

LA FAYETTE MOORE.
METHOD OF TREATING LUMBER.
APPLICATION FILED AUG. 5, 1912.

1,054,597.

Patented Feb. 25, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

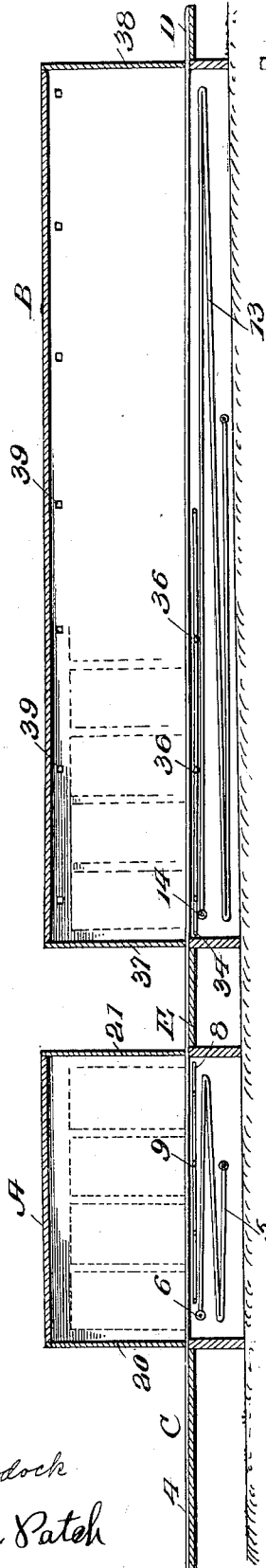
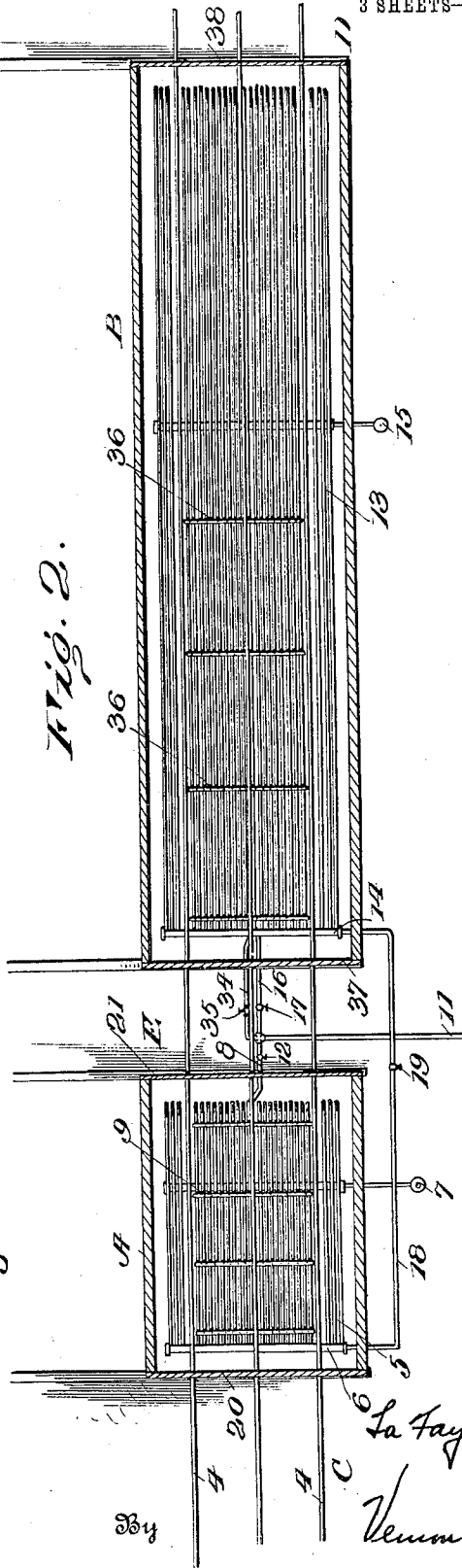


Fig. 2.



Witnesses

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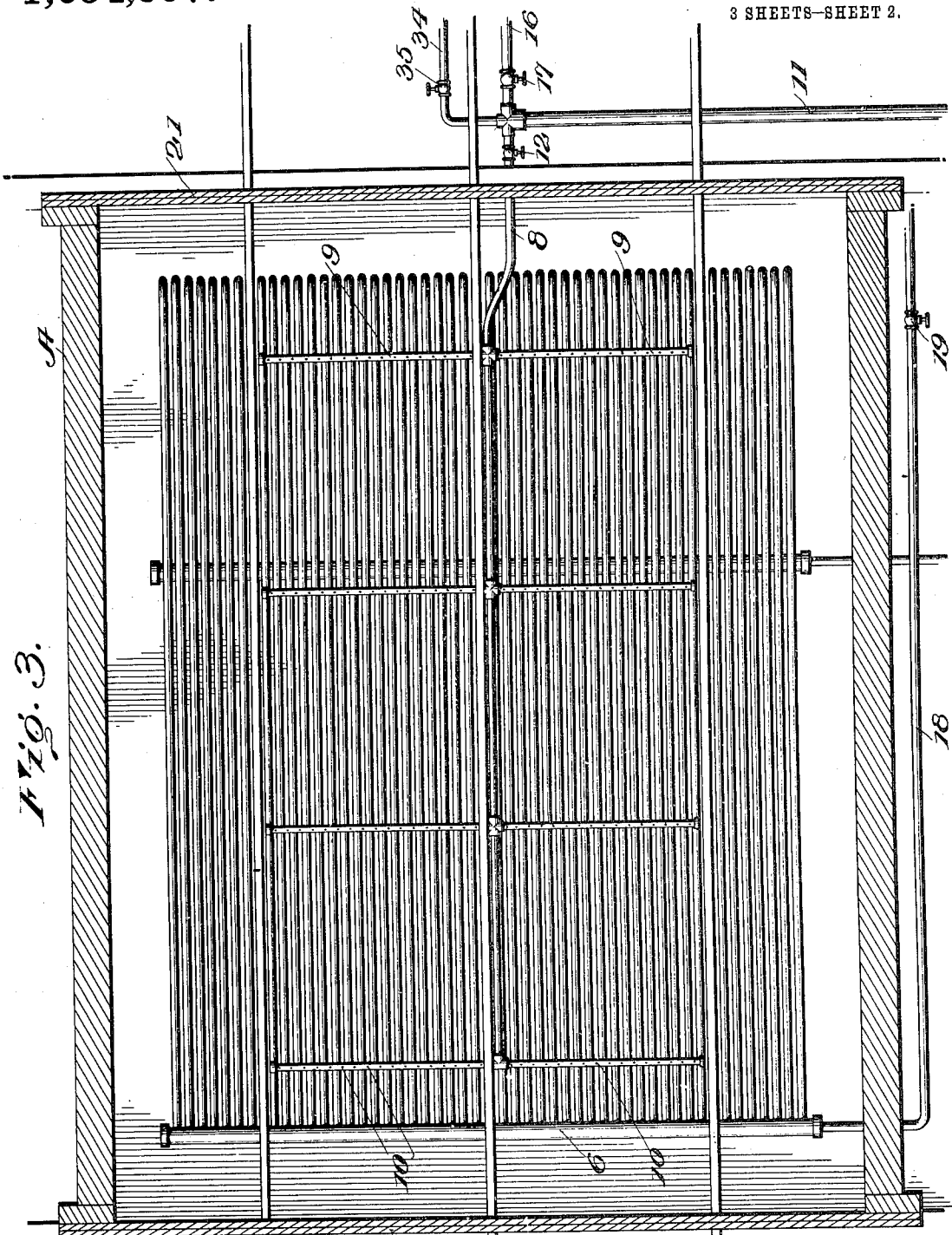


Fig. 3.

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3 SHEETS—SHEET 3.

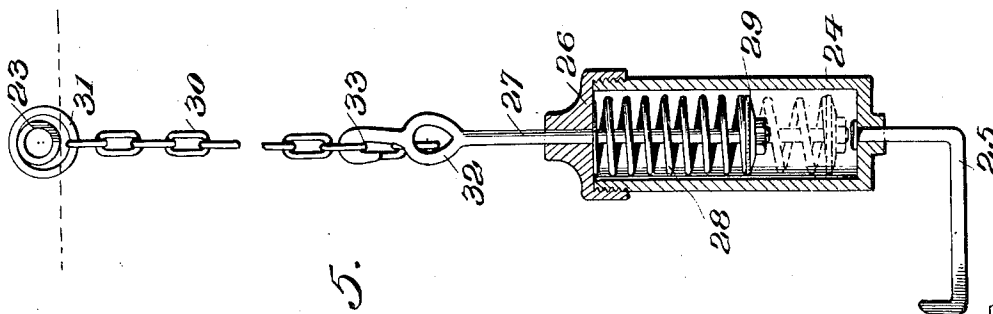


Fig. 5.

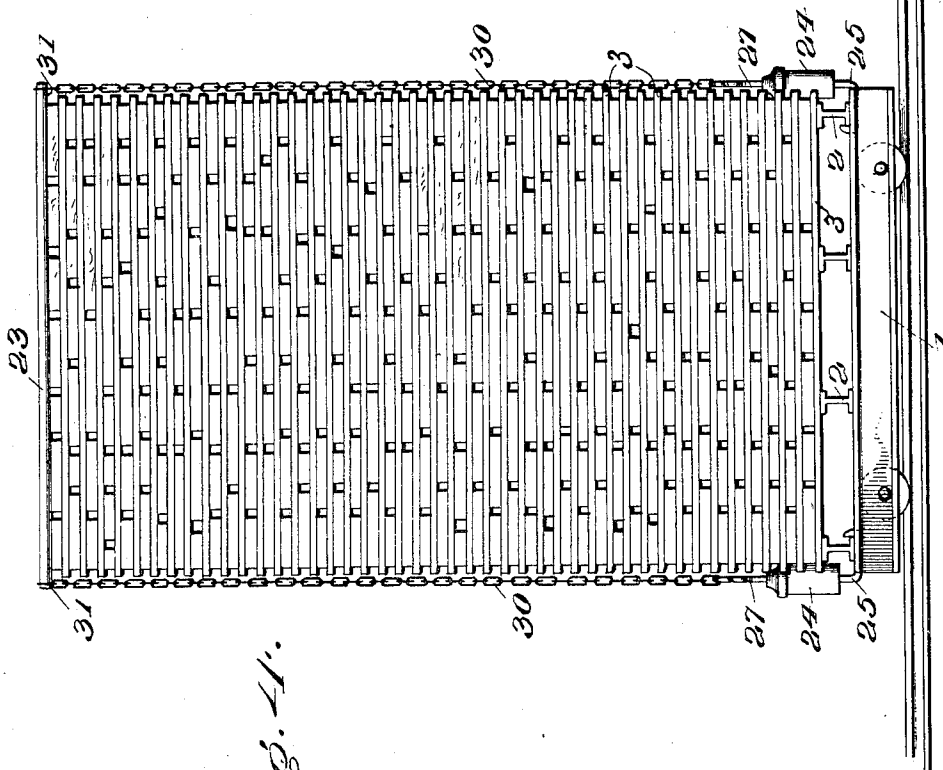


Fig. 4.

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UNITED STATES PATENT OFFICE.

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METHOD OF TREATING LUMBER.

1,054,597.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed August 5, 1912. Serial No. 713,448.

To all whom it may concern:

Be it known that I, LA FAYETTE MOORE, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Methods of Treating Lumber, of which the following is a specification.

My invention relates to an improvement in a method of treating lumber and more especially such woods as gum, oak and cypress, as distinguished from pine, poplar and other coarse grain woods.

In a former Patent No. 769,102, granted to me August 30, 1904, a scalding box and kiln are employed and in the scalding box the scalding is accomplished by the discharge of steam directly into the scalding box. In this way the acids are cooked or boiled and the cells of the sap are broken up and the coloring matter becomes diffused throughout the entire complement of steam in the scalding box. The steam envelops, saturates and protects the lumber while the diffused coloring matter in the steam uniformly penetrates the fibers and distributes itself so that the color of the stock, for instance gum, is given a uniform mahogany brown color throughout which makes it more profitable in the finer cabinet work and the like. While I have precisely the same object in view in my present process, I go a step further in the way of economizing in the use of steam, and also binding the lumber or holding it against warping, thus making this process particularly adaptable for use in treating gum. While the old method above referred to was and is entirely successful, the discharge of so much steam into the scalding box constituted an undue draft upon the boiler capacity.

With my present invention I increase the heat and save boiler capacity at the same time acquiring the degree of heat necessary to scald the lumber in the cooking and coloring process, and this is done by providing the scalding box with heating coils which maintain a certain predetermined temperature throughout and in addition to this relatively fine jets of steam are discharged into the scalding box, as it is found in this way the required amount of steam

is furnished to protect the lumber, the boiler capacity is no longer taxed, and consequently smaller boilers can be employed which means greater economy and altogether better results. In other words, adequate moisture and heat are provided with a minimum draft upon the boilers to effect the cooking and coloring of the lumber. After this cooking and breaking up of the cells, this scalding action upon the natural acids and coloring matter and its diffusion in the surrounding volume of steam, results in a re-distribution and uniform coloring of the lumber throughout, the lumber is removed from the sweat box to the kiln, and on its way from one to the other it is bound tight against warping and twisting in such a way that it will be kept flat and caused to retain its shape as it shrinks in the kiln, the binding means employed acting automatically to retain its tension uniformly upon the stacked lumber as the latter shrinks as the result of the moisture drying out and leaving the cells during the curing process in the kiln, it remaining in the kiln sufficiently long to be satisfactorily dried and cured.

In the accompanying drawings—Figure 1 is a longitudinal vertical sectional view showing one arrangement of scalding box and dry kiln which may be used to accomplish my process; Fig. 2 is a horizontal sectional view of the mechanism disclosed in Fig. 1; Fig. 3 is a view similar to that disclosed in Fig. 2 of the scalding box on an enlarged scale, more clearly to illustrate the arrangement of the parts; Fig. 4 discloses the manner of binding a stack of lumber preparatory to placing it in the dry kiln and after it has been treated in the scalding box, and Fig. 5 is a detail view of the spring pressed means for maintaining an even binding pressure.

For convenience in handling I have found that it is preferable that the lumber be stacked on trucks and this method of stacking is better disclosed in Fig. 4 in which the trucks 1 have the I-beams 2 resting across them and spaced a suitable distance apart. In the treatment of most lumbers cut from hard wood timber, it is preferable that the spacing strips 3 be placed upon the I-beams, after which a layer of lumber is laid, then

more spacing strips, and so on until the stack is completed. In treating the majority of the hard woods I find it is preferable to place the spacing strips preferably about two feet apart from center to center, although it will be understood that the requirements will vary with different woods, and in the treatment of soft woods that the strips might be spaced even five or six feet apart and yet accomplish the result desired, which is that the lumber is held against twisting and warping. In actual practice these stacks are piled to measure probably six and a half feet in width and from ten to eleven feet in height, and as a means of moving them from the loading platform C into the scalding box A, out of the scalding box into the dry kiln B, and then onto the unloading platform D, I have provided tracks 4, 4, on which the trucks 1 are adapted to travel, and suitable doors 20 and 21 which are opened to allow the stacks to pass. Beneath the track and scalding box A a plurality of zigzag coils 5 are provided which are connected with a header 6 at their supply end and connect with a trap 7 at the opposite end. Preferably just above the coils 5 and between them and the tracks 4, a steam pipe 8 is secured, and at intervals throughout the extent of this pipe arms 9 are connected which are provided on their upper surfaces with jet or spray openings 10. The pipe 8 is connected with the main steam pipe 11 from the boiler and the passage of steam therethrough is controlled by a valve 12. It is preferable that these spray pipes be located at such a position that they will discharge steam directly beneath the stacks of lumber as they stand in the scalding box, and in the present instance, where the scalding box is disclosed as being of a dimension twenty feet in width by twenty-eight feet in length, it will be seen that four stacks can be accommodated and that necessarily four sets of spray pipes will be required. The dry kiln B has a plurality of coils 13 positioned beneath the tracks 4 and connected at their one end with the header 14 and at their other extremity to the trap 15. The header 14 is connected by a pipe 16 controlled by valve 17 with the steam pipe 11 from the boiler, and a lead pipe 18 controlled by valve 19 permits the passage of steam from the header 14 to the header 6 for supplying the coils 5.

In carrying out my process, the lumber is stacked on the trucks on the platform C after which it is moved into the scalding box A and the doors 20 and 21 thereof are closed and locked as nearly steam tight as possible. Valves 12, 17 and 19 are then opened thus heating the coils 5 which radiate a dry heat and at the same time introduce steam into the box through the spray pipes 10 connected with the steam pipe 8.

In this way the air in the scalding box is thoroughly saturated with moisture and the temperature is increased to between 220° F. and 250° F. and the lumber is permitted to remain in the scalding box for from eight to ten hours, after which time it has become thoroughly filled with moisture and each of the sap cells has been exploded and the acids and salts thereof diluted in the water and distributed uniformly throughout the fibers of the wood. The steam is then shut off from the spray pipe and coils and the door 21 is opened and this stack is then moved onto the platform E and is bound, as better disclosed in Fig. 4, by placing the metal pipes 23 on top thereof and preferably directly above the vertical row of the spacing strips.

As a means of securing a pressure upon the pipes 23 which will be maintained during the entire drying process and even after the greater part of the moisture has been drawn off, and the lumber is shrunk, I have provided a spring tension device better shown in Fig. 5, in which the casing 24 has the hook 25 secured on the lower end thereof in position to engage beneath the I-beam 2 on the truck. A cap 26 is secured on the upper end of the casing 24 and a plunger rod 27 is mounted to have sliding movement through this cap. A coil spring 28 surrounds the rod 27 and bears at its one end against a head 29 carried by the plunger rod. A chain 30 of the open link variety, carries a ring 31 adapted to be placed over the end of the pipe 23. The plunger rod 27 is provided on its free end with a loop 32 and hook 33, and after the hook 25 has been engaged with one of the I-beams 2, 2, a pry lever may be inserted through the loop 32 and engage with the pile of lumber. The plunger rod 27 is then drawn upwardly against the tension of the spring 28 and the hook 33 is inserted in one of the links of the chain 30. In this way a great pressure is brought to bear upon the top boards of the stack, and these boards, as well as the lower boards on which the greater part of the weight of the stack rests, are held against warping. Also, as the height of the stack decreases due to the shrinkage of the lumber, the tension of the spring 28 presses the pipes 23 downward and maintains the same uniform pressure.

When the lumber is removed from the scalding box A to the platform E, the boards are at a temperature of more than 200° F. and consequently during the binding operation the exteriors dry very quickly and the pores begin to close. In this state the stack is moved into the kilns B and if the process of drying was continued with dry heat, the lumber would become cased on its outer surface and the pores closed, which would prevent thorough seasoning, and to overcome

this difficulty I have provided a pipe 34 connected with the main steam pipe 11 and controlled by a valve 35. The pipe 34 extends for approximately one-half the longitudinal dimension of the kiln and has branch spray pipes 36 similar to the spray pipes 9 of the steam pipe 8 but preferably spaced about twice the distance apart.

It is intended that the kiln shall be of much greater length than the scalding box, and by the proportions of the present disclosure, would be in the neighborhood of one hundred feet long, thus as each stack is removed from the scalding box, the one ahead is moved farther toward the discharge end of the dry kiln. In other words, the first stack near the inlet door 37 and which has just been removed from the scalding box, is thoroughly saturated in its body but is dry on its surface. To prevent the lumber in this stack from casing it is necessary that additional moisture should be supplied, and, as the drying process continues, that this moisture be reduced until the stack reaches the discharge end near the door 38. There is no moisture in the atmosphere at the exit end of the kiln with the exception of that driven off from the lumber and that is very slight. It is preferable that the steam to the coils 13 be regulated to such an extent that the temperature in the dry kiln will range from 190° F. to 200° F. and as live steam which is above the boiling point, is being introduced through the spray pipes 36 at the upper end of the kiln only, the temperature near the door 37 will be materially higher than near the door 38 which will cause a draft from the lower end of the kiln out through the ventilators 39 near the upper end thereof and will thus regulate the moisture and temperature in the different sections of the kiln.

It will thus be seen that I have provided a process with which the acids and resinous matter are evenly distributed throughout the entirety of the lumber being treated and also diluted to such an extent that a certain percentage is carried out, and further by heating the acids to a boiling point, the wood is given a uniform color and that by opening the outer pores of the lumber and keeping them open during the process of drying, the time required to thoroughly season the wood is materially lessened.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is—

1. A process of treating lumber which consists of stacking the lumber so that air may have access to every part thereof, introducing the stack into a chamber, saturating the air in the chamber with moisture, raising the temperature in the chamber to approximately the boiling point, removing the stack from the chamber, binding the lumber to prevent warping in such a manner that the tension will be maintained uniform during the shrinking and swelling of the lumber, and introducing the stack into a dry kiln for drying the lumber.

2. The herein described method of treating lumber which consists in subjecting it to a scalding treatment in a closed chamber wherein the chamber is heated by steam coils at the same time injecting steam in small quantities into the scalding box so that the required degree of heat is maintained without exhausting the boilers, so that the lumber contained therein becomes thoroughly moist and saturated and the acids and coloring matter driven therefrom are diffused in the enveloping steam and uniformly re-distributed throughout the cells of the wood.

3. The herein described method of treating lumber which consists in subjecting it to a scalding treatment in a closed chamber wherein the chamber is heated by steam coils at the same time injecting steam in small quantities into the scalding box so that the required degree of heat is maintained without exhausting the boilers, so that the lumber contained therein becomes thoroughly moist and saturated and the acids and coloring matter driven therefrom are diffused in the enveloping steam and uniformly re-distributed throughout the cells of the wood, subsequently binding the stack of lumber being treated so as to automatically maintain a uniform degree of tension thereon while drying and shrinking whereby to prevent it from warping and twisting.

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

LA FAYETTE MOORE.

Witnesses:

J. D. YOAKLEY,
VERNON E. HODGES.