

March 21, 1944.

T. R. ROBINSON

2,344,923

LOADING AND UNLOADING DEVICE

Filed Sept. 2, 1939

5 Sheets-Sheet 1

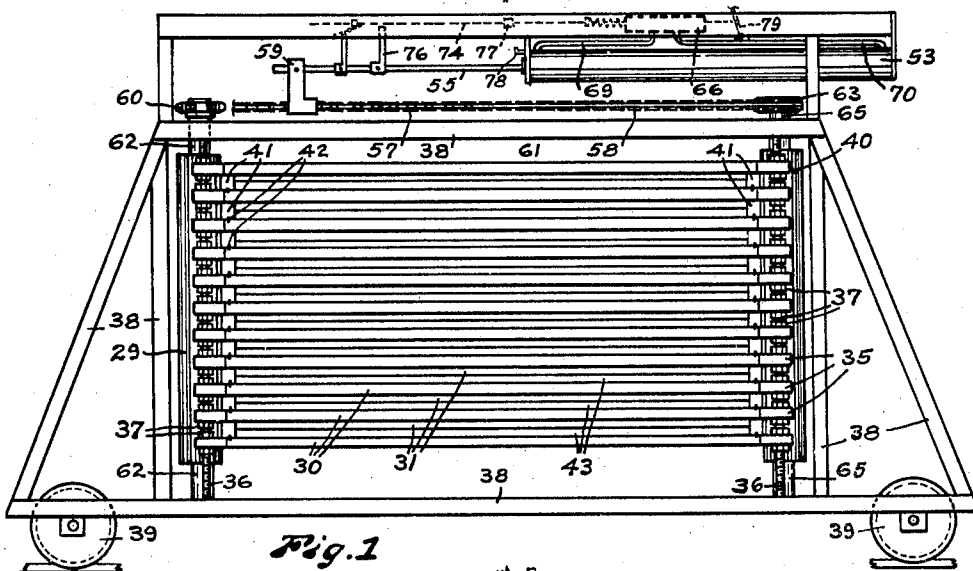


Fig. 1

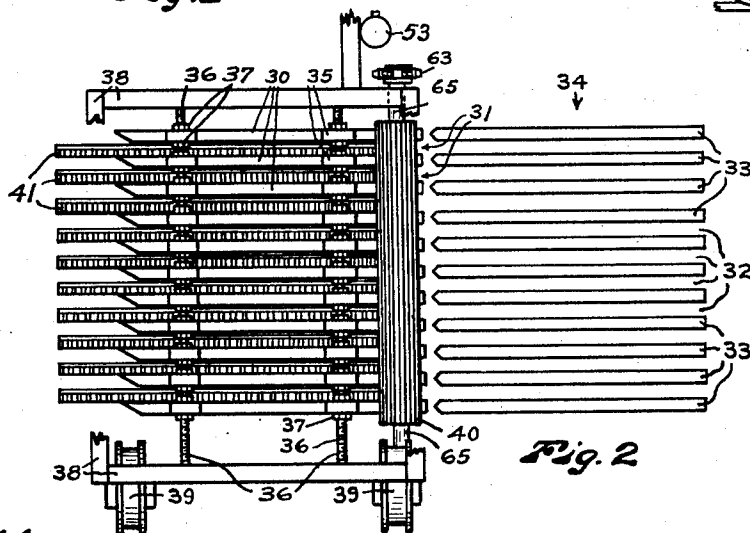


Fig. 2

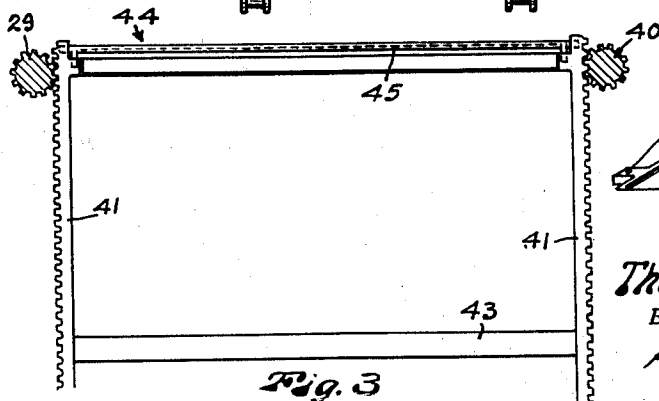


Fig. 3

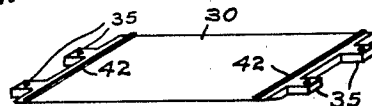


Fig. 4

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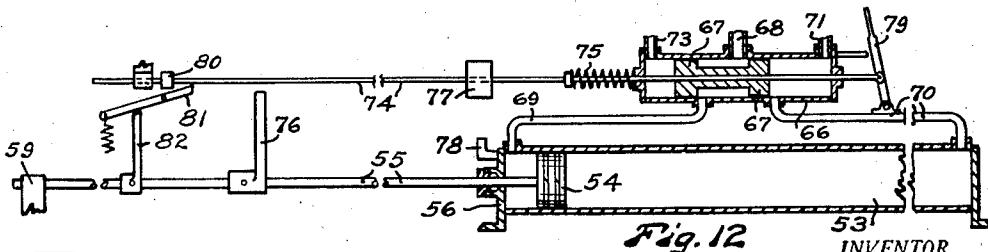
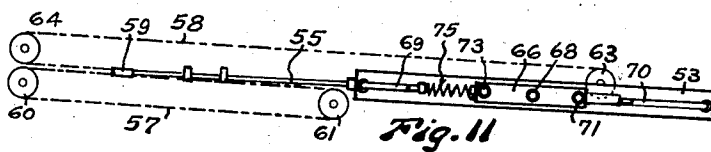
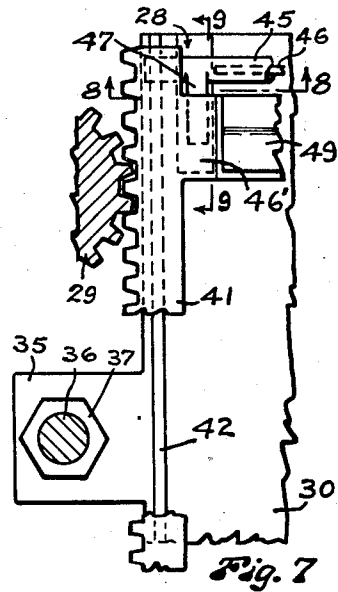
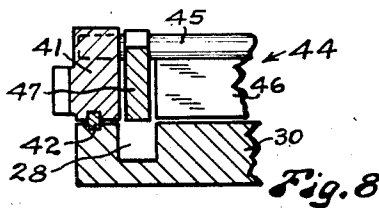
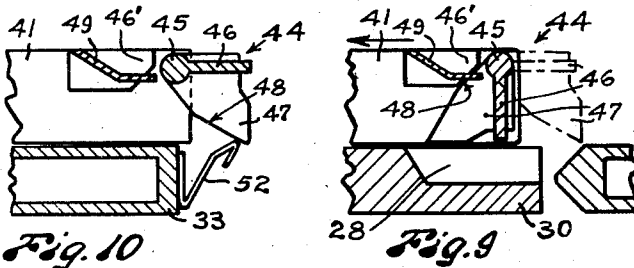
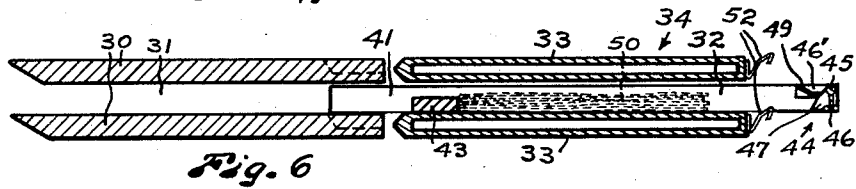
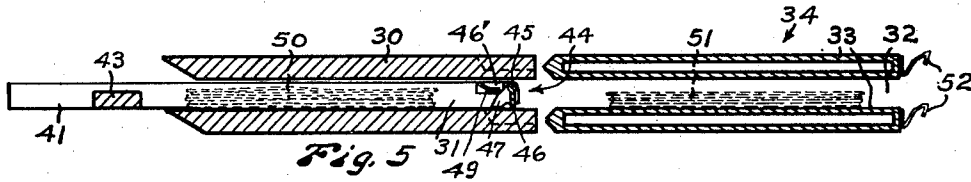
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5 Sheets-Sheet 2



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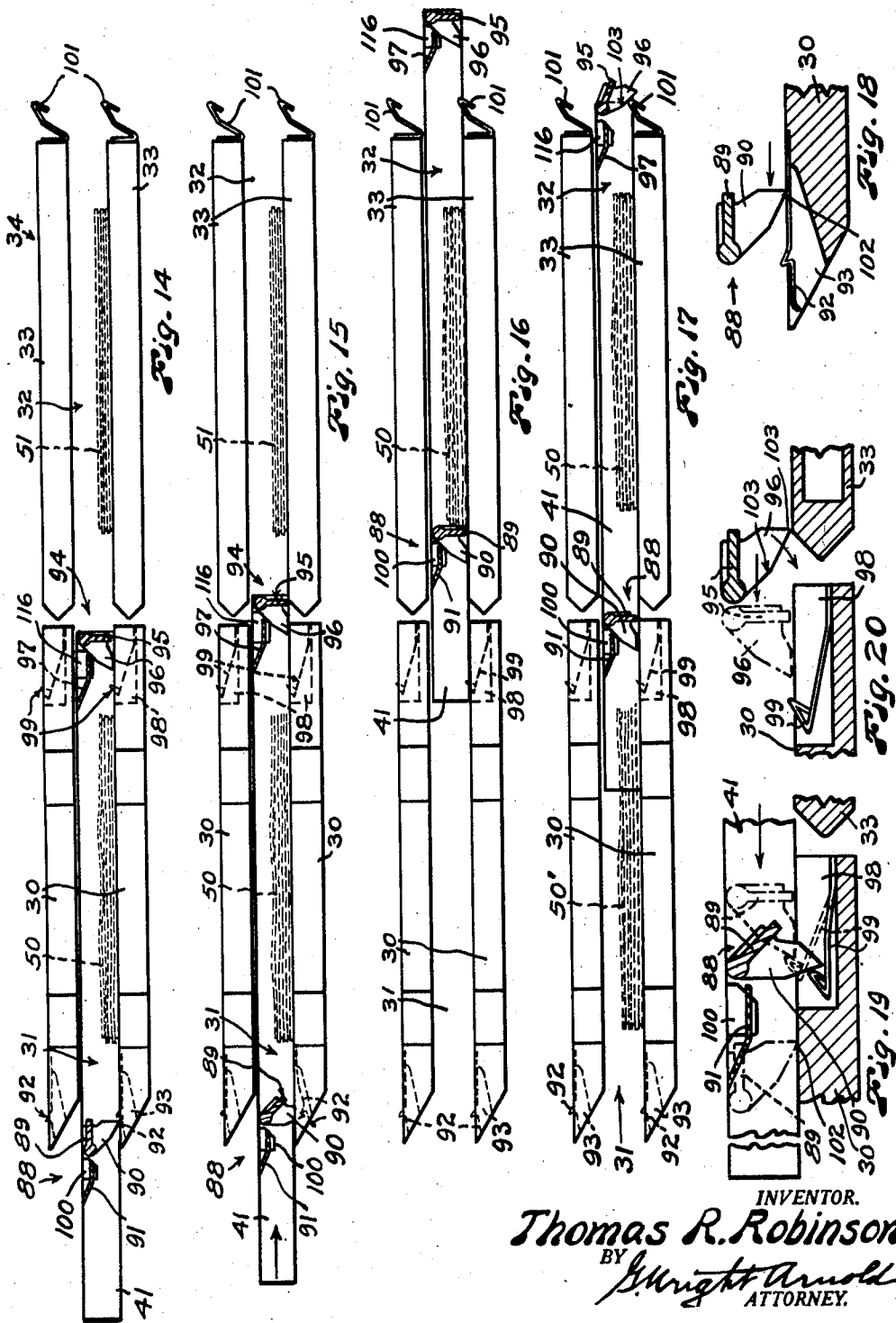
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LOADING AND UNLOADING DEVICE

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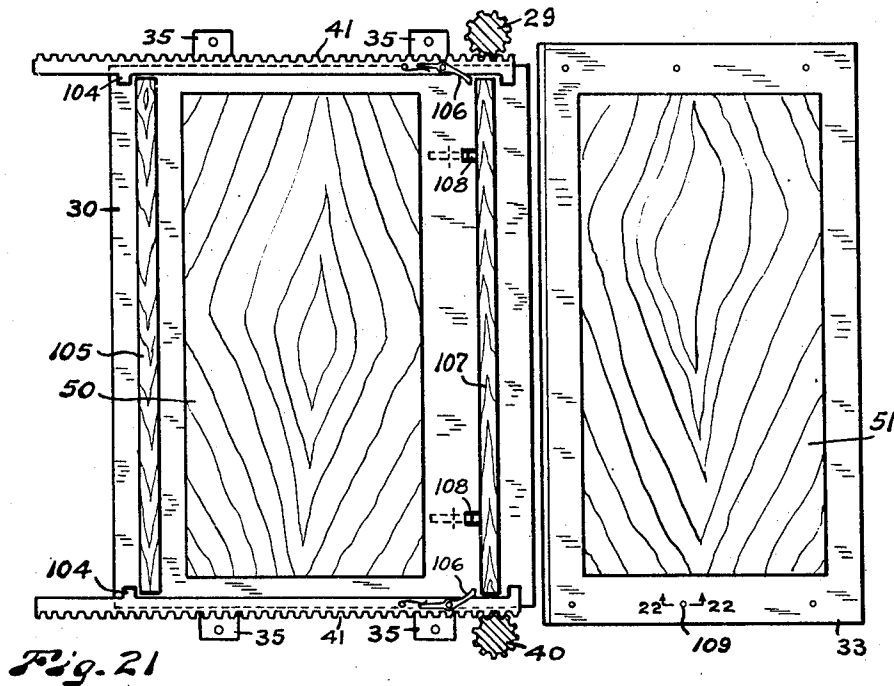


Fig. 21

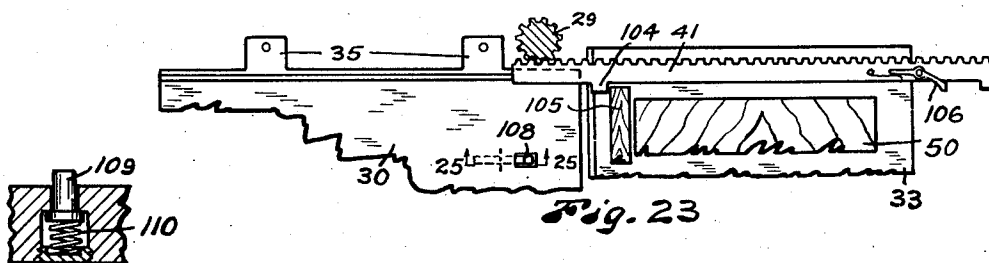


Fig. 22

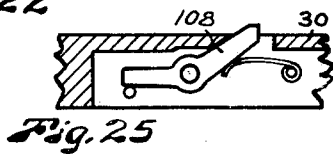


Fig. 25

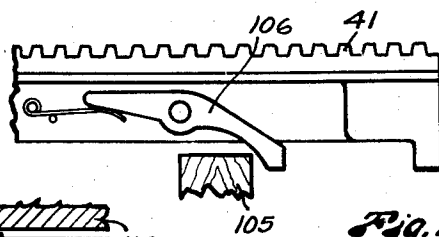


Fig. 24

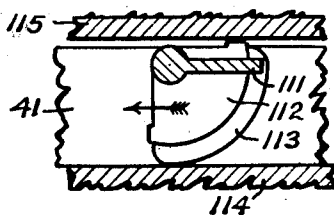


Fig. 26

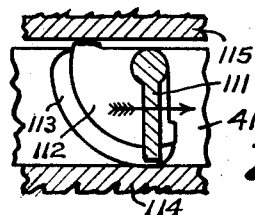


Fig. 27

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5 Sheets-Sheet 5

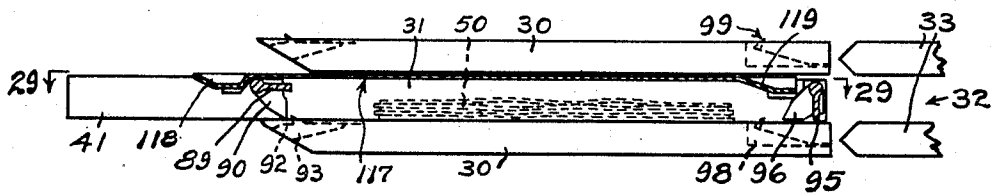


Fig. 28

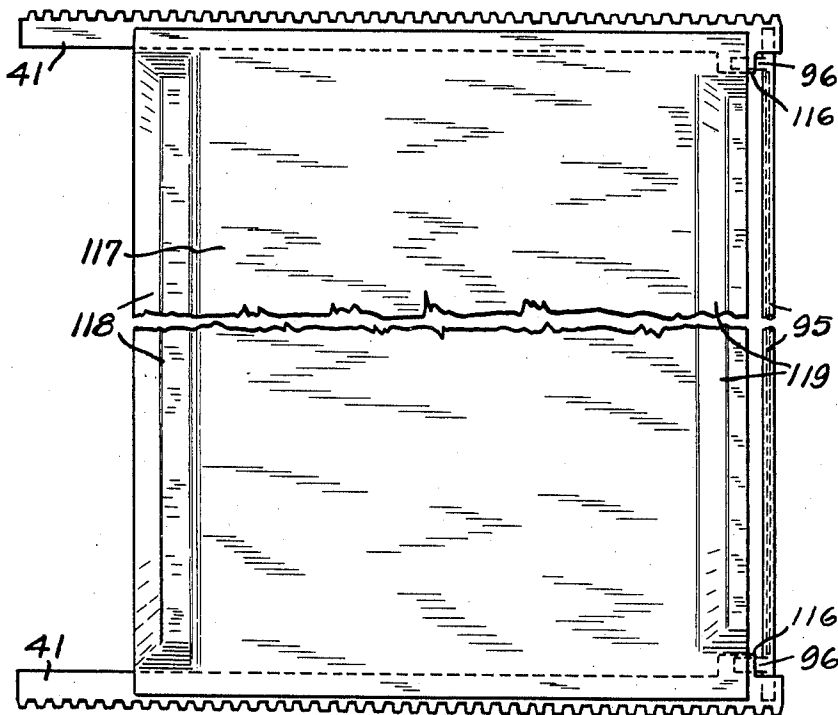


Fig. 29

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UNITED STATES PATENT OFFICE

2,344,923

LOADING AND UNLOADING DEVICE

Thomas R. Robinson, Everett, Wash.

Application September 2, 1939, Serial No. 293,244

8 Claims. (Cl. 214—24)

This invention relates to a loading and unloading device particularly useful in the loading and unloading of a veneer hot plate press. It is to be expressly understood that in setting forth such particular utility of my invention I am not to be limited to any such specific field of utility and the invention is applicable to other fields where like problems exist in whole or in part.

The use of hot plate presses in the veneer or plywood art is becoming more and more common in view of the greater water resistance of the hot process glues over the cold process glues. Also less water may be used in hot process glues, and therefore the panels delivered from the hot presses contain less moisture content than those delivered from cold presses. This reduction of moisture content in the panels is desirable, as panels often check or crack when dried to reduce the moisture content. These, among other reasons, have been effective in increasing the use of hot plate presses in the veneer and plywood art.

Despite such increasing use of hot plate presses, no commercially satisfactory method has been heretofore devised to load and unload such hot plate presses. The hot plate presses comprise a plurality of heated platens movable away from each other to provide an open position. In this open position uncured panels may be inserted into the press between heated platens. Thereafter the platens are moved toward each other, providing heat and pressure on the panels to cure the same. Thereafter the platens are moved away from each other to provide the open position in which cured panels are removed or unloaded from the press and uncured panels are inserted between platens or loaded into the press.

The uncured panels, which are loaded into the press or positioned between platens thereof, generally comprise a plurality of odd numbered plies, as 3, 5, 7, etc. In three ply panels there are two face members and the intermediate member, or the cross banding stock. The face members generally comprise a single sheet and the cross banding stock generally comprises a plurality of pieces in abutting edge to edge relation. Glue material lies between adjacent faces of the face members and the cross banding stock. Due to the fact that the stock in the face members, as well as in the cross banding stock, has generally been dried, it is common for the stock to be wrinkled and warped. These wrinkles and the uneven condition of the stock are, of course, removed by the pressure in the hot plate press.

The cured panel, which is to be unloaded from

the press, is often adhered to a platen. This adherence is caused by one or more of the following: (1) Overflowed glue which is squeezed or pressed out from the panels by the pressure between platens; (2) resins from the wood in the panels; and (3) suction or vacuum between a panel and a platen due to the pressure of the platens causing the panel to closely contact a platen surface.

Due to the fact that the platens are hot, and in the interest of most economical utilization of equipment and labor, it is obviously undesirable to load or unload hot plate presses by hand.

An attempt has been made to provide a mechanical loading and unloading device in which the incoming or uncured panel urges the cured panel out of the hot plate press. However, in view of the loose character of the incoming uncured panel, and the fact that the cured panels are often adhered to the platens, such mechanical loaders and unloaders are not satisfactory. For example, the incoming uncured panel may be disarranged by contact with a cured panel, even though the uncured panel is not adhered to a platen; (2) in the event of adherence of a cured panel to a platen, the disarrangement of the uncured panel may be such as to ruin such panel; (3) the looseness of the uncured panels is such that if they are employed to push out the cured panels, the uncured panels will not be symmetrically and centrally positioned in the press, thus unbalancing the press and causing damage thereto. Despite these objections and others, heretofore the only mechanical loaders and unloaders for veneer presses have employed means wherein the uncured panels urge the cured panels out of the press.

It is an object of this invention to provide independent panel contacting means, one of which urges the cured panel out of the press and the other of which urges the uncured panel into the press. It is a further object of the invention to provide an unloader means which will urge the cured panel out of the press at the same time an uncured panel is loaded into the press, and which means may be retracted over but not contact the uncured panel and thus disarrange the same.

It is a further object of the invention to provide loader and unloader means with removable cross members so that the cross member which unloads the cured panel from the press will be discharged with the cured panel and the cross member which urges the uncured panel into the press will be used in the next cycle of operation to remove the cured panel from the press.

It is a further object of the invention to provide a loader member with a plurality of spaced apart openings therein, which openings coincide with the openings between platens in the hot plate press when opened.

It is a further object of the invention to provide means to move a plurality of uncured panels from the loader member into the hot plate press during one stroke of operation and during the same stroke to remove the cured panels from the hot plate press.

It is a further object of the invention to provide mechanism so that uncured panels may be inserted into the spaces or chambers of the loader member while the device is operating.

It is a further object of the invention to provide a practical, economical and efficient device which will fit in with present plant equipment and provide for rapid loading and unloading of hot plate presses. The rapid loading and unloading of hot plate presses not only economically utilizes the labor and machinery involved, but provides for a more economic utilization of the glue—this for the reason that there is less drying out of the glue by reason of rapid handling and therefore less glue may be used to obtain the same results.

The above mentioned general objects of my invention, together with others inherent in the same, are attained by the mechanisms illustrated in the following drawings, the same being preferred exemplary forms of embodiment of my invention, throughout which drawings like reference numerals indicate like parts:

Figure 1 is an end elevation of a loader and unloader device embodying this invention;

Fig. 2 is a side elevation of the device shown in Fig. 1, with parts broken away, and shown in operative position adjacent spaced apart platens of a hot plate press;

Fig. 3 is a detached plan view of one set of loader and unloader bars of this invention and operative rack and pinion means therefor;

Fig. 4 is a detached perspective view, on a smaller scale, of one of the deck members over which the rack members of Fig. 3 are operated;

Fig. 5 is a sectional view showing two spaced apart deck members of the loader and unloader device in operative position relative to two spaced apart platens of a hot plate press with the unloader bars in one operative position and with panels shown by dot and dash lines;

Fig. 6 is a view similar to Fig. 5 showing another operative position of said parts in Fig. 5;

Fig. 7 is a fragmentary plan view on a larger scale showing a portion of the rack, pinion and unloader bars of Fig. 3 (particularly the upper left hand corner thereof), in operative position relative to the deck member of Fig. 4;

Fig. 8 is a view partly in section and partly in elevation taken substantially on broken line 8—8 of Fig. 7;

Fig. 9 is a fragmentary view partly in section and partly in elevation taken substantially on broken line 9—9 of Fig. 7, showing a portion of one platen of a hot plate press and one deck member of a loader and unloader device and showing by dot and dash lines one position of the dog and unloader bar and by full lines a second position thereof into which the same will fall by gravity;

Fig. 10 is a fragmentary view similar to Fig. 9 but showing the outer end of a press platen and

the position the dog and unloader bar will assume on the return stroke;

Fig. 11 is a somewhat diagrammatic detached view showing a hydraulic and link belt means for operating the pinion means and in turn the racks operatively connected therewith (the control means being broken away as they are shown on larger scale in Fig. 12);

Fig. 12 is a somewhat diagrammatic view, on a larger scale, illustrating a control means for the hydraulic means of Fig. 11;

Fig. 13 is a somewhat diagrammatic view showing an alternative type of drive for the pinion and rack means where electric means replace the hydraulic means of Fig. 11;

Fig. 14 is a view in elevation and similar to Fig. 5, but on a larger scale, showing a modified form of the invention where an oscillating bar is used for loading as well as unloading and showing one operative position of the loading and unloading bar means and further showing an uncured panel as well as a cured panel by dot and dash lines;

Fig. 15 is a view similar to Fig. 14 showing the parts in a second operative position;

Fig. 16 is a view similar to Fig. 14 and showing a still further operative position of the parts;

Fig. 17 is a view similar to Fig. 14 and showing a still further operative position of the parts;

Fig. 18 is a fragmentary view partly in section and partly in elevation of the in-feed end of the loader illustrating the position of the dog and loading bar on the return stroke;

Fig. 19 is a view similar to Fig. 18 but at the out-feed end of the loader, showing one position by dot and dash lines, a second position by full lines, and a third position by dot and dash lines illustrating the operation of the dog and loading bar on the return stroke;

Fig. 20 is a view similar to Fig. 19, showing one position by dot and dash lines and a second position by full lines illustrating the operation of the dog and unloading bar on the return stroke;

Fig. 21 is a plan view with parts in section and parts broken away of a still further modified form of the invention showing the hot plate press with a panel therein, the loader with a panel therein, and the loader and unloader bars and their operative mechanism;

Fig. 22 is a sectional view, on a larger scale, taken substantially on broken line 22—22 of Fig. 21 showing a guide means;

Fig. 23 is a plan view with parts broken away of the parts shown in Fig. 21 and with the loader and unloader means shown in a second operative position;

Fig. 24 is a fragmentary plan view, on a larger scale, illustrating the bar catch mechanism;

Fig. 25 is a sectional view taken substantially on broken line 25—25 of Fig. 23;

Fig. 26 is a fragmentary sectional view similar to Figs. 18 to 20 of a modified form of the invention and illustrating friction means for operating the oscillating dogs and loader or unloader bar connected therewith;

Fig. 27 is a view similar to Fig. 26 except showing a second operative position of the dog and loader or unloader bar when the direction of travel is reversed;

Fig. 28 is a view similar to Fig. 14 with parts broken away showing a modified form of the invention—particularly the deflector means; and

Fig. 29 is a plan view taken substantially on line 29—29 of Fig. 28.

Referring particularly to Figs. 1 to 4, incl., the

loader and unloader device comprises a plurality of deck members 30 (see detached in Fig. 4), which are secured in spaced relation to provide a plurality of chambers 31 in registration with the chambers 32 between the platens 33 in the hot plate press, generally referred to as 34. To provide for adjustment so the loader and unloader device may be used with a plurality of kinds of hot plate presses, the deck members 30 are provided with lugs 35, which lugs are drilled to receive therethrough threaded members 36. Nuts 37 threadably engage the members 36 and the same may be adjusted to provide the chambers 31 in registration with the chambers 32 of the hot plate press 34 when the same is in open position.

As the hot plate press 34 is no part of the invention, the same is only shown in part to illustrate the operative relation thereto of the loader and unloader device of this invention. It is understood, however, that the hot plate press 34 is provided with a plurality of platens 33 which have operative connections to a source of heat, which is generally steam. The platens are provided with means (not shown) to move the platens away from each other to provide the open position, shown in Fig. 2, so that plywood panels may be inserted in the chambers 32 between the platens 33. Then the platens are moved relatively toward each other and the panels are cured by the application thereto of heat and pressure from the platens.

The members 36 are supported in position by frame members 38. Wheels 39 may be employed to provide desirable mobility to the loading and unloading device.

Pinions 29 and 40 are provided at opposite sides of the loader and unloader device. The pinions 29 and 40 may be provided with teeth throughout their length, as shown in Fig. 2, so the teeth of the racks 41 will always engage therewith despite adjustment of the nuts 37. The pinions 29 and 40 are driven in opposite directions a predetermined number of revolutions, stopped, and then driven in reverse directions a predetermined number of revolutions, by means hereinafter described.

The rack members 41, which serve as carriage members, are supported and guided by guides 42 on the deck members 30 (see Figs. 3, 4, 7 and 8) and reciprocate in the chambers 31 of the loader and chambers 32 of the press. The retracted position of the rack members is shown in Fig. 5 and the advanced position in Fig. 6.

The loader bar 43 connects the racks 41. In the form of the invention shown in Figs. 1 to 10, loader bar 43 is fixedly secured to the racks 41. The unloader bar means referred to generally as 44 is mounted by the racks 41 and is provided with an oscillating movement.

Referring more particularly to Figs. 3, 7 and 8, the unloader bar means 44 comprises a transverse unloader bar 46 supported by pivot means 45 to the racks 41. The unloader bar 46, on its forward or unloading stroke, is in the vertical position shown in Figs. 5, 6 and 9 and on its return stroke is in the horizontal position shown in Fig. 10. The dogs 47 insure that on its return stroke the unloader bar 46 will be in a horizontal position. On the return stroke the edges 48 of the dogs 47 ride on the surface of the platens 33 and insure such horizontal position on the return stroke. The deflector 49 is used to prevent irregular or warped portions of a panel 50 (as in Fig. 6) from being engaged by the unloader member 44 during the return stroke. The dogs 47 are

positioned at the ends of the bars 46 and are therefore clear of the central portion where the panels 50 in the loader and panels 51 in the press are located.

As the pinions 29 and 40 are rotated in opposite directions, two racks 41 are projected into each of the chambers 31 and 32 from the position shown in Fig. 5 to the position shown in Fig. 6 and then, upon reversal, the racks are returned to the position in Fig. 5. This constitutes one cycle of operation. With the parts in the position shown in Fig. 5, an uncured panel 50 is inserted into the loader mechanism and ahead of the loader bar 43. The loader bar 43 extends the full width of a chamber 31. As the racks 41 move forward, each loader bar 43 engages with an uncured panel 50 and moves the same out of the loader into a chamber 32 of the press as shown in Fig. 6. The extent of the forward stroke of the racks 41 and the loader bar 43 is adjustable (hereafter described in connection with Fig. 12), so panels of varying sizes may be loaded into a press and will be centrally positioned therein.

On the forward stroke of the racks 41, the surfaces 48 of dogs 47 engage stops 46' and bar 46 serves to unload a panel from chamber 32 in the press by contact of the unloader bar 46 with a panel, as cured panel 51. Because of the shape of the spring clips 52, the dogs 47 will depress the same on their forward stroke but the position of the dogs will not be changed. On the return stroke, the edges 48 contact with spring clips 52 and oscillate the dogs 47 from the position shown in Fig. 6 to the position shown in Fig. 10, and thereafter the edges 48 will ride on the surfaces of the platens 33 and the unloader bars 46 will be maintained in a horizontal position where they will pass over and not disturb the uncured panels 50 which have been loaded into the chambers 32 of the hot plate press.

As the racks 41 near the end of their return stroke, the dogs 47 will pass off the ends of platens 33. The weight of the unloader bars 46 is such that by gravity they will move from the dot and dash line position to the full line position of Fig. 9. The dogs 47 will enter recesses 28 in the deck members 30 to permit such turning of the unloader bars 46. The unloader bars 46 are then in the position shown in Fig. 5 and ready for their forward or unloading stroke.

In Figs. 1, 11 and 12 one type of drive means for reciprocating the racks 41 and parts connected therewith is shown. A fluid pressure cylinder 53 is provided with a sliding piston 54 therein. The piston rod 55 is connected with the piston 54 and is slidable through a packing member in an end wall 56 in the usual manner. The said drive means are supported by the frame members 38. The piston rod 55 is connected to driving chains 57 and 58 connected together as by buckle 59. The chain 57 is reeved around sprockets 60 and 61. The sprocket 60 is fixedly mounted on shaft 62 which shaft also mounts pinion 29 (see Figs. 1 and 11). The sprocket 61 is an idle sprocket. Chain 58 is reeved around sprockets 63 and 64. The sprocket 63 is fixedly mounted on shaft 65 which shaft also mounts pinion 40. As the piston rod 55 is moved in one direction, the sprocket 60, shaft 62 and pinion 29 will rotate in one direction and the sprocket 63, shaft 65 and pinion 40 will rotate in the opposite direction causing the racks 41 to be pro-

jected, and upon reverse movement of the rod 55 the racks 41 will be retracted.

The control means for operating piston 54 may be the usual piston valve which is illustrated in Fig. 12. This mechanism comprises a chamber 66 and a slidable piston 67 therein arranged for movement into three positions. In one position (shown in Fig. 12) fluid under pressure (preferably hydraulic for smoothness of operation) from inlet conduit 68 connects with conduit 69 leading to one side of the piston 54 and the exhaust from cylinder 53 is through conduit 70 and thence exhaust conduit 71. In the second position, fluid from inlet conduit 68 connects with conduit 70 leading to the opposite side of the piston 54 and the exhaust from cylinder 53 is through conduit 69 and thence exhaust conduit 73. Rod 74 connects with the piston 67 and is provided with the usual sliding packing connection. Spring 75 serves to urge the rod 74 and parts connected therewith into the position shown in Fig. 12. The third position is the stop position.

Assuming the parts are in the position shown in Fig. 12, fluid under pressure will pass through inlet conduit 68, thence conduit 69 and against piston 54 urging the piston 54, rod 55 and parts connected therewith toward the right (as shown in Fig. 12). At the end of the desired travel of such piston 54, stop 76, carried by rod 55, will engage with stop 77 carried by rod 74, and move the rod 74 and piston 67 to the right (as shown in Fig. 12). The stop 76 will engage fixed stop 78 at the time the piston closes both conduits 69 and 70 from inlet conduit 68, and the parts thus assume the said third or stop position which is the end of a cycle. At this stop position the racks 41 are retracted and in the position shown in Fig. 5 of the drawings.

To start another cycle of operation, the operator pulls lever 79 to the right. This moves piston 67 to the right and also rod 74. The spring 75 is compressed and stop 80 carried by rod 74 is moved past spring loaded catch 81. Thereupon spring loaded catch 81 holds the rod 74 in this position. In such position, fluid under pressure flows from inlet conduit 68, through conduit 70 and against piston 54. At the same time, the exhaust from the other side of piston 54 connects through conduit 69 to exhaust conduit 73. The piston 54 and rod 55 move to the left until adjustable stop 82 carried by rod 55 engages with spring loaded catch 81, releasing stop 80 therefrom and permitting spring 75 to return rod 74 to the position shown in Fig. 12.

When the rod 55 is moving to the left in Fig. 12, the racks 41 are making their forward stroke and the extent of such forward stroke may be adjusted by sliding adjustable stop 82 on the rod 55.

After the rod 74 has been returned to the position shown in Fig. 12, the piston 54 will move to the right and the racks 41 connected therewith will be retracted until stop 76 engages stops 77 and 78 as previously described.

In Fig. 13, diagrammatically, is shown an alternative method of driving, the shafts 62 and 65. These shafts 62 and 65 are connected to the pinions 29 and 40, and the carriage means as racks 41 in the same manner as shown and described in the previous figures and in the interest of brevity are not further described or shown in this figure. The pinions 60' and 63' are connected with said shafts 62 and 65. Electric motor 83 is connected to a source of power (not shown) and drives speed reduction and control means 84 which is in turn connected to

shaft 85. Worms 86 and 87 are right and left hand threaded and mounted on shaft 85. The worms 86 and 87 mesh with pinions 60' and 63' respectively. By means well known in the art, the control means 84 provides a cycle of operation so that the shaft 85 is turned in one direction the desired number of revolutions and then reversed and turned in the other direction the desired number of revolutions.

In Figs. 14 to 20 incl., a modified form of the invention is shown where the loader bars as well as the unloader bars are provided with an oscillating movement similar to the oscillating movement of the unloader bar means 44 of Figs. 1 to 10, incl. The racks 41, driving means therefor, deck members 30, chambers 31, platens 33, and chambers 32 are the same as in the previous figures, and therefore similarly numbered. The primary purpose of providing oscillating loader as well as unloader means is to permit the loader and unloader device to be charged with uncured panels during movement of the racks 41 and means connected therewith.

The loader bar means, generally referred to as 88, each comprise a transverse loader bar 89 pivotally secured at its respective ends to the racks 41. Two dogs 90 (only one of which is shown), which are similar to the dogs 47 of the previous figures, are secured to the ends of loader bar 89. A deflector 91 similar to deflector 49 is provided so that panels 50 loaded into the loader during travelling movement of the loader bar 89 will not contact said loader bar 89. When the rack 41 is in its fully retracted position as shown in Fig. 14, the dogs 90 rest on and are supported by spring loaded catches 92. The spring loaded catches 92 are depressible in recesses 93 in the deck members 30.

The unloader bar means generally referred to as 94 are similar to the unloader bar means 44. The unloader bar means 94 each comprise a transverse unloader bar 95 pivotally secured between racks 41. Two dogs 96 (only one of which is shown) are secured to the ends of the bar 95. A deflector member 97 is similar to the deflector member 49 of the previous figures. The recess 98 in the deck member 30 is somewhat longer than the recess 38 so that spring loaded catches 99 may be provided ahead of the travel of the dogs 96 for purposes hereinafter described.

Assuming the parts are in the position shown in Fig. 14 of the drawings, as the racks 41 move forward and in the direction of the arrow to the position shown in Fig. 15, the dogs 90 will engage with the spring loaded catches 92 and commence to rotate, assuming the position shown in Fig. 15 of the drawings. As the movement of the racks 41 continues, the dogs 90 will be rotated until the loader bars 89 assume a vertical position. The turning movement of the dogs 90 is limited by stop means 100. After the dogs have turned until the loader bars 89 have assumed a vertical position, the loader bars will be in a position to engage with a panel 50 in a chamber 31. The panel 50 may have been inserted in the chamber 31 during the previous stroke of the loader bar means 88 as on its return stroke the loader bar 89 is in a horizontal position. Also the panel 50 may have been loaded in a chamber 31 at the end of a cycle when loader bar means 88 are at rest.

At the same time the unloader bar 95 at the forward end of the racks 41 has assumed the position shown in Fig. 14 of the drawings where the dog 96 rests against stop 116. The vertical

position of the unloader bar 95 was assumed by gravity similarly to the vertical position of the unloader bar 46 of the previous figures. Unloader bar 95 will engage with a cured panel 51 in the chamber 32 while the loader bar 89 engages with the uncured panel 50. Thus upon forward motion of the racks 41 and parts connected therewith, the cured panel 51 will be discharged and the uncured panel 50 will be loaded into the chamber 32 of the press. Such position is shown in Fig. 16 of the drawings where the racks 41 are at the end of their forward stroke and an uncured panel 50 has been inserted into a chamber 32 of the hot plate press. During the forward motion the dogs 90 and 96 respectively will depress spring loaded catches 99 and 101 respectively without effecting any change in the position of the dogs due to the angular direction of such spring loaded catches. Upon the return stroke the dogs 96 of the unloader bar means 94 will engage with spring clips 101, which are similar to spring clips 52 of the previous figures. The dogs 96 and unloader bar 95 will be oscillated upon further return movement of the racks 41 (see Fig. 17), so that on the return stroke the unloader bars will assume a horizontal position similar to the horizontal position assumed by the unloader bar 46 of the previous figures. The dogs 90 of the loader bar means 88 will engage with spring clips 99 on the return stroke (see Fig. 19), depressing the spring clip 99 from the dotted line position shown in Fig. 19 to the full line position shown therein. The dogs 90 and loader bars 89 connected therewith will be oscillated so that on the return stroke, after the dogs 90 have engaged spring loaded catches 99, the unloader bars 89 will be returned in a horizontal position. In this way uncured panels 50 may be loaded into the chambers 31 during the operation of the loader bar means 88. The deflector means 91 will prevent a panel 50 from being urged directly into the unloader bar means 88. On the return stroke the surfaces 102 and 103 of the dogs 90 and 96 respectively will ride on the deck members 30 and the platens 33 respectively maintaining the loader bars 89 and 95 in a horizontal position. The unloader bar 89 is maintained in a horizontal position on the return stroke for purposes described in connection with the unloader bar 46 of the previous figures.

On the return stroke the dog 90 will ride over the spring loaded catch 92 in view of the angular position of such spring catch, and the loader bar 89 will be maintained horizontal at the end of the stroke as shown in Fig. 14 of the drawings. On the return stroke as soon as the dog 96 is returned sufficiently so that it passes off a platen 33 by gravity the unloader bar 95 will rotate in the direction of the arrow as shown in Fig. 20 so that the dog 96 and unloader bar 95 will move from the full line position shown in Fig. 20 to the dot and dash position shown therein. After a complete cycle of operation and the parts have again assumed the position shown in Fig. 14, then upon the commencement of a new cycle of operation the parts will function as previously described.

In Figs. 21 to 24 incl. of the drawings, I have shown a still further modified form of the invention where detachable members are used for the loader and unloader bars. Pinions 29 and 40, the racks 41, lugs 35 on the deck members 30, parts connected therewith, uncured panel 50, and cured panel 51 are the same as such parts in

the previous figures and for that reason are given similar numbers.

Lugs 104 are carried by the racks 41 and project inwardly sufficiently to support a loading bar 105 but not sufficiently to engage with an uncured panel 50 in the chamber 31 of the loader. On the forward ends of the racks 41, spring loaded pawls 106 project inwardly sufficiently to support an unloading bar 107 but do not project inwardly sufficiently to engage with the cured panel 51. On the forward stroke of the racks 41, lugs 104 engage with the loading bar 105 which in turn engages an uncured panel 50. At the same time the spring loaded pawls 106 engage with an unloading bar 107 which in turn engages with a cured panel 51. On the forward stroke the loading bar 105 and unloading bar 107 first slide along a deck 30 and then along a platen 33. The movement is continued until the cured panel 51 is discharged from the press and the parts assume the position shown in Fig. 23 of the drawings. The unloader bar 107 was discharged with the cured panel 51 and the loading bar 105 was moved into a chamber 32 in the hot plate press as shown in said Fig. 23. Upon the return stroke (see particularly Fig. 24) the racks 41 and spring loaded pawls 106 carried thereby will be returned until the spring loaded pawls 106 contact the bar 105. Upon contact the spring loaded pawls 106 move the loading bar 105 therewith until the loading bar 105 engages with stops 108. Stops 108 project upwardly through the deck members 30 (see Fig. 25) and are spring loaded. The shape of these catches is such that on the forward stroke the bar 105 may pass thereover, but on the return stroke the bar 105 will be held thereby causing a release of the spring loaded pawls 106, and the spring loaded pawls will move back of the bar 105 and into the position shown in Fig. 21 of the drawings. At this time the loader bar 105 will now be in a position to function as an unloader bar and during the next cycle of operation will be the unloader bar 107. Thereupon a new loader bar 105 is manually inserted ahead of the lugs 104.

In view of the fact that in this form of the invention there are no cross ties between the racks 41, preferably I provide depressible guides 109 shown in plan in Fig. 21 and in section in Fig. 22. At all times when the press is open the springs 110 of the depressible guides 109 urge the guides 109 upwardly so they will guide the racks 41, but when the press is closed and the platens 33 move toward each other the guides 109 will be depressed.

The mode of operation of the structure shown in Figs. 21 to 24 incl. may be briefly reviewed as follows: The unloader bar 107 is in position by reason of operations in the previous cycle. The cured panel 51 is in a chamber 32 in the hot plate press. An uncured panel 50 is inserted in place in a chamber 31 in the loader, and a loader bar 105 is placed on a deck member 30 ahead of the lugs 104. On forward movement of the racks 41 the unloader bar 107 slides along a deck member 30 and along a platen 33 engaging with a cured panel 51 and the panel 51 is discharged along with the unloading bar 107. At the same time the loader bar 105 slides along a deck member 30 and a platen 33 carrying an uncured panel 50 into the hot plate press. As the loader bar 105 and panel 50 on their forward stroke engage with catches 108, the catches 108 are depressed in view of their shape (see particularly Fig. 25). The loader bar 105 is moved into the hot plate press into the position shown in Fig. 23 of the drawings. Then

upon retraction of the racks 41 the loader bar 105 remains in its position in the hot plate press until the spring loaded pawls 106 engage with the end portions of the loading bar 105, whereupon the spring loaded pawls 106 engage the loading bar 105, returning the loading bar out of the hot plate press, and until the loading bar engages with catches 108, whereupon the loading bar 105 is held by the stops 108 and the spring loaded pawls 106 are returned past the then stationary loading bar 105 and until the parts assume the position shown in Fig. 21 of the drawings.

Alternative forms of oscillating dogs and loading or unloading bars are shown in Figs. 26 and 27 of the drawings. These loading or unloading bars may be used in place of the oscillating loading or unloading bars shown in Figs. 1 to 20 of the drawings. In such figures the loading or unloading bar 111 is mounted for oscillating movement on racks 41 similar to the unloading bar 46, unloading bar 95 or loading bar 89. Dogs 112 are connected upon the respective ends of the loading or unloading bars 111. Dogs 112 are provided with friction surfaces as rubber 113 which engage with a deck or platen 114. In the direction of travel shown in Fig. 26 of the drawings, the rubber surface 113 will frictionally engage with a deck or platen 114 so that the loading or unloading bar 111 will assume a horizontal position, i. e., the position during the return stroke of the racks 41. During the advancing position of the racks 41 the dogs 112 will frictionally engage with a deck or platen 114 and the loading or unloading bars 111 will assume the vertical position shown in Fig. 27. During both the advancing and retracting travel of the racks 41 a portion of the dogs 112 will slide against a deck or platen 115 so that the same will serve as a stop limiting the movement of oscillation so that in one direction of travel the loading or unloading bar 111 is in a vertical position and in the other direction of travel the said bar 111 is in a horizontal position.

An alternative form of deflector means is shown in Figs. 28 and 29. In Figs. 14 to 17 two deflectors 91 and 97 are shown. Unusually wrinkled and warped stock may engage the deflector 97. To prevent such difficulty I provide the deflector 117 of said Figs. 28 and 29. In these figures, the decks 30, chambers 31, platens 33, chambers 32, racks 41, loader bar means 88, unloader bar means 94, are similar to the similar parts of Figs. 14 to 17 and are similarly numbered. The deflector 117 connects between racks 41 and is in the form of a sheet having portions 118 and 119, which portions are similar in shape and function respectively to deflectors 91 and 97. The main body of the deflector 117 provides a continuous surface between such portions 118 and 119 so that upturned ends of plies of an uncured panel 50 will not be caught by the deflector in passing thereover.

Obviously, changes may be made in the forms, dimensions and arrangement of the parts of my invention, without departing from the principle thereof, the above setting forth only preferred forms of embodiment.

I claim:

1. A loader and unloader for a plywood press having spaced apart horizontal platens providing press chambers therebetween, comprising vertically spaced apart horizontal decks providing loading chambers in registration with and adjacent to said press chambers: vertically posi-

tioned deck supporting means positioned in horizontal spaced relation to said press; longitudinally reciprocable rack members positioned at opposite sides of each loading chamber; unloader bar means extending between and moved by forward portions of the rack members; loader bar means extending between and moved by trailing portions of the rack members; and two vertically positioned driven pinion means positioned at opposite sides of the loading chambers, between said press and said vertically positioned deck supporting means, and connected respectively with said rack means at the respective sides of the loading chambers and moving an unloader bar means and a loader bar means in a loader chamber and into and out of the registering press chamber to engage and intermittently advance material simultaneously through all the press chambers of the plywood press.

2. Panel moving means operable in a chamber between two spaced apart deck members comprising a panel engaging bar extending crosswise of said chamber and angularly movable into a position substantially parallel to said deck members to clear a panel in said chamber and into another position substantially perpendicular to said deck members to engage a panel in said chamber; carriage means for moving said panel engaging bar; dog means connected with said panel engaging bar; deck contacting portions on said dog means angularly positioned relative to said panel engaging bar to hold said panel engaging bar parallel to said deck members when in deck contacting relation and when the carriage means are traveling in one direction; and stop means operatively positioned relative said panel engaging bar limiting movement of said panel engaging bar when in panel engaging position and when the carriage is traveling in the other direction.

3. Panel moving means operable in a chamber between two spaced apart deck members comprising reciprocable carriage members positioned at the sides of the deck members; a panel engaging bar extending crosswise of said chamber and pivotally connected with said carriage members and movable into a position to clear a panel or into a position to engage a panel in said chamber; dog means connected with said panel engaging bar; and dog oscillating means positioned in the path of travel of said dog means engaging said dog means and moving said panel engaging bar from one operative position to another.

4. Panel moving means operable in a chamber between two spaced apart deck members comprising reciprocable carriage members positioned at the sides of the deck members; a panel engaging bar extending crosswise of said chamber and pivotally connected with said carriage members and movable into a position to clear a panel or into a position to engage a panel in said chamber; dog means connected with said panel engaging bar; and resiliently supported dog oscillating means positioned in the path of travel of said dog means engaging said dog means and moving said panel engaging bar during one direction of travel from one operative position to another.

5. Panel moving means operable in a chamber between two spaced apart deck members comprising reciprocable carriage members positioned at the sides of the deck members; panel engaging means extending between and pivotally connected with said carriage members and movable into a position to clear a panel or into a position to engage a panel in said chamber; and means

frictionally engaging a deck member moving said panel engaging means into panel engaging position during one direction of travel and into a position clear of a panel during the other direction of travel.

6. Panel moving means operable in a chamber between two spaced apart deck members comprising reciprocable carriage members positioned at the sides of the deck members; panel engaging means extending between and pivotally connected with said carriage members and movable into a position above a panel or into a position to engage a panel in said chamber; devices positioning said panel engaging means above a panel in said chamber when said carriage means is moving in one direction and to engage with a panel in said chamber when said carriage means is moving in the opposite direction; and deflector means carried by said carriage members above a panel in said chamber for preventing contact between said panel engaging member and irregular portions of a panel during the travel when the panel engaging means is above a panel.

7. In a device for loading and unloading a press having spaced apart horizontal platens providing press chambers therebetween, spaced apart horizontal decks providing loading chambers in registration with and adjacent to said press chambers; longitudinally reciprocable carriage members positioned at opposite sides of each loading chamber; means for imparting forward and return movements to said carriage members; a plurality of separable panel moving bars adapted to extend across said chambers between said carriage members; bar engaging members carried by the rear end portions of said carriage members positioned to engage with and advance a panel moving bar through a loading chamber and into a press chamber; yieldingly mounted bar engaging pawls carried by the forward end portions of said carriage members positioned to engage a

bar in a loading chamber and advance the same through a press chamber to a position of discharge and positioned to retract from said press chamber a panel moving bar that has been left in the intake end portion of a press chamber by said bar engaging members; and yieldably supported one way stop members positioned to arrest retractile movement of said panel moving bar before the return movement of said carriage members is completed, whereby said yieldingly mounted bar engaging pawls will be moved relative to said retracted bar into positions to engage with and advance said retracted bar through a press chamber on their next forward excursion.

8. A loader and unloader for a plywood press having spaced apart horizontal platens providing press chambers therebetween, comprising vertically spaced apart horizontal decks providing loading chambers in registration with and adjacent to said press chambers; vertically positioned deck supporting means positioned in horizontal spaced relation to said press; longitudinally reciprocable rack members positioned at opposite sides of each loading chamber; panel unloader means carried by forward portions of the rack members; panel loader means carried by the rack members and trailing said unloader means; and two vertically positioned driven pinion means positioned at opposite sides of the loading chambers, between said press and said vertically positioned deck supporting means, and connected respectively with said rack members at the respective sides of the loading chambers and moving a panel unloader means and a panel loader means in each loader chamber and into and out of the registering press chamber to engage and intermittently advance panels simultaneously through all the press chambers of the plywood press.

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