

(No Model.)

3 Sheets—Sheet 1.

S. J. HICKS.
MORTISING MACHINE.

No. 493,501.

Patented Mar. 14, 1893.

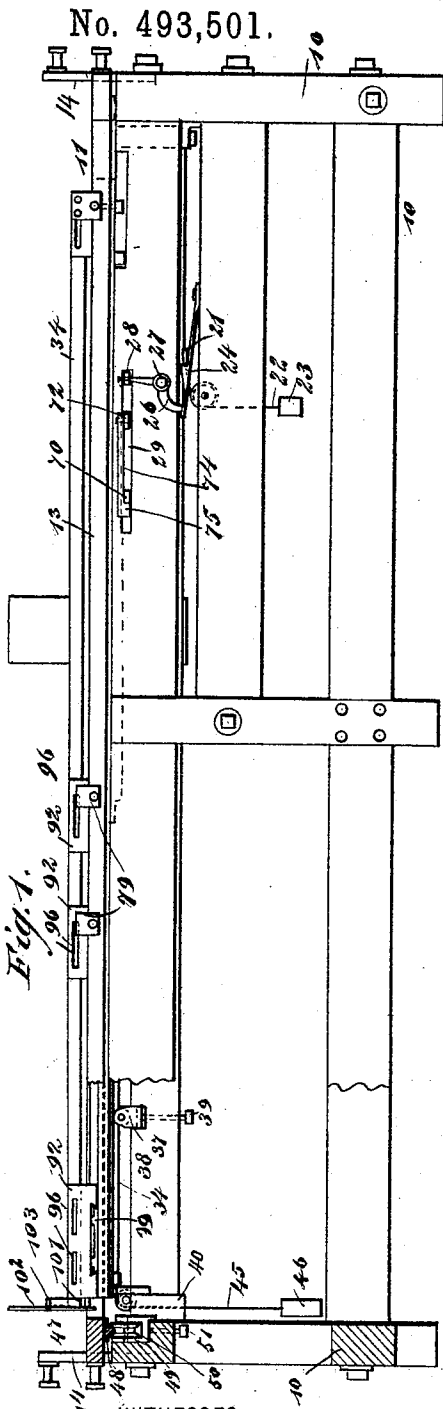


Fig. 1.

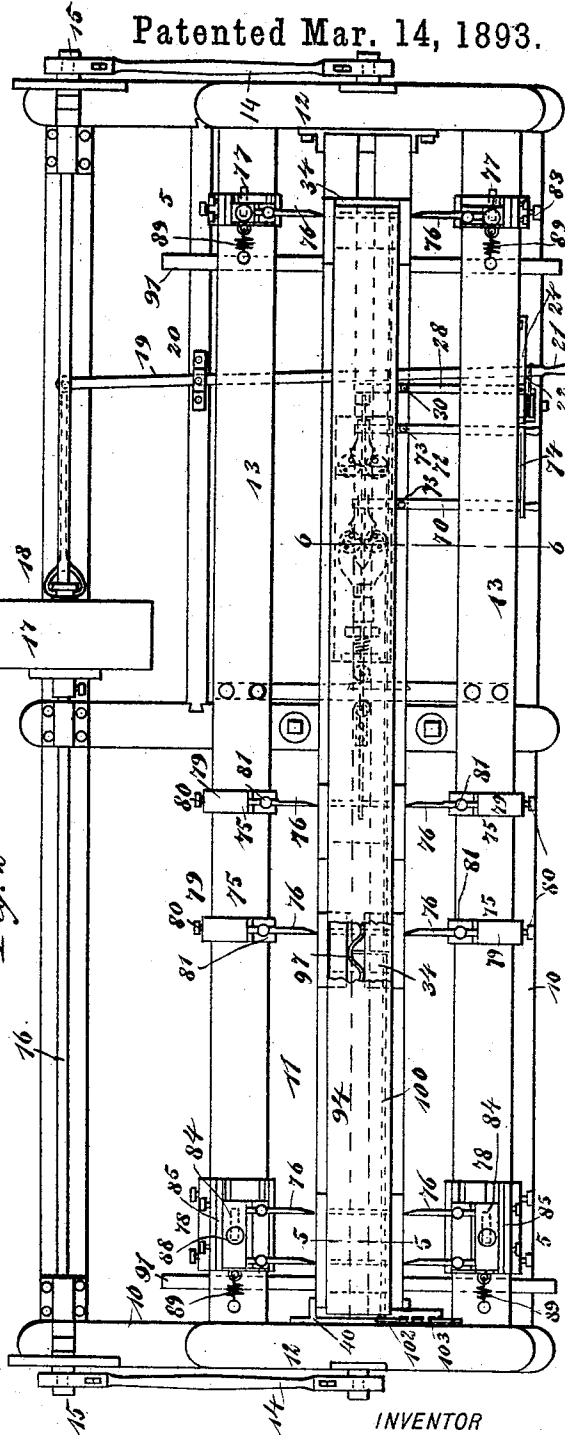


Fig. 2.

WITNESSES:

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BY Munn & Co

ATTORNEYS.

(No Model.)

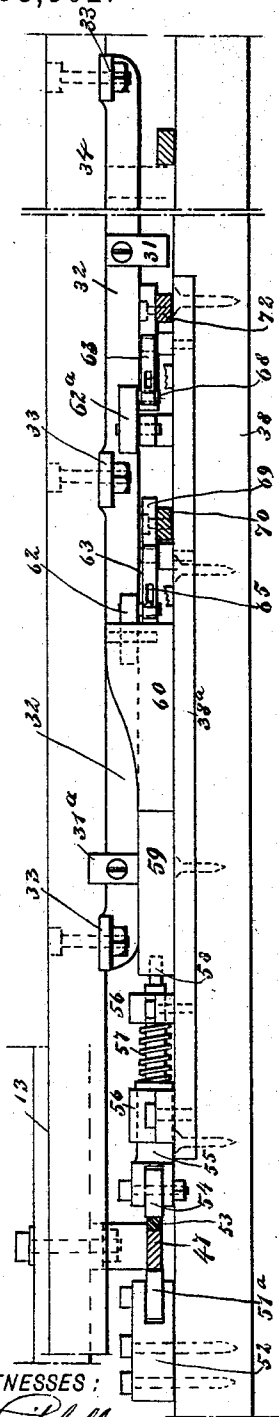
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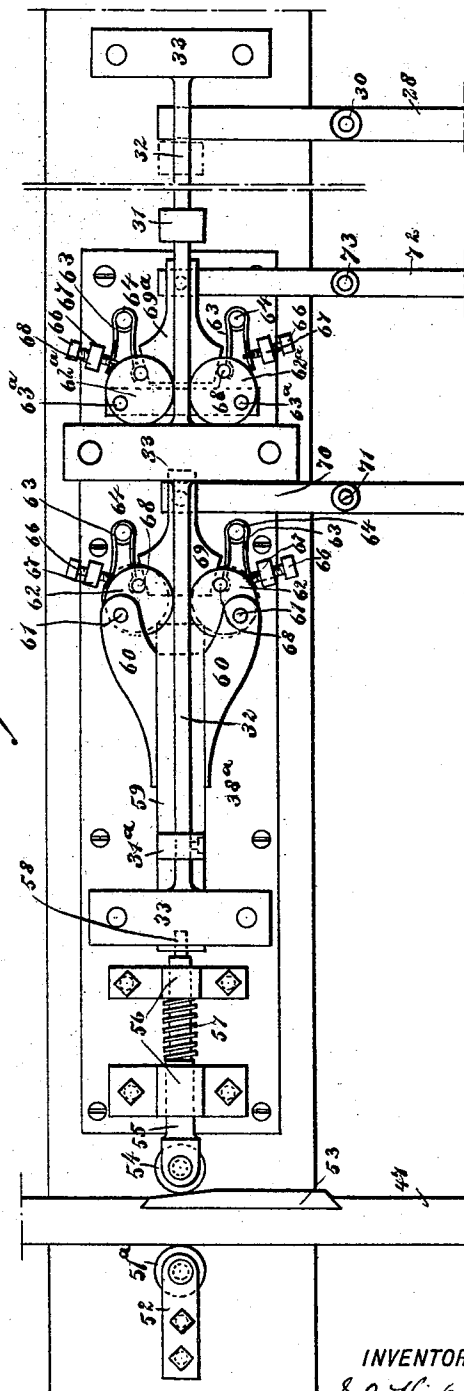
Fig. 3



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Fig. 4



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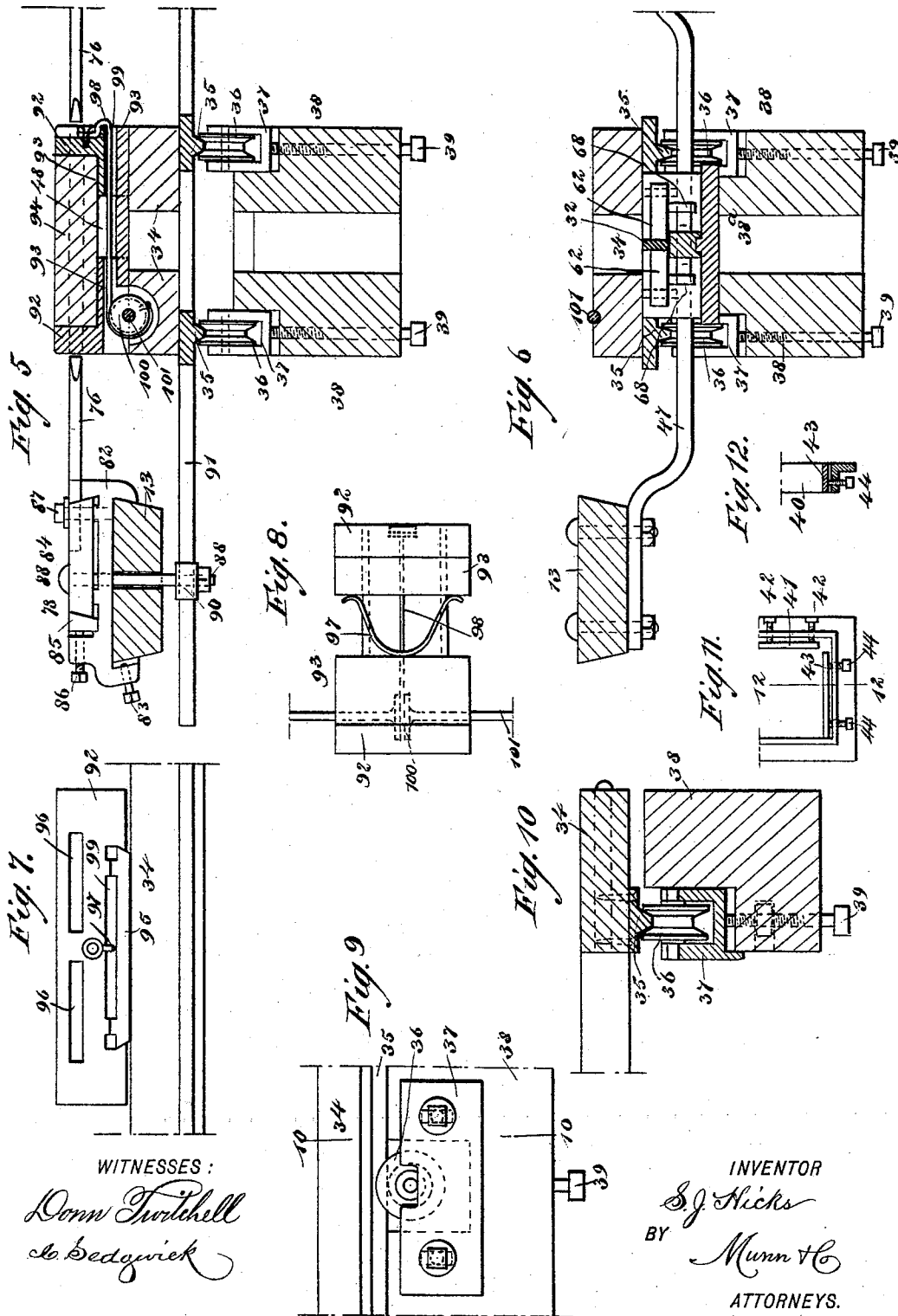
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UNITED STATES PATENT OFFICE.

SIMEON J. HICKS, OF ENGLEWOOD, ILLINOIS.

MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,501, dated March 14, 1893.

Application filed April 20, 1892. Serial No. 429,864. (No model.)

To all whom it may concern:

Be it known that I, SIMEON J. HICKS, of Englewood, in the county of Cook and State of Illinois, have invented a new and Improved
5 Mortising-Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in mortising machines and especially to machines of this class which are adapted to make
10 mortises in the stiles of doors, although the machine may be used for other purposes.

The object of my invention is to produce a machine which will perform its work very nicely and rapidly, which is constructed in
15 such a way that the mortising chisels will operate from both sides of the work, and in which the work, that is, the article to be mortised, may be quickly placed and removed.

To this end my invention consists in certain
20 features of construction and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification,
25 in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation, partly in vertical section, of the machine embodying my invention. Fig. 2 is a broken plan view of
30 the machine. Fig. 3 is a broken detail side elevation of the mechanism for feeding the carriage. Fig. 4 is a plan view of the same. Fig. 5 is a cross section on the line 5—5 in Fig. 2. Fig. 6 is a cross section on the line
35 6—6 in Fig. 2. Fig. 7 is an enlarged side elevation of one of the double clamps used for holding a door stile upon the carriage. Fig. 8 is a plan view of one of the single work clamps. Fig. 9 is a detail side elevation of
40 one of the vertically adjustable bearings of the track rollers. Fig. 10 is a cross section on the line 10—10 in Fig. 9. Fig. 11 is a detail front elevation of one of the bed supporting brackets; and Fig. 12 is a cross section on the line 12—12 in Fig. 11.
45

The machine is provided with a substantial frame 10, on the top of which is a transversely reciprocating frame 11 comprising the end
50 pieces 12 and the parallel side rails 13 which carry the chisel blocks and which are shown in Fig. 2. The ends of the frame 11 are con-

nected by pitmen 14 with cranks 15 on the ends of the driving shaft 16 which shaft is provided with a suitable driving pulley 17 connected with the shaft by means of a com-
55 mon form of clutch 18 which is not shown in detail, but which is thrown in and out of gear with the pulley by a lever 19 fulcrumed at 20 on the machine frame and extending transversely to the front side of the machine, where
60 it terminates in a handle 21. The free end of the lever 19 is secured to a cord 22 which runs over a suitable guide pulley and is provided with a counterbalance or weight 23 which normally throws the lever so as to re-
65 lease the clutch therein.

A spring catch 24 is secured to the main frame adjacent to the free end of the lever 19, and the catch is adapted to engage the lever, as shown in Fig. 1, and hold the lever in po-
70 sition to cause the clutch 18 to throw the pulley 17 into gear. The free end of the catch 24 extends into the path of one arm of a bell-crank 26 which is fulcrumed on the main frame above the catch, and the upper arm of
75 the bell-crank is connected with a transverse and horizontal lever 28, the free end of which is held to move in a slot 29 in the main frame. The lever 28 is fulcrumed on a suitable support, as shown at 30, in Fig. 2, and the inner
80 end of the lever extends into the path of a stop block 31 which is secured to a flat feed rod 32 which rod extends longitudinally of the machine and is provided with flanges 33, by means of which it is secured to the longi-
85 tudinally reciprocating carriage 34. The rod 32 is also provided with a stop block 31^a, as shown in Fig. 3, which block operates to release a portion of the feed mechanism, as hereinafter described. It will be seen that
90 when the stop 31 strikes the inner end of the lever 28 it will move the lever so as to tilt the bell-crank 26 and depress the catch 24 so as to release the lever 19, and the machine will thus be thrown out of gear, but this operation will
95 be more fully described hereinafter.

The carriage 34 has, on its under side, parallel tracks 35 which are held to move on rollers 36, as best shown in Fig. 5, and the rollers are journaled in boxes 37 which are mounted
100 on the stationary bed 38 extending longitudinally of the machine and the boxes 37 may

be adjusted vertically by the bolts 39 which extend vertically through the bed 38 and impinge on the under side of the boxes. The bed 38 has on its upper side a bed plate 38^a, the top surface of which is level with the top surface of the bed, the plate being let into the bed for this purpose and the bed plate serves as a bearing for the feed operating plunger, as described below.

The bed 38 is supported on the main frame in brackets 40 which are adapted to receive the ends of the bed, the brackets having side plates 41 which are adjusted laterally by means of bolts 42 and bottom plates 43 which are adjusted vertically by means of bolts 44, by this means the bed may be brought in just the right position in relation to the other parts of the machine. The carriage 34 which reciprocates on the bed is held normally at one end of the machine by means of the cable 45 and weight 46, as shown in Fig. 1, the cable having one end secured to the carriage and extending over a suitable guide pulley at one end of the machine. The weight will thus effect the return movement of the carriage, and the movement in the opposite direction is effected by means of a feed bar 47 which extends transversely beneath one end of the reciprocating frame 11, as shown in Figs. 1 and 4, and the feed bar is provided, on its under side with a track 48 which runs in a grooved roller 49 held in the box 50 which is adjusted vertically on the main frame by a bolt 51, as shown in Fig. 1, this arrangement being similar to the arrangement shown for adjusting the boxes 37. One edge of the feed bar 47 bears upon a roller 51^a which is held in a hanger 52, as shown in Figs. 3 and 4, and the opposite edge of the feed bar carries a wedge 53 which is dovetailed into the feed bar so that it will be held in place and different sized wedges may be used according to the nature of the feed, that is to say, if the feed plunger is to be moved a comparatively great distance at each stroke of the feed bar, a thick wedge is used, otherwise a thinner wedge is employed. The wedge 53 contacts with the roller 54 on one end of a plunger 55 which is held to move longitudinally in boxes 56 on the bed plate 38^a, and the plunger is held normally against the wedge by a spring 57 which presses against one of the boxes 56 and against a collar on the plunger. The plunger is connected, as shown at 58, with an extension 59 which is held to slide on the bed plate 38^a and which has on opposite sides laterally and forwardly extending ears 60 in which are eccentrically pivoted, as shown at 61, the feed rollers 62, which press against opposite sides of the feed rod 32 on the carriage 34. The feed rollers 62 are held in engagement with the feed rod 32 by springs 63 which are formed into a coil in the middle, as shown at 64, the springs having one end slotted, as shown at 65, and held to an adjusting bolt 66 held to turn in a support 67, and the opposite end of the springs press

upon studs 68 on the under sides of the rollers 62. It will be seen that this eccentric arrangement of the rollers 62 causes them to impinge on the rod 32 when moved forward so as to carry the rod with them, but when moved in the opposite direction the rollers will not move the rod.

A wedge 69 is held to move between the studs 68 on the rollers, and is actuated by a lever 70 which is fulcrumed at one side of the bed 38, as shown at 71, in Fig. 4, and the lever extends forward to the front of the machine where it may be conveniently grasped, and by means of it, the rollers may be thrown off the feed rod so as not to move the carriage. In advance of the rollers 62 are similar rollers 62^a which are also eccentrically pivoted, as shown at 63^a, and these rollers are pressed against the feed rod 32 in exactly the same way as are the rollers 62, the object of the rollers 62^a is to retain the feed bar and carriage in place while the plunger 59 and rollers 62 return to get a new grip on the feed rod. A wedge 69^a is used to throw the rollers 62^a apart, this wedge being operated by a lever 72 which is fulcrumed, as shown at 73, at one side of the bed 38 and which extends forward to the front side of the machine, both levers 70 and 72 being held to move in the slot 29, as shown in Fig. 1.

A strap 74 is secured to the lever 72, and has at its free end a hook 75 which falls over one side of the lever 70, it will thus be seen that the lever 70 may be moved to the right so as to operate the wedge 69 without effecting the lever 72, but when the lever 72 is moved to the right, it will take the lever 70 with it and cause the wedges 69 and 69^a to be simultaneously operated. By operating the wedge 69^a and throwing the retaining rollers 62^a off the feed rod, the weight 46 is permitted to return the carriage to its normal position.

The rails 13 of the reciprocating frame are provided with chisel blocks 75, 77 and 78, which carry the chisels 76, these being held, as shown in Fig. 2, to extend inward toward the carriage 34 and on opposite sides of the same, they will thus be in position to work on both sides of the door stile or other article which is held upon the carriage. The chisel blocks 75 are single plane blocks or rings 79 which are held in place upon the rail 13 by set screws 80, and which may be adjusted to bring them into the desired position. The chisels are held to the blocks in the usual way by clamping. It will be seen that these blocks or chisels are adapted to make mortises corresponding in width to the full length of the carriage stroke, but the blocks 77 and 78 are adapted to make narrower mortises at the same time. These blocks 77 and 78 are alike, with the exception that the blocks 78 are adapted to hold two chisels and the blocks 77, one. These blocks are provided with a bed plate 82 which is held to the rail 13 by set screws 83, and in the recess on the top of the block is a slide plate 84 which is held

to fit snugly by means of a shim 85 and set screw 86, as shown in Fig. 5. The chisel is held to the slide plate 84 by a clamping bolt 87, and the slide plate is held in place by a bolt 88 which extends downward through the bed plate 82 and rail 13, the plate and rail being slotted, as shown in Fig. 2, to permit the necessary movement of the slide plate and its fastening bolt. The slide plate 84 is held normally to one end of the bed plate, (the left-hand end,) as shown in the drawings, by a spring 89.

The lower end of the bolt 88 has a roller 90 on which it extends into the path of a bar 91 which is held to the under side of the carriage 34, as shown in Fig. 5, and this arrangement provides for moving the slide plates against the tension of the spring 89, so as to make a mortise of the right width. That is, when the narrower mortises are completed to the required line, the bar 91 will move the slide plates forward with the carriage until the wide mortises are completed, and when the carriage drops back, the slide plates will drop back by reason of the tension of the slide springs 89.

On the carriage 34 are clamps consisting of oppositely arranged clamping plates 92 which have bottom portions 93 held to extend beneath the door stile 94, as shown in Fig. 5, and these clamping plates are held to slide on transverse plates 95 which are held to the top of the carriage. The middle clamps have single slots 96 in their sides, through which the chisels 76 extend, and the double clamping plates, one of which is shown in detail in Fig. 7, have two of these slots on the side, to receive the chisels carried by the blocks 78. The clamping plates are adapted to hold the stile 94 firmly between them and the plates are normally pressed apart to permit the stile to be easily inserted by means of the spring 97, as shown in Fig. 8. One plate 92 of each clamp has secured to it a cable 98 which extends transversely across the under side of the clamp through a recess 99, and the cable is secured to a drum or pulley 100 on a shaft 101 which is journaled on the upper side of the carriage and extends longitudinally of the same, the shaft having at one end a lever 102 shown in Figs. 1 and 2, by means of which it may be turned and the lever may be fastened beneath the catch 103 on the main frame. This lever mechanism is not shown in detail, and it will be understood that any suitable lever may be used for turning the clamping shaft. The clamping plates will normally be forced apart, as described, and to fasten the stile it is placed between the plates, and the shaft 101 turned so as to force the plates firmly upon the stile. The machine is then operated as follows:—The lever 19 is thrown to the right thus throwing the driving pulley 17 into gear with the shaft 16 by means of the clutch 18, and the lever and clutch are held in place by the spring catch 24. The frame 11 is then reciprocated transversely so

as to cause the chisels 76 to deliver rapid blows upon both sides of the stile 94. At each stroke of the frame 11 and before the chisels come into contact with the stile, the wedge 53 on the bar 47 will engage the roller 54 and move forward the plunger 55 and its extension 59, thus causing the rollers 62 to grip the feed rod 32 and move the carriage and stile forward so as to bring a new portion of the stile into the paths of the chisels. At the return stroke of the bar 47, the spring 57 carries back the plunger and the rollers 62, and the rollers 62^a grip the feed rod 32 and prevent the return of the carriage. When the mortise is completed the stop 31^a will strike the rollers 62, thus forcing them apart, as shown by dotted lines in Fig. 4, and preventing them from operating the feed rod, and at the same time the stop 31 will strike the inner end of the lever 28 and the outer end of the lever will tilt the bell-crank 26, thus depressing the catch 24 and releasing the lever 19 and clutch 18, and the machine will be thrown out of gear and the carriage returned to its normal position by the weight 46. It will be understood that these stops 31 and 31^a may be adjusted so as to engage the rollers and lever at any desired time, and it will be seen that while the operations described are automatic, the levers 70 and 72 may be operated by hand at any time so as to stop the feed of the machine and permit the return of the carriage.

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

1. A mortising machine, comprising a longitudinally reciprocating carriage carrying work-holding clamps, a transversely reciprocating frame having chisels to move above the carriage, the frame having parallel bars arranged on opposite sides of the carriage and carrying the chisel-holding blocks, a clutch-controlled driving mechanism for the reciprocating frame and carriage, and means for releasing the clutch by the movement of the carriage, substantially as described.

2. A mortising machine, comprising a longitudinally movable work carrying carriage, a reciprocating frame carrying chisels to engage the work on the carriage, and a feed mechanism for moving the carriage, said mechanism being operated by the reciprocation of the chisel frame, substantially as described.

3. A mortising machine, comprising a longitudinally movable carriage having work-holding clamps thereon, a transversely reciprocating frame carrying chisels to engage the work, a plunger held to move beneath the carriage and having an adjustable connection therewith, a feed bar secured to the under side of the chisel carrying frame, and a wedge carried by the feed bar and extending into contact with the plunger, substantially as described.

4. The combination, of the longitudinally movable carriage, the transversely reciprocating

ing frame having a feed bar thereon, a feed rod held to the under side of the carriage, a plunger actuated by the feed bar, and a clamp connecting the plunger and the feed rod, substantially as described.

5 5. The combination with the carriage having a feed rod on its under side and the reciprocating plunger held to move beneath the feed rod, of eccentric rollers carried by the
10 plunger and held to press upon opposite sides of the feed rod, and retaining rollers held to engage the feed rod, substantially as described.

6. The combination, of the carriage and its
15 feed rod, spring-pressed feed rollers held to engage the rod, and the lever operated wedge adapted to separate the rollers, substantially as described.

7. The combination, of the movable carriage having a feed rod on its under side, the reciprocating plunger having spring-pressed
20 eccentric rollers to engage the feed rod, the spring-pressed retaining rollers held to engage the feed rod, the wedges adapted to separate
25 the feed rollers and retaining rollers, the levers held to operate the wedges, and the hook strap connecting the two levers, substantially as described.

8. The combination, of the main clutch on
30 the driving shaft, the weight repressed lever for operating the clutch, the catch held to lock the lever, the reciprocating carriage having a stop on its under side, the lever 28 hav-

ing one end extending into the path of the stop, and means for releasing the catch by the movement of the lever 28, substantially as described.

9. In a mortising machine, the combination, of the reciprocating carriage, the reciprocating plunger held beneath the carriage, the spring-pressed eccentric pulleys held to engage the plunger, and the stop secured to the under side of the carriage and adapted to engage the rollers, substantially as described.

10. The combination with the transversely reciprocating frame, the longitudinally movable carriage and the bar carried by the carriage, of a chisel block comprising a bed plate held to the rail of the frame, a spring-pressed slide plate mounted on the bed plate and adapted to carry the chisel and a bolt secured to the slide plate and extending into the path of the carriage bar, substantially as described.

11. In a mortising machine, the combination, with the carriage, of the oppositely moving clamping plates held thereon, a revolvable shaft journaled longitudinally on the carriage, and a cable connection between the shaft and one plate of each clamp, substantially as described.

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Witnesses:

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CHARLES P. JOHNSON.