

March 6, 1928.

1,661,712

P. VAN WAGNER
ELECTRICAL APPLIANCE

Filed July 31, 1924

2 Sheets-Sheet 1

Fig. 1.

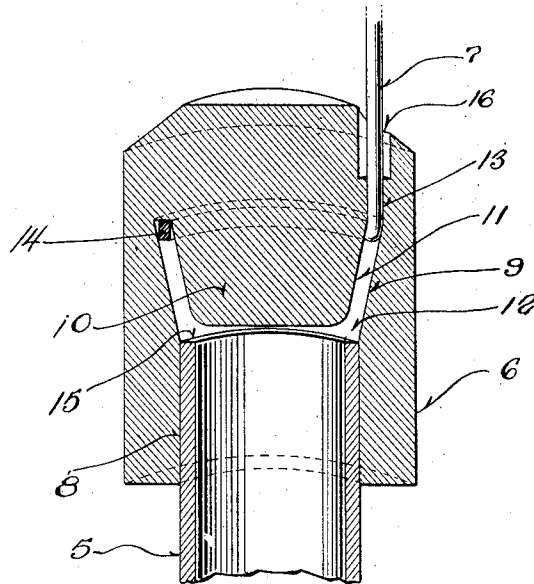


Fig. 2.

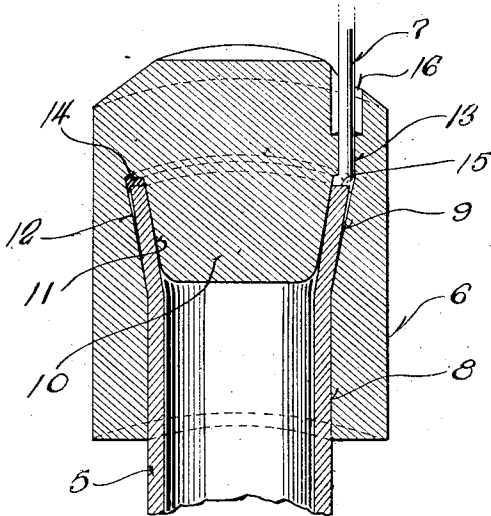
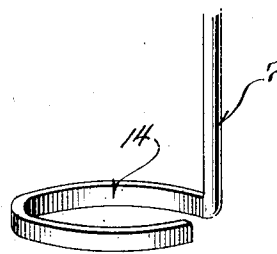


Fig. 3.



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Fig. 4.

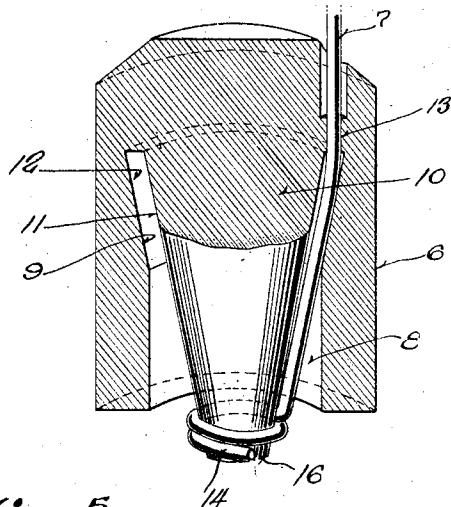


Fig. 5.

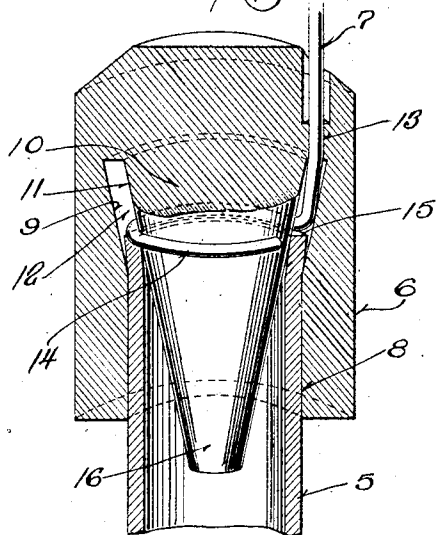
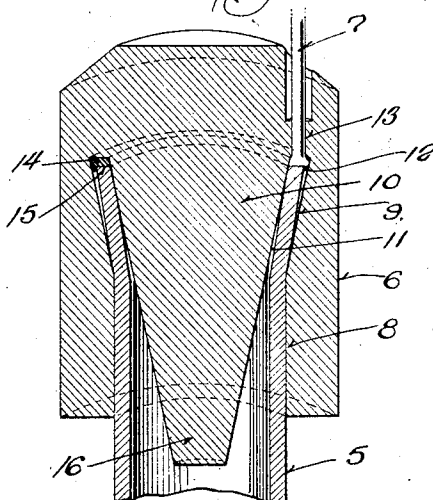


Fig. 6.



Endorse

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UNITED STATES PATENT OFFICE.

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ELECTRICAL APPLIANCE.

Application filed July 31, 1924. Serial No. 729,318.

This invention relates to certain new and useful improvements in electrical appliances and refers more particularly to a ground cap for electrically connecting a conductor with the ground through a tube or rod driven deep enough to reach permanently moist soil.

Heretofore, it has been customary to provide a ground cap, which is secured to the top of a tube or rod driven in the ground, having a well or recess filled with solder in which the end of an electrical conductor is secured by the application of heat in the well known manner. This form of ground cap is objectionable as it requires the use of a blow torch on the job; that the conductors are frequently detached from the cap and that it is necessary to provide means to make an electrical contact between the cap and the ground rod or tube.

Having the above objectionable features to the existing types of ground caps in mind, this invention contemplates as one of its objects means for permanently electrically connecting a conductor with a ground rod or tube to prevent its accidental or unauthorized detachment.

This invention has as another object the provision of a ground cap of the character described in which the electrical conductor is electrically connected directly with the ground rod or tube to thus eliminate the necessity of providing special means to insure a positive electrical connection between the cap and the rod or tube.

A further object of this invention resides in the provision of a device of the character described in which the application of heat to connect the conductor with the ground tube or rod is not required, the electrical connection with the tube or rod being provided by the act of securing the ground cap on the tube or rod.

And a still further object of this invention resides in the provision of an improved ground cap which is of extremely simple construction and which may be readily secured in place without the necessity of any special tools.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel con-

struction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

In the accompanying drawings, I have illustrated two complete examples of the physical embodiment of my invention constructed according to the best modes I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a perspective, sectional view taken vertically through a ground cap and the upper end of a ground rod or tube, the cap being illustrated in its position prior to being fastened on the grounding rod or tube;

Figure 2 is a view similar to Figure 1 illustrating the ground cap as secured in place on the upper end of the grounding rod or tube with the electrical conductor in electrical connection therewith;

Figure 3 is a perspective view of the lower end of the electrical conductor illustrating its shape prior to the securement of the ground cap on the upper end of the rod;

Figure 4 is a perspective, sectional view taken vertically through a modified form of ground cap illustrating the manner of placing the electrical conductor in position prior to placing the cap over the grounding rod or tube;

Figure 5 is a view similar to Figure 1 illustrating the modified form of ground cap, and

Figure 6 is a view similar to Figure 2 of the modified structure.

Referring now more particularly to the accompanying drawings in which like numerals designate like parts throughout the several views; the numeral 5 designates a ground tube or rod, the former being preferable, which is adapted to be driven into the ground sufficiently deep to reach permanently moist soil, and 6 designates a ground cap which is adapted to be secured on the upper end of the ground tube or rod to afford means for electrically connecting a ground wire or electrical conductor 7 therewith.

The cap 6 is of substantially inverted cup-

shape having a bore 8, the inner, closed end of which is flared or taperingly enlarged, as at 9, to receive a boss or projection 10 extending thereinto from the top of the cap. The boss 10 is of less diameter than the inner end of bore 8 and is taperingly reduced so that its peripheral wall 11 is spaced from and parallel with the tapered portion 9 of bore 8 to form a flaring, annular channel 12, into which the upper end of the ground tube or rod 5 is spread or forced when the cap member 6 is pressed or driven thereover, as illustrated in Figure 2.

The conductor 7 has its end portion 14, which may be flattened if desired, passed through an aperture of opening 13 in the top of the cap member, when it is directed laterally and then curved to a diameter substantially equal to that of the upper end of channel 12, as illustrated in Figures 1, 2 and 3. The wire is then retracted through the aperture 13 to position its curved end in the channel 12 before the cap is placed over the end of the ground tube or rod. As the cap member is pressed or driven in position, the upper edge 15 of the tube or rod 5 compresses the end portion 14 of the conductor between it and the inner end of the channel. The conductor 7 being preferably of copper or other comparatively soft metal, fills out the inner end of the channel and is forced in between the upper outer edge of the tube or rod and the adjacent wall portion 9 of the cap member to insure a positive electrical connection between the conductor and the ground tube or rod.

The ground cap is held against detachment by the outward swedging or flaring of the upper end of the tube or rod as the cap member is pressed or forced thereover, the upper end of the tube or rod being forced to fill the channel 12 by the boss 10. In this manner, the cap member 6 is rigidly secured over the upper end of the tube or rod and the conductor 7 permanently electrically connected therewith, as before described.

The outer portion of the opening 13 may be counter-bored, as at 16, for convenience in inserting the conductor 7 therethrough and this counter-bore may be, if desired, filled with lead, solder, wax or any other material.

In Figures 4, 5 and 6, a slightly modified form of grounding cap member is illustrated in which the boss 10 is projected outwardly of the bore 8, as at 16. In this construction, the end 14 of the conductor is twisted or turned about the boss extension 16, as depicted in Figure 4, the turns uncoiling to approximately the diameter of the bore 8 when the tension is released to permit its movement into the position illustrated in Figure 5 prior to the placing the cap over the ground tube. The cap member is then forced over the ground tube to confine the

conductor end 14, between the inner end of the channel and the ground tube, as illustrated in Figure 6, to provide an electrical connection between the conductor and ground tube.

What I claim as my invention is:

1. A device of the character described, comprising a cap member having its under face bored, the inner end of the bore being taperingly enlarged, and said cap having an opening in its upper portion communicating with the upper end of said bore, a ground rod of a normal diameter substantially equal to the minimum diameter of said bore, a conductor adapted to have one end passed into the taperingly enlarged end of said bore through the opening in the cap member, said cap member being adapted to be forced on the upper end of the rod to swell the upper end of the ground rod as the cap member is pressed thereover and rigidly secure the cap member thereon and press the end of the conductor in the tapered bore into electrical connection therewith.

2. A device of the character described, comprising a cap member having its under face bored, the inner end of the bore being taperingly enlarged, and said cap having an opening in its upper portion communicating with the upper end of said bore, a ground rod of a normal diameter substantially equal to the minimum diameter of said bore, a conductor adapted to have one end passed into the taperingly enlarged end of said bore through the opening in the cap member, said cap member being adapted to be forced on the upper end of the rod, and means within said bore for swelling the upper end of the ground rod as the cap member is pressed thereover to rigidly secure the cap member thereon and press the end of the conductor in the tapered bore into electrical connection therewith.

3. A device of the character described, comprising a cap member having its under face bored, the inner end of the bore being taperingly enlarged, a boss formed on the cap member and extended into the taperingly enlarged portion of the bore from the closed end thereof, said boss being of less diameter than said bore and being taperingly reduced to, with the bore, provide a channel which is taperingly enlarged from the outer end of the bore, whereby the cap member may be placed on the upper end of a tube of a diameter not greater than the diameter of the outer portion of said bore and, upon application of pressure to the cap member, be driven on the tube upper end to spread the same into said tapered channel and secure the cap member thereon, and a conductor adapted to have one end disposed in the upper end of said channel and to be secured thereto by pressing of the cap member over the tube to provide

an electrical connection between the conductor and the tube.

4. A device of the character described, comprising a cap member having its under face bored, the inner end of the bore being taperingly enlarged, a grounding tube of a diameter not greater than that of the outer end of the cap member bore, a boss formed on the cap member and extended into the taperingly enlarged portion of the bore from the closed end thereof, said boss being of a diameter less than said bore and being taperingly reduced to, with the bore, provide a channel which is taperingly enlarged toward the closed end of the bore, whereby the cap member may be placed over the upper end of the tube and, upon application of pressure thereto, be driven over the tube upper end to spread the same into said tapered channel and secure the cap member thereon, said cap member having an aperture therein communicating with the upper end of said tapered channel, a conductor adapted to have one end inserted into the channel through said aperture, and an annular ring formed on the end of the conductor in the channel and adapted to be positioned in the inner end thereof prior to the pressing of the cap member on the grounding tube, whereby forcing of the upper end of the grounding tube into said channel by pressing of the cap member thereover spreads the upper end of the grounding tube into said taperingly enlarged channel and confines the annular end of the conductor between it and the inner end of the channel, said conductor annular end substantially filling the inner end of said channel and having an electrical connection with the grounding tube.

5. A device of the character described, comprising a cap member having its under face bored, the inner end of the bore being taperingly enlarged, a grounding tube of a diameter not greater than that of the outer end of the cap member bore, a boss formed on the cap member and extended into the taperingly enlarged portion of the bore from the closed end thereof with its end projected outwardly of the cap member, said boss being of a diameter less than said bore and being taperingly reduced to, with the bore, provide a channel which is taperingly enlarged toward the closed end of the bore, whereby the cap member may be placed over the upper end of the tube and, upon application of pressure thereto, be driven over the tube upper end to spread the same into said tapered channel and secure the cap member thereon, said cap member having an aperture therein communicating with the upper end of said tapered channel, and a conductor adapted to have one end passed into the channel through said aperture and turned about the projected end of the boss prior to pressing of the cap member on the grounding tube, whereby forcing of the upper end of the grounding tube into said channel by pressing of the cap member thereover spreads the upper end of the grounding tube into said taperingly enlarged channel and confines the end of the conductor turned about the boss between the tube upper end and the inner end of the channel to provide an electrical connection between the conductor and the grounding tube.

In testimony whereof I affix my signature.

PAUL VAN WAGNER.