Sept. 11, 1934. J. E. TSAVARIS 1,973,234

ELECTRICAL SWIVEL CONNECTER

Filed July 24, 1933

Fig. 1.

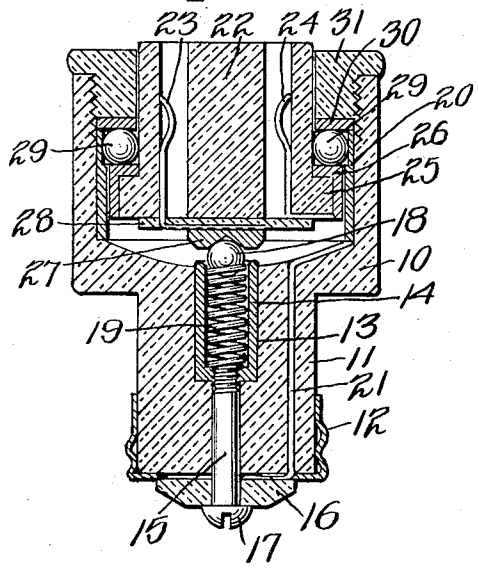


Fig. 3.

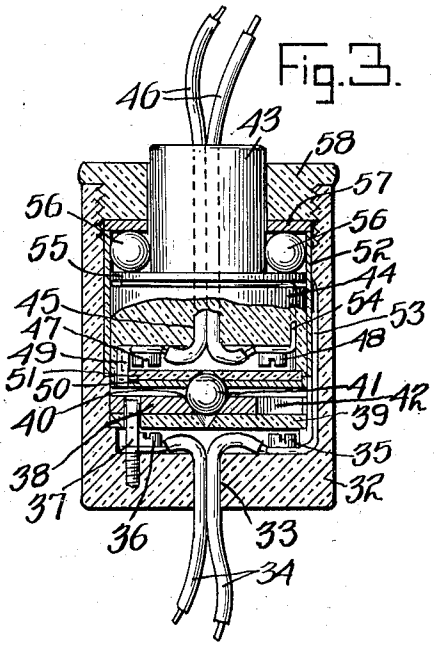


Fig. 2.

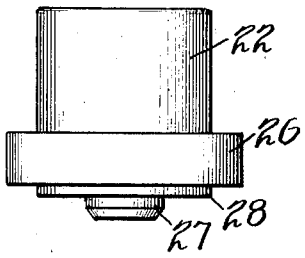


Fig. 4.

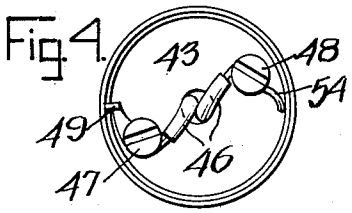
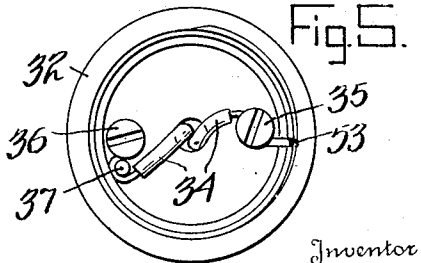


Fig. 5.



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UNITED STATES PATENT OFFICE

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ELECTRICAL SWIVEL CONNECTER

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3 Claims. (Cl. 173—324)

This invention relates to swivel connecters for electrical lines or conductors and the object of the invention is to provide a connecter or plug which is designed and constructed to serve as a swivel connection, either applied at the outlet plug or intermediate the ends of the wires, to prevent the wires from becoming kinked or tangled, thereby eliminating wear and short circuits which would ordinarily result due to such kinking and twisting of the wires, and to provide a device primarily adapted to be used in conjunction with the wire extensions such as used on electric irons, vacuum cleaners, telephones, etc.

Other objects and advantages will become apparent as the description proceeds.

Referring to the accompanying drawing which is made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a section in elevation of the invention of the screw socket type,

Figure 2, a side elevation of the rotatable member,

Figure 3, a section in elevation of a modified form of the device for use in extension cords, and

Figures 4 and 5 are detail views of the connecter posts of the device shown in Figure 3.

In the drawing reference character 10 indicates the casing of the device formed of any suitable insulating material and provided with a reduced end 11 on which a conducting threaded sleeve 12 is mounted. The end 11 is provided with a bore 13 in communication with the hollow upper end of the casing and is provided with a cup-like member 14 secured therein and held in place by a screw 15 threaded in the end thereof. An insulating washer 16 rests against the lower end of the sleeve and is held in place by the screw head 17. The inner face of the hollow portion of the casing is concaved thus providing a recess for a conducting ball 18 which rests on top of the member 14 and is forced outwardly by means of a spring 19 positioned in the member 14.

The inner surface of the casing 10 is provided with a conducting sleeve 20 which is connected by means of a suitable conductor 21 to the sleeve 12, the conductor 21 being embedded in the lower end of the casing as clearly shown in Figure 1.

The rotatable member 22 is formed of insulating material provided with contacts 23 and 24 embedded therein adapted to receive a plug connecter of the conventional type. The inner end of the member 22 is provided with a flange 25 on which a conducting flanged ring 26 is mounted, being connected to the contact 24.

The inner end of member 22 is provided with a central contacting element 27 having a recessed face adapted to seat on the conducting ball 18, and is connected to the contact 23. An insulating washer 28 is provided intermediate the contact element 27 and the inner end of the member 22.

When the member 22 is placed in position in the casing, the upper face of the ring 26, the conducting sleeve 20 and the member 22 form a recess into which a series of conducting balls 29 are placed and retained by a plate ring 30 resting on the tops thereof. An insulating cap 31 is threaded in the upper end of the casing 10 to hold the assembly in position. The spring 19 tends to force the ball 18 upwardly to hold the member 22 against the balls 29 thereby insuring contact between the respective parts of the device yet permitting the member 22 to rotate with respect to the casing 10.

The modified form shown in Figure 3 is formed of an insulating cup member 32 provided with an opening 33 in the lower end through which the wires 34 may be connected to the posts 35 and 36. A pin 37 is provided adjacent the post 36 in contact with the wire 34 and extends upwardly to engage a conducting plate 38. An insulating washer 39 is mounted intermediate the posts 35 and 36 and the plate 38. The plate 38 is provided with a concaved opening 40 in the center in which a conducting ball 41 seats. The plate 38 is also provided with a notch 42 formed in the edge thereof to prevent contact with the wire 53.

The rotating member 43 formed of any suitable insulating material having a flanged lower end 44 and a bore 45 through which the wires 46 extend and are connected to the posts 47 and 48. A pin member 49 is positioned adjacent the post 47 and extends to engage a conducting plate 50 secured in the end of the member 43. The plate 50 is provided with a concaved recess formed in the under surface which seats on the ball 41. An insulating washer 51 is positioned between the plate 50 and the posts 47 and 48.

The cup member 32 has a conducting sleeve 52 secured to the inner surface thereof which is connected in electrical contact with the post 35 by means of a conducting wire 53 positioned intermediate the sleeve and the inner surface of the cup member. A conducting wire 54 is connected to the post 48 and extends upwardly through the member 43 and is wound around and rests on the face of the flange 44. A conducting ring 55 rests on the wire 54. The ring 55 serves as a race or seat for the conducting balls 56. A similar conducting ring 57 is mounted on top of the balls 56.

An insulating cap 58 is threaded into the end of the cup member 32 to hold the assembly in position.

The operation of the device is quite obvious. The device shown in Figure 1 is merely turned into a conventional outlet either with or without the extension plug in place. With the plug in place by turning the device into or out of an outlet, the inner member is not rotated due to the fact that ball conductors allow the parts to rotate with respect to each other yet maintaining electrical contact between the conductor posts. The current in one circuit flows through the screw 15, the member 14, the ball 18, the element 27 to the contact 23 and the other side from the sleeve 12, the wire 21, the sleeve 20, the balls 29, the ring 26 to the contact 24.

In the modified form suitable to be connected intermediate the ends of an extension cord, the cord is severed and the ends are connected to the respective binding posts. One circuit for the current is as follows from one of the wires 34, to the pin 37, the plate 38, the ball 41, the plate 50, pin 49 and hence to the wire 46. The other circuit is made through the other of the wires 34, the wire 53, the sleeve 52, the balls 56, the plate 55, the wire 54, and to the wire 46.

It may be clearly seen that in the case of any twisting or turning of the extension cord from any cause, the device, whether inserted in an outlet or intermediate the ends of an extension cord, will prevent the wires from becoming entangled, thereby eliminating wear on the insulation will prevent pulling loose at the connecter posts and the resulting short circuits and will avoid any inconvenience in the use of such electrical appliances or devices requiring extension cords. The device is so constructed and designed as to insure free movement of the respective parts yet maintain positive contact between the conducting elements and is well insulated to make it safe, durable and useful.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and I therefore do not limit myself to what is shown in the drawing and described in the specification, but only as indicated by the appended claims.

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

1. A device of the kind described comprising a casing having contact elements thereon, a conductive sleeve secured in said casing in electrical contact with one of said elements, a conducting member positioned in said casing in electrical contact with the other of said elements, a rotatable member positioned substantially entirely within said casing, a cap screw threaded into said casing for holding said rotatable member therein, said rotatable member being provided with contacts and with sockets adapted to receive the prongs on a conventional plug, a recessed contact element in electrical connections with one of the said contacts and adapted to seat on said conducting member, means tending to force said conducting member outwardly to insure positive contact, means positioned between said rotatable member and said sleeve for connecting the other contact element to said sleeve thereby maintaining contact between the contacts of said rotatable member and the contact elements on said casing yet permitting free rotation of said rotatable member with respect to said casing.

2. A device of the kind described comprising a casing, contact elements on said casing, a conducting sleeve positioned in said casing in electrical contact with one of said elements, a conducting ball positioned centrally of said casing in electrical contact with the other of said elements, a member rotatably mounted in said casing and provided with contacts thereon and with sockets adapted to receive the prongs on a conventional plug, a cap screw threaded into said casing for holding said rotatable member therein, a conducting plate provided with a recessed face positioned on said conducting ball in electrical contact with one of said contact elements, a series of conducting balls positioned intermediate said member and said conducting sleeve, means for connecting said balls to the other of said contact elements to permit free rotation of said member with respect to said casing yet maintain positive electrical connection, between the contacts of said rotatable member and the contact elements of said casing.

3. A device of the kind described comprising a casing having an enlarged end and a reduced end the enlarged end being hollow to form an enlarged chamber and the reduced end having a threaded sleeve thereon, the said reduced end having a bore communicating with the enlarged chamber, a cup-like member in said bore, the bore having a shoulder intermediate its ends upon which said cup-like member rests, an insulating washer positioned on the said reduced end, a screw having its head engaging said washer and threaded into said cup-like member for holding said washer and said cuplike member in position, a second sleeve in said enlarged chamber and in electrical connection with said threaded sleeve, a rotatable member positioned in said enlarged chamber, a pair of sockets in said rotatable member having contacts adapted to engage prongs on a conventional plug, a plurality of rollers electrically connected with one of said contacts and in engagement with said second sleeve, the other of said contacts being in electrical connection with the said screw.

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