G. McCONNELL.

GLUING MACHINE.

APPLICATION FILED APR. 1, 1919.

1,339,467.

Patented May 11, 1920.

4 SHEETS—SHEET 1.

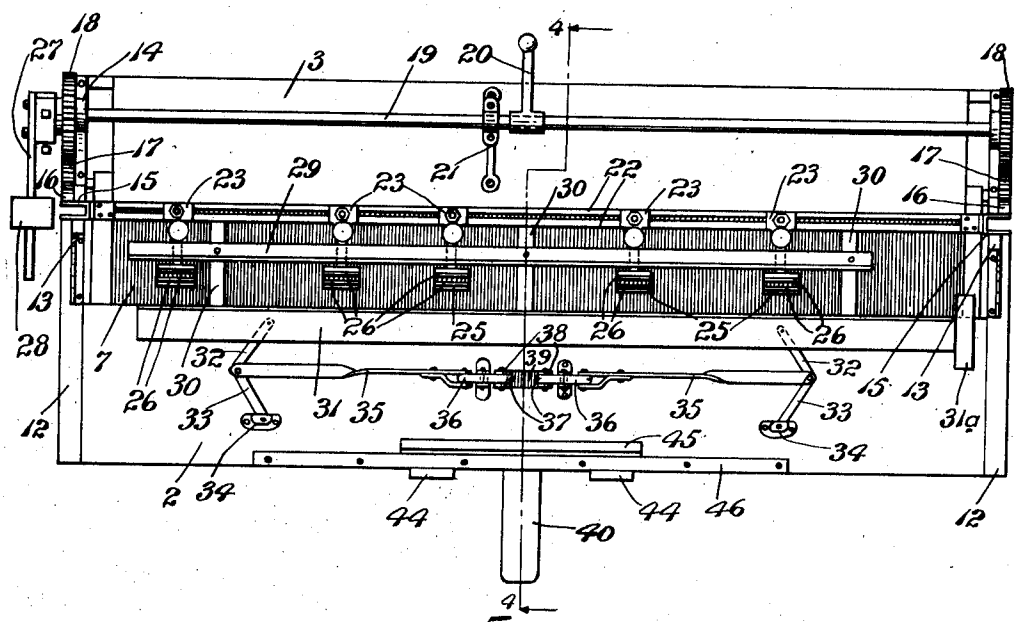


Fig. 1

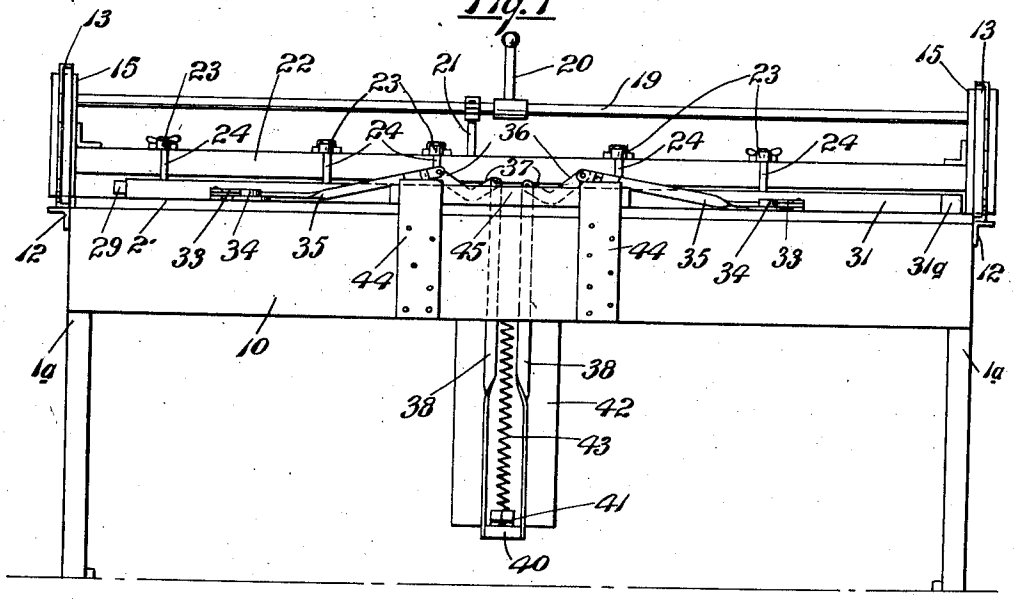


Fig. 2

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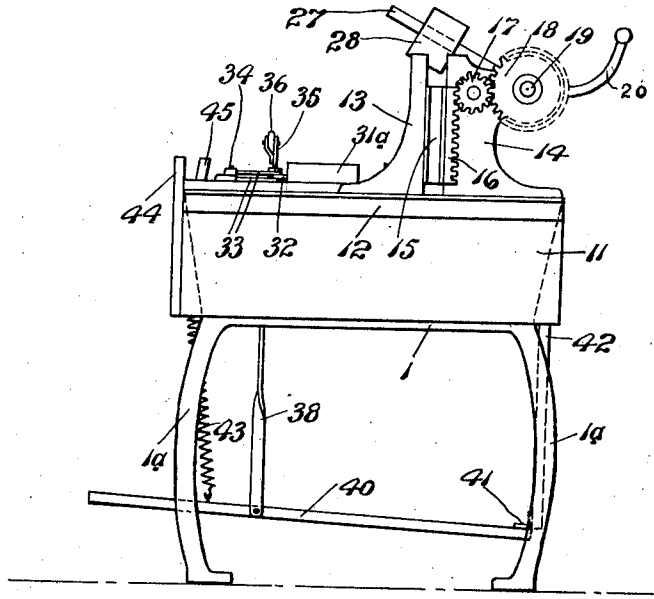


Fig. 3.

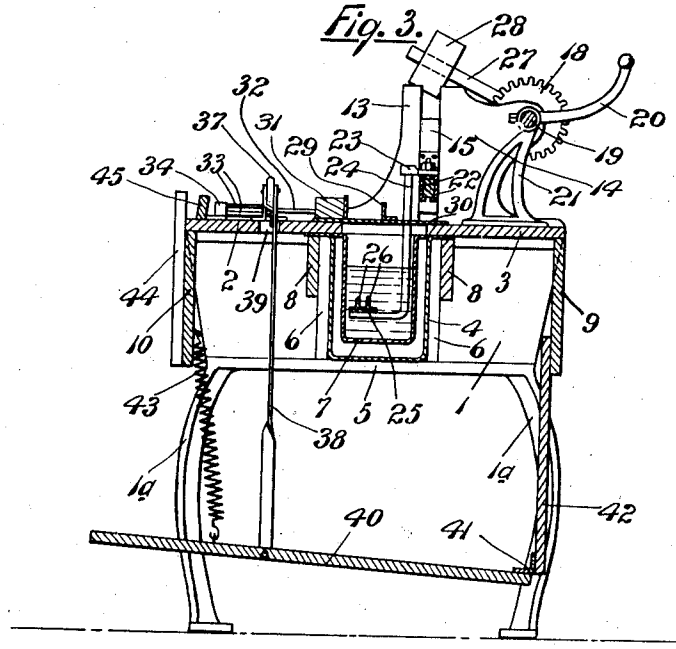


Fig. 4.

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4 SHEETS—SHEET 3.

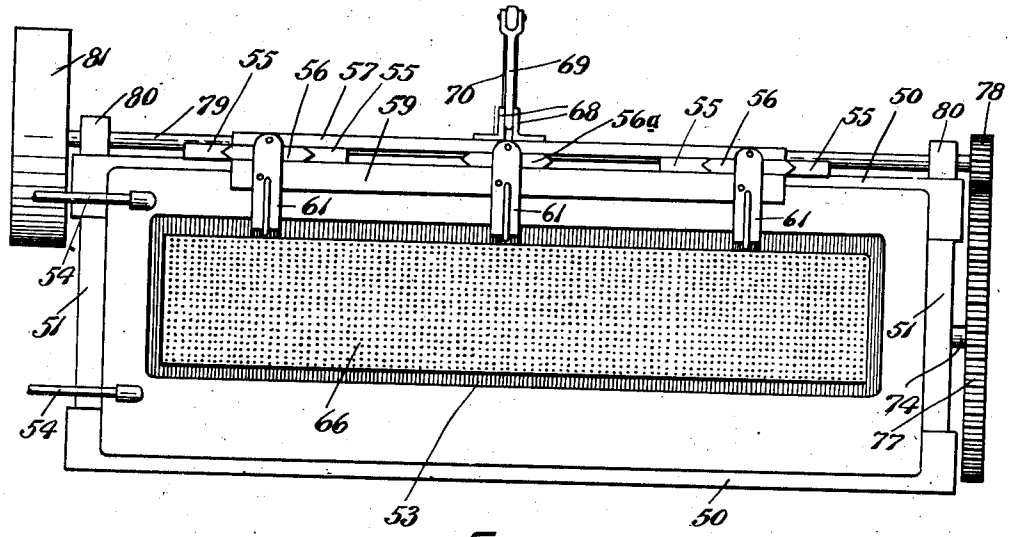


Fig. 5.

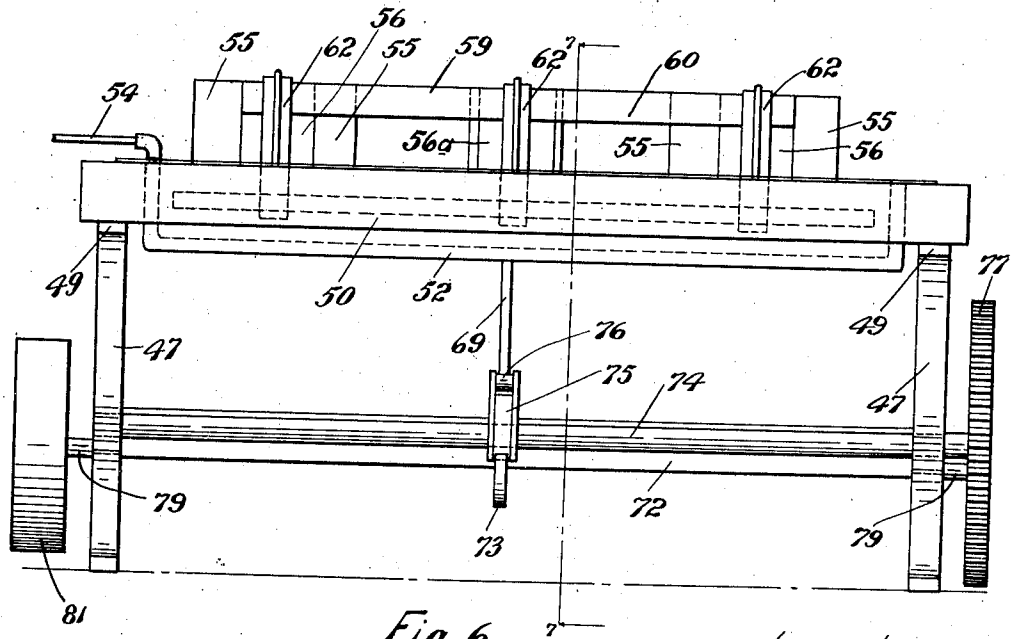


Fig. 6.

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4 SHEETS—SHEET 4.

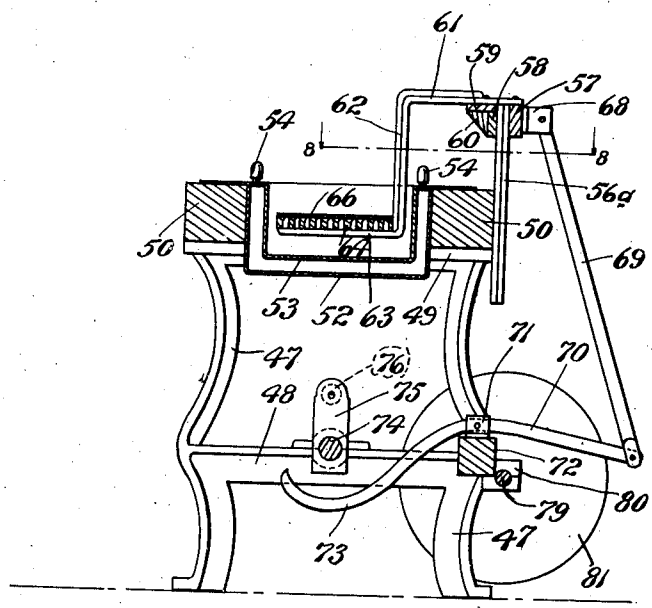


Fig. 7.

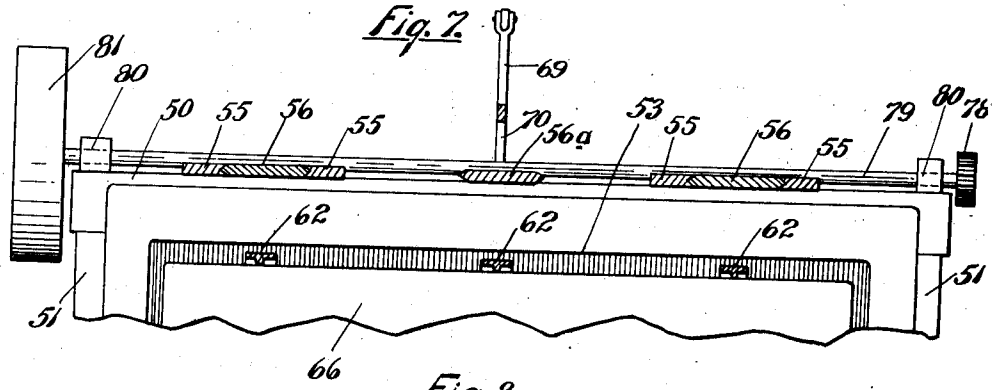


Fig. 8

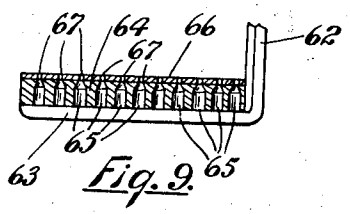


Fig. 9.

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UNITED STATES PATENT OFFICE.

GEORGE McCONNELL, OF GRAND RAPIDS, MICHIGAN.

GLUING-MACHINE.

1,339,467. Specification of Letters Patent. Patented May 11, 1920.

Application filed April 1, 1919. Serial No. 286,751.

To all whom it may concern:

Be it known that I, GEORGE McCONNELL, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Gluing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to gluing machines and has as its principal object and purpose the production of a machine by means of which glue may be readily applied to wood without the necessity of putting it on with a brush, the application of the glue to the wood being at any desired place thereon, and with a great saving of labor and also of glue with a better application of the glue than can be had by hand. My invention consists in many novel combinations and arrangements of parts for attaining this desired result as well as many others which will appear fully and in detail as the description of the structures embodying the invention progresses, reference being had to the accompanying drawings, in which,

Figure 1 is a plan of one form of the gluing machine.

Fig. 2 is a front elevation thereof.

Fig. 3 is an end elevation.

Fig. 4 is a vertical section on line 4—4 of Fig. 1.

Fig. 5 is a plan of a modified form of the gluing machine.

Fig. 6 is a front elevation thereof.

Fig. 7 is a vertical section on line 7—7, of Fig. 6.

Fig. 8 is a fragmentary plan and horizontal section on line 8—8, of Fig. 7, and

Fig. 9 is a vertical section, enlarged, and taken transversely through the movable glue plate of the construction shown in Figs. 5 to 9 inclusive.

Like reference characters refer to like parts in the different views of the drawings.

In construction, for the form shown in Figs. 1 to 4 inclusive, two end supporting frames 1 are provided having depending legs 1^a. Front and rear boards 2 and 3 are located above and rest on the upper members of the frame, there being a longitudinal space between the inner edges of said boards below which a glue tank is located. The tank includes an outer member 4 which rests at its ends on horizontal ribs 5 formed one on each end frame, the sides of the member 4 bearing against vertical ribs 6 on the end frames. The tank is completed by an inner member 7 having sides, ends, bottom and an open upper side, said member 7 being adapted to contain glue, while steam or other equivalent heating fluid is entered into the space between the two members 4 and 7 to keep the glue hot and in fluid condition. The upper edges of the sides of the tank members are turned to horizontal position and rest on longitudinal frame members 8 as shown. At the rear and front of the machine boards 9 and 10, placed vertically and connected by end boards 11 may be used to complete the supporting frame for the machine. It is evident that this supporting structure may be varied greatly without affecting the invention, and the form shown is one only of the many designs of supporting frame which may be used.

At each end of the machine an angle iron bar 12 is located horizontally and connected so as to lie substantially at the upper ends of the end members 1. Two spaced apart vertical brackets 13 and 14 are attached to each of the bars 12, between which a channel bar 15 is mounted to slide vertically. A rack 16 is connected to each channel 15 at the rear side thereof and along the outer side of the bracket 14, each rack being in mesh with an idle pinion 17 mounted on bracket 14, said pinions in turn meshing with gears 18 fixed at the ends of a shaft 19, rotatably mounted at its ends in bearings in brackets 14. Near its middle the shaft is equipped with an operating handle 20, and it is further supported in a bearing at the upper end of a bracket 21 which is attached to the board 3 as shown. The two channels 15 serve as supports for the ends of a longitudinal bar 22 formed of two spaced apart channels which may have a filler member between them if desired. It is evident that by operating the handle 20 the bar 22 may be raised and lowered at will.

At a plurality of points in the length of bar 22 members 23 are located and connected to the bar so as to lie above the same and project a short distance in front thereof. These members 23 may be adjusted to differ-

ent positions in the length of bar 22 to serve different lengths of work. A rod 24 is attached to each member 23 and extends downwardly into the glue holding member 7 of the glue tank, the lower end of each rod being bent forward and serving as a support to carry a glue brush 25 which, in the construction shown, has two upwardly extending and spaced apart ribs 26. At one end of the shaft 19 a bar 27 is connected on which a weight 28 is adjustably mounted which partly balances the weight of the bar 22 and attached parts, making the operation of the device easy. When bar 22 is elevated all of the glue brushes 25 are simultaneously elevated and when lowered all are immersed in the glue.

A stop bar 29 is located lengthwise of and above the glue tank being carried by metal strips 30. A presser or clamp bar 31 is located in front of the stop bar and parallel thereto. A toggle comprising arms 32 and 33 is associated with each end of the bar 31, one of the links or arms 32 having pivotal connection with the bar and the other with a suitable casting 34 connected to the board or table member 2. A link 35 is connected at one end to the knee of each of the toggles, said links extending toward each other and each having pivotal connection to one arm 36 of a bell crank lever while to the other arm 37 thereof a vertical link 38 is pivotally connected at its upper end passing downwardly through a slot 39 in the board 2 and having pivotal connection with a foot pedal 40 which is pivotally mounted at its rear end at 41 to a depending support 42, extending downwardly from the rear board 9. There are two bell crank levers pivotally mounted above the board 2 at the ends of the slot 39 and two depending links 38, the same attaching at their lower ends at opposite sides of the foot pedal. The foot pedal is normally held in upper position by a spring 43 and its action is to normally move the clamping bar 31 away from the stop bar; but on depressing the foot pedal said bar 31 is moved toward stop bar 29 as is evident.

At the front of the machine two vertical bars 44 are fixed in spaced apart relation back of which a bar 45 is placed horizontally, its front face being inclined slightly to the rear. Between said bar and the vertical bars a metal strip 46 is placed and fixed to the board 2.

In operation this machine is adapted to glue side pieces of panels such as are used in the making of many different articles of furniture, refrigerators, etc. These pieces are grooved lengthwise and the intermediate portions of the panel have projecting tongues to enter the grooves at various points. The two grooved pieces are placed with their grooved edges down lying on the strips 30 and against the stop bar 29. The foot pedal is then operated to bring the clamping bar 31 against the opposite side of the pieces and clamp them between the two bars 29 and 31. The handle 20 is then grasped and moved to elevate the brushes 25, the ribs 26 entering the grooves of said pieces, it being evident that glue is applied at various spaced points in each of the pieces. The brushes may be adjusted for the different panels, and a greater or less number used as desired. One of the pieces thus glued is placed with its grooved edge up between bars 44 and 45, the intermediate portion of the panel applied thereto, its tongues entering the groove at the glued points, and the other piece applied at the upper edge of the intermediate portion of the panel with its glued portions coming in engaging relation with other tongues on the intermediate panel portion and then struck with a hammer to bring the parts of the panel together. In the forward movement of the clamping bar 31, a guide block 31ª may be used to cause it to move forward uniformly.

With this construction glue may be easily and quickly applied where desired and at no other points, the application being made with great rapidity and no excess of glue being applied must later be scraped off. The labor saving over the old brush method of applying the glue is large, a much neater and cleaner job of gluing may be done, and there is a large saving in material used, all of which makes the invention when used for panel gluing one of great value.

In Figs. 5 to 9 inclusive a modified form of gluing machine is used operating on the same principle but worked by power and adapted to be used for surface gluing. In this construction, supporting end frames are used each having legs 47 connected by an intermediate cross member 48 and an upper cross member 49. A frame comprised of front and rear beams 50 connected by ends 51 lies above and is supported by the end supports, there being an open space in the frame in which the glue tank may be located. The glue tank comprises outer and inner members 52 and 53, the latter holding the glue and with spaces between the members into which steam may be entered and circulated, inlet and outlet pipes 54 being used to carry the steam.

A number of vertical guides 55 are secured to the rear frame beam 50, extending above the same and between pairs of which slides 56 are slidably mounted. The upper ends of the slides are connected by bars 57 and 58, with strengthening and reinforcing bars 59 and 60 in front of the bar 58 so that a plurality of spaced apart bars 61 may be rigidly connected thereto, extending forward to points above the glue tank, being thence turned downwardly as indicated at

62 and then in a forward direction to make supports for the glue plate which may be immersed in the glue and then elevated above it in the operation of the machine as will later appear.

The glue plate comprises a wood plate 64 having a plurality of vertical openings 65 therethrough narrowing in size at their upper ends, and above the wood member a metal plate 66 is located with a plurality of openings 67 in alinement with the upper ends of the openings 65.

On the rear of the bar 57 two angles 68 are attached to which the upper end of a link 69 is pivotally connected, its lower end having pivotal connection with the rear end of an operating lever 70 which is pivotally mounted between its ends at 71, the support of the pivot bearing being a member 72 located lengthwise of the machine. The front end of the lever 70 is curved downwardly to pass under a shaft 74, being spaced a short distance therefrom, normally as indicated at 73, and on the shaft 74 an arm 75 is fixed equipped with a roller 76 at its free end which in the rotation of the shaft comes into contact with the curved portion 73 of the operating lever and raises the glue plate to a point above the tank once with each revolution of the shaft. The curve of the part 73 is such that after the glue plate is raised, it is held in elevated position for a time before it is allowed to drop by gravity when the roller passes from the operating lever.

At one end of the shaft 74 a gear 77 is fixed, meshing with which is a pinion 78 fixed on the end of a drive shaft 79 mounted in bearings 80 at the rear of the machine. A drive pulley or wheel 81 is fixed at the other end of the shaft and it is designed that by means of a belt this wheel may be driven from any suitable source of power, such as an electric motor, line shaft or the like.

With this machine, with each rotation of the shaft 74 the glue plate is immersed in the glue and raised above the glue, remaining stationary for a period when in upper position. When the glue plate is in upper position, the surfaces of boards may be placed against it, glue adhering as is evident. The holes through the glue plate permit the excess of glue to drain back into the tank leaving enough, however, to cover the surface of a board or boards placed against it with a film of glue and insuring against too great an amount of the glue which, if too much is used, is merely wasted. The boards when properly supplied with the glue film may be placed in any suitable clamp to glue them together.

These machines are practical and operative, and have proved their value in continual use over a period of several months.

I claim:

1. In a machine of the character described, an elongated support, a glue tank having an open upper side carried by and positioned lengthwise of the support, vertical guides on the support, members mounted between the guides and adapted to move up and down therebetween, a horizontal bar connected to said members, means for moving said members and attached bar in an upward direction, and means carried in front of the bar and depending below the same to immerse in the glue when the bar is in lower position.

2. In a machine of the character described, an elongated support, a glue tank having an open upper side carried by and positioned lengthwise of the support, vertical guides on the support, members mounted between the guides and adapted to move up and down therebetween, a horizontal bar connected to said members, a plurality of bars attached to said horizontal bar and extending downwardly therefrom, each having a horizontal section at its lower end turned forward to make a support, and means carried by said horizontal sections and adapted to immerse in glue in the tank in the lower position of the horizontal bar, and elevate above the glue in the upper position thereof.

3. In a machine of the character described, a support, a glue tank carried by the support, a bar located above the tank, means for mounting the bar for vertical movements thereof with respect to the support and tank, means for elevating the bar, and a plurality of glue members carried by the bar at spaced apart intervals in the length thereof, said members immersing in glue in the tank when the bar is in lower position and rising above the glue when the bar is in upper position.

4. In a machine of the character described, an elongated support, a glue tank having an open upper side located lengthwise of the support, a horizontal bar located above and at the rear of the tank, a plurality of glue members adjustably mounted on the bar and adapted to enter the tank, means to raise and lower the bar, and means to clamp boards to be glued at a point over the tank whereby said glue members come in contact therewith when the bar is elevated, substantially as described.

5. In a machine of the character described, an elongated support, a glue tank having an open upper side located lengthwise of the support, pairs of vertical spaced apart guides on the support, members slidably mounted between the guides, a horizontal bar carried by said members at a point

above and to the rear of the tank, means to elevate said members and bar, a plurality of glue members carried by said bar in spaced apart relation to each other and adapted to enter the tank in lower position of the bar, a stop bar located lengthwise of and above the tank back of said glue members, a clamping bar located above and at the front of the tank, and means to move the clamping bar toward the stop bar, substantially as described.

6. In a machine of the character described, an elongated support, a glue tank carried by and located lengthwise of the support, a horizontal bar mounted for vertical movements and located above and at the rear of the tank, means on said bar adapted to enter the tank and immerse in glue therein in lower position of the bar and elevate above the tank on movement of the bar to upper position, means to move the bar to upper position, a stop bar located over and lengthwise of the tank back of said means on the horizontal bar, a clamping bar located at the front and lengthwise of the tank, means normally maintaining the clamping bar in said position, and means for moving the clamping bar toward the stop bar, substantially as described.

7. In a machine of the character described, an elongated support, a glue tank carried by and located lengthwise of the support, a pair of vertical guides on the support at each end of the tank, a member slidably mounted between each pair of guides, a rack connected to each member, a rotatably mounted shaft, gearing connections between the ends of the shaft and the racks, an operating handle on the shaft, a plurality of glue members, a horizontal bar to which said glue members are connected in spaced apart relation, said bar being connected at its ends to said first mentioned members, and means to hold boards lengthwise of and above the tank in position to be engaged by said glue members on upward movement of the same imparted by manual operation of the handle, substantially as described.

8. In a machine of the character described, an elongated support, a glue tank carried by and located lengthwise of the support, a stop bar positioned lengthwise and above the tank, means for carrying said stop bar, a clamping bar located lengthwise and in front of the tank, a pair of toggle links at each end of the clamping bar, one of said links being pivotally connected to the bar and the other to the support, a link member connected to each pair of toggle links at the knees thereof and extending toward each other, a pair of bell crank levers pivotally mounted on the support to one arm of each of which each link member is connected, a foot pedal pivotally mounted at its rear end and located below the tank extending in front of the support, a spring for elevating the front end of the foot pedal, a pair of vertical links connected to the foot pedal and to the other arms of said bell crank levers, a horizontal bar located lengthwise of the tank and above the same, means to raise and lower the same, and means on the bar adapted to immerse in glue in the tank when the bar is in lower position and come in front of the stop bar and above the glue when said horizontal bar is raised to upper position.

9. In a machine of the character described, an elongated support, a glue tank located lengthwise of the support, a bar located in parallel relation to the length of the tank means for mounting the bar on the support for up and down movements, means for moving the bar to upper position, its weight normally tending to move it to lower position, and a plurality of glue members carried by the bar in spaced apart relation adapted to enter the tank when the bar is in lower position and elevate above the tank when the bar is in upper position, each of said glue members including two spaced upwardly extending ribs parallel to the bar and adapted to enter grooves or mortises in the edges of boards, substantially as described.

10. A machine containing the elements in combination claimed in claim 9 combined with means to hold said boards in position for entrance of said ribs in said grooves or mortises, substantially as described.

11. In a machine of the character described, a support, a glue tank carried by the support, a bar located above the tank, means for mounting the bar for vertical movements thereof with respect to the support and tank, means for elevating the bar, and a plurality of glue members adjustably connected to the bar at intervals in the length thereof and adjustable to different positions in the length of the bar, said members immersing in glue in the tank when the bar is in lower position and rising above the glue when the bar is in upper position.

In testimony whereof I affix my signature.

GEORGE McCONNELL.