(No Model.) 3 Sheets—Sheet 1.

# W. A. FLETCHER.

## LUMBER KILN.

No. 421,690. Patented Feb. 18, 1890.

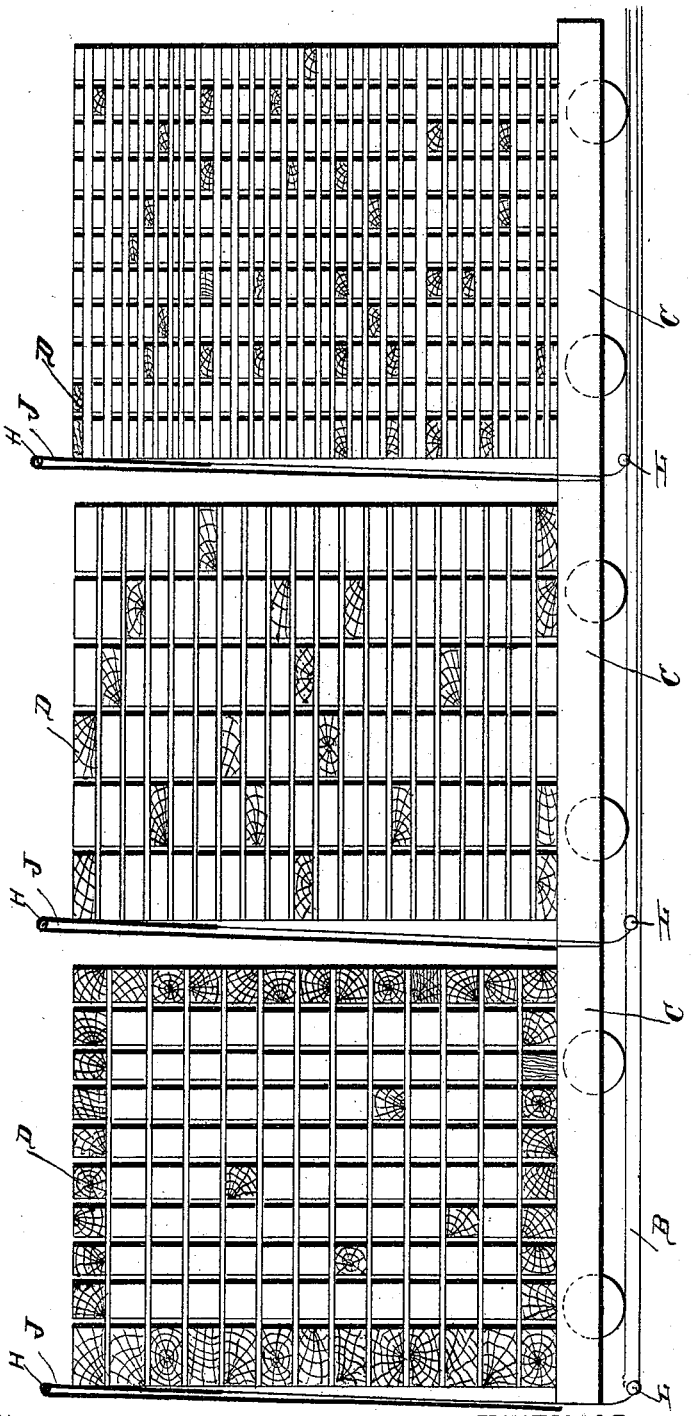


Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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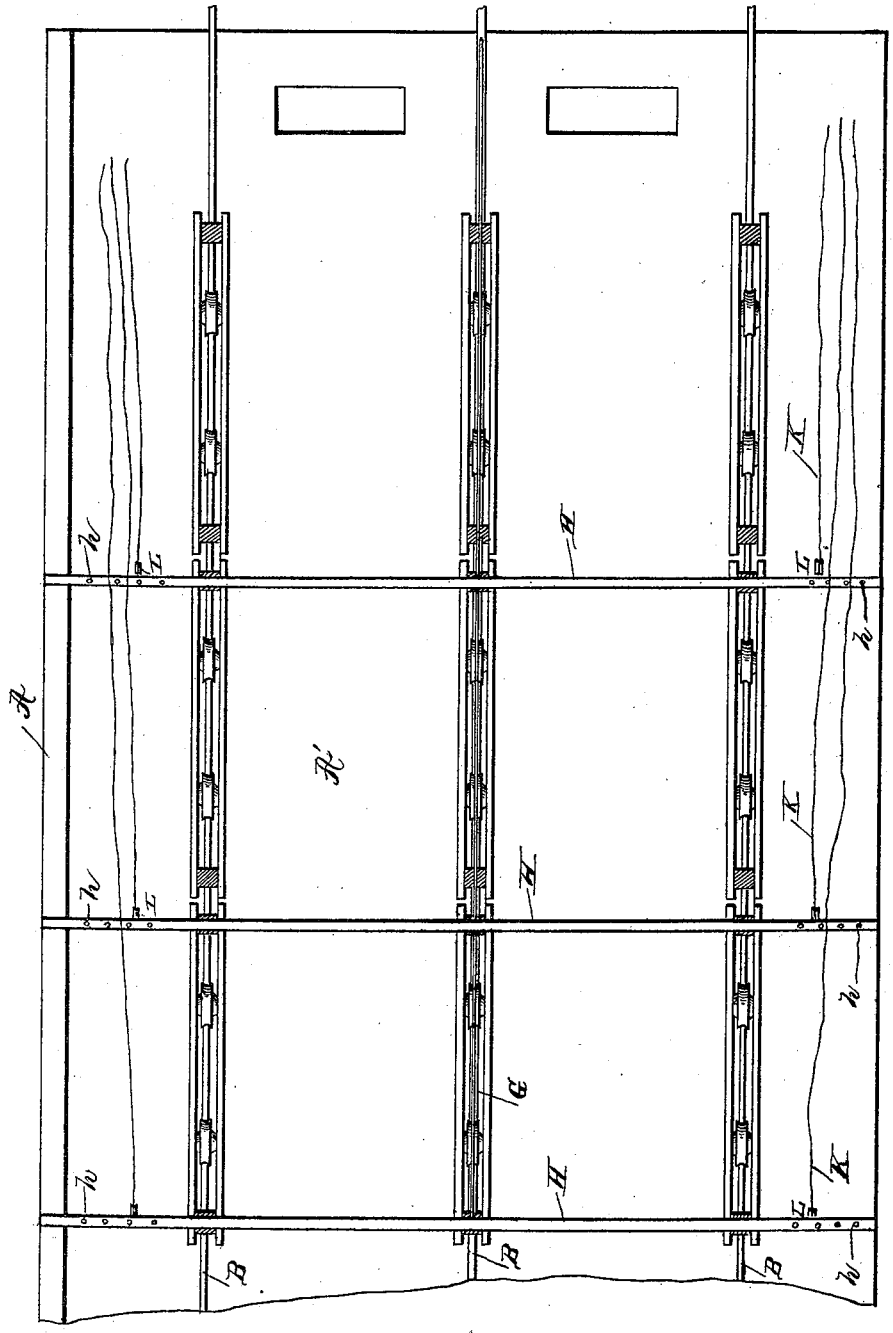


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(No Model.) 3 Sheets—Sheet 3.

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## LUMBER KILN.

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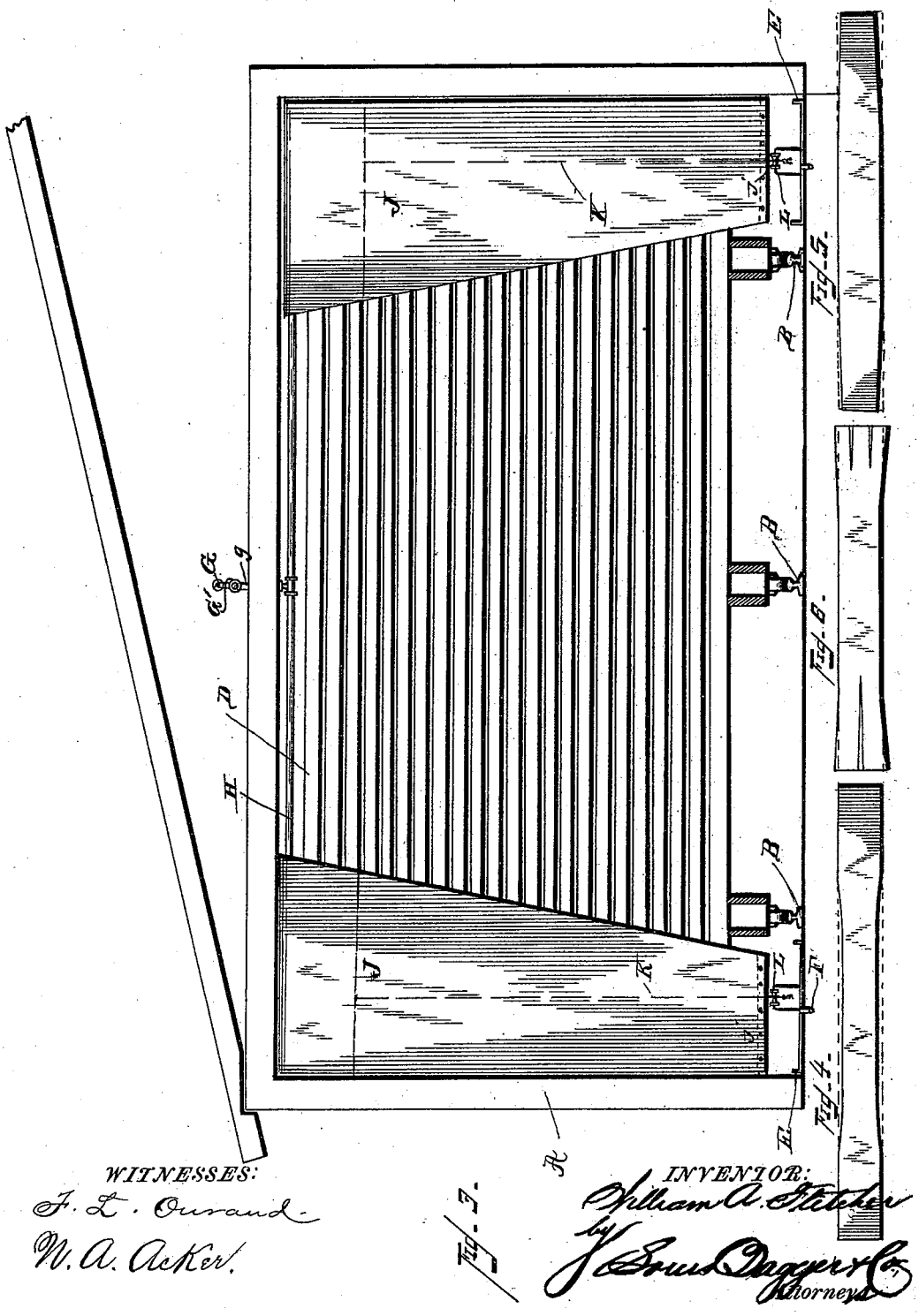


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# UNITED STATES PATENT OFFICE.

WILLIAM ANDREW FLETCHER, OF BEAUMONT, TEXAS.

## LUMBER-KILN.

SPECIFICATION forming part of Letters Patent No. 421,690, dated February 18, 1890.

Application filed August 16, 1889. Serial No. 320,964. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM ANDREW FLETCHER, a citizen of the United States, and a resident of Beaumont, in the county of Jefferson and State of Texas, have invented certain new and useful Improvements in Lumber-Kilns; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention has relation to certain new and useful improvements in lumber-driers; and it consists of the details of construction and arrangement of parts, as hereinafter more fully pointed out in the drawings and described in the specification.

The object of this invention consists in providing a lumber-drier of such construction as will permit of the green lumber placed therein to be dried to have a direct current of dry heated air applied directly throughout the center of the pile, while the outer ends of said pile will be subjected to a moist heat simultaneously therewith, thereby causing a central shrinkage of the lumber in the first instance, while the outer ends of the pile remain unshrunken, and afterward to allow for the application of a uniform current of hot dry air to the whole surface of the pile, so as to cause a shrinkage of the outer ends equal to the central shrinkage, thereby preventing the checking or cracking of the outer ends, as is the case where the lumber is subjected to the direct application of hot dry air throughout the pile in the first instance.

Referring to the drawings forming a part of this application, Figure 1 is a view in elevation of my improved lumber-drier, one side thereof being removed for the purpose of showing the location of the cars and piled lumber thereon. Fig. 2 is a top plan view of the drying-room, showing the water-supply pipes arranged thereabove. Fig. 3 is an end view of the drier, showing clearly the position of the curtains when raised; Fig. 4, a detail view of a plank, so as to illustrate the shrinkage of the same when treated in my improved drier. Fig. 5 is a view of a plank, showing how it should shrink by the old methods; and Fig. 6 is a view illustrating the checking or cracking of a plank when treated by the driers now in use.

Similar letters of reference are used to illustrate corresponding parts throughout the entire specification and several views of the drawings.

The letter A is used to designate the drier proper, and B the iron tracks arranged in the dry-room A′.

C represents the cars or trucks upon which the lumber to be dried is placed, said piled lumber being indicated by the letter D. These cars or trucks, with built lumber thereon, are adapted to run upon the tracks B into the drying-room A′.

E E are evaporating-pans placed on the floor of the room to one side of the outer tracks, so as to be directly beneath the projecting ends of the lumber.

Running beneath the floor of the drier and connecting with the evaporating or drip pans are drip-pipes F.

Above the ceiling of the dry-room runs parallel therewith the water-supply pipe G, which pipe connects at suitable intervals, by means of short downward-extending pipes *g g g*, with the branch pipes H H H, located beneath the ceiling and within the dry-room, said pipes running the entire width of the room, and having their outer portions provided with a series of perforations *h h h* directly above the evaporating-pans located at the sides of the floor. Of course the location of these pipes may be changed without altering the character of my invention.

Over the perforated ends or portions of the branch pipes I hang the upper end of the curtains J J, and the lower ends thereof I secure to the strip *j j*, secured above the evaporating-pans E E to the frame of the drying-room and extending laterally therefrom, and by preference the curtains are made with a gradual taper toward their lower end. To the loose ends of said curtains, overlapping the perforated portion of the branch pipes, is secured one end of the pulley-cord K. This cord is then extended downwardly back of the curtain, and, passing beneath the sheave L, is extended rearwardly, so as to be conveniently operated. If we suppose the curtains to be in the position illustrated in Fig. 3 and

it is desired to lower the same, all that is necessary to be done is simply to release the free rear end of the cord K, and the entire curtain may thus be permitted to fall to the floor of the room. On the other hand, when it is desired to raise the curtains from the position just mentioned, it is only necessary to pull on the free end of the cord, and after the curtains have been raised sufficiently for the upper free end to hang over the perforated ends of the pipes H the rear end of the cord may again be secured. Said curtains are designed to cover or protect the projecting ends of the piled lumber placed in the dry-room, also to separate one pile from the other, as clearly shown in Fig. 3 of the drawings. The curtains, when raised so as to overlap the perforated portion of the branch pipes, have a gradual incline from the top to the bottom, for the purpose hereinafter described.

The lumber to be dried is run into the dry-room in a green condition, and the stacking thereof upon the cars or trucks is in the ordinary manner.

In the drawings I have shown the drying-room as being provided with three cars piled with lumber; but of course any desired number of cars may be arranged therein by merely increasing the supply of branch water-pipes and of the hereinbefore-described cover-curtains. I have also shown the evaporating-pans as being constructed separate from the floor; but, if so desired, they may be formed in the floor proper.

The operation of my improved drier is as follows: Green lumber having been previously piled upon the cars or trucks, the same are then caused to be run into the dry-room until the proper point is reached, (depending upon the number of piles to be dried,) the ends of the lumber projecting beyond the sides of the cars over the evaporating-pans. The curtains are raised until the wide ends thereof lap over the perforated portion of the branch water-pipes, when the lower ends are secured to the strip over the evaporating-pans. The ends of each pile of lumber to be dried are protected by means of the curtains in the manner above described. Water is then introduced into the branch pipes by the opening of the stop-cocks G′, located at the top of the downwardly-extending pipes *g g g*, from whence it flows through the perforations *h h h* onto the curtains J J into the pans E E. The water is prevented from falling directly from the branch pipes into the evaporating-pans by reason of the curtains being hung at an incline. After the water has been turned on, the dry-room is tightly closed and dry hot air introduced therein in any suitable manner and allowed to circulate freely between the several layers of lumber. It is obvious that by allowing a continuous flow of water over the curtains the hot dry air coming in contact therewith at the ends of the lumber will create a moist heated air at that portion of the pile, while the center thereof will be subjected to a direct current of hot dry air, which will necessarily cause a shrinkage thereof. After subjecting the piles of green lumber to the application of a dry and moist heat, as above described, for a sufficient length of time—that is, until the center of the pile has become partly shrunk—the flow of water is cut off and the curtains allowed to fall to the floor by the pulling of the pulley-cords and the lumber exposed throughout to the action of the dry hot air, so as to cause the shrinkage of the outer ends correspondingly with the center of the pile. Whatever water has not been carried off from the curtains by way of evaporation by reason of the direct current of hot air coming in contact therewith flows into the evaporating-pans, and if not carried by evaporation therefrom flows out through the drip-pipes F, connected with the evaporating-pans. After the thorough shrinkage of the lumber has been accomplished the hot current of air is cut off, the dry-room opened, and the cars, together with the dried lumber, run out thereof.

By the use of the present driers the lumber is subjected to the direct circulation of the dry hot air, and it is obvious that, as such material is in a green state when placed in the drying-room, the outer ends thereof dry with greater rapidity than in the center of the pile, and thus is caused the checking or cracking of such ends by reason of the undue pressure created by the unequal contraction. The effect of such drying is clearly illustrated in Fig. 5 of the drawings, wherein the natural green wood is represented by dotted lines, while the full lines indicate the wood after having been subjected to the direct application of the hot dry air.

By the use of my improved drier the shrinkage of the board is accomplished in a manner just the reverse of that previously described—that is, the necessary shrinkage takes place in the first instance in the center of the pile of boards before the dry hot air is given free circulation to the whole pile, after which the flow of the water is cut off, protecting-curtains removed from the ends of the pile, and the hot air admitted to the full length of the lumber, so as to create a shrinkage of the ends equal to the center shrinkage of the boards, thereby preventing the checking or cracking of the ends thereof, inasmuch as the shrinkage of the center previous to the ends has a tendency to close the fiber of the wood instead of causing the same to open.

Owing to the natural tendency of the heated air to ascend, and consequently create a quicker drying at the top of the pile, I provide, in order to keep the direct current of hot air farther from the ends of the lumber, the curtains, as before stated, wider at their top than bottom.

Having thus fully described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

1. The combination, with the dry-room of a lumber-drier, of the main water-supply pipe, branch pipes located beneath the ceiling and within the dry-room, said pipes having their outer portions perforated, connecting-pipes, stop-cocks for controlling the flow of the water through said pipes, evaporating-pans located on the floor beneath the perforated portion of the branch pipes, and the cover-curtains, the upper ends of which pass over the perforated portion of said pipes, and laterally-extending strips secured above the evaporating-pans, and to which the lower ends of the curtains are secured, substantially as and for the purpose herein shown and described.

2. In the herein-described dry-room of a lumber-drier, the combination, with the perforated branch water-pipes, of the gradually-tapering cover-curtains for protecting the ends of the piled lumber during the first stage of drying, and of the pulley-cords attached to the upper ends of said curtains for lowering the same, substantially as herein shown and described.

3. The combination, with a drier, of the herein-described water-supply, evaporating-pans, cover-curtains having their lower ends secured above said evaporating-pans and their upper ends overlapping the perforated ends of the transverse branch pipes, sheaves journaled in bearings in the bottom of the drier, and pulley-cords secured to the overlapping upper ends of the curtains and passing down to the rear of the same and beneath the sheaves, substantially as described.

4. The combination, with the dry-room of a lumber-drier, of the main supply-pipe, branch water-pipes having their outer portions perforated connected to said main supply-pipe, stop-cocks for regulating the flow of water through said pipes, connecting-pipes for the main and branch pipes, evaporating-pans located to one side of the floor of the dry-room, so as to be beneath the projecting ends of the piled lumber, outlet or drip pipes connecting with the evaporating-pans and passing beneath the floor of the room for carrying off the surplus water from the evaporating-pans, cover-curtains for the projecting ends of the lumber, gradually tapering toward their lower ends, passing over the perforated portion of the branch pipes, and having their lower ends secured over the evaporating-pans, so as to hang at an incline, pulley-cords secured to the top of the cover-curtains for lowering said curtains, and of the pulley-cord sheave located near the bottom of the dry-room, substantially as and for the purpose herein shown and described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM ANDREW FLETCHER.

Witnesses:
E. M. CURRY,
J. T. TERRY.