Aug. 31, 1926. 1,598,592

T. J. BARRETT

PRESERVATION OF POLES AND THE LIKE

Filed Jan. 27, 1925

FIG. I.

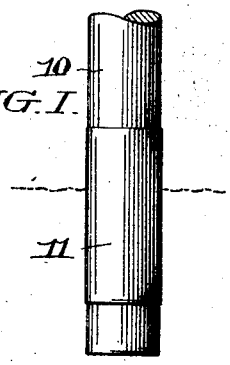


FIG. II.

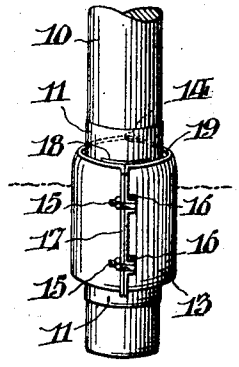


FIG. III.

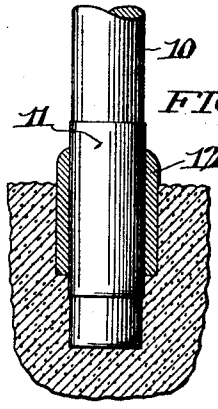


FIG. IV.

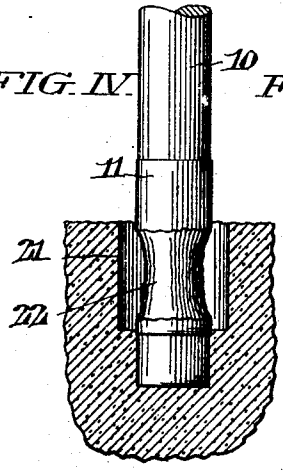


FIG. V.

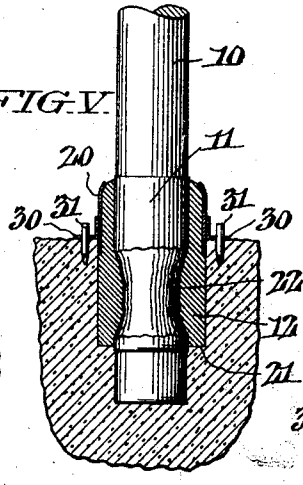


FIG. VI.

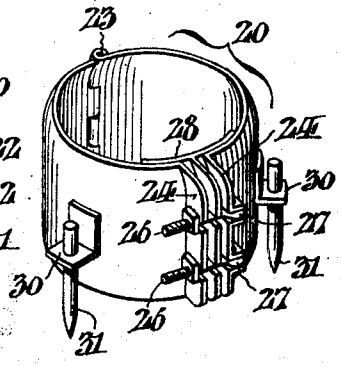


FIG. VII.

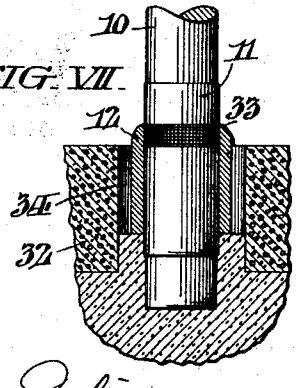
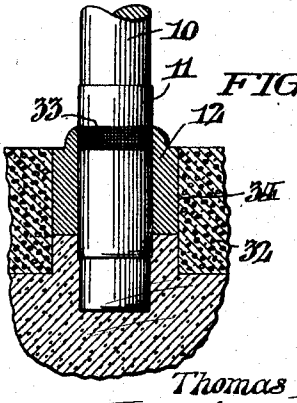


FIG. VIII.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PRESERVATION OF POLES AND THE LIKE.

Application filed January 27, 1925. Serial No. 5,014.

My invention relates to the treatment and preservation of poles and posts that are set in the ground, and the like; such as telegraph and telephone poles; posts or piles for fences, guard rails, or other structures; etc., etc. I aim to prevent or minimize deterioration or decay; to obviate accidental failures in service; and, in general, to prolong the useful life of poles, posts, piles, etc. Through my invention, these and other advantages can be realized easily and at relatively small cost; the preservative treatment can be carried out on the job, without necessity for elaborate or expensive plant and equipment; and poles that have already been installed (and even decayed somewhat) can be successfully and economically treated, without resetting or disturbing them.

To retard decay of wooden poles, various expedients have heretofore been resorted to. For example, such poles have been creosoted or the like, especially their ends that are to be set in the earth have been given such treatment. Also, poles have been set or encased in concrete at and below the surface of the ground.

In methods of preservation such as typified by creosoting, the preservative does indeed penetrate the fiber of the wood and destroy the action of fungus and other deteriorating organisms; but it does not form any impervious protective layer or coating on the outside of the pole treated, and only retards decay to a relatively limited degree. Such methods, also, are practically applicable only to new poles, before they are set.

Setting poles in concrete is not only subject to the same limitation, but also involves peculiar disadvantages of its own. When a pole is set directly in the ground, the soil affords it yielding support at the ground line, so that elastic flexure of the pole below ground is possible, and the variation of bending stresses due to wind or other forces is gradual. When the pole is set in concrete, on the contrary, its portion thus encased is held rigid and inflexible, so that the bending stress is not distributed, as before, but is sharply concentrated in maximum intensity at the point or level where the pole enters the concrete. Under these conditions, the pole is liable to be suddenly snapped off at this point. This condition is the more serious because water running down the pole causes it to decay just at and above the artificial ground line represented by the top of the concrete, so that the weakness from decay is greatest at the very point where the greatest stress is concentrated.

In preferred forms of embodiment such as hereinafter described, my invention obviates all such disadvantages of prior practice. For a pole set directly in the earth, it affords even better protection from decay than a setting in concrete, yet does not impair its flexibility, nor result in concentrated or accelerated decay above the protected area. As compared with creosoting, on the other hand, it affords the advantage of an impervious adherent coating on the exterior of the pole, and even a thick protective jacket around it. It is applicable to old poles, that have been in service for some time, and even decayed, with about the same advantage and convenience as to new ones,— whether the latter have been put or set in their holes or not. In the case of such old poles, especially, it permits reinforcement of the portions at the ground line, that have been weakened by decay, without impairment of the protection afforded at this region, by reinforcing means enclosed in the protective jacket. And while it ordinarily finds its most perfect and advantageous exemplification in the case of poles set and bedded directly in the ground, it is also adaptable and useful for the protection of poles which are wholly or partly set in concrete for any reason.

In the drawings, Fig. I is a fragmentary side view of the lower end of a pole, illustrating the application of my invention thereto.

Fig. II is a similar tilted view, showing a mold around the pole for the formation of a bituminous jacket thereabout.

Fig. III is a side view of a jacketed pole in place in the ground, the jacket appearing in section.

Fig. IV is a fragmentary side view of the lower end of a pole already set in the ground, illustrating the application of my invention under these conditions.

Fig. V is a similar view, illustrating the jacketing of the pole under such conditions.

Fig. VI is a perspective view of a mold suitable for jacketing a pole already in place in the ground.

Figs. VII and VIII are views generally similar to Figs. IV and V, illustrating the application of my invention to a pole set in concrete.

In carrying out my invention with a wooden pole or post as here illustrated, such pole or post 10 preferably receives an adherent bituminous protective coat 11, so applied as to penetrate below the surface of the wood somewhat. This coat 11 is applied to the portion of the pole 10 at the ground line (indicated by dots and dashes in Figs. I and II), so as to extend some distance below the surface of the ground and also a short distance above. In addition, the pole 10 is preferably further protected by a bituminous jacket 12 of substantial thickness, applied to its coated portion at 11. Preferably, the bituminous coating 11 extends a short distance above the jacket 12, and also somewhat below it. The coating and jacketing may, one or both, be done either before or after the pole 10 is placed in ground, and even after its lower portion has been tamped or otherwise permanently "set".

In giving a new pole 10 (as illustrated in Figs. I–III) an adherent, penetrant bituminous coating 11, I prefer to proceed (assuming that the pole is dry, or after it has been dried in any suitable way, as by heating with a blow torch) by applying bitumen, with a volatile inflammable liquid, to the portion of the pole 10 that is to be coated. An oil-fluxed asphalt of about 50 degrees penetration, softened or dissolved in an organic solvent, such as gasoline, is very suitable: e. g., 70 parts asphalt with 30 parts or more of gasoline. With such proportions of solvent or "liquefier", the material will be of freely liquid consistency, so that it can readily be brushed or sprayed on. Directly after application of this bituminous material, its inflammable fluid is ignited (as by means of a torch) and burnt away. By the combustion of the volatile fluid, sufficient heat is developed to further dry and heat the exterior of the pole 10, and to melt the bitumen itself and cause it to be partly absorbed by the wood. The bitumen not absorbed into the pores of the wood remains on its surface, in the form of a thin protective coating 11, firmly adherent to the wood by virtue of the penetration of the latter by the bitumen. With a volatile inflammable solvent, such as gasoline, benzine, or the like, the bituminous residue will remain practically uncoked or otherwise unaffected by the burning out of the fluid. As above stated, this operation can be carried out either before the pole 10 is placed in the ground or afterward, before the earth is filled in around the portion to be coated. Even alone, without addition of a bituminous jacket 12, such a coating 11 on a pole 10 affords it valuable protection.

After coating, the pole 10 may be invested or incased in a jacket 12 of suitable bituminous material, which may be applied or formed about it in any suitable way. With a proper degree of heat (according to the particular character of the bituminous material used), this jacket 12 will virtually blend with the bitumen 11 already on the pole 10, thus forming a compact, waterproof layer, firmly adherent to the entire area of the pole which it covers by virtue of the penetration of the latter with bitumen in the initial coating operation.

If the jacketing of the pole 10 is done before it is put into the ground, a split mold 13 may preferably be employed, as illustrated in Fig. II. As here shown, this mold 13 consists of longitudinal separated halves hinged together at 14, and detachably secured together by bolts 15 pivoted to one half at 16 and adapted to be engaged in a slotted flange 17 on the other half. A sheet metal shield 18 or the like may be placed over the junction of the mold halves, inside the mold, to obviate any leakage of bitumen at the junction. After the mold 13 has been secured, the bitumen may be poured in through an opening 19 at the top of the mold. When the bitumen has solidified, the mold 13 is removed, leaving the jacketed pole 10 ready for placing and setting in the ground. If the jacketing is done after the pole 10 has been placed in the ground and tamped up to the portion to be covered with bitumen, the walls of the cavity around the pole will serve as a mold for the corresponding portion of the jacket 12. In order to extend the jacket 12 above the ground in this case, the mold cavity afforded by the earth may be supplemented with a split metal mold 20, such as hereinafter described in connection with Figs. V and VI.

A bituminous jacket 12 of this character affords various advantages. Owing to its natural flexibility, the jacket 12 does not impair or interfere with the free flexure of the pole 10, though it affords the most thorough protection to the portion at the ground line, where decay occurs. When the coating 10 is allowed to extend above the top of the jacket 12, it prevents water accumulating on the top of the jacket from rotting the pole at its artificial "ground line". Preferably, the top surface of the jacket 12 may be beveled or rounded off (either in molding, or with a suitably heated tool afterward,) as shown in Fig. III. The thickness of such a jacket 12 may conveniently be about 2 inches or more and it may preferably extend some 8 inches or 9 inches above ground. A great variety of materials may be employed for such a jacket 12: e. g., pure bitumen of approximately the same character as that used for the coat 11 or bituminous mastic, including sufficient rather small grained mineral or other filler to render it harder and less liable to soften under extreme sun heat. A good, tough bitumen of this character will not be cracked

or chipped off by any ordinary accidental impact to which it may be subjected.

In dealing with a pole 10 that has already been set or in service for some time as illustrated in Figs. IV and V the earth is removed close around it, as at 21, to a depth below that at which decay is likely to be serious. If the pole is found decayed, the decayed wood is removed, as indicated at 22. The portion of the pole 10 in the cavity 21 is preferably well dried, as by heating with a blow torch. Then, while the pole 10 is still hot, bitumen with an inflammable volatile fluid is applied to the portion to be protected and the volatile fluid ignited, just as before. In the burning out of the fluid the pole 10 is heated, dried and coated with bitumen, as already described, and the walls of the cavity 21 are also heated and dried. Thereafter the bituminous jacket 12 may be molded about the coated portion of the pole, as shown in Fig. V,—the mold afforded by the ground cavity 21 being preferably supplemented with a metal mold 20, such as shown in Fig. VI.

As here shown, the mold 20 is split lengthwise to facilitate placing it about the pole 10, and its halves are hinged together at 23. Opposite the hinge 23, the halves have flanges or lugs 24, 24, one of which is slotted at 25, while the other carries bolts 26 pivoted thereto at 27, and adapted to be engaged in the slot 25 and tightened to draw the mold halves together. Thus the bolts 26 afford a range of adjustability of the mold to take care of some variation in pole sizes. As shown, a curved metal shield 28 is provided to cover the interval between the mold flanges 24, 24; preferably, it has a lug, 29 apertured to take the bolts 26, so that the latter may hold it in place. A short distance above its lower edge, the mold 20 has laterally projecting external feet 30 apertured for stakes or pins 31 to be driven into the ground, to hold the mold in position.

In dealing with a pole 10 already set, it may sometimes be preferred to pour bitumen softened with an inflammable volatile fluid (such as gasoline) into the hole 21 around the pole 10, and to ignite and burn out the fluid,—instead of applying the material in the form of a coat on the pole 10. When this is done, the burning out of the fluid will result in a penetrant and adherent bituminous coating on the pole 10, and in the concurrent formation of the jacket 12 around the pole. If sufficient bitumen to fill the mold cavity does not remain after the solvent has burned out, additional bitumen may be poured in.

Figs. VII and VIII illustrate the application of my invention to a pole 10 set in concrete 32. While this may be done substantially according to any of the methods described above, as here shown, the pole 10 has received its initial bituminous coating 11; a bituminous jacket 12 has been applied to it; and it has been set and tamped about up to the lower end of the jacket. In this instance, a metallic grillage or reenforcement 33 is shown secured around the pole 10 at the upper end of the jacket 12, to reenforce this more exposed portion of the jacket and assist in holding it in position. In this instance, the concrete 32 is not molded directly around the jacket 12: on the contrary, the cavity 34 in the concrete around the pole is of such size as to leave a narrow interval (an inch or so) outside the jacket. A volatile inflammable fluid (e. g., gasoline) may thus be introduced into the cavity 34 around the jacket 12,—either in a suitable absorbent, or simply poured in,—and there ignited and burned away. The burning away of this fluid will serve to heat the concrete walls of the cavity, the bituminous jacket 12, and even the pole 10 itself. As soon as the inflammable fluid has been burned away, molten bitumen may be poured into the cavity 34 to make an effective seal, as shown in Fig. VIII.

If preferred, bitumen with inflammable volatile fluid may be poured into the cavity 34 and burned away, thus drying and coating the walls of the cavity and even fusing the exterior of the jacket 12 itself. After the burning away of the solvent, additional bitumen can be poured in to complete the jacket, using a mold such as shown in Fig. VI for its upper portion, if required.

The above described methods can be applied to the protection of metal poles, posts, etc., as well as to wooden ones. In such cases, the burning away of the volatile inflammable fluid dries any moisture from the pole and produces on it a bituminous coating that adheres and protects it, and causes the bituminous jacket (when such a jacket is employed) to adhere to it,—although the bitumen does not, of course, penetrate sound metal as it does wood. In thus treating iron or steel poles already in service, any loose rust may preferably be cleaned off, as well as all adherent dirt. Firmly adherent rust need not be disturbed, since the bitumen will penetrate and seal its pores or cracks effectually.

Having thus described my invention, I claim:

1. A pole yieldingly set and bedded in the ground, and invested, at the ground line, in an adherent flexible bituminous protective jacket itself directly embedded in the ground.

2. A pole yieldingly set and bedded in the ground, impregnated with bitumen, and invested, at the ground line, in an adherent flexible bituminous protective jacket itself directly embedded in the ground.

3. The method of preserving a pole that is set and bedded directly in the ground, without impairing its flexibility, which comprises infixing it, at the ground line, in an adherent bituminous jacket itself directly embedded in the ground.

4. The method of preserving a pole that is set and bedded directly in the ground, without impairing its flexibility, which comprises coating and impregnating it with bitumen and infixing it, at the ground line, in an adherent bituminous jacket itself directly embedded in the ground.

5. The method of preserving a pole which comprises coating the pole with liquid bitumen containing a volatile inflammable fluid; burning out the latter, and thus adherently coating the pole with the bituminous residue; and molding about the coated pole, at the ground line, a flexible bituminous jacket, adherent to the pole by virtue of its bituminous coating.

6. A method for treating and preserving a pole already set, which comprises applying bitumen and a volatile inflammable fluid about the portion of the pole at the ground line, burning away the fluid, and thus heating the walls of the cavity around the pole, as well as the bitumen; and pouring hot bitumen into the cavity around the pole.

7. A method of treating and preserving a pole already set, which comprises removing any decayed wood at the ground line; applying bitumen and a volatile inflammable fluid about the corresponding portion of the pole, and burning away the latter; and pouring and molding hot bitumen around the pole.

8. A method for treating and preserving a pole already set, which comprises removing any decayed wood at the ground line; heating and drying the corresponding portion of the pole, and applying thereto bitumen and a volatile inflammable fluid; and burning away the latter and thus impregnating and coating the pole with bitumen.

9. A method for treating and preserving a pole already set, which comprises applying bitumen and a volatile inflammable fluid about the portion of the pole at the ground line, and burning away the fluid.

10. The method for treating and preserving a pole which comprises applying thereto bitumen and a volatile inflammable fluid, and burning away the latter and thus adherently coating the pole with bitumen.

11. The method for treating and preserving a pole which comprises coating the pole with bitumen softened with a volatile inflammable fluid, and burning out the latter and thus impregnating and coating the pole with the bituminous residue.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 22nd day of January 1925.

THOMAS J. BARRETT.