

C. W. PEN DELL.
GROUNDING DEVICE.
APPLICATION FILED JAN. 9, 1918.

1,342,645.

Patented June 8, 1920.

Fig. 1.

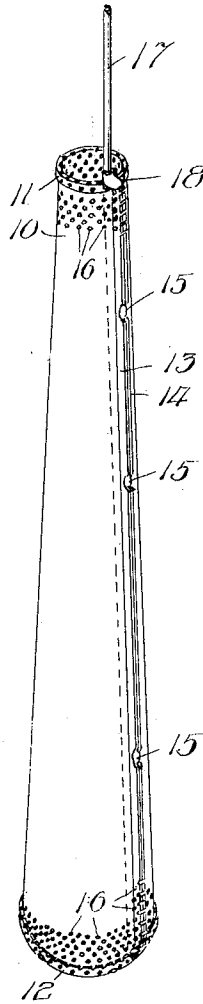


Fig. 2.

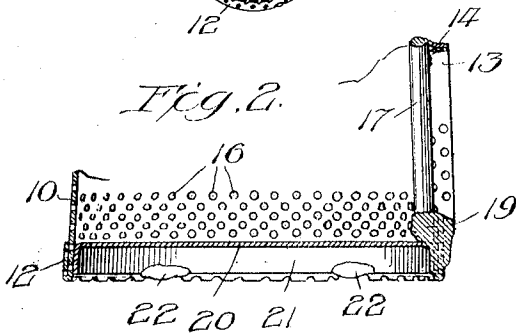


Fig. 4.

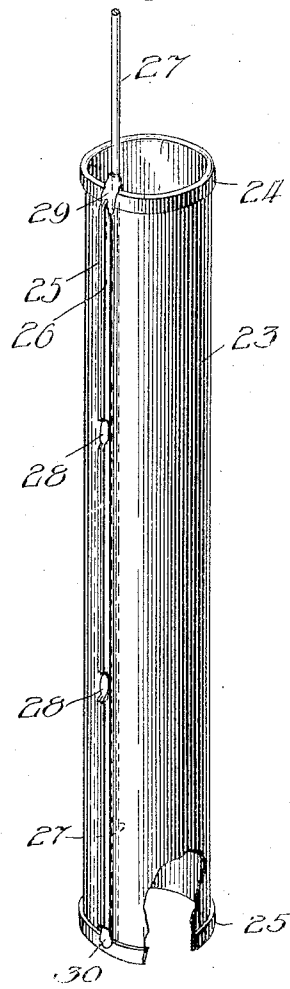
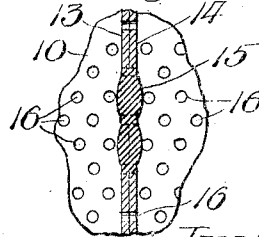


Fig. 3.



Inventor:
Charles William Pendell

by Thomas H. Ferguson
Atty

UNITED STATES PATENT OFFICE.

CHARLES WILLIAM PEN DELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO PARAGON ELECTRIC COMPANY, A CORPORATION OF ILLINOIS.

GROUNDING DEVICE.

1,342,645.

Specification of Letters Patent.

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Application filed January 9, 1918. Serial No. 211,089.

To all whom it may concern:

Be it known that I, CHARLES WILLIAM PEN DELL, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Grounding Devices, of which the following is a specification.

The present invention relates to devices for grounding telephone, telegraph, electric lighting and other electric wires as is commonly done in such systems.

It has been common practice heretofore to provide such ground connections by driving a metal pipe in the ground, or by burying a metallic plate, cone, or the like, in the ground and connecting the grounding wire of the system to it. In such cases the wire has been soldered to the buried grounding member and in some instances the grounding device has had its parts connected together by solder. In other instances the grounding device has been made up of different metals. In all these cases of the prior art there is a galvanic action set up between the buried different metals and, as a result, there is a rapid deterioration in the value of the ground connection. In such cases the galvanic action is often sufficiently great to completely open the electrical connection within a few years and to so weaken the mechanical connection that the grounding wire may be readily pulled away from the buried grounding member by hand.

The object of the present invention is to overcome this rapid deterioration of the grounding device and as a result of a study of the problem and repeated experiments, I have discovered that if the grounding wire and the grounding member to which the wire is attached be of the same metal and the wire and member be connected by welding, there is no galvanic action and the life of the device is greatly increased over the grounding devices of the prior art.

In the accompanying drawing I have illustrated two different forms of grounding devices constructed in accordance with my invention, and the scope of the invention is set forth in the appended claims.

In said drawing Figure 1 is a perspective view of a grounding device in the form of a perforated cone; Fig. 2 is a vertical section of a portion of the same upon an enlarged scale; Fig. 3 is a similar detail illustrating

one of the welded joints; and Fig. 4 is a perspective view of a similar grounding device of cylindrical formation. Throughout these views like characters refer to like parts.

Referring to the form of the invention illustrated in Figs. 1, 2, and 3, 10 designates a truncated cone composed of a sheet of metal, preferably copper, provided with a flange 11 at its top and a flange 12 at its bottom and having its longitudinal edges terminating in flanges 13 and 14. The flanges 11 and 12 are formed by turning the metal back upon itself, as clearly illustrated. The flanges 13 and 14 extend radially outward from the axis of the cone and abut against each other, as clearly illustrated. These flanges are held together by a succession of welds 15 which may be produced by any desired welding process and which in the present instance show that they have been formed by melting down portions of the flanges 13 and 14. An oxygen acetylene torch is preferably used for this purpose. The cone 10 is provided throughout its length with a plurality of openings 16 to allow for the passage of moisture and earthy materials into intimate contact with all portions of the cone when in use. In some instances the cone may be filled with a porous and moisture retaining substance. The grounding wire 17 may be connected at one or more points to the cone 10, as desired. In the present instance a welded joint 18 is provided at the upper end of the cone and a similar joint 19 at the lower end, and the wire 17 runs throughout the length of the cone, as illustrated. In both of these welds 18 and 19 the metal of the cone and of the wire 17 has been heated sufficiently to run together and form the welded connection. In this form of the invention I also preferably provide a bottom 20 for the cone and this bottom is provided with an annular flange 21 which is secured to the adjacent portion of the cone by welding the same together at desired points, as indicated at 22. One of the welds formed between the flanges 13 and 14 is shown in section in Fig. 3 and there the metal of the two flanges is shown as run together to form the welded joint. Where desired in making a weld additional metal may also be supplied. In the present instance the parts of the cone are composed of the same material, preferably copper. The wire 17 is also composed of the same

material as the cone and is also preferably composed of copper. In case any metal is added in forming the welded joint, the metal should also be of the same material as the cone 10 and the wire 17.

In the second form of the invention, namely that illustrated in Fig. 4, the grounding member consists of a cylinder 23 having flanges 24 and 25 at its top and bottom, formed by turning back the metal upon itself, and provided with longitudinal outwardly extending flanges 25 and 26, which are similar to the flanges 13 and 14 of the first form of the invention. In this form a wire 27 corresponds to the wire 17 and extends throughout the length of the cylinder 23, as indicated by the dotted lines. In this instance the joints 28, 29 and 30 are formed in the same way as the joints 15, 18 and 19 of the first form of the invention. Likewise in this form of the invention the same metal is used in all parts of the device, whether in the cylinder 23, the wire 27, or in the metal added in making any of the welded joints.

In operation the entire grounding device except the upper end of the grounding wire is buried in the earth and, as before indicated, the interior of the device in each instance may be filled by some porous moisture-absorbing material, such as charcoal or the like, but in lieu thereof the interior may be filled in with earth. Ordinarily a hole is dug and the device is placed in it and then the hole is filled up with earth. Because of the welded connections and the use of the same metal throughout, the contact of the device with the earth does not result in galvanic action between the parts of the device,

and consequently there is no deterioration at the points where the grounding wire is connected to the grounding member, but the connection remains unimpaired both electrically and mechanically.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A grounding device for electric circuits comprising a relatively thick copper grounding wire and a grounding member of relatively thin sheet copper welded to said wire, thereby providing a connection which shall be free from deterioration by galvanic action when the device is in service buried in the ground.

2. A grounding device for electric circuits comprising a copper grounding wire and a compactly shaped copper grounding sheet, said wire and sheet being of substantially differing thicknesses and being welded together, thereby providing a connection which shall be free from deterioration by galvanic action when the device is in service buried in the ground.

3. A grounding device for electric circuits comprising a copper grounding wire, a relatively thin copper sheet shaped so as to bring non-adjacent edges together, said edges being flanged and the flanges welded together at intervals, and said sheet being welded to said wire, whereby said welded connections are free from deterioration from galvanic action when the device is in service buried in the ground.

In testimony whereof I have hereunto subscribed my name this 28th day of November, A. D. 1916.

CHARLES WILLIAM PEN DELL.