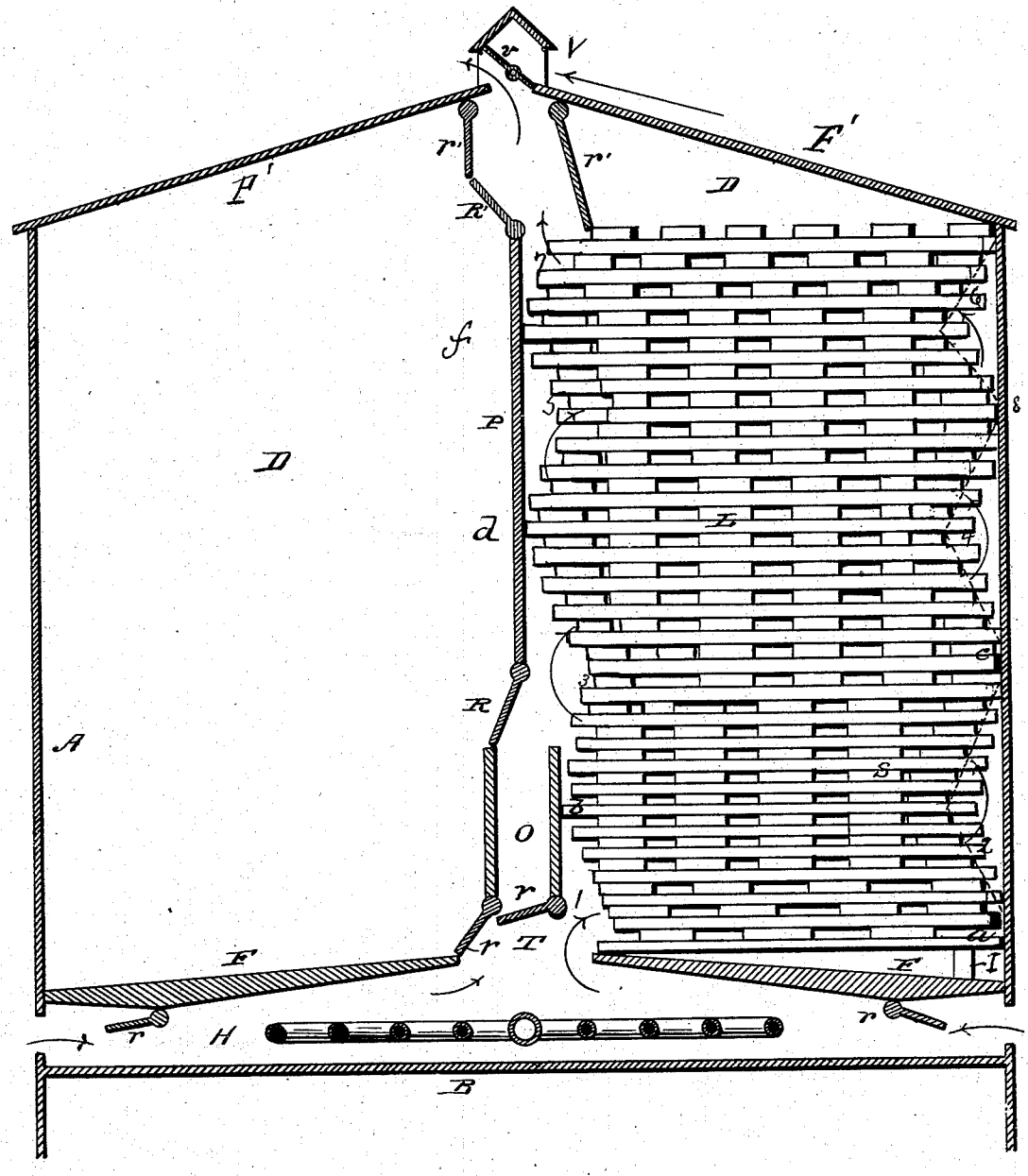
(No Model.) 2 Sheets—Sheet 1

E. MYERS.

LUMBER KILN.

No. 295,667. Patented Mar. 25, 1884.

Fig. 1.



WITNESSES

E. F. Bates.

Philip Cunasi.

INVENTOR

E. Myers—

by Audrson & Smith

Atts.

ATTORNEYS

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

(No Model.) 2 Sheets—Sheet 2.

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Fig 3

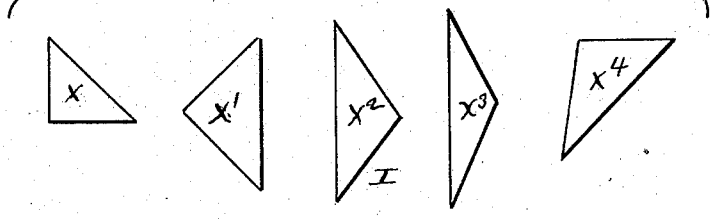
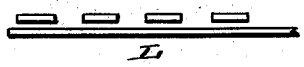


Fig. 2.



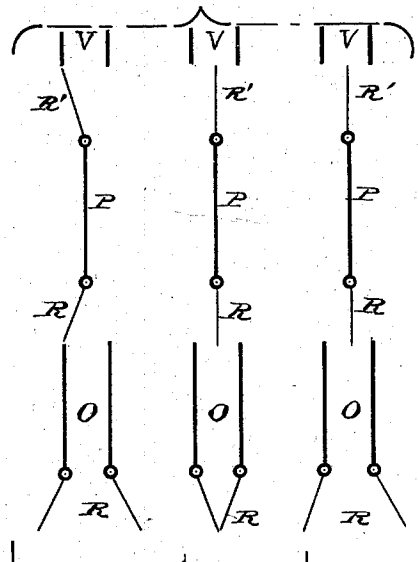


Fig. 6

Fig. 7.

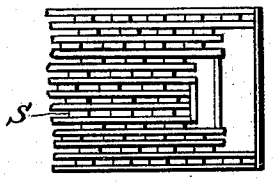
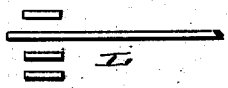


Fig. 5.



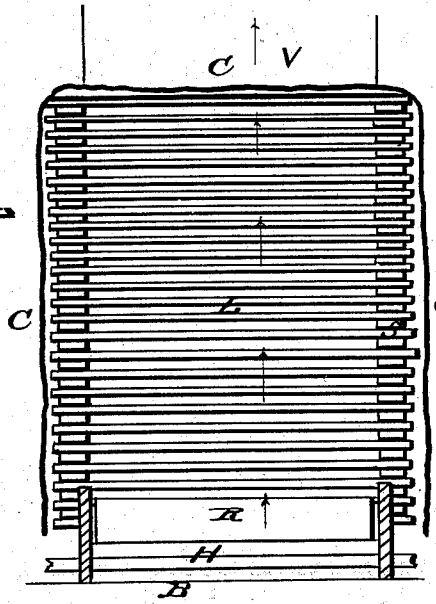


Fig 4.

WITNESSES

E. H. Bates,

P. C. Masi

INVENTOR

E. Myers,

by Audrain & Smith

his ATTORNEYS

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

UNITED STATES PATENT OFFICE.

EPHRAIM MYERS, OF SUSPENSION, ALABAMA.

LUMBER-KILN.

SPECIFICATION forming part of Letters Patent No. 295,667, dated March 25, 1884.

Application filed February 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIM MYERS, a citizen of the United States, residing at Suspension, in the county of Bullock and State of Alabama, have invented certain new and useful Improvements in Lumber-Kilns; 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 letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a vertical sectional view. Fig. 2 is a detail view, showing the crossing lumber. Figs. 3, 4, 5, 6, 7 are detail views.

This invention has relation to lumber-kilns for drying lumber; and it consists in the construction and novel arrangement of devices, as will be hereinafter fully described, and particularly pointed out in the claims appended.

Referring by letters to the accompanying drawings, A A designate the outer upright end walls of the kiln; B, the bottom of the same; F F, the floors of the drying-rooms and the ceiling or upper part of the heating-room; P, the partition between the drying-rooms; F′, the roof, and D D the drying-rooms.

In Fig. 1, H designates the heating-room containing the steam-pipes. The heating-room is placed beneath the drying-rooms, having its ceiling somewhat corresponding with the inclination of the roof, and having the highest point of its ceiling at the throat or opening T, and inclining upward from both cold-air inlets. Its shape is cuniform, or that of a very obtuse wedge inverted. *r r* designate cold-air inlets or registers at opposite sides of the heating-room. T is the throat or passage through which the heated air enters the drying-rooms, and V the ventilator through which it passes out of the kiln. By this arrangement cold air more readily finds its way into the heating-room, and after being heated it rushes to the highest point upward into the drying-rooms. The steam-pipes are a main pipe having smaller ones connected with and diverging from each side thereof. The main pipe may be extended, and other pairs of rooms added, if desired. Between the drying-rooms is a partition, P, which forms one end wall of each room, and is divided at its base, so as to form a flue, O, to each lower side of which is hinged a register or valve, R, for the purpose of controlling the air by changing it from one room to the other, or admitting it into both rooms at the same time, or passing it up through the flue O, as may be desired. To the top of the partition P a register or valve, R′, is hinged in such a position as to be connected with the ventilator when swung either to the right or the left.

Fig. 6 shows the various positions of the valves, whereby the air is admitted into one room and shut out from the other, and vice versa, so that men can be working in one room while lumber is being dryed in the other—*i. e.*, taking out dried lumber and replacing it with green—and the heating apparatus need never be idle, as is necessary where each drying-room has a separate heating-room and heating apparatus.

The use of the flue O is to admit air from the heating-room directly to the upper sections of the pile, where it does not dry as rapidly as in the lower part of the pile, by reason of the air becoming overcharged with moisture before reaching the upper part.

The ventilator is constructed as follows: A suitable aperture is provided in the roof, over which a superior covering or roof is erected. A valve, *v*, is placed between the main and superior roof, and so hinged as to be deflected by the wind, and to operate as a damper to prevent it from passing downward through the aperture. It will be obvious that the wind passing up over the sides of the roof will take an upward direction, and would pour or fall over into the aperture; but I take advantage of the inclination of the roof and rising motion of the wind by poising or pivoting the damper *v* in such a way as that the wind will strike the upper part of it and tilt it over against the opposite side of the superior roof, which will swing the lower part of the damper till it comes in contact with the main roof, and thus close the windward side of the aperture or flue and open the leeward side, thereby putting the current of the hot air under the lee of the damper and allowing it to pass out freely and unobstructed by the wind-currents.

$r' r'$ are valves hinged to the roof at or near the aperture auxiliary to the valve R′, whereby the ventilator is rendered adjustable.

x x' x^2 x^3 x^4 are partition guide patterns or molds or matrices, and are placed in position, as the lumber is piled, to form cavities in the lumber-pile, and also to divide the outer cold air from the hot air within. These pattern-guides are composed of angular boards and remain in place while the lumber is being dried. They may vary in shape, being more or less acute or oblique in outline, as may be required to produce diverse cavities, some kinds of lumber requiring larger and deeper cavities in the pile, in order to dry and season well.

For the purpose of more effectually excluding the outer cold air from the pile, as well as to confine the hot air within it, whereby the draft or circulation of hot air through it is greatly increased, and also for the purpose of saturating the lumber with steam, which is an efficient agent in the process of seasoning, and which is more thoroughly accomplished by confining the steam closely to and within the pile, I provide a covering, C, Fig. 4, for the lumber pile, made of flexible material, such as heavy ducking or tarpaulin. This may be used over the top of the pile and ends of the lumber in the kiln, or to cover the whole pile, if constructed in the open air. I deem a flexible covering for a lumber pile a novel but important factor in the process of seasoning lumber.

The manner of piling the lumber is based on the physical law that hot air rises, and is therefore as follows: Beginning at the point *a* of the drying-room, and laying the lumber or boards L transversely of the room, and on beams provided for the purpose, first having placed a guide-pattern, I, near each end of the lumber and resting against the wall, the first layer is laid until the throat T is reached. The next layer and the cross-strips S, which are placed transversely of the lumber and between the layers, are inclined by following the edges of the guide patterns toward the wall. Continuing the work by placing the lumber against the guide-patterns and the cross-strips against the sides thereof, the pile is obliquely raised till a point—such as *b*—on the wall is reached, against which the last layer is closely placed, to prevent the air from rising up into the space 3 above. This is designated the first section of the pile. From this point the second section is similarly laid and inclined in the opposite direction until a point—such as *c*—on the opposite wall is reached, and thus on, inclining the sections from right to left and from left to right till the pile is completed, placing the guide-patterns as the work goes on. The inclination or obliquity of the sections may be increased or diminished by using different guide parts; hence the points *a b c d*, &c., are not stationary, but occur, according to the guide-patterns used, wherever the lumber being piled meets the wall. The guide-patterns, being movable, are used also in various lengths of lumber.

As may readily be seen, a lumber pile thus constructed contains all the flues for the circulation of air through it, within its own limits, and may be built in the open air and enveloped with the flexible covering C, which would close the cavities 2 4 6 instead of the walls. Then by admitting hot air under the covering at T it would circulate through the pile, provided, of course, that an outlet be allowed at 7. The angular cavites 2 4 6 are but continuations of the spaces or flues between the layers of lumber, and might be divided accordingly by placing boards vertically to connect with each layer. (See Fig. 7.) The air, as shown by the arrows, after it enters the inlets *r r*, being heated, is accelerated into the opening or throat T, and passes through the interspaces of the first section of the pile into the lower part of the cavity or flue 2, whence it rises and passes into and through the interspaces of the second section into the lower part of the cavity or flue 3, thence likewise into 4, thence into 5, finally passing out through the ventilator V. This peculiar manner of piling lumber, and the shape of the cavities or flues produced thereby, is most favorable to the rapid and even circulation of hot air through the pile, because the layers of lumber overlapping each other, the interspaces produced in the upper part of the cavities are presented directly above the corresponding ones in the lower part thereof, and the least possible resistance to its entrance into the interspaces is met and no obstacle is found in its normal ascent save only the lumber itself, the interspaces being presented nearly vertical to the planes of the upward-curving air-currents. In other words, the lower half of each cavity, where the air emerges from the interspaces, being narrow at its base and widening upward, admits the air freely into the cavity, while the upper half of each, where it enters the interspaces, is broad at its base (which is the middle of the cavity) and narrowing upward. There is room above for only enough air to fill the upper interspaces. The remainder is held down, as it were, and turned into the lower ones, and the curvatures of the currents, as they emerge from the interspaces below, are maintained until they enter the corresponding ones of the upper half of the cavities. The shape of these flues precludes the possibility of any counter-currents of air. The effect of this arrangement of lumber, interspaces, and walls with respect to each other is to give the air-currents in the cavities an upward curvilinear direction, which, in connection with their passage through the interspaces, form sinuous air-currents throughout the pile.

The advantages are, first, cheapness and simplicity of construction; second, economy in heating apparatus, by turning the heated air into either room, and emptying one room and refilling it while lumber is being dried in the other; third, strong draft—*i. e.*, power

to draw, as the draft of a stove or chimney; fourth, complete, rapid, and even circulation of air through every part of the lumber pile, thus drying it evenly and uniformly; fifth, complete control of the air by simple means; sixth, facility of increase of capacity by the addition of more pairs of rooms and the extension of the main heating-pipe.

I am aware that it is common to pile lumber between cross-strips between the layers, and I do not intend to claim this; but my invention consists in thus piling it and overlapping the layers, (so as to present the interspaces, as nearly as possible, in the normal path of the air-currents, which can be best done by confining all the air-flues within the pile of lumber,) in connection with devices for dividing the outer air from the air within.

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

1. In the construction of a lumber pile for seasoning and drying the boards, the herein-described process of piling it upon cross-strips the ends of which engage with angular pattern guides or formers, the inclined edges of the formers coming in contact with the lumber, and their sides with the cross-strips, which are located near each end of the pile, the vertical edges of the formers abutting against the walls of the kiln, thereby forming cavities or flues between the lumber pile and the walls of the kiln, and preventing the outer air from entering the pile inside of the cross-strips and formers, for the purpose of circulating hot air through the pile, substantially as specified.

2. The combination, with the chambers D D, having the inclined floors F F and rooms F′ F′, and the vertical central partition, P, having the swinging valve R at its lower end and the swinging valve R′ at its upper end, of the swinging valves r' r', hinged to the base of the ventilator V, the flue *o* below the partition P and above the floors F F, provided at its lower end with swinging valves adapted to engage the inner edges of the inclined floors F F, and the heating-chamber below, having cold-air inlets provided with valves r r, substantially as specified.

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

EPHRAIM MYERS.

Witnesses:

B. B. BEALL,

A. B. FONTAINE.