C. A. HAAS.

VENEER DRIER.

APPLICATION FILED FEB. 25, 1911.

993,775.

Patented May 30, 1911.

3 SHEETS—SHEET 1.

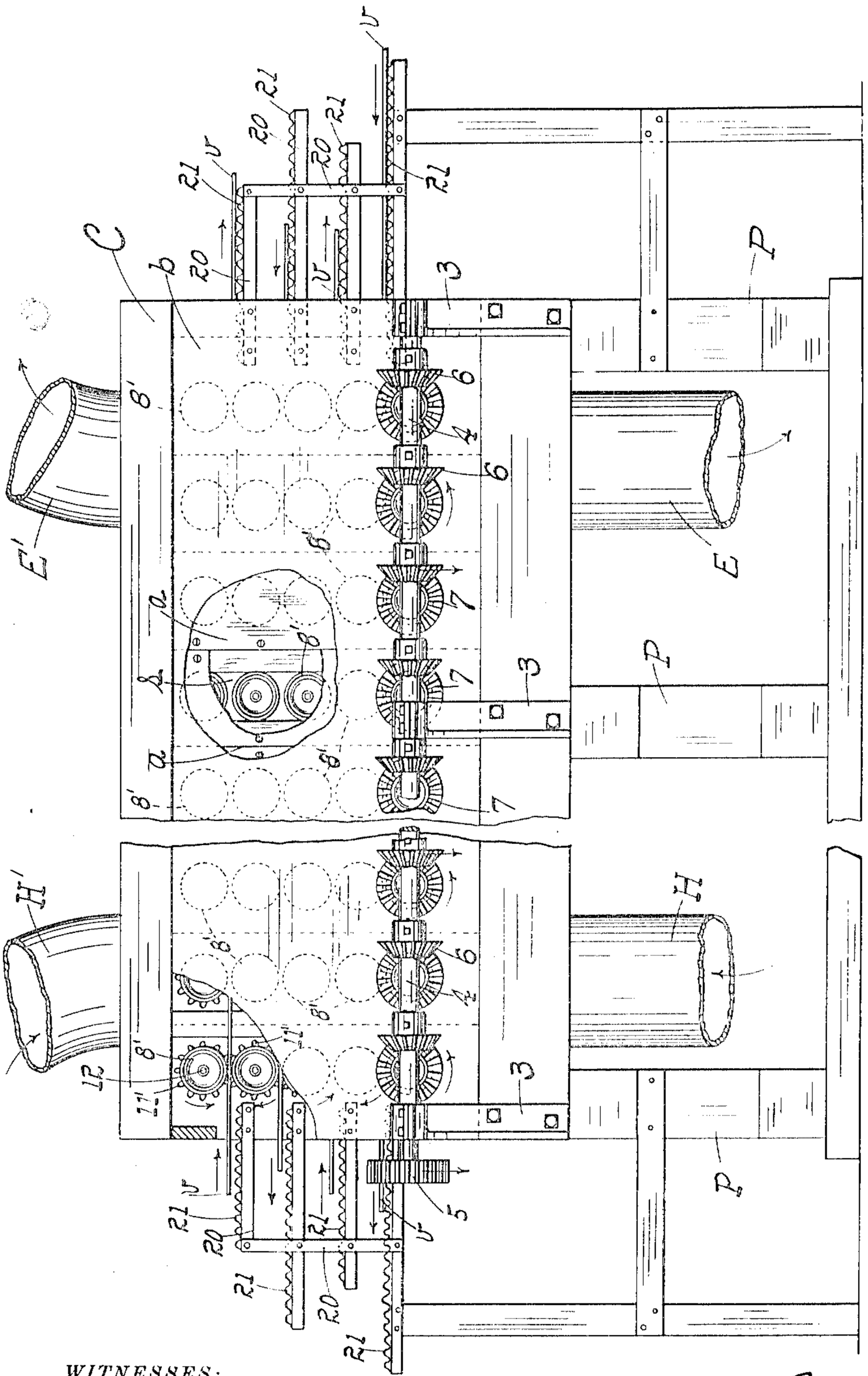

FIG. 1.

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3 SHEETS—SHEET 2.

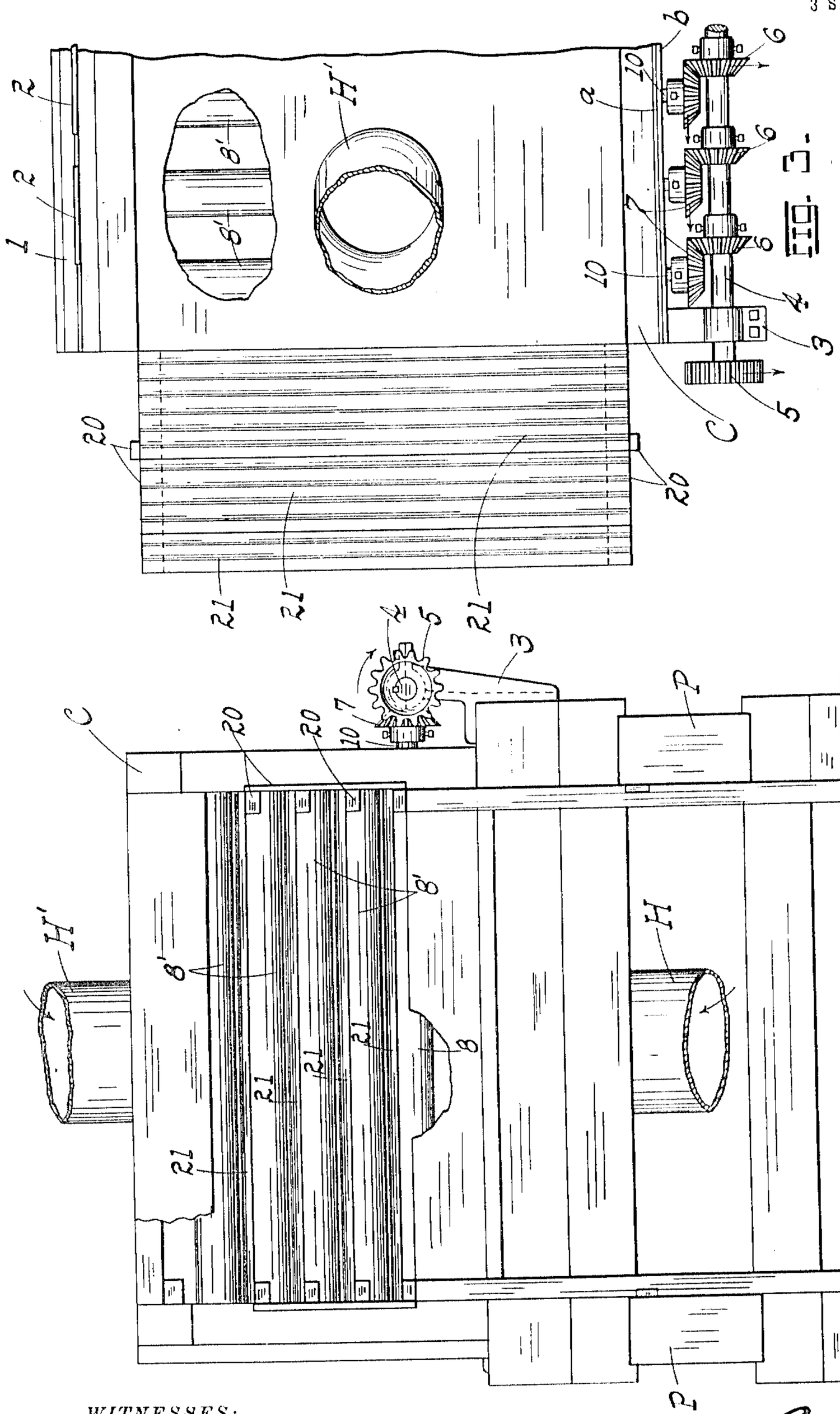

FIG. 2.

FIG. 3.

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3 SHEETS—SHEET 3.

FIG. 6.

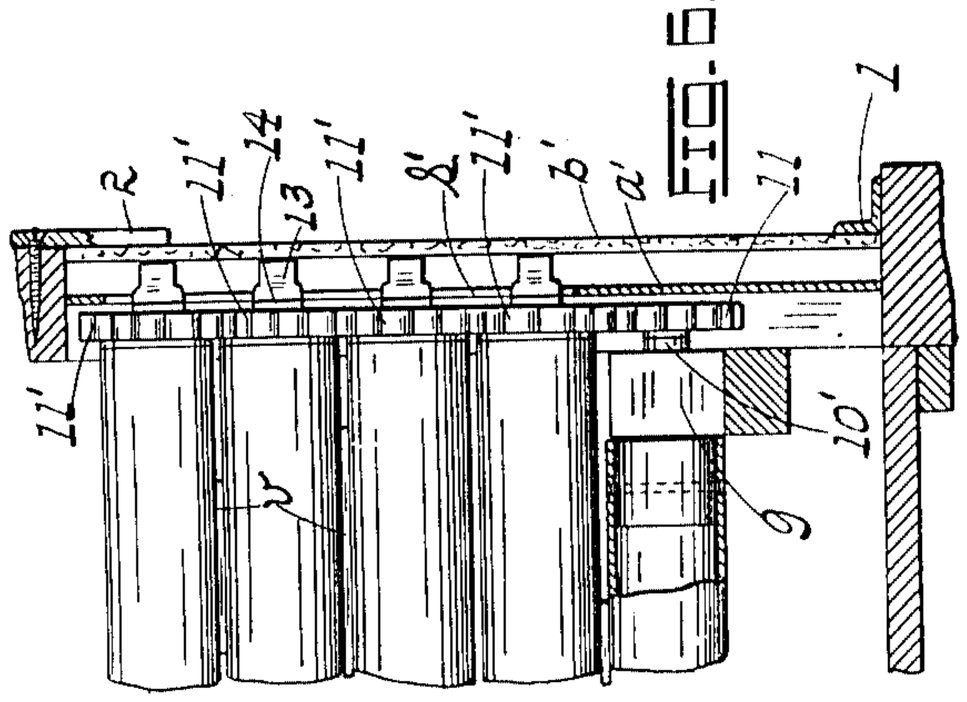


FIG. 8.

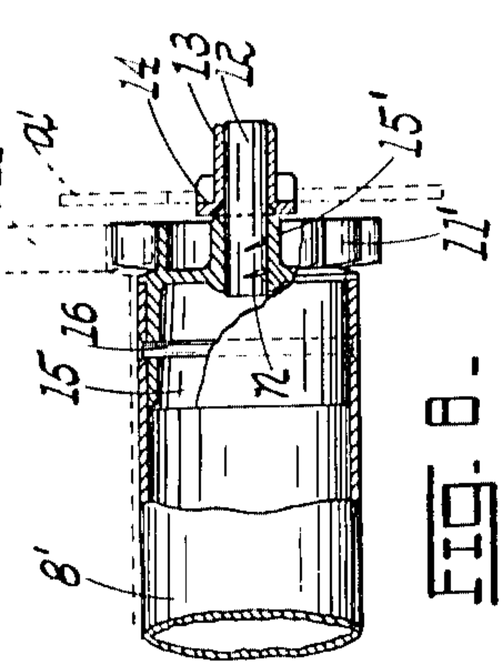


FIG. 10.

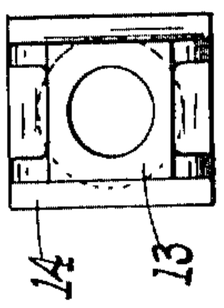


FIG. 9.

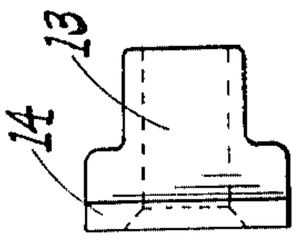


FIG. 4.

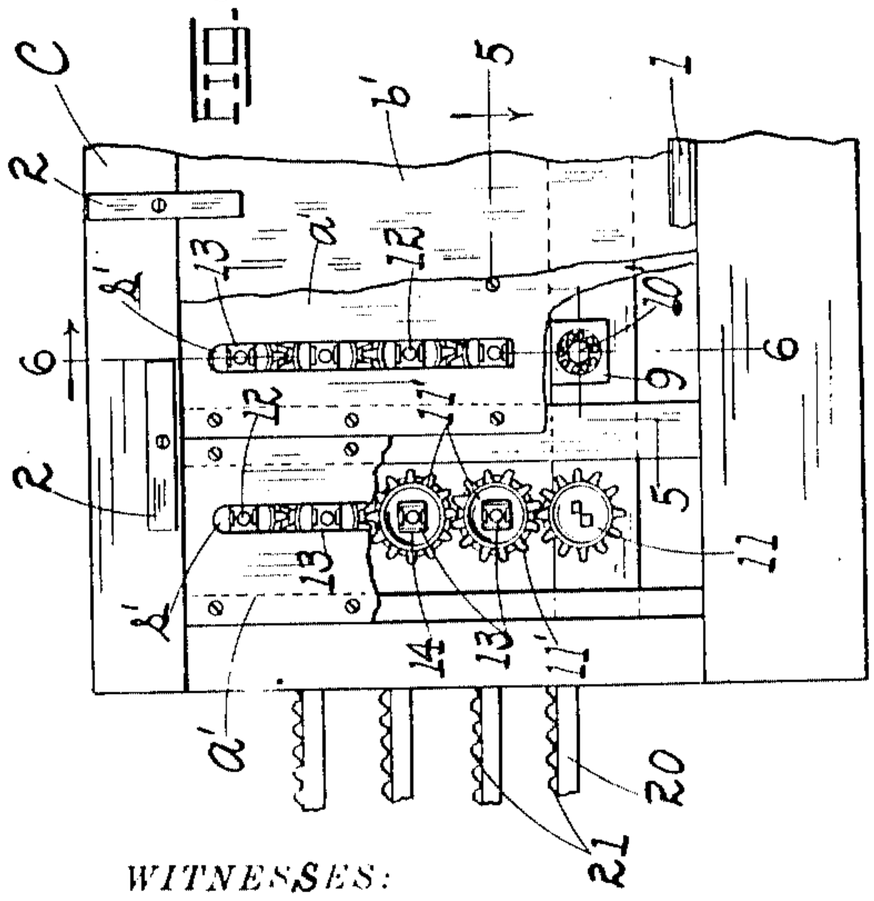


FIG. 7.

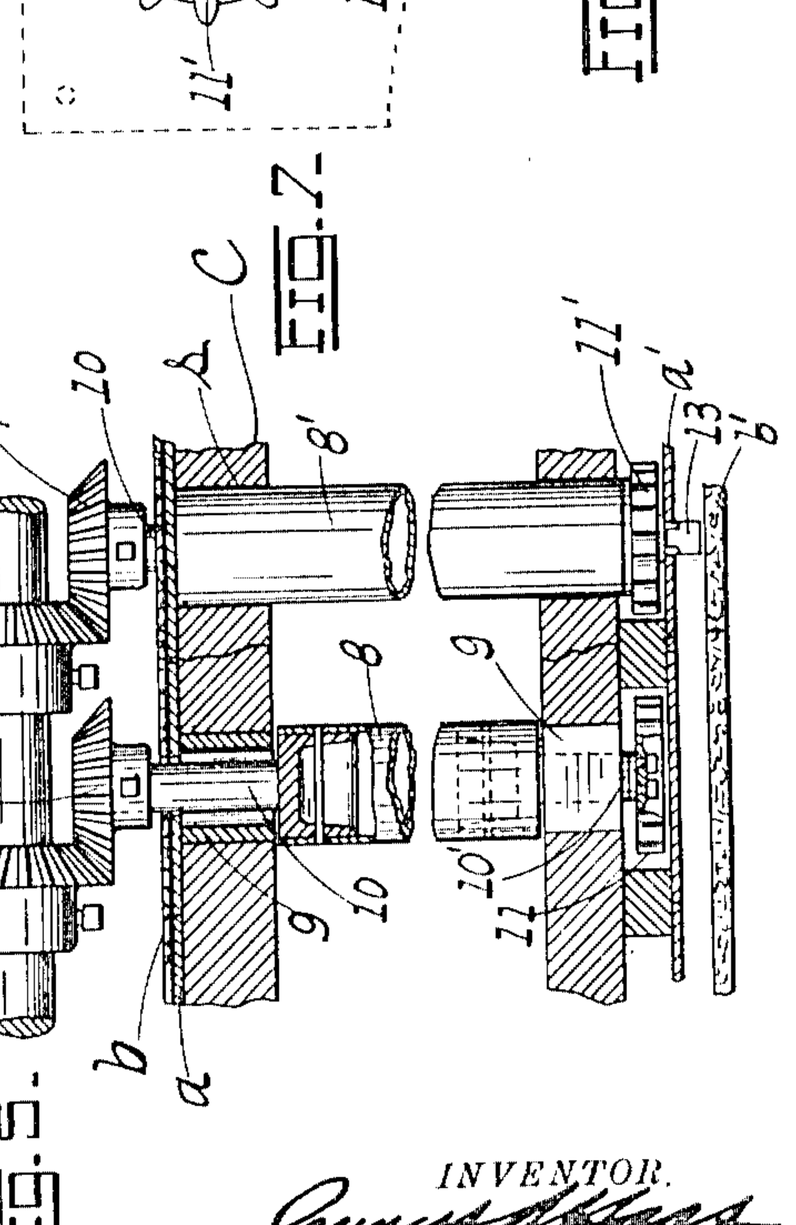
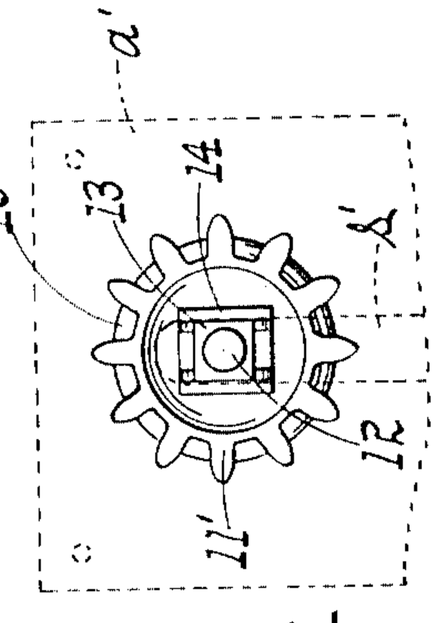


FIG. 5.



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VENEER-DRIER.

993,775. Specification of Letters Patent. **Patented May 30, 1911.**

Application filed February 25, 1911. Serial No. 610,833.

To all whom it may concern:

Be it known that I, CYRUS A. HAAS, citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Veneer-Driers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in veneer driers; and it consists in the novel construction of apparatus more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the apparatus, broken between the ends of the drying chamber or casing; Fig. 2 is an end elevation thereof; Fig. 3 is a top plan of one end of the same; Fig. 4 is a side elevation of one end of the drier, parts being removed to expose the gearing; Fig. 5 is an enlarged horizontal section on the broken line 5—5 of Fig. 4; Fig. 6 is an enlarged vertical cross-section on the line 6—6 of Fig. 4; Fig. 7 is an end view of Fig. 8; Fig. 8 is an elevation of one end of the veneer-advancing or feed-roller, parts being broken; Fig. 9 is a side view of the terminal sliding bearing which supports the spindle of the roller; and Fig. 10 is a face view of said bearing.

The object of my invention is to construct a veneer-drying apparatus which will advance or feed the sheets of veneer through a drying chamber or casing by means of series of rollers between which the sheets are guided as they travel through said chamber, the weights of the rollers being such as not to interfere with the freedom of shrinkage of the veneer while drying, and yet being sufficient to prevent undue warping of the material.

A further object is to provide means for the free vertical play of the rollers to accommodate the veneer sheets fed between them, without a disengagement of the gearing with which the ends of the rollers are identified.

A further object is to construct the rollers with a view of securing the most effective feed, and to provide further and other structural features the advantages of which will be best apparent from a detailed description of the invention, which is as follows:—

Referring to the drawings, C represents a casing or chamber of convenient height and width, and of any suitable length, said casing being built in any mechanical manner but preferably of wood or metal studding, one side wall of the chamber being covered with an inner permanent sheet metal layer *a* protected with an outer asbestos layer *b* (Fig. 6), the opposite side being provided with a similar sheet metal wall *a'* from which is suitably spaced an outer removable asbestos wall or section *b'*, the base of the latter being protected by an angle-bar 1, and the upper portion being held in place by rotatable latches 2. By turning the latches 2 to a horizontal position, the section *b'* may be removed so that access can be had to the wall-layer *a'* when occasion requires.

Disposed longitudinally along the side of the chamber C above the bottom thereof, and adjacent to the layer *b*, and supported on brackets 3, is a drive-shaft 4 terminating in a gear-wheel 5, which may mesh with the gearing of any suitable motor or other source of power (not shown). Disposed at intervals along said shaft are a series of bevel pinions 6 which mesh with corresponding bevel pinions 7 at the adjacent ends of the series of relatively fixed bottom feed rollers 8 mounted in bearings 9, 9, above the floor of the casing, the pinion 7 being secured to the spindle 10 of said roller, the opposite spindle 10' carrying a gear wheel or pinion 11 inside the wall *a'* (Fig. 5). Since the pinions 7 are all engaged by the pinions 6 from the same side (Fig. 1) it follows that all the fixed bottom rollers 8 will rotate simultaneously in the same direction with any given rotation of the shaft 4.

Mounted transversely across the chamber C, parallel to and over each roller 8, are a series of vertically yielding rollers 8' (all the rollers being made of piping as shown) the ends adjacent the metal layer *a* being confined in vertical slots *s* formed in the side wall of the casing (Fig. 1) the spindles 12 with their supporting bearings 13 playing freely in the vertical slots *s'* formed in the sheet-metal wall *a'*, the bearings being guided and kept against accidental displacement by the side wings 14 which lap over the opposite edges of the said slot. The ends of the pipes 8' which carry the spindles 12 (Fig. 8) are closed by cup-shaped plugs 15 over the peripheral walls of which the pipe is slipped, the plug being

secured by a pin 16 passed through the pipe and plug wall, the hub 15′ of the plug being cast around the spindle 12 which is first notched by one or more indentations *n*, the metal filling said indentations and thus making practically a one-piece member of the two. Formed with the plug 15 around the hub 15′ thereof is the pinion 11′, the pinions 11′ of the rollers 8′ of any set meshing with one another, the bottom pinion 11′ meshing with the pinion 11 of the bottom fixed roller 8. The teeth of the rollers 8′ extend radially and sufficiently beyond the periphery of the pipe comprising the body of the roller, that even with a maximum thickness of a sheet of veneer inserted between two contiguous rollers, the teeth of their pinions will remain in mesh so that rotation from one roller may be imparted to the coacting roller. The connection between the roller 8′ and its pinion 11′ as described is considered eminently practical, and so far as I am aware, is new.

As shown in the drawings, the casing C is preferably raised above the ground by props or standards P, this allowing for the free accommodation of the bottom hot air inlet pipe H, and the bottom outlet pipe E, the casing being tapped at the top opposite the pipe H, with a similar hot air inlet pipe H′ and opposite the pipe E, by an outlet or discharge pipe E′, said pipes H, H′, leading from any suitable source of hot air supply (not shown). Both sets of pipes H, H′, E, E′, are disposed on the longitudinal center of the casing, the pipes H, H′, being at one end, and the pipes E, E′, being at the opposite end.

Mounted at each end of the casing on frame work 20, and positioned so as to permit the feeding of the veneer *v* into the race-way (between the rollers) through which it shall travel in the chamber are corrugated sheet metal ledges or platforms 21, the veneer being initially deposited on the platform and shoved into the chamber. The outer portions of the platforms 21 are staggered, the second from the top projecting beyond those above and below it, and the bottom shelf or platform projecting beyond those above it. This arrangement facilitates the handling of the sheets of veneer, which are inserted at one end over the top and third shelf or platform, and at the other end over the second from the top, and bottom shelf, the sheets traveling in opposite directions to reach their respective shelves, and as a rule making two runs through the chamber before the necessary quantity of moisture has been expelled therefrom, or before they are thoroughly dried.

It will be seen from the foregoing that the feed mechanism comprises a series of sets of rollers, each set being composed of a number of vertically superposed rollers which (with the exception of the bottom roller 8) yield vertically to admit of the insertion of the veneer between the rollers of any coacting pair and its travel through the drying chamber. Since a roller of any set occupies a vertical position corresponding to that of a corresponding roller of an adjacent set, there will be formed between the members of corresponding pairs of rollers of the consecutive sets, a race-way for the free travel of the veneer sheets. The weights of the rollers are such that while they suffice to hold the veneer against warping while drying, they accord it perfect freedom to shrink so that no splitting follows from the treatment. The thinner sheets may be treated in the race-ways formed between the three top rollers, while thicker sheets (which can better support a greater weight of piping 8′) may be treated in the race-ways formed between the three bottom rollers of the successive sets. In this way different thicknesses of veneer may be treated in the same machine. For woods which can support considerable weight, thin veneer cut therefrom may be run through any of the race-ways without disastrous results. The yielding rollers in parting to make room for the veneer sheets are accorded the necessary play by the slots *s*, *s*′, as obvious, though the members of any coacting pair are never separated sufficiently to disengage the gears 11, 11′, or 11′, 11′. In their vertical movements the ends of the rollers 8′ opposite the gears 11′ rub against the sheet metal layer *a* of the casing wall, the metal contacting surfaces reducing the friction to a minimum. The hot air enters from opposite directions through the pipes H, H′, and the moisture laden air resulting from the drying operation escapes through the discharge mains E, E′, the disposition of the pipes H, H′, being such that the hot air strikes the veneer from top and bottom, working toward the center, whence it circulates toward the exit flues E, E′, filling the chamber C in such circulation and effectively drying the veneer. For some purposes a single run through the casing may suffice, for example in treating veneer for butter dishes which does not require perfect drying. As the rollers 8′ rotate in their bearings 13, the latter play up and down in the slots *s*′ as obvious from the drawings.

Any length of drying chamber may be employed, though in practice chambers ranging from thirty to one hundred feet give excellent results for the majority of material treated.

By "veneer" of course, is meant thin lumber ranging from say one-quarter or one-eighth of an inch in thickness to any below that, one sixty-fourth of an inch being perhaps as thin as is generally employed in practice.

One roller being positively driven by its neighbor, it follows that there can be no slipping between the rollers and veneer, thus insuring a positive advance for the material treated, at a uniform rate of speed.

Having described my invention, what I claim is:—

1. A veneer drier comprising a chamber open to the traverse of hot-air currents, a series of successive sets of rollers disposed throughout said chamber between opposite walls of the same, each set comprising a bottom fixed member and a number of superposed yielding members geared together, and to the fixed member, the ends of the chamber being open to permit feeding of the material between the members, and means for imparting simultaneous rotation to the bottom roller members at the same rate of speed.

2. A veneer drier comprising a chamber open to the traverse of hot-air currents, a series of successive sets of rollers disposed throughout said chamber between opposite walls of the same, each set comprising a bottom fixed member and superposed yielding members geared thereto, and a drive-shaft geared to the bottom fixed members.

3. A veneer drier comprising a chamber, means for introducing hot-air thereinto through the top and bottom of the chamber at one end of the latter, means for allowing for the escape of the waste gaseous products through the top and bottom of the opposite end of the chamber, a series of successive sets of feed-rollers disposed throughout the chamber between the sides thereof, each set comprising a bottom fixed roller terminating at one end in a bevel pinion and in a gear at the opposite end, and a number of superposed yielding rollers terminating at one end in gears meshing with one another, the gears of the lowest members of the yielding rollers meshing with the gears of the bottom fixed members, a longitudinally disposed drive-shaft provided with bevel pinions meshing with the bevel pinions of the fixed rollers, spindles for the yielding rollers projecting beyond the roller ends, bearings for the spindles, the opposite walls of the chamber being provided with suitable slots to allow for the vertical play of the bearings aforesaid and of the opposite ends of the rollers, and suitable shelving at the ends of the casing for directing the veneer sheets between the terminal rollers of the series, any pair of one set receiving the veneer advanced from a corresponding pair of an adjacent set.

4. In combination with a veneer-drying chamber having opposite vertically slotted walls, hollow or tubular rollers having one end mounted yieldingly in the slots of one of the walls, a cup-shaped plug closing the opposite end of the passage of each tube, a spindle carried by and projecting beyond the plug, a bearing for the spindle projecting through the slot of the opposite chamber wall, wing formations on the bearings lapping the edges of the slots, gears formed with the plugs and disposed about the axes of the spindles thereof, the casing being provided with a metal wall section serving as an abutment for the ends of the rollers opposite the spindles.

5. In combination with a veneer-drying chamber provided with a fixed side wall, an inner metal layer and an outer superposed heat-non-conducting layer secured to said wall, a metal wall section on the opposite side of the casing, an outer heat nonconducting removable wall section spaced from the metal section, the metal sections and opposite side wall of the casing being provided with vertical slots, feed-rollers mounted between the side walls of the chamber, one end of each roller playing in the slot receiving the same, a spindle projecting from one end of the roller, a bearing for the spindle playing in the slot of the metal section aforesaid and projecting into the space between said section and the outer removable heat non-conducting section, gears cast about the spindles and confined within the chamber on the inside of the metal wall section, wings on the bearings lapping the edges of the slots in the metal wall section, and bearing against the inner surface of said section, the gears of the several rollers being in mesh with one another, a bottom fixed roller geared to the yielding rollers, and a drive-shaft located outside the chamber for imparting rotation to the fixed rollers.

In testimony whereof I affix my signature, in presence of two witnesses.

CYRUS A. HAAS.

Witnesses:

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FANNIE E. WEBER.