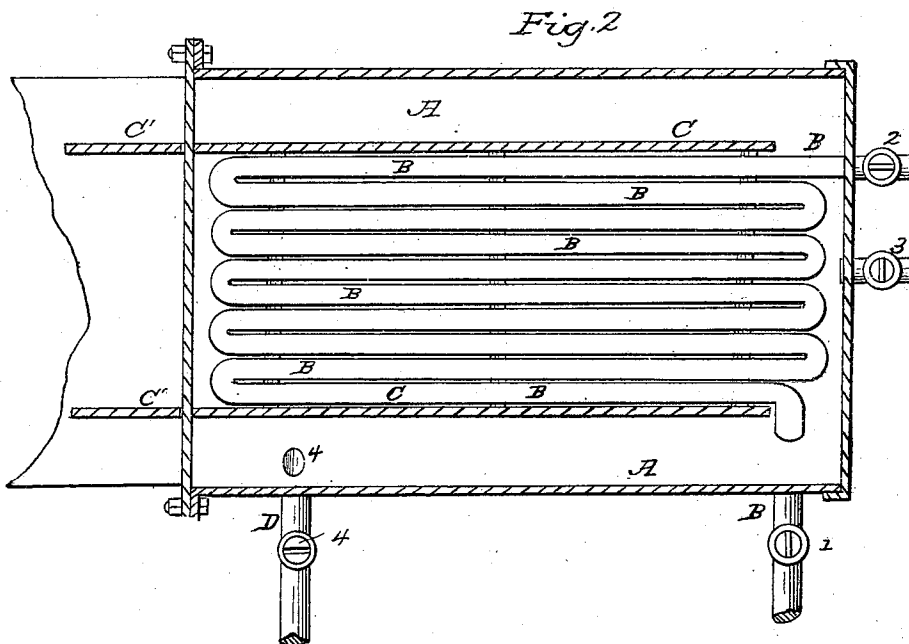
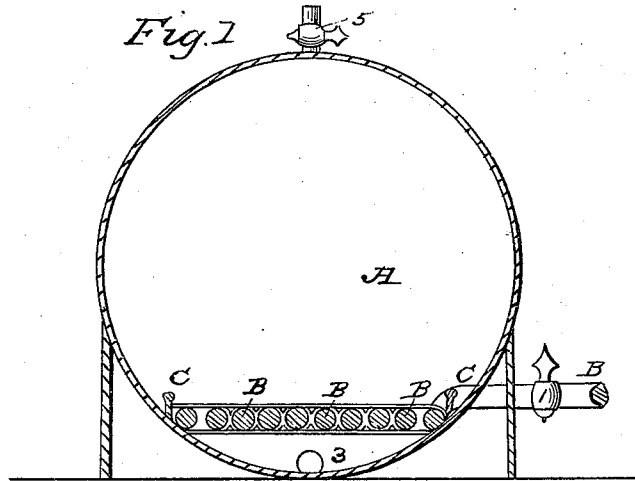


M. R. MOORE.

Lumber Drier.

No. 24,230.

Patented May 31, 1859.



WITNESSES

Benj. Mordon

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UNITED STATES PATENT OFFICE.

MORDECAI R. MOORE, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR SEASONING LUMBER.

Specification of Letters Patent No. 24,230, dated May 31, 1859,

To all whom it may concern:

Be it known that I, MORDECAI R. MOORE, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and Improved Apparatus for Seasoning Lumber or Timber of Every Description; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings and to the letters of reference marked thereon.

My invention has for its objects the perfect seasoning or drying of lumber, or timber of every description, in a more expeditious and economical manner than heretofore; and consists in providing, for the purpose, a capacious steaming-and-drying chamber, or vessel, fitted with internal track-rails, steam pipes and stop cocks, in such a manner that a truck or trucks, "piled" with the lumber to be seasoned, may be readily run into the said chamber, inclosed therein steam tight, and the lumber subjected to the direct action of steam for a sufficient length of time to extract the sap and gummy matters therefrom and, immediately after, to the drying action of air in motion heated by a steam pipe, extended within the said chamber, until the said lumber is perfectly seasoned or dried—the said track-rails being in juxtaposition with external track-rails, and the said steam pipes in communication with an external steam generator of any suitable kind, substantially as and for the purposes hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe, more in detail, its construction and operation.

In the drawings, Figure 1, represents a vertical transverse section, and Fig. 2, a horizontal section, of the receiving, or steaming and drying vessel, with its fixtures.

Like letters, in both figures, indicate the same objects.

A, is the receiving vessel; B, the zig-zag air-heating pipe leading from a distant generator, (not shown in the drawings) through the said vessel (A); C, C, the track-rails for guiding and supporting a truck (not shown in the drawings) loaded, or "piled and stripped," with the lumber to be seasoned; D, a conducting steam-pipe leading from the said generator and opening directly into the vessel (A); and 1, 2, 3, 4 and 5, the several stop-cocks appertaining to the said vessel.

I construct the receiving vessel (A), of a cylindrical form, of boiler-iron plates, riveted together in the usual manner, and of such a capacity, or diameter and length, as the number of trucks used, or the business to be carried on may require—one of its ends, A', being adapted for removal and replacement (by means of screw-bolts-and-nuts, in the usual well known steam-tight manner) as occasion may, from time to time, require.

The air-heating steam-pipe (B) leads from any suitable distinct and distant steam generator, and passes through the wall of the vessel (A), thence longitudinally backward and forward, in a zig-zag manner, any required number of times, having in view the radiation of a sufficient amount of heat therefrom over, and a few inches above, the lower side or bottom of the said vessel (A), substantially in the manner shown in the drawings, and ultimately out again through the wall of the vessel, where it is fitted with a stop-cock (2); a like cock (1) being fitted in the said pipe at any point between the vessel (A) and the said distant generator.

The track-rails (C, C,) are secured permanently and parallel with each other, along on the lower side of the vessel (A) in such a manner as to be adapted to receive and support at a short distance above the zig-zag part of the pipe (B), a truck, or trucks, of a suitable size, with a proper complement of piled and stripped lumber, the said track-rails being also in juxtaposition with external track-rails, C', C', leading from the said vessel (A) so that the said loaded truck or trucks may be readily introduced or withdrawn from the vessel, as occasion may require. The steam conducting pipe (D) also leads from the distant steam generator, before mentioned, but opens directly into the vessel (A), and is also fitted with a stop-cock (4) at any point thereof between the said vessel (A) and the said generator.

On a line with the bottom, or lowest side of the vessel (A), there is fixed an out-and-inlet pipe and stop cock (3), for the purposes of discharging condensed steam or water and admitting air, as will hereinafter be explained; and in the upper side, or top, of the said vessel (A), a like pipe and stop-cock (5) is adapted for the purpose of allowing the vapor and air to escape, on commencing, or during the drying part of the process. A safety-valve may also be fixed

in the upper side of the said vessel (A) but it is not deemed necessary, if the said vessel be, as it should, properly constructed for strength.

- 5 As lumber, when nearly dry and also hot, is exceedingly ignitable from a spark, the generator of heat should be distant from the drying vessel, or be separated by a close wall; and, in an economical point of view, 10 it would be proper to inclose the vessel (A), and also the parts of the pipes (B, and D,) which connect the vessel (A) and the generator together, in wood casing, or with brick-work for the purpose of diminishing the loss of heat therefrom by radiation. 15

- Operation: A truck (or trucks) having been provided for the purpose, and loaded, or "piled and stripped," with successive layers of the lumber to be seasoned, is run into the 20 vessel (A) and the front-plate or head (A'), is then secured, steam-tight, in its place. The operator now closes the stop cocks 1, 2, and 3, and then admits steam, from the generator, through the pipe (D). He now 25 closes the stop cock (5) which is on the highest part of the said vessel (A), and thus subjects the lumber inclosed, to the action of steam and at the same pressure as may be in the generator, which should be 30 regulated to whatever degree of pressure may be found most expedient or suitable to the purpose, having in view the strength of the apparatus. This steaming part of the process is to be steadily thus kept up, say 35 from six to twelve or fifteen hours—as the thickness, or hardness of the pieces of lumber may require for the perfect solution and extraction of the sap, or gummy matters in the said lumber; and as soon as this result is effected—which a little experience 40 will enable the operator to determine by the length of time the same has been so acted upon—the operator opens the stop cocks 1, 2, 3, and 5, and closes the stop cock, 4, thus 45 permitting the steam, and also the water which has accumulated in the bottom of the vessel (A) by condensation, to escape—and the steam which is being produced by the generator, to pass continuously through the 50 zig-zag pipe (B), and thus to heat the air which continuously enters the said vessel (A), through the opened stop-cock (3), and eventually passes out, with the rising vapor from the lumber, through the opened stop-cock (5); and so on continuously, until all 55 the moisture in the said lumber has been driven out, or the lumber has become thoroughly dried or seasoned; which result will be effected in, say from 12 to 24 or 30 60 hours—as the thickness or hardness of the pieces of lumber may require—when the head plate (A') may be removed, and the truck or trucks with the seasoned lumber thereon, withdrawn, run off by the external 65 track, and another truck or series of trucks,

loaded with green lumber, substituted and submitted to the same treatment, and therefore, without necessarily causing any material loss of heat by delay.

It is obvious that the steaming and drying may be accomplished in separate vessels or receiving chambers, connected by rail-tracks, and supplied with steam and heat by one generator; but I consider the one vessel (A), adapted as described for both parts of 75 the process, as the most suitable and economical.

The demand for seasoned lumber is always greatly above the supply, and the consequence is, the cupidity of the trade is excited, and lumber, said to be seasoned, is sold and used in the construction of some of our best and most expensive buildings; in the construction of costly furniture &c., 80 which, shrinking in a short time after, results in producing permanent loss as well as vexation and disappointment to the owners of the buildings, furniture &c.; and injury to the reputation of the innocent constructors; and the ultimate cause of all these 90 evils, exists in the fact that it takes from one to four years to weather-season lumber piled in the yards; and to which delay, besides the interest on the capital so invested, is to be added the cost of insurance and yard 95 room for the whole time. It is proper to state, however, that the time has in some instances been greatly shortened by piling the lumber in ventilated chambers and heating them by contained stoves or furnaces; but 100 the greatly increased risk from fire—inseparable from this mode of drying—enhances the cost almost to the same extent as the prolonged mode of weather-seasoning; besides, in both these modes—as most of the lumber 105 is now transported from the place of production by means of canal-boats and rail-road cars—the sap and gummy matter is not extracted, as was formerly the case in rafting—and being, therefore, necessarily retained, it gives nourishment to the numerous destructive insects which, for years after, continue to penetrate and destroy the 110 lumber; whereas, by the practice or use of my improved mode of seasoning, as herein described, lumber may be taken, green, or directly from the saw-mill, and in the course of 24 to 48 hours be delivered, perfectly free from sap and gummy matter, as well as 115 thoroughly dried or seasoned, at a cost of not more than one dollar per thousand feet. And the steaming and drying both being effected at one continuous operation, and by means of steam from a distant generator, 120 there is no risk from fire-sparks, nor loss of heat and consumption of time and labor, by changing the lumber from a steamer, to a drier unconnected therewith. 125

Another important consideration in favor of my invention arises from the fact that it 130

can be as readily practiced at the places of growth and original manufacture of the lumber as well as in our cities, and so effect a saving of at least thirty per cent. on the cost of canal or rail-road transportation, in consequence of its diminished weight.

I am aware that lumber has before been subjected to the direct action of steam, in close vessels, for the purpose of softening and rendering it more pliable; that it is common to dry lumber "piled" in chambers heated by a contained furnace; and that plane-timber has been "piled" within a close vessel fitted with internal steam pipes, in communication with an external generator, and an exhausting apparatus—for the purposes of steaming and drying the same; therefore I do not claim either of the de-

vices herein described, separately considered; but

Having thus fully described the construction and operation of my improved apparatus for seasoning lumber, what I claim as new and desire to secure by Letters Patent is—

The combined arrangement of the track-rails (C and C'), or their equivalents, with a steaming-and-drying chamber; or vessel (A), fitted with steam pipes and stop-cocks or valves, substantially as described, so as to operate therewith substantially in the manner and for the purposes specified.

M. R. MOORE.

Witnesses:

BENJ. MORISON,
JAS. R. OLDDEN.