

UNITED STATES PATENT OFFICE.

WILLIAM A. HALL, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN MAHOGANY COMPANY, A CORPORATION OF MAINE.

ART OF COLORING WOOD.

No. 901,094.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed April 2, 1906. Serial No. 309,409.

To all whom it may concern:

Be it known that I, WILLIAM A. HALL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented or discovered certain new and useful Improvements in the Art of Coloring Wood, of which the following is a specification.

It is well known that the darker parts of some kinds of hard woods, such, for example, as birch, are much more valuable for lumber, for use in building purposes or for cabinet work, than are the lighter parts of such woods. For example, the red hearts of birch wood command a price at wholesale for lumber purposes, at from \$40.—to \$50.— or more per thousand feet, whereas the light parts of the same wood bring only something like \$18.— to \$20.— per thousand feet, at the same points of delivery. It is therefore very desirable that these lighter parts of the wood be darkened, as this will render them much more valuable for lumber purposes, and I have discovered that by subjecting logs, blocks or other forms of wood to the action of very hot water under pressure for such a length of time as will cook the wood entirely through, the lighter parts of the wood are so stained by their cooked resinous and gelatinous ingredients as to render the wood permanently much darker, or of a brownish or reddish color, after it has been dried and converted into lumber.

The invention is carried into effect by placing boards, blocks or logs of wood in water in closed receptacles or tanks and then heating the water to temperatures above 212 degrees Fahrenheit, and preferably to temperatures varying from 290 to 300 degrees Fahrenheit, which will be indicated from about 65 to 85 pounds of steam pressure to the square inch, the blocks or logs being subjected to the boiling process or the action of the hot water until they may be said to be thoroughly cooked. The cooking process is kept up for several hours in the closed tanks or receptacles, which may be of any well-known construction which will permit of considerable steam pressure, and consequently high temperatures; so that the resinous and gelatinous parts of the wood will be thoroughly cooked, and thereby stain the lighter wood to a reddish or brownish tinge, these darkened colors being retained by the wood after the same has been dried and con-

verted into lumber in any suitable manner. The time of cooking will vary with the sizes of the logs or the degree of hardness of the wood. For small logs or soft wood about two hours will be sufficient, but for larger logs and harder woods the time of cooking may be increased up to ten or twelve hours.

While the cooking of the wood at high temperatures, as above indicated, will very considerably darken the same, such darkening effects may be increased or varied by adding various chemicals to the water in which the wood is cooked. For example, by adding a solution of borax to the water a reddish tinge will be given to the wood, this reddish tinge being the darker the greater the percentage of the borax solution, and while a 2% solution of borax will considerably redden the darkened wood this reddish effect will be increased by increasing the strength of the borax solution. Also by using a solution of salts of iron in the cooking water greenish-gray tints are given to the darkened wood; and these effects may be varied by varying the strength of the solution of salts of iron, or by using different iron salts. A 5% solution of sulfate of iron or a 2% solution of chlorid of iron, will conduce to the greenish-gray tints which will, of course, be varied with the strength of the solutions. Other chemicals may be employed in the cooking water to give different shades or tints to the darkened wood. The staining effect of these chemical solutions, with which the water may be impregnated throughout the cooking operation, or which may be added to the water towards the close of such cooking process, as may be found most advantageous, is quite different from the staining effect of dyes which may be added to the water to stain or darken the wood. In the latter instance the wood is stained to but a little depth from the surfaces, but the effect of the chemicals which combine with the cooked ingredients of the wood to produce different shades is to stain or color the wood throughout, or at least down to the heart, according to the time during which the cooking process is continued.

It is found that by cooking the wood for the purpose of darkening the same the wood is also hardened, more or less, when the same is dried and converted into or rendered suitable for lumber.

The hardening and darkening of the wood by the cooking process hereinbefore de-

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scribed is due largely to the change effected in the ligneous matter of the wood. This ligneous matter, however, is rendered more or less soluble by the cooking process, so that
5 some of it is leached out of the lumber into the cooking water which is turned very dark thereby. The removal of a certain percentage of the ligneous matter from the wood would render the same somewhat lighter,
10 when dried, than it was before being subjected to the cooking process, but where certain salts or solutions of solid matter such, for example, as the salts of iron hereinbefore referred to, are added to the water in which the
15 cooking is done, such salts not only offset in weight the ligneous matter which has leached out in the cooking process, but also serve to offset or counteract what would otherwise be an injurious destructive effect due to the
20 cooking of the wood at the high temperatures referred to; the said salts also filling the pores and making the wood much harder than it otherwise would be, as also deepening the color of the wood further than would be
25 effected by the cooking process in water alone. It has been definitely ascertained that the lumber thus cooked at high temperatures in water containing certain salts or solutions of solid matter is much less inclined
30 to warp and crack when dried than when it is cooked in plain water, so that the wood is not only darkened by the process of cooking the

same in water containing certain salts or solutions of solid matter, but is not liable to warp and crack when dried.

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Having thus described my invention or discovery I claim and desire to secure by Letters Patent:

The herein described process of darkening and hardening wood for lumber purposes, 40 consisting in thoroughly cooking boards, logs or blocks of wood for several hours in water to which has been added certain salts or solutions of solid matter which combine with the ingredients of the wood to darken and 45 harden the same, such cooking being effected in a closed receptacle at a temperature or temperatures exceeding 240° F., so as to permanently darken the light parts of the wood by the staining effects resulting from the cooked 50 resinous and gelatinous ingredients thereof augmented by the effects of the chemical salts or solutions added to the cooking water, the said salts or solutions serving to offset or counteract any destructive effects due to cooking 55 at high temperatures and also counteracting a tendency of the wood to warp and crack when dried.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM A. HALL.

Witnesses:

A. W. PERKINS,

THEODORE H. FRAEHLICHT.