

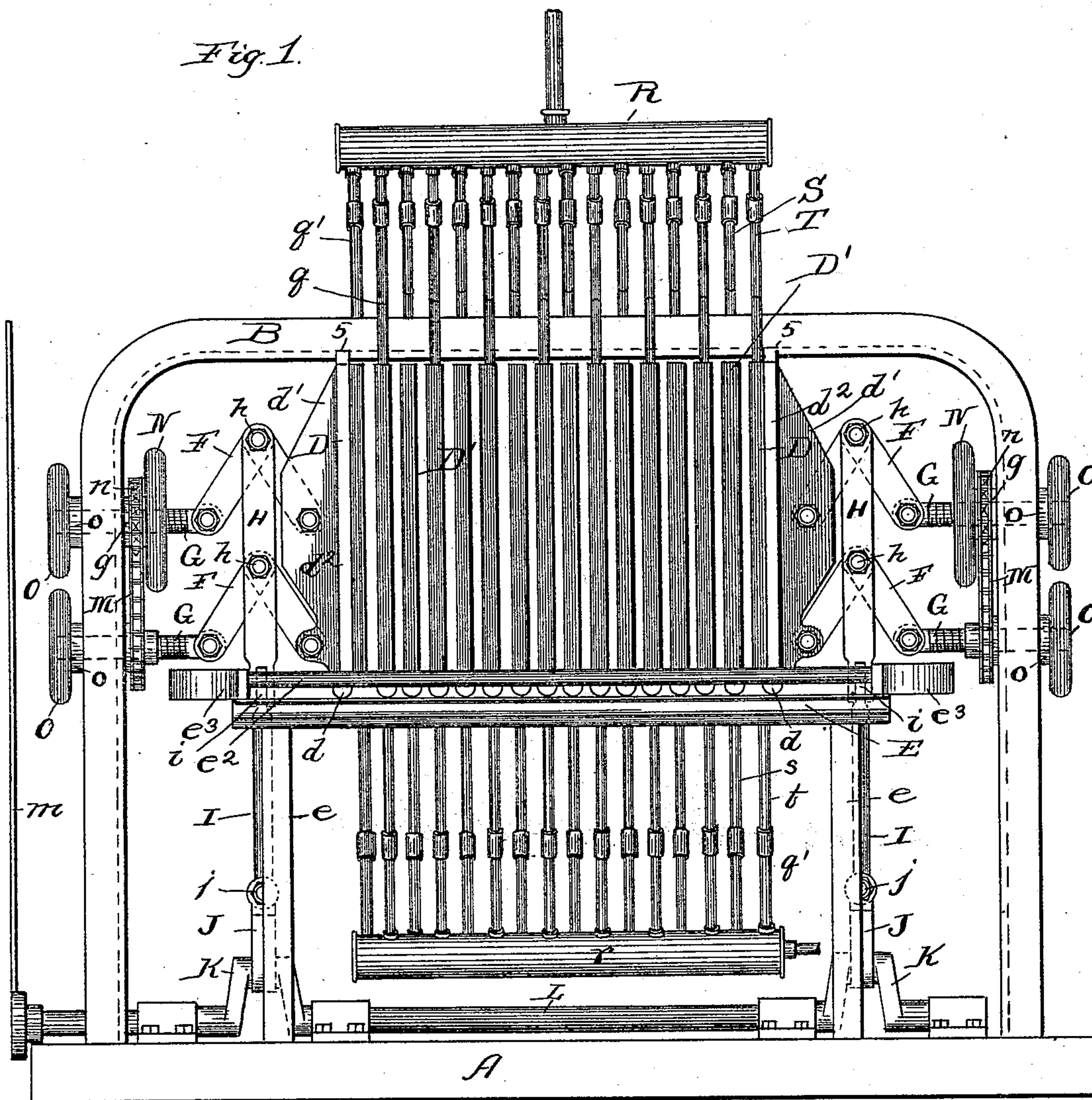
(No Model.)

3 Sheets—Sheet 1.

A. S. NICHOLS.  
APPARATUS FOR DRYING VENEERS.

No. 515,357.

Patented Feb. 27, 1894.



Witnesses:

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*Emma Stark*

Inventor:  
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*His Attorneys.*

(No Model.)

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Fig 2.

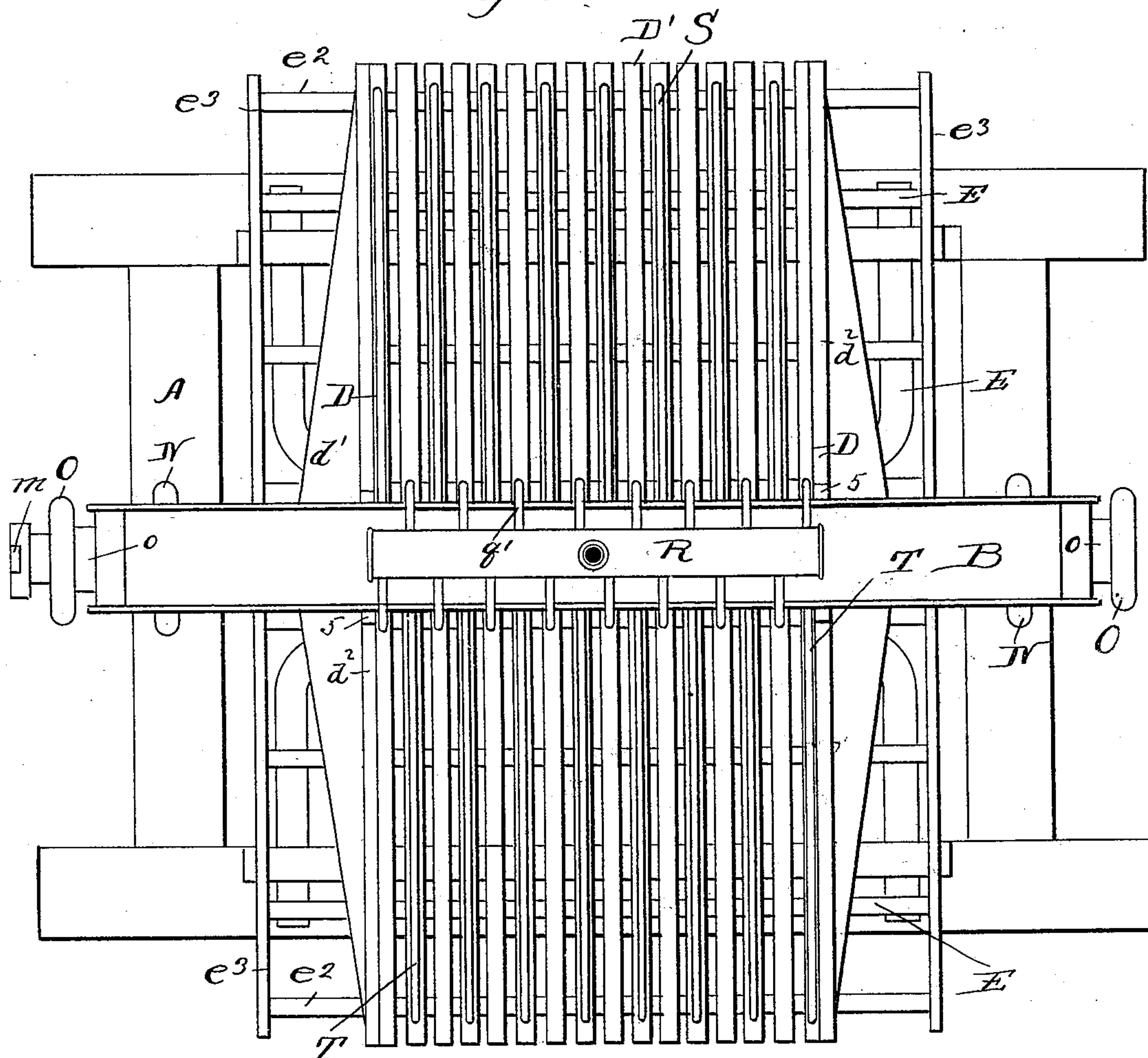
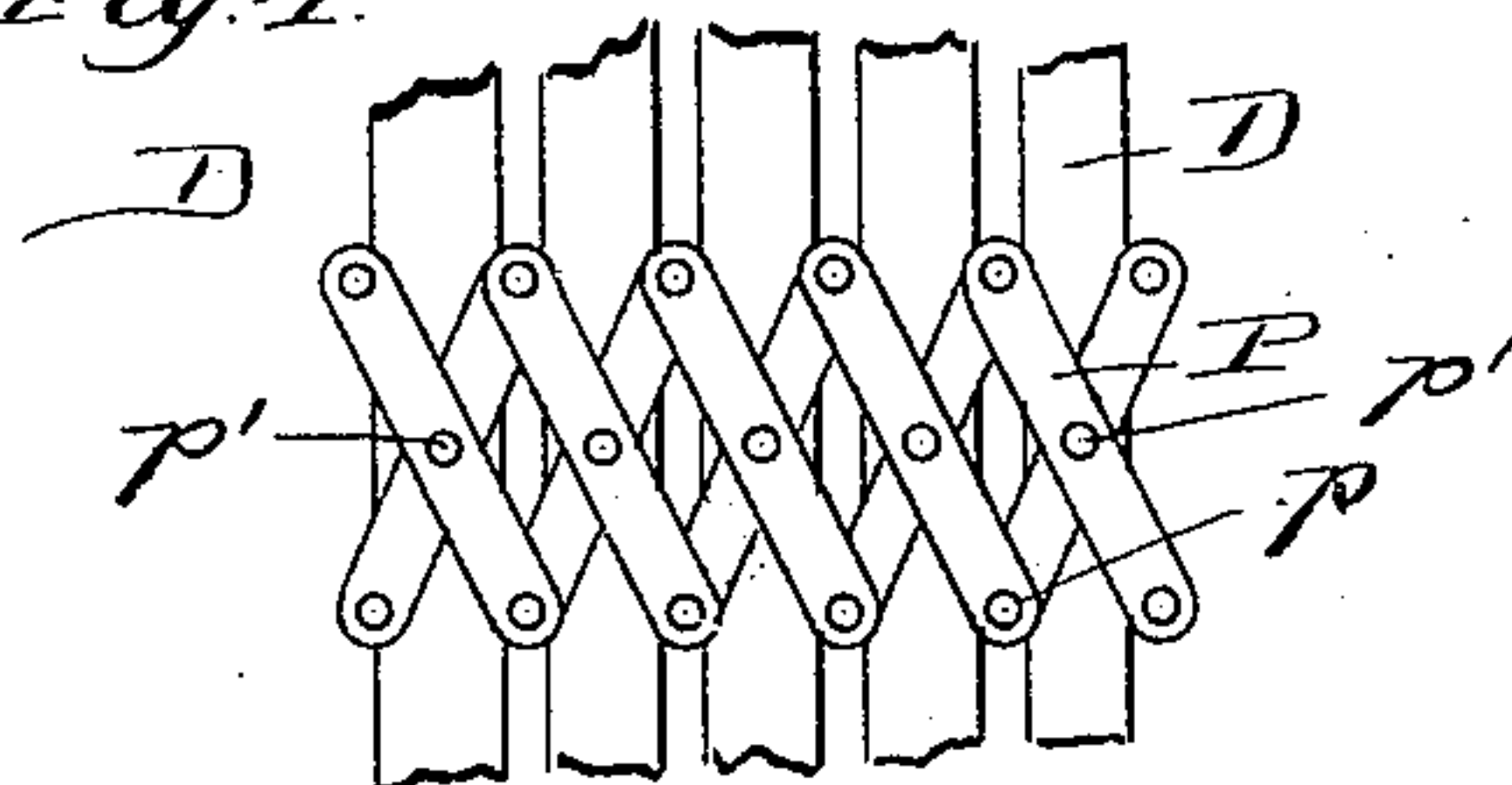


Fig 4.



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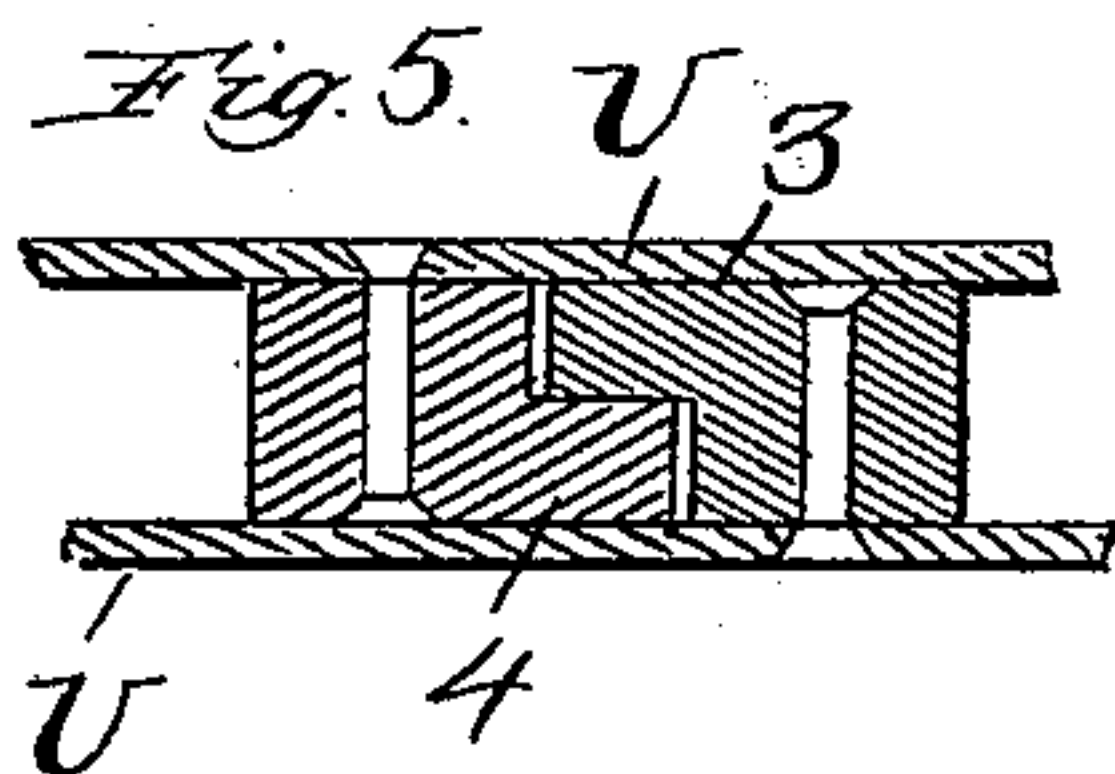
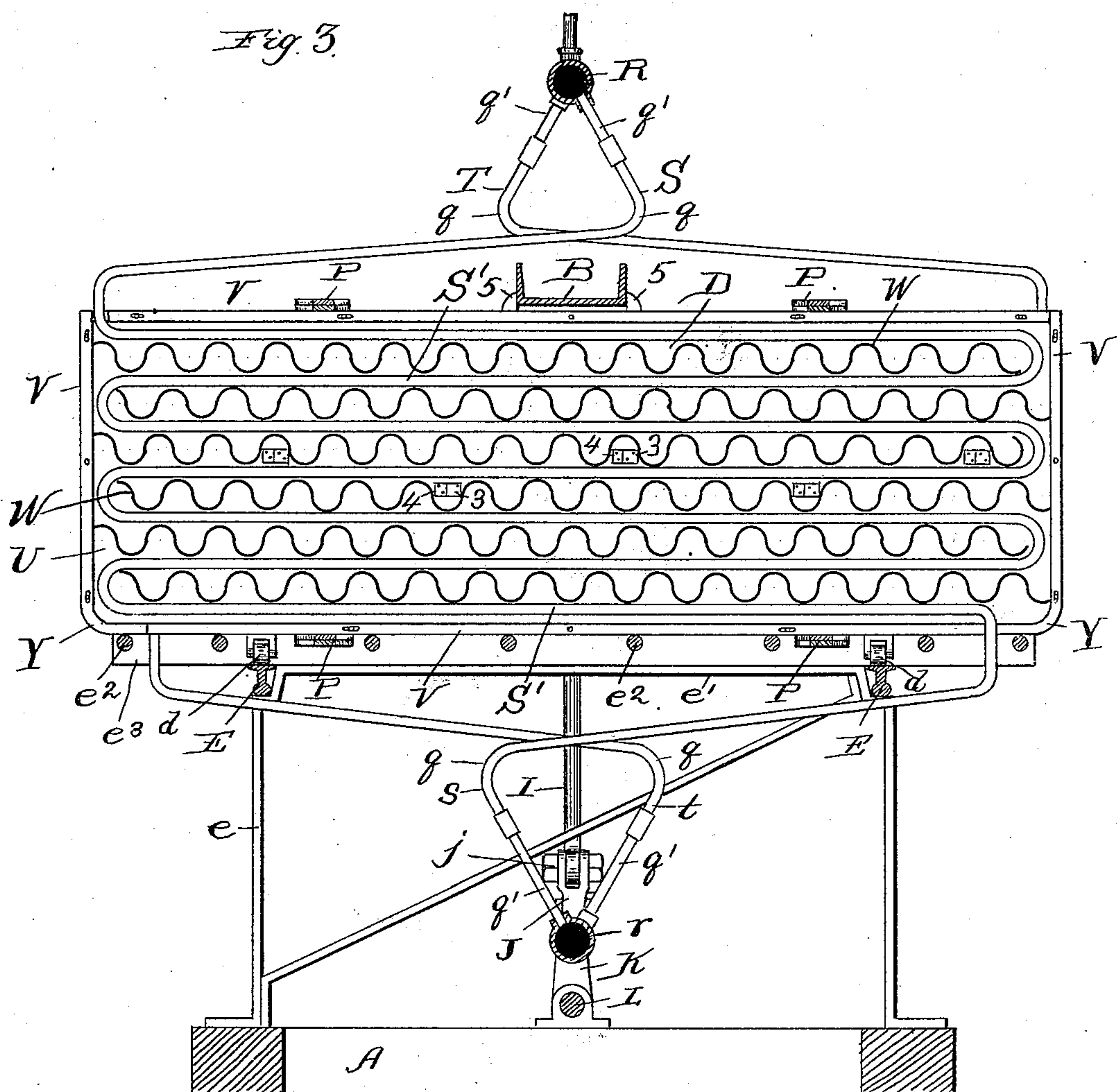
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# UNITED STATES PATENT OFFICE.

AARON S. NICHOLS, OF CHICAGO, ILLINOIS.

## APPARATUS FOR DRYING VENEERS.

SPECIFICATION forming part of Letters Patent No. 515,357, dated February 27, 1894.

Application filed March 14, 1892. Serial No. 424,799. (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 Apparatus for Drying Veneers, of which the following is a specification.

This invention relates to the construction of a drier adapted to be used in drying veneers.

In the construction of the drier I employ a series of vertical platens between which the veneers are placed, and means whereby the platens may be pressed together and opened. Each platen is formed of a surrounding edge frame and sheet metal sides, the latter forming the faces which come in contact with and act upon the veneers, and they are heated interiorly by a coil of steam pipes connected at one end to a steam supply and at the other end to a drip or discharge. The devices by which the pressure is created which acts to force the platens together are located at the ends of the series of platens and move the platens toward one another or away from each other according as the drier is to be closed upon the veneers or opened. The intermediate platens are joined together and to the end platens by pivoted links which communicate motion from the end platens to the intermediate ones, so that the entire series will move simultaneously with the end platens when the latter are actuated, both in closing and opening. By means of the links I also insure the uniform moving apart of all the platens when the end plates are drawn away from each other, so that room is obtained between each adjacent pair of them either for handling the stock or for allowing the shrinkage of the veneers and the escape of the moisture.

The invention consists in the novel construction of the several parts and in the novel combination of parts more particularly set forth below.

In the drawings Figure 1 is a front elevation and Fig. 2 a plan of my improved drier. Fig. 3 is a vertical section of the drier, the face of one of the platens being omitted to show the interior construction thereof. Fig.

4 is a detail showing the manner of joining the platens together, and Fig. 5 is a partial vertical section of the platen.

All the parts of my drier are preferably mounted upon a floor frame A so that the entire drier may be put together at the place of manufacture and shipped or moved from place to place without dismantling.

B is a metal beam bent into inverted U-form as illustrated at Fig. 1 and secured to the frame A at its lower ends. This beam forms what may be appropriately termed the backbone of the drier as it forms the abutments or resistances necessary at each end of the drier in creating pressure upon the platens. It is preferably formed of metal rolled into channel shape whereby it is rendered very rigid.

The series of platens is indicated by D and D'. They are each provided with anti-friction rollers or casters *d* at each end, and these casters traverse and find support upon the rails E resting upon standards *e* attached to the frame A. Each pair of standards *e* may be united by a brace *e'* which may be in one piece with them. The casters traveling along the rails render easy the movements of the platens in opening and closing. The veneers are sustained while in the press by rods *e<sup>2</sup>* secured in bars *e<sup>3</sup>* sustained upon the rails E. The end platens are secured to plates *d<sup>2</sup>* located upon their outer surfaces and such plates are each provided with cast metal webs *d'* to which are pivoted the ends of two toggles F, as clearly indicated at Fig. 1, the other ends of said toggles being each joined to adjusting screws G passing through the beam B and capable of a longitudinal movement therethrough as hereinafter more particularly set forth. The two toggles at each end of the drier are connected together by bars H joined to them at their junctions *h*, and this bar is joined to a connecting rod I by a pivoted joint *i*. Said connecting rod is joined to a short pitman J by a universal joint at *j* and the pitmen at both ends of the machine are connected to cranks K upon a shaft L operated by hand lever *m*. By means of the connections described, the operator applies power to the hand lever turning the shaft L and



straightens out the toggles F or shortens them according as he desires to close or open the platens.

As the thickness of the stuff to be dried may vary, I preferably provide means whereby the toggles F may force the platens close or less close together according to the necessities of the work in hand. These means consist of the screws G and the devices whereby they are adjusted in or out with respect to the beam B. The screws do not themselves rotate, but upon each of them I provide adjusting nuts, both inside and outside the beam B. The nuts *g* inside the beam are provided with sprocket teeth *n* on their peripheries and a sprocket chain M connects each pair of such nuts together. A hand wheel N is also rigidly affixed to one of said nuts, and is used when the nuts are to be turned. The adjustments given to both the screws G is simultaneous in point of time and alike in extent. Upon the outside of the beam B are the nuts *o* and hand wheels O for operating them, these nuts drawing the screws outward in a direction the reverse of that imparted by the nuts *g*.

The series of platens is connected to the end platens, by devices which insure the opening of all of them simultaneously so as to allow the shrinkage of the veneers and also so as to allow the removal or insertion of the stock. These devices consist of pivoted links P applied to the edges of the platens in lazy tongs fashion, that is to say, the links are pivoted at their ends to each other as shown at *p* and they are also pivoted at their centers *p'* to each other and to the platens. It will be seen that by this construction when the end platens are drawn back by the toggles, the interior platens will move with them, and that each adjacent pair will be simultaneously opened or spread apart, according to the amount of movement imparted to the end platens. This movement may be only slight when it is simply desired to relieve the pressure momentarily to allow the shrinkage of the veneers and the escape of the moisture, or it may be to the full extent permitted by the toggles, and is governed by the operator in the use of the hand lever *m*. The closing of the platens, due to the reverse movement of the end platens, is also simultaneous and uniform through the entire series. The opening of the entire series of platens in this manner obviates a very serious objection to driers of this class as heretofore made, the center sections having been provided with no means for spreading them when the pressure was taken off by the outward movement of the end platens.

I have employed with the platens two parallel toggles at each end, one above the other. My object in this is to secure an equal amount of pressure throughout the entire surface of the platens, and to insure their moving in parallel vertical planes. The material placed in a drier of this kind always fills the lower

portions of the spaces between the platens, and if narrow the upper portion of such spaces may be wholly vacant and unoccupied. If the pressure therefore were applied only at the central horizontal plane of the platens, there would be a tendency by the platens to spread at the bottom and to come closer together at the top. By the use of the two toggles arranged as shown, I overcome this. I prefer also to place one of the toggles near the lower plane of the platens because the lower portions of the spaces between the platens are always filled. I provide universal joints at *j* in the connections between the toggles and their operating cranks because of the variety of positions in which the bars H may be when they are actuated due to the different positions of the toggles in the different adjustments, and also because of the different positions of the cranks K.

All the series of platens are connected by suitable pipe connections S and T to a header R located above and which supplies them with steam, and by other pipe connections *s* and *t* to a header *r* located below and which acts as a drip or discharge. All those pipe connections are so constructed as to avoid as far as possible any straining of the joints which connect them to the headers, either by reason of expansion or contraction, or by reason of the changes of position by the platens. This result I accomplish by carrying all the pipe connections from the ends of the platens to which they are respectively joined to a point beyond the headers and then in a nearly vertical and partially reversed direction to their junction with the headers. In other words each of the pipes has formed in it, between the points where it is joined to the header and to the platens, an elbow or bend *q* which renders the connecting pipes so flexible that they yield to the extent necessary to prevent rupture of their joints with the header.

In practice the uniting of the pipe connections to the header, or to the short pipes *q'* secured in the latter, does not generally result in bringing the united pipes of the several platens to an absolute length, and if no provision were made in the pipes themselves to take up or yield to the extent required by their variations from the proper length, there might be a tendency by the pipes to crowd the platens lengthwise and thus cause them to bind unnecessarily upon the pivots by which they are connected to the moving links. I obtain this compensating ability in the pipes by making that portion of them extending from the bends *q* to the headers nearly vertical and locating the joint between the pipes and headers in this vertical portion. By this construction, if the joined pipe is shorter than it ought to be, the horizontal portion of the pipes between bends *q* and the platen simply yields upwardly in case of pipes S or T, and downwardly in case of pipes *s* or *t*, and the reverse yielding would occur in



case the pipes were too long, but in neither case is any strain caused tending to move the platens lengthwise. It is desirable also to avoid rupture of the steam pipes at the points where they join the platens, and to avoid difficulty of this kind I make the steam pipe connections and the coils in the platens in one piece, thus avoiding all joints except those near the headers, the pipes S s and the coil S' within the platens being in one piece, and the pipe connections and coils in the other platens being similarly formed in this respect.

The platens consist of four edge pieces V as shown and suitable face plates or contact surfaces U of sheet metal suitably riveted to the frame. The steam pipe coils are located between the sheets U and enter through or between the edge pieces at one corner and pass out at the diagonal corner. The plates U are sustained against collapse by corrugated strips W of metal bearing at their edges against the plates. These strips are employed in such number as may be necessary, and they are conveniently disposed between the courses of steam pipes, as clearly shown at Fig. 3. The surface sheets are also provided with devices adapted to prevent their bulging at the centers, consisting of L shaped blocks 3 and 4, employed in pairs and secured one to each sheet in such relative position that they will interlock with each other when the platen is put together as plainly indicated at Fig. 5. This interlocking action does not however, prevent movement by one block with respect to its mate without disengaging, so that in all the changes due to unequal expansion or contraction of the surface sheets, no breakage or damage is likely to occur. The edge pieces V are unattached to each other and need not even abut closely. The plates to which the end platens are joined have lugs 5 5 at either side of the beam B, serving to guide them in their movements. Some of the connections from the platens are joined at one side of the headers and some of them at the other side. The corners of the platens are rounded, as shown at Y, to give opportunity to take hold of the veneers when they are to be removed.

In the use of the apparatus, the operator closes the platens upon the veneers and retains them under pressure for a short time; he then moves the lever *m* in the proper direction to separate the platens, thus releasing the pressure and allowing the veneers to shrink, which they do instantly; he then again closes the platens, thereby renewing the pressure, and continues it so long as may be necessary to effect a complete curing of the veneers. This opening and closing of the platens is desirably a quick one, and hence the drier is provided with devices for opening and closing the platens which are speedy in their action.

I claim—

1. The combination in a drier of a series of

vertical individually heated platens, comprising end platens and two or more intermediate platens, means for opening and closing the end platens at will, and positive connections to the intermediate platens whereby the latter are positively forced apart simultaneously with the end platens, substantially as set forth.

2. The combination in a drier of a series of vertical individually heated platens, comprising end platens and two or more intermediate platens, means for opening and closing the end platens at will, supports for said platens upon which they are free to move sidewise, and positive connections to the intermediate platens whereby the latter are positively forced apart simultaneously with the end platens, substantially as specified.

3. The combination in a drier of a series of vertical individually heated platens, comprising end platens and two or more intermediate platens, means for opening and closing the end platens at will, supports for said platens, supports for the veneers, and positive connections to the intermediate platens whereby the latter are positively forced apart simultaneously with the end platens, substantially as specified.

4. The combination in a drier of a series of vertical and sidewise movable platens, comprising end platens and two or more intermediate platens, and double toggles at each end of the series acting upon the end platens, and positive connections to the intermediate platens whereby movement imparted to the end platens by the double toggles is communicated to the intermediate platens to positively force them apart, substantially as specified.

5. The combination with the series of vertical and sidewise movable platens, of the double toggles at each side of the series actuating the outside platens and adjusting screws for regulating such toggles connected together so as to secure uniformity in their adjustments, substantially as specified.

6. The combination in a drier of a series of vertical and sidewise movable platens with the headers R and *r*, and flexible pipe connections from said platens to said headers, said connections being carried from the corners of the platens to the farther side of the headers and then reversed to a junction with the headers, forming elbows or bends *q*, substantially as specified.

7. The combination of the series of vertical and sidewise movable platens and rods *e*<sup>2</sup> supporting the veneers which are placed between the platens, the platens being rounded at their lower corners for convenience in taking out the veneers, substantially as specified.

8. In a drier, a series of vertical and sidewise movable platens in combination with the headers R and *r*, and flexible connections between said platens and said headers, some of said connections being joined to one side of the headers and some of them to the other side thereof, substantially as set forth.



9. The combination with the platens and headers of the steam pipe connections having a horizontal portion extending from the platen corner to a point beyond the header and then  
5 bent reversely and vertically to a junction with the header, substantially as specified.

10. The combination with the platens and headers of steam pipe connections having the bends  $q$ , and a nearly vertical portion between  
10 said bend and the header, and the joint with the header being formed in said vertical portion, substantially as set forth.

11. The combination with the surface plates of an interiorly heated platen, of separate in-  
15 terlocking devices attached to the plates near their centers and serving to prevent bulging by them, substantially as specified.

12. The combination with the surface plates of an interiorly heated platen, of separate interlocking L shaped blocks attached to the  
20 plates and adapted to prevent the bulging thereof, substantially as set forth.

13. In a veneer drier, the combination with a series of vertical, heated and sidewise movable platens, of supports, independent of the  
25 platens, for supporting the veneers and adapted to sustain them in a vertical position and to allow them to move with the platens, substantially as specified.

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