May 18, 1926. 1,585,171

E. SATZGER, SR

DOOR CLAMPING MACHINE

Filed August 15, 1924 3 Sheets-Sheet 1

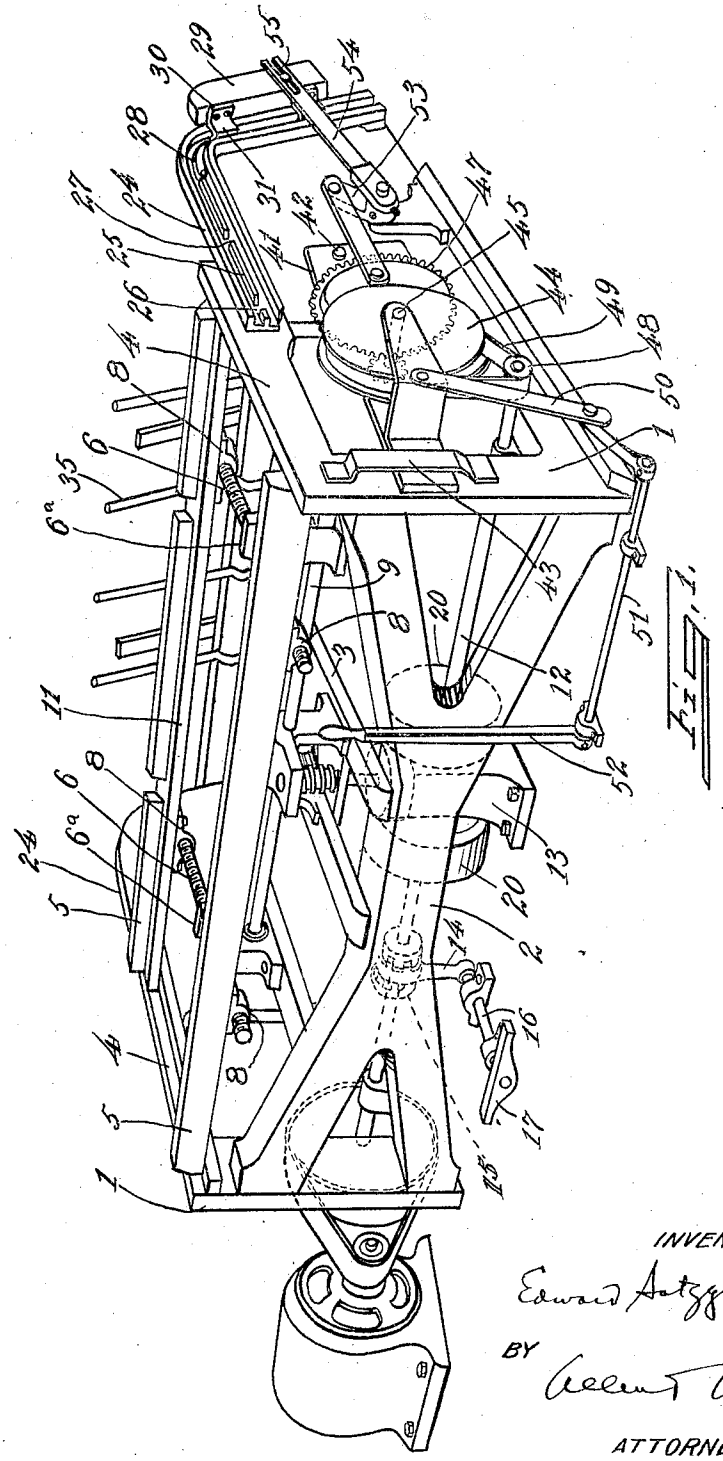


Fig. 1.

INVENTOR:
Edward Satzger Sr.
BY
Albert Teller
ATTORNEYS.

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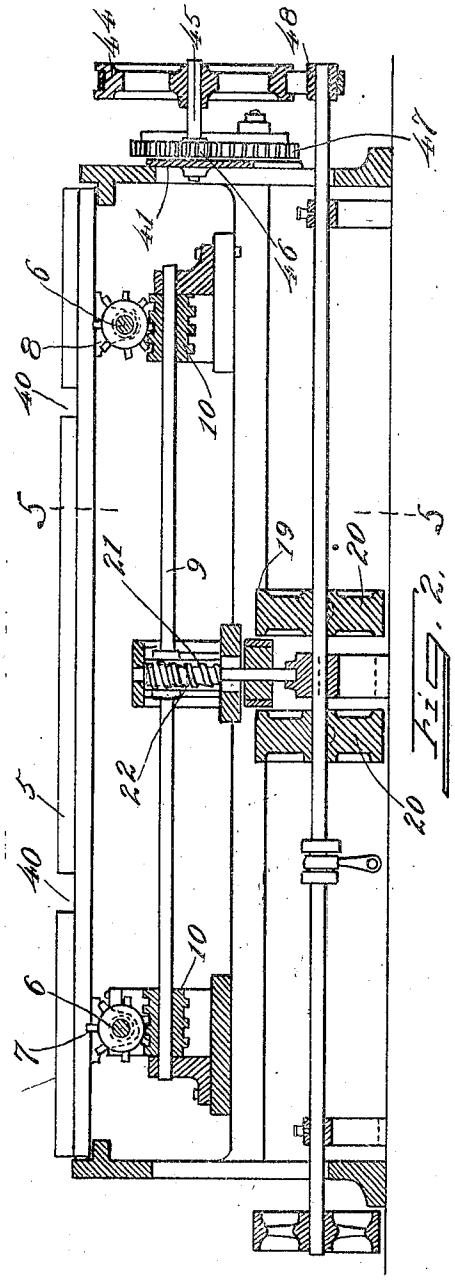


Fig. 2.

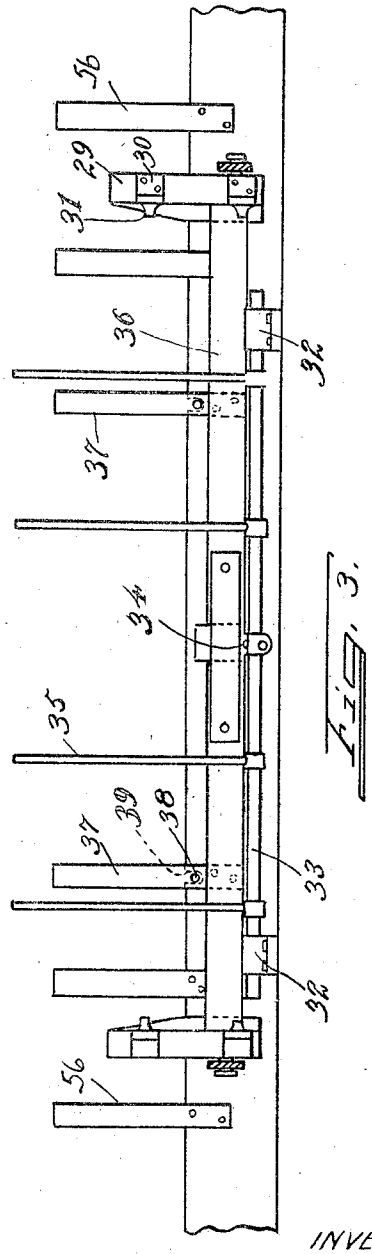


Fig. 3.

INVENTOR:
Edward Satzger Sr
BY
Allen & Allen
ATTORNEYS.

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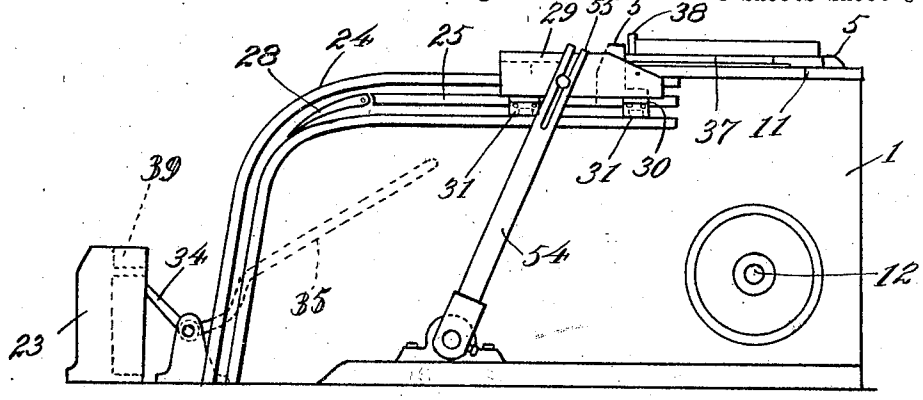


Fig. 4.

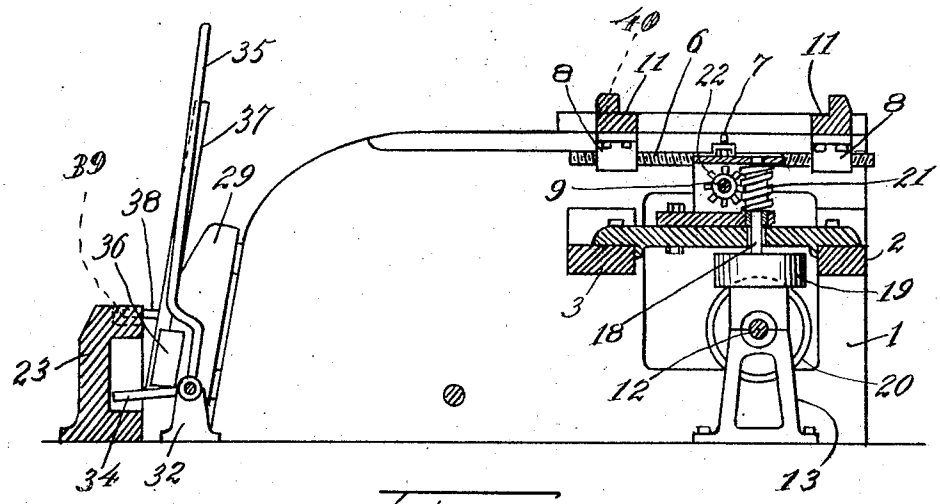


Fig. 5.

INVENTOR:
Edward Satzger Sr
BY
Allen & Allen
ATTORNEYS.

Patented May 18, 1926. 1,585,171

UNITED STATES PATENT OFFICE.

EDWARD SATZGER, SR., OF CINCINNATI, OHIO.

DOOR-CLAMPING MACHINE.

Application filed August 15, 1924. Serial No. 732,273.

My invention relates to machines for setting together the panels and frame pieces of a door or the like and then clamping the pieces tightly together.

In the manufacture of doors at the present time, the daily production is much reduced due to the fact that the assembling of doors is done at one point, and the door then lifted carefully and placed in a clamp and the dowels and pieces forced tightly together. The floor space required, time required for transporting the assembled pieces, and fitting them into the clamp, and delays in operation of the clamp, all tend to hold down quantity production, and take up floor space in the factory.

It is my object to provide a device on which the door parts are to be assembled, a lifting device, controlled from a power driven clamp of which the assembling rack is a part, and a clamp onto which the lifting device gently and accurately sets the assembled door. The structure of my invention does away with the delays above mentioned, and provides for a great simplification in operations in the door factory.

I accomplish my object by that certain construction and arrangements of parts to be hereinafter more specifically pointed out and claimed.

In the drawings:

Figure 1 is a perspective view of my machine.

Figure 2 is a section taken through the operating devices of the clamp and the lifting element.

Figure 3 is a front elevation of the parts at the rear of the machine.

Figure 4 is a side elevation of the machine.

Figure 5 is a cross section taken on the line 5—5 of Figure 2.

The machine has a frame having sides 1, 1, a front 2, and cross supporting frame 3. Mounted along the inside top of the side frames are supports 4, 4, on which two movable clamp bars 5 slide. On the supporting frame 3 are journals 6^a, 6^a, for a pair of screws 6. The screws have worm wheels 7 thereon, and the two ends thereof are oppositely threaded, and lie in threaded boxes 8 on the two clamp bars. In the supporting frame 3 is a cross shaft 9, which has worms 10 thereon meshing with the worm wheels for turning the screws, thereby decreasing or increasing the space between the two clamp bars. The clamp bars are of angle shape in cross section, so as to present a supporting strip 11 for the door.

The drive shaft 12 of the machine, which is supported in the sides, and in a central journal frame 13, is of the floating type and is moved to and fro by means of an arm 14 engaging a grooved collar or sleeve 15 on the shaft. The arm is mounted on a rock shaft 16, which is moved so as to impart movement to the arm by a foot treadle 17.

A vertical jack shaft 18, set into the cross frame 3 and on the frame 13, has a horizontal friction wheel 19, and on the drive shaft are two friction wheels 20, the location of the parts being such that shifting of the shaft lengthwise will move one or the other friction wheel up against the side of the horizontal wheel thereby driving the jack shaft selectively in the desired direction. A worm 21 on the jack shaft meshes with a worm wheel 22 on the horizontal cross shaft 9, thereby driving the cross shaft and thus adjusting the relative positions of the clamp bars.

Mounted at the rear of the main frame is a frame 23, on which the door parts are to be assembled. This frame has a common base with the clamp frame parts, and extending from the side frames at the top and sloping downwardly toward the frame 23, are a pair of tracks 24, at each side of the machine. The tracks are double width at the top portions thereof, and narrow down to single width at the rearward portions thereof. Dividing the tracks at the double portions into two parts are the fixed bars 25, one in each track, and the bars have notches 26 and 27 therein, for a purpose to be described.

At the rear of the bars 25 are hinged bars 28, which normally lie by gravity against the lower bar of the main track portions.

The carriers for the lifting frame are shown in this instance as wooden blocks 29, which have plates 30 screwed to the undersides thereof, two plates to each block. The plates have double angle shape in cross section, with the final bends in the form of tongues 31 which lie in the tracks, last above described. As the blocks are moved in the tracks beginning with their rearmost position shown in Figure 1, they first slide up the single track portions, over the hinged spacing bars, and along the fixed spacing bars. When they come to the notches in

the bars the two tongues of the block plates drop through the notches onto the lower track, being then in the position shown in Figure 4. A rearward motion causes the block to slide along the lower track portion, the block plates lifting the tongue as they pass by it, and thus pass to the lower-most position again. The drop of the blocks causes the lifting frame to deposit a door, already assembled at the rear of the machine into the supporting portions of the clamp bars.

Mounted on a pair of brackets 32 at the rear of the machine but ahead of the assembling frame 23, is an auxiliary supporting back for the supporting frame. This device has a main rock shaft 33, on which is a tongue 34, to be engaged by the lifting frame, thereby rocking the shaft. On the shaft are the bars 35, which when the shaft is rocked over, will lie ahead of the assembling support, and supply a rest for the parts of the door frame as they are being assembled.

The lifting frame is formed of a cross bar 36 connected to the two sliding blocks, a pair of vertical arms 37, supporting the door during the lifting, and a pair of projecting pins 38, supporting the edge of the door as it is lifted.

The assembling support has a pair of notches 39, into which the pins sink when the lifting frame is moved back to its rearward position, and the cross bar 36 engages the arms on the rock shaft of the auxiliary back support for the door. Thus when the lifting frame is back, the parts of a door are set together with the one edge of the door on the support 23, and the other parts resting against the arms on the lifting device, and the auxiliary arms. The movement of the slide blocks will then lift the door away from the support 23, holding the edge on the two pins 38, and will move the door bodily to a horizontal position over the clamp bars. The notches 40 in the rear clamp bar will permit the two arms 37 to drop, with the slide blocks, and the subsequent rearward movement of the blocks will result in the rear-clamp bar stripping the door away from the lifting device, leaving it ready for clamping.

To operate the slide blocks, a rocking back board 41 is pivoted at 42 on one of the side frames, with its other end sliding behind a bracket 43. A pulley 44 is mounted on a shaft 45 on the board 41, said shaft having a gear 46, which meshes with another and larger gear 47, also on the board. The drive shaft has a small pulley 48 thereon, from which a belt 49 drives the pulley 44, although the belt is slack when the rocking board is down in the position it assumes by gravity. To lift the rocking board to belt tightening and thus to driving position, an arm 50 is provided, which is connected to the rocking board and to a rock shaft 51 at the front of the machine. A hand lever 52 serves to energize the rock shaft, thereby driving the gears last above noted.

On the gear 47 is a pitman, which is connected to an arm 53 on the rocking lever 54. This lever 54 has a forked end 55 engaging over a stud on the adjacent lifting block. Thus as the gear 47 is revolved, the rock lever is moved, thereby sliding the block and with it the lifting frame, through the cycle that has been described.

If desired the assembling support may be made much longer than the machine, above described, as indicated in Figure 3 and back supports 56 erected thereon, so that two or three crews of men can be assembling doors, and sliding them into position for engagement by the lifting device.

The operation of the machine has been described as part of the description of parts and will not require a further description. It will be evident that I have provided a machine which takes care of all the operations of assembling, lifting and clamping a door. I do not insist upon the mechanical arrangement, so far as its details are concerned, and will set forth in the claims that follow, the points of invention which I believe to be inherent in my structure.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier for a door, means for swinging the carrier through an arc from the assembling support to the door clamp, and means for stripping the door from the carrier, so as to leave it within the clamp.

2. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, said carrier so constructed and moved as to lift the door edgewise and carry it into a sidewise relation.

3. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier for a door, and means for moving the carrier from the assembling support to the door clamp, and means for stripping the door from the carrier, so as to leave it within the clamp, said carrier having means for picking up the door edgewise from the assembling support,

and so constructed and moved as to deposit it sidewise in the clamp.

4. In a device of the character described, a pair of relatively movable longitudinal clamps for a door or the like, a carrier having an edgewise support, and a back support for a door, means for moving the carrier so as to bring its edgewise support downwardly whereby a door may be assembled edgewise with relation to the said two supports, and means for moving the carrier so as to bring its back support downwardly, and over the clamps.

5. In a device of the character described, a pair of relatively movable longitudinal clamps for a door or the like, a carrier having an edgewise support, and a back support for a door, means for moving the carrier so as to bring its edgewise support downwardly, whereby a door may be assembled edgewise with relation to the said two supports, and means for moving the carrier so as to bring its back support downwardly, and over the clamps, and means for stripping the door away from the said carrier, leaving it in position for engagement by the clamps.

6. In a device of the character described, a pair of relatively movable longitudinal clamps for a door or the like, a carrier having an edgewise support, and a back support for a door, means for moving the carrier so as to bring its edgewise support downwardly whereby a door may be assembled edgewise with relation to the said two supports, and means for moving the carrier so as to bring its back support downwardly, and over the clamps, and means for lowering the carrier to depress the back supports when same are over the clamps so as to deposit the door on the clamps, one of said clamps having grooves therein to permit the said lowering of the backing supports of the carrier.

7. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, said edge support for the door on the carrier comprising a plurality of projecting elements, said assembling support having notches into which said projecting elements sink, when the carrier is in position of co-operation with the assembling support.

8. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, and an auxiliary back support for the door co-operating with the back supports on the carrier.

9. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, and an auxiliary back support for the door co-operating with the back supports on the carrier, said auxiliary back support comprising a rock shaft having a series of arms thereon, serving as the back support, and a member adapted to be engaged by the carrier to rock the shaft so as to bring the said arms into back supporting relation.

10. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, said means comprising a guideway element, blocks supporting the carrier in the said guideway element, and means for moving said blocks, said guideway element extending horizontally along the clamp portion of the device, and thence bending downwardly to the assembling support.

11. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, said means comprising a guideway element, blocks supporting the carrier and having members in the said guideway element, and means for moving said blocks, said guideway element extending horizontally along the clamp portion of the device, and thence bending downwardly to the assembling support, said guideway having openings therein adjacent the clamp portion of the device, through which the block members drop to lower the blocks, and a return track for the blocks extending to the downward portion of the said guideway.

12. In a device of the character described,

the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier having a back support and an edge support for a door, and means for moving said carrier to position with its edge and back supports co-operating with the assembling support, and to a position over the clamp, so as to carry the door to the clamp, said means comprising a guideway element, blocks supporting the carrier and having members in the said guideway element, and means for moving said blocks, said guideway element extending horizontally along the clamp portion of the device, and thence bending downwardly to the assembling support, said guideway having openings therein adjacent the clamp portion of the device, through which the block elements drop to lower the blocks, and a return track for the blocks extending to the downward portion of the said guideway, and a movable section in the guideway first mentioned adapted to rise to permit the blocks to slide from the return track to the downwardly extending portion of the said guideway.

13. In a device of the character described, the combination of a door clamp, means for operating said clamp, an assembling support for a door, a carrier for a door, means for moving the carrier from the assembling support to the door clamp, and means for stripping the door from the carrier so as to leave it within the clamp, said operating means for the clamp and the carrier comprising a drive shaft and clutch devices for selectively operating the clamp to open and close same, and the carrier to move and return same.

EDWARD SATZGER, SR.