No. 635,572. Patented Oct. 24, 1899.

LA FAYETTE MOORE.

POP VALVE FOR KILNS.

(Application filed Dec. 24, 1898.)

(No Model.) 2 Sheets—Sheet 1.

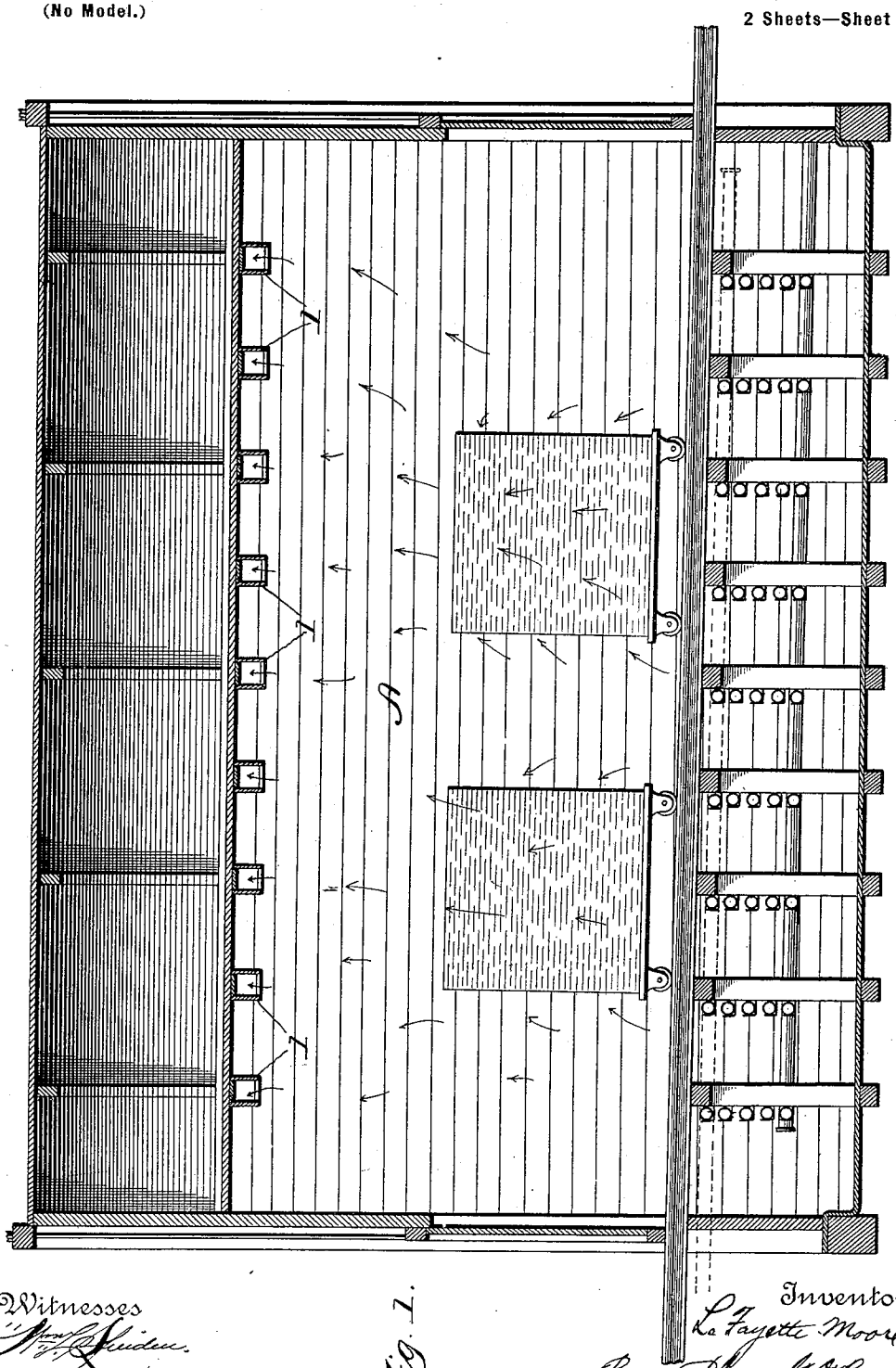


Fig. 1.

Witnesses
Wm. L. Louden.
Ralph C. Warfield.

Inventor
La Fayette Moore
By Rhea & O'Brien & Co.
His Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 635,572. Patented Oct. 24, 1899.

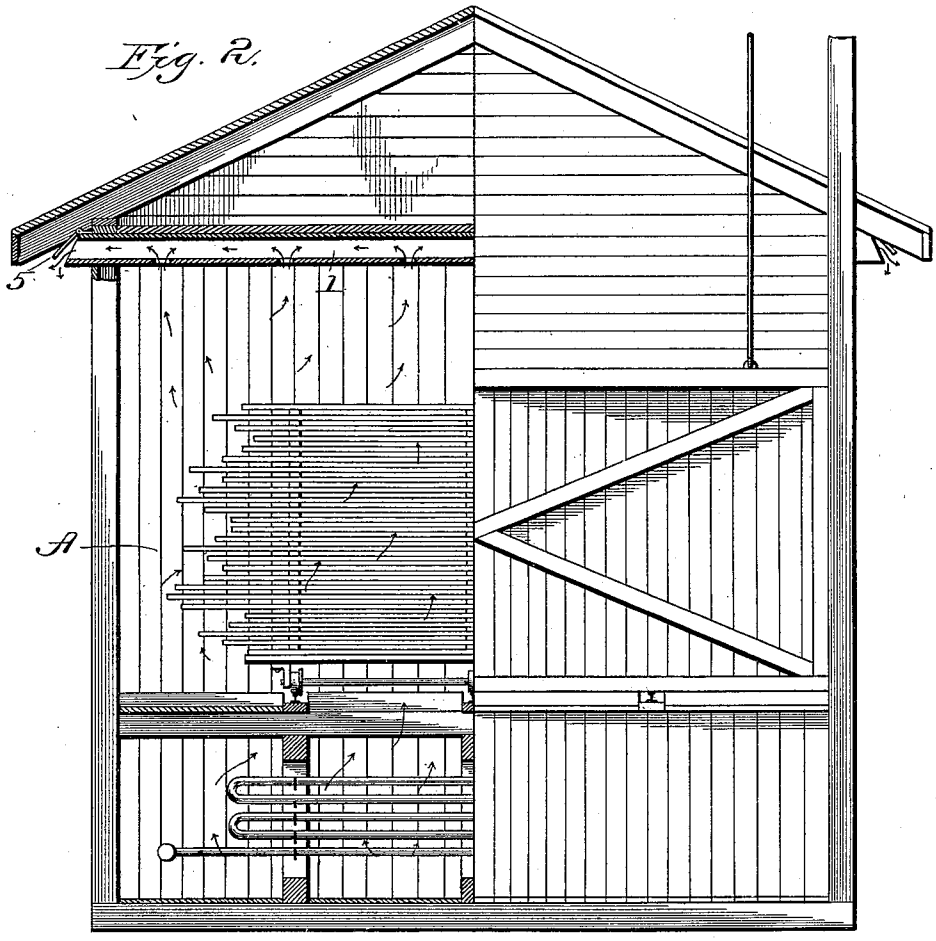
LA FAYETTE MOORE.

POP VALVE FOR KILNS.

(Application filed Dec. 24, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.



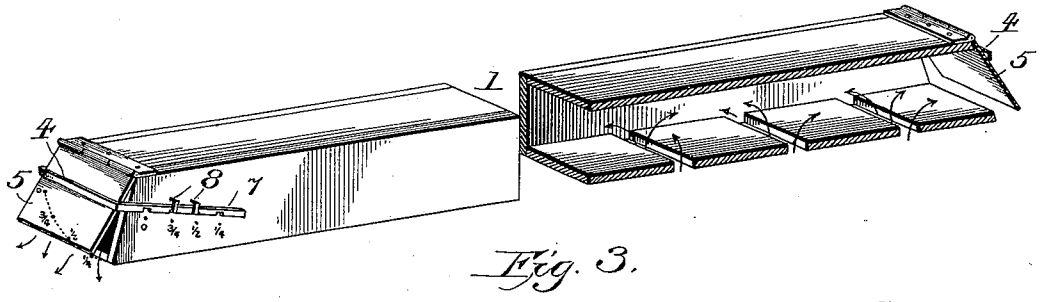


Fig. 3.

Witnesses
Wm. L. Spinden
Ralph C. St. Warfield.

Inventor
La Fayette Moore
By Rhesa G. DeBois & Co.
his Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LA FAYETTE MOORE, OF SHERMAN, TEXAS.

POP-VALVE FOR KILNS.

SPECIFICATION forming part of Letters Patent No. 635,572, dated October 24, 1899.

Application filed December 24, 1898. Serial No. 700,213. (No model.)

To all whom it may concern:

Be it known that I, LA FAYETTE MOORE, a citizen of the United States of America, residing at Sherman, in the county of Grayson and State of Texas, have invented certain new and useful Improvements in Pop-Valves for Kilns, of which the following is a specification.

My invention relates to an improvement in pop-valves for kilns, the object being to provide a construction of the character named which may be applied to any variety of kiln now in use.

A further object is to provide a device which will operate automatically by vapor-pressure, so that any excess of moisture created during the curing process is allowed to escape according to the expansion and pressure in the kiln-room.

A further object is to greatly diminish the cost of kilns to the user by dispensing with the elaborate paraphernalia heretofore deemed indispensable, such as inlets and outlets and downtakes at the base of the kiln.

A still further object is to provide means for keeping the material, as lumber, being treated wet until heated through, thus enabling the drying of the stock evenly by first forcing and expelling the moisture contained in the material and drying from the center outward gradually until all the moisture or sap is forced from the stock through the open pores by heat and expansion, the pores being kept open the while by heavy vapor that cannot escape except by pressure through the valves which constitute a part of the present invention and which are located at or near the upper portion of the kiln-room.

The amount of water contained in every square foot of green lumber averages from one and three-fourths to two and one-fourth pounds. By applying heat in a kiln containing green stock the lumber is kept wet until heated through. This I accomplish by means of my pop-valve, which is constructed to afford the only means of escape from the kiln-room, and this escape is effected only by the steam-pressure through the pop-valve, which results automatically from the steam formed and pressure created by heating the sap to the boiling-point, the stock in this way being kept in a steam-bath or vapor which is forced from the lumber by the high degree of heat.

It has been demonstrated that with openings to kilns and outlets for moisture to escape freely a sufficient amount of moisture has not been retained in the kiln-room to keep the surface of the stock wet enough to prevent the surface pores from closing, especially on oak and hard wood, where the stock is subject to 200° of heat and rapid drying is required. The consequence is that the stock becomes case-hardened before it is thoroughly heated through, after which the sap or water near the center begins to expand, and in being forced by expansion it finds escape through the surface of the stock, leaving checks and split openings on the face of the stock after being dried. It is the object of my present invention to obviate these objections, and it is done by the use of my improvements, which have in view the use of a perfectly tight kiln, or at least as tight as practicable, and providing it with a flap-valve which is operated by the created pressure within to automatically relieve the excess of pressure. As I construct this valve so that the temperature must rise to a predetermined point before it will operate, my purposes are readily accomplished. The temperature is allowed to reach as high as from 200° to 220° of heat at the outset, and as 212° is boiling-point the moisture in the stock to be dried soon begins to expand after being heated. The kiln being as tight as possible, the pressure soon raises the flap valve or valves and the moisture escapes according to the pressure in the kiln, and the consequence is that the stock is evenly heated, the risk of fire and combustion is avoided, and case-hardening, checking, and defects resulting from not retaining sufficient moisture during the drying process are avoided.

With the above objects in view my invention consists in certain novel features of construction and combinations of parts, which will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a kiln, showing my improved flap-valve. Fig. 2 is a transverse sectional view, and Fig. 3 is an enlarged detail view, of one of the valves.

A represents the kiln. This may be of any variety of construction, and I do not wish to be confined to any particular design of kiln,

as my present invention pertains more particularly to the flap-valve devised for the purposes mentioned and the accessory features which may be applied to any known kiln in use, whether for the drying of lumber or other purposes. The main thing to be considered is a practically air-tight kiln, and for the sake of economy this may be constructed without great elaboration in the simplest possible manner. Provision must of course be made for the heating-coils at the bottom, if steam or hot water is employed, and tracks for the lumber-trucks, if the lumber is to be run in in that fashion, and any variety of other means may be employed, as the user may require, without departure from the present invention.

The features of this invention consist, primarily, of a box 1, which may be made in any suitable dimensions; but for purposes of description we will say its internal transverse dimensions are six inches by six inches. This box extends the length or width of the kiln just beneath the ceiling, the extreme end opening outside of the kiln-room, conveniently just beneath the eaves of the roof.

A number of openings are formed in the box for the escape of the moisture created, and these openings correspond in dimensions and number with the cubic inches at the outer ends of the box. For example, there are six two-by-six-inch openings formed in the box, which will be equivalent in the aggregate to the cubic inches at the two ends. The ends of the box are preferably inclined, as shown, the bottoms extending out farther than the tops, and on each end a flap-valve is hinged at its upper edge, and these flap-valves have a bail 4 encompassing them. The valves may be set at different positions, according to the moisture required in the curing process, in which event these bails may be notched, as at 7, to engage the staples 8, which form guides for the ends of the bails and stops as well to hold the flaps one-quarter, one-half, three-quarters, or wide open, as the case may be, according to the pressure desired. For instance, in Fig. 1 the valve 5 is shown one-quarter open for drying oak or hard wood, where more than an ordinary amount of moisture is required, and it is obvious that as less moisture is necessary the valves might be set wider open—say one-half open—and in this way the same kiln may be used for all varieties of wood to be dried, and as some woods require more rapid heat and but little moisture in the kiln, and others, like oak, cypress, and other hard woods, require that the surface be kept wet while it is being heated through to the center, provision is made in this apparatus for all these different treatments. By this construction of valve and bail the latter may be adjusted to maintain any required pressure within the kiln.

In applying the flap-valve to other kilns I would have to close the inlets, outlets, and downtakes at the base of the kiln in order to get a pressure sufficient to work the valves.

This same process and apparatus may be employed for drying brick, as it has peculiar advantages in this application, because by retaining the moisture until the bricks are heated through it prevents the top surface of the brick from cracking before beginning to dry from the center, which is the case where rapid currents of air are allowed to escape in a kiln with surface moisture when first exposed to the heat.

It is evident that slight changes might be made in the form and arrangement of the several parts described without departure from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth; but,

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

1. The combination with a practically air-tight kiln, of a box in the top protruding outside of the kiln at each end, said box having openings therein for the entrance thereinto of the vapors from the kiln, and valves on the protruding ends of the box.

2. The combination with a kiln, of a box extending through the upper portion of the kiln and terminating at each of its ends outside of the kiln, said outer ends inclining, a flap hinged to the upper edge of each of these ends and means connected therewith for regulating the valve.

3. The combination with a kiln, of a box extending through the upper portion of the kiln and terminating at each end outside of the kiln, a flap hinged at each protruding end, and means capable of being set to define the extent to which the flaps may open whereby to regulate the pressure to be attained inside of the kiln.

4. The combination with a kiln, of a box extending through the upper portion of the kiln and terminating outside of the kiln at each of its ends, flap-valves hinged at said protruding ends, and bails encompassing said flap-valves and adjustably secured to the boxes whereby to regulate the extent to which a valve may be forced open and to correspondingly determine the pressure to be attained in the kiln.

LA FAYETTE MOORE.

In presence of—
J. D. HAIZLIP,
J. Q. ADAMSON.