

(No Model.)

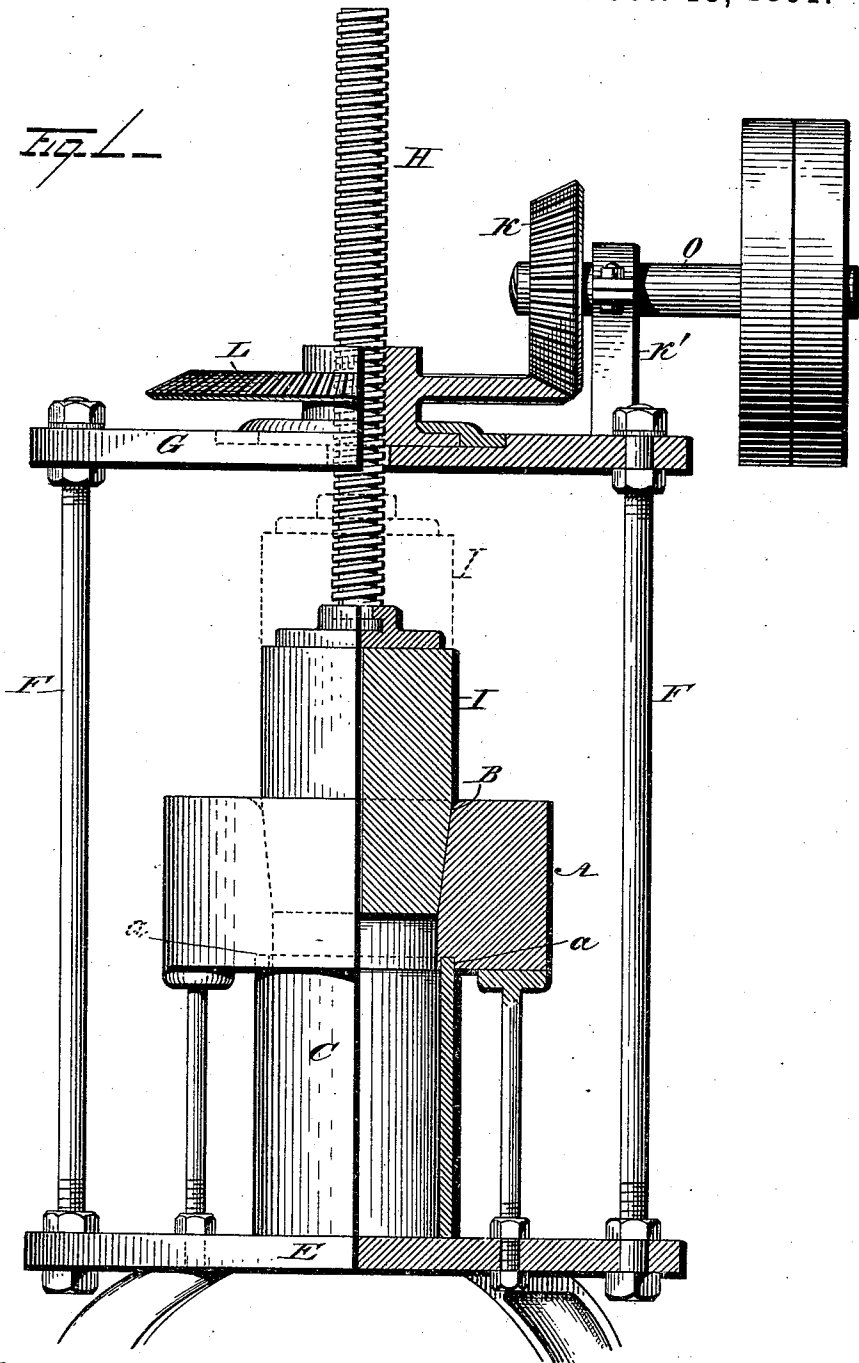
2 Sheets—Sheet 1.

H. L. DU BOIS.

PROCESS OF SEASONING HUB BLOCKS, SPOKES, &c.

No. 461,329.

Patented Oct. 13, 1891.



Witnesses:

John Nolan
John Wilson

Inventor

Henry L. DuBois

by Mark Wicks Collier
Att'y.

(No Model.)

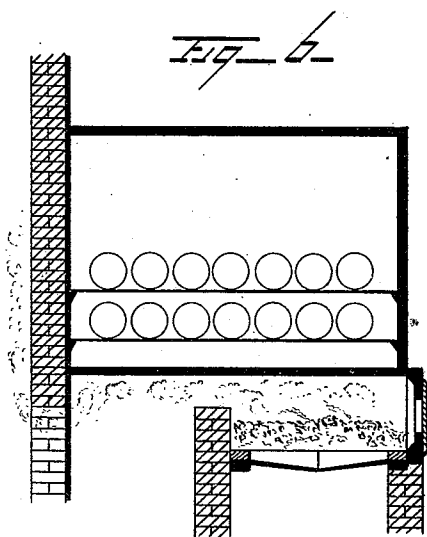
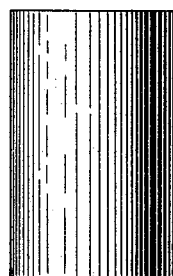
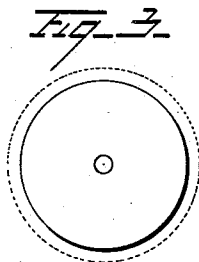
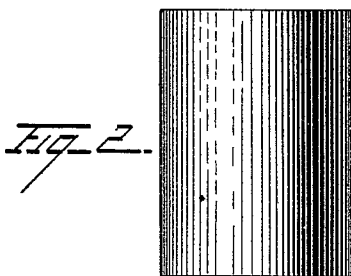
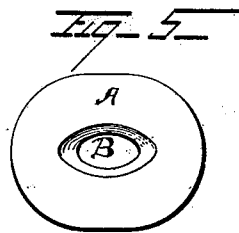
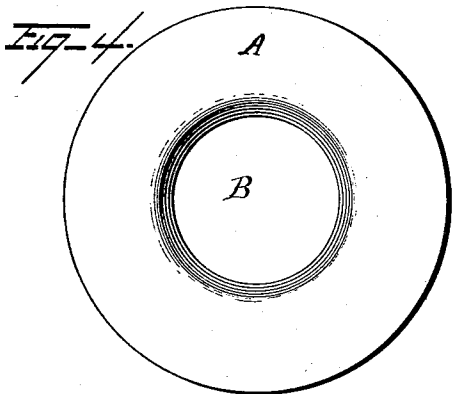
2 Sheets—Sheet 2.

H. L. DU BOIS.

PROCESS OF SEASONING HUB BLOCKS, SPOKES, &c.

No. 461,329.

Patented Oct. 13, 1891.



Witnesses:
John Nolan
John Wilson

Inventor
Henry L. DuBois
by *Mark W. Collett*
att'y.

UNITED STATES PATENT OFFICE.

HENRY L. DU BOIS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE STANDARD HUB COMPANY, LIMITED, OF SAME PLACE.

PROCESS OF SEASONING HUB-BLOCKS, SPOKES, &c.

SPECIFICATION forming part of Letters Patent No. 461,329, dated October 13, 1891.

Application filed October 18, 1889. Serial No. 327,402. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. DU BOIS, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented a new and useful Process for Seasoning Hub-Blocks, Spokes, and other Timbers, of which the following is a clear and sufficient specification, reference being had to the drawings annexed.

My process chiefly relates to seasoning those woods which cannot safely be seasoned in a drying-room on account of their liability to crack when exposed to artificial heat.

Before my invention the seasoning of hub-blocks, which are made almost entirely of either elm or gum wood, was done, essentially, in the following manner: After the blocks, which were made from a piece of wood containing the center of the limb, were cut and a hole bored in them they were placed in a dry covered place and left to season. This seasoning took from one to three years to complete, according to the size of the block, which after this period had elapsed is turned into the required size and shape of the hub. If at this time the wood was still not sufficiently dry, the hub was replaced to season, or, if very small, was sometimes placed in a drying-room. The seasoning of oak spokes, which are cut from the part of the wood lying between the bark and the center, was heretofore performed by leaving them exposed to the air for a length of time about the same as that required for seasoning hub-blocks. During the whole of these operations the shrinkage of the wood causes many, both of the hub-blocks and the spoke-blocks, to split or crack and become useless.

The object of my invention is to perfectly season hub-blocks, spokes, and other timbers in a manner that will avoid all danger of loss by splitting and cracking of the timber, but in a manner which will not reduce its natural strength or elasticity, and, secondarily, to avoid the loss of interest on the timber being seasoned, the cost of storage, and similar expenditures by reducing the period of seasoning to a very short time.

My invention consists, essentially, in subjecting green timber (which has preferably undergone a previous softening sufficient to

permit it to be easily manipulated in the subsequent process) to a compression exerted only in a lateral direction upon the fibers and applied with substantial uniformity on the lines of natural shrinkage of the wood, by which compression the structural arrangement of the fibers and medullary rays and their mutual connections are not disturbed. Said compression should be continued until the timber is reduced to or slightly below the substantial volume and form to which the natural shrinkage of seasoning would reduce it, (called, technically, the "shrinkage line,") but not sufficiently to crush the wood, though, if desired, sufficient pressure may be used to close the ducts that run lengthwise in the wood. In hub-blocks this decrease in size takes place radially and amounts to about from one-sixth to one-tenth of the diameter. The object of this peculiar compression, which forms a very marked feature of my invention, is to keep in their normal positions the fibers and medullary rays of the wood, and thereby to preserve the connection of the fibers with each other and with the medullary rays which together give the cohesive power (that of resisting disruptive strains) to the wood, so that the wood seasoned by my process retains its natural tenacity, elasticity, and power of resisting the internal strain to which hubs in particular, on account both of the strain of driving in the spokes and in their service on the road, are subjected. This tenacity, elasticity, and power of resisting internal strain has been found to be destroyed in great measure by any compression which disturbs the wood structure, as all compression not made substantially as above described tends to do. When I have compressed the wood in this manner, I subject it to a drying heat while confined to the volume and form to which the above-described pressure has reduced it—that is, to the substantial volume and form to which the natural shrinkage of seasoning would reduce it—until sufficiently dried and seasoned—that is thoroughly dried, preferably, however, not baked hard, as that is very apt to destroy the tenacity and elasticity of the wood.

In practice I carry out mechanically the

process in the following manner, though many other mechanisms could be employed to accomplish the same results.

Figure 1 is a sectional elevation of the compressing apparatus and the mold or casing for confining the wood after compression. Figs. 2 and 2^a show the comparative size of the green hub-block and the interior of the mold or casing. Fig. 3 is an end view of a hub-block having the central hole filled with an incompressible material. Fig. 4 is a plan view of a die intended to be used in compressing hub-blocks and similar timbers. Fig. 5 is a plan view of a die intended to be used in compressing spokes and similar timbers. Fig. 6 is a sectional view of an oven.

I place the green timbers in a steam-box or hot-water bath until they are sufficiently softened. In practice I soften them about as much as is done when the wood is intended to be bent, but take care not to disintegrate the wood. Before compressing the timbers I prefer to fill with a piece of iron or similar substance any holes made therein, especially the hole bored ordinarily through the hub-block.

The compression of the wood I perform in practice by driving it lengthwise through a tapering die A, having a hole B of sufficient diameter at the top to admit the wood easily and decreasing sufficiently in diameter at the bottom to reduce the wood below the shrinkage line at the bottom. The shape of the cross-section of this die should be at all parts similar to the cross-section of the wood to be compressed. In hub-blocks or other similar articles where the heart of the tree is included in the timber, the compression being substantially radial, the section of the hole B should be circular and decrease substantially equally on all its radii. In compressing the timbers made from the wood taken from between the heart and the bark I arrange the hole B in the die A, so as to compress the wood substantially to the volume and form it would shrink to in the natural seasoning. This shrinkage takes place both in the direction perpendicular to and in the direction parallel to the medullary rays, but is greater in the direction perpendicular to them, and in this direction, therefore, the greater compression should be made, and consequently the hole B in the die used to compress wood taken from between the heart and the bark should decrease in section more extensively on the lines perpendicular to than on the lines parallel to the medullary rays.

To drive the timber through the die, I employ an ordinary force-press having bed-plate E, standards F F, cross-head G, and screw H. I operate this screw by the bevel-wheels L and K, the latter attached to the shaft O and working in bearings K'.

To keep the wood confined while being dried out, I provide a mold or casing C, which fits into the grooves *a a* in the bottom of the die A, and has a cross-section similar to the cross-section of the compressed wood suffi-

ciently small to prevent the wood from swelling substantially above the volume and form to which the natural shrinkage of seasoning would reduce it.

To operate this compression, I place the wood, preferably hot and fresh from the softening, on the top of hole B of die A, which has been placed on top of mold or casing C, this latter being placed on bed-plate E of the press. I then rotate the screw H and drive the block I through the die into the mold or casing. I then rotate the screw H backward, remove the mold or casing, substitute another, and repeat the operation. I then dry out the wood held in compression by placing it contained in the mold or casing, preferably in an oven, and subjecting it therein to a drying heat until seasoned. This heat is preferably the heat of an ordinary baker's oven and the time occupied in drying from eight to fourteen hours, (though a longer or shorter time is sometimes requisite,) when the wood will be seasoned. After being seasoned the wood can be taken out of the mold or casing and utilized in the ordinary manner. It is found to be substantially the same in structure as wood dried in the ordinary natural seasoning with the air.

I am aware that heretofore wood has been compressed and heated under pressure to harden it and to deprive it of its natural elasticity in order to make it a substitute for bone and metal and the like. Wood prepared for this purpose would, because of the loss of its elasticity, be useless for the uses to which wood seasoned by my process is applied.

I am also aware that there is nothing new in female dies provided with taper-holes or in mechanism adapted to drive materials through them, as they have been used for many years.

What I claim, and desire to cover by Letters Patent, is—

1. The process of seasoning wood, which consists in compressing it substantially to the natural shrinkage line by pressure applied only in a direction substantially lateral to the fibers and on the line of natural shrinkage, and then subjecting said wood while thus compressed to a drying heat, substantially as described, whereby the structural arrangement of its fibers and medullary rays remains undisturbed and its strength unimpaired.

2. The herein-described process of seasoning wood, which consists in first softening the wood, then compressing it substantially to the natural shrinkage line, but without crushing the wood fibers, and then subjecting said wood while wholly confined under compression to a drying heat, substantially as specified, whereby the fibrous structure of the wood is uninjured and its strength and elasticity unimpaired, substantially as set forth.

3. The method of seasoning wood, which consists in first subjecting the wood to pressure in a direction transversely to the grain

of the wood, and then drying the wood while it is thus subjected to such transverse pressure, substantially as described.

4. The method of seasoning wood, which
5 consists in first softening the wood, then compressing the wood in the direction transversely to the grain of the wood, and then

drying the wood while it is thus subjected to such transverse pressure, substantially as described.

HENRY L. DU BOIS.

Witnesses:

MARK WILKS COLLET,
JAMES S. PHILLIPS.