A. S. NICHOLS.

LUMBER DRIER.

APPLICATION FILED JULY 1, 1914.

1,138,136.

Patented May 4, 1915.

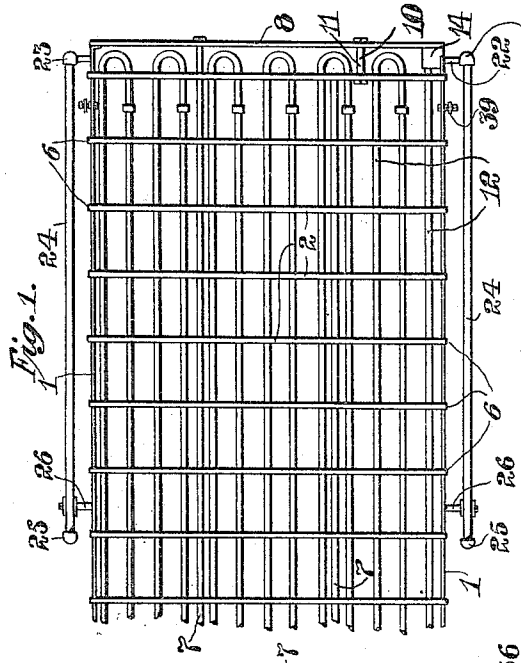


Fig. 1.

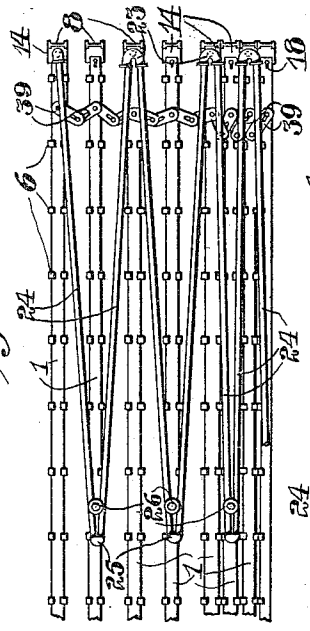


Fig. 2.

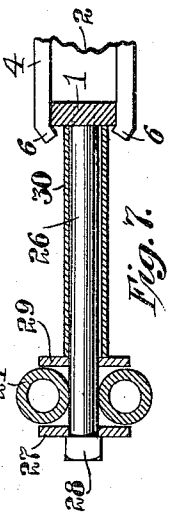


Fig. 7.

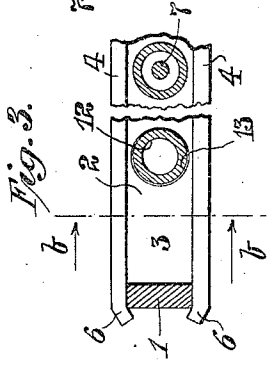


Fig. 3.

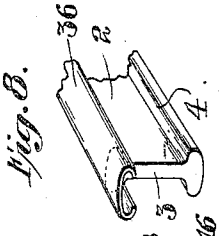


Fig. 8.

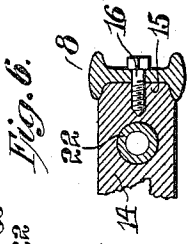


Fig. 6.

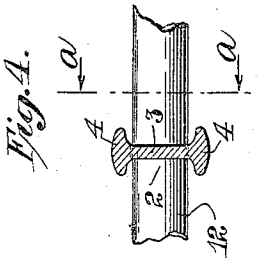


Fig. 4.

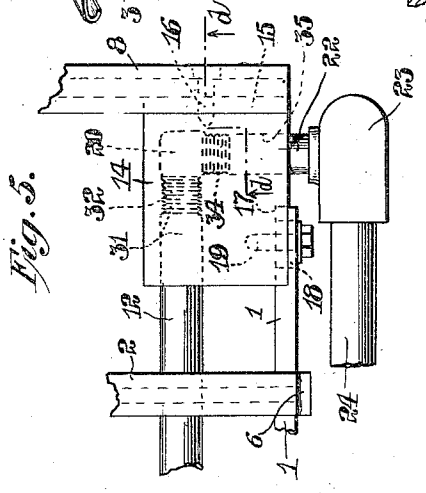


Fig. 5.

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

UNITED STATES PATENT OFFICE.

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LUMBER-DRIER.

1,138,136. Specification of Letters Patent. Patented May 4, 1915.

Application filed July 1, 1914. Serial No. 848,451.

To all whom it may concern:

Be it known that I, AARON S. NICHOLS, a citizen of the United States, and a resident of New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Lumber-Driers, of which the following is a specification.

This invention relates to improvements in lumber driers and particularly to improvements in that kind of driers in which the lumber while being dried is held between a series of platens which can be separated for permitting the insertion and removal of the lumber and then brought together again after the lumber has been inserted, so as to hold the lumber in proximity to the steam pipes while the drying takes place.

The object of my invention is to provide certain new and useful improvements in the platens whereby their construction is greatly simplified, the cost reduced, their strength increased and the entire apparatus made more effective and rigid, less apt to get out of order or to require repairs and is capable of holding a greater load.

In the accompanying drawings in which like letters of reference indicate like parts in all the figures:—Figure 1 is a plan view of one end of a platen containing an embodiment of my present invention, showing parts connected with the platen below. Fig. 2 is a side view of a series of superimposed platens and parts connected therewith, some of the platens being shown separated to permit of the introduction of lumber. Fig. 3 is a detail transverse sectional view showing the connection between the I beam cross bars and the side bars, said section being taken on the line *a*—*a* of Fig. 4. Fig. 4 is a vertical section on the line *b*—*b* of Fig. 3. Fig. 5 is a plan view of one corner of one platen. Fig. 6 is a vertical transverse sectional view on the line *d*—*d* of Fig. 5. Fig. 7 is a detail side view of the supporting bolt for the steam supply pipes. Fig. 8 is a detail combined cross sectional view and perspective view of one of the cross bars showing the detachable cap thereon, parts being broken away.

Platens or practically horizontal frames are superimposed and held on a suitable base frame and are connected by a series of slotted links with each other and with a top frame which can be moved toward and from the base frame, preferably by means of hydraulic plungers, so that the platens can be separated for the purpose of permitting the introduction of the lumber and gradually brought together as the spaces between them are filled and can be successively separated when the dried lumber is to be removed. These platens carry serpentine or like steam conducting pipes for live or exhaust steam and these serpentine pipes are connected with steam supply pipes which are located at the side edges of the platens and supported on the side edges of the platens.

In the present application I do not intend to claim broadly the features above enumerated as such constructions are well known and have been used for a number of years.

My improved platen is formed of two longitudinal side rails which are separated the width of the platen, which for example may be from five to six feet, more or less, as may be desired and these side rails are united by a greater or less number of cross bars, the number depending upon the length of the platen and these cross bars are spaced about twelve inches apart, more or less.

The side rails 1 are preferably rectangular in cross section and are placed on edge. The cross bars 2 consist of a vertical web 3 having top and bottom flanges 4 projecting from both sides so as to give the entire bar 2 in substance, the cross sectional appearance of an I beam, but the top and bottom surfaces of these flanges 4 are rounded or curved convexly so as to obviate all sharp edges which might make impressions in the lumber resting thereon. By curving the flanges in this manner, I obtain a greater accumulation of metal in said top and bottom flanges whereby the transverse supporting bars are materially strengthened. For the purpose of attaching the cross bars 2 to the side rails 1, the end portions of the webs of the cross bars are cut out between the top and bottom flanges 4 as shown in Fig. 3 and the side rails 1 are passed into the recesses thus formed, which recesses are cut of such depth that the outer faces of the side rails are some distance back of the ends of the tongues 6 formed by the flanges 4 by cutting out the web at the ends of the cross bars, that is the tongues 6 project some distance beyond the outer surfaces of the side rails 1. Then said tongues 6 are forcibly bent toward each other and partly over the outer side faces of the side rails 1 as shown in Fig. 3 whereby each side rail is held and

clamped firmly and securely against an end of each cross bar, as by such bending of the tongues 6, the inner surfaces of the side rails 1 are pressed against the end edges of the webs of the cross bars 2. At the same time the tongues 6 are bent so as to extend over the outer side surfaces of the side rails 1, which produces a very firm and rigid connection. As the curved top and bottom flanges of the cross bars project beyond the upper and lower edges of the side rails, the timber or other material being dried resting between the platens is held between such flanges and air spaces open at the sides, are thus formed between the superimposed platens, which air spaces lengthwise of the side rails are equal to the distance between the flanges of two adjacent cross bars and in height are equal to the thickness of the flanges beyond the edges of the side rails. These air spaces permit the air to circulate freely between the several platens and the material thereon. The cross bars are further braced and stiffened by longitudinal tie rods 7 which are passed through suitable holes in the cross bars and these tie rods are secured at their ends by nuts. One of the tie rods extends through to the end bars 8 and through all the cross bars 2, while the other tie rod extends from the first cross bar adjacent to an end bar 8 through all the cross bars to the first cross bar adjacent to the end bar 8 at the other end of the platen. Spreader tubes 7^a surround the tie rods 7 between each two cross bars 2 and also between the end bars 8 and adjacent cross bars. The end bars 8 are also stiffened and braced by a short tie rod 10 passing through each end bar and adjacent cross bar 2, which tie rod is also surrounded by a spreader tube 11. In this way I obtain a strong, rigid and comparatively light platen of simple construction, which does not present any sharp edges to the lumber placed thereon. The steam pipes 12 for conveying the steam for drying purposes, which may be live or exhaust steam, are arranged in serpentine lines in each platen and pass through openings 13 in the webs of the cross bars 2. One end of each serpentine pipe is connected with a steam supply pipe at one corner of the platen and with another steam supply pipe at the opposite corner of the platen and these supply pipes at the two opposite ends of the platen are located at opposite sides of the group of platens. The end of each serpentine pipe is connected with a coupling block 14, which coupling blocks are arranged at diagonally opposite corners of the platen. Each coupling block 14 is held in a corner formed by an end bar 8 and a side rail 1 and has the side resting against the inner surface of the end bar 8, provided with a tongue 15, between the top and bottom surfaces so as to fit against the inner surface of the end bar which is also of I beam shape like the cross bars 2. A screw 16 is screwed through the web of the end cross bar 8 into the block 14. The ends of the side rails 1 fit in recesses 17 cut into the outer side faces of the blocks 14 in which recesses the ends of the side rails can slide lengthwise to permit of expansion and contraction and each side rail 1 is provided at its end with a longitudinal slot 18 through which a screw bolt 19 is passed and is screwed into the block 14 as shown in Fig. 5 so that the block 14 is thus securely held in place on the end bar and on the end of a side rail but permits of relative movement of parts due to expansion and contraction.

Each block 14 is provided in its inner end with a bore or recess 31 in which the end of the serpentine pipe 12 fits, the threaded end of said pipe being screwed into a threaded portion 32 at the inner end of the bore and leading to a chamber 20. This chamber 20 communicates with a threaded portion 34 of a like bore 35 extending to the outer side of the block 14. The threaded portions 32 and 34 are of such dimensions that the threaded pipe ends screwed into the same fit steam tight and prevent leakage. At the same time, the ends of the pipes extending into the bores 31 and 35 can turn slightly in these bores. The bore 35 as shown is located between the end of the side rail 1 and the outer end of the block and into this bore 35, the steam pipe 22 is inserted, the threaded inner end of which is screwed into the threaded portion 34. The outer end of the short pipe 22 is screwed into the side of a coupling 23 into the opposite ends of which the steam supply pipes 24 are screwed, which supply pipes in the well known manner, are made in the shape of a zig-zig so that the pipes can spread and move together as the platens are spread and moved together. These supply pipes at the ends opposite those connected with the blocks 14 in the several platens are connected with each other by U-shaped couplings 25.

As the platens are separated, the zig-zag pipe is stretched and as the platens are brought together, the several members of the zig-zag pipe move toward each other at the outer ends of the platen and to permit of such movement of parts, the above described connection of the blocks 14 are made as such connections permit the short pipes 22 to turn in the bores 35 and the threaded ends of the pipes to turn in the threaded parts 34 which however prevent leakage of steam. Those parts of the short pipes 22 resting against the sides of the bore brace and stiffen the same and prevent undue strain on the threaded parts.

For the purpose of supporting the steam supply pipes, bolts 26 are screwed into the side rails 1 of the platen so as to project a

greater or less distance from the outer sides of the same and a washer 27 is mounted on each bolt adjacent to its head 28. A second washer 29 is placed on the bolt and between said second washer and the side rail 1, a pipe 30 surrounds the bolt, said pipe 30 being of such length that the washers 27 and 29 are separated a distance slightly greater than the diameter of the steam conveyer pipes 24 united by the U-shaped couplings 25, one of the pipes 24 connected with each U-shaped coupling 25, passing over the bolt 26 and the other beneath the bolt so that these bolts thus support the steam supply pipes and also hold them in vertical alinement as the pipes are confined between the washers 27 and 29, which prevent any lateral movement of these supply pipes as the platens are moved toward and from each other.

In order to prevent liquids that may ooze from the lumber and which are more or less of an acid or alkaline character that would attack iron or steel and for preventing condensed steam or moisture from rusting the flanges of the cross bars on which the lumber rests, which might tend to discolor or mar the appearance of the dried lumber, I in some cases provide the top flanges or both the top and bottom flanges of the cross bars with a longitudinal cap 36 which is made of metal which does not oxidize in such a manner as to discolor the lumber, for example these caps 36 could be made of copper, hardened more or less so that it can slide lengthwise and spring on the flanges to be held in place. With such caps the lumber would not come in contact with the iron or steel cross bars.

39 represents slotted links connecting the platens. As appears from Fig. 2, the outer ends of two pipes 24 forming V-shaped figure, are connected with the blocks 14 in the corners of alternate platens and the bolts 26 project from the platen between the two with which the two legs of the V-shaped pipe thus formed are connected so that the inner ends of the pipes 24 are above and below the bolt 26 projecting from the side of the platen between those two platens, with the steam coils of which the pipes 24 are connected.

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

1. A platen for driers composed of side rails and cross bars, the cross bars consisting of flanged bars with the outer surfaces of the flanges curved convexly, transversely to the length of the flanged bars and the ends of said cross bar being held on the side rails, substantially as set forth.

2. A platen for lumber driers constructed with side rails and cross bars, the cross bars being composed of flanged bars, the top and bottom surfaces of the cross bars being in planes higher and lower than the upper and lower edges respectively of the side rails and said side rails and cross bars being connected with each other, substantially as set forth.

3. A platen for driers composed of side rails and cross bars, the cross bars having their upper surfaces curved convexly transversely to the length of the cross bars and said curved surfaces being above the planes of the upper edges of the side rails, substantially as set forth.

4. A platen for lumber driers composed of side rails and cross bars, the cross bars having their upper and lower surfaces curved convexly transversely to the length of the cross bars and said curved surfaces of the cross bars being respectively above and below the planes of the upper and lower edges of the side rails, substantially as set forth.

5. In a platen for driers, the combination of side rails, end bars and cross bars uniting the side rails between the end bars, with hollow blocks in the corners of the platen, the end parts of the side rails resting against the outer side surfaces of said blocks, said end portions of the side rails being provided with a slidable connection, substantially as set forth.

6. In a platen for driers, the combination of side rails, end bars and cross bars uniting the side bars between the end bars, with hollow blocks in the corners of the platen, chambers in said blocks extending to the outer side and inner end of the block, steam coil pipes held in the cross bars of the platen and having their ends connected with said chambers at the inner ends of the blocks and steam supply pipes beyond the outer side edges of the platen and connected with said chambers in the blocks at the outer side of the blocks, substantially as set forth.

7. In a platen for driers, the combination with side rails, end bars and cross bars uniting the side rails, of blocks in the corners of the platens, communicating chambers in said blocks extending from the inner ends and outer sides of the blocks, the outer ends of the blocks being shaped to fit against the inner surfaces of the end bars of the platen, the end portions of the side rails of the platen resting on the outer sides of the blocks and a slidable connection between the side rails and the outer sides of the blocks, steam coil pipes mounted in the cross bars of the platen and communicating with the chambers in the blocks at the inner ends of the blocks and steam pipes on the outside of the platen communicating with the chambers in the blocks at the outside of the same, substantially as set forth.

8. In a platen for lumber driers, the combination of side rails, end bars and cross bars uniting the side rails with corner blocks having communicating chambers terminating at

the inner ends and outer sides of the blocks, the end bars of the frame being secured to said blocks and the side rails of the frame being connected with the blocks by a slidable connection, steam circulating pipes in the platen and steam conducting pipes at the outside of the platen, connected with said chambers in the blocks at the inner end and outer side of said blocks, respectively, substantially as set forth.

9. The combination with a series of superimposed platens for driers, of steam circulating pipes connected within the platens, substantially V-shaped steam supply pipes connected with the steam circulating pipes of alternate platens, at the ends of the platens and a supporting bolt projecting from the sides of the platen between the two, with which the V-shaped pipes are in communication, at or near the apex of the V-shaped pipes and extending between the legs of the two V-shaped pipes, substantially as set forth.

10. The combination with a series of superimposed platens for driers, of steam circulating pipes connected within the platens, substantially V-shaped steam supply pipes connected with the steam circulating pipes of alternate platens, at the ends of the platens and a supporting bolt projecting from the sides of the platen between the two with which the V-shaped pipes are in communication, at or near the apex of the V-shaped pipes and extending between the legs of the two V-shaped pipes, washers mounted on said bolt at opposite sides of the two legs of the V-shaped pipes extending respectively above or below the bolt, substantially as set forth.

11. The combination with a series of superimposed platens for driers, of steam circulating pipes connected within the platens, substantially V-shaped steam supply pipes connected with the steam circulating pipes of alternate platens, at the ends of the platens and a supporting bolt projecting from the sides of the platen between the two, with which the V-shaped pipes are in communication at or near the apex of the V-shaped pipes and extending between the legs of the V-shaped pipes, washers mounted on said bolt at opposite sides of the two legs of the V-shaped pipe extending respectively above or below the bolt and a tube mounted on said bolt between the inner washer and the side rail of the platen to hold the washers against the said pipes, substantially as set forth.

12. The combination with a series of superimposed drying platens, of steam circulating pipes in the same, a series of steam conducting pipes located adjacent to the outer sides of the platen extending lengthwise of the same, said pipes being alternately connected with each other by couplings at the inner and outer ends to form zig-zag conduits, said zig-zag conduits having two adjacent outer bends connected with the steam conducting pipes of two alternate platens, said zig-zag pipes being supported at their inner joined ends by bolts projecting from the sides of the platens between the two connected with the outer bends of said pipes, substantially as set forth.

13. In a platen for driers, the combination with side bars and flanged cross bars, of detachable cap pieces on the flanges of said cross bars, substantially as set forth.

Signed at New York city, borough of Manhattan, in the county of New York and State of New York this 7th day of April A. D. 1914.

AARON S. NICHOLS.

Witnesses:
E. H. DETTLING,
E. S. VOTEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."