Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

Filed Dec. 9, 1931 9 Sheets-Sheet 1

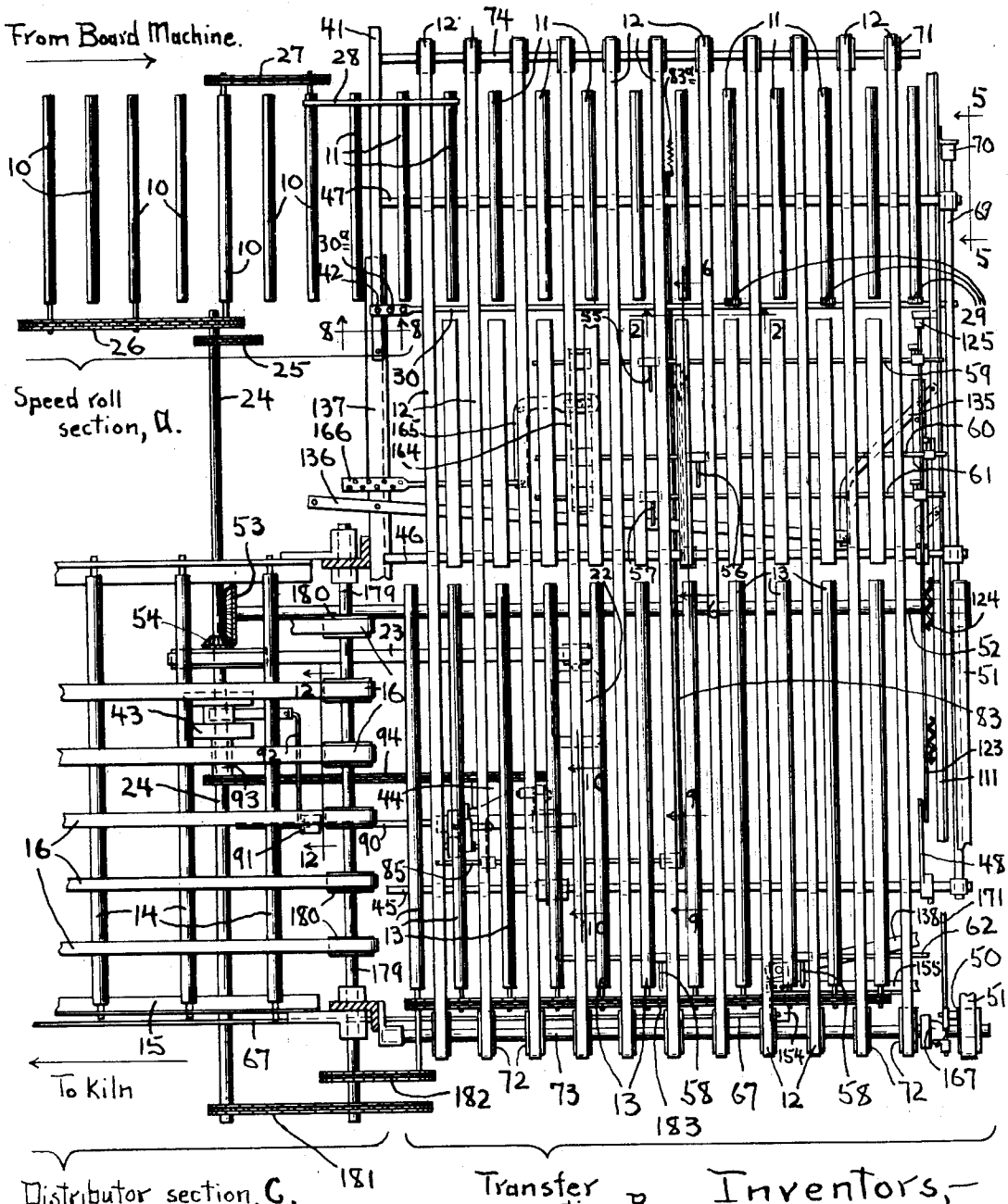


Fig. 1.

Inventors,
Douglas C. Jeffrey
and
Henry V. Wolfe,
By Fricke & DeBuck,
Attorneys.

Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

Filed Dec. 9, 1931 9 Sheets-Sheet 2

Fig. 2.

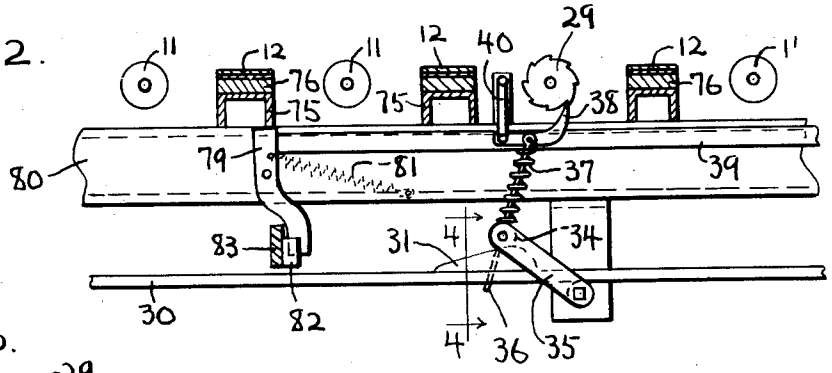


Fig. 3.

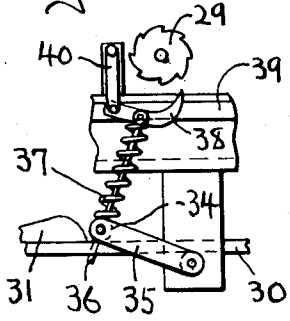


Fig. 4.

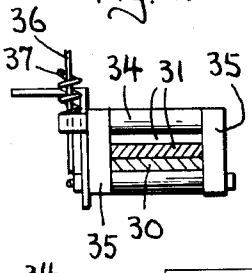


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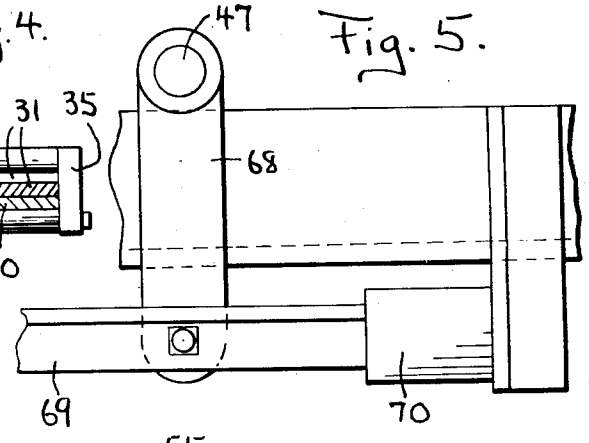


Fig. 4a

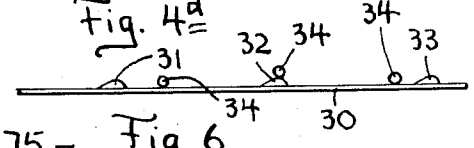
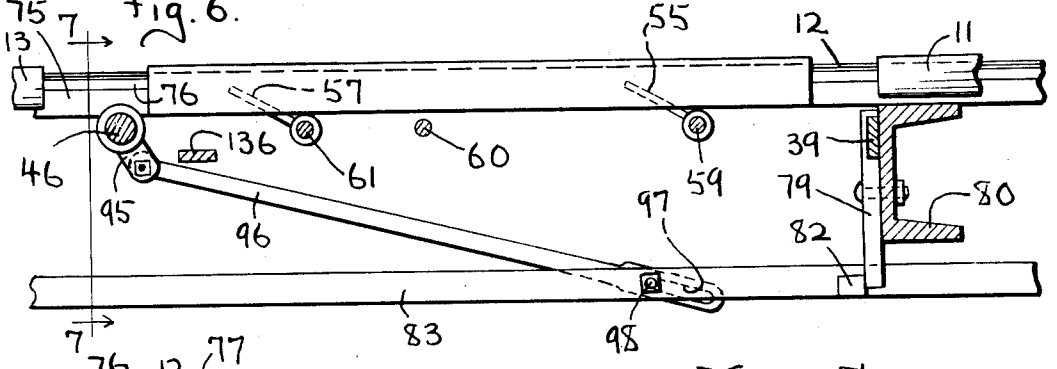


Fig. 6.



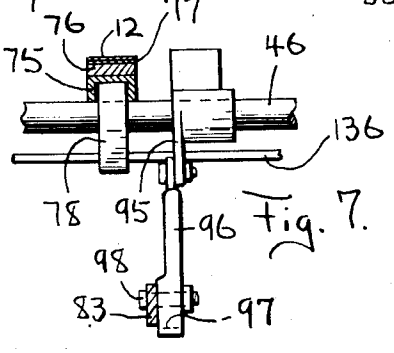


Fig. 7.

Inventors,—
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Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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Fig. 8.

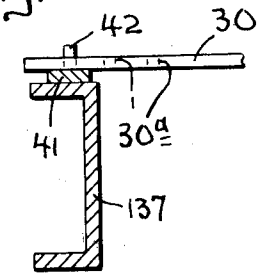
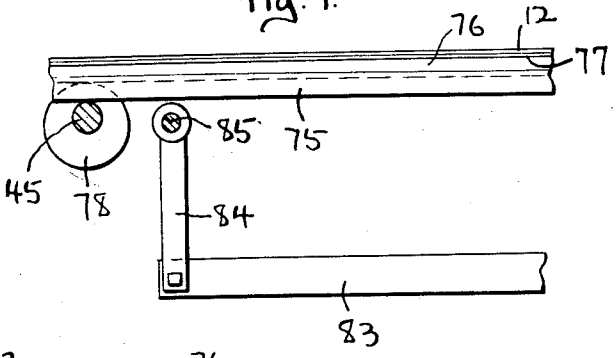


Fig. 9.



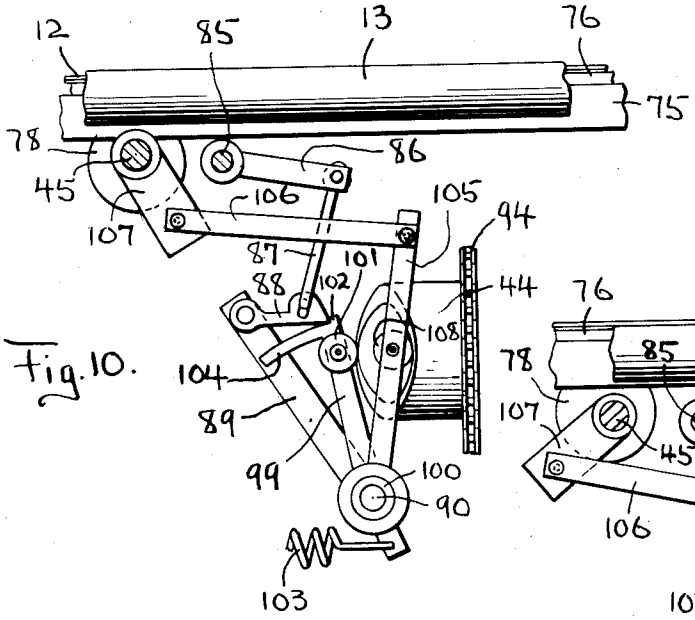


Fig. 10.

Fig. 11.

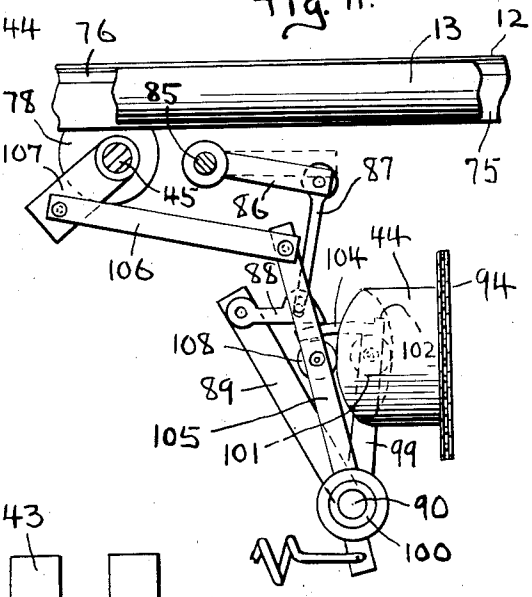
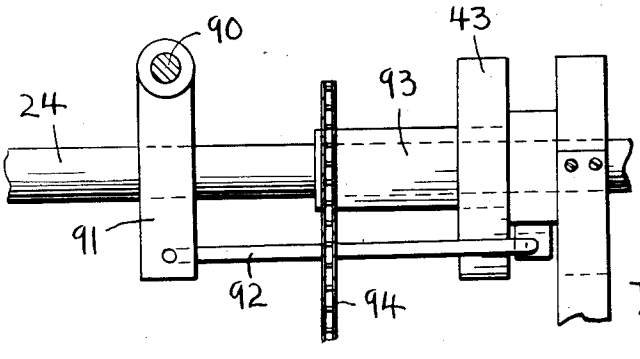


Fig. 12.



Inventors,—
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and
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By Fricke & DeBuck,
Attorneys.

Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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Fig. 13

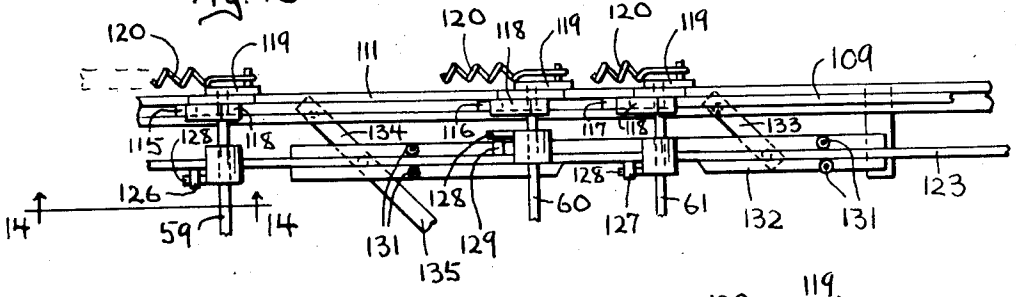


Fig 14.

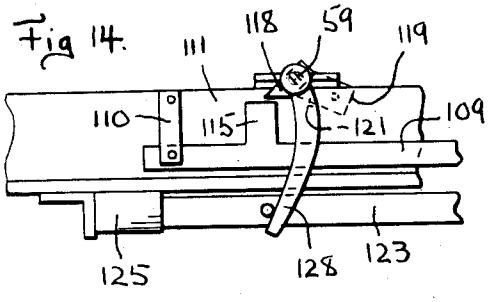


Fig. 15.

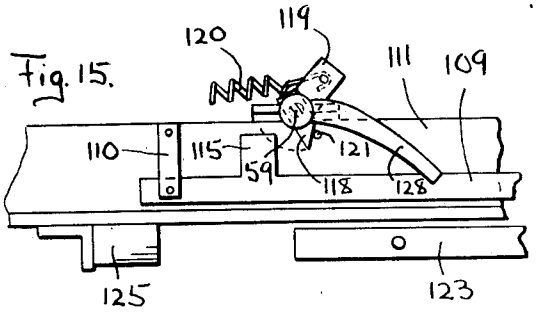


Fig. 16.

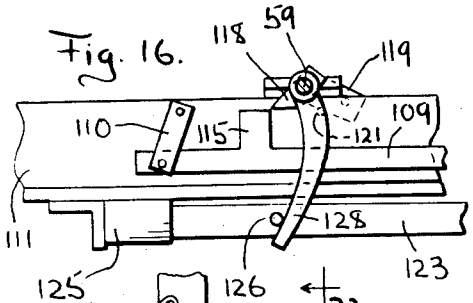


Fig. 17.

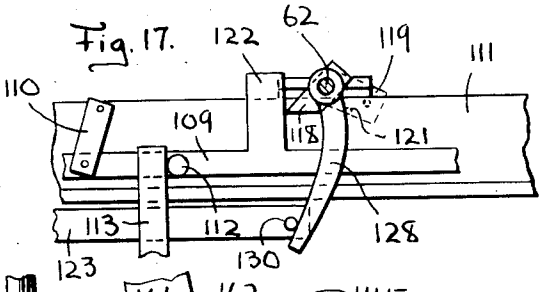
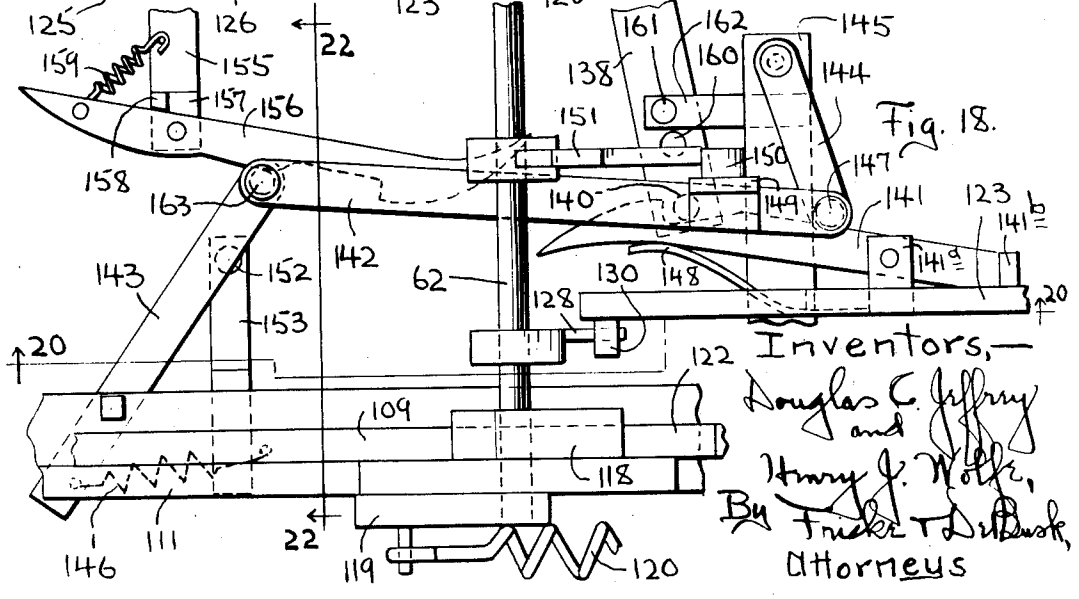


Fig. 18.



Inventors,—
Douglas C. Jeffrey
and
Henry J. Wolfe,
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Attorneys

Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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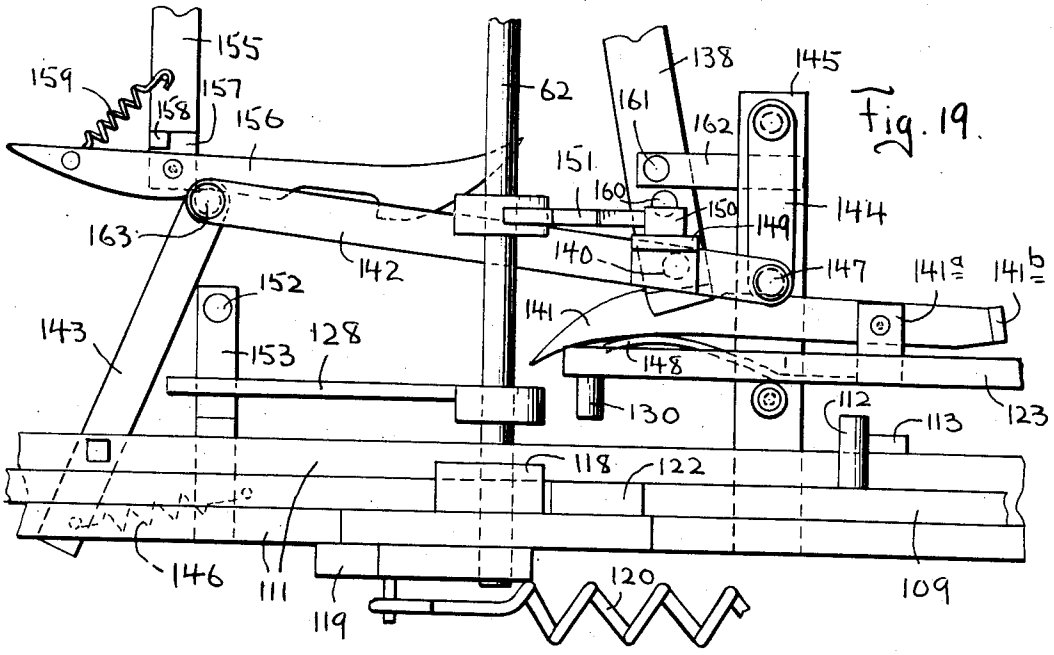
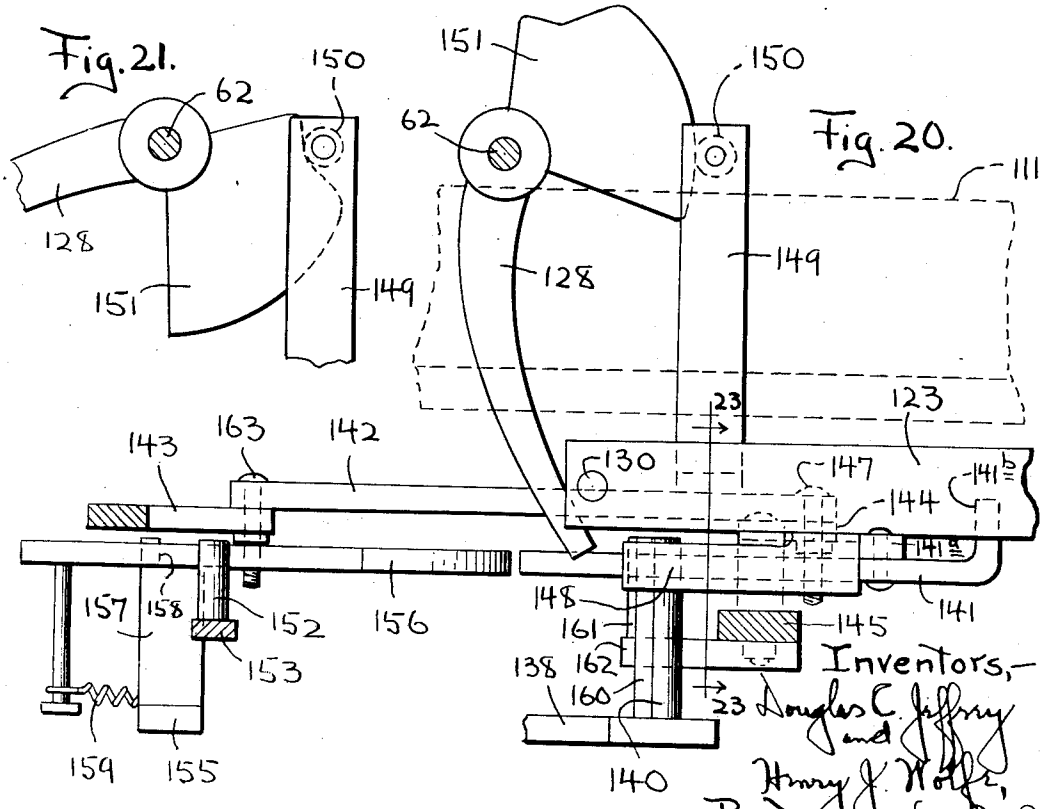


Fig. 19.



Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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Fig. 22.

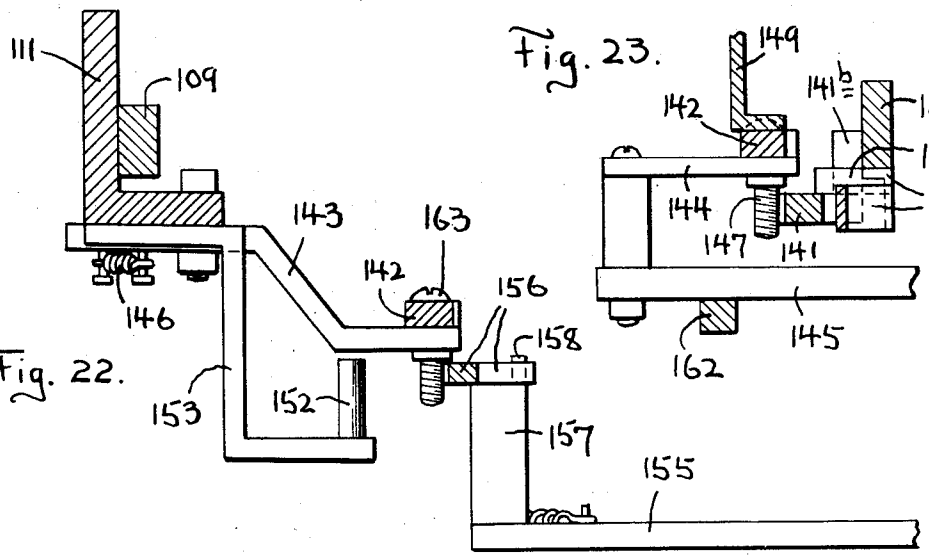


Fig. 23.

Fig. 24.

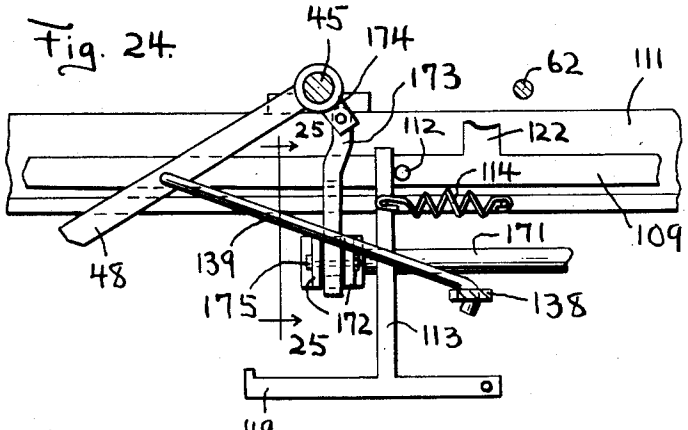


Fig. 25

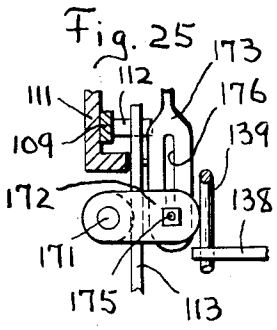
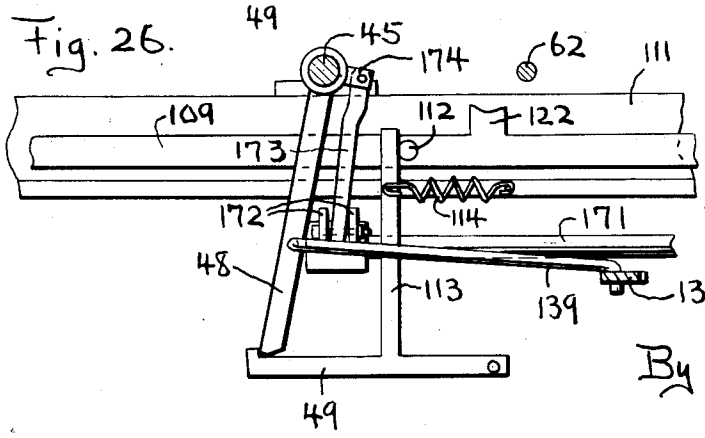


Fig. 26.



Inventors,-
Douglas C. Jeffrey and
Henry J. Wolfe,
By Fricke & DeBusk,
Attorneys.

Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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Fig. 27.

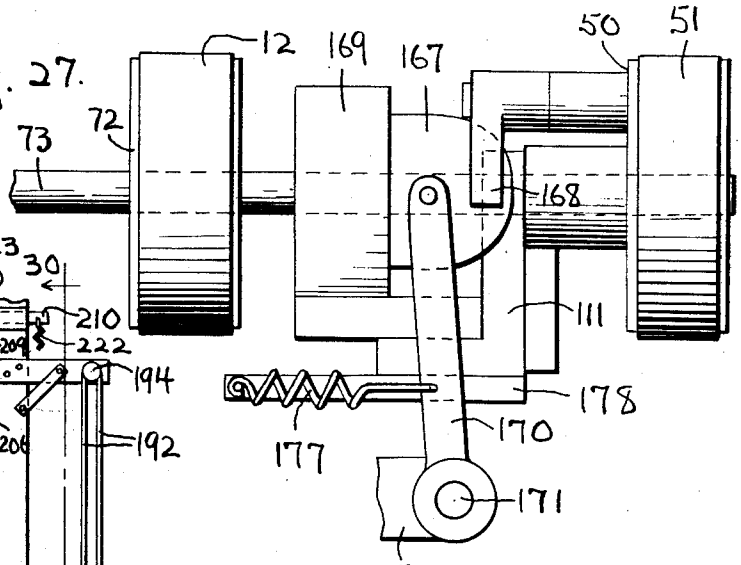


Fig. 28.

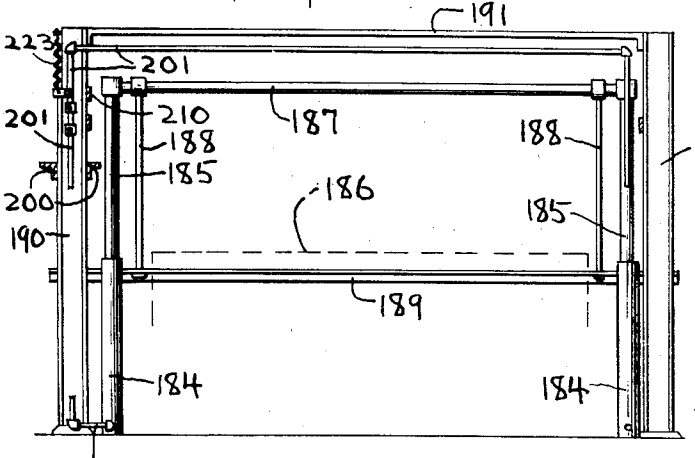


Fig. 29.

Inventors,
Douglas C. Jeffrey
and
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By Tucker & Brook
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Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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Fig. 30.

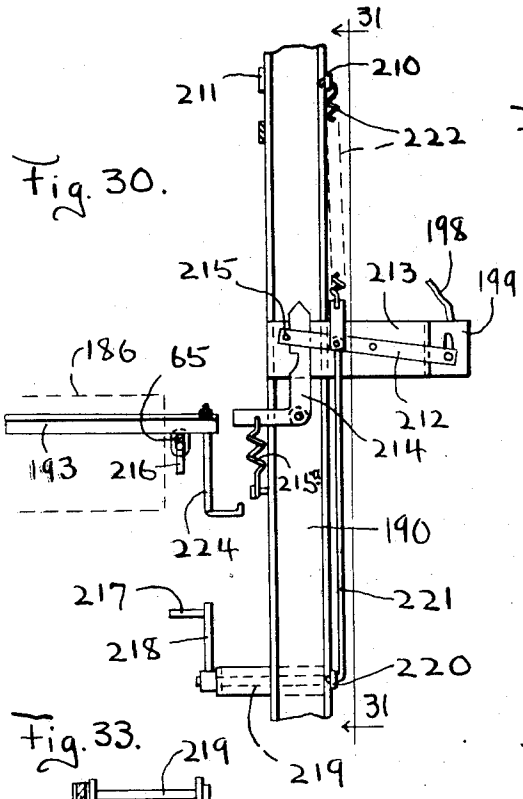


Fig. 31.

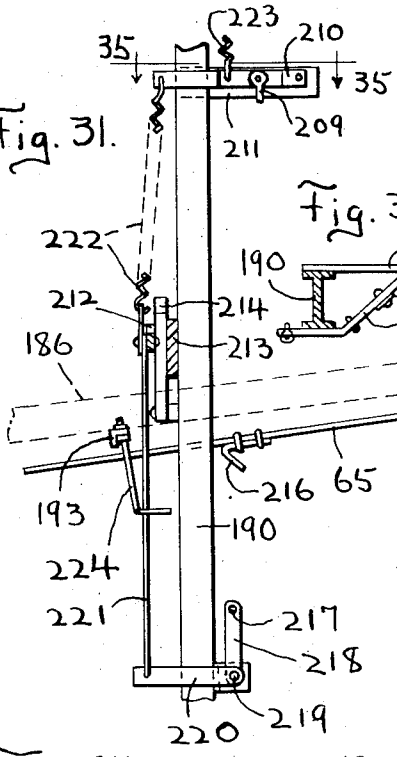


Fig. 35.

Fig. 33.

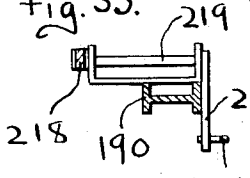


Fig. 34.

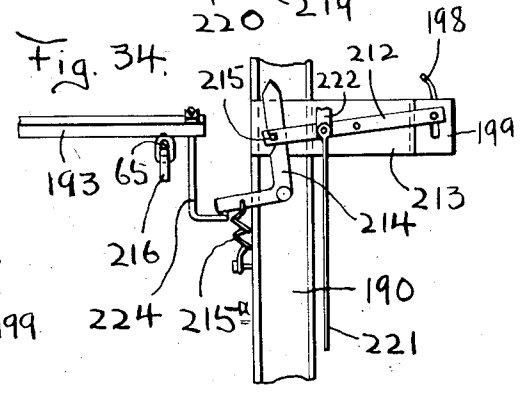
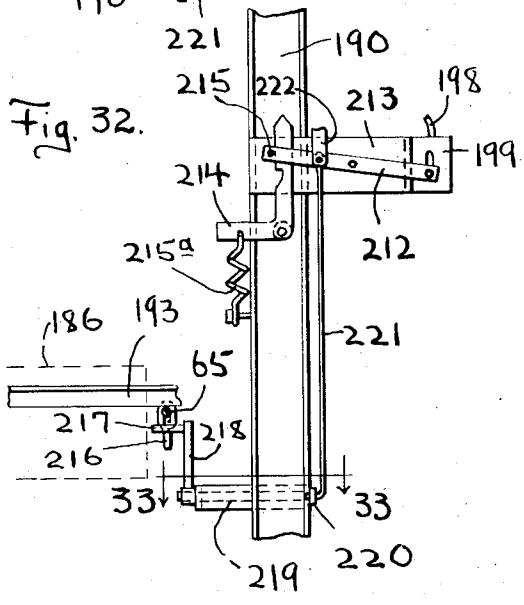


Fig. 32.



Inventors,-
Douglas C. Jeffrey and
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Oct. 3, 1933. D. C. JEFFREY ET AL 1,929,204

TRANSFER MEANS FOR BOARD MACHINES

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Fig. 36.

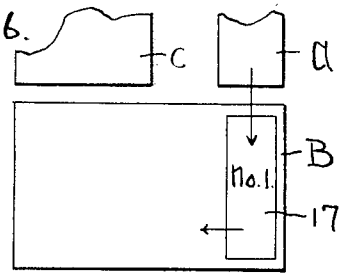


Fig. 37.

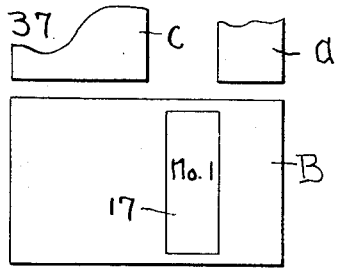


Fig. 38.

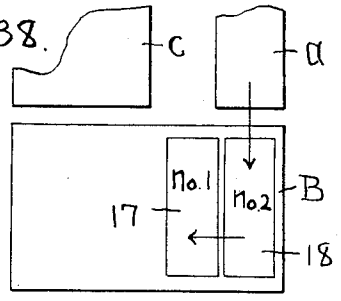


Fig. 39.

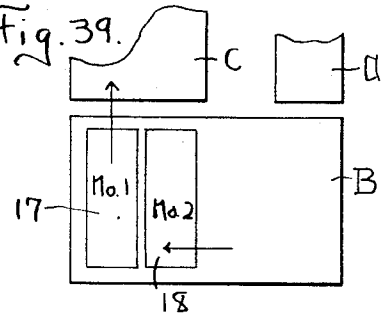


Fig. 40.

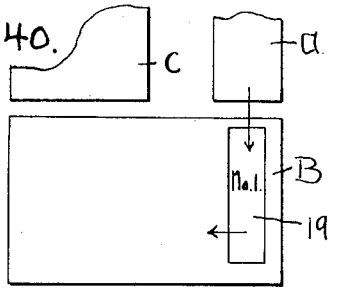


Fig. 41.

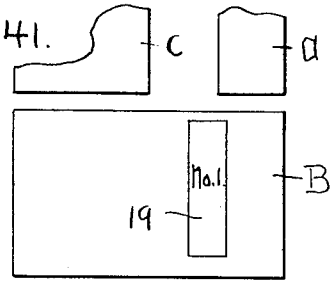


Fig. 42.

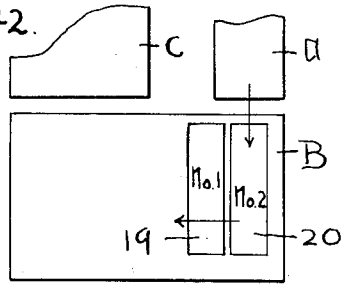


Fig. 43.

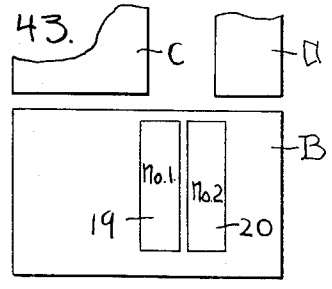
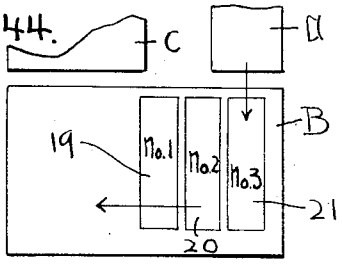


Fig. 44.



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Patented Oct. 3, 1933 1,929,204

UNITED STATES PATENT OFFICE

1,929,204

TRANSFER MEANS FOR BOARD MACHINES

Douglas C. Jeffrey and Henry J. Wolfe, Akron, N. Y., assignors to Universal Gypsum & Lime Co., Chicago, Ill., a corporation of Delaware

Application December 9, 1931. Serial No. 579,920

43 Claims. (Cl. 198—21)

Our invention relates to transfer means for board machines and has for its object the provision of a new and improved form and arrangement of parts by which successively formed sections of gypsum wall board or plaster board produced on a board machine may be automatically handled as the sections come from the board machine for delivery to a kiln within which the final drying of the product is effected.

It is one of the objects of our invention to provide means controlled by the movement of the board and effective at the end of the forward movement of the board section at the end of the board machine for giving such section a movement transversely of the machine and for stopping such transverse movement when the board has moved a distance slightly greater than its width. It is another object of our invention to provide additional cooperative means controlled by the movement of said board section and by the movement of the next succeeding board section when it reaches a position alongside of said first named section for giving said two sections a movement together transversely of the machine and for stopping such transverse movement when said two sections reach a point in alignment with the distributor or movable conveyor and the kiln at the opposite side of the machine. It is another object of our invention to provide means controlled by the movement of the board sections into position in alinement with the kiln for causing a vertical adjustment of the movable conveyor.

It is another object of our invention to provide alternatively acting means controlled by the movement of the board whereby a board section is first given a movement transversely of the machine a distance slightly greater than its width, whereby said section and the next succeeding section are then given a movement together transversely of the machine a distance slightly greater than the width of one of said sections, and whereby said two sections and a third section are then given a movement together transversely of the machine and stopped when they reach a point in alignment with the feeder or distributor and the kiln.

It is one of the objects of our invention to provide improved means for throwing into operation the means for transferring the successive board sections transversely of the machine whereby the position longitudinally of the board machine at which the transverse movement of the section takes place may be varied. It is one of the objects of our invention to provide an improved trip roller mechanism and associated parts adapted automatically to throw the transfer means into operation.

It is one of the objects of our invention to provide an improved arrangement comprising power driven means controlled by the movement of the board for throwing the transverse transfer mechanism into operation. To this end, it is one of our objects to provide an improved arrangement comprising a clutch mechanism thrown into operation in timed relation to the movement of the board, with means operated by the clutch for quickly effecting the desired adjustment of the parts for making the transfer mechanism operative and then serving promptly after such initial action to throw the clutch mechanism out of operation, latching means being preferably provided for holding the transfer mechanism in operation after the release of the clutch and until further movement of the board serves in due time to release said latching means.

It is one of the objects of our invention to provide improved means for adjusting the parts for securing the operation of the selected one of a plurality of trip rollers employed.

It is another object of our invention to provide improved means for controlling the positions at which a board section being carried by said transfer means shall act for releasing the latching means for causing the transverse transfer mechanism to be thrown out of operation. To this end, it is one of our objects to provide a plurality of trip arms located at different points along the transverse transfer mechanism for releasing said latching means, together with improved means by which a selected one or more of such trip arms may be thrown into use while others are left idle. It is another object of our invention to provide means by the use of which such trip arms may be adjusted slightly transversely of the machine.

It is one of the objects of our invention to provide improved means controlled by the movement of the board sections for resetting the trip arms after they have operated in connection with a given board section, with the arrangement such that any given trip arm shall remain in inoperative position for the predetermined desired period after being tripped while one or more succeeding board sections pass, and shall then be returned to operative position in time to act upon the predetermined one of the succeeding board sections. To this end, it is one of our objects to provide improved means for shifting a reset-

ting bar member for bringing about the desired succession of engagements and operations of the trip arms.

It is one of the objects of our invention to provide an improved latching means adapted to have operative engagement for holding the transverse transfer mechanism releasably in operative condition after it has been moved to operative position by the power driven means above referred to, together with means controlled by the transverse movement of the board sections for releasing the latching mechanism when successive board sections reach the predetermined desired positions transversely of the machine. It is another object of our invention to provide means controlled by the movement of the board sections for applying power intermittently to the transverse transfer mechanism for controlling the transverse movements of the board sections and for insuring the stoppage of such sections in the predetermined desired positions either at the limit of the transverse movement of the sections or at an intermediate position. It is one of the objects of our invention to provide an arrangement comprising a latch releasing member which may be operated by selected ones of the several trip arms and associated parts, in which arrangement said latch releasing member after actuation automatically returns to position for operation by another trip arm and associated parts, the arrangement, however, preferably being such that when said latch releasing member is operated by the trip arm by which the board sections are stopped at the limit of their transverse movement the latch releasing member after actuation is held out of operative position until the resetting mechanism has operated for bringing the trip arms again to their operative positions.

It is one of the objects of our invention to provide an improved arrangement of parts by which the distributor or movable conveyor is adjusted vertically in timed relation to the movements of the board sections, by which such movable conveyor may be given a series of controlled downward movements by gravity and may then be automatically given an upward movement to its uppermost operative position for delivery of the board sections again to the top level in the kiln. It is one of the objects of our invention to provide an improved arrangement in which such distributor timing mechanism is coordinated with the above mentioned latching mechanism, with the resetting mechanism, with the latch releasing means, and with a clutch mechanism by which power is applied intermittently to the transverse transfer mechanism for effecting the transfer of the board sections into alignment with the kiln.

It is one of the objects of our invention to provide power driven means for raising the movable conveyor, together with means controlled by the movement of the board sections for throwing the power driven means into operation and means controlled by the movement of the movable conveyor for throwing the power driven means out of operation at the end of the raising operation. To this end, it is one of the objects of our invention to provide an arrangement comprising a hydraulic ram or rams operated by a motor driven pump for raising the distributor, together with improved means for starting and stopping the motor in the desired timed relation. It is one of the objects of our invention to provide in such arrangement that the distributor or movable conveyor may have its downward movement by gravity under the control of a regulator valve through which the oil or other hydraulic agent passes from the cylinder of the ram to a supply tank as the distributor descends. It is one of the objects of our invention to provide in such arrangement a pressure controlled relief valve interposed in the connections in such manner that if the pump continues to operate after the movable conveyor has reached the limit of its upward movement the hydraulic agent from the pump may be diverted from the rams to the supply tank, thus avoiding the necessity for an exceedingly accurate timing of the operation of the pump and its controlling means.

In the arrangement as employed by us, the pump is connected with the rams by a main line of piping which at a suitable point is connected with the supply tank, the same main line of piping being employed for discharging the oil from the cylinders of the rams to the supply tank as that employed for delivering the oil to the cylinders from the pump. In order to render such arrangement effective, it is one of the objects of our invention to provide a shut-off valve in the short lead from said main line of piping to the supply tank, together with means operating in coordination with the action of the pump for closing such shut-off valve when the pump is operating so as to insure that the oil from the pump shall pass into the cylinders and for opening the shut-off valve when the pump is silent so as to permit the oil to pass from the cylinders to the supply tank through the regulator valve for permitting the movable conveyor to descend when the mechanical support for such conveyor is removed temporarily from time to time for the downward adjustment of the device.

It is another object of our invention to improve mechanisms of this type in sundry details hereinafter pointed out. The preferred means by which we have accomplished our several objects as illustrated in the drawings are hereinafter specifically described. That which we believe to be new and desire to cover by Letters Patent is set forth in the claims.

In the drawings,—

Fig. 1 is a diagrammatic plan view of the forward end of our improved machine, some of the operating parts being omitted and other parts being shown upon an exaggerated scale for clearness of illustration;

Fig. 2 is a vertical section upon an enlarged scale taken substantially at the line 2—2 of Fig. 1, and being also somewhat diagrammatic;

Fig. 3 is a view of a portion of the parts as shown in Fig. 2 showing a changed position of the parts;

Fig. 4 is a vertical cross section taken at line 4—4 of Fig. 2;

Fig. 4*a* is a diagrammatic view showing the relation of the several trip roller mechanisms as shown in Figs. 2, 3 and 4;

Fig. 5 is a view of a fragmentary portion of the machine as seen substantially at the line 5—5 of Fig. 1;

Fig. 6 is a vertical section upon an enlarged scale taken substantially at the line 6—6 of Fig. 1;

Fig. 7 is a vertical section taken at line 7—7 of Fig. 6;

Figs. 8, 9 and 10 are vertical sections upon an enlarged scale taken at the lines 8—8, 9—9 and 10—10, respectively, of Fig. 1;

Fig. 11 is a view similar to Fig. 10 but showing a changed position of the parts;

Fig. 12 is a view upon an enlarged scale being substantially a section at line 12—12 of Fig. 1;

Fig. 13 is a top plan view of a fragmentary portion of our machine showing the means for shifting the resetting bar transversely;

Fig. 14 is a vertical section taken at line 14—14 of Fig. 13;

Fig. 15 is a view similar to Fig. 14 but showing a changed position of the parts;

Fig. 16 is another view similar to Fig. 14 but showing a different changed position of certain of the parts;

Fig. 17 is a view of a mechanism generally similar to that shown in Figs. 14, 15 and 16 but differing therefrom in certain respects;

Fig. 18 is a top plan view of certain of the operative parts located substantially at the corner of the machine as shown at the lower right-hand corner of Fig. 1;

Fig. 19 is a view similar to Fig. 18 but showing a changed position of certain of the parts;

Fig. 20 is a vertical sectional view taken substantially at line 20—20 of Fig. 18;

Fig. 21 is a view of certain of the parts as shown in Fig. 20 but showing a changed operative position of the parts;

Fig. 22 is a vertical sectional view taken substantially at the line 22—22 of Fig. 18;

Fig. 23 is a vertical sectional view taken substantially at the line 23—23 of Fig. 20;

Fig. 24 is a vertical sectional view showing the arrangement of the latching mechanism by which the transverse transfer belts are held releasably in operative position, being a vertical sectional view looking forwardly at a point near the forward right-hand corner of the machine;

Fig. 25 is a vertical sectional view taken at line 25—25 of Fig. 24;

Fig. 26 is a view similar to Fig. 24 but showing a changed position of certain of the parts;

Fig. 27 is a fragmentary view showing the clutch and brake mechanism at the forward right-hand corner of the machine provided for driving the transverse transfer belts, the view being taken as seen from the side of the machine;

Fig. 28 is a diagrammatic view showing a side elevation of the movable conveyor making up the distributor section of the machine, the front portion of which is shown in plan in Fig. 1;

Figs. 29 and 30 are vertical cross sections taken substantially at the lines 29—29 and 30—30, respectively, of Fig. 28, both of the views being upon an enlarged scale, and the scale of Fig. 30 being greater than that of Fig. 29;

Fig. 31 is a vertical sectional view taken at line 31—31 of Fig. 30;

Fig. 32 is a view similar to Fig. 30 but showing a changed position of the movable conveyor;

Fig. 33 is a horizontal sectional view taken substantially at line 33—33 of Fig. 32;

Fig. 34 is another view similar to a portion of Fig. 30, but showing another changed position of the movable conveyor and other parts;

Fig. 35 is a horizontal sectional view taken substantially at the line 35—35 of Fig. 31; and

Figs. 36 to 44 inclusive are diagrammatic views showing successive positions of board sections in the course of the operation of the machine, Figs. 36 to 39 illustrating the operation in connection with 48 inch board and Figs. 40 to 44 illustrating the operation in connection with 32 inch board.

Referring now to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters, it will be seen that our machine comprises a speed roller section A (see Fig. 1) forming the forward end portion of a board machine, a transfer section B arranged across the forward end of the speed roll section and extending transversely therefrom, and a distributor section C extending rearwardly (toward the left in Fig. 1) to a kiln. In the arrangement shown, the speed roll section comprises a series of rollers 10, revolubly mounted in position in a horizontal plane, with every alternate roller driven by power in the direction for carrying a board section forwardly to the right in said Fig. 1 into position upon a plurality of idler rollers 11. The transfer section comprises a plurality of endless belts 12, the upper plies of which normally stand below the level of the topmost portions of the rollers 11, being provided with means for raising the upper plies of the belts into operative position for lifting a board section from the rollers 11 and carrying such board section transversely toward the distributor section of the machine. The transfer section comprises further a plurality of driven rollers 13 located with their top portions at a higher level than the normal position of the top plies of the belts 12 but at a lower level than such top plies of the belts when raised to their operative positions. The rollers 13 are driven in the direction for carrying a board section toward the left in Fig. 1 into position upon the distributor section of the machine. The distributor section, in turn, comprises a plurality of rollers 14 mounted in transverse position on a vertically movable frame-work 15, endless belts 16 being provided for cooperation with said rollers 14 for carrying a board section toward the left in said Fig. 1 for delivery to a kiln 16*a* (see Fig. 28) at the desired level in said kiln.

In the arrangement shown, the rollers 10 are driven constantly at such a speed as to carry a board section forward toward the right in Fig. 1 six or eight times more rapidly than the rate of movement of the board on the board machine before being operated upon by the cutting mechanism. In this arrangement, the belts 12 are driven intermittently, being adapted when in operation to carry a board section transversely of the machine at approximately the same speed as that at which the board section moves on the rollers 10. The rollers 13 of the transfer section and the rollers 14 and belt 16 of the distributor section are driven constantly during the operation of the machine, at such rate as to carry a board section toward the left in Fig. 1 at approximately the same speed as that at which the section is moved by the rollers 10 and the belts 12.

Referring now to the diagrammatic views 36 to 39, the operation of the machine when operating on board sections of the normal 48 inch width will be briefly outlined. A board section 17 is moved along the speed roll section A into position as shown in Fig. 36 where it is supported by the rollers 11. Means is provided, controlled by the movement of the board section into this position, for raising the upper plies of the belts 12 and for throwing the belts into operation for carrying the board section 17 toward the left in Fig. 36 a distance slightly greater than the width of the board section into the position as shown in Fig. 37, means being provided, also controlled by the movement of the board section into this position, for stopping the operation of the belts 12 and for lowering the upper plies of the belts out of operative position. When a second board

section 18 reaches the position upon the rollers 11 alongside of the board section 17 as shown in Fig. 38, the upper plies of the belts 12 are again raised and the belts are thrown into operation for carrying the two board sections 17 and 18 together toward the left in said Fig. 38 to the position as shown in Fig. 39, means being provided, controlled by the movement of the board sections into this position, for stopping the operation of the belts 12 and for lowering the upper plies of the belts, such means being in part the same as that by which the belts are controlled for the first mentioned stop and adjustment. As soon as the board sections have stopped in the position as shown in Fig. 39 and the upper plies of the belts have been lowered, such board sections are acted upon by the rollers 13 which carry the sections into position on the distributor C.

The operation of the machine when working with board sections of 32 inch width is shown diagrammatically by Figs. 40 to 45. A board section 19 is first forwarded into position as shown in Fig. 40, and then moved toward the left in said figure to the position as shown in Fig. 41, such movement toward the left being slightly greater than the width of the board section. A second board section 20 is then forwarded into position alongside of the section 19 as shown in Fig. 42, and said two sections 19 and 20 are moved together to the left by a distance slightly greater than the width of one of the sections to a position as shown in Fig. 43. A third section 21 is then forwarded into position alongside of the section 20 as shown in Fig. 44, whereupon the three sections 19, 20 and 21 are moved together to the left until stopped when in alignment with the distributor C and the kiln 16*a*, after which the board sections are promptly moved toward the kiln by the constantly driven rollers 13.

In the operation on 32 inch board, the upper plies of the belts are raised and the belts are thrown into operation by the same means as that by which like effects are produced by the means as above described in connection with operation upon 48 inch board. The means for stopping the operation of the belts and for lowering the upper plies when the sections reach a position in alignment with the distributor and the kiln is the same for the operation on 32 inch board as for operation on 48 inch board. Cooperating means is provided, in addition to that above mentioned in connection with the operation upon 48 inch board, for stopping the board sections at their intermediate positions for operation upon 32 inch board, the necessity for providing such additional cooperating means resulting from the fact that it is necessary to stop the 32 inch sections at different points transversely of the machine from the point at which the 48 inch sections have their intermediate stop.

In the form of machine as shown in our drawings, power is applied to the driven rollers 10 of the speed roll section from a motor 22 by which the remaining portions of the machine are driven. The motor 22 is connected by means of a belt 23 with a main driving shaft 24 from which power is applied by a sprocket chain 25 and cooperating parts to one of the rollers 10, which roller in turn is connected by means of a sprocket chain 26 and cooperating parts with the driven rollers 10 located at the left as shown in Fig. 1. Additional sprocket chain means 27 at the opposite side of the speed roll section serves to apply power to the last one of the rollers 10. An endless belt 28 is also employed when desired for applying power directly from the roller 10 to one or more of the rollers 11 which normally operate as idler rollers. The belt 28 ordinarily would not be used except when the machine is operating upon board sections of comparatively short length.

In the arrangement as shown in our drawings, the upper plies of the transfer belts 12 are raised by power from the motor 22 and are then driven by a clutch mechanism operated by this same motor. The means for raising the upper plies of the belts and for throwing the clutch into and out of operation for driving the belts at the desired intervals are controlled by the movement of the board from the speed roll section of the machine to the transfer section. In the arrangement shown, this effect is attained through the medium of one or another of the idler rollers 11. As is shown in Fig. 1, three of the rollers 11 are provided with ratchet gears 29 by which motion may be transmitted from the roller when actuated by a board section brought into contact with such roller in its movement toward the right in Fig. 1. In the arrangement shown, means is provided in connection with each of said ratchet wheels 29 for transmitting motion therefrom, the arrangement being such that any one of the three ratchet wheels may be made operative or when desired all three of such ratchet wheels 29 may be rendered inoperative. Whenever in the operation of the board machine a splice is made in either the top or the bottom paper liner of the board, it is ordinarily necessary that a limited length of board be thrown out as defective, and this result is preferably attained at this portion of the machine. Whenever it is desired that a section of board be kept from entering the kiln, the means for transmitting motion from the ratchet wheels 29 are silenced and the defective sections are caused to pass forward off of the machine without actuation of the belts 12.

The means as provided in our machine for effecting this type of control and actuation is shown in Figs. 2, 3, 4 and 4*a*. A bar 30 is employed running longitudinally of the machine, as is clearly shown in Fig. 1 adjacent to the ends of the idler rollers 11. This bar 30 is provided with cams 31, 32 and 33 which are differentially arranged upon the bar 30 with respect to rollers 34 which are movably mounted with respect to the bar 30. As is best shown in Figs. 2 and 3, each of the rollers 34 is journalled between two short bars 35 which are pivotally mounted at opposite sides of the bar 30 in such arrangement that when one of the cams is moved into critical position with respect thereto the roller is raised by the cam into spaced relation to the bar 30. Each of the rollers 34 in turn is connected by means of a link 36 and a spring 37 with a pawl 38 pivotally mounted upon a slide bar 39, the arrangement being such that when the pawl 38 is raised into the position as shown in Fig. 2 such pawl 38 and the slide bar 39 will be moved toward the left in said Fig. 2 upon the next following rotation of the ratchet wheel in clockwise direction in Fig. 2, such bar 39 being free to move by reason of being carried by swingingly mounted links 40. Whenever one of the cams carried by the bar 30 is brought into position beneath one of the rollers 34, the corresponding pawl 38 is moved into operative position with respect to the ratchet wheel 29.

As is clearly shown in Fig. 4*a*, the arrangement is such that when the bar 30 stands in one

position the cam 32 is thrown into operation. When the bar 30 is moved a short distance to the left, the cam 32 is moved out of operation before the cam 33 is brought into operation. A further movement of the bar 30 toward the left brings the cam 33 into operation while the cams 31 and 32 remain inoperative. A still further movement of the bar 30 toward the left brings the cams into such position that all three are inoperative. If on the other hand the bar 30 be moved toward the right from the position shown in Fig. 4*a*, the cam 32 is moved out of operation before the roller 34 reaches the cam 31 serving thus to throw all of the cams again out of operation. A still further movement of the bar 30 toward the right brings the cam 31 into operation, with the cams 32 and 33 still out of operative position. As will be appreciated by an examination of Fig. 4*a*, and as above explained, when any one of the cams 31, 32 or 33 is in operative position, the slight movement of the bar 30 toward the left changes the relative positions of the parts in such way that all of the cams are rendered inoperative. As is clearly shown in Figs. 1 and 8, the rear end of the bar 30 is provided with three openings 30*a* any one of which may be brought into operative engagement with an upwardly projecting pin 42 carried by a transverse lever 41. When such pin 42 engages the middle opening of the bar 30, with the lever 41 in normal position as shown in Fig. 1, the cam 32 will be in operation. When the pin 42 engages the rearmost opening of the bar 30, the rearmost cam 31 is in operation. When the pin 42 engages the foremost opening of the bar 30, the foremost cam 33 is brought into operative position. When the lever 41 is swung a short distance rearwardly toward the left in Fig. 1, all three of the cams are made inoperative regardless of which of the three openings in the bar 30 is engaged by the pin 42.

The means actuated by the movement of the bar 39 toward the left by the selected one of the three ratchet wheels 29 for raising the upper plies of the belts 12 and for throwing such belts into operation comprises a train of mechanism extending substantially across the machine. This mechanism serves first for throwing a clutch 43 into operation for transmitting power from the shaft 24 to a rotary cam device 44. This cam 44 by its rotation serves to give rocking movement to eccentric shafts 45, 46 and 47 by which the upper plies of the belts 12 are raised to operative position, and serves by further rotation to throw the clutch 43 out of operation, the eccentric shaft 45 meanwhile being held in its turned position by means of a latch arm 48 engaged by a latch lever 49, as is best shown in Figs. 24 and 26. The arrangement is such that upon a movement of the bar 39 toward the left in Fig. 2 by any one of the ratchet wheels 29 the clutch 43 is operated for driving the cam 44 so as to effect an upward movement of the upper plies of the belts 12. A second clutch mechanism 50 is provided, together with mechanism operated by the movement of the latch arm 48 for throwing the clutch into operation for driving the belts 12, such clutch 50 being driven by means of a belt 51 connecting the clutch with a shaft 52 which in turn is connected by means of bevel gears 53 and 54 with the main driving shaft 24. Means is provided for stopping the operation of the belts 12 and for lowering the upper plies of said belts, this being effected by the release of the latch lever 49 from the latch arm 48 in the desired timed relation with respect to the movement of the board sections along the transfer belts 12. The means for releasing the latch 49 for permitting this result comprises trip arms 55, 56, 57 and 58 mounted respectively upon shafts 59, 60, 61 and 62 so located that such trip arms shall be engaged by a board section carried by the belts 12 at different points along the belts whereby such trip arms may be operated at the desired critical points in the movement of the board sections by the transfer belts.

In the operation of our machine, after the trip arms 55, 56, 57 and 58 have been thrown out of operative position by the action of a board section carried across the machine by the belts 12, means is brought into operation for resetting such of said trip arms as are designed for use under different conditions. This resetting means is arranged for resetting the arms 58 and the arm 56 when the machine is operating on 48 inch board, or for resetting the arms 58 and the arms 55 and 57 when the machine is operating upon 36 inch board, the operation in either instance being automatic throughout after a manual setting of the parts for bringing about the desired selective action.

Our machine employs a horizontally pivoted movable conveyor, being the conveyor comprising the rollers 14 and the belt 16 mounted upon the frame-work 15. Means is provided for raising this conveyor by power and for holding the conveyor releasably by means of a latch 63 adapted to engage in succession a series of teeth or lugs 64 comprising a rack bar mounted on the forward end of the kiln 16*a* (see Fig. 28). The latch 63 is connected by means of a link 65 with a lever 66 which in turn is connected by lost motion means with a link 67 extending forward to the forward right-hand corner of the machine where it is connected with mechanism by which a forward pull is exerted upon the link and the latch 63 in timed relation to the movement of the board sections along the transfer belts 12. In the arrangement shown, the mechanism is so arranged as to withdraw the latch 63 for permitting a single step downward movement of the movable conveyor upon each movement of the trip arms 58 out of operative position.

In the arrangement as shown in our drawings each of the eccentric shafts 45, 46 and 47 is provided with a depending arm 68 upon its forward end such arms 68 of the three shafts being connected by means of a heavy transverse bar 69 pivotally connected thereto (see Fig. 5). By the use of the connecting bar 69, when the eccentric shaft 45 is given a rocking movement by power from the cam 44, a similar movement is given also to the shafts 46 and 47. The arrangement is such that when the transfer belts 12 are in their lowered or inoperative position the arms 68 hang in vertical position and that when power is applied to the shaft 45 for raising the belts 12 the bar 69 is moved toward the left in said Fig. 5. For cushioning the return movement of the heavy bar 69, we have provided a heavy buffer 70 preferably of rubber in position to engage and stop the return movement of the bar 69.

As is clearly shown in Fig. 1, each of the belts 12 is supported by two pulleys 71 and 72, each of the pulleys 72 being mounted upon a shaft 73 upon which the clutch 50 is mounted, and each of the pulleys 71 being mounted upon an idler shaft 74. The eccentric shafts 45, 46 and 47 are in spaced relation to each other transversely of the machine, each of said shafts extending across

a short distance below the upper plies of the belts 12, as is clearly shown in Fig. 7. Extending along underneath the top plies of the belts 12 are a series of bar members each comprising a channel 75, a strip 76 preferably of wood, and a metal facing member 77, the upper face of which is in contact with the under face of the top ply of the belt 12. The channels 75 are adjustably supported from the eccentric shafts 45, 46 and 47 by means of eccentrics 78, as is clearly shown in Figs. 7 and 9. When the eccentric shafts are in the position as shown in said Figs. 7 and 9, the upper plies of the belts 12 are supported at a lower level than that of the topmost portions of the rollers 11 and 13 (see Fig. 6). When the shafts are given their rocking movement by power from the cam 44, however the upper plies of the belts are raised to a higher level than that of the topmost portions of the rollers 11 and 13 so as to render the belts effective for lifting a board section out of contact with the rollers.

The train of mechanism between the slide bar 39 actuated by the trip rollers 11 and the clutch 43 as above suggested comprises a trip lever 79 (see Fig. 2) pivoted intermediately upon a frame bar 80 with its upper end held yieldingly by a spring 81 in contact with the rear end of the bar 39. The lower end of the trip lever 79 normally stands in engagement with a lug 82 carried by a transverse slide bar 83 which extends across the machine to a point adjacent to the cam 44 (see Fig. 1). A spring 83*a* connects the end of the bar 83 with any suitable portion of the frame-work for holding the bar yieldingly against movement toward the left in Fig. 6. When the bar 39 is moved toward the left in Fig. 2, the lever 79 is given a rotation in counter-clockwise direction against the action of the comparatively weak spring 81, serving to carry the lower end of such lever 79 out of engagement with the face of the lug 82, whereupon the spring 83*a* serves to move the bar 83 toward the right in Figs. 6 and 9. This serves to swing toward the right an arm 84 depending from a rock shaft 85 for giving such rock shaft a rotary movement in counter-clockwise direction as shown in Figs. 9 and 10. This movement in turn serves to raise an arm 86 extending horizontally from the rock shaft 85 and serving through a link 87 to lift a pawl 88 mounted upon an arm 89 which is fixedly carried by a shaft 90 extending longitudinally of the machine, as is best shown in Fig. 1. The rock shaft 90 in turn is provided at its rear end portion with a depending arm 91 which is connected by means of a link 92 with the clutch 24, such clutch 24 being of the type comprising a spring adapted normally for holding the clutch in operation. Upon the release of the pawl 88 by its upward movement, the arm 89 is free to move toward the right in Fig. 10 under the influence of the spring clutch.

In the construction shown, the clutch 43 is connected by a hub or sleeve 93 and sprocket chain mechanism 94 with the cam 44 for driving such cam by power from the main driving shaft 24. Means is also provided as hereinafter described for throwing the clutch 43 out of operation at the end of a single complete revolution of the cam 44. Means is also provided actuated by a portion of the rotation of the cam 44 for rotating the eccentric shaft 45 in the direction for raising the upper plies of the belts 12, such rotation of the shaft 45 serving to cause the latch arm 48 to be operatively engaged by the latch lever 49 (see Fig. 26) for holding the upper plies of the belts in continued operative position after the cam 44 has passed the position at which it is effective for this purpose.

Means is provided for resetting the bar 83 into operative engagement with the lever 79 after such bar 83 has moved toward the right in Fig. 6 for throwing the clutch 43 into operation as above described. This resetting means comprises an arm 95 carried by the eccentric shaft 46 and depending therefrom, connected at its lower end with a link 96 connected by means of a slot 97 and pin 98 with the bar 83. When the eccentric shaft 46 is given a rocking movement in clockwise direction in said Fig. 6 by reason of its connection with the eccentric shaft 45 by the bar 69 as above set forth, the link 96 is moved toward the left in said Fig. 6. At about the end of the stroke of the link 96 toward the left the pin 98 engages the end of the slot 97 for exerting a pull on the bar 83 toward the left for moving such bar against the action of the spring 83*a* for bringing the lug 82 on such bar again into operative engagement with the lever 79 as shown in Fig. 2. As will be readily understood, the lug 82 is beveled at the side located at the left in Fig. 6 for causing the lug to have a camming effect upon the lever 79 for effecting such reengagement. By the provision of the slot 97, the bar 83 is free to move toward the right independently of the link 96 upon movement of the lever 79 out of latching position as above described.

The means for holding the arm 89 releasably at the limit of its movement toward the left in Figs. 10 and 11 corresponding to the inoperative position of the clutch 43, comprises an arm 99 swingingly mounted upon a sleeve 100 which in turn is revolubly mounted upon the rock shaft 90. This arm 99 normally stands in the position as shown in Fig. 10, being held in such position by a roller 101 revolubly mounted thereon engaging the high point of the cam 44. With the arm 99 in such position, the pawl 88 engaging a lug 102 on the upper end of the arm 99 serves to hold the clutch 43 out of operation. When the pawl 88 is released from the lug 102, the arm 88 is swung toward the right in Fig. 10 into the position as shown in Fig. 11 corresponding to the operative position of the clutch 43. A spring 103 having an operative connection at one end with the arm 99 and at its opposite end with a suitable portion of the frame-work normally holds the arm 99 at the limit of its motion toward the right in said Figs. 10 and 11. As a result of this arrangement, when the pawl 88 has been released so as to cause the clutch 43 to be thrown into operation, the arm 99 swings toward the right in said Figs. 10 and 11 during about the first half of the complete revolution of the cam 44, into the position as shown in Fig. 11. Upon the movement of the arm 99 to the right, the lug 102 is again carried into position at the right of the pawl 88, the pawl being supported from the arm 99 by an arc-shaped sector 104 carried by said arm 99. When the arm 99 is again moved toward the left upon the second half of the rotation of the cam 44, the pawl 88 is again brought into operative engagement with the lug 102. As the result of this construction, the arm 89 is swung toward the left in said figures again into the position as shown in Fig. 10 so as to throw the clutch 43 out of operation at the end of a single complete rotation of the cam 44.

The means for giving the eccentric shaft 45 the rocking movement by power from the cam 44 comprises an arm 105 revolubly mounted upon the sleeve 100, the upper end of such arm 105 be-

ing connected by a link 106 with the lower end of an arm 107 depending from the eccentric shaft 45. The arm 105 is provided with a roller 108 in engagement with the cam 44. With the cam 44 in normal position as shown in Fig. 10, the eccentric shaft 45 is in the position corresponding to the lowered positioned of the transfer belts 12. When, however, the cam 44 is given a rotary movement for carrying the arm 105 toward the left into the position as shown in Fig. 11, the eccentric shaft 45 is rotated for raising the upper plies of the belts 12 as above described, the engagement of the latch lever 49 with the latch arm 48 as shown in Fig. 26 serving to hold the parts in continued operative position after the cam 44 has continued its rotary movement again to the position as shown in Fig. 10.

The means by which the trip arms 55, 56, 57 and 58 are effective for stopping the operation of the belts 12 and for throwing their upper plies out of raised operative position will now be described. For this purpose, we have provided a latch bar 109 supported by pivotally mounted links 110 on the inner face of a transversely extending frame bar 111. At a point adjacent to the eccentric shaft 45 upon which the latch arm 48 is mounted, this latch bar 109 is provided with a pin 112 extending from one face of the bar and normally engaging an arm 113 rising from the latch lever 49 (see Figs. 24 and 25) in such arrangement that when the latch bar 109 is moved a short distance toward the left in Fig. 26 said arm 113 shall be swung toward the left for carrying the lever 49 downwardly out of engagement with the latch arm 48, serving thus to permit the shaft 45 to rotate in clockwise direction in said figure for lowering the top plies of the transfer belts 12. A spring 114 normally draws the arm 113 toward the right in Fig. 24.

The latch bar 109 is provided with upwardly extending lugs 115, 116 and 117 adjacent to the shafts 59, 60 and 61 respectively as is shown in Fig. 13. Each of the shafts 59, 60 and 61 is provided with a dog 118 fixedly mounted thereon adapted, when said shafts are in the position as shown in Fig. 14 with the trip arms 55, 56 and 57 in their lowered positions, to extend normally over the upper ends of the lugs 115, 116 and 117. The arrangement is such that when the trip arms 55, 56 and 57 are in their raised position, corresponding to the condition shown in Fig. 15, the dogs 118 extend downwardly alongside of the lugs 115, 116 and 117 in such position that when the shafts 59, 60 and 61 are rocked in clockwise direction in said Fig. 15 to the position as shown in Fig. 14 said dogs 118 by engagement with said lugs 115, 116 and 117 serve to give the latch bar 109 a limited movement toward the left, serving to release the latch lever 49 from the latch arm 48 as above described. When in such clockwise movement of the dogs 118 the ends of the dogs pass out of engagement with said lugs 115, 116 and 117, the bar 109 is brought back by gravity to normal position as shown in Fig. 14, so as to permit the arm 113 and the latch lever 49 to return to operative position as shown in Fig. 26 ready for engagement with the latch arm 48.

Each of the shafts 59, 60 and 61 is also provided with an arm 119 upon its end portion at the outer face of the frame bar 111. Each of said arms 119 is connected by a coiled spring 120 with a suitable portion of the frame-work of the machine at the left as shown in Fig. 13, the arrangement being such that such springs 120 tend to hold the shafts in the position as shown in Fig. 14, with the trip arms down and tend alternatively to hold the shafts in the position as shown in Fig. 15 with the trip arms up, the arms 119 being arranged in such angular position as to cause the springs 120 to pass the line of centers upon the rocking movement of the shafts from either position to the other. Stop pins 121 are provided upon the frame bar 111 as shown in Fig. 15 for limiting the rocking movements of the shafts 59, 60 and 61 in counter-clockwise direction as shown in said Fig. 15. The rock shaft 62 is likewise provided with a dog 118 and a spring controlled arm 119 as above explained in connection with the rock shafts 59, 60 and 61.

At a point adjacent to the rock shaft 62, the latch bar 109 is provided with an upwardly extending lug 122 of such length as to prevent the dog 118 from passing out of engagement therewith when the shaft 62 is turned to the limit of its movement in clockwise direction as shown in Fig. 17. As a result of this arrangement, when the trip arms 58 are moved downwardly out of operative position, the latch bar 109 is moved toward the left in the same manner as above described in connection with the shafts 59, 60 and 61. The bar 109 is not permitted, however, to return by gravity toward the right, but is maintained in its displaced position as shown in Fig. 17. In this position of the bar 109, the lugs 115, 116 and 117 are held in horizontally spaced relation to the dogs 118 (see Fig. 16) so as to permit a downward swinging movement of the dogs 118 such as is brought about when the trip arms 55, 56, 57 and 58 are reset again to their raised operative positions.

The means for resetting the trip arms 55, 56, 57 and 58 will now be described, together with the means we have provided for selectively operating either the trip arms 56 and 58 or alternatively the trip arms 55, 57 and 58. The means for effecting this resetting operation comprise a resetting bar 123 slidable transversely of the machine adjacent to the frame bar 111. As is clearly shown in Fig. 1, a long coiled spring 124 is connected with the resetting bar 123 and with the frame bar 111 tending to hold the resetting bar yieldingly at the limit of its movement toward the left in Fig. 13. At a point located a short distance to the left of the rock shaft 59 as shown in Fig. 14, a buffer 125 is provided, preferably of rubber, for limiting the movement of the resetting bar 123 toward the left by the action of the spring 124.

The resetting bar 123 is made effective for giving the shafts 59, 60, 61 and 62 the desired rocking movements for carrying the trip arms 55, 56, 57 and 58 to their raised positions by means of pins 126 and 127 extending from the inner face of said bar 123 for engagement with resetting arms 128 carried by the shafts 59 and 61, a pin 129 extending from the opposite face of the bar 123 for engagement with a resetting arm 128 carried by the shaft 60, and a pin 130 carried by said bar 123 for engagement with a resetting arm 128 carried by the shaft 62. The end portion of the bar 123 as shown in Fig. 13 is mounted between lugs or rollers 131 carried by a plate 132 which is mounted upon pivotally mounted links 133 and 134 so as to provide for shifting the end of the bar toward and from the frame bar 111. When the parts are in the position as shown in Fig. 13, the resetting arms 128 carried by the shafts 59 and 61 are in position to engage the pins 126 and 127, while the resetting

arm 128 carried by the shaft 60 is not in position to engage the pin 129. When, however, the bar is shifted toward the frame bar 111, the pins 126 and 127 are moved out of the path of motion of the arms 128 of the shafts 59 and 61, and the pin 129 is moved into the path of movement of the resetting arm 128 carried by the shaft 60. The shifting of the resetting bar 123 in this manner is effected by the use of an arm or lever 135 forming a continuation of the link 134, such lever 135 having a pivotal connection with a link 136 (see Fig. 1) which is adjustably connected with a frame bar 137 in adjusted positions with respect thereto for holding the resetting bar 123 in the selected one of its two alternative positions.

For effecting an operative resetting movement of the resetting bar 123 toward the right in Fig. 13 and toward the left in Fig. 18, we have provided a horizontally extending vertically pivoted lever 138 adjacent to the rock shaft 62 near the forward right-hand corner of the machine. As is clearly shown in Figs. 24 and 26, this lever 138 is connected by a link 139 with the latch arm 48 in such arrangement that when the latch arm is swung downwardly by the rotation of the rock shaft 45 for raising the upper plies of the transfer belts 12 such lever 138 is swung toward the right in Fig. 25 to the position shown in Fig. 26, such movement being toward the left as the parts are shown in Figs. 18 and 19. This swinging movement of the lever 138 toward the left in Fig. 18 occurs every time the clutch 43 is thrown into operation by the action of one of the trip rollers 11 for effecting a rotation of the cam 44 for raising the upper plies of the belts. The lever 138 is likewise given a return swinging movement toward the right in said Fig. 18 every time the latch lever 49 is released by the action of one of the trip arms when actuated by a board section being carried across the end of the machine by such transfer belts 12. Motion is transmitted from said lever 138 to the resetting bar 123 by means of a pin 140 extending upwardly from the lever and engaging a hook 141 pivotally mounted on a bracket 141*a* carried by the resetting bar 123. A lug 141*b* carried by the hook 141 serves to limit the swinging movement of the hook away from the resetting bar. Means is provided for throwing the hook 141 into and out of operative position with respect to the pin 140 in timed relation to the movement of the board sections by the transfer belts 12, the arrangement being such in our machine as shown that the hook 141 is held out of operative position so as not to engage the pin 140 except upon the stroke of the lever 138 toward the left in said Fig. 18 next following the downward movement of the trip arm 58.

In our arrangement, means is provided controlled by the rotation of the shaft 62 for throwing the hook 141 into operative position upon the downward stroke of the trip arms 58 and for withdrawing the hook from operative position upon the upward or resetting stroke of the trip arms. This means comprises a bar 142 pivotally mounted on swinging links 143 and 144, the link 143 being pivotally mounted on the frame bar 111 and the link 144 being pivotally mounted on a bracket 145 extending horizontally from said frame bar. A coiled spring 146 is connected between the link 143 and the frame bar 111 tending to hold the bar 142 moved to the limit of its motion toward the left in said Fig. 18. In the arrangement shown, the link 144 is pivotally connected with the bar 142 by means of a pin or bolt 147, the lower end portion of which is adapted to engage the edge of the hook 141. The arrangement is such that when the bar 142 is moved to the limit of its motion toward the right in Fig. 18 a flat spring 148 carried by the resetting bar 123 moves the hook 141 into its operative position as shown in said Fig. 18. When, however, the bar 142 is moved to the limit of its motion toward the left in said Fig. 18, as is illustrated in Fig. 19, the pin or bolt 147 by engagement with the edge of said hook 141 forces the hook toward the resetting bar against the action of the flat spring 148 into the position as shown in said Fig. 19 where it is out of the path of movement of the pin 140 carried by the lever 138.

Means is provided controlled by the rotation of the shaft 62 for moving the bar 142. This means in the arrangement shown comprises a standard 149 rising from the bar 142 and provided with a roller 150 on its upper end portion engaging a cam 151 carried by the shaft 62. The arrangement is such that when the trip arms 58 are in their lowered position corresponding to the showing of Fig. 20 the cam 151 holds the bar 142 the limit of its movement toward the right in said Fig. 20 against the action of the spring 146. When the shaft 62 is given a rotary movement in clockwise direction in said Fig. 20 to the position as shown in Fig. 21 for raising the trip arms 58 to their operative positions, the roller 150 is permitted by the cam 151 to move toward the left in said Fig. 21 under the influence of the spring 146 for carrying the hook 141 out of operative position against the action of the flat spring 148.

As will be readily understood from the above, the hook 141 is at all times out of operative position except when the trip arms 58 are in their lowered inoperative positions. When the two board sections are moved toward the left from the position as shown in Fig. 38, or the three board sections are moved toward the left from the position as shown in Fig. 44, the leading edge of the board section farthest to the left engages one or both of the trip arms 58 so as to throw such trip arms out of operative position, serving thus to throw the hook 141 into operative position. When thereafter the next succeeding board section reaches the position as shown in Fig. 36 or Fig. 40, and the lever 138 is given a movement toward the left in Fig. 18 under the influence of the latch arm 48, the hook 141 by engagement with the pin 140 carries the resetting bar 123 toward the left in Fig. 18 (toward the right in Fig. 13) for resetting the trip arms 58 and resetting either the trip arm 56 or the trip arms 55 and 57 depending upon the adjustment of the link 136 as above described. When the hook 141 in engagement with the pin 140 of the lever 138 is moved a sufficient distance toward the left in Fig. 18 for insuring the resetting of the several trip arms in use, the hook 141 is brought into engagement with a pin 152 rising from a bracket 153 carried by the frame bar 111 so as to be released from the pin 140 by a camming action of said pin 152 on the end portion of the hook. The subsequent movements of the lever 138 do not have any operative effect until the hook 141 is again thrown into operative position upon the next following downward movement of the trip arms 58.

Means is also provided actuated by the strokes of the lever 138 for releasing the latch 63 by a forward pull on the link 67 in timed relation to

the movement of the board sections along the transfer belts 12. As is shown in Fig. 1, the forward end of the link 67 is connected with a short arm 154 pivotally mounted on the same axis as that upon which the lever 138 is mounted. A lever 155 rigidly connected with the arm 154 extends forwardly alongside of the lever 138, the arrangement being such that when the lever 155 is given a swinging movement toward the lever 138 the latch 63 is withdrawn from the rack on the kiln for permitting the movable conveyor to descend.

The means provided for giving the lever 155 an operative movement in the desired timed relation by power from the lever 138 comprises a hook 156 pivotally mounted on the upper end of a bracket 157 carried by said lever 155. The upper end of the bracket 157 is provided with a lug 158 adapted by engagement with the edge of the hook 156 to limit the swinging movement of the hook in clockwise direction as shown in Fig. 18. The hook is normally held swung to the limit of its motion in clockwise direction in said figure by a coiled spring 159 connected between the hook and the lever 155. The arrangement is such that when the hook is in operative position it is adapted to engage a pin 160 rising from the lever 138 adjacent to the pin 140 so as to draw the lever 155 toward the right in Fig. 18 upon a stroke of the lever 138 toward the right. A pin 161 is also provided in the path of the operative movement of the hook 156 adapted by a camming engagement with the end of the hook to disengage the hook from the pin 160 at the end of the operative stroke of the lever 155 toward the right in said Fig. 18. This pin 161 is carried by a bracket 162 mounted on the bracket 145.

In the arrangement shown, means is provided for holding the hook 156 normally out of operative position and arranged to permit the hook to move into operative position in timed relation to the movement of the board sections. This result is effected by the mechanism already described, the pin or bolt 163 by which the bar 142 is pivotally connected with the link 143 being adapted by engagement with the edge of the hook to hold the hook out of operative position when the bar 142 is standing at the limit of its motion toward the left in Fig. 19 but to permit the spring 159 to move the hook into operative position when the bar 142 is moved toward the right in said figure into the position as shown in Fig. 18. The arrangement of the cam 151 is such that when the shaft 62 is given only a slight rotation in counterclockwise direction in Fig. 21 when the trip arms 58 start their downward movement under the influence of the board sections on the transfer belts 12 the bar 142 is moved quickly toward the right into the position as shown in Fig. 18, this being done before the dog 118 on said shaft 62 has acted upon the lug 122 and consequently before the latch lever 49 has been released from the latch arm 48. The arrangement is such that upon the downward movement of the trip arms 58 the hook 156 is first thrown into engagement with the pin 160 carried by the lever 138 and that upon the stroke of the lever 138 following immediately the hook 156 and the lever 155 are given an operative stroke toward the right in said Figs. 18 and 19.

Means is provided for shifting the shafts 59, 60 and 61 slightly transversely of the machine for controlling the positions at which the trip arms 55, 56 and 57 are operative. This means comprises a transversely extending bar 164 (see Fig. 1) provided with suitable bearings for said shafts, said bar being slidable transversely of the machine through the medium of a bell crank lever 165 which in turn is operated by a link 166 adjustably connected with the frame bar 137.

The means for throwing the transfer belts 12 into operation in timed relation to the movements of the board sections on said belts through the medium of the clutch 50 and the shaft 73 comprises a cam member 167 (see Fig. 27) slidably mounted on the shaft 73 adapted when moved toward the right in said Fig. 27 to throw the clutch into operation by the action of a lever 168 which is displaced outwardly upon such movement of the cam. A braking mechanism 169 of any suitable type is provided in connection with the cam 167 adapted to resist the rotation of the shaft 73 when the cam is moved toward the left in said figure.

Motion is transmitted to the cam 167 through a lever 170 rising from one end of a transversely disposed shaft 171 the opposite end of which is connected by horizontally extending arms 172 and a link 173 with a short arm 174 carried by the shaft 45. As is shown in Fig. 25, the link 173 is connected with the arms 172 by means of a pin 175 carried by the arms 172 working in a slot 176 in the link. The arrangement is such that when the shaft 45 is given an operative rotary movement in counterclockwise direction in Fig. 24 for raising the upper plies of the transverse belts 12 as above described the link 173 is moved upwardly, serving at about the end of such upward movement to raise the arms 172 for giving the shaft 171 a rocking movement in clockwise direction in Fig. 27 for throwing the clutch 50 into operation. A coiled spring 177 connected between the arm 170 and a bracket 178 carried by the frame bar 111 serves to resist the movement of the arm 170 toward the right. This spring also serves to throw the clutch 50 quickly out of operation upon a slight movement of the arm 170 toward the left in said Fig. 27 whereby the drive of the belts 12 is discontinued and the brake 169 is applied for stopping the rotation of the shaft 73 before the shaft 45 is rotated sufficiently for lowering the upper plies of the transverse belts.

Referring now particularly to Figs. 1 and 28, it will be seen that the movable conveyor comprising the rollers 14 and the endless belts 16 mounted on the frame-work 15 is pivotally mounted at the receiving end so as to take the board sections readily from the rollers 13, in the construction shown the conveyor being pivotally mounted on the shaft upon which the pulleys for the belts 16 are mounted. In our drawings, this shaft is indicated by the numeral 179, and the pulleys by the numerals 180. This shaft is driven for operating the belts 16 by sprocket chain driving means 181 connecting the shaft with the main driving shaft 24. The shaft 179 is also connected by sprocket chain driving means 182 with the roller 13 farthest toward the left in Fig. 1, which roller in turn is connected by sprocket chain driving means 183 with the remaining rollers 13.

For raising the movable conveyor comprising the endless belts 16 to its uppermost position at which it is held releasably in position by the releasable latch 63, we have provided a hydraulic ram at each side of the machine as is clearly shown in Fig. 29, the cylinders being indicated by the numerals 184 and the pistons

by numerals 185. In Fig. 29 and certain other figures of the drawings, we have indicated the conveyor proper diagramatically by a dotted line showing, the conveyor in such instances being indicated by the numeral 186. As it clearly shown in said Fig. 29, the pistons 185 are connected together by means of a cross bar 187 which in turn is connected by links 188 with a cross bar 189 extending transversely of the movable conveyor.

As is clearly shown in Figs. 28 and 29, a frame-work is erected across the conveyor at an intermediate point, such frame-work comprising upright beams 190 connected by a cross bar 191. For counter-balancing the weight of the conveyor more or less completely, we have provided cables 192 connected with the ends of a cross bar 193 of the conveyor, such cables extending upwardly from the conveyor about suitably supported pulleys 194 and thence downwardly to suitable counter-balancing weights 195.

The means for feeding fluid under pressure to the cylinders 184 underneath the pistons 185 comprises a pump 196 driven by an electric motor 197, the motor 197 being driven by electrical power delivered through a cable 198 from a switch 199 (see Fig. 30). The motor and pump in the construction shown are mounted upon a heavy bracket 200 extending out from the standard 190 at the left as shown in Fig. 29.

The pump 196 is connected with the cylinders 184 by means of a line of piping 201 which extends directly from the pump to the cylinder at the left in Fig. 29 and extends upwardly and over to the cylinder at the opposite side as is best shown in Fig. 29. Oil or other fluid to be delivered by the pump 196 to the cylinders 184 under pressure is taken from a tank 202 through a pipe 203 connecting the tank with the pump. The arrangement is such that when the motor 197 operates, the pump delivers oil from the tank 202 to the cylinders underneath the pistons serving to raise the pistons and the movable conveyor 186. In the construction illustrated, a pressure controlled safety valve 204 is provided in the line of piping 201, being connected by a pipe 205 with the tank 202. The arrangement is such that if the conveyor is held rigidly against upward movement while the motor and pump continue to operate the fluid under pressure from the pump is adapted to be diverted through the pressure control relief valve 204 directly to the tank 202 so as to avoid unnecessary breakage. We have also provided a check valve 206 in the line of piping 201 for preventing the flow of the oil or other fluid under pressure in the reverse direction to the pump 196.

For permitting the discharge of oil from the cylinders 184 to the tank 202 independently of the pump, we have provided a by-pass pipe 207 leading from the line of piping 201 to the tank 202. This pipe 207 is provided with an adjustable valve 208 by which the rate of flow through the pipe 207 may be regulated. As will be readily understood, when the pipe 207 is open except for the partial closure by the valve 208, and with the conveyor supported mechanically only by a latch 63 at each side of the machine, when such latch 63 is retracted by a pull on the link 67 as above described, the conveyor is adapted to move downwardly until it is stopped mechanically by the latch 63 or in some other suitable manner, the rate of such movement being controlled directly by the adjustment of the valve 208, such valve 208 and its cooperating parts comprising in effect a fluid operated cushioning trap.

As will be readily understood in order that the pump 196 shall be effective for raising the movable conveyor, it is necessary that the by-pass pipe 207 be closed during the effective operation of the pump. This result is effected in the construction illustrated by the use of a shut-off valve 209 interposed in the by-pass piping 207, such shut-off valve being connected with a lever 210 for control by the lever in timed relation to the movements of the conveyor. The lever 210 in the construction shown is pivotally mounted on a bracket 211 extending from one of the standards 190, as is best shown in Fig. 35.

The means for controlling the movements of the movable conveyor comprises a lever 212 pivotally mounted at its intermediate point upon a bracket 213 upon which the switch 199 is mounted. The arrangement is such that, when the lever 212 stands in the position as shown in Fig. 30 where it is turned to the limit of its motion in clockwise direction, the switch is open, the switch shown being of that type normally held open by spring pressure, and that when the lever is turned to the limit of its motion in the opposite direction to the position as shown in Fig. 34 the switch is closed. For holding the lever 212 releasably in the position at which the switch is closed against the action of the spring means of the switch, we have provided a latch lever 214 adapted by engagement with a pin 215 on the lever 212 to hold said lever in the position as shown in said Fig. 34. In the arrangement shown, the lever 214 is normally held turned to the limit of its motion in counter-clockwise direction as shown in Fig. 34 by a spring 215*a* connected between the horizontal arm of the lever and the standard 190.

In the construction as illustrated, the lever 212 is automatically swung to the position as shown in Fig. 34 by means controlled by the movement of the movable conveyor to its lowermost position and actuated by the movement of the link 65 by which the latch 63 is controlled. This means comprises a short arm 216 fixedly mounted on the link 65 in such position as to engage a pin 217 carried by a vertically disposed arm 218, said arm 218 being mounted on one end of a rock shaft 219, the opposite end of which is provided with a horizontally extending arm 220 whose outer end in turn is connected by a link 221 with the lever 212. The arrangement is such that when the movable conveyor reaches its lowermost position the arm 216 stands directly opposite the pin 217 at the right of said pin as shown in Fig. 31. When shortly thereafter the link 65 is given a stroke toward the left in said Fig. 31, through the action of the lever 155 as above described, the arm 218 is swung toward the left in said Fig. 31 serving to move the arm 220 downwardly for swinging the lever 212 in the direction for closing the switch 199. This results in the operation of the motor 197 and the pump 196 for forcing oil into the cylinders 184 for raising the movable conveyor. For effecting such result, however, it is necessary that the valve 209 also be closed. For accomplishing this purpose, we have provided a link 222 in the form of a spring connected between the lever 212 and the lever 210. The spring link 222 is of sufficient strength for insuring that the lever 210 shall be drawn downwardly for closing the valve 209 upon a downward stroke of the lever 212 to the position as shown in Fig. 34. A spring 223 connected between the lever 210 and the standard 190 in opposition to the spring 222 serves for holding the lever 210 in its raised position for holding the valve 209 open when the

lever 212 stands in its raised position as shown in Figs. 30 and 32.

When the lever 212 is moved to the position as shown in Fig. 34 for starting the motor and the pump, it is held in its turned position against the action of the switch spring means until the latch lever 214 is moved in clockwise direction in said Fig. 34 against the action of the spring 215 out of engagement with said lever 212. In our arrangement, this is effected automatically when the movable conveyor reaches its uppermost position, such result being attained by reason of an arm 224 carried by the cross bar 193 of the movable conveyor. As is shown in Fig. 34, the lower end of the arm 224 is so positioned as to engage the outer end of the horizontal arm of the latch lever 214 at about the time when the conveyor reaches the uppermost desired position so that upon a very slight additional upward movement after such engagement the latch will be released for bringing about an opening of the switch 199 for stopping the upward movement of the conveyor.

In operation, when a board section such as the section 17 in Fig. 36 moves toward the right in Fig. 1, into engagement with the operative one of the idler rollers 11 as controlled by the position of the slide bar 30, the ratchet 29 and pawl 38 serve to move the bar 39 toward the left in Fig. 2 for releasing the trip lever 79. As is above described, this serves through the bar 83 and its connected parts to throw the clutch 44 into operation for raising the upper plies of the belts 12 for moving the board section transversely of the machine, the belts 12 being actuated through the medium of the clutch 50 which is automatically thrown into operation. The clutch 44 is automatically thrown out of operation and reset as above set forth in detail, the belts 12 and cooperating parts being held in operative position thereafter by the engagement of the latch lever 49 with the latch arm 48. The trip lever 79 (see Fig. 2) is reset into operative engagement with the bar 83 through the medium of the link 96 (see Fig. 6) in connection with the raising of the belts 12 into operative position as heretofore described.

When the board section moves into position as shown in Fig. 37, it engages the trip arm 56, serving through the cooperating parts to release the latch lever 49 for permitting the belts 12 to move out of operative position, and serving at the same time to open the clutch 50. When thereafter a second board section comes into the position of the section 18 in Fig. 38, the belts 12 are again thrown into operation in the manner above described for carrying the two sections toward the left in Fig. 38 until the board section 17 engages the trip arms 58 for throwing the belts 12 out of operation, for opening the clutch 50, for retracting the latch 63 so as to permit the movable conveyor to descend one notch, and for moving the bar 142 from the position as shown in Fig. 19 to the position shown in Fig. 18 so as to effect a resetting of the trip arms upon the next succeeding movement of the lever 138 toward the left in said figures (toward the right in Fig. 24) by the action of the latch arm 48.

When the trip arm 58 is moved out of operative position as above suggested serving to throw the belts 12 out of operation, the two board sections 17 and 18 are lowered into position upon the rollers 13 by which the board sections are delivered to the rollers 14 and the belts 16 so as to be carried to the kiln 16*a*.

The arrangement of the movable conveyor and its cooperating parts is such as above described that the conveyor is moved downwardly a single notch following each successive delivery of board sections thereto until at the lowermost position the lever 218 is brought into action, (see Fig. 32) for swinging the lever 212 downwardly for starting the motor 197 and the pump 196 for raising the conveyor, the link 222 serving at the same time through the lever 210 to close the valve 209 for insuring delivery of the pumped oil to the cylinders 184. When the conveyor reaches its uppermost position (see Fig. 34), the arm 224 serves by engagement with the lever 214 to release the lever 212 for throwing the motor and pump out of operation and for opening the valve 209.

By our improved arrangement as above described, we have provided for automatic handling of the board sections for their transfer from the board machine to the kiln. The arrangement is such that a single attendant at the forward end of the board machine is easily able to do everything necessary in connection with proper running of the machine, in marked contrast to constructions heretofore in use in connection with which three or four attendants were kept working under pressure for taking care of the product from the board machine. Moreover, by the use of our construction, the board sections are arranged evenly in the kiln so that the drying is effected evenly without excessive heat on any particular piece of board. The arrangement is such that the single attendant in charge of the forward end of the board machine and of the transfer mechanism can very easily within a few seconds make the necessary adjustments for successful operation on different widths of board. We have found in practice in the use of our improved mechanism that there is practically no waste whatever in the operation of the machine due to misplacement or to displacement of the board sections on the machine.

While we prefer to employ substantially the form of mechanism as shown in our drawings and as above described, it is to be understood that our invention is not limited to such construction except so far as the claims may be so limited by the prior art.

We claim:—

1. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, means actuated by the movement of a board section on said transfer mechanism for throwing the transfer mechanism out of operation when the section has moved a distance slightly greater than its width so as to accommodate the next succeeding board section on the transfer mechanism alongside of said first named board section, and means actuated by the movement of said two board sections on said transfer mechanism for throwing the transfer mechanism again out of operation when said sections reach the limit of their movement on said transverse transfer mechanism.

2. In a mechanism of the type described, the

combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, and manually controlled adjustable means for silencing said means for throwing the transfer mechanism into operation whereby at any time the desired number of board sections may be forced off the end of said first named conveyor in lieu of being handled by said transfer mechanism.

3. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, a trip roller in the path of movement of a board section along said conveyor, and means actuated by the rotation of said trip roller by a board section passing along said conveyor for throwing said transverse transfer mechanism into operation.

4. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, a plurality of trip rollers in the path of movement of a board section along said conveyor, means actuated by the rotation of a selected one of said trip rollers by a board section passing along said conveyor for throwing said transverse transfer mechanism into operation, a control member, and means comprising a plurality of cams operable differentially by said control member whereby any selected one of said trip rollers may be made operative or alternatively all of said trip rollers may be made inoperative.

5. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, means actuated by the movement of a board section on said transfer mechanism for throwing the transfer mechanism out of operation when the section has moved a distance slightly greater than its width so as to accommodate the next succeeding board section on the transfer mechanism alongside of said first named board section, means actuated by the movement of said two board sections on said transfer mechanism for throwing the transfer mechanism out of operation when said two sections have moved a distance slightly greater than the width of one of said sections so as to accommodate the next succeeding board section on the transfer mechanism alongside of said two sections, and means actuated by the movement of said three board sections on said transfer mechanism for throwing the transfer mechanism out of operation when said three sections reach the limit of their movement on said transverse transfer mechanism.

6. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, means actuated by the movement of a board section on said transfer mechanism for throwing the transfer mechanism out of operation when the section has moved a distance slightly greater than its width so as to accommodate the next succeeding board section on the transfer mechanism alongside of said first named board section, means actuated by the movement of said two board sections on said transfer mechanism again out of operation when said sections reach the limit of their movement on said transverse transfer mechanism, and means for providing an adjustment transversely of the machine for the means by which the transfer mechanism is thrown out of operation at the end of the initial transverse movement of said first noted board section whereby the clearance between said first named board section and the succeeding board section may be controlled.

7. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism in the form of a plurality of endless belts across the end of said conveyor and extending transversely therefrom, power driven means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for raising the upper plies of said belts into position for taking the board section from the end of said conveyor and giving the section a movement transversely of the machine, and clutch mechanism thrown into operation by said power driven means for driving said belts.

8. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism in the form of a plurality of endless belts across the end of said conveyor and extending transversely therefrom, power driven means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for raising the upper plies of said belts into position for taking the board section from the end of said conveyor and giving the section a movement transversely of the machine, clutch mechanism thrown into operation by said power driven means for driving said belts, and means actuated by the movement of the board section along said belts for throwing said clutch mechanism out of operation and lowering the upper plies of said belts out of operative position.

9. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism in the form of a plurality of endless belts across the end of said conveyor and extending transversely therefrom, power driven means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for raising the upper plies of said belts into position for taking the board section from the end of said conveyor and giving the section a movement transversely of the ma-

chine, clutch means thrown into operation by said power driven means against the action of a spring for driving said belts, latching means for holding the upper plies of said belts in raised position and holding said clutch mechanism in operation and means actuated by the movement of the board section along said belts for releasing said latching means so as to permit said clutch to be thrown out of operation and permitting the operative plies of the belts to move downwardly.

10. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism in the form of a plurality of endless belts across the end of said conveyor and extending transversely therefrom, a plurality of heavy rock shafts extending across underneath the upper plies of said belts, bars extending over said shafts underneath said upper plies, eccentrics on said shafts adapted upon rotation of the shafts to raise said bars and said upper plies for elevating the board section from said conveyor, power driven means actuated by each board section in turn as it reaches approximately the end of said conveyor for giving said shafts a rotary movement for elevating said board section, and clutch mechanism thrown into operation by said power driven means for driving said belts.

11. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism in the form of a plurality of endless belts across the end of said conveyor and extending transversely therefrom, a plurality of heavy rock shafts extending across underneath the upper plies of said belts, bars extending over said shafts underneath said upper plies, eccentrics on said shafts adapted upon rotation of the shafts to raise said bars and said upper plies for elevating the board section from said conveyor, power driven means actuated by each board section in turn as it reaches approximately the end of said conveyor for giving said shafts a rotary movement for elevating said board section, clutch mechanism thrown into operation by said power driven means for driving said belts, latching means for holding said shafts in turned position serving to maintain the belts in raised operative position and to hold said clutch in continued operation, and means actuated by the movement of the board section at the desired point along said belts for releasing said latching means for stopping the belts and lowering their upper plies.

12. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism in the form of a plurality of endless belts across the end of said conveyor and extending transversely therefrom, a plurality of heavy rock shafts extending across underneath the upper plies of said belts, bars extending over said shafts underneath said upper plies, eccentrics on said shafts adapted upon rotation of the shafts to raise said bars and said upper plies for elevating the board section from said conveyor, power driven means actuated by each board section in turn as it reaches approximately the end of said conveyor for giving said shafts a rotary movement for elevating said board section, clutch mechanism thrown into operation by said power driven means for driving said belts, latching means for holding said shafts in turned position serving to maintain the belts in raised operative position and to hold said clutch in continued operation, and means comprising a plurality of trip arms located at different points along said belts in position to be actuated successively by the movement of the board section along the belts adapted to release said latching means for stopping the belts and lowering their upper plies at points corresponding to the locations of said trip arms.

13. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms located at different points along said transverse transfer mechanism adapted when in upright position to be engaged by a board section moving along said transfer mechanism, yielding means connected with said trip arms in position to be moved past centers for holding the trip arms yieldingly in either their upright operative positions or their turned inoperative positions, and means actuated by the downward movement of each of said trip arms successively when engaged by the board section on said transfer mechanism to throw said transfer mechanism out of operation for stopping the board section at a position corresponding to the position of the trip arm.

14. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms located at different points along said transverse transfer mechanism adapted when in upright position to be engaged by a board section moving along said transfer mechanism, yielding means connected with said trip arms in position to be moved past centers for holding the trip arms yieldingly in either their upright operative positions or their turned inoperative positions, a trip bar movable transversely of the machine, dogs carried by the trip arms in position to engage lugs on the trip bar for giving the trip bar a longitudinal movement upon the downward movement of a trip arm, and means actuated by such longitudinal movement of the trip bar for throwing said transfer mechanism out of operation for stopping the transverse movement of the board section.

15. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms located at different points along said transverse transfer mechanism adapted when in upright position to be engaged by a board section moving along said transfer mechanism, yielding means connected with said trip arms in position

to be moved past centers for holding the trip arms yieldingly in either their upright operative positions or their turned inoperative positions, a trip bar movable transversely of the machine and tending normally to return to a predetermined position after displacement, lugs carried by said bar, dogs carried by the several trip arms with the exception of the trip arm located farthest away from said first named conveyor each adapted upon the downward movement of its trip arm to engage one of said lugs for moving the trip bar out of its predetermined normal position and to move past said lug for permitting the trip bar to return to said predetermined position, a dog carried by said trip arm located farthest away from said first named conveyor adapted upon the downward movement of its trip arm to engage one of said lugs for moving the trip bar out of its predetermined normal position and adapted to remain in engagement therewith for maintaining the trip bar out of normal position, and means actuated by said movements of the trip bar out of normal position for throwing said transfer mechanism out of operation for stopping the transverse movement of the board section.

16. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms located at different points along said transverse transfer mechanism adapted when in upright position to be engaged by a board section moving along said transfer mechanism, means actuated by a downward movement of each of said trip arms successively when engaged by a board section on said transfer mechanism to throw said transfer mechanism out of operation for stopping the board section at a position corresponding to the location of the trip arm, and means adapted automatically when the transfer mechanism is thrown into operation next following the downward movement of the trip arm located farthest away from said first named conveyor to reset the several trip arms into their upright position.

17. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms located at different points along said transverse transfer mechanism adapted when in upright position to be engaged by a board section moving along said transfer mechanism, means actuated by a downward movement of each of said trip arms successively when engaged by a board section on said transfer mechanism to throw said transfer mechanism out of operation for stopping the board section at a position corresponding to the location of the trip arm, a lever, means for swinging said lever in one direction when said transfer mechanism is thrown out of operation and for swinging it in the opposite direction when the transfer mechanism is thrown into operation, and means operated by the next succeeding movement of said lever in said opposite direction following the downward movement of the trip arm located farthest away from the first named conveyor for resetting the several trip arms into their upright positions.

18. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms located at different points along said transverse transfer mechanism adapted when in upright position to be engaged by a board section moving along said transfer mechanism, means actuated by a downward movement of each of said trip arms successively when engaged by a board section on said transfer mechanism to throw said transfer mechanism out of operation for stopping the board section at a position corresponding to the location of the trip arm, a resetting bar slidably mounted transversely of the machine, a lever, means for swinging said lever in one direction when said transfer mechanism is thrown out of operation and for swinging it in the opposite direction when the transfer mechanism is thrown into operation, a hook member movably mounted on said resetting bar adapted normally to stand clear of said lever and adapted in a changed position to engage the lever for movement therewith, means actuated by the movement of said resetting bar with said lever for moving said trip arms to their upright positions, and means actuated by the downward movement of the trip arm located farthest away from the first named conveyor for moving said hook member into said changed position for engagement with lever.

19. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, means actuated by each board section in turn as it reaches approximately the end of said first named conveyor for throwing said transverse transfer mechanism into operation, a plurality of trip arms arranged at varied positions along said transfer mechanism, means actuated by the downward movement of any one of said trip arms for throwing said transverse mechanism out of operation, a resetting bar slidably mounted transversely of the machine, resetting arms connected with said trip arms respectively and located some at one face and others at the opposite face of said resetting bars, lugs on said resetting bars for engagement with said resetting arms, and means for giving said resetting bar a movement transversely of the bar, the arrangement being such that in one position the lugs engage only the resetting arms at one face of the bar and that in the other position the lugs engage only the resetting arms at the opposite face of the bar.

20. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board sec-

tion in turn from said conveyor and giving the section a movement transversely of the machine, a trip roller in the path of movement of the board section along said conveyor, clutch means adapted when thrown into operation in turn to throw said transverse transfer mechanism into operation, yielding means tending to hold said clutch means in operation, latch means for holding said clutch means out of operation against the action of said yielding means, and means actuated by the rotation of said trip roller by a board section passing along said conveyor for releasing said latching means.

21. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, a trip roller in the path of movement of the board section along said conveyor, clutch means adapted when thrown into operation in turn to throw said transverse transfer mechanism into operation, yielding means tending to hold said clutch means in operation, latch means for holding said clutch means out of operation against the action of said yielding means, means actuated by the rotation of said trip roller by a board section passing along said conveyor for releasing said latching means, and means actuated by said clutch means after a predetermined rotary movement thereof for throwing the clutch means out of operation and resetting said latching means after said transfer mechanism has been thrown into operation.

22. In a mechanism of the type described, the combination of a conveyor for carrying forward a series of board sections, transverse transfer mechanism for taking each successive board section in turn from said conveyor and giving the section a movement transversely of the machine, a trip roller in the path of movement of the board section along said conveyor, a cam, clutch means adapted when thrown into operation to rotate said cam, means actuated by a partial revolution of said cam to throw said transverse transfer mechanism into operation, yielding means tending to throw said transfer mechanism out of operation, latching means for holding said transfer mechanism in operation independently of said cam, yielding means tending to hold said clutch means in operation, latching means for holding said clutch means out of operation against the action of said second named yielding means, means actuated by the rotation of said trip roller by a board section passing along said conveyor for releasing said second named latching means for throwing said clutch into operation, and means actuated by a complete revolution of said cam for throwing the clutch out of operation.

23. In a mechanism of the type described, the combination of a vertically movable conveyor, a transverse transfer mechanism for carrying a board section transversely of the conveyor into alignment therewith, an upright rack member and latching means one of which is carried by said conveyor for releasably supporting the conveyor, and means actuated by the movement of a board section along said transfer mechanism into alignment with said conveyor for releasing said latching means for permitting the conveyor to descend until the next succeeding rack tooth engages said latching means and timed with respect to the movement of the board sections along said conveyor for preventing such downward movements during the delivery of the board from the conveyor.

24. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections therealong to different levels, means for releasably supporting said conveyor at the several elevated positions, means for delivering board sections to said movable conveyor, power actuated means for raising said conveyor, and means actuated by the movement of a board section to said movable conveyor after a predetermined downward movement of the conveyor for throwing said conveyor raising means into operation for effecting an upward movement of the conveyor and timed with respect to the movement of the board sections along said conveyor for insuring the completion of such upward movement during a period between successive deliveries of board from the conveyor.

25. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, a transverse transfer mechanism movable vertically into and out of operative position for carrying board sections transversely of the conveyor into longitudinal alignment therewith, latching means for holding said transfer mechanism in elevated operative position, other latching means for releasably supporting said conveyor at any one of the several levels at which board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means actuated by the movement of a board section along said transfer mechanism for releasing said first named latching means for permitting the transfer mechanism to move downwardly out of operative position, and means actuated by the downward movement of said transfer mechanism out of operative position for releasing said second named latching means for permitting the conveyor to descend to the next lower level.

26. In a mechanism of the type described, the combination of a vertically movable conveyor, a transverse transfer mechanism for carrying a board section transversely of the conveyor into alignment therewith, an upright rack member and latching means one of which is carried by said conveyor for releasably supporting the conveyor, means actuated by the movement of a board section along said transfer mechanism into alignment with said conveyor for throwing said transfer mechanism out of operation, and means actuated by the movement of said transfer mechanism out of operative position for releasing said latching means for permitting the conveyor to descend until the next succeeding rack tooth engages said latching means.

27. In a mechanism of the type described, the combination of a vertically movable conveyor, a transverse transfer mechanism for carrying a board section transversely of the conveyor into alignment therewith, an upright rack member and latching means one of which is carried by said conveyor for releasably supporting the conveyor, a lever, means actuated by the movement of said transfer mechanism out of operative position for swinging said lever, a second lever, a hook member movably mounted on one of said levers adapted normally to stand clear of the other lever and adapted in a changed position to engage said other lever for causing the two levers to swing in unison, means actuated by the movement of a board section along said transfer mechanism into

alignment with said conveyor for initially moving said hook into position for engaging the adjacent lever and for then throwing said transfer mechanism out of operation for giving said two levers an operative swinging movement, and means actuated by said operative swinging movement of said first named lever for releasing said latching means for permitting the conveyor to descend until the next succeeding rack tooth engages said latching means.

28. In a mechanism of the type described, the combination of a vertically movable conveyor, a cylinder, a piston operatively mounted in said cylinder, means actuated by a stroke of the piston for raising said conveyor, means for feeding board sections to said movable conveyor, and means con rolled by the movement of said board sections to said conveyor for forcing fluid under pressure into said cylinder for giving said cylinder and piston a relative movement, the timing of the movements of board sections to said conveyor and the movements of said sections along said conveyor and the timing of the upward movements of the conveyor by said piston both with respect to their duration and with respect to their relative sequence being such that said upward movements are in each instance completed during the interval between successive deliveries of board sections from said conveyor.

29. In a mechanism of the type described, the combination of a vertically movable conveyor, a cylinder, a piston operatively mounted in said cylinder, means actuated by a stroke of the piston for raising said conveyor, means for feeding board sections to said movable conveyor, means controlled by the movement of said board sections to said conveyor for lowering the conveyor by intermittent step movements, and means rendered operable by the movement of the conveyor to its lowermost position for forcing fluid under pressure into said cylinder for giving said cylinder and piston a relative movement, the timing of the movements of board sections to said conveyor and the movements of said sections along said conveyor and the timing of the upward movements of the conveyor by said piston both with respect to their duration and with respect to their relative sequence being such that said upward movements are in each instance completed during the interval between successive deliveries of board sections from said conveyor.

30. In a mechanism of the type described, the combination of a vertically movable conveyor, a cylinder, a piston operatively mounted in said cylinder, means actuated by a stroke of the piston for raising said conveyor, means for feeding board sections to said movable conveyor, means controlled by the movement of said board sections to said conveyor for lowering the conveyor by intermittent step movements, means rendered operable by the movement of the conveyor to its lowermost position for forcing fluid under pressure into said cylinder for giving said cylinder and piston a relative movement, and means actuated by the movement of the conveyor to its topmost position for stopping the stream of fluid under pressure into said cylinder, the timing of the movements of board sections to said conveyor and the movements of said sections along said conveyor and the timing of the upward movements of the conveyor by said piston both with respect to their duration and with respect to their relative sequence being such that said upward movements are in each instance completed during the interval between successive deliveries of board sections from said conveyor.

31. In a mechanism of the type described, the combination of a vertically movable conveyor, a cylinder, a piston operatively mounted in said cylinder, means actuated by a stroke of the piston for raising said conveyor, means for feeding board sections to said movable conveyor, means controlled by the movement of said board sections to said conveyor for lowering the conveyor by intermittent step movements, and means rendered operable by the movement of the conveyor to its lowermost position and actuated by the movement of the board sections to said conveyor for forcing fluid under pressure into said cylinder for giving said cylinder and piston a relative movement.

32. In a mechanism of the type described, the combination of a vertically movable conveyor, a cylinder, a piston operatively mounted in said cylinder, means actuated by a stroke of the piston for raising said conveyor, means for feeding board sections to said movable conveyor, a pump, a motor for driving said pump, a supply tank, means operatively connecting said cylinder with said pump and said tank whereby upon the operation of the pump fluid is taken from the tank and forced into the cylinder and whereby when the pump is silent the fluid is free to flow at an adjustable rate from the cylinder to the tank, means controlled by the movement of the conveyor to its lowermost position and actuated by the movement of board sections to said conveyor for starting said motor, and means controlled by the movement of the conveyor to its uppermost position for stopping the motor.

33. In a mechanism of the type described, the combination of a vertically movable conveyor, a cylinder, a piston operatively mounted in said cylinder, means actuated by a stroke of the piston for raising said conveyor, means for feeding board sections to said movable conveyor, a pump, a motor for driving said pump, a supply tank, a conduit connecting the tank with the pump, a main line of piping connecting the pump with the cylinder, a pipe leading from said main line of piping to said tank, a shut-off valve in said last named pipe, means controlled by the movement of the movable conveyor for closing said valve and starting said motor when the conveyor reaches its lowermost position, means controlled by the movement of the conveyor to its uppermost position for opening said valve and stopping the motor, and means interposed in said pipe leading from the main line of piping to said tank for controlling the rate of movement of the fluid through said pipe for controlling the downward movement of the conveyor by gravity.

34. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections therealong to different levels, means for releasably supporting said conveyor at any one of the several levels at which board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections at predetermined intervals to said movable conveyor, power actuated means for raising said conveyor, and means adapted automatically at timed intervals during the operation of the mechanism to release said supporting means for permitting downward movement of the conveyor and adapted automatically after a predetermined

number of downward movements of the conveyor to throw said raising means into operation for a limited period for effecting an upward movement of the conveyor, and timed with respect to the periods of delivery of board sections to the conveyor and with respect to the speed of movement of said board sections along the conveyor for preventing vertical movements of the conveyor during the periods of delivery of board sections from the conveyor.

35. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for releasing said latching means for permitting the conveyor to move downwardly, other latching means for holding said releasing means out of operation, means for delivering board sections to said conveyor, and means for releasing said second named latching means in predetermined timed relation to the movement of board sections to said conveyor for effecting thereby the release of said first named latching means.

36. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections transversely to said conveyor, an arm swingingly mounted in the path of the board sections moving to said conveyor so as to be movable downwardly by engagement with the forward edge of a board section when said board section reaches approximately the limit of its transverse movement to the conveyor, and means actuated by such downward swinging movement of said arm adapted by power to release said latching means for permitting the conveyor to move downwardly to the next lower level.

37. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, a transverse transfer mechanism movable vertically into and out of operative position for carrying board sections transversely of the conveyor into longitudinal alignment therewith, latching means for holding said transfer mechanism in elevated operative position, other latching means for releasably supporting said conveyor at any one of the several levels at which board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means comprising a movable part adapted upon a downward movement of said transfer mechanism out of operative position when said movable part is in operative position to release said second named latching means for permitting the conveyor to move downwardly, and means actuated by the movement of a board section along said transfer mechanism for moving said movable part into said operative position and for then releasing said first named latching means for permitting such downward movement of said transfer mechanism.

38. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections to said conveyor transversely of the conveyor, means adapted when thrown into operation to raise said conveyor from its lowermost position to its topmost position, and means controlled by the transverse movement of a board section to said conveyor adapted when the conveyor is in an elevated position to release said latching means for permitting the conveyor to move downwardly to the next lower level and adapted when the conveyor is in its lowermost position to throw said conveyor raising means into operation.

39. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections to said conveyor transversely of the conveyor, means controlled by the transverse movement of a board section to said conveyor for releasing said latching means for permitting the conveyor to move downwardly to the next lower level, and fluid operated trap means for controlling and cushioning the downward movements of said conveyor.

40. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections to said conveyor transversely of the conveyor, means adapted when thrown into operation to raise said conveyor from its lowermost position to its topmost position, means controlled by the transverse movement of a board section to said conveyor adapted when the conveyor is in an elevated position to release said latching means for permitting the conveyor to move downwardly to the next lower level and adapted when the conveyor is in its lowermost position to throw said conveyor raising means into operation, and means cooperating with said conveyor raising means adapted by a fluid operated trap effect to cushion the downward movements of said conveyor.

41. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated posi-

tions automatically to stop the conveyor at the next lower level, means for delivering board sections to said conveyor transversely of the conveyor, fluid operated means adapted when thrown into operation to raise said conveyor from its lowermost position to its topmost position, means controlled by the transverse movement of a board section to said conveyor adapted when the conveyor is in an elevated position to release said latching means for permitting the conveyor to move downwardly to the next lower level and adapted when the conveyor is in its lowermost position to throw said conveyor raising means into operation, and means comprising a by-pass connection around said conveyor raising means and a regulating valve in said connection for cushioning the downward movements of said conveyor.

42. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections to said conveyor transversely of the conveyor, fluid operated means adapted when thrown into operation to raise said conveyor from its lowermost position to its topmost position, means controlled by the transverse movement of a board section to said conveyor adapted when the conveyor is in an elevated position to release said latching means for permitting the conveyor to move downwardly to the next lower level and adapted when the conveyor is in its lowermost position to throw said conveyor raising means into operation, means comprising a by-pass connection around said conveyor raising means and a regulating valve in said connection for cushioning the downward movements of said conveyor, and means adapted when said conveyor raising means is thrown into operation to close said by-pass connection.

43. In a mechanism of the type described, the combination of a conveyor movable vertically for delivery of board sections to different levels, latching means for releasably supporting said conveyor at any one of the several levels at which said board sections are to be delivered by said conveyor and adapted normally when released with the conveyor at any of its several elevated positions automatically to stop the conveyor at the next lower level, means for delivering board sections to said conveyor transversely of the conveyor, fluid operated means for raising said conveyor from its lowermost position to its topmost position, an electric motor for driving said fluid operated means, means controlled by the transverse movement of a board section to said conveyor adapted when the conveyor is in an elevated position to release said latching means for permitting the conveyor to move downwardly to the next lower level and adapted when the conveyor is in its lowermost position to throw said motor into operation for raising said conveyor, means comprising a by-pass connection around said conveyor raising means and a regulating valve in said connection for cushioning the downward movement of said conveyor, a shut-off valve in said by-pass connection, and means adapted when said motor is thrown into operation to close said shut-off valve and when thereafter the motor is thrown out of operation again to open said shut-off valve.

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