March 4, 1930. E. E. GOUCHER ET AL 1,749,702

ELECTRIC SWIVEL

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Fig. 1.

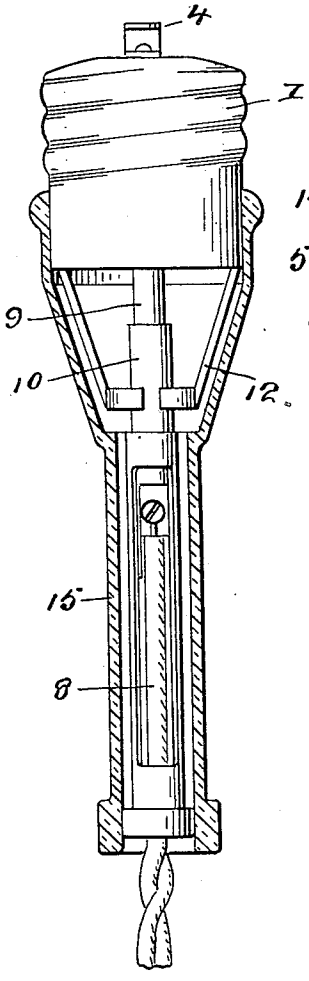


Fig. 2.

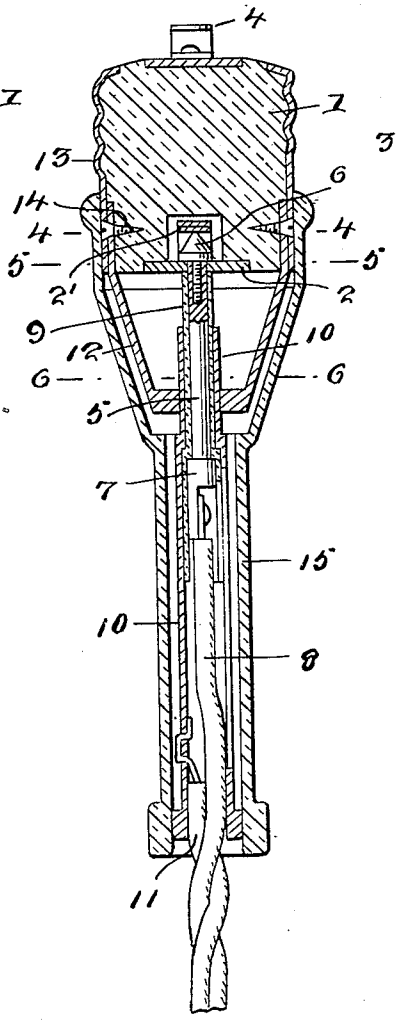


Fig. 3.

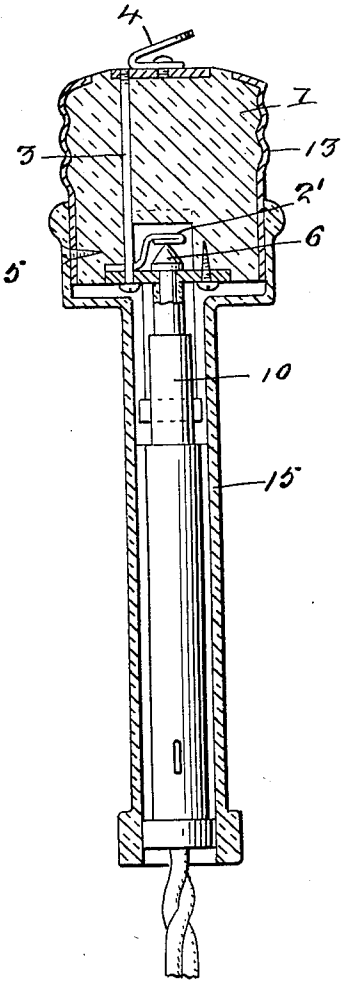
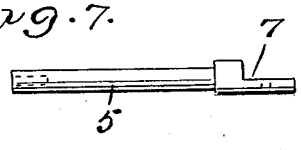


Fig. 7.



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Fig. 4.

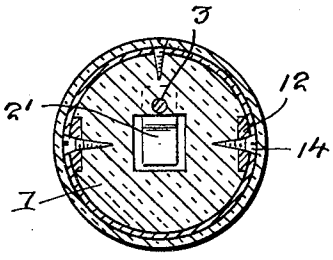


Fig. 5.

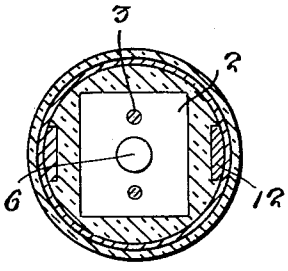


Fig. 6.

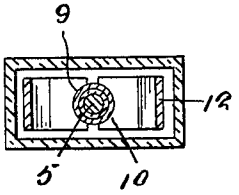


Fig. 8.

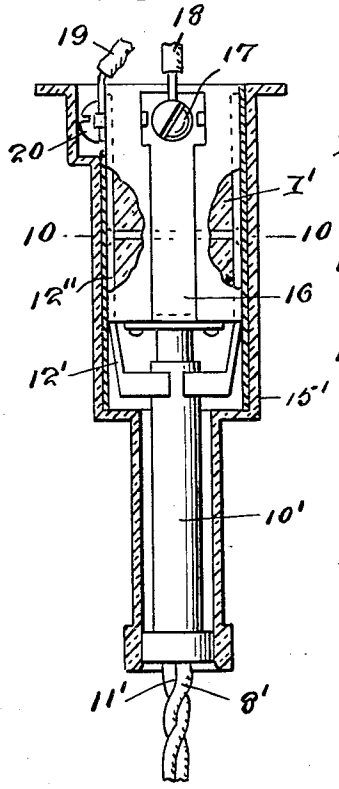


Fig. 9.

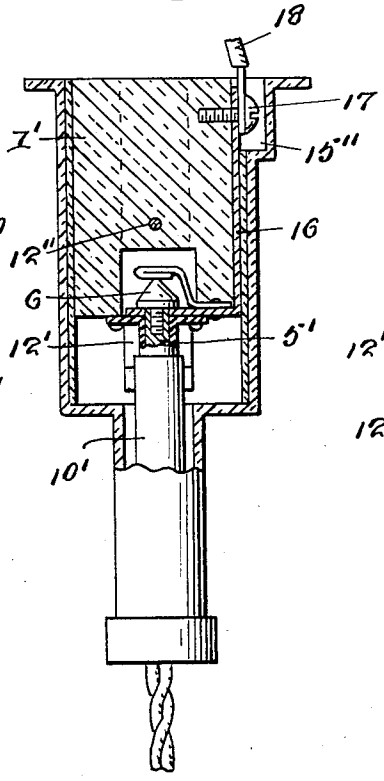
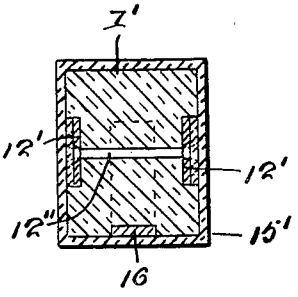


Fig. 10.



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Fig. 11.

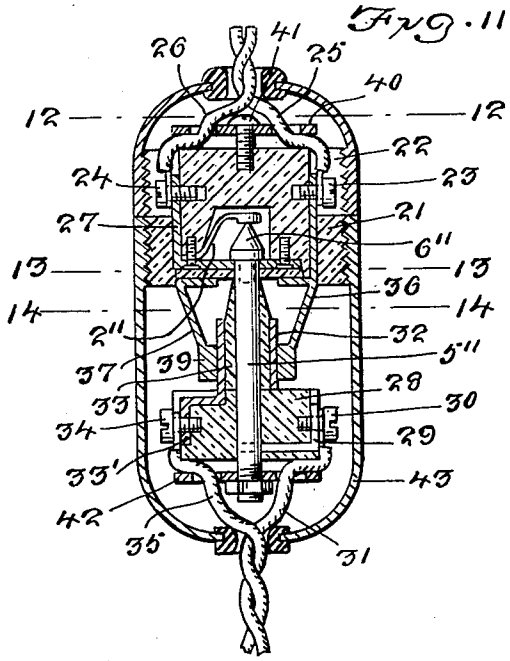


Fig. 12.

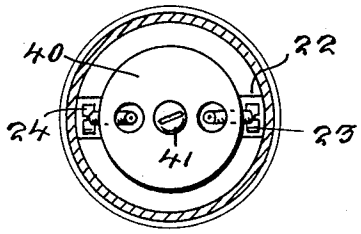


Fig. 13.

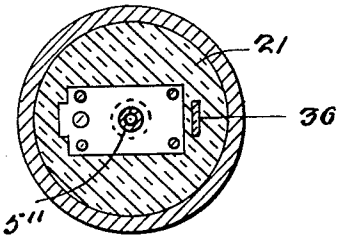


Fig. 14.

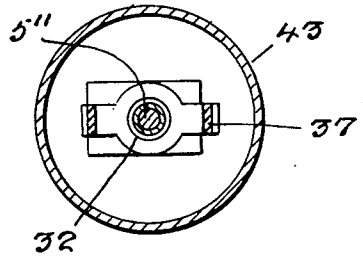
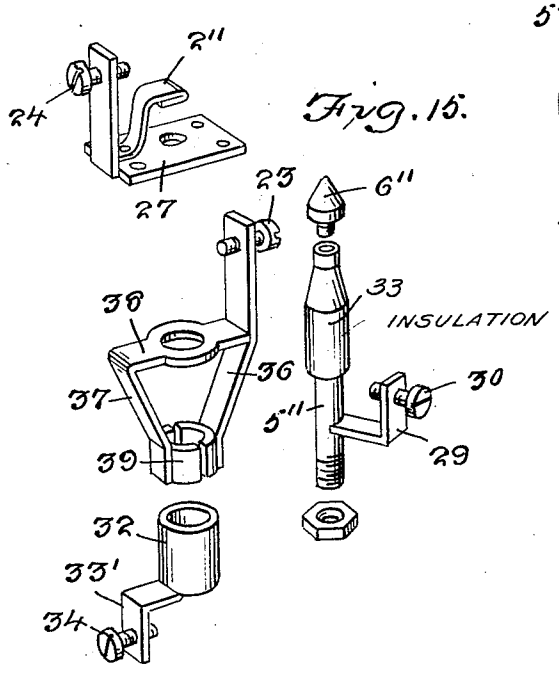


Fig. 15.



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UNITED STATES PATENT OFFICE

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ELECTRIC SWIVEL

Application filed August 25, 1928. Serial No. 301,970.

This invention relates to a swivel connection for electric conductors, the general object of the invention being to provide a pair of members which are swiveled together whereby one member can be rotated in relation to the other without breaking the connection between the conductors of the members and without causing twists or kinks in the conductors.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an elevation, partly in section, of one form of the invention.

Figure 2 is a longitudinal sectional view through Figure 1.

Figure 3 is a similar view but taken at right angles to Figure 2.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is a section on line 5—5 of Figure 2.

Figure 6 is a section on line 6—6 of Figure 2.

Figure 7 is a view of the inner rod to which one of the conductors is attached and which is rotatably connected with the plug.

Figure 8 is a longitudinal sectional view showing a modification.

Figure 9 is a similar view, but taken at right angles to Figure 8.

Figure 10 is a section on line 10—10 of Figure 8.

Figure 11 is a longitudinal sectional view showing another modification.

Figure 12 is a section on line 12—12 of Figure 11.

Figure 13 is a section on line 13—13 of Figure 11.

Figure 14 is a section on line 14—14 of Figure 11.

Figure 15 is a view showing various parts of the device shown in Figure 11.

Referring to the first form of the invention, the numeral 1 indicates the plug member having a plate 2 fastened to its rear end, a rod 3 connecting this plate with the central contact 4 of the plug. A bar 5 is rotatably fastened to the center of the plate by a screw 6, the end of the bar passing through a hole in the plate and the free end of the bar is enlarged and recessed, as at 7, to receive the terminal of the conductor 8. A sleeve 9 of non-conducting material surrounds the bar to insulate the same from a tubular member 10 to which the terminal of the conductor 11 is connected. The inner end of this tubular member terminates a short distance from the rear end of the plug. A pair of spring arms 12 is fastened to the plug and to the shell 13 thereof by the screws 14 and the free ends of these arms are recessed and engage the tubular member. As shown, the tubular member extends well beyond the bar 5 and its insulating sleeve 9 and said tubular member is electrically connected with the shell 13 by the arms 12, while the bar 5 is electrically connected with the central contact 4 of the plug by the threaded rod 3 and the plate 2. Thus the plug can be rotated without rotating the bar 5 and tubular member 10 and the parts connected therewith without breaking the electrical connection between the contacts of the plug and the conductors 8 and 11, so that the plug can be screwed into a socket without twisting or kinking the wires 8 and 11.

In order to insure good electrical connection, we provide a spring plate 2′ which is connected with the plate 2 and engages the conical head of the screw 6, so that some of the current will pass from the plate to the member 5 and some of the current will pass from the plate through the member 2′, the head of the screw to the member 5.

A housing 15, formed of non-conducting material, has its enlarged part fastened to the outer end of the plug with its restricted part, which forms a handle, surrounding the tubular member 10, so that the plug can be screwed into a socket by grasping the handle part

of this housing without the hand of the user coming in contact with the metal parts of the device.

In the modification shown in Figures 8, 9 and 10, which is useful for connecting one one pair of conductors with another pair, the plug 1′ is of rectangular shape in cross section and is, of course, formed of non-conducting material and has an L-shaped strip 16 extending along one side thereof and partly across the outer end thereof, with this end part having a hole therein to receive the rod 5′ so that the screw 6′ connects this strip 16 with the rod 5′. The other end of the strip is connected by a screw 17 with the terminal of a conductor 18. The spring arms 12′ are fastened to the plug as in the first form, and engage the tubular member 10′ and one of these arms is connected to the terminal of the conductor 19 by a screw 20 so that current will pass from the conductor 11′ through the tubular member 10′ to one of the spring arms and then pass from the arms over the conductor 19, the current returning over the conductor 18, strip 16, bar 5′ to conductor 8′. The housing 15′ which encloses the interior parts of this device is formed with the offset portions 15″ which form recesses to receive the terminals of the conductors 18 and 19 and the heads of the screws 17 and 20.

As but one of the spring arms 12′ is connected with the conductor, we connect the other spring arm with the said arm by a bar 12″ which passes through the plug so that the two arms are electrically connected together.

The modification shown in Figures 11 to 15, is useful for connecting one pair of conductors with another, where friction is to be minimized and a perfect electrical connection must be maintained at all times, as in radios, telegraph, telephone, etc.

In these figures, 21 indicates an exteriorly threaded plug formed of insulating material and provided with the oppositely arranged recesses 22 adjacent its outer end for receiving the screws 23 and 24 which engage the ends of the conductors 25 and 26. A substantially L-shaped plate 27 is placed in the plug with one arm perforated and threaded to receive the screw 24 and its other arm having a hole therein to receive the rod 5″, the rod being attached to the plate by the conical headed screw 6″ which is engaged by the spring plate 2″ attached to the plate 27, so that current will pass from the conductor 26 through the plate 27, spring plate 2″, screw 6″ into the bar 5″. This bar 5″ passes through a plug 28 spaced from the plug 21 and an angle plate 29 engages the bar 5″ and is attached to the plug by the screw 30 which passes through the terminal of the conductor 31. A tubular member 32 encircles a sleeve 33 of insulating material which surrounds a part of the bar 5″ and an extension 33′ of the tubular member is connected with the plug 28 by the screw 34 which also passes through the terminal eye in the conductor 35. A brush carrying arm 36 passes through the plug and the screw 23 passes through a hole in this arm and connects the conductor 25 with said arm. A short brush carrying arm 37 is connected with the arm 36 by the cross piece 38 which has a hole therein which spaces the cross piece from the bar 5″. The brushes 39 on these arms engage the tubular member 32. A disk 40 is fastened to the outer end of the plug 21 by a screw 41 and this disk has holes therein through which the conductors 25 and 26 pass, this disk acting to clamp the conductors to the plug. A similar disk 42 is placed on the lower end of the bar 5″ for clamping the conductors 31 and 35 to the plug 28. Thus it will be seen that current will flow from the conductor 26, plate 27, bar 5″ to conductor 31 and the current will return through the conductor 35, tubular member 32, the brush carrying arms 36 and 37 to the conductor 25.

A sectional housing 43 encloses the parts with the adjacent ends of the two sections threaded to the plug 21, the ends of the housing having holes therein through which the conductors pass.

From the foregoing it will be seen that in all forms of the device, one part can be rotated in relation to the other part without breaking the circuit and without kinking or twisting the wires, and if the wires should become twisted, a slight pull on the wires will cause the swivel connection to rotate in a reverse direction and thus remove the kinks.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What we claim is:—

1. A swivel connection for electric conductors comprising a plug, a bar rotatably connected with the central part of the outer end of the plug, a member of non-conducting material covering the bar, a tubular member encircling the non-conducting member, conductors connected with the bar and the tubular member, means for electrically connecting one of the contacts of the plug with the bar, a brush for electrically connecting the other contact of the plug with the tubular member and a housing formed of non-conducting material mechanically connected with the plug and enclosing the brush, the bar and the tubular member.

2. A swivel connection for electric conductors comprising a plug, a bar rotatably connected with the central part of the outer end of the plug, a member of non-conducting material covering the bar, a tubular member

encircling the non-conducting member, conductors connected with the bar and the tubular member, means for electrically connecting one of the contacts of the plug with the bar, a spring arm for electrically connecting the other contact of the plug with the tubular member and a housing formed of non-conducting material mechanically connected with the plug and enclosing the spring arm, the bar and the tubular member.

3. A device of the class described comprising a plug having a pair of contacts thereon, a plate at the rear end of the plug, a bar rotatably and electrically connected with the plate, means for connecting the plate and bar with one contact of the plug, a pair of spring arms, one of which is connected with the other contact of the plug, a sleeve of non-conducting material encircling the bar, a tubular member surrounding the sleeve and extending beyond the outer end thereof, the spring arms having recessed portions contacting the tubular member, a conductor connected with the tubular member, a conductor connected with the bar and a housing of non-conducting material connected with the plug and enclosing the tubular member and the spring arms.

4. A device of the class described comprising a plug having a pair of contacts thereon, a plate at the rear end of the plug and electrically connected with one contact, a bar rotatably and electrically connected with the plate, a spring member connected with the plate and engaging a part on the bar, a pair of spring arms carrying brushes connected with the plug and also connected with the other contact, a sleeve of non-conducting material encircling a part of the bar, a tubular member surrounding the sleeve and engaged by the brushes, a conductor connected with the tubular member, a conductor connected with the bar, clamping means for each set of conductors for preventing strain at the points of junction of the conductors with the members to which they are connected and conductors connected with the contacts.

In testimony whereof we affix our signatures.

ELMA E. GOUCHER.
RODNEY B. CUMMINGS.