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WOODEN POLES WITH ELECTRICALLY ISOLATED SECTIONS AND A CENTRAL
OPENING FOR THE INTRODUCTION OF A PRESERVATIVE

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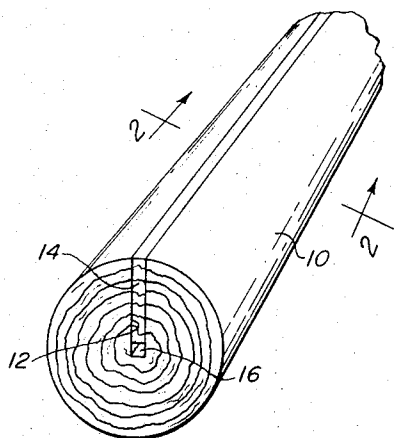


Fig. 1

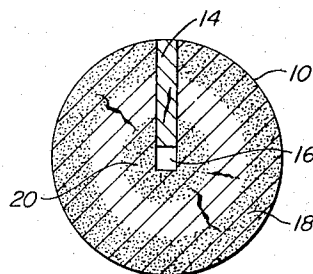


Fig. 2

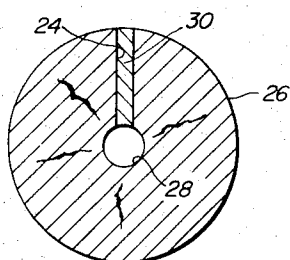


Fig. 3

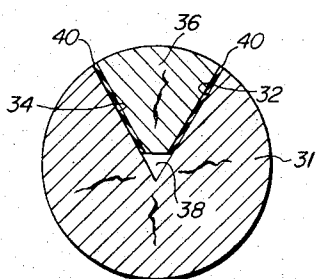


Fig. 4

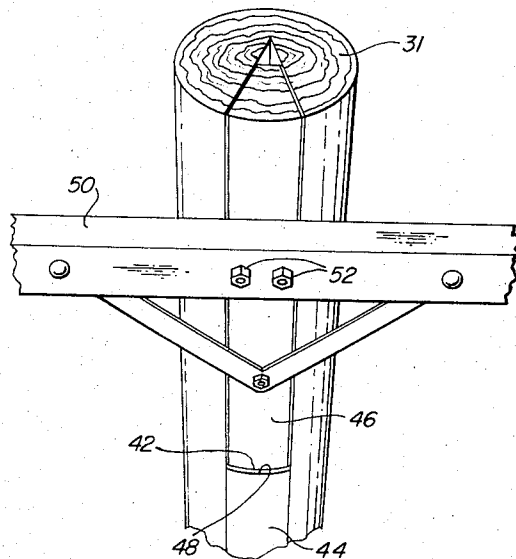


Fig. 5

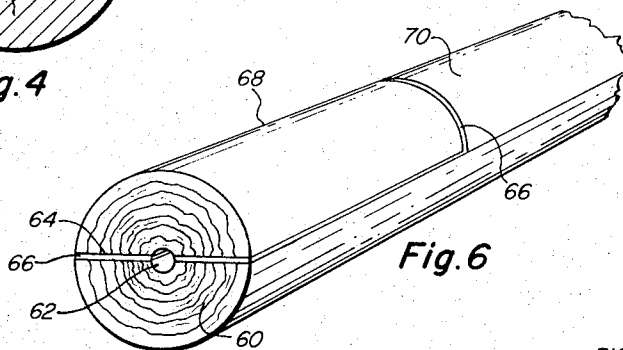


Fig. 6

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WOODEN POLES WITH ELECTRICALLY ISOLATED SECTIONS AND A CENTRAL OPENING FOR THE INTRODUCTION OF A PRESERVATIVE

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ABSTRACT OF THE DISCLOSURE

Poles and timbers are slotted and heartwood removed. Slot is then closed with insert secured in place with insulating adhesive but leaving hollow core into which preservative may be placed. Insert may be used for supporting electrical circuits thus insulated from balance of pole.

Most woods have little natural resistance to rot and decay. To impart some degree of resistance to attack poles and timbers are frequently impregnated with preservative chemicals such as creosote and pentachlorophenol. Securing penetration of the preservative is difficult and resort has been made to pressure treatment in an effort to secure penetration of the preservative as deeply as possible. However, since penetration cannot be secured for more than an inch or two, members which have a dimension greater than three or four inches in each direction can ordinarily not be penetrated to their centers. This is particularly undesirable in the case of poles since the heartwood forming the center of such poles has the least resistance to rot and decay. As a result, most of the attack on poles works from the heartwood outwardly.

In an effort to secure a greater depth of penetration of the interior of poles and timbers the same have been incised from their surface and it also has been proposed that the same be bored for their length through the center. Even with incising adequate penetration of preservative to the center frequently is not obtained and boring of the center of the pole or timber is limited to members of relatively short length for it is not possible, practically, to attempt to bore a member for a depth of more than a few feet.

It is, therefore, an object of the present invention to provide a method whereby long poles and timbers may be more thoroughly impregnated with a preservative than with processes heretofore available.

More particularly it is an object of the present invention to provide a process whereby the heartwood of a pole or timber may be saturated with a preservative.

Another object is to provide an arrangement whereby a supply of preservative may be maintained in the center of a pole.

Still another object of the invention is to provide a pole having superior electrical insulating properties.

Other objects and advantages of the invention will become apparent hereinafter.

In accordance with the present invention a pole to be treated with the preservative is formed with an opening through the side of the pole extending to the center thereof and for the length thereof, thereby providing an opening through the heartwood for the entire length of the pole. The opening is then closed with a plugstrip except for the center portion thereof so as to leave an aperture or hole extending the length of the pole. The pole may be then subjected to pressure treatment whereby the very heart of the pole may be treated with preservative since the preservative may flow through the

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center hole and inwardly to the wood therefrom as well as inwardly from the outer surface of the pole. Upon erection of the pole the center hole may be filled with a preservative thereby providing a reservoir of preservative which may slowly seep into the surrounding heartwood and which may also seep through such cracks and checks as may form in the pole thus inhibiting the commencement of rot and decay.

In another embodiment of the invention a pair of angularly displaced slices are formed in a pole to the center thereof so as to divide the pole into two separate portions. Material is then removed from at least one of such portions along the center thereof so as to provide an axial, lengthwise extending opening after which the pole is reassembled, securing the portions together with adhesive having high electrical resistance, that is, higher electrical resistance than that of the wood composing the pole, whereby the two portions are effectively insulated from one another electrically thus enhancing the electrical properties of the pole for use as an electrical circuitry support.

For a more detailed description of the invention reference is made to the accompanying drawings wherein:

FIG. 1 is a perspective view of a pole manufactured in accordance with the invention;

FIG. 2 is an enlarged sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is a cross sectional view of a pole constructed in accordance with still another modification;

FIG. 4 is a cross sectional view of a pole constructed in accordance with still another modification;

FIG. 5 is a fragmentary perspective view of the pole of FIG. 4 illustrating the manner of using the same; and

FIG. 6 is a fragmentary perspective view of still another embodiment of the invention.

Referring now to FIG. 1, in accordance with the method of the invention a timber or pole such as shown at 10 to be treated is formed with an opening 12 by any suitable means as by routing such that the opening extends from the periphery of the pole to the center thereof and from one end to the opposite end of the pole. The slot or opening 12 is thereafter closed by a suitable plugstrip 14 except for the portion of the opening 12 at the very center of the pole thereby leaving an axial, lengthwise extending opening 16.

After the insertion of the plugstrip 14 the pole may be subjected to pressure treatment so as to impregnate the exterior surface of the pole 10 with a preservative such as creosote or pentachlorophenol or other suitable preservative. At the same time the preservative will, of course, enter the opening 16 causing effective penetration of the preservative throughout the center portion of the pole as more particularly indicated in FIG. 2 where the area of penetration of the preservative from the exterior of the pole is indicated by the dotted area 18 and where the area of penetration of preservative from the opening 16 is indicated by the dotted area 20.

After pressure treatment the opening 16 may, if desired, be filled with a liquid preservative and the opposite ends of the opening plugged whereby a reservoir of preservative is present in the pole and which preservative will, in due course of time, be absorbed by and migrate through the wood to maintain a plentiful supply of preservative within the wood of the pole.

Referring to FIG. 3, in accordance with a further embodiment of the invention, a slot 24 is formed in a pole 26 as previously described and the slot widened at the center of the pole by inserting a router or other tool through the slot to form a large opening 28 at the center of the pole. Thereafter, a plugstrip 30 is inserted in the slot 24. The pole 26 may be subjected to pressure treatment as in the previous case and the opening 28 filled

with preservative and plugged at both its ends after pressure treatment. It should be remarked that in certain instances it may be desirable that the pole be erected in the soil without plugging the bottom end and that thereafter it be filled with preservative so that preservative can slowly seep out into the surrounding soil at the bottom of the pole. The preservative leaking into the soil will inhibit the growth of decay inducing micro-organisms present in the soil.

In accordance with still another embodiment of the invention as shown in FIG. 4 the pole 31 to be treated is formed with a pair of radial slices 32, 34 inclined at an acute angle with respect to each other so as to cut a wedge shaped piece 36 from the pole. Thereafter, a portion is removed from the apex of the wedge 36 and the wedge reinserted in the member and secured in its original position whereby the removed portion of the wedge defines an opening 38 extending the length of the pole. Preferably, in securing the wedge 36 in position, an adhesive having substantially higher electrical resistance than that of wood, such as, for example, an epoxy resin adhesive, is utilized to secure the wedge in position, the adhesive being formed as a complete film on the opposite surfaces of the wedge 36 or on the surfaces of the wedge cut formed in the pole 10. A filler strip indicated at 40 may be required on one or both sides of the wedge to compensate for the material removed in forming the wedge cuts 32, 34. The filler strips may also be formed of a material having high electrical resistance.

The advantage of forming the filler strips 40 of high electrical resistance or utilizing an adhesive of such properties is that the wedge 36 is thereby insulated from the remainder of the pole 31 so that electrical circuits mounted on the wedge are insulated from circuits mounted elsewhere on the pole.

After the wedge 36 is removed from the pole it may be cut transversely, as indicated at 42 in FIG. 5 to form pieces 44, 46, and either prior to or at the time that it is reinserted in the pole a layer of electrical insulating material 48 positioned between the pieces of the wedge so as to electrically insulate the pieces 44, 46 from one another. The electrical insulating material may again be in the form of an adhesive having an electrical resistance substantially higher than that of wood, or it may be a separate sheet of electrical insulating material secured between the pieces 44, 46 of the wedge with suitable adhesive.

As indicated in FIG. 5 in the reassembled pole a cross-arm 50 is secured by suitable fasteners such as bolts 52 to one of the wedge pieces 46 whereby such a crossarm is insulated from the remainder of the pole and from the earth by the layers of electrical insulating material 40, 48 separating the piece 46 from the remainder of the pole 31. By reason of this construction leakage currents from transmission lines supported on the crossarm 50 are minimized. Because of the relatively high moisture content of wood leakage currents through the conventional crossarm and pole are substantial. Wood, though it is considered to be an insulator, actually conducts a substantial current because of the relatively high moisture content that remains in the wood. With the section 46 insulated from the balance of the pole 32 by an epoxy resin or like high resistance product, leakage currents may be substantially reduced.

Still another aspect of the invention is shown in FIG. 6. In this embodiment the pole or timber 60 is sliced longitudinally diametrically the same. At least one, both in the illustrated embodiment, of the halved portions is

then grooved along the center line thereof on the exposed face as indicated at 62 and the pole halves are then reunited again preferably using an electrical insulating adhesive so as to insulate the pole halves from one another. Prior to reassembling the pole one of the halves may be cut transversely as indicated at 66 and a layer of electrical insulating material inserted between the pieces 68, 70 to insulate the same when the pole is reassembled. Thus, an electrical transmission line secured to one of the portions 68, 70 is effectively insulated from the remainder of the pole so as to minimize leakage currents from the transmission line through the pole.

As previously described, in all of the embodiments shown, the pole is preferably pressure impregnated after reassembly of the same and after erection the opening through the center of the pole may be filled with a liquid preservative. As will be apparent, preservative may be added to the opening in the pole as necessary from time to time to maintain a supply therein. Long timbers or other wooden members may be treated in like fashion.

Having illustrated and described a preferred embodiment of the invention it should become apparent to those skilled in the art that the invention permits of modification in arrangement and detail. I claim all such modifications as come within the spirit and scope of the appended claims.

I claim:

1. An elongate, generally round wood pole, said pole having an axial opening therein extending the length thereof,

said pole having therein at least two layers of electrical insulating material having a conductivity less than that of wood, each extending from said center opening to the surface of said pole and for the length of said pole.

2. A pole as set forth in claim 1 wherein said areas are co-planar.

3. A pole as set forth in claim 1 wherein said areas are at an acute angle with respect to each other.

4. A pole as set forth in claim 1 wherein said pole has a layer of electrical insulating material extending transversely of said pole between the first mentioned layers.

5. An elongate, generally round wood pole, said pole having an axial opening therein extending the length thereof,

said pole having at least two layers of electrical insulating material having a conductivity less than that of wood spaced circumferentially from one another and extending from said center opening to the surface of said pole and longitudinally of said pole for at least a portion thereof from one end of said pole, and

a layer of insulating material extending transversely of said pole between said two layers whereby a part of said pole is electrically insulated by said layers from the remainder of said pole.

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