Nov. 30, 1926. 1,609,230

C. E. WARNER

SWIVEL ATTACHMENT PLUG

Filed Nov. 1, 1920 2 Sheets-Sheet 1

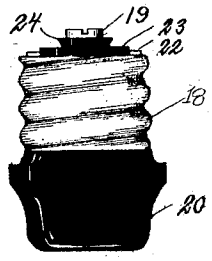



Fig. 1.

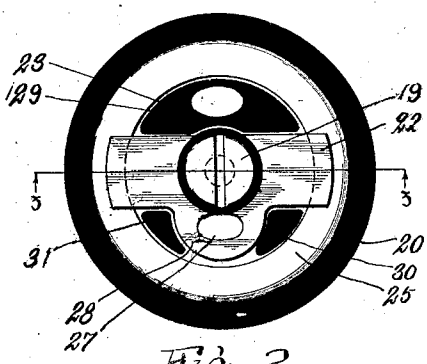



Fig. 2.

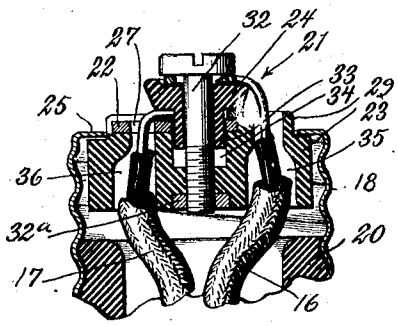



Fig. 4.

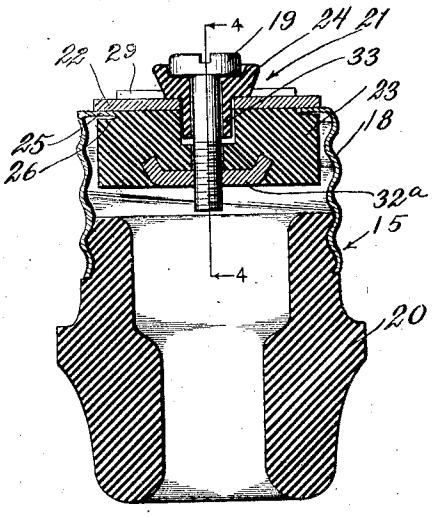



Fig. 3.

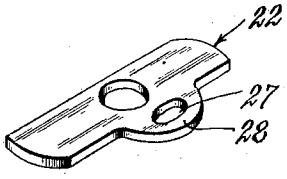



Fig. 5.

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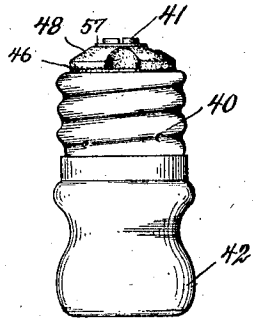



Fig. 6.

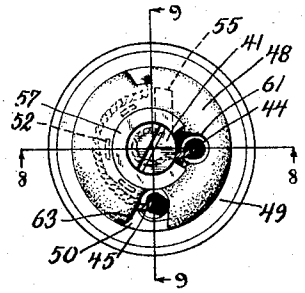



Fig. 7.

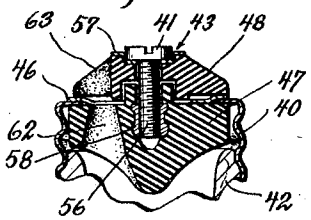



Fig. 9.

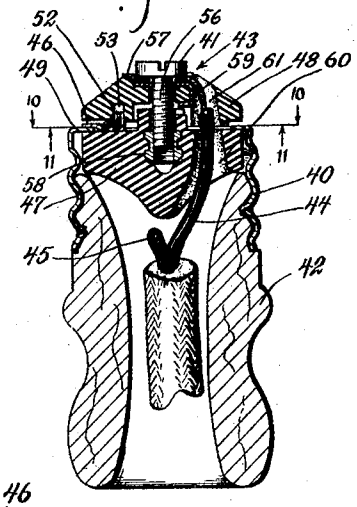



Fig. 8.

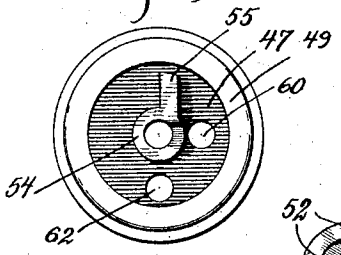



Fig. 10.

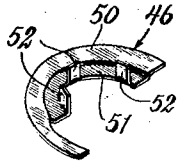



Fig. 12.

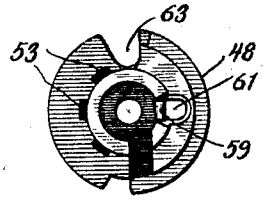



Fig. 11.

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# UNITED STATES PATENT OFFICE.

CHESTER E. WARNER, OF BERWYN, ILLINOIS, ASSIGNOR TO BENJAMIN ELECTRIC MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## SWIVEL ATTACHMENT PLUG.

Application filed November 1, 1920. Serial No. 420,909.

My invention relates to electrical connector devices, and more particularly to swivel attachment plugs.

One of the objects of my invention is to provide an improved swivel attachment plug which will be durable and efficient in use, easy to wire and cheap to manufacture.

Further objects will appear from the detailed description to follow and from the appended claims.

In the drawings in which two embodiments of my invention are shown—

Fig. 1 is a side elevation of a swivel shell attachment plug;

Fig. 2 is a top plan view of the plug shown in Fig. 1 on an enlarged scale;

Fig. 3 is an axial section on the line 3—3 of Fig. 2;

Fig. 4 is substantially a section on the line 4—4 of Fig. 3 but showing the plug wired;

Fig. 5 is a perspective view of the sliding contact;

Fig. 6 is a side elevation of another form of attachment plug embodying my invention;

Fig. 7 is a plan view of the plug shown in Fig. 6;

Fig. 8 is an axial section on the line 8—8 of Fig. 7;

Fig. 9 is substantially an axial section on the line 9—9 of Fig. 7 but showing the plug not wired;

Fig. 10 is a view on the line 10—10 of Fig. 8;

Fig. 11 is a view on the line 11—11 of Fig. 8; and

Fig. 12 is a detail perspective view of the sliding contact member.

Referring to the construction shown in Figs. 1 to 5 inclusive, this comprises a swivel shell attachment plug 15, in which both of the binding terminals are located outside the threaded shell contact at the entering end of the plug, and in which both of the wires are secured in place by the same operation.

The plug 15 comprises a threaded shell contact 18, a center contact 19, an insulating handle member 20 secured to the threaded shell contact 18, a binding terminal construction 21 for securing the wires 16 and 17, a sliding contact member 22, for swivel or sliding engagement with the threaded shell contact 18, whereby the threaded shell contact 18 can be rotated without twisting the cords 16 and 17, an insulating base 23, for supporting the center contact 19, the sliding contact member 22, and the wiring terminal construction 21 and insulating the parts with respect to each other, and an insulating spacer or washer 24 for insulating the wires 16 and 17 from each other, and forming part of the binding terminal construction 21.

The threaded shell contact 18 has an inwardly extending annular flange 25, which extends into a corresponding rabbet or recess 26 in the insulating base 23, the sliding contact member 22 having wing portions overlying the inwardly extending flange 25, the flange 25 fitting loosely between the wing portions of the sliding contact and insulating base 23 whereby a swivel connection is provided between the threaded shell contact and the sliding contact member 22, and whereby the sliding contact 22 and insulating base 23 are held against endwise movement with respect to the threaded shell contact 18. In order to position the wire which is connected with the sliding contact member 22, the sliding contact member 22 is provided with an opening 27 in the wing portion 28 through which the end of the conductor 17 is led to its binding terminal. In order to position the sliding contact member 22, the insulating base 23 is provided with three bosses 29, 30 and 31 (Fig. 2) which straddle the sliding contact member 22 and prevent it from rotating with respect to the insulating base 23.

The wiring terminal construction 21 comprises the insulating button or spacer 24 heretofore referred to, between which and the sliding contact member 22 the conductor 27 is clamped, and the center contact screw 32, between which and the spacer 24 the end of the conductor 16 is clamped, this center contact screw 32 being threaded into a nut $32^a$ embedded in the insulating base 23.

The upper face of the insulating button 24 is dished slightly to afford a depression to receive the end of the conductor 27, in which depression the conductor is clamped by the head of the center contact screw 32. In order to keep the bared end of the wire

17 from getting in contact with the center contact screw 32 the spacer 24 is provided with a downwardly extending annular sleeve or barrier 33 around which the end of the wire 17 is wrapped, which barrier 33 keeps the wire out of contact with the center contact screw 32. The insulating base 23 is recessed at 34 to receive this annular barrier 33, and is also provided with a pair of openings 35 and 36 for the passage of the wires 16 and 17.

In wiring the device, the center contact screw 32 is loosened up, the bared end of the wire 17 is wrapped around underneath the insulating spacer 24, the bared end of the wire 16 is wrapped around underneath the center contact screw 32, and the center contact screw 32 is then made to clamp both of the conductors 16 and 17 by a single operation.

In screwing the plug into a socket, the insulating base 23 and sliding contact member 22 do not rotate but the threaded shell contact 18, being swiveled with respect to the wiring terminals, can be screwed into the socket without twisting the cord.

The construction shown in Figs. 6 to 12 inclusive, comprises a threaded shell contact 40, a center contact 41, an insulating handle member 42 (which may be of wood if desired) secured to the threaded shell contact 40, a wiring terminal construction 43 for clamping both of the conductors 44 and 45 by a single operation, a sliding contact member 46 having a sliding or swivel engagement with respect to said shell contact 40, an insulating base 47, and an insulating cap 48 for supporting the wiring terminal construction 43, the center contact 41 and the sliding contact 46 in their proper relative position with respect to each other. The inwardly extending flange 49 of the threaded shell contact 40 is located between the insulating base 47 and the cap 48, whereby relative endwise movement is prevented, the sliding contact 46 also being held in place between the base 47 and cap 48 and in sliding engagement with the inwardly extending flange 49. This sliding contact member 46 may be a sheet metal stamping having an arcuate flange portion 50 which slidably engages the inwardly extending flange 49, having an annular depressed portion 51 in which the end of the conductor 45 lies, and having a plurality of upwardly extending lugs 52, which extend into recesses 53 in the insulating cap 48 to position the sliding contact member 46 with respect to the cap 48 and base 47 and prevent relative rotation therebetween. These upwardly extending lugs 52 also serve to help confine the bared end of the conductor 45 and keep it away from the center contact screw.

The insulating base 47 and cap 48 are centered with respect to each other and prevented from relative rotation by means of an upwardly extending annular boss 54 on the insulating base 47, this boss 54 having a laterally extending wing portion 55, the cap 48 being provided with a corresponding recess to receive the annular boss 54 with its lateral extension 55, whereby the parts are centered to prevent relative rotation.

The binding terminal construction 43 comprises, in addition to the head of the center contact screw 56, a dish-shaped sheet metal stamping 57, between which and the head of the center contact screw 56, the bared end of the wire 44 is clamped. The binding terminal construction 43 comprises also the insulating button or cap 48, between which and the sliding contact 46 the bared end of the conductor 45 is clamped. This clamping action is effected by means of the center contact screw 56 which is threaded into a metal bushing 58, embedded in the insulating base 47. The sheet metal stamping 57 is held in place on the insulating cap 48 by means of a tongue portion 59 bent over a portion of the cap. The insulating base 47 and cap 48 are provided with registering openings 60 and 61 respectively for the passage of the wire 44 to the binding terminal. The insulating base 47 and cap 48 are provided with registering openings 62 and 63 respectively, for the passage of the feed wire 45.

The wiring and operation of the device is substantially the same as in the form previously described, the screw 41 being loosened, in wiring, sufficiently to permit the end of the conductor 45 to be wrapped around between the sliding contact 46 and cap 48, and to permit the end of the conductor 44 to be wrapped around between the cup-shaped member 57 and the head of the binding screw 56. The screw 56 is then tightened down to clamp both the conductors 44 and 45 at one operation.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A swivel attachment plug comprising a center contact, a shell contact, a sliding contact member swiveled with respect to said shell contact, and a wiring terminal construction for securing a pair of wires comprising an insulating washer, between which and said sliding contact one of the wires is held, and a screw between the head of which and said washer the other wire is held.

2. A swivel attachment plug comprising a center contact, a shell contact, an insulating base, a sliding contact mounted on said insulating base, slidably engaging said shell contact, an insulating washer between which and said sliding contact one of the wires is held, and a center contact screw between which and the insulating washer the other wire is held.

3. A swivel attachment plug comprising a center contact, a shell contact, an insulating base, a sliding contact mounted on said insulating base, slidably engaging said shell contact, an insulating washer between which and said sliding contact one of the wires is held, and a center contact screw between which and the insulating washer the other wire is held, said center contact screw serving to hold said washer and sliding contact in place on said insulating base.

In witness whereof, I have hereunto subscribed my name.

CHESTER E. WARNER.