

No. 674,342.

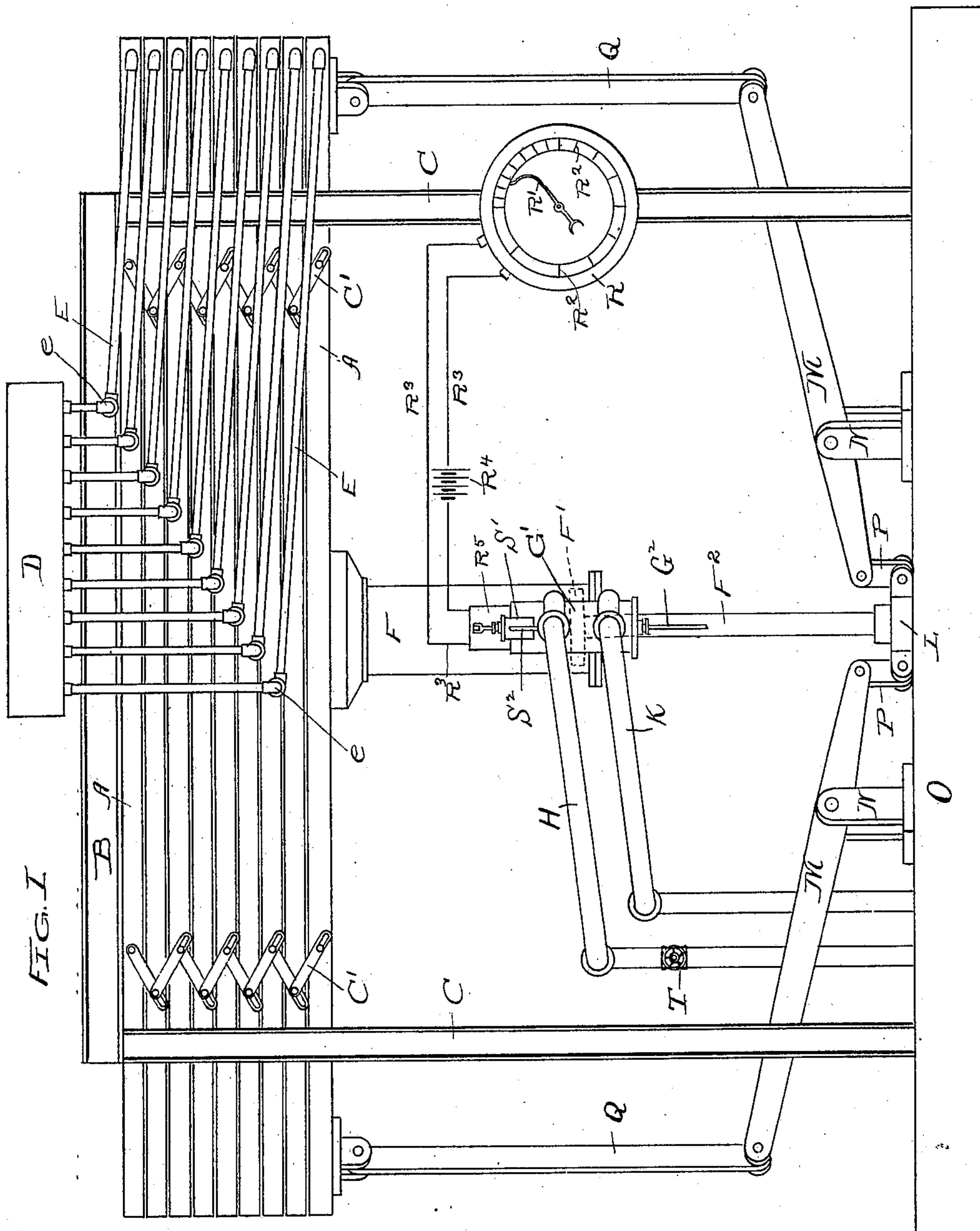
Patented May 14, 1901.

A. S. NICHOLS.
DRIER FOR VENEERS.

(Application filed Dec. 7, 1895.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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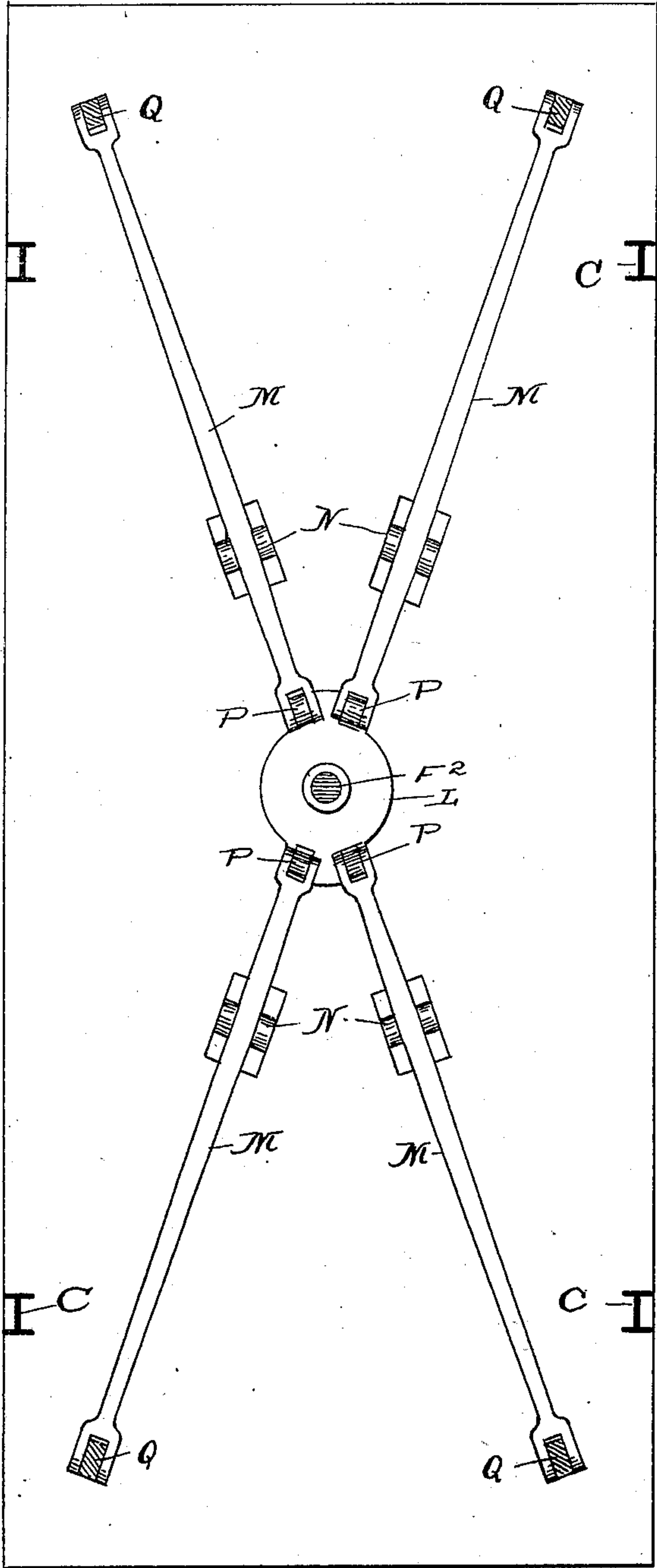
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2 Sheets—Sheet 2.

FIG. 2.



WITNESSES:

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FIG. 5.

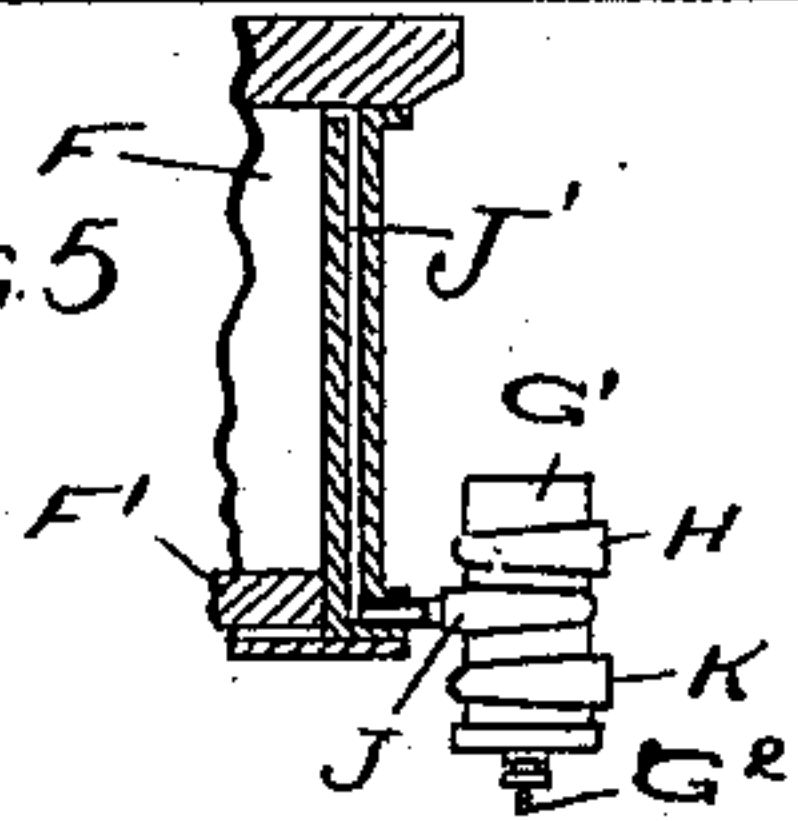


FIG. 3.

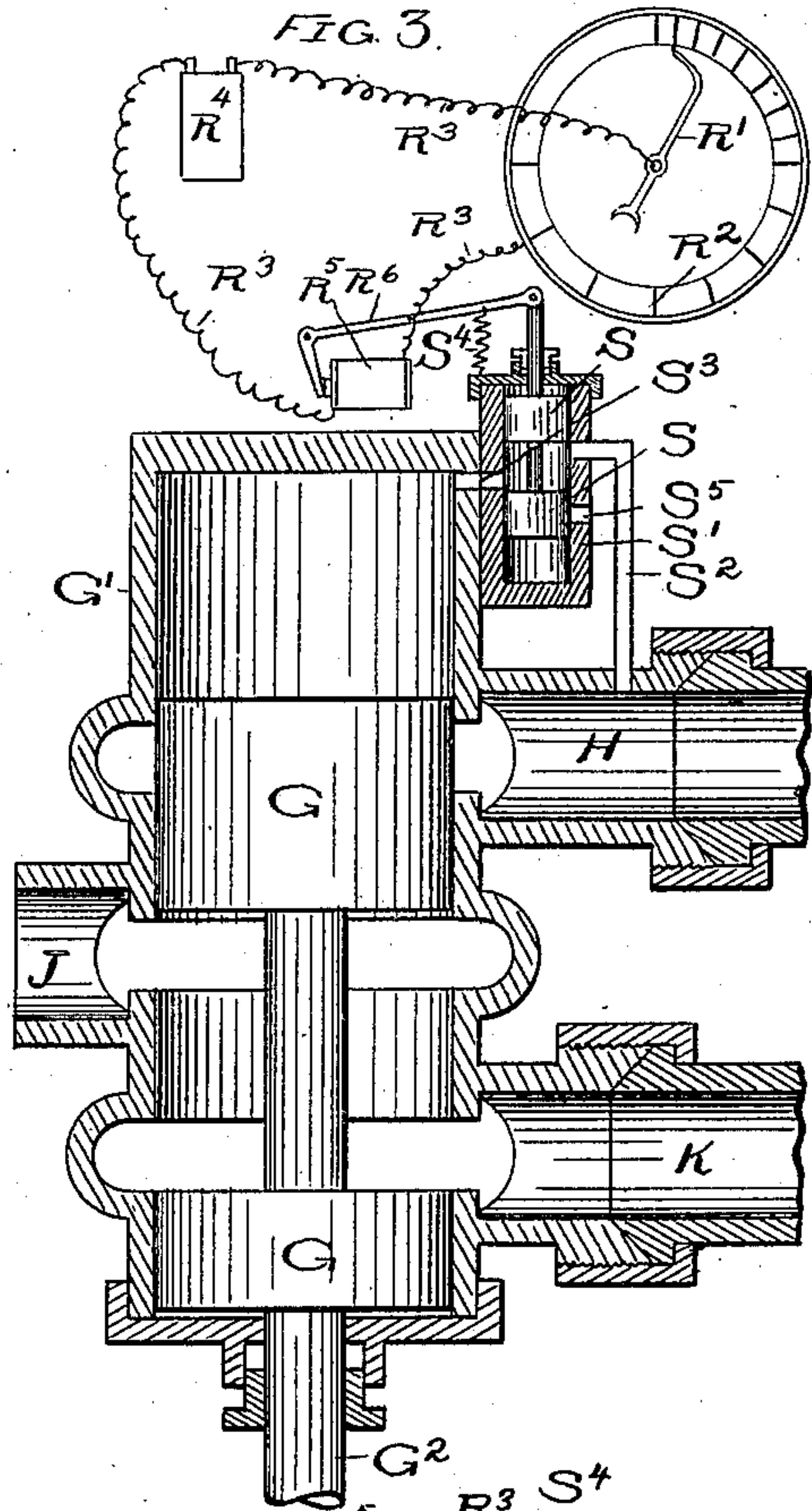
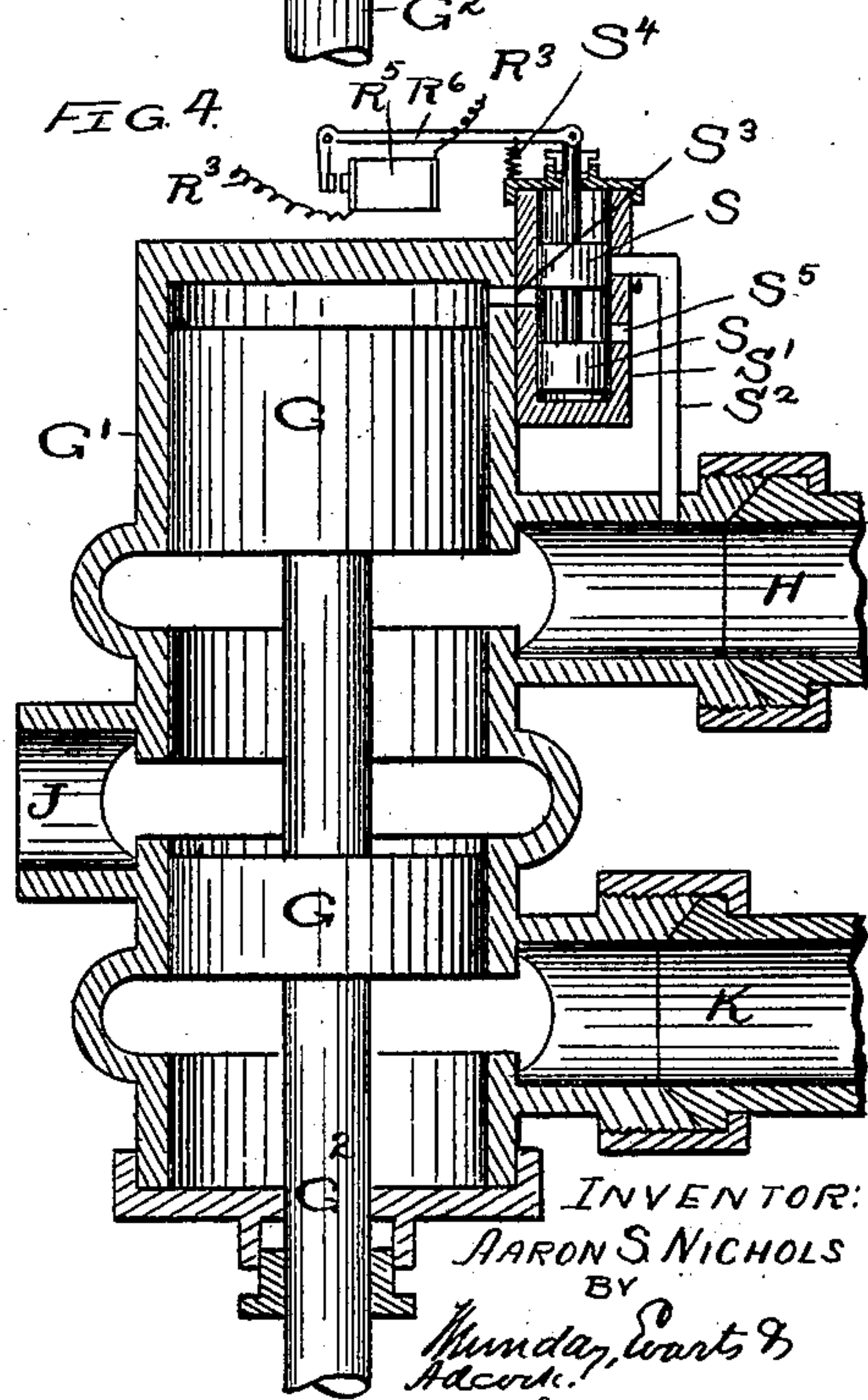


FIG. 4.



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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 OF THE FIRM OF NICHOLS AND HOWARD.

DRIER FOR VENEERS.

SPECIFICATION forming part of Letters Patent No. 674,342, dated May 14, 1901.

Application filed December 7, 1895. Serial No. 571,344. (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 Driers for Veneers, &c., of which the following is a specification.

In that class of veneer-driers which consist of a series of steam-heated platens adapted to receive the veneers between them and to exert pressure upon them during the drying operation it is desirable that the platens be opened several times during the drying operation, so as to release the pressure upon the veneers and allow them to shrink and at the same time give escape to the moisture in the veneers which has at the times of opening been vaporized by the heat. A drier consisting of a series of vertical and sidewise-movable platens adapted to be thus opened is shown in the patent to me No. 515,357, of February 27, 1894. In my present invention I arrange the platens horizontally in a pile one above the other and move them vertically instead of arranging them vertically and side by side and moving them sidewise, as in my patented construction. By this change I overcome a serious objection to the patented construction, due to the fact that only one veneer can be put into each interspace of the vertical-platen drier, and as veneers are illy adapted to rest edgewise one on another the single sheet or veneer must of necessity be positioned at the bottom of the space. By reason of this feature of the vertical-platen driers their capacity in drying narrow stock is limited, and it is also true that when closed upon the stock the platens do not meet with the same resistance at the top that they do at the bottom, because the veneer-spaces are unfilled at the top, and this causes a strain upon the apparatus. In the changed construction the interspaces can be filled from edge to edge of the platens with narrow stock and the entire area of each interspace can be utilized, thereby giving the apparatus the same capacity for drying narrow stuff as it possesses for the wide stuff. Moreover, the narrow stock can be so disposed between the platens as to equalize the pressure or strain

upon the different parts of the platens. My said patented construction is further subject to the objection that it cannot be opened and closed quickly enough for some kinds of veneers, and the labor involved in manually operating the opening and closing devices is onerous and requires the almost constant attendance of the operator, and hence I have devised and combined with the platens mechanism adapted not only to open and close them automatically, but also adapted to perform the operation so quickly that the platens do not remain open long enough to allow either splitting or chilling of the veneers. Indeed the operation of my improved mechanism is practically instantaneous, the closing movement following the opening one immediately and both movements being quick. I have adopted as the best means for thus actuating the platens, a cylinder and piston adapted to be actuated by steam or other quick-acting gas or fluid under pressure, and I prefer to locate them under the pile of platens and to fasten the upper platen so that it will be held stationary and coact with the piston in closing the platens upon the veneers and causing the necessary pressure thereon. I have also combined with the platens and their opening and closing devices regulating mechanism whereby the opening and closing of the platens is made to take place at stated intervals and as often as the nature of the work on hand requires.

The nature of my said improvement is set forth in and will be more fully understood from the description which I give below, and from the accompanying drawings, wherein—

Figure 1 is an elevation of my improved drier. Fig. 2 is a horizontal section showing the lever system, and Figs. 3 and 4 are vertical sections of the cylinder of the valve controlling the lifting-cylinder. Fig. 5 is a detail section showing the connection between the lifting-cylinder and the steam-supply.

In said drawings, A A represent the platens, which, as shown, are arranged in a pile one above another in horizontal or substantially horizontal planes. The upper platen is stationary, being secured to a proper framework, of which the beam B is a member. Such

framework may be sustained upon the upright beams C, which also serve as side guides to the movable platens. The platens are all attached each to its neighbor platen by several series of slotted links C', which allow the platens to move vertically to the extent required. The steam whereby the platens are heated is supplied by the header D and conducted therefrom to the platens by the series of pipes E, having flexible joints at e.

Under the pile of platens is located the lifting and pressure-exerting mechanism, which is adapted after the sheets of veneers are in place between the platens to raise the movable ones of the series until they are brought into close contact with both faces of the veneers and to cause such pressure thereon as will straighten the veneers, if they are warped or wrinkled, and retain them in a perfectly flat condition during the drying. In this operation the upper platen, being stationarily held, resists the upward lift, and thus causes the pressure necessary. The lifting and pressure-exerting mechanism referred to should be such as will allow the platens to open and give opportunity for the shrinkage of the veneers and the escape of the vaporized moisture and close them almost immediately and quickly, and thus avoid chilling the veneers, and the construction which I have conceived to be the best for the purpose is a press or jack adapted to be operated by steam, gas, or fluid under pressure. I prefer to use steam and to employ as the press or jack the cylinder F, the piston F' in said cylinder, and a valve G in cylinder G', controlling the admission of the steam to and its discharge from the cylinder F. The press is placed centrally under the pile of platens, and where the lever system hereinafter described is employed with it it is desirable that the cylinder and piston of the press be inverted, as shown. The cylinder is of course attached to the bottom platen. The valve is provided with two heads and is shown in Fig. 3 as shutting off the entrance of steam from pipe H and as opening the exhaust which takes place through pipe K. The steam connection between the valve and the cylinder F is shown at J. In this position of the valve the platens are open; but when it is shifted to the position shown at Fig. 4 the exhaust is closed and the steam-inlet opened, so that cylinder F is charged, and thereby the platens are closed and caused to exert the necessary pressure and heat upon the veneers. They remain in action until the valve is shifted back to the position given at Fig. 3, which opens the exhaust and closes the inlet, so that the platens become free to open. The shifting of valve G is automatically effected, as hereinafter fully set forth.

The stem F² of piston F' of the lifting-cylinder extends downward and is provided at its lower end with a head L, which serves as a means for its attachment to the lifting-levers M, pivotally supported by the standards N, rising from the floor or bed O, a link P

being interposed between the head L and the converging ends of the levers M. There are four of the levers M, and the outer end of each of them is joined to the bottom platen at the corners or margin of the latter by means of vertical bars Q, the joints between the levers and bars and between the bars and the platen being pivoted, as plainly indicated. With this system of levers connected to the piston F' it will be seen that the result of the admission of steam to the cylinder F will be the forcing of the piston downward against the resistance afforded by the levers and at the same time the exertion of an upward power upon the cylinder, which with the assistance afforded by the levers will lift the platens until they are all closed upon the veneers with sufficient pressure to straighten out the latter, and this condition may be maintained as long as necessary for the work in hand. It will also be seen that the result of exhausting the steam from behind piston F' will be the withdrawal of the lifting power and the consequent fall of the platens by gravity to their open position.

By means of the levers I am enabled to use a single motor or power-supplying device, and yet to apply the power equally to all parts of the platen, which is a matter of importance in the case of large platens, inasmuch as it insures the necessary pressure over all the area of the platens, avoids strains upon the platens, and permits their construction with lighter frames. By the use of the single motor and the levers I am also enabled to apply the power simultaneously to the different parts of the platens—a result which would be very difficult, if not absolutely impossible, of attainment by a plurality of motors.

The shifting of the controlling-valve is automatic, as already stated, and is effected as follows: A time-movement is contained in the case R and actuates the pointer R'. At intervals in the margin of the face of the time-movement are one or more electrical contact strips or points R², and these points and the moving pointer are adapted when the pointer touches any of the points to complete an electric circuit formed by the wires R³ and embracing the battery R⁴ and magnet R⁵. When the circuit is thus completed, the magnet is energized and rocks the lever R⁶, one end of which is attached to the magnet-armature, and in so doing shifts the auxiliary valve S in cylinder S'. This valve-cylinder is supplied with steam from the pipe H by a branch S² and is also connected to one end of valve-cylinder G' by the port or passage S³. The valve S has two heads, as shown; so that the steam-pressure felt by it will be balanced and its movements rendered easy. In the position given at Fig. 3 the valve S is shown as having been shifted so as to uncover steam-inlet pipe S² and admit steam into the space between the end of the cylinder and the head of valve G, and this results, of course, in an immediate shifting of

valve G from the position of Fig. 4 to that of Fig. 3 and also in the opening of the platens by opening the exhaust from the main cylinder F. While the platens are open both valves S and G remain as shown at Fig. 3. As soon, however, as pointer R' moves off the contact-point the magnet releases its control of lever R⁶ and said lever and valve S instantly move under the power of spring S⁴ to the position shown at Fig. 4, thereby opening exhaust-port S⁵ and closing inlet-pipe S² and giving escape to the steam by which valve G was shifted and allowing the valve G to be moved to the position of Fig. 4 by contact of stem G², attached to valve G and projecting downward, as in Fig. 1, with head L upon the stem F² of the lifting-piston F', which contact takes place as the platens are nearing the conclusion of this opening movement. The return of valve G thus caused allows the lifting-cylinder to recharge with steam, and thereby to bring about an immediate closing of the platens. The parts remain in the positions to which they are now moved—that is to say, with the platens closed and the valves in their Fig. 4 position—until the pointer R' reaches another contact-point R², when the operation described is repeated. At the conclusion of the drying the steam is shut off by the valve T to avoid any further closing of the platens until the stock has been removed and fresh stock put in.

It will be understood that the platens may be opened as often as desired and at regular long or short intervals or at varying intervals. In practice I find it better to open them less frequently toward the latter part of the drying operation than at the commencement. This may be regulated by properly positioning the contact-points R² and by employing a number thereof corresponding to the number of times the platens should be opened, and in order to permit changes in the number and positions of contacts without removing the pointer I prefer to make the latter of spring metal, so its end may be bent to one side and move around the inner surface of the ring in which the contact-points are supported. It will also be understood that I do not wish to be limited to the use of electrical connections between the time-movement and the auxiliary valve, as it is obvious such connections need not be electrical.

By the use of the means described the platens are opened quickly and closed quickly and without any loss of time between the opening and closing, so that the veneers may be given all necessary opportunity to shrink without becoming chilled and without splitting. Their use not only permits a quickening of the movements, but also enables me to greatly increase both the size and the number of platens without any loss in the celerity of the movements.

The construction which I have illustrated and described is adapted to admit steam to the lifting-cylinder just before the platens

have completed their falling movement in opening. In this manner the fall is cushioned, so that the links C' are not strained and the operation is rendered comparatively noiseless.

I claim—

1. The veneer-drier wherein are combined a series of heated platens adapted to receive the veneers between them and also adapted to be opened and closed and to press the veneers, devices for so moving and holding the platens, and regulating mechanism embracing a time-movement and adapted to control said devices and cause them to release and renew the pressure upon the veneers at stated intervals, substantially as specified.

2. The veneer-drier wherein are combined a series of heated platens adapted to receive the veneers between them and also adapted to be opened and closed and to press the veneers, a quick-acting mechanism such as a cylinder and piston for so moving and holding the platens, and mechanism comprising electrical contacts and an automatically-operated circuit-closer cooperating therewith suitably controlling the said quick-acting mechanism and adapted to cause the opening and closing of the platens at intervals.

3. The drier wherein are combined a series of heated platens arranged one above another in a pile and adapted to receive the stock between them, and also adapted to be quickly opened and closed and to press the stock, an inverted cylinder and piston and levers placed under the pile and all connected with the bottom platen, and means whereby the upper platen may hold the series against the pressure of the piston and levers, substantially as specified.

4. The drier wherein are combined a series of heated platens adapted to receive the material between them and also to be opened and closed, and a quick-acting power mechanism such as an inverted cylinder, piston and levers all connected with the bottom movable platen for opening and closing the platens, substantially as specified.

5. The combination with the series of opening and closing platens, of a cylinder and piston, a system of levers adapted to act in unison with the piston in moving the platens, and automatic mechanism for controlling said cylinder, substantially as specified.

6. The combination with the series of platens arranged one above another in a pile, of the inverted cylinder and piston placed centrally under the pile and connected with the bottom platen, and a system of levers cooperating with the cylinder and piston and actuated thereby and also connected with the bottom platen, substantially as specified.

7. The combination with the heated platens arranged in a pile, of a stationary frame to which the upper platen is fastened, a quick-acting power mechanism for opening and closing the platens, such mechanism being located under the platens, and comprising a

system of levers, substantially as specified, and an automatic means for setting said power mechanism in operation.

8. The combination with the platens, arranged in a pile, of a cylinder and piston adapted to be operated by fluid-pressure, a valve controlling the fluid, an auxiliary valve for shifting said controlling-valve, and a time-movement connected to said last-mentioned valve and adapted to cause its actuation substantially as specified.

9. The combination with a series of heated platens arranged in a pile and adapted to be opened and closed, of quick-acting automatic power mechanism comprising a system of levers having short and long arms, the latter connected with the platens, and a cylinder and piston connected with the other ends of the levers, for imparting a quick opening and immediate closing movement to the platens at intervals.

10. The veneer-drier wherein are combined a series of steam-heated movable platens arranged horizontally and in a pile essentially as set forth, quick-acting power mechanism acting to open and close the platens very quickly and automatic means for setting said

power mechanism in operation, whereby injury to the veneers by splitting or chilling is avoided, substantially as specified.

11. The veneer-drier wherein are combined a series of heated horizontal platens adapted to receive the veneers between them and also adapted to be opened and closed and to press the veneers, a quick-acting cylinder and piston for so moving and holding the platens, mechanism suitably connected to and controlling the cylinder and adapted to cause the opening and closing of the platens at intervals, and automatic means for controlling the supply of fluid to the piston, substantially as specified.

12. The combination with a series of opening and closing platens, a quick-acting power mechanism for opening and closing the platens, and an automatic mechanism for controlling said quick-acting mechanism to cause the said operation of the platens at stated intervals.

AARON S. NICHOLS.

Witnesses:

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H. M. MUNDAY.