J. H. PICKETT.

CORNER LOCKING MACHINE.

APPLICATION FILED DEC. 12, 1906.

963,063.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

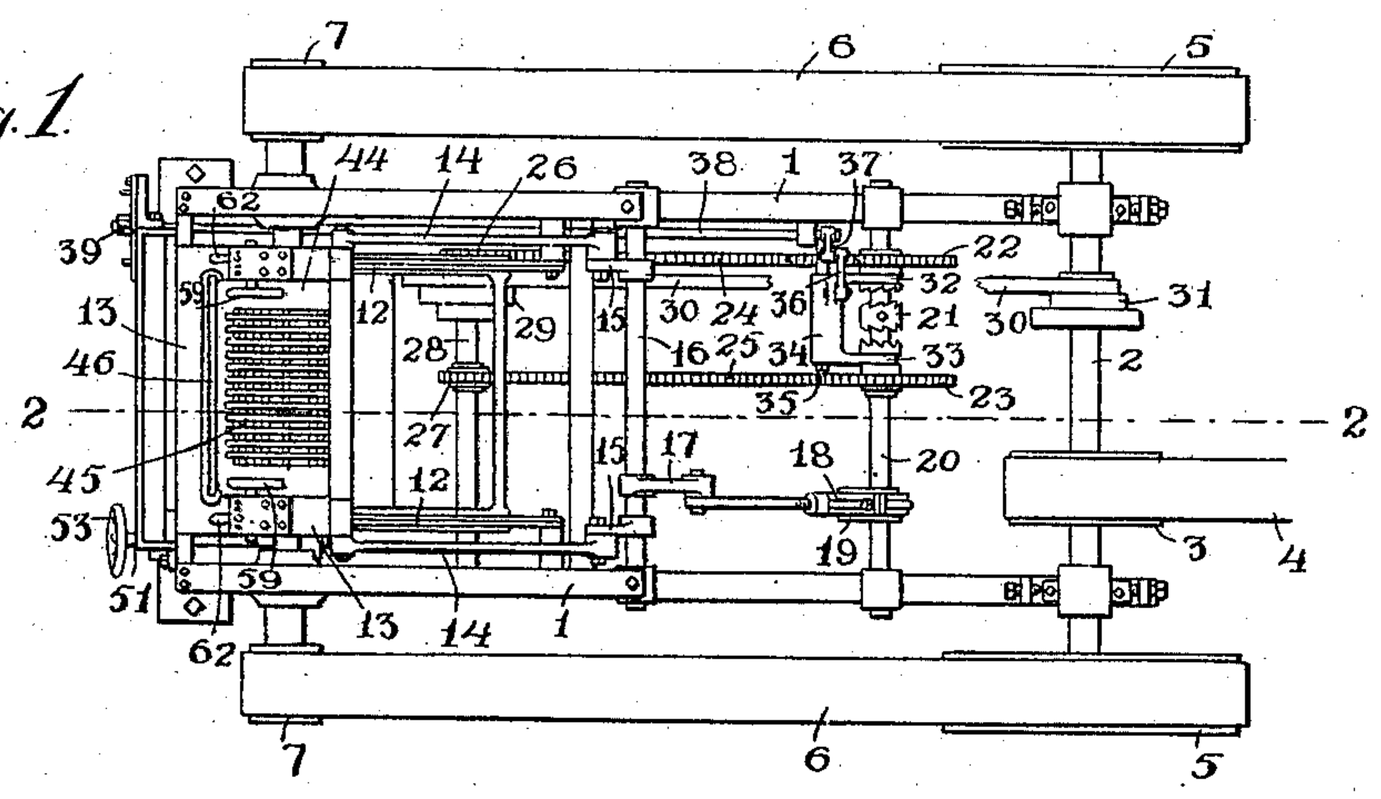


Fig. 2.

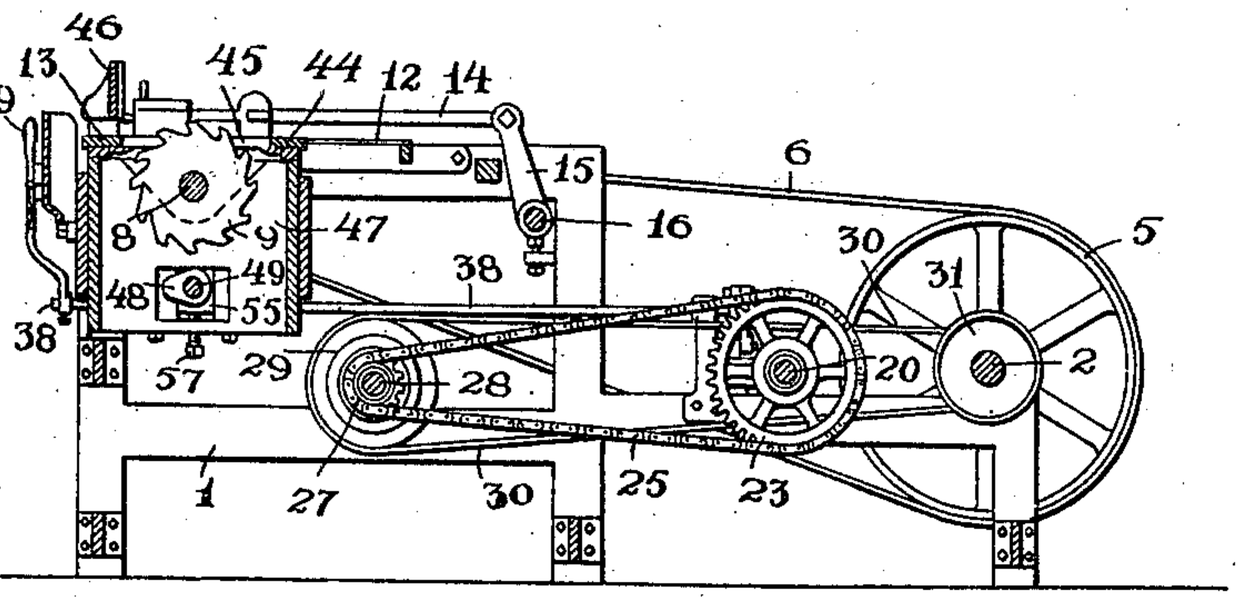


Fig. 3.

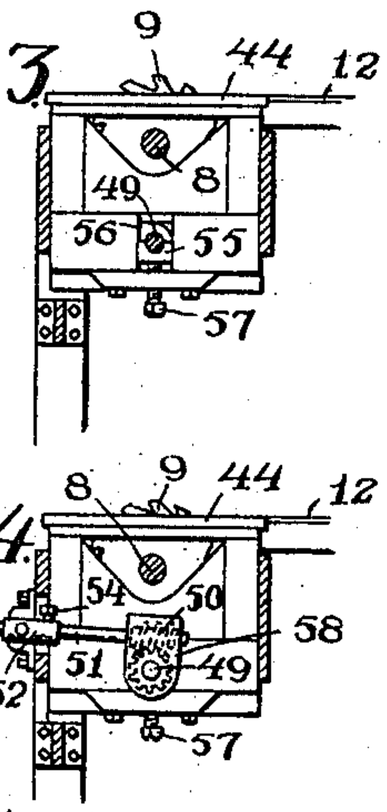


Fig. 4.

Fig. 5.

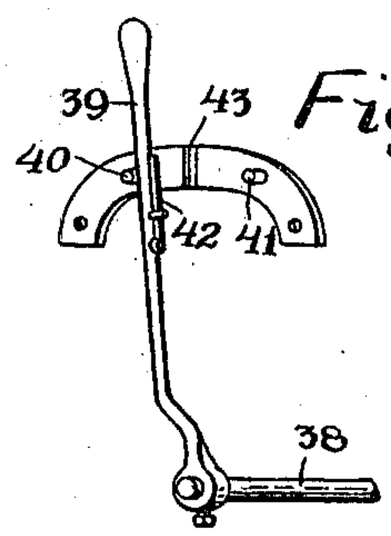


Fig. 6.

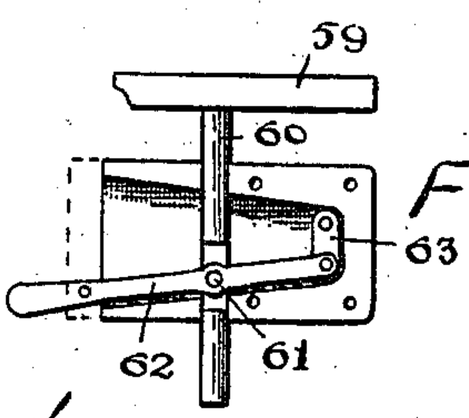


Fig. 7.

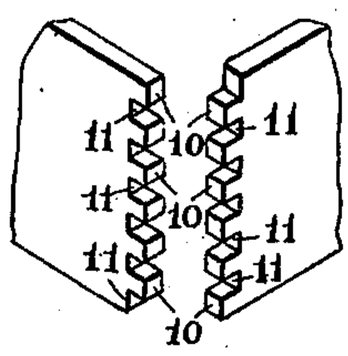
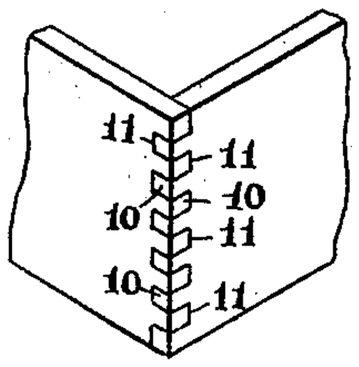


Fig. 8.



Witnesses

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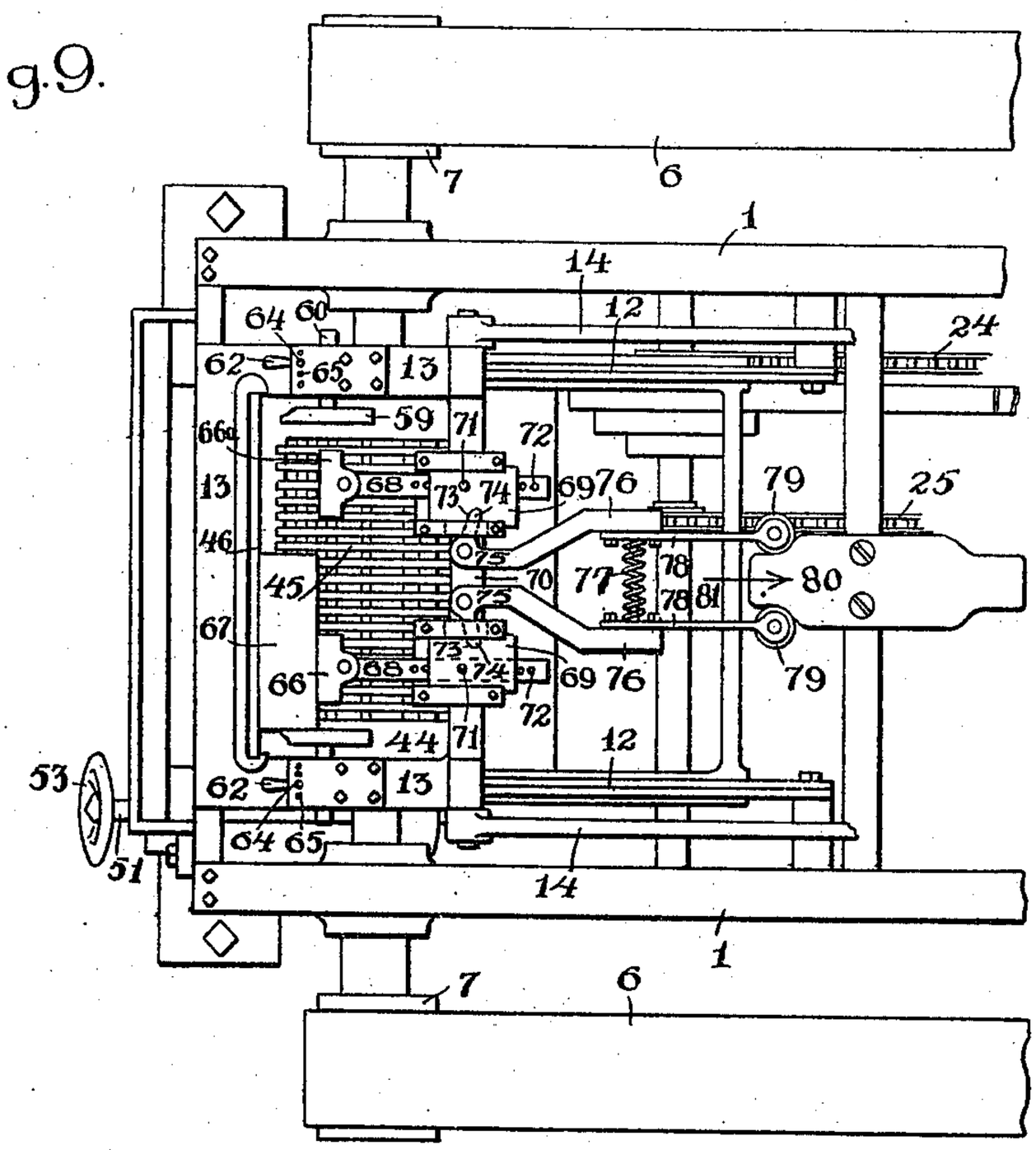
2 SHEETS—SHEET 2.

Fig.9.



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UNITED STATES PATENT OFFICE.

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CORNER-LOCKING MACHINE.

963,063. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed December 12, 1906. Serial No. 347,447.

To all whom it may concern:

Be it known that I, JOSEPH H. PICKETT, a citizen of the United States, residing at Gardner, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Corner-Locking Machines, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 is a top view of my improved machine. Fig. 2 is a side elevation shown in section on line 2—2, Fig. 1. Figs. 3 and 4 are detail views of the table lifting mechanism. Fig. 5 is a detail of the shipping mechanism. Fig. 6 is a top view, with cap removed, of gage plate adjusting mechanism. Fig. 7 represents two interlocking box sides. Fig. 8 shows box sides interlocked, and Fig. 9 is a top view on a larger scale of the carriage showing a work clamping mechanism.

Similar reference figures refer to similar parts in the different views.

My present invention relates to that class of machinery known as corner locking machines, by which a series of teeth is formed upon the edges of wooden pieces which are to form the ends and sides of a wooden box, and by which they are interlocked, as represented in Figs. 7 and 8, and my invention consists in the construction and arrangement of parts as hereinafter described and pointed out in the annexed claims.

Referring to the accompanying drawings 1 denotes the framework of the machine and 2 the driving shaft, carrying a belt pulley 3 having a belt connection 4 with its driving power. The driving shaft 2 also carries a belt pulley 5 having a belt connection 6 with a pulley 7 upon a saw arbor 8. The arbor 8 carries a gang of saws 9, the space between adjacent saws being equal to the thickness of the teeth 10 formed on the box, and the thickness of the saws being equal to the space 11 between the teeth.

The machine is provided on opposite sides with rails 12 forming a track for a reciprocating carriage 13. The ends of the carriage 13 are connected by links 14 to radial arms 15, carried upon a rocking shaft 16. The rocking shaft 16 is provided with a radial arm 17 which is pivotally connected with an eccentric strap 18 on an eccentric 19 carried upon a shaft 20. Attached to the shaft 20 is a collar 21 having upon its opposite ends clutching teeth adapted to be engaged by similar clutching teeth on the hubs of slidable sprocket wheels 22 and 23, which turn loosely upon the shaft 20, except when connected thereto by the clutching mechanism.

The sprocket wheels 22 and 23 are connected by chain belts 24 and 25 with smaller sprocket wheels 26 and 27 attached to a shaft 28. The shaft 28 is provided with a cone pulley 29, preferably placed between the sprocket wheels 26 and 27, and connected by a belt 30 with a similar cone pulley on the driving shaft 2. The hubs of the slidable sprocket wheels 22 and 23 are grooved and are engaged by the shipping forks 32 and 33 projecting from a plate 34 which slides upon a spindle 35, projecting from the framework 1. The plate 34 is connected by a link 36 with a radial arm 37 carried on a rocking shaft 38, which extends lengthwise of the machine to the forward end where it is provided with a lever handle 39, by which the shaft 38 may be rocked by the operator and the plate 34 moved along the spindle 35 to alternately shift the sprocket wheels 22 and 23 into engagement with the clutch collar 21, the central position of the sliding plate 34 holding both of the sprocket wheels out of engagement with the clutch collar. In order to prevent the clutch teeth from being thrown into violent contact as the sprocket wheels are shifted, I place stop pins 40 and 41 in the framework of the machine to limit the angular movement of the lever handle 39. The lever handle 39 is also provided with a yielding spring latch 42 which slides over the framework of the machine and engages a notch 43 in the framework whenever the lever handle 39 is brought into its central position, in which position both of the sprocket wheels 22 and 23 are held out of engagement with the clutching collar 21. The sprocket wheels 22 and 23 are preferably made of different sizes in order that the shaft 20 may be driven at different rates of speed as it is connected with either the sprocket wheel 22 or the sprocket wheel 23. The shaft 28 from which the sprocket wheels 22 and 23 are driven is subject to changes of speed by means of the cone pulleys 29 and 31, these changes being three in number in the present instance, thereby enabling six different

rates of speed to be given to the shaft 20 and consequently to the reciprocating carriage 13. The adjustment of the speed of the reciprocating carriage enables the machine to be operated to its fullest capacity as determined by the material operated upon and the alertness of the operator.

The carriage 13 consists of the rectangular framework which slides back and forth upon the rails 12 and within which the work is placed resting upon a horizontal work supporting table 44 held by the framework of the machine, and comprising a series of parallel bars 45 or grid between which the saws 9 project sufficiently far to form spaces 11 in the box ends of the requisite depth. The reciprocating table 44 carries a pushing plate 46, which bearing against the side of the work moves it across the horizontal table and over the tops of the rotating saws. The work supporting table 44 is supported upon the top of a rectangular lifting frame 47 capable of sliding in vertical ways in the framework of the machine, and resting at its opposite ends upon a pair of lifting cams 48, carried upon a cam shaft 49 which is rotated through a worm gear connection 50 with a short shaft 51 journaled in a tilting journal box 52 and carrying a hand wheel 53 by which the lifting cams 48 may be rotated in either direction in order to raise or lower the work supporting table 44. The cam shaft 49 is ordinarily held from reverse movement by its worm gear connection with a shaft 51, but for additional security I provide the tilting journal box 52 with a set screw 54, by which the shaft 51 may be tightened.

The cam shaft 49 is journaled in boxes 55 which are adjustable in vertical ways 56 in the framework of the machine, and the boxes are adjusted by means of adjusting screws 57 which are held in the framework of the machine and bear against the under side of the boxes. By means of the screws 57 the cam shaft 49 can be raised or lowered to provide for an accurate vertical adjustment of the work supporting table 44. The cam shaft 49 and the hand wheel shaft 51 are coupled together by both being journaled in a shell or case 58, which incloses the worm gear connection between the shafts and protects it from dust. As the cam shaft 49 is raised or lowered the inner end of the hand wheel shaft 51 is also permitted to follow the cam shaft by means of the tilting journal box 52.

When the work is placed behind the pushing plate 46 with its end resting upon the work table, its position with reference to the cutting saws is determined by means of adjustable gage plates 59 which bear against the edges of the work as it is pushed across the table and over the revolving saws. The gage plates 59 are provided on both sides of the machine in order to allow the work to be cut at one end while held against the gage plate on one side of the machine, and at its opposite end while held against the gage plate upon the opposite side of the machine. The gage plates 59 and their adjusting mechanism upon each side of the machine are duplicates of each other, and a description of one will suffice for both. The gage plate 59 presents a vertical wall to the edge of the work and is held upon the end of a cylindrical sliding arbor 60 sliding in ways in the carriage of the machine and pivotally connected at 61 with a lever 62. The lever 62 is pivotally connected by a short link 63 with the frame of the carriage, and is provided with a locking pin 64 which passes through the lever into one of a series of holes 65 in order to lock the lever and hold the gage plate in its desired position.

In Fig. 7 I have shown portions of the pieces forming the sides of a wooden box, and in Fig. 8 I have shown a perspective view of one corner of a completed box, showing the pieces united by the interlocking of the teeth 10 of one piece with the spaces 11 of the other piece. It will be noted that one of the spaces 11 is formed flush with one edge of the pieces, while the space at the opposite edge is removed, the thickness of one of the teeth and the position of the piece to be cut relatively to the end saw in the gang of saws is determined by varying the position of the side gages 59.

In Fig. 9 I have shown a top view of the reciprocating carriage on a larger scale, and a clamping mechanism, with means for automatically actuating the same for the purpose of holding the work against the pusher plate 46 during the movement of the work across the revolving saws. This clamping mechanism is omitted from Fig. 1 in order to better disclose the operative parts of the machine and because the scale of Fig. 1 is too small to adequately disclose its construction and method of operation. The clamping mechanism consists of two clamping plates 66 and 66ª adapted to bear against the work as the latter is held against either one or the other of the gage plates 59. In the present instance the work is represented as a block 67 of sufficient thickness to form a number of end or side pieces by sawing the block after the teeth have been formed upon it by the corner locking machine. The block 67 is represented as held against the pushing plate by means of the clamping plate 66. The clamping plates 66 and 66ª are pivoted upon the ends of bars 68 which are adjustably held in sliding plates 69 sliding in ways on the rear cross bar 70 of the carriage 13. The bars 68 are held in position on the plates 69 by means of pins 71 which pass through the sliding plates 69 and into any one of a series of holes 72 in the bars 68. The sliding

plates 69 are recessed on their inner sides at 73 to receive the ends of the arms 74 of the bell crank levers 75 pivoted on the cross bar 70. The arms 76 of the bell cranks are connected by a spiral spring 77 with its tension applied to rock the bell cranks and draw the clamping plates away from the pushing plate 46 and release the work. Attached to the arms 76 of the bell crank are yielding arms 78, carrying at their free ends friction rolls 79 which bear against the edges of a cam plate 80 rigidly attached to the framework of the machine. As the carriage is moved in the direction of the arrow 81 the friction rolls 79 are separated by the cam plate 80 rocking the bell cranks and carrying the clamping plates 66 and 66[a] toward the pushing plate 46, and applying sufficient pressure to securely clamp the work against the pushing plate. As the carriage 13 reaches the end of its rearward movement the cam plate 80 allows the bell cranks to be rocked by the tension of the spiral spring 77, thereby reversing the movement of the clamping plates and releasing the work which can then be removed by the operator, and as the carriage is returned to its foremost position the work can be replaced in proper position to be again operated upon by the revolving saws. By the action of the cam plate 80 the clamping plates 66 and 66[a] are tightened against the work during the reciprocating movement of the carriage, while the work is passing over the saws, but they are automatically released from the work at each end of the reciprocating movement of the carriage for a sufficient period to allow the work to be changed. The blocks of wood to be operated upon are cut of approximately uniform size, but a change may be made from blocks of one size to those of another by adjusting the bars 68 in the sliding plate 69. The clamping plates 66 and 66[a] are preferably pivoted upon the bars 68 that they may actuate themselves to blocks which are thicker at one end than the other.

I claim,

1. In a corner locking machine, the combination with a gang of cutting saws, of a horizontal table, a lifting frame capable of sliding vertically in the framework of the machine and supporting said table, cams bearing directly against said lifting frame, a shaft carrying said cams, means for rotating said shaft, and means for vertically adjusting said shaft.

2. In a corner locking machine, the combination with a gang of cutting saws, of a work supporting table, a lifting frame supporting said table, a pair of cams bearing directly against said lifting frame, a shaft carrying said cams, means for the vertical adjustment of said shaft, a tilting shaft operatively connected with said cam shaft, and a hand wheel carried by said tilting shaft.

3. In a corner locking machine, the combination with a work supporting table and a lifting frame supporting said table, of a pair of vertically adjustable journal boxes, adjusting screws held in the framework and bearing against said boxes, a cam shaft journaled in said adjustable boxes, means for rotating said shaft and cams carried by said shaft and bearing against said lifting frame.

4. In a corner locking machine, the combination with a table and a lifting frame supporting said table, of a pair of cams bearing against said lifting frame, a shaft carrying said cams, means for vertically adjusting said cam shaft, and a second shaft having a worm gear connection with said cam shaft and mounted in a tilting journal box, thereby arranged to follow the vertical movement of said cam shaft.

5. In a corner locking machine, the combination with a reciprocating carriage and a pushing plate held by said carriage, of a clamping device for holding the work against the pushing plate and comprising a sliding bar, a bell crank engaging said bar and held on said carriage, and a fixed plate held in the path of said bell crank as the carriage reciprocates, whereby the bell crank is rocked to carry said sliding bar toward the work.

6. In a corner locking machine, the combination with a work holding reciprocating carriage and a pushing plate in contact with the work on said carriage, of a slidable plate on said carriage and means for actuating said slidable plate, comprising a cam surface and a connecting lever between said slidable plate and said cam surface arranged to move said slidable plate toward said pushing plate, said lever provided with a yielding arm to allow for inequalities in the work held between said pushing plate and said slidable plate, and a spring for reversing the movement of said slidable plate.

7. In a corner locking machine, the combination with a work holding reciprocating carriage and a pushing plate, of a slidable plate on said carriage, a bell crank on said carriage operatively connected with said slidable plate and provided with a yielding arm, a spring to rock said bell crank in one direction, and a fixed plate adapted to contact with the yielding arm of said bell crank as the carriage reciprocates, and to move said slidable plate into contact with the work on said carriage.

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Witnesses:

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