

# UNITED STATES PATENT OFFICE.

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## PROCESS OF PRESERVING WOOD.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, SYLVESTER W. LABROT, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have  
5 invented certain new and useful Improvements in Processes of Preserving Wood; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the  
10 same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to the preservation of wood.

Its object is to render the wood uniformly absorb-  
15 ent, and to secure a uniform distribution of the total allotted quantity of preservative so as to obtain an equal quantity of preservative per unit of measure of the wood to be preserved.

To the accomplishment of the foregoing and such  
20 other objects as may hereinafter appear the invention consists in the features hereinafter described:

Ordinarily in the preservation of wood by submerg-  
ing it in a preserving fluid, for instance in creosote, that portion of the charge of wood in the bottom of  
25 the cylinder first becomes submerged in the fluid, and then the charge at the top of the cylinder becomes submerged. The porosity and absorbent ability of wood varies greatly. Close grain, non-absorbent and comparatively green wood will take up a smaller  
30 amount of the preserving fluid than will be taken up by comparatively dry, open grain and absorbent timber. Owing to the natural conditions of the tim-  
ber, and the practical conditions of operation, it is impracticable to assort the timber according to its  
35 degree of porosity or ability to absorb the preserving fluid, so as to obtain a charge of wood in the cylinder for all of which the conditions and requirements will be the same. Consequently there is a material vari-  
ation in the amount of preserving fluid that each of  
40 the varieties of wood in the cylinder will absorb or take up from the total allotment of the fluid for the cylinder charge under treatment. Hence the con-  
ditions mentioned render it practically impossible under the usual method to obtain a uniform distribu-  
45 tion of a small quantity of the preserving fluid throughout any given cylinder charge. To make it possible to fill the cylinder with the preserving fluid and obtain a uniform distribution of the fluid throughout all the wood constituting the charge and having different  
50 degrees of porosity or power of absorption is the purpose of the present invention.

In carrying out the present process, the wood is subjected in a closed vessel or cylinder to an air pressure continued for a period sufficient to thoroughly  
55 permeate the cells of the wood with air. The intensity of this air pressure will vary or depend on the porosity

of the wood, and with the amount of preservative it is proposed to force into each cubic foot of the wood under treatment. Without lowering materially this air pressure which fills the cells of the wood with air, 60 the preserving fluid, for instance creosote, is next introduced into the cylinder and caused to fill the cylinder. The cells of the wood having been first filled with compressed air the pressure of air within the cells prevents the more absorbent woods from ab- 65 sorbing the fluid, and the cylinder can then be filled with the fluid without the wood in the bottom of the cylinder, or the more porous woods, absorbing undue quantities of the preserving fluid, or more of the fluid than other portions of the wood or charge, the cylinder 70 being provided with suitable pressure gages to indicate the pressure within the cylinder. This is due to the fact that the air pressure within the cells of all the wood in the cylinder is practically uniform and consequently the conditions substantially the same 75 for all portions of the wood constituting the charge.

The cells of the wood having been filled with compressed air sufficient to prevent the wood absorbing the preservative fluid, the next step is to fill the chamber with the preservative. To this end, the cylinder being 80 provided with a relief or pop-off valve set to release at a predetermined pressure, the preservative is forced by a suitable pump, into the cylinder from a tank of given dimensions, the dimensions of the tank enabling to be determined the amount of preservative to be forced 85 into the timber. The relief valve having been set for a predetermined pressure, the preservative is forced into the cylinder containing the compressed air until the cylinder is filled with the preservative, the compressed air other than that filling the cells of the timber 90 gradually finding its escape through the relief valve as its place is taken by the preservative forced into the cylinder, which continues until the cylinder is finally filled with the preservative. The relief valve is then closed, and an additional quantity of the preservative 95 forced into the cylinder, and as this additional supply of preservative must be taken care of, it penetrates the wood driving ahead of it the compressed air in the cells further into the pores of the wood, as the pressure of the additional supply of preservative is in excess of the 100 compressed air in the wood cells. The desired quantity of preservative having been driven into the pores of the wood, which quantity is ascertainable and determined by the capacity of the supply tank, the forcing pump is stopped in its work, and by another pump 105 the preservative fluid in the cylinder is withdrawn. This leaves the cylinder free of the preserving fluid and relieved of air pressure. The preservative having been withdrawn and the cylinder closed, air is again forced into the cylinder under a pressure of 50 to 100 pounds, 110 more or less. This pressure drives or scatters the preservative which is in the cells of the wood, and evenly



distributes it through the cells of the entire charge of wood, throughout the penetrable part of the timber. This completes the process, and leaves the wood in condition to be withdrawn and replaced by another charge.

From the foregoing it will be observed that the wood cells are first filled with compressed air so as to exclude or prevent the preservative penetrating the pores or cells of the wood, thus enabling the cells of all the wood constituting the charge, and which may be of varying degrees of porosity, to be equally brought under the influence of the compressed air so that when the preserving fluid is supplied to the cylinder it will not enter the pores of the wood of greater porosity any more than it will enter the pores of the wood of greater density; that after all the wood has been brought to practically the same condition of resistance to absorption of the fluid, the fluid is admitted to the cylinder to fill the same, proportionately displacing the compressed air which finds its escape through the relief valve, the compressed air in the wood cells continuing to resist the absorption of the preservative; that an additional supply of the preservative is then forced to the cylinder, the pressure under which the same is placed causing the fluid now to penetrate the wood cells and to drive ahead of it the air which is in the cells, the compressed air in the cells yielding under this pressure of the fluid and not ejecting the fluid out of the cells; that the surplus fluid is then withdrawn from the cylinder, and air pressure then applied to drive the fluid which is in the wood cells further into the penetrable portions of the wood. This insures an equable transfusion of the preservative throughout the pores of all the timber under treatment. Besides obtaining a uniform distribution throughout each cubic foot of the wood under treatment, it brings the quantity of preservative to penetrate the pores of the wood absolutely under the control of the operator, so that more or less of the preservative may be made to penetrate the pores of the wood as may be desired.

In carrying out this process the degrees of pressure may vary more or less depending on the conditions to be met at the time. Ordinarily an air pressure of 30 to 40 pounds, more or less, may be maintained for approximately a period of ten minutes, to fill the cells with compressed air; next the cylinder is filled with the preservative against the pressure mentioned; then an additional quantity of the preservative is added and forced into the timber until systematic measurements show the desired quantity of preservative has penetrated the pores of the wood, which may take from ten to twenty minutes, more or less, when using a small quantity of the preservative and a pressure of 50 pounds, or thereabout; or when a large quantity of preservative is used this period of treatment may cover a period of two or three hours, and under a pres-

sure advanced to about 125 pounds; the preservative is then withdrawn from the cylinder, and air pressure ranging from 80 to 100 pounds applied and maintained for say 15 minutes, more or less, or until the air gage stands at the highest pressure, thus demonstrating that such pressure is uniform throughout the timber and that the air with the preservative has penetrated the depths of the timber.

The foregoing is sufficient for an intelligent understanding of the process, although as previously stated the pressures and the period of treatment will vary according to conditions, but in all cases the essentials hereinbefore set forth should be observed.

This method enables a small quantity of preserving fluid to be equally distributed throughout all portions of a charge of wood to be treated notwithstanding material differences in the natural porosity or absorbing powers of the different pieces of wood constituting the charge under treatment. The result is economy in the amount of fluid necessary, the avoidance of over saturation or charging of the wood with the fluid, a more uniform and more thorough distribution of the fluid, and a better preservation of the wood.

Having described my invention and set forth its merits, what I claim is:—

1. In the process of preserving wood, the steps consisting in subjecting wood in a closed vessel to air pressure to charge the cells of the wood with compressed air sufficient to prevent absorption of a preserving fluid, and then introducing a preserving fluid into the vessel, while relieving the air pressure in the vessel proportionately to the volume of preserving fluid admitted, without permitting a reduction of air pressure in the cells of the wood sufficient to permit the fluid to be absorbed by the wood, substantially as described.

2. In the process of preserving wood, the steps consisting in subjecting the wood in a closed vessel to air pressure to charge the cells of the wood with compressed air sufficient to prevent absorption of a preserving fluid, then introducing a preserving fluid into the vessel to replace displaced air from the vessel while maintaining said air pressure in the cells of the wood, and then injecting additional fluid into the vessel to force the fluid into the cells of the wood, substantially as described.

3. The process of preserving wood, consisting in subjecting the wood in a closed vessel to air pressure to charge the cells of the wood with air sufficient to prevent absorption of a preserving fluid, then introducing a preserving fluid into the vessel in contact with the wood while maintaining said air pressure in the cells of the wood, then raising the pressure of the enveloping fluid by adding additional fluid to force the fluid into the cells of the wood, then withdrawing the fluid from the vessel, and then applying air pressure to distribute the fluid in the wood throughout the pores of the wood, substantially as described.

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

SYLVESTER W. LABROT.

Witnesses:

JAS. SIMON.

PIERRE D. OLIVIER.