binding screws and then after reassembling of the clamp on the body the wires are again connected to the binding screws. Therefore, a result secured by this construction is to make the user remove the wires from the binding screw when making the shift to permit turning or adjustment of the clamp through the other half of the circle, so that there will be no danger of his turning the clamp the full circle or approximately 360° while the wires are still connected to the binding screws with consequent damaging of the wiring.

Having thus set forth the nature of our invention, what we claim is:

1. A plug cap comprising an insulating body, a swivel plate mounted to turn on the body, a cord grip including a base plate mounted to turn on the body, a stop carried by the body, a stop means mounted to turn with the base plate adapted to engage the stop to limit turning movements of the grip, holding means on the body extending between the two plates, and means connecting the plates and adapted to clamp them on the holding means to secure the grip against turning.

2. A plug cap comprising an insulating body, an intumed flange on the body, a swivel plate mounted under the flange to turn relative to the body, a cord grip including a base plate mounted to turn on the outer side of the flange, stop means mounted to turn with the base plate, a stop carried by the body adapted to cooperate with said means to limit turning movements of the grip, and screws connecting the two plates and adapted to clamp the plates against the flange to hold the grip against turning.

3. A plug cap comprising an insulating body, an intumed flange on the body, a swivel plate mounted under the flange to turn relative to the body, a clamp having a base on the outer side of the flange adapted to turn relative to the body, a stop carried by the body, stop means mounted to turn with the base adapted to engage said stop to limit turning movements of the clamp, and clamping means connecting the base to the plate and adapted to clamp them on the flange to hold the clamp against turning.

4. A plug cap comprising an insulating body, a cover on the body having an intumed flange spaced from the body, a swivel plate mounted to turn between the flange and body, a cord grip having a base mounted to turn on the outer side of the flange, a stop means mounted to turn with said base, a stop on the cover adapted to cooperate therewith to limit turning movements of the grip, and means connecting the base and swivel plate adapted to clamp them at opposite

sides of the flange to hold the grip against turning.

5. A plug cap comprising an insulating body, a cover on the body having an intumed flange on the top thereof spaced from the body, a swivel plate mounted to turn between the body and flange, a stop lug on the cover, a cord clamp including a base plate on the outer side of the flange and mounted to turn relative to the body, a stop plate mounted between the base and the flange to turn with the base, said stop plate having a flange extending throughout a part of its periphery and adapted to engage said stop at its opposite ends to limit turning movements of the clamp, and screws connecting the base and swivel plate and adapted to clamp them on the first flange to hold the clamp against turning.

6. A plug cap comprising an insulating body, a cover enclosing the body having an intumed flange on the top thereof spaced from the body, a swivel plate mounted to turn between the body and flange, a stop lug on the cover, a cord clamp including a base plate on the outer side of the flange and mounted to turn relative to the body, a stop plate mounted between the base and the flange to turn with the base, said stop plate having a flange extending laterally from its periphery and for about one-half of its circumference, a second flange on said stop plate extending laterally in the opposite direction from the first flange and for substantially the remainder of the circumference, the opposite ends of one flange being adapted to engage the stop lug to limit turning movements of the clamp and the stop plate being reversible to bring either flange into position to engage said lug, and screws connecting the base and swivel plate and adapted to clamp them on the first flange to hold the clamp against turning.

7. A plug cap comprising an insulating body, a swivel plate mounted to turn on the body, a cord grip including a base plate mounted to turn on the body, a holding means on the body extending between the two plates, a limit stop on the body, a stop plate mounted between the base plate and the holding means to turn with said base plate, said stop plate having stop flanges extending laterally therefrom on opposite sides thereof and each extending for only a portion of its circumference, said stop flanges being each adapted to engage the limit stop at their opposite ends when the plate is in a given position to limit turning movements of the grip, said stop plate being reversible to bring the different flanges to limiting position, and means connecting the base and swivel plates adapted to clamp them on the holding means to hold the grip against turning.

8. A plug cap comprising an insulating body, a cover enclosing the body and including an intumed flange spaced above the top of the body, a swivel plate mounted between the flange and body for turning movements, a cord grip including a base plate mounted at the outer side of said flange, a stop plate mounted between the base and the flange and having a pair of stop flanges extending laterally therefrom on opposite sides thereof and located on diametrically opposite peripheral portions of the plate, said stop plate and said swivel plate having similar eccentrically located openings requiring turning of the plates approximately a half revolution relatively to each other to bring them into alignment on reversal of the stop plate, a stop on the cover to be engaged by the ends of the stop

flanges to limit turning movements of the cord grip, and screws connecting the base and swivel plates and adapted to clamp them on the first flange to secure the grip against turning.

9. A plug cap comprising an insulating body, a cover enclosing the body and including an intumed flange spaced above the top of the body, a swivel plate mounted between the flange and body for turning movements, a cord grip including a base plate mounted at the outer side of said flange, a stop on the cover, a stop plate mounted between the base plate and the flange to turn with the base plate and having stops extending laterally therefrom in opposite directions on diametrically opposite peripheral portions of the plate, said latter stops being arranged so that one may engage the first stop when the plate is one side up and the other may engage the first stop when the plate is reversed to bring the other side up, screws connecting the base plate and swivel plate and adapted to clamp the plates on the flange to hold the grip in adjusted positions, and said screws being located laterally of a diagonal line through the axis of rotation so that when the stop plate is reversed this plate and the swivel plate must be turned a half revolution relative to each other before reassembling.

10. A plug cap comprising an insulating body, an intumed flange on the body, a swivel plate mounted under the flange to turn relative to the body, a cord grip including a base plate mounted

to turn on the outer side of the flange, screws connecting the two plates and adapted to clamp the plates on the flange to hold the grip against turning, said grip being formed of sheet metal including a central and two side wing portions, the central portion being curved to form a top and side wall at an angle to each other and the side portions extending at right angles thereto, lugs on the lower ends of the wing portions extending through the base plate and folded over on the underside thereof to secure said member to the plate, a clamp plate, and screws on the first grip member connected with the clamp plate to clamp a conductor cord between them.

11. A plug cap comprising an insulating member, a cord grip comprising a member formed from sheet metal including a central and two side wing portions, the central portion being curved to form a top and side wall at an angle to each other and the side portions extending at right angles thereto to form a substantially U-shaped section, a base plate, means for securing the lower ends of the wing portions to the base plate, means for mounting the base plate on the body for turning movements thereon, a clamp plate, and means for clamping a conductor cord between the first member and said clamp plate.

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