

Dec. 1, 1925.

1,563,684

J. E. BLACK

VENEER PRESS AND THE LIKE

Filed Jan. 2, 1925

5 Sheets-Sheet 1

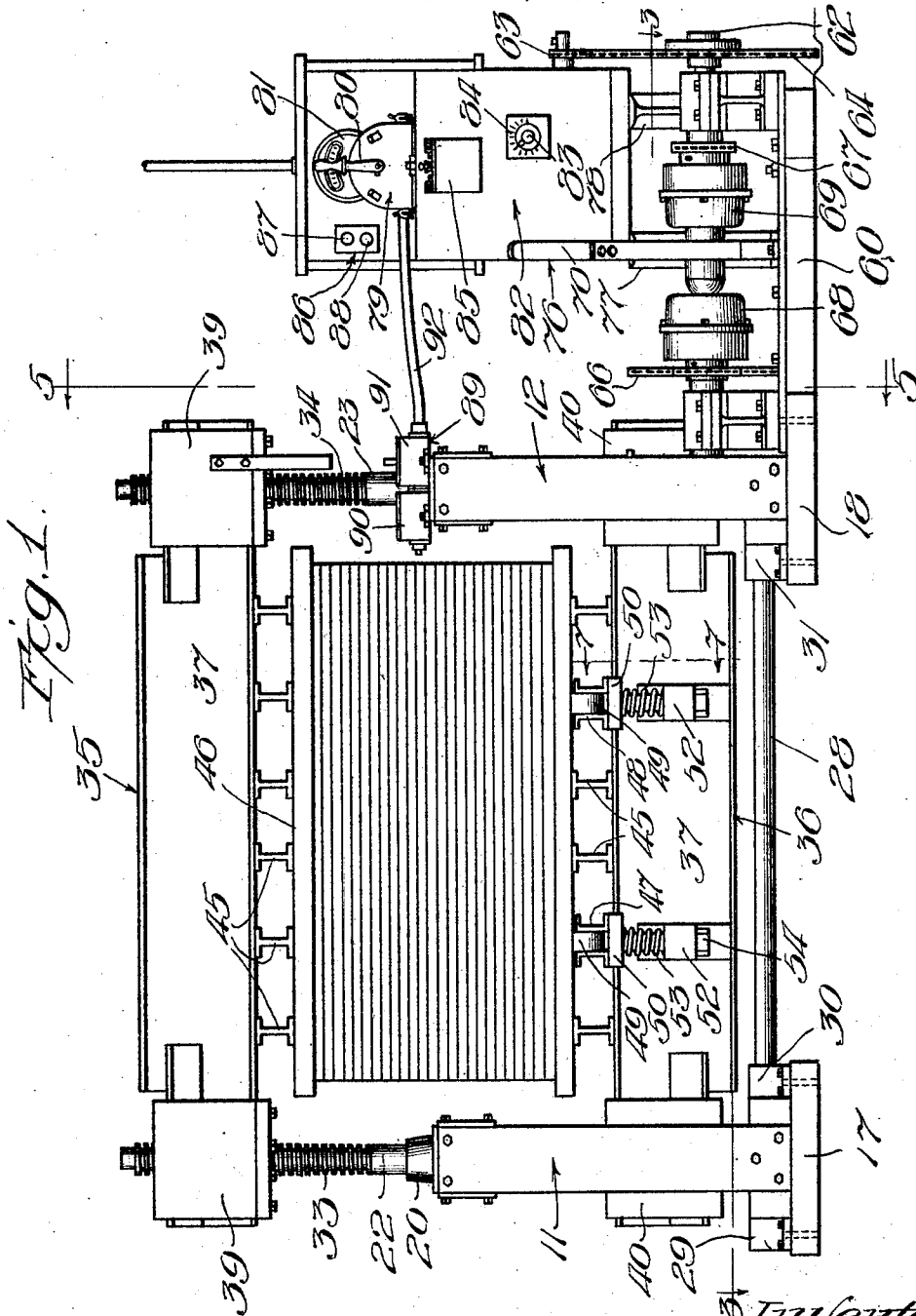


Fig. 1.

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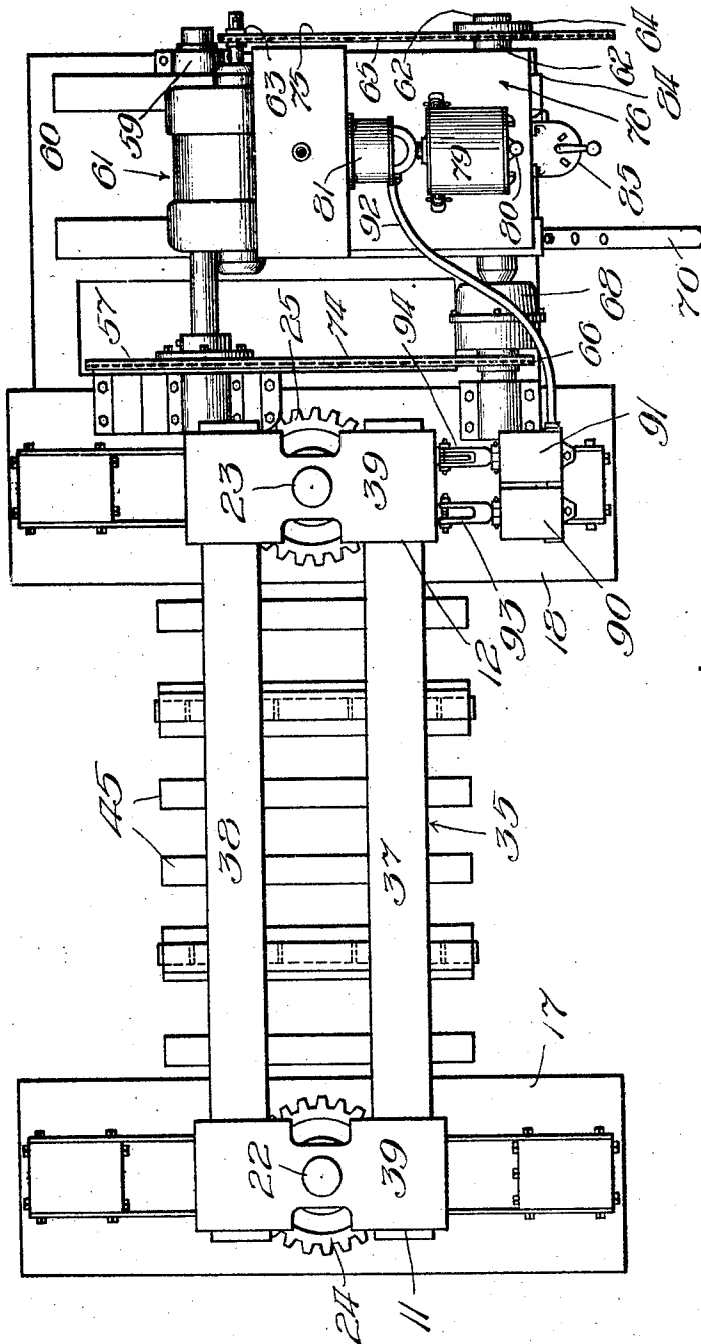


FIG. 2.

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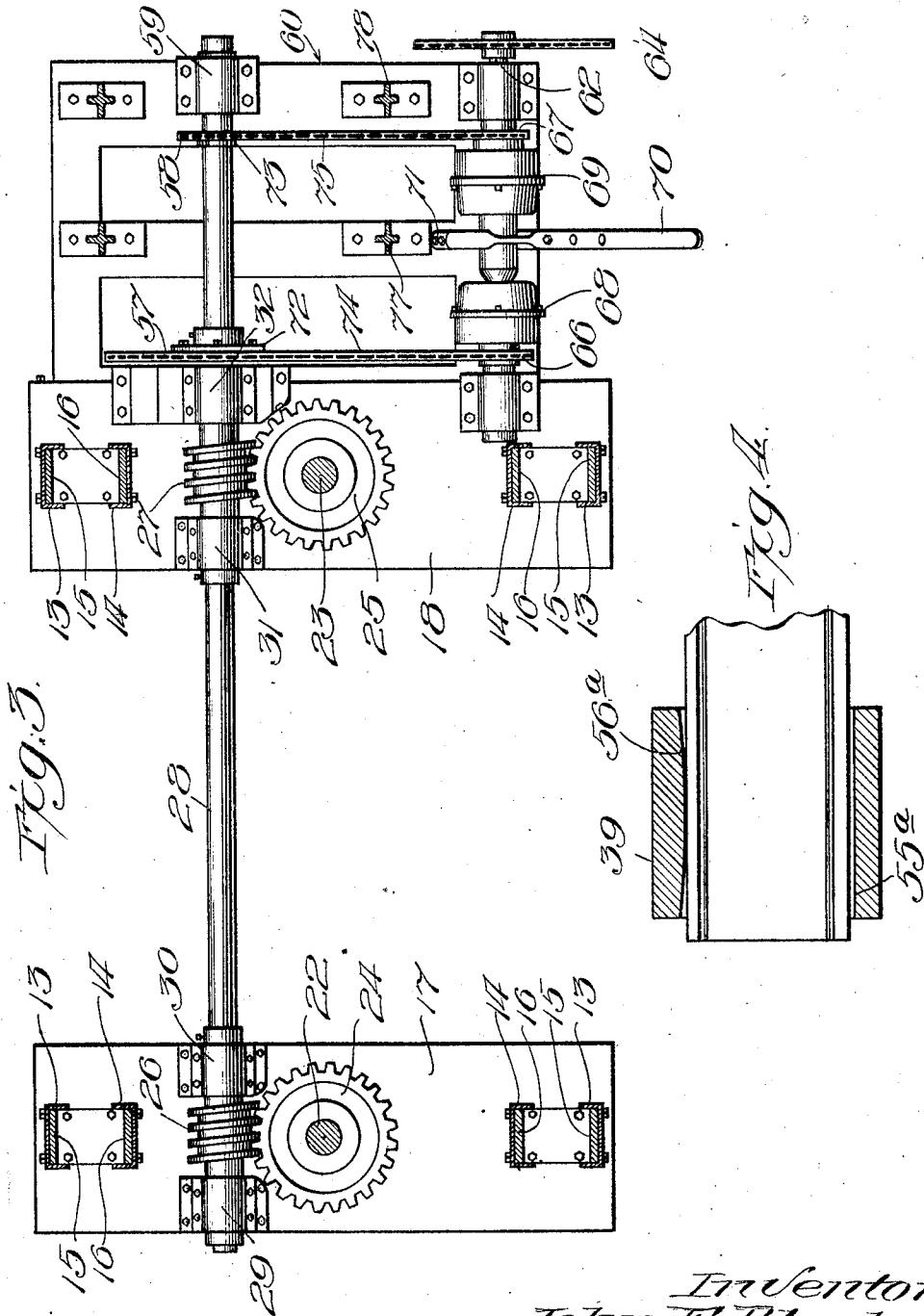
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5 Sheets-Sheet 3



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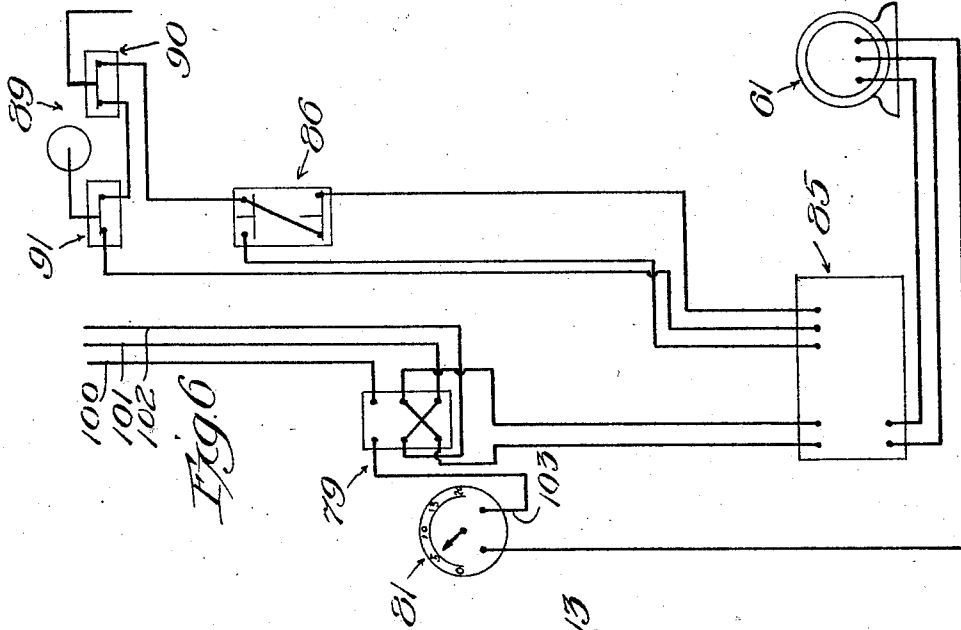
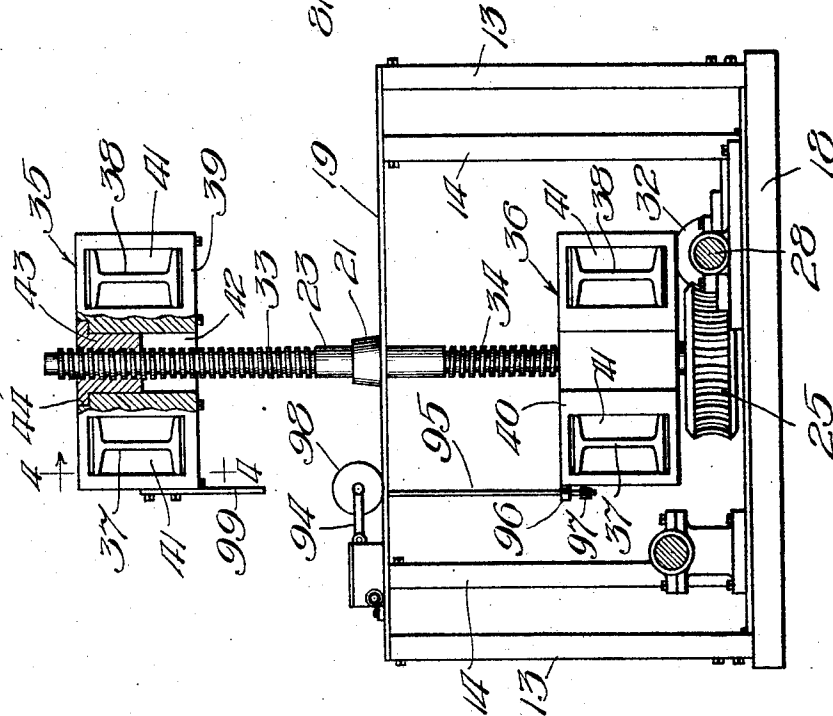


Fig. 5.



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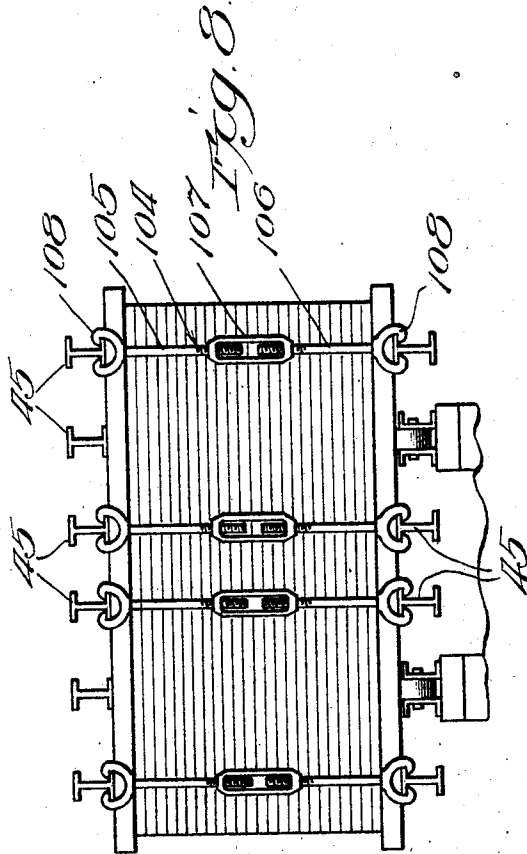
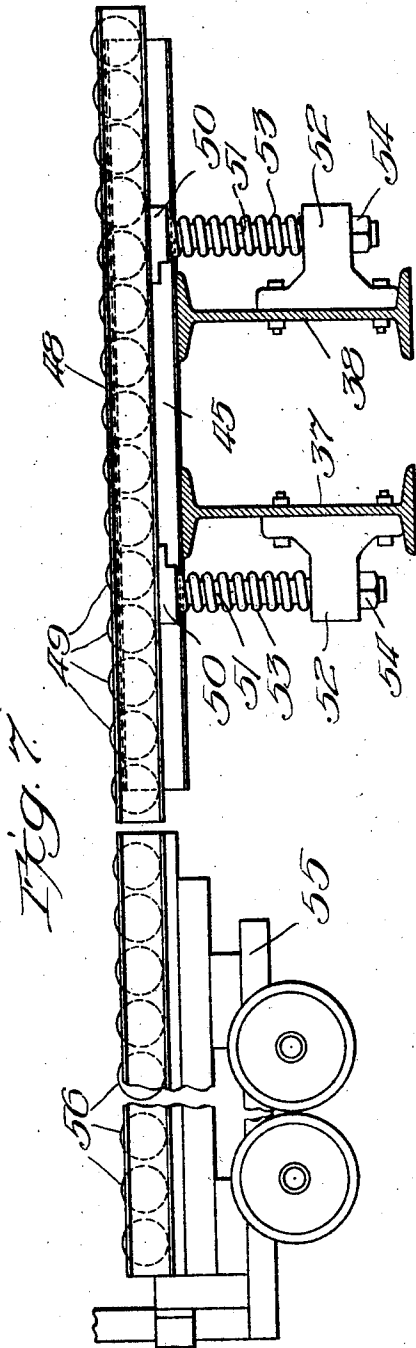
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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE.

JOHN E. BLACK, OF MENDOTA, ILLINOIS.

VENEER PRESS AND THE LIKE.

Application filed January 2, 1925. Serial No. 220.

To all whom it may concern:

Be it known that I, JOHN E. BLACK, a citizen of the United States, residing at Mendota, in the county of La Salle and State of Illinois, have invented certain new and useful Improvements in Veneer Presses and the like, of which the following is a specification.

This invention has to do with certain improvements in veneer presses and similar machines. It has reference particularly to improvements in presses for placing the veneer boards under the desired amount of pressure and then retaining said pressure substantially uniform for such length of time as may be necessary to insure proper cementing of the veneer sheets together.

One of the objects of the invention is to provide a machine of such construction that the pressure will be applied in increasing amount up to the desired maximum pressure, whereupon the pressure will be retained at the desired degree, further increase of pressure being discontinued.

In connection with the above, another feature of the invention relates to the provision of an electrically operated press wherein the pressure is generated by the use of an electric motor. As the pressure increases the load on this motor increases proportionately with corresponding proportionate increase in the amount of current used by the motor; and by the use of a suitable electric relay or tripping switch, the device may be so arranged that the circuit will be opened when the pressure and current reach the predetermined limit.

A further feature in connection with the above is the provision of an arrangement such that after the desired pressure has been established the pile of veneer boards may be locked together, so as to retain the entire pile under the desired pressure. The locked together pile may then be removed from the machine proper and taken to a suitable point for storage during the drying operation. During this drying operation the pile itself is retained locked together

and under the full pressure previously established in the veneer press.

Still a further feature in connection with the above is the provision of an improved form of base for supporting the pile of veneer boards within the machine, prior to and subsequent to the pressing operations. This improved base is so arranged that the pile of boards may be readily shifted into place within the machine from a trackway or carrier system leading up to the machine, and is also so arranged that the compressing force may be readily and satisfactorily delivered from the machine to the pile in place.

Another feature of the invention relates to the provision of an improved arrangement of transmission devices for communicating the movements between the operating motor and the press. In this connection, one object is to make provision for ready reversal of the press heads, so that after the pile of boards has been placed under pressure the press heads can be readily released or vice versa.

A further object in connection with the above is to provide a variable speed transmission device whereby the press heads may be initially moved towards each other at a relatively rapid travel, the transmission ratio being subsequently reduced when pressure is being exerted on the pile, with corresponding increase of the amount of pressure so exerted.

A further feature of the invention relates to the provision of automatic tripping devices whereby as the extreme limits of movement of the pressheads are approached the device will be tripped automatically so as to avoid over travel and also to avoid jamming or damage to the parts.

Another feature relates to the provision of a suitable indicator such as an ammeter for showing the amount of current being delivered to the motor, either in terms of amperes or pounds of pressure exerted on the pile of veneer boards.

Other objects and uses of the invention

will appear from a detailed description of the same, which consists in the features of construction and combination of parts hereinafter described and claimed.

5 In the drawings:

Figure 1 shows a front elevation of a complete machine embodying the features of the present invention, illustrating a pile of veneer boards in place between the press heads;

10 Fig. 2 shows a plan view corresponding to Fig. 1;

Fig. 3 shows a horizontal section substantially on the line 3—3 of Fig. 1, looking in the direction of the arrows;

15 Fig. 4 shows a fragmentary detail section enlarged, on the line 4—4 of Fig. 5, looking in the direction of the arrows, illustrating the manner in which the pressure on the beams of the press heads may be equalized and twisting strains avoided;

20 Fig. 5 shows a vertical section on the line 5—5 of Fig. 1, looking in the direction of the arrows;

25 Fig. 6 shows diagrammatically an electric circuit for the motor and control devices of the arrangement illustrated in Figs. 1 to 4 inclusive;

30 Fig. 7 shows a fragmentary transverse section on the line 7—7 of Fig. 1, looking in the direction of the arrows, but on enlarged scale, and also illustrates a truck alongside of the lower press head by which the pile of material may be transported to or from the lower press head of the veneer press itself;

35 and
Fig. 8 shows a side view of a pile of veneer boards clamped together by the separate clamping devices extending between the upper and lower beams so as to retain the pile under pressure after removal from the veneer press itself.

40 The machine illustrated in the drawings includes a pair of end stands 11 and 12, respectively. Each of these end stands preferably comprise two pairs of vertical channels 13 and 14 facing each other, as shown in Fig. 3, and having the flat bars 15 and 16 within their channeled portions so as to give them added strength. The vertical posts thus built up are carried by the end pedestals 17 and 18, respectively.

45 Across the top ends of the posts at each end of the machine are the horizontal flat bars 19 which serve to establish a platform for the support of column bearings 20 and 21, respectively.

50 The vertical tension shafts 22 and 23 are journaled in the bearings 20 and 21, respectively, and are also suitably journaled at their lower ends in the base blocks 17 and 18, respectively. The worm gears 24 and 25 are secured to the lower ends of said shafts and are respectively engaged by the worms 26 and 27 on a horizontal drive shaft

28. Said drive shaft is in turn journaled to the base block 17 by the journals 29 and 30 and is journaled to the base block 18 by the journals 31 and 32.

55 The vertical shafts 22 and 23 are provided at their upper and lower ends with the threads 33 and 34, respectively, said threads being of reversed pitch, as clearly indicated in Fig. 5. The upper and lower press heads 35 and 36 are provided, the same spanning the distance between the shafts 22 and 23. Each of these heads preferably includes a pair of I-beams 37 and 38 spaced apart a sufficient distance to embrace the vertical shafts and thread blocks between them.

60 The end portions of the I-beams for the upper and lower press heads are preferably formed of rectangular castings 39 and 40. These castings are provided with horizontal transverse openings 41 for the accommodation of the end portions of the I-beams and are also provided with vertical central openings 42 for the accommodation of the tension shafts. Preferably a threaded block 43 is seated into each of the openings 42, said block having a flange 44 which seats into a suitable recess in the face portion of the end block itself. The flanges and shoulders just referred to are relatively so positioned that the tension necessary to draw the upper end lower heads towards each other will be preferably communicated to the end blocks.

65 The pile of veneer boards being operated upon may be placed directly between the I-beams of the upper and lower press heads, but ordinarily use will be made of a series of short transverse I-beams 45, as indicated in Figs. 1, 2 and 8 in particular. These transverse beams will bear directly against a relatively thick board 46 at the top or bottom of the pile as the case may be so as to distribute the layer evenly over the entire area thereof.

70 As a matter of convenience, in manipulation, it is preferred that the lower press head 36 carry a pair of transverse beams 47 and 48, respectively, a series of rollers 49 being journaled in each of said beams. These beams are shallower than the transverse beams 45 already referred to, so that a certain amount of movement of the beams 47 and 48 together with their rollers is allowed for within the confines of the beams 45.

75 The beams 47 and 48 are carried by brackets 50 on the upper end of pins 51, said pins 51 being slidably mounted within bracket blocks 52 which are secured to the press head beams 37 and 38, respectively. Springs 53 are provided which raise the brackets 50 and beams 47 and 48 under spring tension a distance which is limited by the nuts 54 on the lower ends of the pins 51. The adjustment should be made in such a way that

when fully lifted the rollers 49 will project a slight distance above the top edges of the beams 37 and 38, as indicated in Fig. 7. Under these circumstances, when the press heads are separated from each other a pile of veneer boards may be run into position on top of the rollers 49 and held in such position until the press heads are drawn together. Thereupon, the springs 52 will be compressed until the transverse beams 45 of the lower press head have been forced into direct engagement with the pile of veneer boards, as indicated in Fig. 1. When this takes place the direct pressure of the heads will be exerted on the veneer boards themselves.

The beams 37 and 38 of the upper and lower press heads are so mounted within the respective end blocks 39 and 40 as to provide for a certain amount of tilting of the beams with respect to said end blocks. This is provided by reason of the fact that the openings 55 in the blocks 39 and 40 are large enough to allow a slight tilting of the beams, and the bearing surfaces of the blocks are curved, as indicated at 56^a in Fig. 4, to provide the parts to tilt slightly for adjustment purposes. In the above connection, it is noted that the bearing surfaces of the upper blocks 39 are at the top sides of the openings, whereas the bearing surfaces for the lower blocks 40 are at the bottom sides of the openings thereof.

A drive shaft 28 carrying the worms 26 and 27 preferably reaches beyond the base block 18 and carries a pair of sprockets 57 and 58 on its projecting portion. The projecting portion of this shaft is also preferably journaled in an outboard bearing 59. This bearing is illustrated in Figs. 1, 2 and 3, as being carried by a sidewise projecting base section 60.

A driving motor 61 is mounted above the base section 60 and drives a jack shaft 62 through the medium of sprockets 63 and 64 and a chain 65. The parts are preferably designed to give a substantial gear reduction at this point. The jack shaft 62 is adapted to drive either of the sprockets 66 and 67 under control of suitable clutches 68 and 69, which clutches are operated by a hand lever 70 pivoted to the projecting base member at the point 71. By swinging the hand lever to one side or the other with respect to the neutral position, illustrated in Fig. 3, one or the other of the clutch members will be brought into operation so as to lock the corresponding sprocket 66 or 67, as the case may be, to the jack shaft 62.

The sprockets 66 and 67 are drivingly connected to the main shaft 28 by sprockets 57 and 58, respectively, and the chains 74 and 75, respectively. Preferably, the gear ratios between the sprockets 66 and 57 and the sprockets 67 and 58 are different, al-

though they both drive in the same direction. As a result, with the fixed motor speed and, therefore, a fixed jack speed, the speed reduction with consequent increase of torque to the shaft 28 can be changed.

Mounted above the supplemental base member 60 is a control stand 76. The same is preferably carried by a pair of brackets 77 and 78 which stand upwardly a sufficient distance, so that the control stand will clear the jack shaft and clutch devices. In the construction illustrated the motor itself is also carried immediately behind the control stand and is also supported by these brackets 77 and 78.

The control stand includes a circuit controller 79 having a control handle 80 which can be swung either side of the central position depending upon the desired direction of rotation of the motor. When running the motor forward, the press heads are forced together, whereas by reversing the motor the press heads are drawn apart.

The control stand also includes an instrument 81 which may be graduated to indicate the amount of pressure exerted between the press heads either directly in total pounds, or in pounds per square foot, or in amperes. Preferably, the instrument is graduated to read amperes as well as total pressure.

The control stand also preferably includes a control box 82 having a control handle 83 by means of which a variable rheostat within the box is controlled so as to control the maximum pressure which can be exerted by the motor. When this limit is reached the motor will automatically stop and thus automatically limit the pressure delivered to the pile. The rheostat may be graduated, as indicated at 84, corresponding to the graduations on the instrument 81, so that the operator can set the pointer of the control handle 83 to the desired maximum pressure which he wishes to exert; and when this pressure is reached the motor will stop automatically, and the instrument 81 will at the same time indicate the corresponding pressure.

If desired, an overload relay 85 may also be placed on the control stand so as to automatically open the circuit in case of abnormal current being fed to the motor. Also a push button switch 86 may be placed on the stand, the same having the start and stop buttons 87 and 88, respectively.

In order to limit the travels of the press heads toward and from each other, I have provided an automatic switch 89, the same being conveniently mounted on the upper end of the stand 12. This switch preferably includes two switch elements 90 and 91 placed side by side and both of them being connected in series with the main electric circuit by suitable conductors located in a

conduit 92 reaching across from the switch elements to the control stand.

These switch elements include fingers 93 and 94, respectively, both of which project towards the tension shaft 23. The finger 93 carries a downwardly depending rod 95, the lower end of which reaches through an eye 96 of the lower press head block 40 and carries a nut 97 which can be set into the desired position. As soon as the lower head block 40 descends sufficiently low the eye 96 will engage the nut 97 and draw the finger 93 down so as to open the circuit.

The other finger 94 carries a roller 98, and a bar 99 is secured to the block 39 of the upper press head in such a position that when said head has moved down sufficiently, it will engage the roller 98 and thus trip the switch element 91. The opening of either switch element opens the circuit. In this way danger from excessive movement is eliminated.

Referring to Fig. 6, I will explain the electric circuit therein; but manifestly many other arrangements of electric circuit might be substituted in place of the one particularly illustrated. In this circuit the motor 61, is shown as a three phase alternating current induction motor. The incoming three phase wires 100, 101 and 102 are brought directly to the control switch 79. One of the legs 103 of the three phase circuit is led through the pressure indicator 81 to the motor and the other legs are led to the control box 85. From this control box suitable circuits are carried to the push button station 86 and to the motor. This control box 85 may be of any standard form, such as a standard magnetic starter of the Westinghouse Electric & Manufacturing Company.

The automatic cut out switches 90 and 91 are shown as connected in series with each other and with one of the legs of the circuit passing through the push button station.

Referring particularly to Fig. 8, I have therein illustrated the manner in which a pile of boards may be clamped together so as to retain them under pressure after the press heads of the veneer press itself have been released. For this purpose, use is made of a series of tension bars 104 each comprising upper and lower sections 105 and 106 joined together by a turn buckle 107. The outer ends of the sections 105 and 106 are bifurcated and hooked, as shown at 108, so that they can be slipped over the flanges of the bars 45 so as to hold them under the desired tension even after the pressure heads have been released.

It will be understood that while I have herein shown and described only a single embodiment of the features of my present invention, and also only a single wiring

circuit for controlling the operation, etc., nevertheless, I do not intend to limit myself to the same, except as I may do so in the claims.

I claim:

1. In a machine of the class described, the combination of upper and lower vertically movable press heads, vertical tension shafts adjacent to the ends thereof, said shafts having their end portions in oppositely threaded engagement with the adjacent press head ends whereby simultaneous rotation of both shafts causes movement of the press heads towards or from each other, an electric motor, a jack shaft operatively connected thereto, a pair of sprockets rotatably mounted on the jack shaft, a drive shaft, driving connections therefrom to both of the tension shafts, driving connections of unequal gear ratio from both of the sprockets to the drive shaft, clutch mechanism between the jack shaft and each sprocket enabling said sprockets to be selectively connected to the jack shaft, and suitable electric circuits for control of the motor including a reversing switch permitting reversal of motor direction, a magnetic limit switch adapted to open the circuit upon the flow of current in excess of a predetermined amount, an indicator operable according to volume of current delivered to the motor, and having its scale suitably graduated to indicate pressure exerted between the press heads, together with limit switches operable to open the motor circuit at extreme limits of movement of the press heads towards and from each other, substantially as described.

2. In a machine of the class described, the combination of upper and lower vertically movable press heads, vertical tension shafts adjacent to the ends thereof, said shafts having their end portions in oppositely threaded engagement with the adjacent press head ends whereby simultaneous rotation of both shafts causes movement of the press heads towards or from each other, an electric motor, a drive shaft, driving connections therefrom to both of the tension shafts, operative connections from the electric motor to the drive shaft, clutch devices in said connections, and suitable electric circuits for control of the motor including a reversing switch permitting reversal of motor direction, a magnetic limit switch adapted to open the circuit upon the flow of current in excess of a predetermined amount, an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, together with limit switches operable to open the motor circuit at extreme limits of movement of the press heads towards and from each other, substantially as described.

3. In a machine of the class described, the

combination of upper and lower vertically movable press heads, vertical tension shafts adjacent to the ends thereof, said shafts having their end portions in oppositely threaded engagement with the adjacent press head ends whereby simultaneous rotation of both shafts causes movement of the press heads towards or from each other, an electric motor, a drive shaft, driving connections therefrom to both of the tension shafts, operative connections from the electric motor to the drive shaft, clutch devices in said connections, and suitable electric circuits for control of the motor including a reversing switch permitting reversal of motor direction, a magnetic limit switch adapted to open the circuit upon the flow of current in excess of a predetermined amount, and an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, substantially as described.

4. In a machine of the class described, the combination of upper and lower vertically movable press heads, vertical tension shafts adjacent to the ends thereof, said shafts having their end portions in oppositely threaded engagement with the adjacent press head ends whereby simultaneous rotation of both shafts causes movement of the press heads towards or from each other, an electric motor, a drive shaft, driving connections therefrom to both of the tension shafts, operative connections from the electric motor to the drive shaft, clutch devices in said connections, and suitable electric circuits for control of the motor including a magnetic limit switch adapted to open the circuit upon the flow of current in excess of a predetermined amount, an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, together with limit switches operable to open the motor circuit at extreme limits of movement of the press heads towards and from each other, substantially as described.

5. In a machine of the class described, the combination of upper and lower vertically movable press heads, vertical tension shafts adjacent to the ends thereof, said shafts having their end portions in oppositely threaded engagement with the adjacent press head ends whereby simultaneous rotation of both shafts causes movement of the press heads towards or from each other, an electric motor, a driven shaft, driving connections therefrom to both of the tension shafts, operative connections from the electric motor to the drive shaft, clutch devices in said connections, and suitable electric circuits for control of the motor including a magnetic limit switch adapted

to open the circuit upon the flow of current in excess of a predetermined amount, an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, substantially as described.

6. In a machine of the class described, the combination of upper and lower vertically movable press heads, vertical tension shafts adjacent to the ends thereof, said shafts having their end portions in oppositely threaded engagement with the adjacent press head ends whereby simultaneous rotation of both shafts causes movement of the press heads towards or from each other, an electric motor, a drive shaft, driving connections therefrom to both of the tension shafts, operative connections from the electric motor to the drive shaft, clutch devices in said connections, and suitable electric circuits for control of the motor including an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, substantially as described.

7. In a machine of the class described, the combination of upper and lower vertically movable press heads, an electric motor, operative connections therefrom to both press heads operable to move the press heads toward or from each other selectively under control of the operator, and suitable electric circuits for control of the motor including a reversing switch permitting reversal of motor direction, a magnetic limit switch adapted to open the circuit upon the flow of current in excess of a predetermined amount, an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, together with limit switches operable to open the motor circuit at extreme limits of movements toward and from each other, substantially as described.

8. In a machine of the class described, the combination of upper and lower vertically movable press heads, an electric motor, operative connections therefrom to both press heads operable to move the press heads toward and from each other selectively under control of the operator, and suitable electric switches for control of the motor including a reversing switch permitting reversal of motor direction, a magnetic limit switch adapted to open the circuit upon the flow of current in excess of a predetermined amount, and an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, substantially as described.

9. In a machine of the class described,

the combination of upper and lower vertically movable press heads, an electric motor, operative connections therefrom to both press heads operable to move the press heads towards or from each other selectively under control of the operator, and suitable electric circuits for control of the motor including an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated to indicate pressure exerted between the press heads, substantially as described.

10. In a machine of the class described, the combination of upper and lower vertically movable press heads, an electric motor, operative connections therefrom to both press heads operable to move the press heads towards or from each other selectively under control of the operator, and suitable electric circuits including an indicator operable according to volume of current delivered to the motor and having its scale suitably graduated, substantially as described.

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