

No. 631,764.

Patented Aug. 22, 1899.

A. S. NICHOLS.
LUMBER DRIER.

(Application filed Jan. 4, 1896. Renewed Jan. 25, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

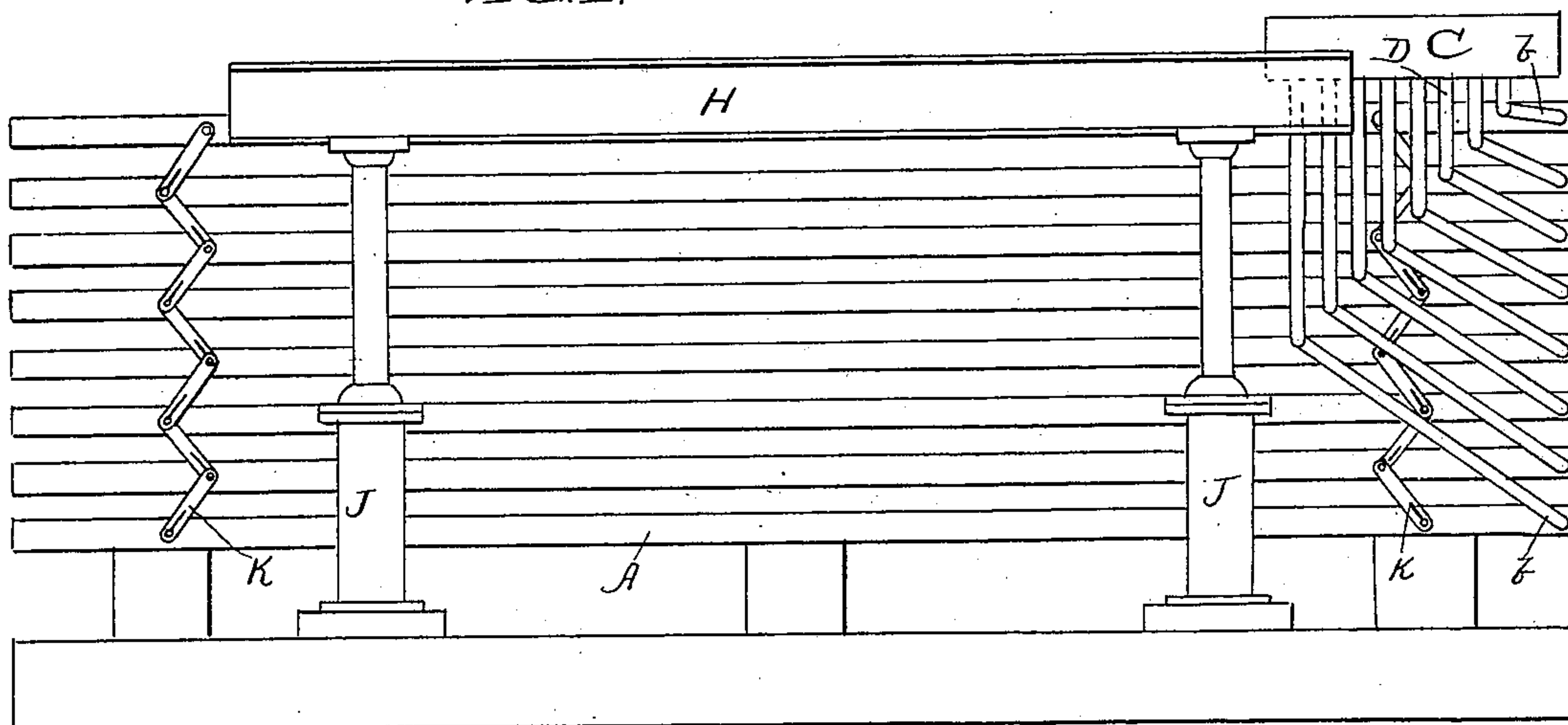
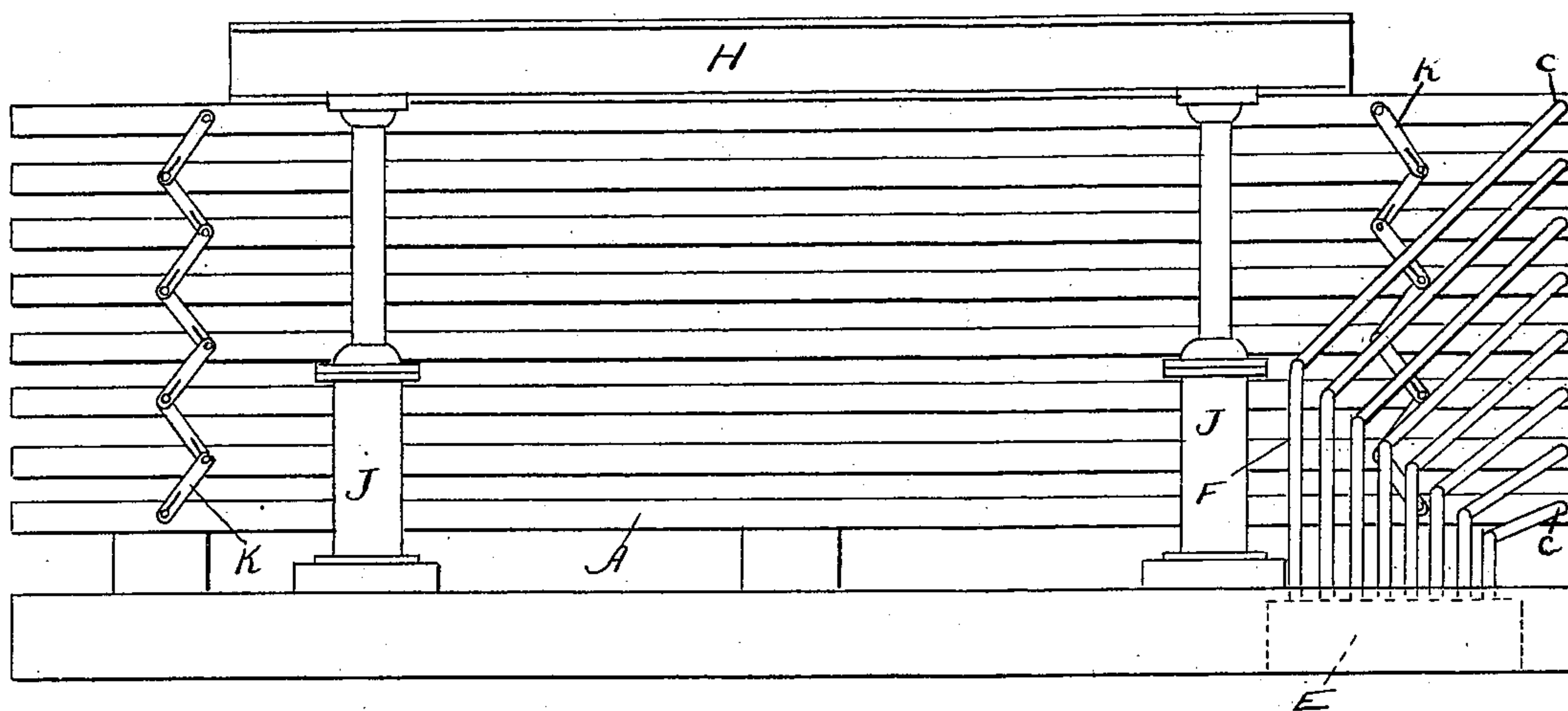


FIG. 2



WITNESSES:

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FIG. 3.

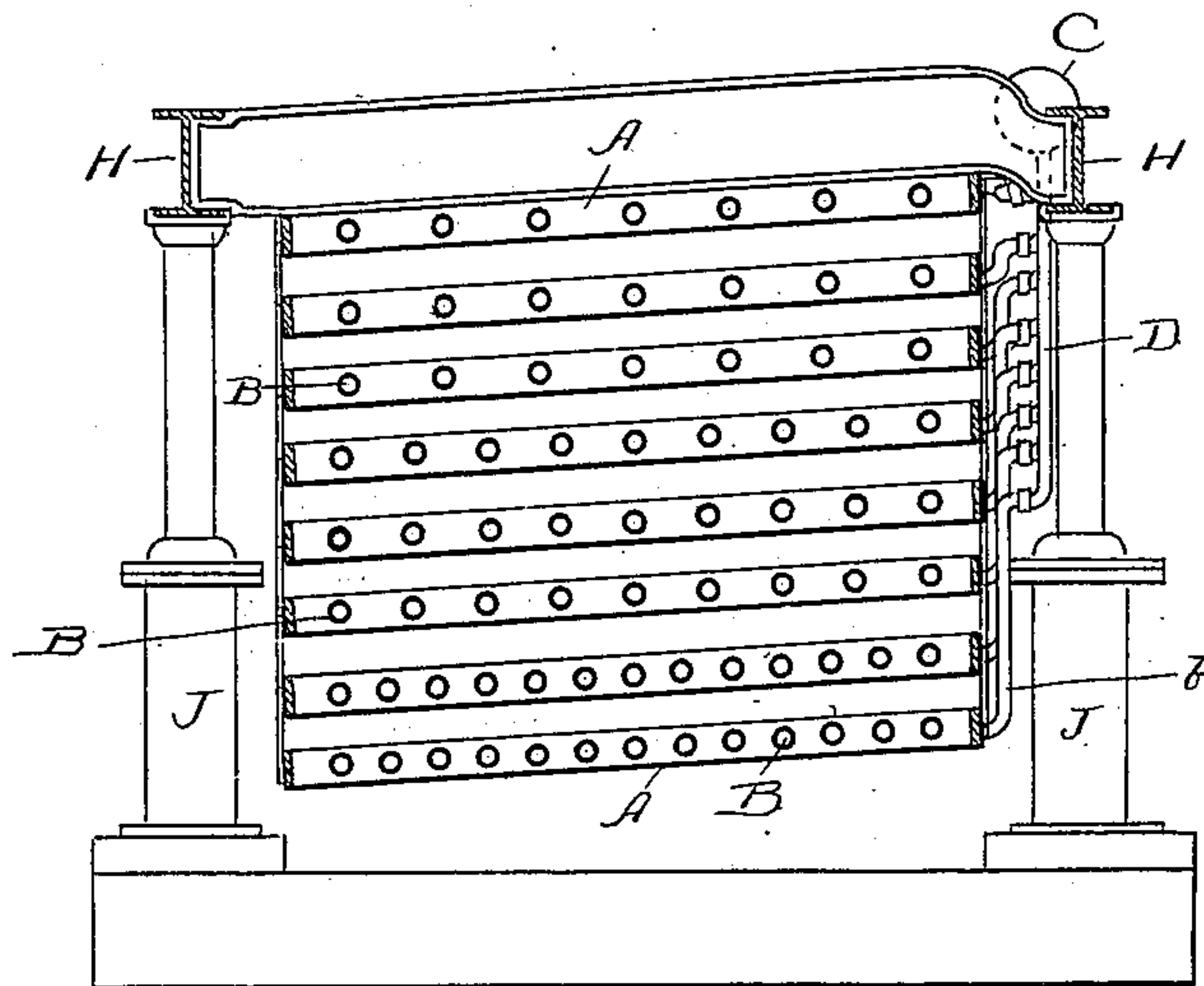
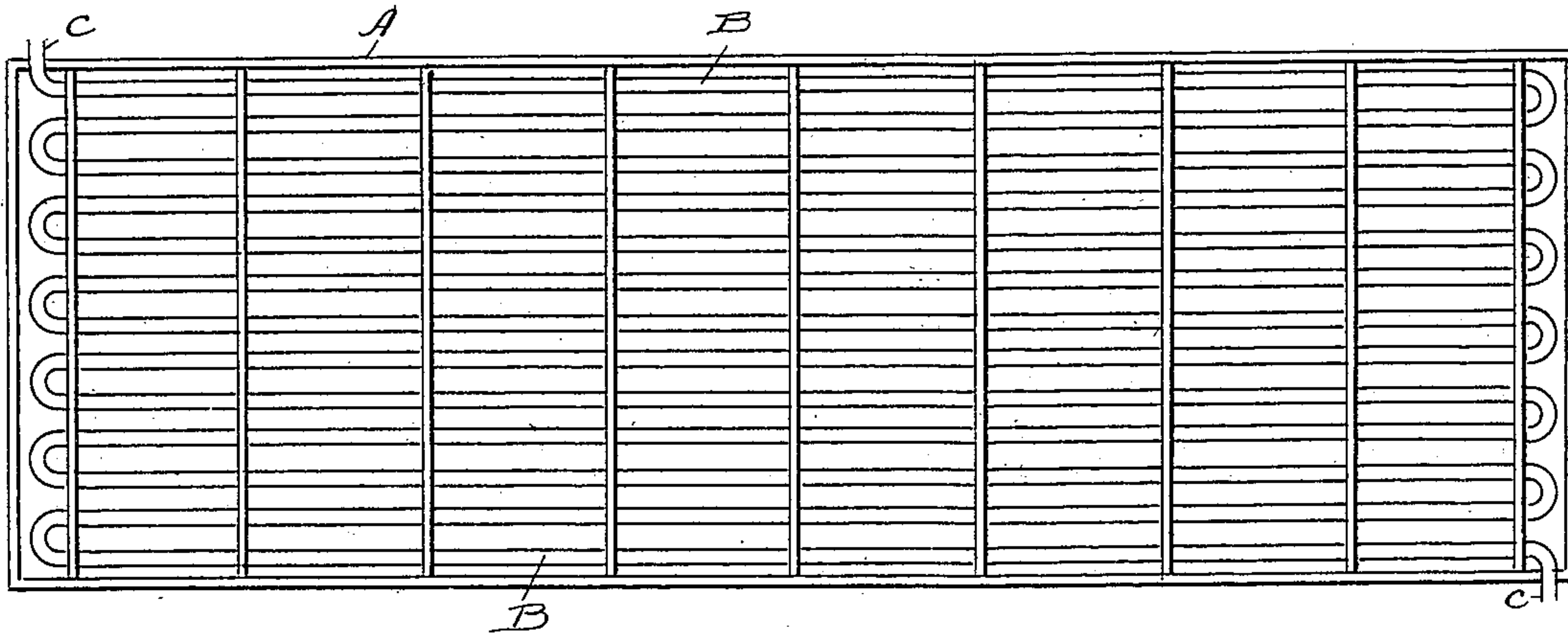


FIG. 4.



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UNITED STATES PATENT OFFICE.

AARON S. NICHOLS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND
MESNE ASSIGNMENTS, TO BENJAMIN H. REEVE, RECEIVER.

LUMBER-DRIER.

SPECIFICATION forming part of Letters Patent No. 631,764, dated August 22, 1899.

Application filed January 4, 1896. Renewed January 25, 1899. Serial No. 703,389. (No model.)

To all whom it may concern:

Be it known that I, AARON S. NICHOLS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Lumber-Driers, of which the following is a specification.

Of recent years many driers have been built and put into use for the drying of the various kinds of lumber which consist of a series of platens heated by internal steam-coils and arranged horizontally one above the other and also provided with actuating devices whereby they may be moved together, so as to bring the platens into close contact with the lumber which is placed between them and at the same time exert such pressure thereon as to straighten the lumber if it is crooked or warped and prevent any tendency to warp or get out of shape which it may exhibit while drying. Though these driers are very efficient and do excellent work and effect a great saving in the amount of time required by other driers, I have nevertheless conceived that they can be improved especially in the matter of drainage. In the horizontal-platen driers referred to there is very little, if any, natural drainage, the feed-inlet and drip-outlet being necessarily located at the same level, with the bends in the pipe forming obstructions to the flow, so that the water of condensation must be driven out by a blast of steam; but even this method of freeing the pipes of water is not wholly successful, as a small residuum of water is always left in the pipes after the blast has been used. This residuum of water, small as it is, affects the operation of the platens unfavorably during the drying by shielding or covering the bottom of the pipes from the steam, so that such bottom portions remain cooler than the upper or top portions, with which the steam comes in contact, and causes the lumber to be heated unequally, the surfaces next the tops of the pipes being exposed to a higher heat than the surfaces next the bottoms of the pipes. In some cases in drying thick stuff this unequal heating has necessitated the reversing or turning over of the lumber, so that both sides thereof may be acted upon by the high heat given off from the upper side of the pipe.

A further objection to the horizontal-platen driers is that they cannot be run unless connected to a source of high-pressure steam, because of the necessity of the high pressure in forcing out the water and avoiding the danger which would attend any freezing of the pipes while they contain a considerable body of water.

To obviate these objections is the main object of the invention, and I accomplish this by changing the series of platens from their parallel horizontal positions to parallel inclined positions, the inclination being such relative to the direction in which the courses of pipes are arranged in the platens as to insure the complete and perfect draining off of all water of condensation. The inclination should be in a direction at right angles to the pipe courses, as hereinafter particularly set forth, in order that each course may drain into the next course without any tendency by the bends to form traps for the water, and the guides and actuating devices are also so constructed as to preserve the parallelism and inclination of the platens in all positions of the latter.

A still further objection to these horizontal-platen driers wherein the platens consist of an open framework with pipes disposed in courses between the upper and lower surfaces of the frame is that they do not act equally upon all the lumber, the lumber between the upper platens receiving a much greater heat than between the lower platens. This unequal action is due to the fact that the heat given off by the lower platens is by reason of the open construction of all the platens free to rise in the spaces formed between the pieces of lumber and through the upper platens and be thus brought into contact with the lumber between the upper platens, as well as that in immediate contact with the lower platens, from which the heat came. In other words, the lumber at the top of the apparatus is acted upon not only by the heat of the upper platens but by that rising from the lower ones as well. To remedy this evil, I graduate the amount of steam-pipe in the platens from the bottom to the top of the series, the lowest ones having the greatest amount, the group next above a somewhat-reduced amount, the

third group still less, and so on to the top. In this manner I insure substantially the same heat at the top as at the bottom of the series of platens and secure uniform drying of the stock without checking the circulation of the hot air through the apparatus in any manner.

In the drawings, Figure 1 is a front or side elevation of my improved platen-drier. Fig. 2 is a rear elevation. Fig. 3 is a vertical cross-section, and Fig. 4 is a plan of one of the platens.

In the drawings, A A represent the platens of the drier. Each of these is heated by courses of steam-pipe B B, running lengthwise of the platens, the steam being supplied to the piping B at *b* and drawn therefrom at *c*. A steam-supply header C, furnishing either high or low pressure steam, is connected to each platen by a pipe D, and each discharge *c* is joined to discharge-header E by a pipe F. The top frame, to which the power is applied in opening and closing the platens, is shown at H, the hydraulic rams which furnish the power for that purpose at J, and the slotted links connecting the platens and serving as means whereby each platen may lift those below it at K.

As shown at Fig. 3, the platens are arranged in parallel and inclined positions, the inclination being downward from the side at which the steam-outlet *b* is located toward the side at which the outlet *c* is located. In other words, the inclination is at right angles to the courses of the steam-pipe, so that the steam and water move through the same in a downward and unbroken path, notwithstanding it is a devious one. In this manner every part of the steam-pipe in the platens is perfectly and entirely drained and the difference in temperature between the top and bottom surfaces thereof, heretofore alluded to, is overcome.

While I have illustrated this branch of the invention as applied to a drier for operating upon lumber, it will be understood that it may be used in any description of drier wherein the stuff is placed between platens heated by steam. It also enables the user to effectually prevent any freezing of water in the pipes in cases where the drier is not placed in a constantly-warm room and also adapts the drier to be used with low-pressure or exhaust steam.

It will be noticed that the platens illustrated consist of metal framework B' and the courses of piping B, the latter passing to and

fro through openings in the cross-bars of the frame. With this construction the air is free to pass vertically through the platens and to circulate around all the pipes, and to equalize the heat between the upper and lower portions of the apparatus I gradually diminish the number of courses of pipe in the platens from the lower platens to the top ones, so that the upper platens, which receive the hot air from the lower platens, may be furnished with less heat by their own pipes than are the lower platens.

I claim—

1. The drier for drying wood, consisting of a series of vertically-movable parallel and inclined platens, heated by internal courses of steam-pipe and joined by flexible connections to the steam supply and discharge and means for operating the platens, substantially as specified.

2. The drier for drying wood, consisting of a series of vertically-movable parallel and inclined platens, heated by internal courses of steam-pipe and joined by flexible connections to the steam supply and discharge means for operating the platens, and supports for said platens adapted to permit the vertical movement of the platens without loss of parallelism, substantially as specified.

3. The drier for drying wood, consisting of a series of vertically-movable parallel and inclined platens, heated by internal courses of steam-pipe and joined by flexible connections to the steam supply and discharge and means for operating the platens, the inclination of the platens being at right angles to the courses of pipes, substantially as specified.

4. The drier for drying wood, consisting of a series of vertically-movable parallel and inclined platens, heated by internal courses of steam-pipe and joined by flexible connections to the steam supply and discharge and means for operating the platens, in combination with a steam-supply header furnishing low-pressure steam, substantially as specified.

5. The drier for drying wood, consisting of a series of vertically-movable parallel platens made open so as to permit the air to move upward through them, and each heated by courses of pipes, the number of courses of pipes being diminished toward the top platens, substantially as specified.

AARON S. NICHOLS.

Witnesses:

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FRED M. PURMORT.