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PROCESS OF STRAIGHTENING CROOKED WOODEN POLES AND PILES

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WORK TANK

PRESSURE PUMP

TREATING CYLINDER

ADJUSTABLE FLOW CONTROL

Fig. 1.

Fig. 2. PRIOR ART

Fig. 3.

Fig. 4.

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This invention relates in general to improving the straightness of crooked wooden poles, posts or posts cut from the boles of crooked trees. Many trees have a natural bend which is a disadvantage when the tree is considered as a possible bale to be cut into a pole for use as a utility pole, pile or fence post. This invention further relates only to such wooden items as aforesaid that are to be given conventional pressure treatments with steam or hot liquid preservatives in cylinders or autoclaves. The preservatives are usually creosote, creosote solutions, penta chlorphenol in petroleum or creosote, or other oil borne preservatives or water borne preservatives.

More particularly, the present invention comprises a process for straightening these crooked, wooden poles, piles or fence posts hereinafter termed poles, in which the plasticizing conditions inherent in the conventional preservative treatments are combined with restraint on the poles until they have cooled, after the preservative treatment, to a stage at which the fibers around the outermost periphery of the poles are dried to a state below their saturation point for a depth of at least 4/4", at which time they have achieved permanent improvement in straightening.

The primary object of the present invention is to provide a practicable, economical and permanent method of improving the straightness of crooked wooden poles by utilizing the conditions inherent in the conventional pressure treating cylinders, i.e., steam conditioning for the pressure impregnation and/or the use of hot preservatives. The steaming or soaking of small wooden parts for curving them for use in furniture, boat ribs, etc., is an ancient art. However, none of the efforts to straighten wooden poles made from the boles of crooked trees have been satisfactory prior to this invention. The prior art efforts to improve the straightness of crooked wooden poles have included the following:

Crooked poles are stacked prior to the preservative treatment for seasoning with the bow vertical and with other poles stacked on top so that their weight against the bow removes some of the crook. Unfortunately, as soon as these temporarily straightened poles are given the preservative treatment, the plasticizing conditions in the cylinder cause the pole to relax into its former crooked condition.

Another method attempted has been to so load the crooked poles on the trams going into the treating cylinder that the weight of other poles above them on the vertical bow causes them to straighten temporarily. However, when these poles are removed from the cylinder and the trams, immediately after treating or before they are thoroughly cooled, they are still plastic and tend to resume their original crooked state. In fact, unless properly supported while hot, they may develop additional crooks.

The present invention gives quite different results with the wooden poles cut from the boles of crooked trees.
poles together, or by means of a block in between to overbend the poles to allow for a certain amount of spring back, restraining the poles in this straighter position by means of bands, cable, chains, or other means. The poles, still held together, are steamed in the cylinder as is normal for conditioning them for preserving treatment and treated with the hot preservative, then allowed to cool before removing the bands.

In addition to the general objects recited above, the invention has for further objects such other improvements and advantages in process and product as may be found to obtain from the following description thereof, taken in connection with the accompanying drawings, diagrammatically illustrating a few forms of carrying out the invention:

Figure 1 shows diagrammatically a conventional system for hot heat preserves pressure treatment of poles;
Figure 2 is a schematic view illustrating poles stacked to press out bowed in seasoning, prior to heat preservation treatment, in which the results are only temporary;
Figure 3 is a view illustrating two actual crooked poles prior to straightening;
Figure 4 is a view of the same poles with intermediate blocks and bands prior to applying the restraint;
Figure 5 is a view of the same poles with the restraint applied prior to heat treatment;
Figure 6 is a view of these same actual poles straightened after the heat treatment and after the cooling of the same with the restraint applied and the bands then removed.

Figures 7 to 10 are schematic views of two crooked poles before straightening, after interposition of blocks for overbending, as tightened and steamed and liquid preservative treated, and straightened after cooling;
Figures 11 to 13 are schematic views illustrating the use of straights with a crooked pole before, during, and after cooling.

The same reference numerals are used for like parts in each of the several views.

Referring to the drawings, the wood preserving treatment which provides the heat and plasticity in the poles, that is novelly employed with the present invention, in conjunction with restraint on crooks in poles until they cool, for converting crooked poles to straights meeting or bettering the classical standard specifications set by the American Standards Association, is carried out in any one of the conventional manners, by loading the poles on trams or cars and running them into a treating cylinder 10, wherein the poles are steamed under pressure to saturate the fibers of the outer periphery of the pole, and to penetrate the mass of the wood with heat, to store the same for subsequent drying out of the fibers at the outer periphery of the pole to a point below their saturation point, after the poles are removed for cooling.

Generally, after conditioning the poles with steam, preservative is introduced under pressure, and this places air previously stored in the wood under a pressure which is relied on, when the pressure is released, to expel excess preservative from the wood.

The preservative is usually fed from a work tank 21 to the treating cylinder 10 by a pressure pump 12 and under control of an adjustable flow control 14. Upon release of pressure, the excess preservative flows back in cycle to the work tank, all as described, for example in Herman U.S. Patent No. 2,668,779, of 1954.

For more permanently straightening the crooks in such poles of the class generally employed as utility poles, piles or fence posts, in lieu of the prior art general procedure of stacking crooked poles as illustrated in Figure 2, to press out the bow in seasoning the wood, which results in only temporarily in straightening the poles, the present invention applies an abutting force to the crook portion of the pole while its outer periphery is above the saturation point of the fibers and the mass of the pole is still hot from the heat and wood preservative treatment, to force the crooked section toward the general axis of the pole, and maintains the straightened pole in this restrained position until the treated pole is cooled after said heating and treatment to a state at which the saturated fibers at the periphery of the straightened crooked portion are dried below their saturation point by the outflow of heat from the mass of the pole.

In accordance with the present process, two actual crooked poles as shown in Figure 3, with bows therein before straightening, have blocks 15 placed between them as shown in Figure 4, so that they can be over bent by bands 16 in order to allow for spring back. The poles are tightened by the bands as shown in Figure 5 and remain in this position relative to each other during steaming, and liquid preserving treatment under pressure in the cylinder 10, and thereafter until cooled as aforesaid. After such cooling, the bands are removed and the poles are permanently straightened as shown in Figure 6.

Figures 7-10 show a similar way of straightening two crooked poles 13 with a single intermediate block and bands at opposite ends, as the respective figures show the original sweep or crook, the poles ready for straightening of the bands, the over bent position of the poles with the bands tight, and the straightened poles after cooling as aforesaid.

Figure 11 shows a straight member, which can be of steel, wood, or other material and a crooked pole to be straightened without the interposition of a block, and Figure 12 shows the band in place tightened up, and the two are treated in the cylinder 10 in this, and later cooled while still in this, drawn up relation.

Figure 13 shows these two members after cooling with the band removed. The pole 13 is straightened, and there has been some spring back in the original crooked pole 13, since it was not over bent.

The invention is not limited in scope to the exact procedure just described. For example, poles can be straightened between the steaming period and the pressure period of the treating operation, or they can be straightened immediately after the liquid preserving treating operation, while still plastic and left restrained in the straighter position until cooled.

The invention as herein-above set forth is embodied in particular form but may be variously embodied within the scope of the following claims.

I claim:

1. A process for combined preserving treatment and straightening of wooden poles suitable for utility or building poles, piles or fence posts cut from boles of trees and having crooks therein, comprising: forcing heat into the wood of a said pole under pressure in the form of at least one of the group consisting of steam for conditioning of the wood for preserving treatment and hot liquid preserving until at least 3/4" of its outer periphery is above the saturation point of the fibers, and treating the so-heated poles with impregnant; applying an abutting force to the crook portion of the pole while the 3/4" outer periphery is above the saturation point and the mass of the pole is still hot from the aforesaid heat treatment and thus forcing the crooked section toward the general axis of the pole; and maintaining the thus-straightened crooked portion of the pole in this restrained position until the treated pole is cooled after said heating and preserving treatment to a state at which the saturated fibers of the 3/4" periphery of the straightened crooked portion are dried below their saturation point by the outflow of heat from the mass of the pole and thereafter removing the restraint from the pole.

2. A process as claimed in claim 1, and in which the restraint is applied to the pole prior to, during, and after the heat treatment, as well as during the cooling of the pole after the heat treatment.

3. A process, as claimed in claim 1, and in which...
the restraint is applied to the pole soon after the heat treatment and while the wood is still plastic therefrom, as well as during the cooling of the pole.

4. A process as claimed in claim 1, and in which the poles so treated as ones whose outer peripheries are below the fiber saturation point before they are subjected to the aforesaid heat treatment.

5. A process for combined preservative treatment and straightening of wooden poles suitable for utility or building poles, piles, or fence posts cut from the boles of trees and having crooks therein, comprising: applying another member in abutting relation to a crooked pole and drawing the member and the pole together so as to exert an abutting force to the crook portion of the pole and forcing the crooked section toward the general axis of the pole; forcing heat into the wood of a said pole under pressure in the form of at least one of the group consisting of steam for conditioning of the wood for preservative treatment and hot liquid preservative and treating the so-heated poles with impregnant, whereby at least the outer \( \frac{1}{4} \) in. of the periphery of said crooked pole is brought above the saturation point of the fibers while the mass of the crooked pole is still under the aforesaid crook straightening abutting force and maintaining the straightened crooked portion of the pole in this restrained position until the heat treated pole is cooled after said heating and preservative treatment to a state at which the saturated fibers of the \( \frac{1}{4} \) in. periphery of the straightened crooked portion are dried below their saturation point by the outflow of heat from the mass of the pole, and thereupon removing the member from said abutting relation with the cooled straightened pole.

6. A process as claimed in claim 5, and which includes the steps of applying another member in abutting relation to the crooked pole and drawing the member and the crooked pole together so as to exert the aforesaid abutting force to the crook portion of the pole and force the crook section toward the general axis of the pole.

7. A process as claimed in claim 6, and which also includes the step of including chocks between the abutting members with overbending of the poles during the aforesaid cooling of the poles.

8. A process as claimed in claim 6, and in which said another member is another pole, and in which the poles are drawn together by tying means encircling the poles and drawn tightly around the poles.

9. A process for straightening of wooden poles suitable for utility or building poles, piles, or fence posts cut from boles of trees and having crooks therein, comprising: forcing heat and moisture into the wood of a said pole until a least \( \frac{1}{4} \) in. of its outer periphery is above the saturation point of the fibers; applying an abutting force transversely of the axis of the pole to the crook portion of the pole intermediate its length while the \( \frac{1}{4} \) in. outer periphery is above the saturation point and the mass of the pole is still hot from the aforesaid heat treatment and thus forcing the crooked section toward the general axis of the pole; and maintaining the thus-straightened crooked portion of the pole in this restrained position until the heat treated pole is cooled after said heating to a state at which the saturated fibers of the \( \frac{1}{4} \) in. periphery of the straightened crooked portion are dried below their saturation point by the outflow of heat from the mass of the pole and thereupon removing the restraint from the poles.

10. A process as claimed in claim 9, and which includes the steps of applying another member in abutting relation to the crooked pole and drawing the member and the crooked pole together so as to exert the aforesaid abutting force to the crook portion of the pole and force the crook section toward the general axis of the pole.

11. A process as claimed in claim 10, and which also includes the step of including chocks between the abutting members with overbending of the poles during the aforesaid cooling of the poles.

12. A process as claimed in claim 10, and in which said another member is another pole, and in which the poles are drawn together by tying means encircling the poles and drawn tightly around the poles.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor(s)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>53,610</td>
<td>Hanvey</td>
<td>Apr. 3, 1866</td>
</tr>
<tr>
<td>316,961</td>
<td>Hansen et al.</td>
<td>May 5, 1885</td>
</tr>
<tr>
<td>1,250,480</td>
<td>Marten et al.</td>
<td>Dec. 18, 1917</td>
</tr>
<tr>
<td>1,330,804</td>
<td>Haskell et al.</td>
<td>Feb. 17, 1920</td>
</tr>
<tr>
<td>2,668,779</td>
<td>Herman</td>
<td>Feb. 9, 1954</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS