April 15, 1930. E. G. STACK 1,754,700

VENEER STACKER

Filed March 6, 1928 5 Sheets-Sheet 1

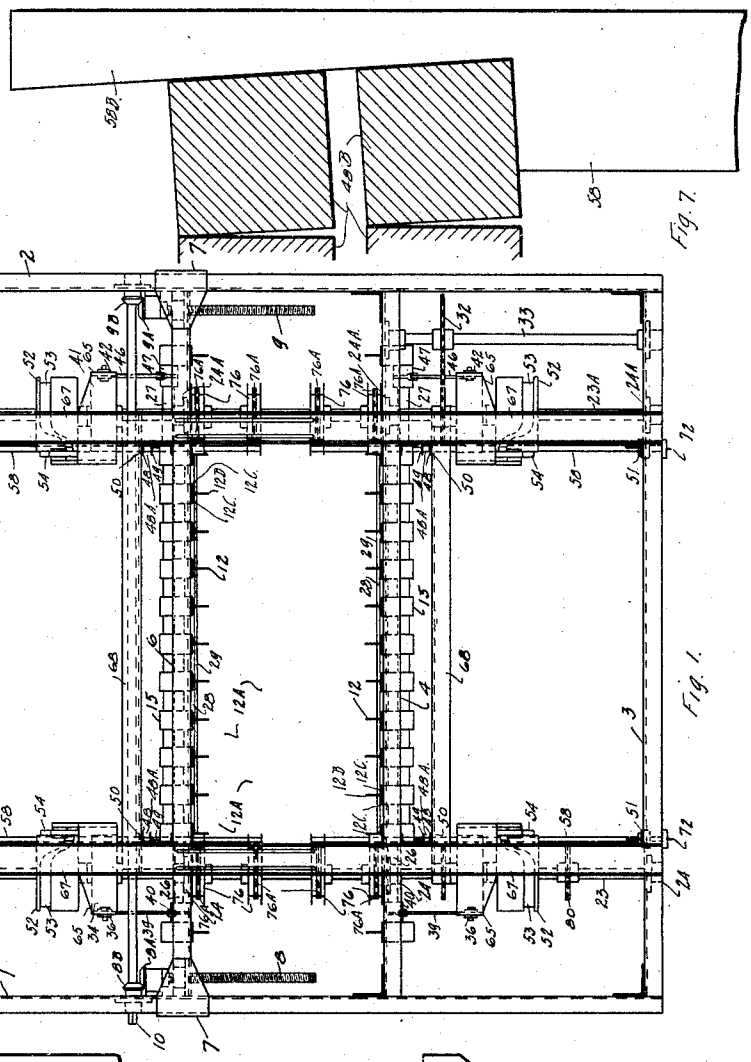


Fig. 1.

Fig. 7.

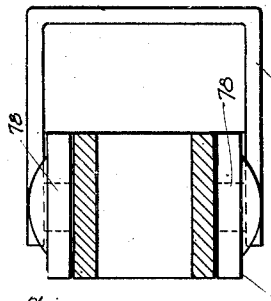


Fig. 6.

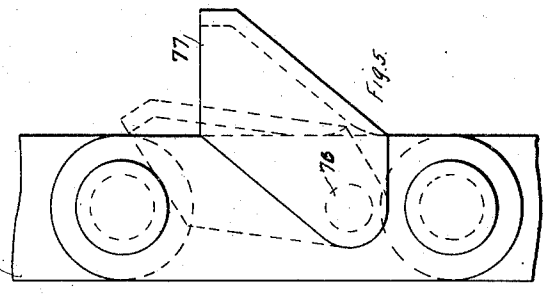


Fig. 5.

Witnesses
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VENEER STACKER

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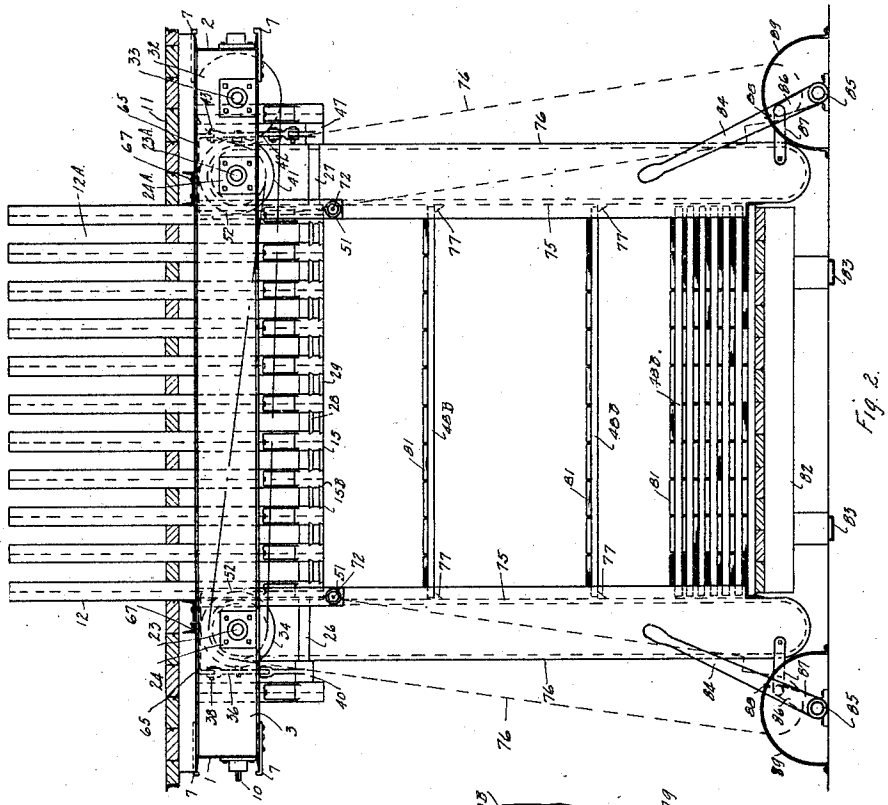


Fig. 2.

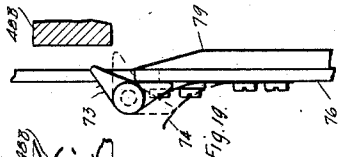


Fig. 14.

Fig. 17

Fig. 18.

Witnesses.
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April 15, 1930. E. G. STACK 1,754,700

VENEER STACKER

Filed March 6, 1928 5 Sheets-Sheet 3

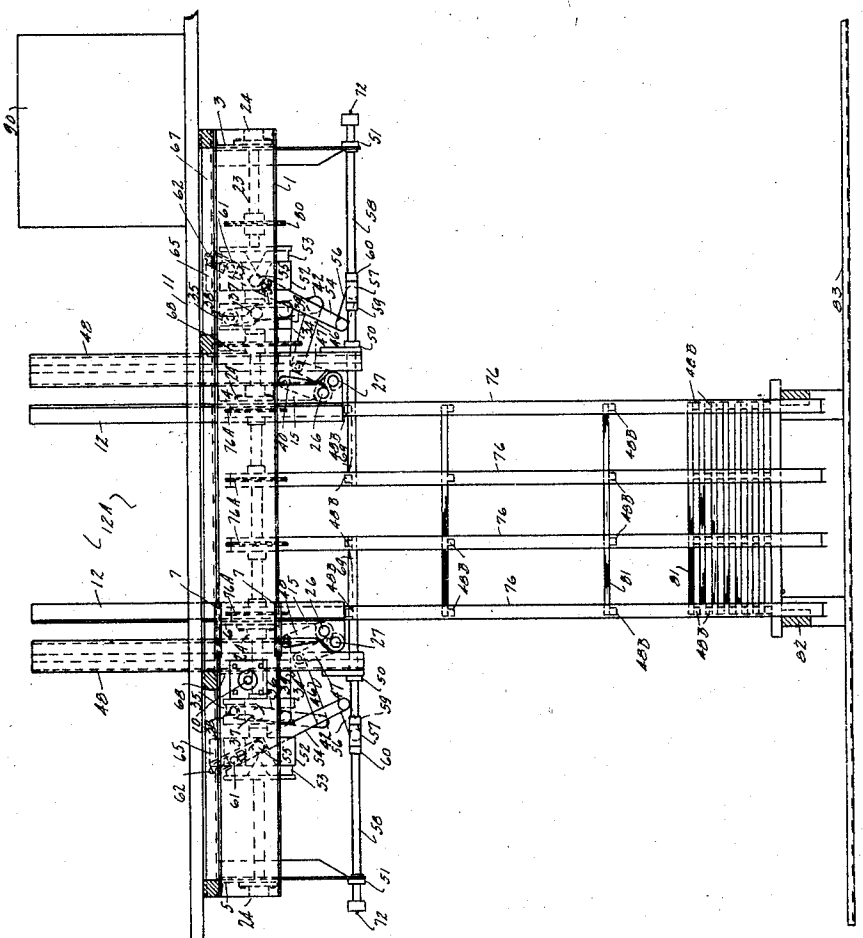


Fig. 3.

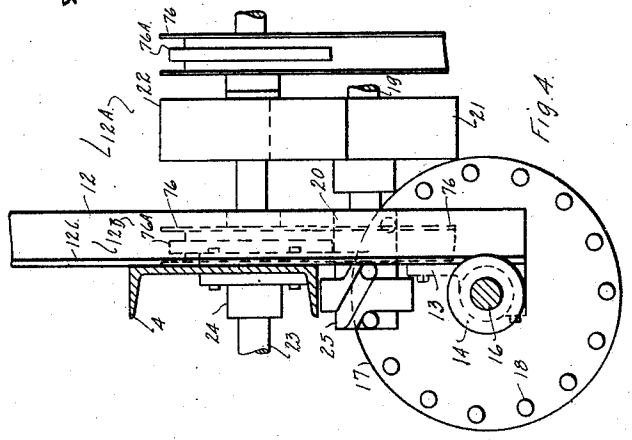


Fig. 4.

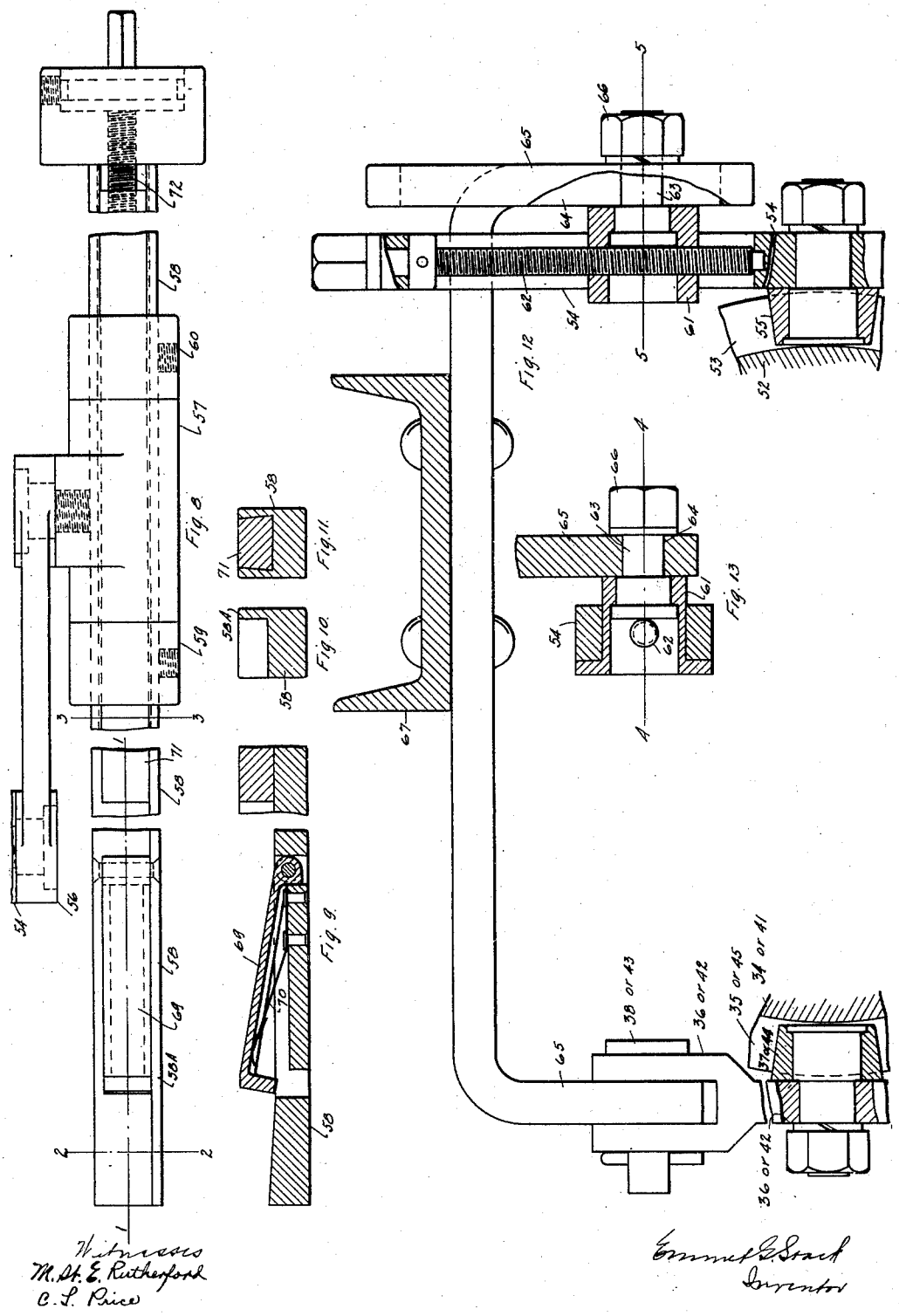
Witnesses
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April 15, 1930. E. G. STACK 1,754,700

VENEER STACKER

Filed March 6, 1928 5 Sheets-Sheet 4



April 15, 1930. E. G. STACK 1,754,700

VENEER STACKER

Filed March 6, 1928 5 Sheets-Sheet 5

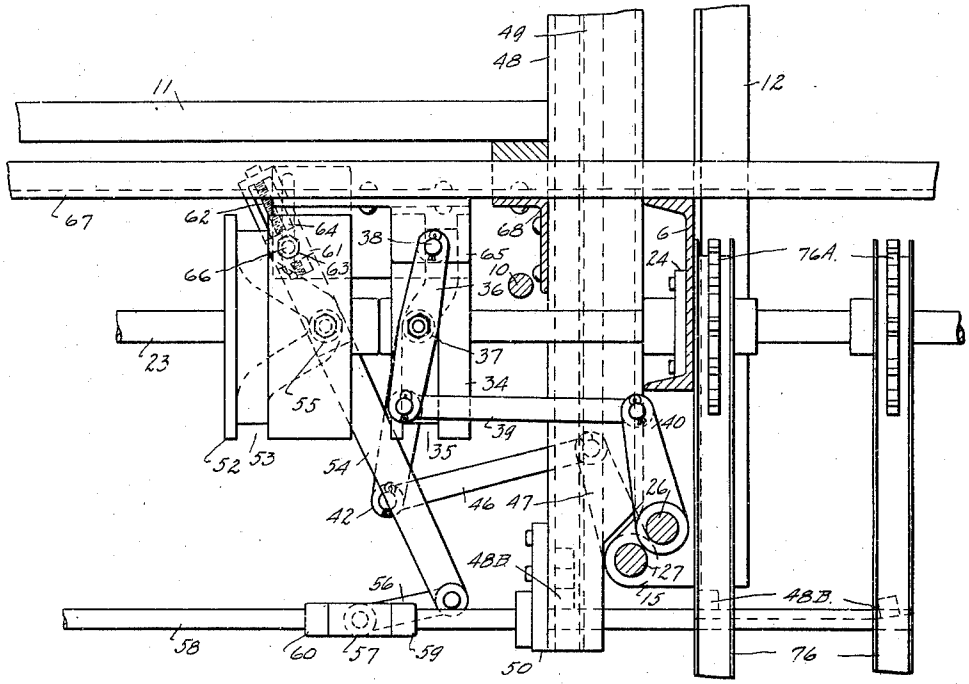


Fig. 20.

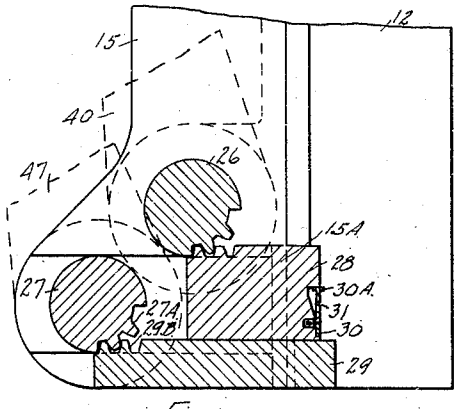


Fig. 14.

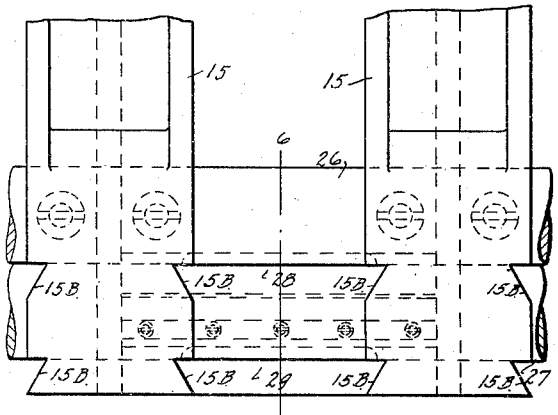


Fig. 15.

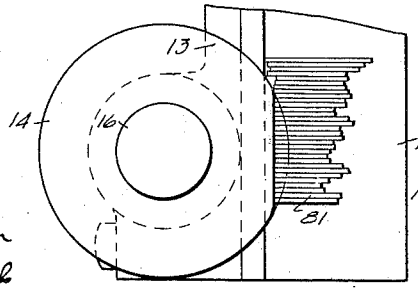


Fig. 21.

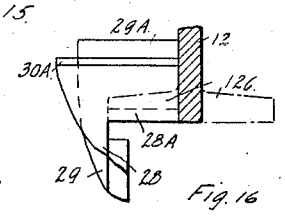


Fig. 16.

Witnesses:
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Patented Apr. 15, 1930 1,754,700

UNITED STATES PATENT OFFICE

EMMET G. STACK, OF MARSHFIELD, OREGON

VENEER STACKER

Application filed March 6, 1928. Serial No. 259,512.

My invention relates to a stacker particularly adapted to handle such veneers as are cut on my horizontal rotary slicer for which patents are pending, namely veneers for battery separators, box tops, and the like. In using my stacker in conjunction with my slicer I place the slicer on an upper floor and let the veneers, as they are sliced off, slide down onto either a moving or stationary stock table on an intermediate floor. The veneers are taken from the stock table and placed in any of a series of hoppers in number sufficient to take care of the number of vertical courses desired in a kiln load. In my drawings I have shown ten such hoppers. Any desired number of stickers are automatically placed and a pre-determined number of veneers from each of the several hoppers are ejected therefrom onto the stickers which are then lowered to their place in the kiln load being built on the jack frame placed on the lower floor or kiln level. It can be seen that, instead of receiving the veneers from slicers above, they may be elevated from clippers on a lower floor.

The object of my invention is to get away from the expensive hand stacking now used in many plants because of the poor work done by any mechanical stackers so far developed.

Another object is to build a kiln load similar in structure to the hand-built load, namely: a load in which the number of stickers desired for any particular length of veneer can be placed for each horizontal course where they are wanted; a load in which all the stickers in a vertical column are directly over one another; a load in which the outside stickers are placed over the ends of the veneers; a load in which each packet of veneers contains the same number; a load in which the ends and sides of each packet are approximately even and in which the packets in any vertical column are directly over one another.

Another object is to avoid the fall-downs incident to kiln drying because of the ragged loads built mechanically so far—it is claimed that the savings made in labor over hand methods is more than offset by the value of stock spoiled.

Another object is to further eliminate labor now required in other mechanical stackers to handle the same amount of material.

Another object is the perfection of a stacker that occupies only a small fraction of the space required for the working of any of the present stackers or for sufficient space to stack the same amount by hand.

Another object is the perfection of a stacker that is very simple, of rugged, cheap construction, easy to adjust, operate and control, positive in action, efficient and durable in service, practically automatic when once started—the human element only enters in keeping the hoppers filled and removing the loads as they are completed.

Another object lies in the perfection of a machine the capacity of which is only limited by the means employed to take the finished loads away—the multiple hoppers and their arrangement permit of them being filled by more than one person and from one or both sides.

I accomplish the above objects in the machine illustrated in the accompanying drawings, in which—

Fig. 1, is a plan view; Fig. 2, is a side view; Fig. 3, is an end view with the means for moving the bottom of the chain skids backwardly removed; Fig. 4, is a view showing the resilient roll used as the veneer packet ejecting means together with its indexing mechanisms; Fig. 5, is a side view of the lowering lug; Fig. 6, is a plan view of the lug; Fig. 7, is a view showing a sticker plunger taking stickers from multiple sticker hoppers; Fig. 8, is a plan view of the sticker plunger used with a single sticker hopper; Fig. 9, is a section on 1—1, Fig. 8; Fig. 10, is a section on 2—2, Fig. 8; Fig. 11, is a section on 3—3, Fig. 8; Fig. 12, is a view showing the pivot bearings for the levers operating the sticker plungers and the ejecting and holding slides together with the cam rollers (in section) for moving them, part of the sticker plunger pivot being shown in section along the vertical center line of the lever and cam rollers as along line 4—4, Fig. 13; Fig. 13, is a section on 5—5, Fig. 12, being cut on a horizontal center line thru the pivot bearing of the sticker plunger

lever; Fig. 14, is a section on 6—6, Fig. 15; thru the slide type of ejecting and holding means; Fig. 15, is an end view of the slides and the shaft bearings; Fig. 16, is a plan view of the T-heads of the slides; Fig. 17, is a section on 7—7, Fig. 18, showing the relation of the hopper member 12, the plunger 58, the latch 73, with the lowering lug 77; Fig. 18, is a side view showing the relation of the above members; Fig. 19, is an end view of the latch and sticker guides, Fig. 20, is a view showing the barrel cams and levers more in detail than as shown in Fig. 3; Fig. 21, is a view showing the resilient roll 14 more in detail than as shown in Fig. 4.

Similar numerals refer to similar parts thruout the several views.

In proceeding to describe my invention in detail I wish to point out that many deviations may be made in the details of construction and many modifications may be made without departing from the basic idea and, while I shall describe a desirable form of the machine and its construction, I do not limit my invention to it. I shall also illustrate and describe other possible means of accomplishing the main features since I am not as much interested in the exact details as in the broad combination of the main elements.

Primarily the stacker consists of a series of hoppers suitably disposed and adaptable to receive veneers from the top side; sticker placing means; means for evening and ejecting a pre-determined number of veneers simultaneously from the bottom side of each hopper onto the stickers; and means for lowering the stickers and the packets of veneers to their place on the kiln load.

The drawings show a frame or base which may be supported on posts or in any other suitable manner (no means of support being shown). To the two end channels 1 and 2 are secured the channel girts 3, 4, and 5. The channel girt 6 has the guide pieces 7 fastened to it and thus it may be moved along the length of and at right angles to the end girts 1 and 2. It is moved and held by the action of the screws 8 and 9 which are operated thru the gears 8A and 8B and 9A and 9B. The end of the shaft 10 carrying the gears 8B and 9B is adapted to receive and to be turned by a ratchet or other suitable means (none being shown). The object of moving the channel 6 is to vary the distance between it and the channel 4 so as to accommodate various lengths of veneers that it may be desirable to handle thru the machine. If only one length of veneers is to be handled this adjustment would not be necessary. The channels 3 and 5 serve to make the machine a self-contained unit. They also serve as supports for the work floor 11. It is possible to dispense with them and support the appendages shown attached to them by other members or to the building.

To the channels 4 and 6 are secured a series of T's 12 which form the ends and sides of the hoppers 12A. Like the channels used in the base the T's 12 might be replaced by other forms but they serve their purpose in a cheap and efficient manner. The number of T's 12 is governed by the number of vertical courses desired in the kiln load. These T's 12 extend above the channels 4 and 6, and incidentally above the working floor 11, and below them to carry the bearings 13 when the resilient rolls 14 shown in Fig. 4, are used as the evening and ejecting means; or the bearings 15, when the evening and ejecting means shown in Figs. 1, 2, 3, 14, and 15 are used. In Fig. 4, the bearings 13 are shown carrying the shaft 16 on which the resilient rolls 14 are spaced between the legs 12B of the T members 12 of the hoppers 12A. The rolls 14 project beyond the T flanges 12C so that the distance between the rolls 14 on the opposite ends of the hoppers 12A is less than the overall length of the veneers going thru the machine. On one end of the shaft 16 is the face plate 17 having sixteen rollers as 18 equally spaced thereon. A shaft 19 is carried in the bearings 20 and rotated thru the spur gear 21 which meshes with the spur gear 22 on the head sprocket shaft 23 rotatable in the bearings 24. A cam 25 on the shaft 19 is adapted to advance the rollers 18 one spacing during part of one of its revolutions and to hold them from further movement during the remainder of the revolution, thus the rolls 14 are moved thru one-sixteenth of a revolution for each revolution of the cam shaft 19, and incidentally the head sprocket shaft 23. As the rolls 14 on each end of the hoppers 12A move toward each other simultaneously, veneers, aggregating in thickness the distance the roll 14 moves, are evened up and ejected from each hopper 12A while the stock above is held from following thru. In Figs. 1, 2, 3, 14, and 15, the bearings 15 support the shafts 26 and 27 which are similarly designated for like functions at both ends of the hoppers 12A. Dovetails 15B are cut in the ends of the bearings 15 in which the ram slides 28 and the release slides 29 work, the one above the other. Rack teeth 28B cut in the top face of the ram slide 28 mesh with the teeth 26A cut in the lower side of the shaft 26 and in a like manner the teeth 29B cut in the slide 29 are engaged with the teeth 27A cut in the bottom of the shaft 27. No matter what type of evening and ejecting means is used it is desirable that they extend the full width of the veneers so that any chance of splitting them will be avoided. The bottom of the flanges 12C of the T's 12 are cut away and the adjacent face of the bearings 15 is recessed, the recess 15A permitting the T-shaped heads 28A and 29A of the slides 28 and 29 to be

receded behind the face of the hoppers or the T flanges 12C. A spring plate 30 having a projecting lip 30A is placed in a recess cut in the face of the ram slide 28, the upper part of the recess being enlarged so as to form the space 31 into which the upper end of the spring plate 30 may yield under pressure. When the ram slide 28 is advanced its full distance into the hoppers 12A the distance between opposite projecting lips 30A across the load is about ⅛″ less than the overall length of the veneers being put thru the machine. The approximate dimensions when handling veneers cut 36″ long would be: inside of hoppers, 36½″; between faces of opposite ram slides 28 both above and below the projecting lips 30, 36⅛″; between projecting lips 30A, 35⅞″; between the faces of opposite release slides 29, 35″; overall height of ram slide 28, 2″; projecting lip 30A, $\frac{1}{16}$″ thick; under projecting lip 30A to top of release slide 29, $1\frac{1}{32}$″. The dimensions given above would vary with the length of veneers being handled and also with the change in number and thickness of the veneers going into a packet 81. The above dimensions refer especially to packets 81 measuring 1″ in thickness. This is an advantageous thickness to handle for veneers are usualy cut so many to 1″. As it is, it will be seen that one piece of veneer will come opposite the projecting lips 30A and will be held securely by them due to them crushing into the wood. Even though the pressure is sufficient to cause the projecting lips 30A to yield they will still grip the veneer securely under all conditions and under all positions of the projecting lips 30A. When the ram slides 28 are receded back of the faces 12C of the T's 12 the stock in the hoppers 12A drops onto the release slides 29 where it is held while the ram slides 28 advance and even the stock up and the projecting lips 30A grip the piece coming opposite them. The veneers below the one gripped by the projecting lips 30A are free to drop immediately the release slides 29 are receded back of the face of the ram slides 29 while the stock above is held against coming thru. The piece held by the projecting lips 30A becomes the bottom piece of the next packet 81 released and being centered releases the whole packet evenly and it drops as a unit.

The synchronized movement of the slides 28 and 29 and the sticker placing means is obtained by the use of cams on the head sprocket shaft 23 and the tail sprocket shaft 23A. The tail sprocket shaft 23A is mounted in bearings 24A on the opposite end of the machine from the head sprocket shaft 23, from which it receives its power. A reverse motion is given the shaft 23A by means of the idler sprocket 32 mounted on the idler shaft 33. A barrel cam 34 mounted on the head sprocket shaft 23 has a groove 35 cut in its periphery which imparts the desired movement to the lever arm 36 by means of the roller 37 working in the groove 35. One end of the lever arm 36 pivots on the bolt 38 while the opposite end is connected by the rod 39 to the rocker arm 40 keyed to the ram slide operating shaft 26. The shaft 26 on the opposite side of the machine is worked in a like manner. Thru the barrel cams 41 mounted on the tail shaft 23A, the lever arms 42 pivoted on the bolts 43 and carrying the rollers 44 working in the grooves 45 of the cams 41, the proper movements are imparted thru the rods 46 connecting with the rocker arms 47 keyed to the release slide operating shafts 27.

Sticker hoppers 48A are placed on each side of the machine and are each formed by a pair of channels 48 and a pair of angles 49 both having their flanges pointing in. Sticker placing means primarily consist of four plungers 58 two on each side of the machine with one on each end of a sticker 48B. A guide bearing 50 secured to the bottom end of the hopper channels 48 forms an inner support for the plunger 58, while a similar bearing 51 supports the outer end. Barrel cams as 52 are mounted on the head and tail shafts 23 and 23A respectively and impart the proper movements to the plungers 58 by means of the grooves 53 cut in their periphery. Movement is transferred to the levers 54 by the rollers 55 working in the grooves 53. The lower end of the levers 54 are connected by the links 56 to the sliding nuts 57 located on the plunger bars 58 by the collars 59 and 60. The end of the plunger bars 58 are adjustable with relation to the hopper 48A by this arrangement. The stroke of the plunger bars 58 is regulated by shifting the fulcrum point of the levers 54. A sliding nut 61 is positioned in the slotted end of the lever 54 by means of the adjusting screw 62. The nut 61 carries a pivot bolt 63 about which it may turn, the bolt 63 being slidable into position in a slot 64 in a pivot plate 65 and clamped by the nut 66. The pivot plates 65 which also serve the pivot bolts 38 and 43, are secured to the two channels 67 which also serve to tie the channels 3, 4, 5, and 6, together and which carry the two angles 68 which support the work floor 11 adjacent the machine. The plunger bar 58 takes one sticker 48B out of the sticker hopper 48A by means of a hinged trigger 69 held in position by the spring 70 which also permits it to yield as the plunger 58 is turned under the stickers 48B in the hopper 48A at the end of a working cycle. A sliding spline 71 adjustable along the plunger 58 by means of the adjusting screw 72 takes out the second sticker 48B. The stickers 48B just before they reach their correct position push by the latch 73 which is immediately returned to position by the spring 74, thus preventing the stickers 48B from returning as the plunger 58 slides out from under them.

By means of the adjustment described the stickers 48B can be placed where wanted for any length of veneers. Another method illustrated in Fig. 7, has a plunger as 58 with a plain scarfed end as 58B which is long enough to carry two stickers as 48B. In this instance one sticker 48B is taken from each of two hoppers as 48A placed side by side instead of two stickers 48B out of one hopper. The sliding collar adjustment and the adjustable fulcrum point for the lever are the only ones needed with this arrangement. In using this arrangement the both stickers 48B are carried out to the far position where the inner sticker 48B is held from coming back with the returning plunger 58 which places the outer sticker 48B on the return stroke. If only a few lengths of veneers were to be handled separate non-adjustable bars 58 could be used—one for each length.

The lowering means consist of a series of oppositely placed chains 75 running over the sprockets 76A keyed to the head and tail sprocket shafts 23 and 23A and around the skids 76 depending from the above shafts. These chains 75 are movable on the shafts 23 and 23A so that their centerlines are opposite any place it is desired to place the stickers 48B. The chains 75 have spaced on them the lugs 77 pivotable on the pins 78 in such a manner that on a downward movement of the chain 75 the upper end of these lugs 77 will fall away from the chain 75 but will yield upwardly toward the chain 75 when they strike any obstruction from below on their downward travel. On the side adjacent the hoppers 12A the sides of the skids 76 extend beyond the lug links and carry the guide strips 79 which confine the side movements of the stickers 48B to close limits. End movement of the stickers 48B is gauged by the guide lip 58A of the plunger 58 and by the chain 75 when once positioned on the lugs 77. The lugs 77 are spaced so that one comes into the proper position at the proper time during each working cycle.

I have shown the kiln loads built on truck jack frames 82 with chains 83 to carry the empty frames 82 under the machine and the loads out. Any method that would work in under the existing conditions could be adopted. The veneers are taken off the stock table 90 or they are delivered within reach of the person or persons who keep the hoppers full in any suitable manner. The hoppers 12A are deep so that a whole load may be stored up during the time the full load is being removed and an empty jack frame 82 placed. This is a decided advantage over any one hopper arrangement.

With power applied thru any suitable agency to the head sprocket shaft 23 as thru the sprocket 80 and stock in the hoppers 12A the machine is ready for operation. The movements of the various main elements are timed to come into operation at the proper time in the working cycle. With the ram slides 28 receded and the release slides 29 out the lug 77 comes into position, and as it does the plungers 58 move outwardly taking one sticker 48B out of the hopper 48A with the trigger 69 and a second with the spline 71. As the stickers 48B pass by the latches 73 the latter are returned to place by the springs 74 and the stickers 48B prevented from returning with the plunger 58 as it pulls from under them and lets them fall on the lugs 77. Immediately the stickers 48B are in position on the lugs 77 the release slides 29 recede and let the packet 81 formed by the ram slides 28, which moved out following the outward movement of the release slides 29, drop out of the hoppers 12A onto the stickers 48B. The guide strips 79 keep the stickers 48B with their load of packets 81 in place as they travel down till the first course comes to rest on the jack frame 82 and the lug 77 continues around the skid 76. The second course stickers 48B come to rest on the first course packets 81 and the lugs 77 yield and continue around the skid 76. The third and fourth courses together with any desired number of courses come to rest in their respective order. When a load is built to the desired height the machine is stopped and by moving the lever 84 keyed to the rocker shaft 85 on which are secured the rocker arms 86 connected by the links 87 to the skids 76 the bottom of the skids 76 are moved back clear of the load and may be held in that or the working position by a latch 88 on the lever 84 by engaging with the notched quadrant 89.

While I am aware that many of the elements of my stacker may be found in other machines still in view of the prior art I claim the novel combination of these elements that go to make up the basic idea of the machine described together with certain details of construction.

I claim:

1. A machine for building loads of veneers and the like, comprising: a base; a series of stock hoppers suspended therefrom and adaptable to receive stock at their upper end; means adjacent to their lower end operable to discharge the stock simultaneously from the several hoppers in predetermined quantities; means whereby stickers are placeable where wanted to receive the discharged stock; two spaced drive shafts carried by the base; a series of lowering means depending from the drive shafts in operable relation whereby the stickers and imposed stock are positioned in the load being built.

2. A machine for building loads of veneers and the like, comprising: a base; a series of stock hoppers suspended therefrom; sticker placing means; means adaptable to eject a predetermined number of veneers simultaneously from each hopper onto stickers placed

by the sticker placing means; two series of operable lowering means in operable relation whereby the stickers and imposed veneers are positioned in the load being built.

3. A machine for building loads of veneers and the like, comprising: a base; a series of stock hoppers suspended therefrom; sticker placing means; means adaptable to eject a packet of veneers of predetermined thickness simultaneously from each hopper onto stickers placed by the sticker placing means; two series of operable lowering means in operable relation whereby the stickers and imposed packets are positioned in the load being built.

4. A machine for building loads of veneers and the like, comprising: a base; a series of adjustable stock hoppers suspended therefrom and adaptable to receive stock at their upper end; means adjacent to their lower end operable to discharge the stock simultaneously from the several hoppers in predetermined quantities; means whereby stickers are placeable where wanted to receive the discharged stock; two spaced drive shafts carried by the base; a series of lowering means depending from the drive shafts in operable relation whereby the stickers and imposed stock are positioned in the load being built.

5. A machine for building loads of veneers and the like, comprising: a base; a series of adjustable stock hoppers suspended therefrom; adjustable sticker placing means; means adaptable to feed stock out of the hoppers in predetermined quantities onto stickers placed by the sticker placing means; two series of operable lowering means in operable relation whereby the stickers and imposed stock are positioned in the load being built.

6. A machine for building loads of veneers and the like, comprising: a base which includes end girts and a number of side girts one of which is in adjustable relation to its opposite; members spaced on the adjustable girt and its opposite so as to form a series of stock hoppers; sticker placing means adjustable to hopper changes; means adaptable to feed stock out of the hoppers in predetermined quantities onto the stickers placed by the sticker placing means; two series of operable lowering means in operable relation whereby the stickers and imposed stock are positioned in the load being built.

7. A machine for building loads of veneers and the like, comprising: a base; a series of adjustable stock hoppers suspended therefrom; adjustable sticker placing means; means adaptable to feed stock out of the hoppers in predetermined quantities onto stickers placed by the sticker placing means; lowering means whereby the stickers and imposed stock are positioned in the load being built comprising two driven shafts carried by the base in spaced relation, drive sprockets keyed to the shafts, chains driven by the sprockets around skids depending from the shafts, said skids being adjustable along their supporting shaft and into operable relation to those of the opposite series, sticker carrying lugs spaced on the chains and pivotable thereon in such a manner as to permit their upper end to fall away a limited distance from the chain when the same is travelling downward yet operable to yield upwardly toward the chain when striking any obstruction from beneath.

8. A machine for building loads of veneers and the like, comprising: a base; a series of adjustable stock hoppers suspended therefrom; sticker hoppers spaced at the stock hopper ends; sticker placing means having their ends adjacent to the sticker hoppers adjustable thereto and with the stock hoppers whereby stickers may be placed where desired under the stock hoppers; means adaptable to feed stock out of the hoppers in predetermined quantities onto the stickers placed by the sticker placing means; two series of operable lowering means in operable relation whereby the stickers and imposed stock are positioned in the load being built.

9. A machine for building loads of veneers and the like, comprising: a base; a series of adjustable stock hoppers suspended therefrom; sticker hoppers placed adjacent to the stock hopper ends; sticker placing means comprising variable stroke plungers spaced adjacent to the ends of the sticker hoppers, said plungers having parts adjacent to the hoppers adaptable to take stickers out of the hoppers and place them in predetermined positions under the stock hoppers; means adaptable to feed stock out of the hoppers in predetermined quantities onto the stickers; two series of operable lowering means in operable relation whereby the stickers and imposed stock are positioned in the load being built.

10. A machine for building loads of veneers and the like, comprising: a base; a series of adjustable stock hoppers suspended therefrom; sticker hoppers placed adjacent to the stock hopper ends; sticker placing means comprising variable stroke plungers spaced adjacent to the ends of the sticker hoppers, said plungers having parts adjacent to the hoppers, adaptable to take stickers out of the hoppers and place them in predetermined positions under the stock hoppers, comprising a forward shoulder and an adjustable rear shoulder; means adaptable to feed stock out of the hoppers in predetermined quantities onto the stickers placed by the sticker placing means; two series of operable lowering means in operable relation whereby the stickers and imposed stock are positioned in the load being built.

11. A machine for building loads of veneers and the like, including a base; a series

of stock hoppers suspended therefrom and adaptable to receive stock at their upper end; means adjacent their lower end operable to discharge the stock simultaneously from the several hoppers in predetermined quantities; sticker hoppers placed adjacent the stock hopper ends; means whereby stickers are placeable where wanted under the hoppers to receive the discharged stock, and oppositely disposed endless chains having spaced lugs thereon for lowering the stickers and imposed stock to their position in the load being built.

12. A machine for building the courses in a load of veneers to be dried, including a base; a series of stock hoppers suspended therefrom and adaptable to receive stock at their upper end; means adjacent their lower end operable to eject a predetermined number of veneers simultaneously from each hopper; sticker hoppers placed adjacent the stock hopper ends; and means whereby the stickers are placeable where wanted under the hoppers to receive the discharged stock.

13. A machine for building the courses in a load of veneers to be dried, including a base; a series of stock hoppers suspended therefrom and adaptable to receive stock at their upper end; means adjacent their lower end operable to eject a packet of veneers simultaneously from each hopper; sticker hoppers placed adjacent the stock hopper ends, and means whereby the stickers are placeable where wanted under the hoppers to receive the discharged stock.

Signed at Marshfield, in the county of Coos and State of Oregon, this 3rd day of April, 1929.

EMMET G. STACK.