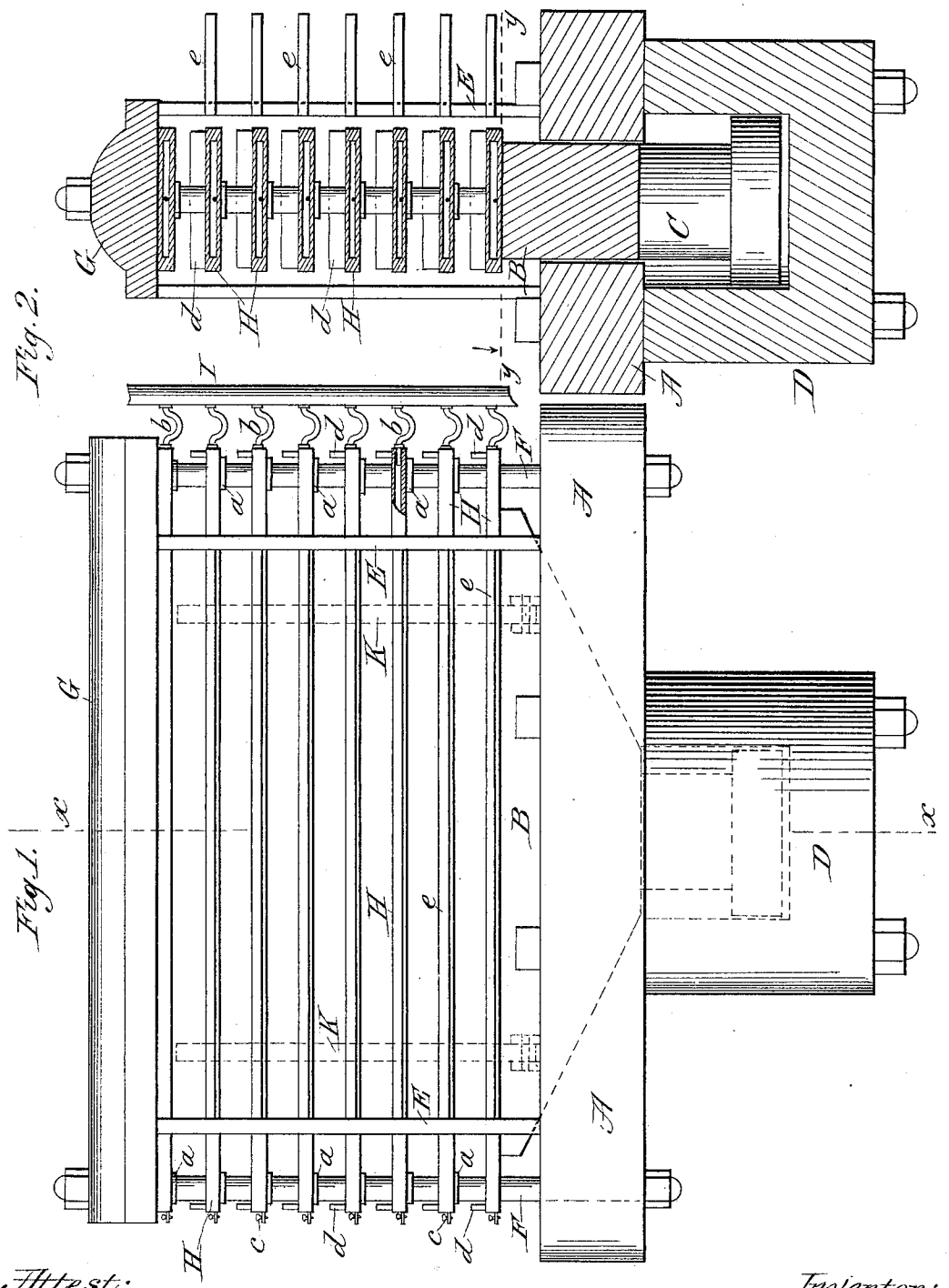
(No Model.) 2 Sheets—Sheet 1.

H. S. SMITH.

LUMBER DRIER.

No. 327,030. Patented Sept. 29, 1885.



Attest:
F. H. Schott
A. R. Brown

Inventor:
Herman S. Smith
by John C. Tasker atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

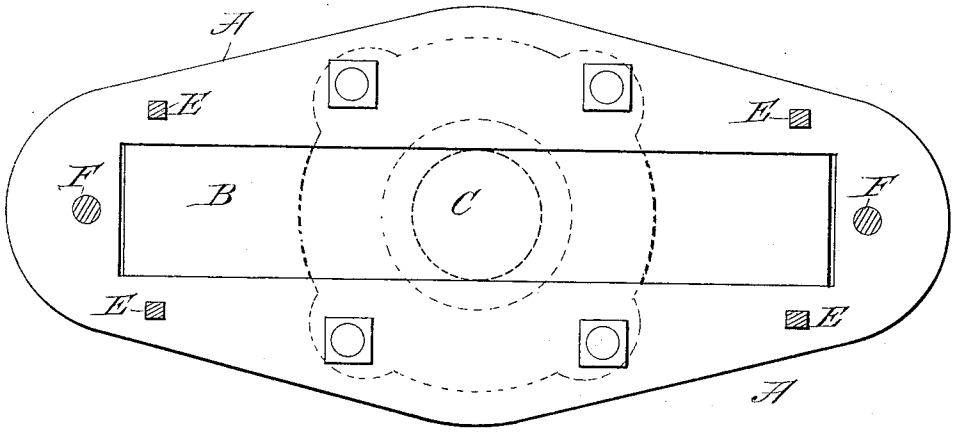


Fig. 4

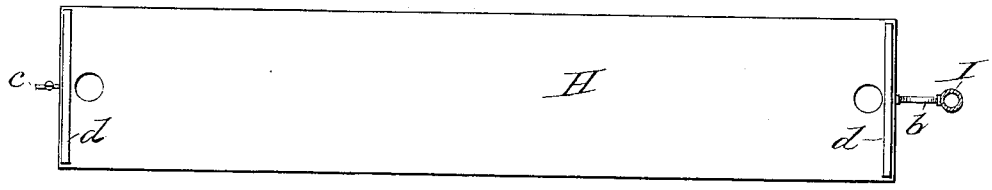
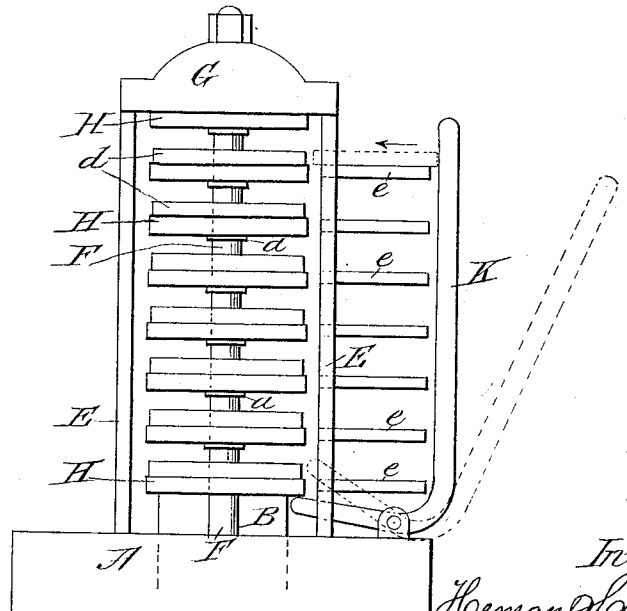


Fig. 5.



Attest:
F. H. Schott
A. R. Brown.

Inventor:
Heman S. Smith,
per John A. Sackett, Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HEMAN S. SMITH, OF BROOKLYN, NEW YORK.

LUMBER-DRIER.

SPECIFICATION forming part of Letters Patent No. 327,030, dated September 29, 1885.

Application filed June 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, HEMAN S. SMITH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Pressing and Drying Lumber; 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 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.

This invention relates to compressing and drying lumber, the object being to cook or solidify its albuminous constituents, so as to cure or season the lumber rapidly with but little expense, and without materially diminishing its weight, the durability and solidity of the wood being greatly increased.

The invention consists in the construction and combination of the parts of a lumber drying and pressing apparatus, as hereinafter more particularly described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a side elevation of a lumber pressing and drying machine constructed in accordance with my invention. Fig. 2 is a vertical transverse section of the same on the line *x x* of Fig. 1. Fig. 3 is a horizontal section of the machine on the line *y y* of Fig. 2. Fig. 4 is a plan view of one of the hollow press-plates with the stand-pipe in section, and Fig. 5 is a partial end view of the machine.

Like letters of reference designate like parts in the several views.

A is the bed-plate, B the lower platen, C the piston, and D the cylinder of a hydraulic press, the construction of these parts being similar to that shown in my former patent, No. 250,593, dated December 6, 1881, for stave bending and drying machines.

On the bed-plate A are standards E E and guide-posts F F, that support the cap-piece G, the bed, cap, and connections being made of great strength to withstand the force of the press-piston in compressing the lumber that is placed in the press.

A series of vertically-moving press-plates, H H, are supported in the space inclosed by the standards E and F, between the bed and cap. When the press is open, these press-plates are supported at suitable intervals by means of collars *a a* on the guide-posts. The press-plates H H are made hollow, as shown in Fig. 2, in order that they may be heated by introducing steam, hot water, or other heating medium into their interior.

It is obvious that the press-plates can be heated in various ways; but I prefer to use, in connection with the hollow plates H, a stand-pipe, I, that is connected to said plates by flexible pipes *b*, as shown in my former patent. By this means a heating fluid can be passed through the stand-pipe and conveyed without interruption into the interior of the press-plates, no matter what their position in the press may be. The hollow press-plates can be connected with a stand-pipe at one or both ends of the press, as desired, though ordinarily only one stand-pipe will be required. Each press-plate is provided with a cock, *c*, for drawing off the water of condensation when steam is used as a heating medium.

At each end of the press-plates is a vertical stop, *d*, which, by coming in contact with the adjacent plates, distribute the pressure equally throughout the machine, so that all the lumber under treatment will be equally and thoroughly compressed, and at the same time heated sufficiently to cook or solidify its contained albumen.

Attached to the standards E E, on one side of the press, and coincident in position with the press-plates H H, when the press is open, are tables or shelves *e e*, for supporting the lumber before it is introduced into the press. A bell-crank lever, K, is pivoted on the same side of the press, near each end, as shown in Fig. 5, and by dotted lines in Fig. 1, in such position that as the press is opened the lower press-plate H in its descent will strike against the short arms of said levers, so as to bring their long arms forcibly in contact with the projecting edges of the lumber that rests on the shelves or tables *e e*, thereby forcing said lumber from the shelves *e* into the press and against the compressed lumber on the press-plates, the uncompressed lumber taking its place upon

the press-plates, while the finished or compressed lumber falls from the press on the opposite side. The lumber that has already been treated in the press, and which rests on the opened press-plates, is thus automatically removed and its place supplied by the uncompressed lumber.

The operation of this machine in compressing and curing lumber and the effect produced will be readily understood. The lumber to be treated is placed on the shelves *e e* and hollow press-plates H H in a longitudinal position, instead of transversely, as in my former patent for a stave-pressing machine, and may be arranged in one or more layers, as desired. The press is then put into motion by means of hydraulic power, in connection with a suitable air-accumulator, so as to cause a firm and rapid upward movement of the several press-plates, with their loads, the stops *d d* on said plates serving to distribute the pressure throughout the press contents, and thereby effect a uniform compression in the upper and lower layers of lumber. The heating medium conveyed by the stand-pipe I is introduced into the hollow press-plates constantly through the flexible pipes or tubes *b b*, whether the press is opened or closed. The press-plates are thus kept constantly heated to a degree sufficient to vaporize the moisture of the lumber in contact therewith, thereby cooking the albumen in the wood, solidifying its connective tissues, and rendering it firm and solid under the conjoined pressure of the press. After remaining in the press for ten, fifteen, or twenty minutes the descent of the press-plates will actuate the levers K K, so as to eject the compressed lumber and replace it with the uncompressed material that is in readiness on the shelves *e e*, as before described. The finished lumber as it falls from the press is removed and stacked or piled in any convenient manner to cool and dry without further treatment. It will be observed that this method of compressing and drying lumber results in retaining the albumen and other valuable constituents of the wood-fiber and connective tissues, and solidifies them in a firm and coherent mass, thus greatly increasing the density and durability of the finished product. It also renders the lumber uniform in texture without liability of internal or external checking, and enables it to resist the injurious effects of moisture and changes in temperature.

My process or method of treating lumber is particularly applicable to veneers, which are thereby prevented from warping or curling, and also to all classes of lumber that is rich in vegetable sap and juices, the latter being thereby thoroughly consolidated with the woody fiber and connective tissues, so as to produce a firm and dense article of lumber that is not liable to split, check, or warp.

Heretofore in compressing and drying lumber the vegetable juices and albuminous matters have been allowed to escape with the moisture or vaporized elements of the wood, the result being a light spongy product that will not resist the effects of heat and moisture. In drying lumber under pressure it has also been heretofore proposed to subject the lumber alternately to heat and cold, steam or heated air being first brought into contact with the press-plates, and then replaced by an access of cold water. The effect of this treatment, however, is to condense the vapor or steam generated in the wood before it has an opportunity of cooking and solidifying the albumen and vegetable juices, and the lumber so treated is therefore not thoroughly cured.

By my method of treatment even the most refractory varieties of wood or lumber can be speedily and thoroughly cured in such a manner as to retain all its valuable qualities and without material diminution in weight or bulk.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lumber pressing and drying machine, the combination of the bed-plate A, standards E E, guide-posts F F, having collars *a a*, the cap G, supported by said standards and guide-posts, the hollow press-plates H H, supported horizontally on the collars *a a*, and having exit-cocks *c* and stops *d d*, the movable platen B, carrying the lower press-plate, and the stand-pipe I, having flexible tubes *b b*, for connecting with each press-plate, substantially as described.

2. In a lumber pressing and drying machine, the combination, with the movable press-plates H H and the fixed tables *e e*, supported by the standards E E at one side of the machine, of the bell-crank levers K K, pivoted to lugs on the bed-plate, and adapted to be actuated by the lower press-plate in its descent, substantially as described.

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

HEMAN S. SMITH.

Witnesses:
A. R. BROWN,
M. P. C. CALLAN.