A. LARSON & F. G. HOGLAND.

MORTISING MACHINE.

APPLICATION FILED MAR. 17, 1910.

1,067,928.

Patented July 22, 1913.

4 SHEETS—SHEET 1.

Fig. 15.

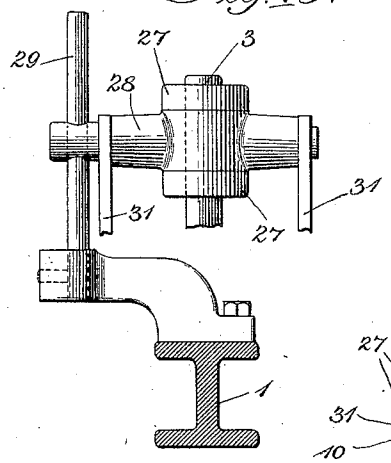


Fig. 16.

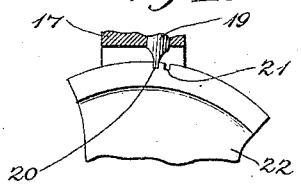


Fig. 17.

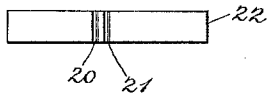


Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

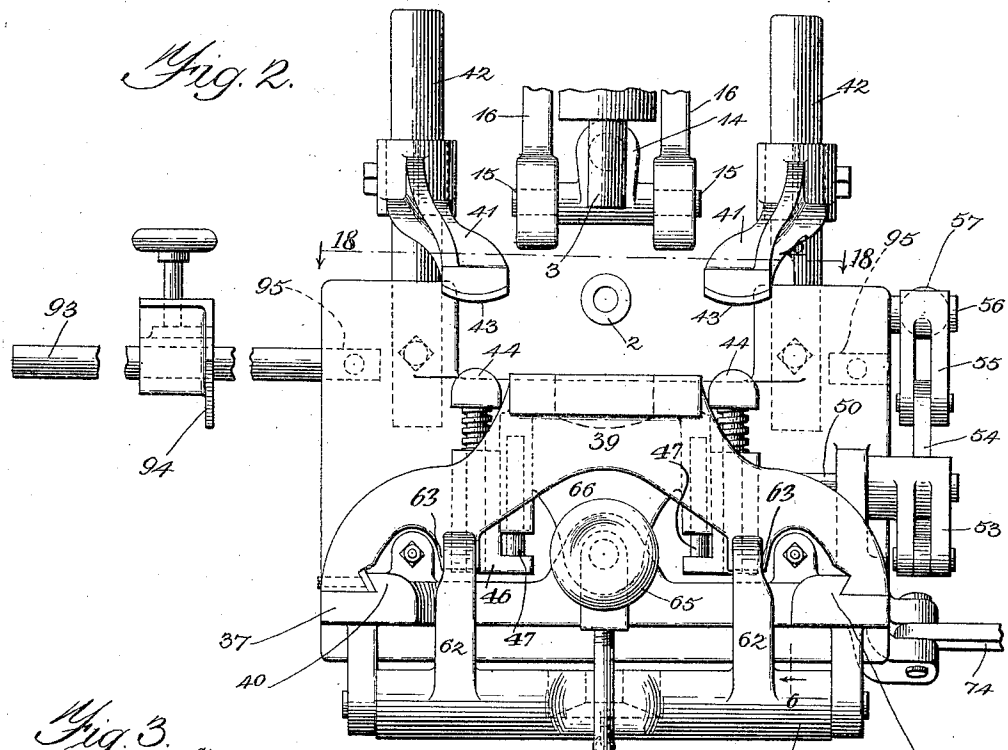


Fig. 3.

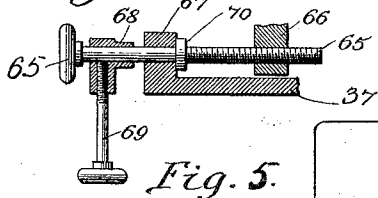


Fig. 5.

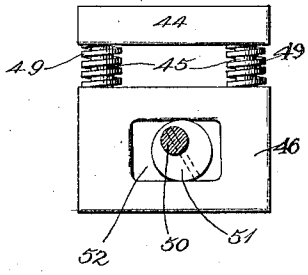
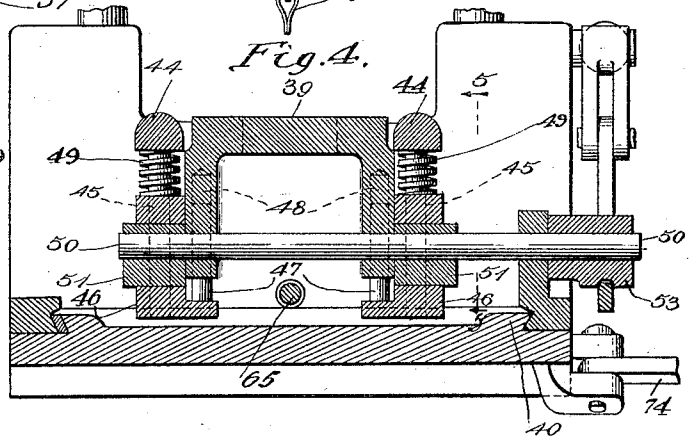


Fig. 4.



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4 SHEETS—SHEET 3.

Fig. 18.

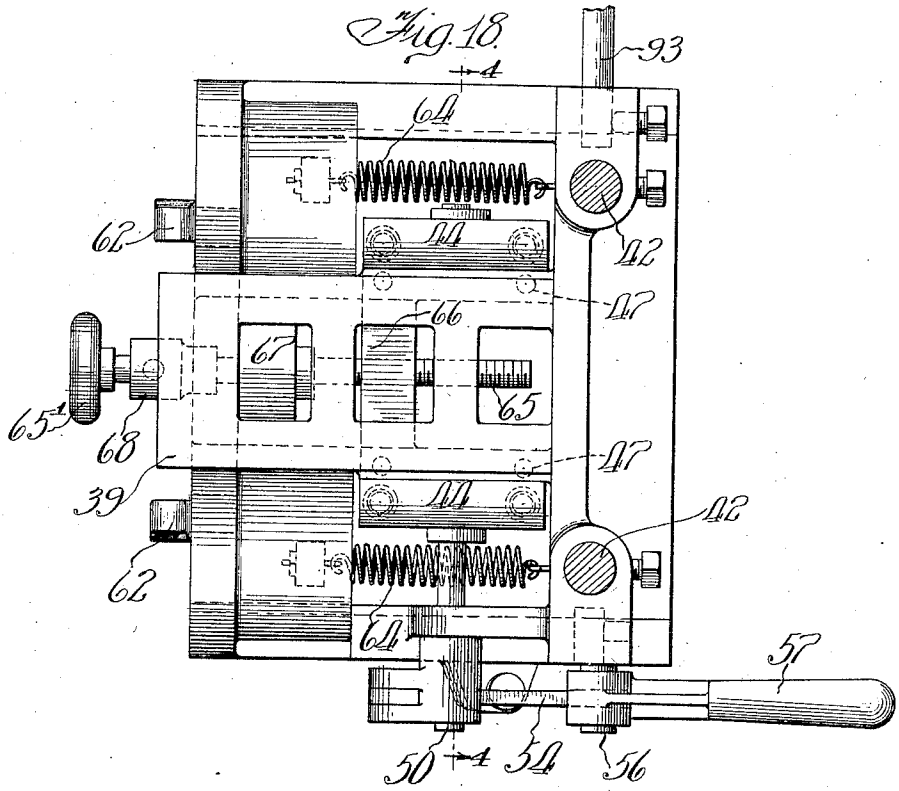
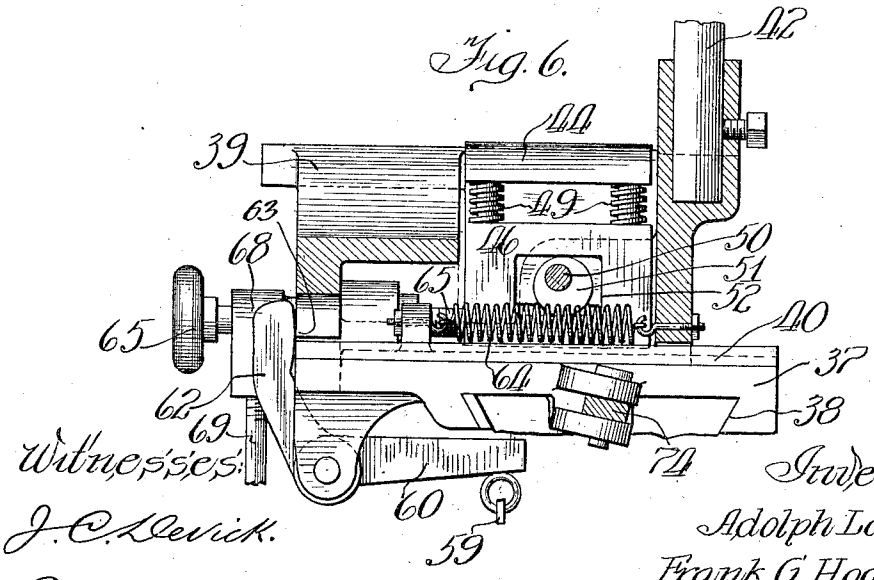


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

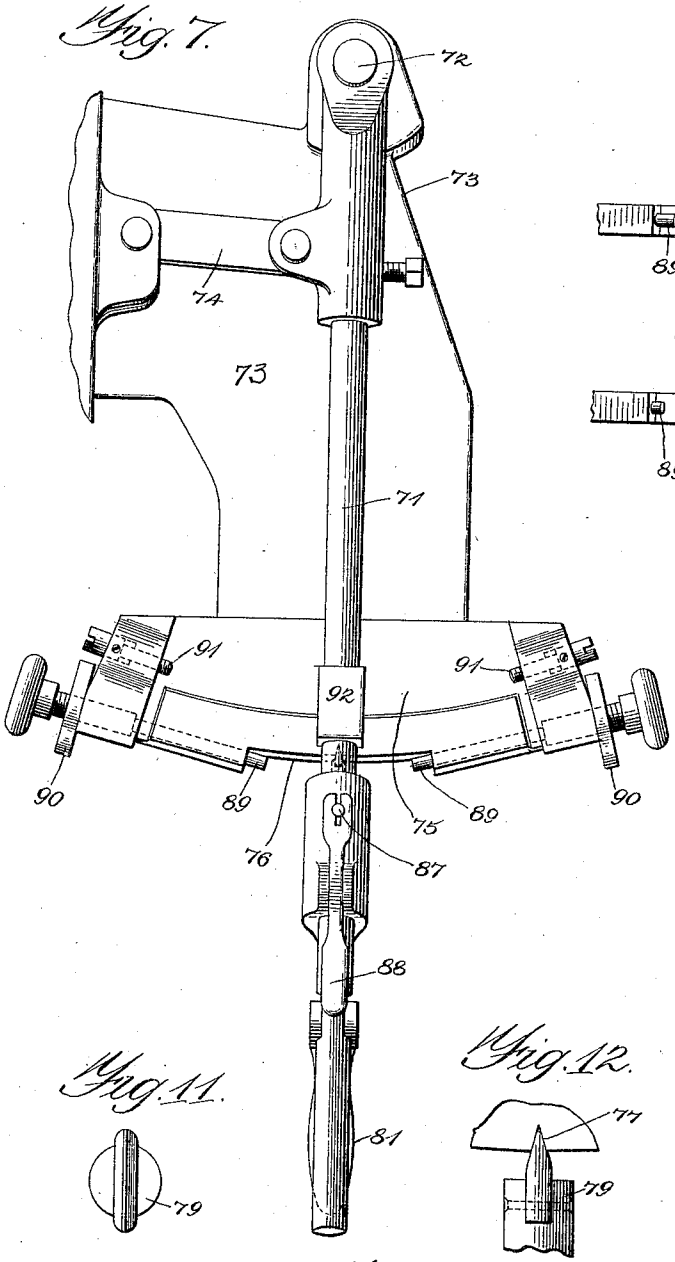


Fig. 8.

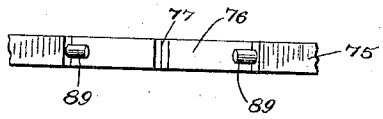


Fig. 9.

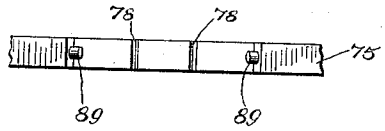


Fig. 10.

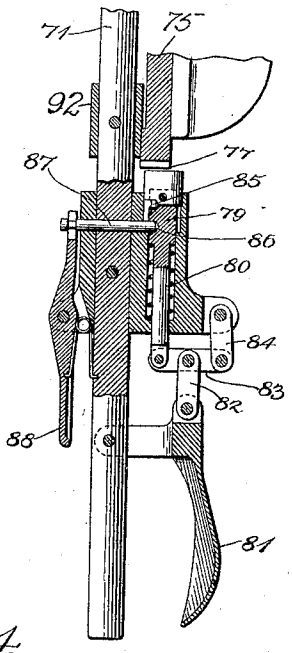


Fig. 11.

Fig. 12.

Fig. 13.

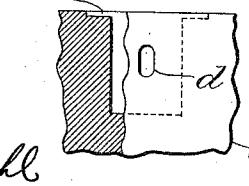
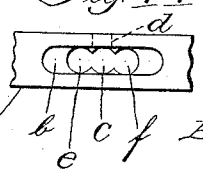


Fig. 14.



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UNITED STATES PATENT OFFICE.

ADOLPH LARSON AND FRANK G. HOGLAND, OF ROCKFORD, ILLINOIS, ASSIGNORS TO NATIONAL LOCK COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

MORTISING-MACHINE.

1,067,928. Specification of Letters Patent. **Patented July 22, 1913.**

Application filed March 17, 1910. Serial No. 549,917.

To all whom it may concern:

Be it known that we, ADOLPH LARSON and FRANK G. HOGLAND, citizens of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Mortising-Machines, of which the following is a specification.

This invention relates to a machine especially adapted for forming a lock mortise and a key-hole opening in a drawer front or similar part, and the object of the invention is to improve the machine shown in Patent No. 955,834, issued April 19, 1910, to Levin Faust and Frank G. Hogland.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying the features of our invention. Fig. 2 is a fragmental front elevation. Fig. 3 is a sectional detail of a stop for the movement of the platen. Fig. 4 is a sectional view of a portion of the work-clamping means taken along the line 4 4 of Fig. 18. Fig. 5 is a sectional view taken in the plane of dotted line 5 5 of Fig. 4. Fig. 6 is a detail view illustrating a means for moving the work-supporting platen the sectional portions of which are on the lines 6 6 of Fig. 2. Fig. 7 is a detail view of the means for moving the carriage from side to side. Figs. 8 and 9 are views of alternative constructions of gage and lock for said carriage-moving means. Fig. 10 is a sectional detail view of a portion of said carriage-moving means. Figs. 11 and 12 are details of a locking plunger carried by said carriage-moving means. Figs. 13 and 14 are views illustrating the work done by the machine. Fig. 15 illustrates a guide for a cross-head employed in the machine. Figs. 16 and 17 are views of a locking sector used in connection with the operating lever. Fig. 18 is a fragmental plan view taken in the plane of line 18—18 of Fig. 2 and showing the work supporting carriage and platen.

The general construction of the embodiment herein shown is substantially similar to that illustrated in the above mentioned patent. It therefore will not be described herein in detail. The supporting frame 1 of the machine is provided with bearings in which a bit spindle 2 is rotatable and horizontally slidable, and other bearings in which a bit spindle 3 is rotatable and vertically slidable. The spindle 2 is continuously rotated by means of a belt 4 running over a pulley 5 on the main shaft 6 and over a pulley mounted on the spindle 2 and having a spline connection therewith. The spindle 3 is continuously rotated by means of a belt 7 extending over a grooved portion 8 of the pulley 5, over suitable guide means 9, and over a grooved pulley or sheave 10 having a spline connection with the spindle 3.

The bit spindle 2 is reciprocated by means comprising a rod 11 which is longitudinally slidable in suitable bearings in the machine frame and to the rear portion of which is adjustably secured a cross-head 12 having an opening therein through which the spindle 2 extends and in which said spindle is rotatable. Collars 13 are fixed upon the spindle 2 at opposite sides of the cross-head 12. Upon the forward end of the rod 11 is fixed a collar 14 (Fig. 2) carrying studs 15 which lie within the forked arms 16 of a hand lever 17, said hand lever being pivoted at 18 in the machine frame. A spring-actuated detent 19 carried by the lever 17 (Fig. 16) is adapted to engage in either of two notches 20 and 21 in a locking sector 22 fixed in the frame. Between the collar 14 and a stationary portion of the machine frame is a coiled spring 23 which tends to move the rod 11 and hence the bit spindle 2 forwardly. The forward movement of said parts is limited by the engagement of a stop 24 on the rod 11 with the stationary stop portion 25. The stop 24 may be adjustably fixed upon the rod 11 by means of a set screw 26.

Upon the upper end of the bit spindle 3 are fixed two collars 27 between which is a cross-head 28, said cross-head having an opening therein through which the bit spindle passes and in which said spindle is rotatable. In one end of the cross-head 28 is an opening through which extends loosely a guide pin 29 (Fig. 15, Sheet 1) fixed in the machine frame in a vertical position. Said guide pin serves to prevent twisting or pivotal movement of the cross-head on the bit spindle. The cross head is connected to rigid arms 30 forming a part of the hand lever 17 by means of links 31.

A knee 32 is vertically slidable upon a gib 33 on the machine frame. The knee may be moved in any suitable manner, as by a screw shaft 34 arranged to be rotated by bevel gearing 35 and a hand crank 36.

A carriage 37 is horizontally slidable

from side to side upon a gib 38 on the knee 32.

A work-supporting platen 39 is horizontally slidable forward and back upon the guides 40 on the carriage 37. Said platen is furnished with suitable means for clamping the work. We have herein shown relatively stationary clamping members 41 which are adjustably attached to vertical posts 42 fixed upon the platen. The operating faces of the clamping members 41 are preferably curved and may be covered with leather or other suitable material 43.

The movable clamp members consist, in this instance, of two bars 44 having rounded upper surfaces and each located below one of the clamp members 41. Each of the clamp members 44 has two pins 45 fixed thereto, which pins are vertically slidable in a block 46, said block having two vertical guide pins 47 fixed thereto which are slidable in openings 48 in the frame of the platen. Coiled springs 49 are placed upon the pins 45 between the bar 44 and the block 46. The blocks 46 are arranged to be moved to raise and lower the clamp members 44 by means of a rock shaft 50 journaled in the frame of the platen and having eccentrics 51 thereon, which eccentrics lie within openings 52 in said blocks.

It will be seen that when the shaft 50 is rocked to throw the eccentrics 51 upwardly, the clamp members 44 will be yieldingly pressed against a piece of work placed between said clamp members and the clamp members 41. The clamp members 44 may be locked in such position by rotating the eccentrics slightly over center.

The means herein shown for rocking the shaft 50 consists of a crank arm 53 fixed upon said shaft and connected by a link 54 with a lever 55 pivoted at 56. Fixed with relation to said lever is a handle 57 by means of which the lever may be rocked to oscillate the shaft 50. The platen, in this instance, is arranged to be moved back and forth by means comprising a treadle 58 which is connected by a chain 59 to an arm 60 having a hub 61 which is pivotally supported upon the carriage 37. On the hub 61 are two upwardly-extending arms 62 which are arranged to bear against projections 63 upon the platen 39. It will be seen that when the treadle 58 is depressed, the platen will be pushed rearwardly by the arms 62. The means for restoring the platen consists, as herein shown, of coiled springs 64 (Fig. 6) connected at one end to the frame of the platen and anchored at their other end to the carriage 37.

Means may be provided for adjustably limiting the rearward movement of the platen. We have herein shown a screw 65 which takes into a lug 66 on the platen frame and passes loosely through a lug 67 on the carriage 37. On said screw is adjustably mounted a stop 68 adapted to contact the lug 67. The stop 68 may be adjustably fixed in position by means of a set screw 69. The forward or spring-caused movement of the platen is limited by the engagement of a collar 70 on the screw 65 with the stop lug 67. Said screw has a handle 65′.

The means for laterally moving the carriage 37 consists of a hand lever 71 which is pivoted at 72 to a bracket 73 on the knee 32. A link 74 connects said hand lever with the carriage 37. Fixed in the forward end of the bracket 73 is a plate 75 having a portion 76 which is curved upon the arc of a circle concentric with the axis of the hand lever 71. At a suitable point or points upon the surface 76 are formed one or more locking notches 77 78 (Figs. 8, 9 and 10). A locking plunger 79 (Fig. 10) is slidably mounted upon the hand lever 71, a coiled spring 80 tending to move said plunger into locking engagement with the notches 77 or 78. The operating end of said plunger is preferably in the form of a blade, as indicated in Figs. 11 and 12. The plunger 79 is arranged to be withdrawn by means of a lever 81 which is connected with the plunger by a system of links 82, 83 and 84, as indicated in Fig. 10. In the plunger 79 are formed two openings 85 86 to receive the end of a locking pin 87, said pin being arranged to be moved by the finger lever 88.

The plate 75 carries two adjustable stops or gage members 89, which as herein shown, are in the form of pins having a screw-thread connection with said plate and which may be locked in adjusted position by means of jam nuts 90. When the plunger 79 is withdrawn from engagement with a notch 77 or 78, the hand lever 71 may be swung to move the carriage 37 laterally, the sidewise movement of the carriage being limited by the engagement of the plunger 79 with the stops 89. Also mounted upon the plate 75 are two adjustable screw gage-stops 91 which may be engaged by the portion 92 of the lever 71 when the plunger 79 is retracted sufficiently to permit its forward end to clear the forward edge of the plate 75 and the stops 89. The plunger may be locked in such retracted position by placing the pin 87 in the recess 85.

A rod 93 having an adjustable gage-stop 94 thereon may be attached to either side of the machine in position to assist in properly locating the work, sockets 95 being provided to receive said rod.

In use, a drawer front *a* or other part to be mortised is placed upon the platen 39 with the edge in which the mortise is to be formed directed toward the rear and in the horizontal plane of the spindle 2. The

work is clamped upon the platen by means of the members 41 and 44 as hereinbefore described. Assuming the detent 19 to be in the notch 20, the operator withdraws said detent and swings the lever 17 until the detent springs into the notch 21, thereby advancing the horizontal spindle 2 until the bit carried thereby has entered the edge of the drawer-front to a slight depth. The plunger 79 is then fully retracted and the hand lever 71 swung right and left to the extent permitted by the gage-stops 91, thereby cutting a shallow recess *b*, for the reception of the selvage of the lock. The hand lever 71 is then returned to its central position and locked by the engagement of the plunger 79 with the notch 77. The operator then swings the operating lever 17 rearwardly into the position shown in Fig. 1 until the stop 24 engages the stop 25, thereby advancing the horizontal bit to bore a hole *c* (Fig. 14) in the edge of the drawer-front. Then swinging the lever 17 in the opposite direction, the operator withdraws the horizontal bit and lowers the vertical bit to bore a hole in the upper side of the work, and while the vertical bit is in the work the operator moves the platen rearwardly by depressing the treadle 58, so as to cause said vertical bit to form the key-hole *d*. The platen is then returned to its normal position, and the lever 17 swung into its intermediate position. The hand lever 71 is then swung, say, to the right to the limit determined by the right-hand gage-stop 89 and the horizontal bit advanced to bore a hole *e*. Withdrawing the horizontal bit, the operator swings the lever 71 to the limit of the left-hand gage-stop 89 and advances the horizontal bit to bore a hole *f*, and then swings the lever 71 to the right to cause the horizontal bit to remove the wood remaining between the holes *c*, *e* and *f*. The lock mortise and key-hole are now complete, and the horizontal bit is withdrawn.

It will be understood that the order of the various movements as just described may be varied by the operator to suit his convenience.

We have described the operation of forming a mortise to receive a certain size of lock. For wider locks it may be necessary to bore four or more holes such as the holes *c*, *e* and *f*, the gage-stops 89 and 91 being adjusted accordingly. The location of the key-hole may vary with different sizes of locks, hence the notches 77 78 will be located with proper reference to the work to be done. The location of the locking notch 21 (Fig. 16) also depends upon the depth of the selvage recess to be formed.

We would have it understood that the invention is not restricted to the details herein described, for various modifications will occur to persons skilled in the art.

We claim as our invention:

1. In a mortising machine, in combination, mortising mechanism; movably-mounted work-supporting means; a hand lever connected to said work-supporting means; two pairs of adjustably-mounted gage stops; and a member carried by said hand lever adapted to engage one pair of said gage stops to limit the reciprocatory movement of said work-supporting means, said member being movable out of position to engage said pair of gage stops so as to permit said hand lever to be swung to engage said other pair of gage stops.

2. In a mortising machine, in combination, mortising mechanism; movably-mounted work-supporting means; a hand lever connected to said work-supporting means; two pairs of adjustably-mounted gage stops; a plunger carried by said hand lever; means for moving said plunger with relation to said hand lever; and means for locking said plunger with relation to said hand lever in position to engage one of said pairs of gage stops to limit the reciprocatory movement of said work-supporting means and for locking said plunger out of position to engage said pair of gage stops to permit said hand lever to engage said other pair of gage stops to limit the reciprocatory movement of said work-supporting means.

3. In a mortising machine, in combination, mortising mechanism; movably-mounted work-supporting means; a bracket; a plate on said bracket, said plate having a curved portion; gage stops having a screw-thread connection with said plate at opposite sides of said curved portion; another pair of gage stops having a screw-thread connection with said plate and located a greater distance apart than the stops of said first pair; a hand lever pivoted on said bracket and attached to said work-supporting means, said hand lever being mounted in position to swing between and contact the second mentioned pair of gage stops; and a plunger movably mounted on said hand lever and adapted to engage the first mentioned pair of gage stops and movable out of position to engage said stops, said plunger being adapted to engage a locking notch formed in said curved portion to lock said lever against movement.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."