Sept. 20, 1927. 1,642,928

J. E. KOCHA

VENEER DRIER

Filed May 27, 1925 4 Sheets-Sheet 1

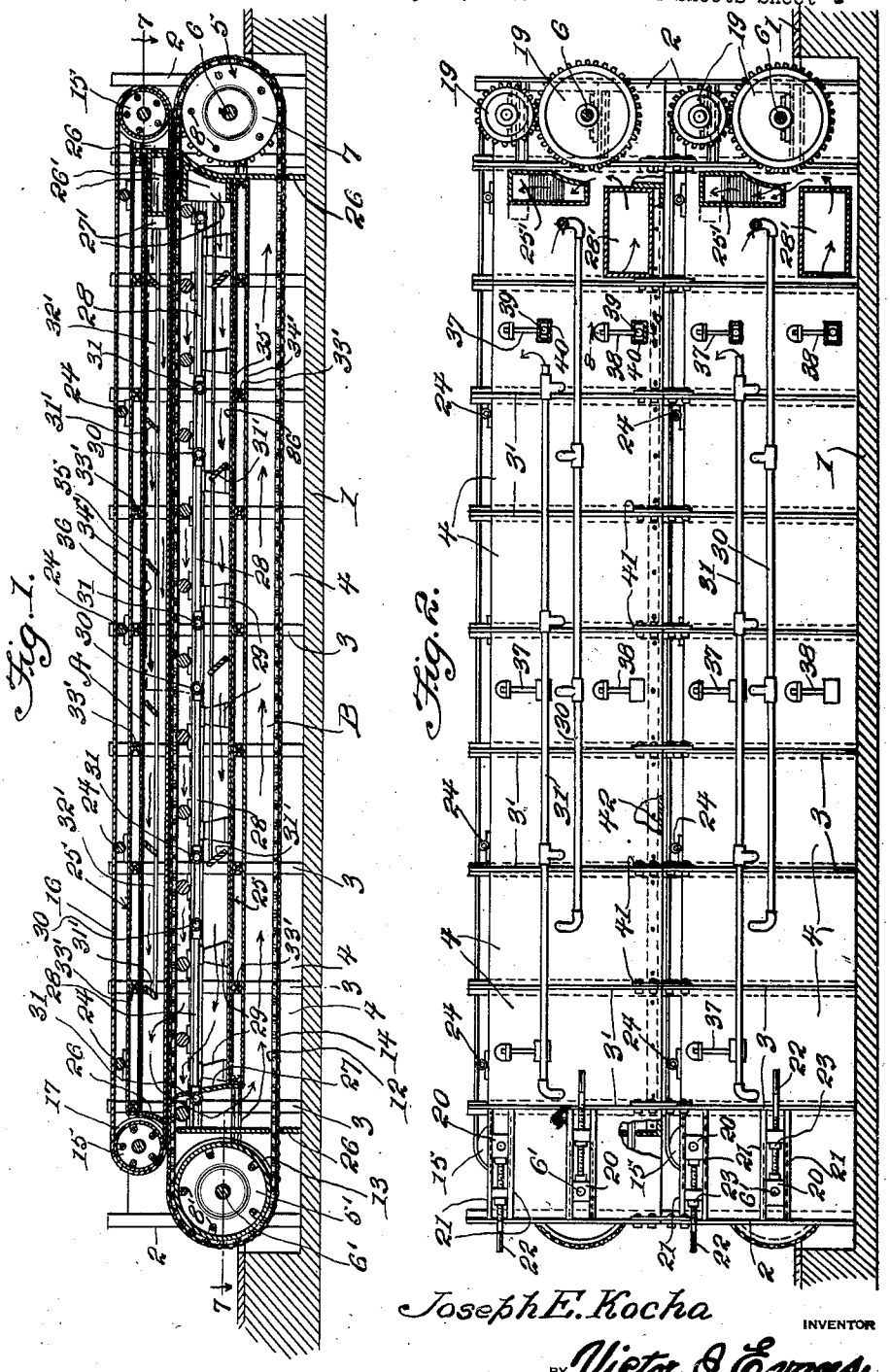


Fig. 1.

Fig. 2.

Joseph E. Kocha INVENTOR

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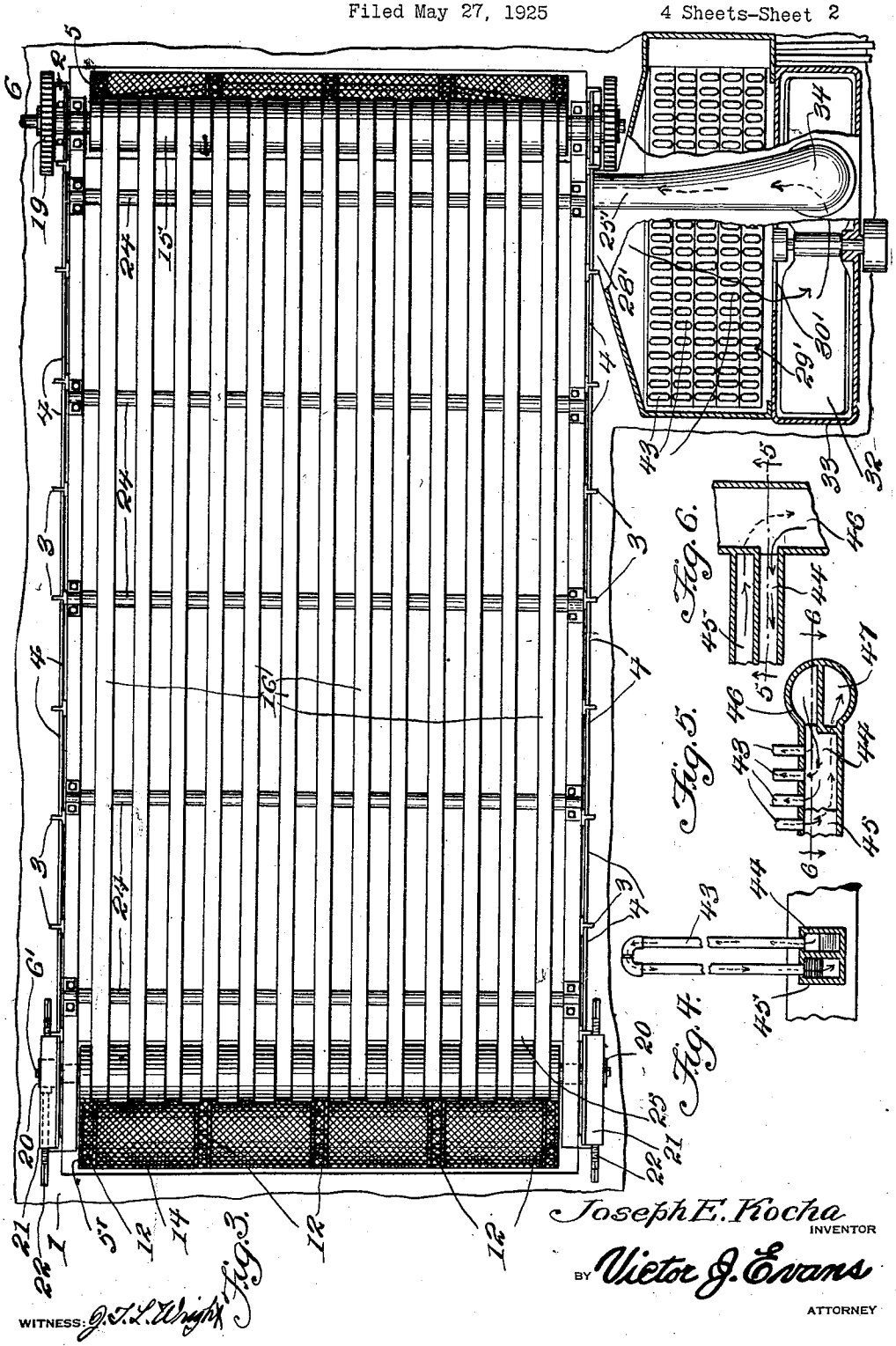


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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Filed May 27, 1925 4 Sheets-Sheet 3

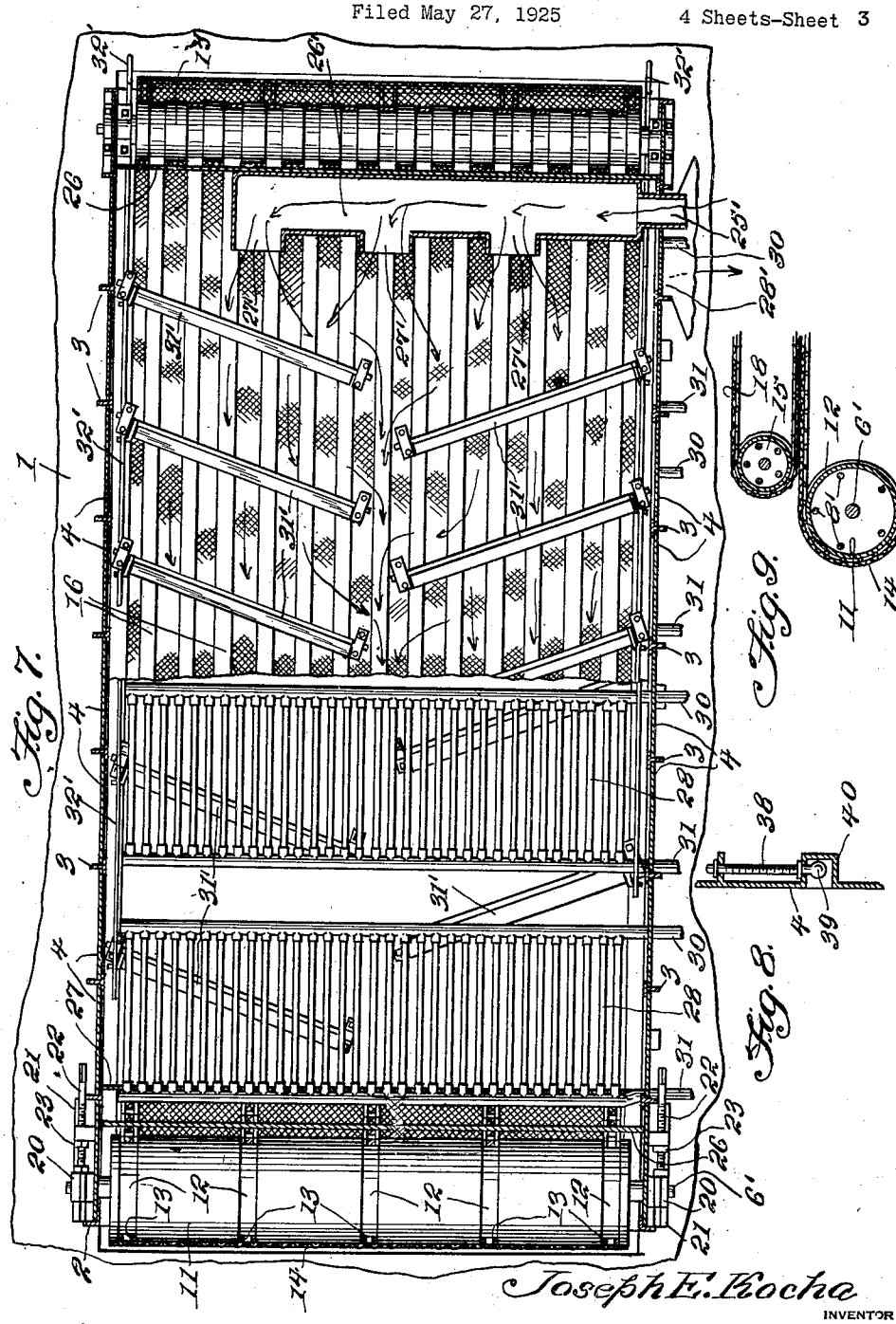


Fig. 7.



Fig. 9.



Fig. 8.

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Sept. 20, 1927. 1,642,928

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Filed May 27, 1925 4 Sheets-Sheet 4

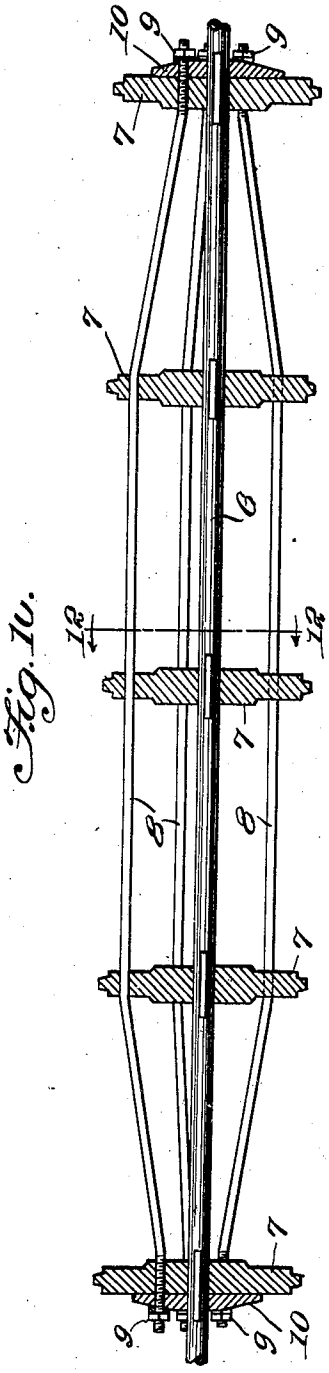



Fig. 10.

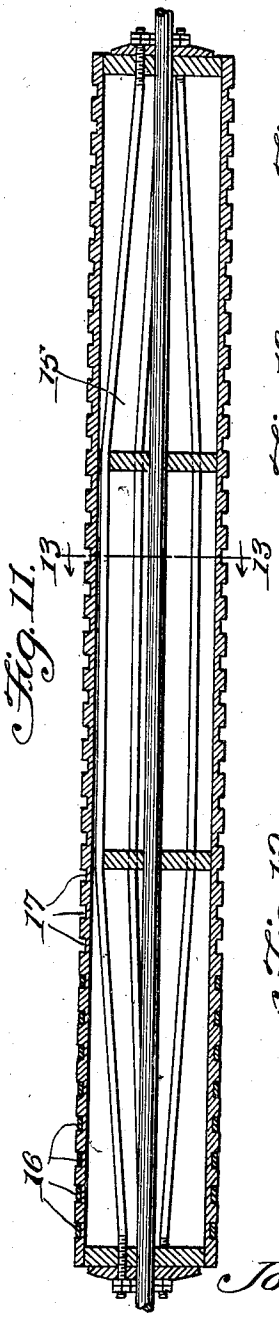



Fig. 11.

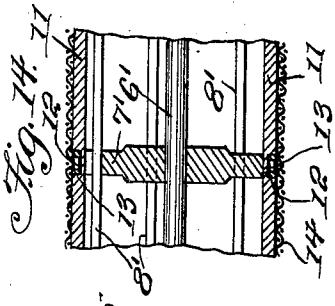



Fig. 14.

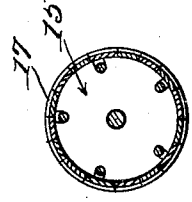



Fig. 13.

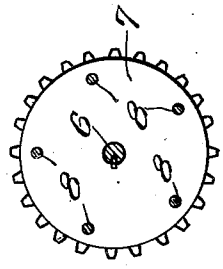



Fig. 12.

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Patented Sept. 20, 1927. 1,642,928

# UNITED STATES PATENT OFFICE.

JOSEPH EDWIN KOCHA, OF LINDEN, NEW JERSEY.

## VENEER DRIER.

Application filed May 27, 1925. Serial No 33,244.

This invention relates to a device for drying veneer, the general object of the invention being to provide means whereby the maximum amount of material can be dried in the minimum amount of time.

Another object of the invention is to provide conveyor means for the veneer which is so constructed that the veneer is held flat and is prevented from curling up or buckling.

A further object of the invention is to provide means whereby the conveyors can be held under the proper tension at all times.

Another object of the invention is to provide a chamber through which the material is fed by the conveyors with means for heating the chamber and for passing heated air.

Still another object is to provide means for controlling the flow of air through the chamber.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be he hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a longitudinal sectional view through one construction of the invention.

Figure 2 is an elevation showing a double construction.

Figure 3 is a top plan view, with parts broken away and parts in section.

Figure 4 is a view showing one of the coils of the heater, with the headers of the heater in section.

Figure 5 is a section on line 5—5 of Figure 6.

Figure 6 is a section on line 6—6 of Figure 5.

Figure 7 is a section on line 7—7 of Figure 1.

Figure 8 is a section on line 8—8 of Figure 2.

Figure 9 is a fragmentary sectional view showing a modification.

Figure 10 is a longitudinal sectional view through the conveyor roll which is provided with the sprockets.

Figure 11 is a similar view through one of the rolls of the upper conveyor.

Figure 12 is a section on line 12—12 of Figure 10.

Figure 13 is a section on line 13—13 of Figure 11.

Figure 14 is a fragmentary longitudinal sectional view through the first roll of the bottom conveyor.

In these views, 1 indicates the foundation for the device and upon which rests the uprights 2 for the conveyor rolls and the T-beams 3 to which the metal plates 4 are fastened, the beams and plates forming a casing for enclosing the device. The roll 5 for the bottom conveyor comprises a shaft 6 which has its ends journaled in the uprights and upon which are keyed a plurality of sprocket disks 7 and the brace rods 8 which pass through holes in the disks and have their ends threaded to receive the nuts 9 which engage the washers 10, which lie on the outer faces of the end disks. The roll 5′ for the other end of the lower conveyor is made of a shaft 6′ which has its ends journaled in the uprights and which carries the disks 7′ which are fastened together by the stay rods 8′, and the longitudinally extending slats 11 which are connected with the disks, so that this roll 5′ is of cylindrical shape and it has grooves 12 in its outer surface for receiving the conveyor chains 13 which also pass over the sprockets 7. Thus when the roll 5 is rotated, from any suitable source, the chains and roll 5′ will also be moved. A covering 14 of wire mesh is attached to the chains and forms the conveying medium. The upper conveyor is of less length than the lower conveyor and comprises the rolls 15 and the conveyor 16 which is composed of a plurality of belts which engage grooves 17 formed in the outer surface of the rolls 15. These rolls 15 are composed of disks, stay rods and slats, as is the roll 5′, but a greater number of grooves are made in the rolls 15 for receiving the belts forming the upper conveyor. If desired, this upper conveyor can have its conveying medium formed of wire mesh, the same as the lower conveyor. This arrangement is shown in Figure 9, where the wire mesh is shown at 18 on the upper conveyor. The shafts at the rear end of the two conveyors are geared together by the gears 19, so that the upper conveyor will be rotated from the lower one and these gears must be so proportioned that the two conveyors will move at the same

speed. The lower stretch of the upper conveyor lies close and parallel to the upper stretch of the lower conveyor so that when the veneer is fed in between the two stretches, it will be held flat between the two stretches and will be prevented from wrinkling or buckling under the action of the heat.

The shafts of the front rolls 5′ and 15 are each carried by the blocks 20 which are mounted to slide in the guideways 21 and which are adjusted in the guideways by the screw shafts 2 connected with the blocks and passing through the nut members 23 in the guideways. Thus by turning these shafts, the front rolls can be adjusted to properly tighten the conveyors. I also provide idler rolls 24 for the upper reaches or stretches of the conveyors for preventing the same from sagging. These rolls are suitably supported from the framework of the device.

A chamber A is formed in the casing through which the contacting portions of the conveyors pass. This chamber is formed of the upper and lower walls 25 and the end walls 26, the end walls extending down past the lower wall to the base or foundation 1. The front end wall is spaced from the front end of the lower wall and a supplemental end wall 27 extends from the front end of the lower wall to the upper part of the lower conveyor, so that the front end of chamber A is separated by said wall 27 from the chamber B which is formed by the lower wall 25 and the foundation 1. The lower part of the lower conveyor passes through the chamber B. The end walls 26 are each provided with an opening through which the contacting portions of the conveyors pass to enter and leave chamber A.

A plurality of heating coils 28 are arranged in the chamber A and are supported therein by the posts 29 which rest upon the lower wall 25, so as to heat the air in the chamber A. Steam or other heating fluid is introduced to the coils by means of the supply pipe 30, the discharge pipe for the coils being shown at 31.

Air is circulated through the chambers A and B by means of a fan 32, the casing 33 of which has its discharge 34 connected by the conduit 25′ with a tubular member 26′ in the rear end of the chamber A and which is provided with the discharge ports 27′ so that the air passing into the tubular member 26′ will pass through said ports into the rear end of the chamber and then this air will flow along the chamber, coming in contact with both faces of the veneer held between the conveyors and will then pass over the end wall 27 into chamber B and will pass from said chamber through the outlet 28′ into the heater 29′ and return to the fan casing through the port 30′ therein. Thus the air will be used over and over again and it will be heated in the heater 29′ before it passes into the fan casing. The air is further heated by the coils 28 in the chamber A and its flow through said chamber can be regulated by the baffle plates 31′ hingedly arranged in the upper and lower parts of the chamber and adjusted by the rods 32′ which extend to the exterior of the casing, so that by moving these rods, the baffle plates can be turned on their pivots so as to obstruct more or less the passage of air through the chambers.

The walls 25 are formed with air spaces within them and each wall is composed of the cross beams 33′ to which the outer wall strips 34′ and the inner strips 35 are connected. Each inner surface is covered by a layer 36 of asbestos or the like.

Heat indicating means or thermometers 37 and moisture indicating means 38 are provided for indicating the temperature and the moisture of the air in chamber A and each of these devices is arranged as shown in Figure 8, where its lower end 39 is arranged in a chamber 40 which is in communication with the chamber A. The rest of the device is outside of the main casing so that it can be easily read from the exterior of the apparatus.

Figure 2 shows a pair of conveyors arranged over a first pair of conveyors, so that this figure shows a double construction and in this case, the T-beams 3′ of the upper device is connected with the beams of the lower device by the connecting plates 41. The upper device is provided with a bottom 42 which is spaced above the upper reach of the top conveyor of the lower device.

I prefer to make the heater 29′ of a series of coils 43 which have their lower ends connected with the inlet passages 44 and their outlet passages 45, each set of these passages being connected with an inlet header 46 and an outlet header 47. Thus the steam or other heating fluid will flow through the coils and the air passing from the apparatus into the fan casing will flow around said coils and thus be heated and the moisture removed therefrom.

From the foregoing, it will be seen that as the veneer is placed between the front rolls of the two conveyors, it will be caught between the upper and lower conveyors and be fed into the chamber A, where it will be subjected to the heated air passing through the chamber and which is heated by the steam coils in the heater 29′ and by the coils 28 in said chamber. This air can contact with both faces of the veneer through the perforations in the lower conveyor and through the spaces between the belts of the upper conveyor. Thus the veneer will be dried and as it is clamped between the two conveyors, it cannot buckle or wrinkle un-

der the action of the heat. The veneer will pass from the chamber thoroughly dried and the air, laden with moisture from the veneer, will be drawn by the fan through the heater and returned to the chamber A to act upon the veneer being fed into the same. By this invention, large quantities of veneer can be treated very quickly and with the minimum amount of fuel.

The machine is especially designed for drying wide strips of material, such as mahogany and other imported wood that are sliced and sawed in long sheets and which must be fed through the machine across the apron so that the machine must be very wide. The machine is also driven from a variable speed control so that the speed of the apron can be regulated according to the amount of moisture in the wood.

It is thought from the foregoing description that the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

1. A veneer drying apparatus comprising a casing having a longitudinally extending chamber therein, upper and lower conveyors having endless conveying members which are perforated, the upper reach of the lower conveyor and the lower reach of the upper conveyor lying close together and being parallel so as to clamp between them the veneer strips, these portions of the conveying members passing through the chamber and dividing it into an upper part and a lower part, the lower part having its front end closed while the upper part has its front end open and means for introducing air into the rear end of the said chamber.

2. A veneer drying apparatus comprising a casing having a longitudinally extending chamber therein, upper and lower conveyors having endless conveying members which are perforated, the upper reach of the lower conveyor and the lower reach of the upper conveyor lying close together and being parallel so as to clamp between them the veneer strips, these portions of the conveying members passing through the chamber and dividing it into an upper part and a lower part, the lower part having its front end closed while the upper part has its front end open, means for introducing air into the rear end of the said chamber and means for heating the air.

3. A veneer drying apparatus comprising a casing having a longitudinally extending chamber therein, upper and lower conveyors having endless conveying members which are perforated, the upper reach of the lower conveyor and the lower reach of the upper conveyor lying close together and being parallel so as to clamp between them the veneer strips, these portions of the conveying members passing through the chamber and dividing it into an upper part and a lower part, the lower part having its front end closed while the upper part has its front end open, a blower connected with the rear end of the chamber for introducing air therein, means for connecting the open end of the top part of the chamber with the inlet of the blower and means for heating the air.

4. A veneer drying apparatus, comprising a casing having an upper and a lower chamber therein, upper and lower conveyors having their contacting stretches passing through the upper chamber, a fan having its discharge connected with one end of the upper chamber, a heater connected with the inlet of the fan and with the lower chamber, means for connecting the chambers together so that air will pass from the fan into the upper chamber, through the same into the lower chamber and from the lower chamber through the heater back into the fan, heating means in the upper chamber and means for controlling the flow of air through the upper chamber.

In testimony whereof I affix my signature.

JOSEPH EDWIN KOCHA.