

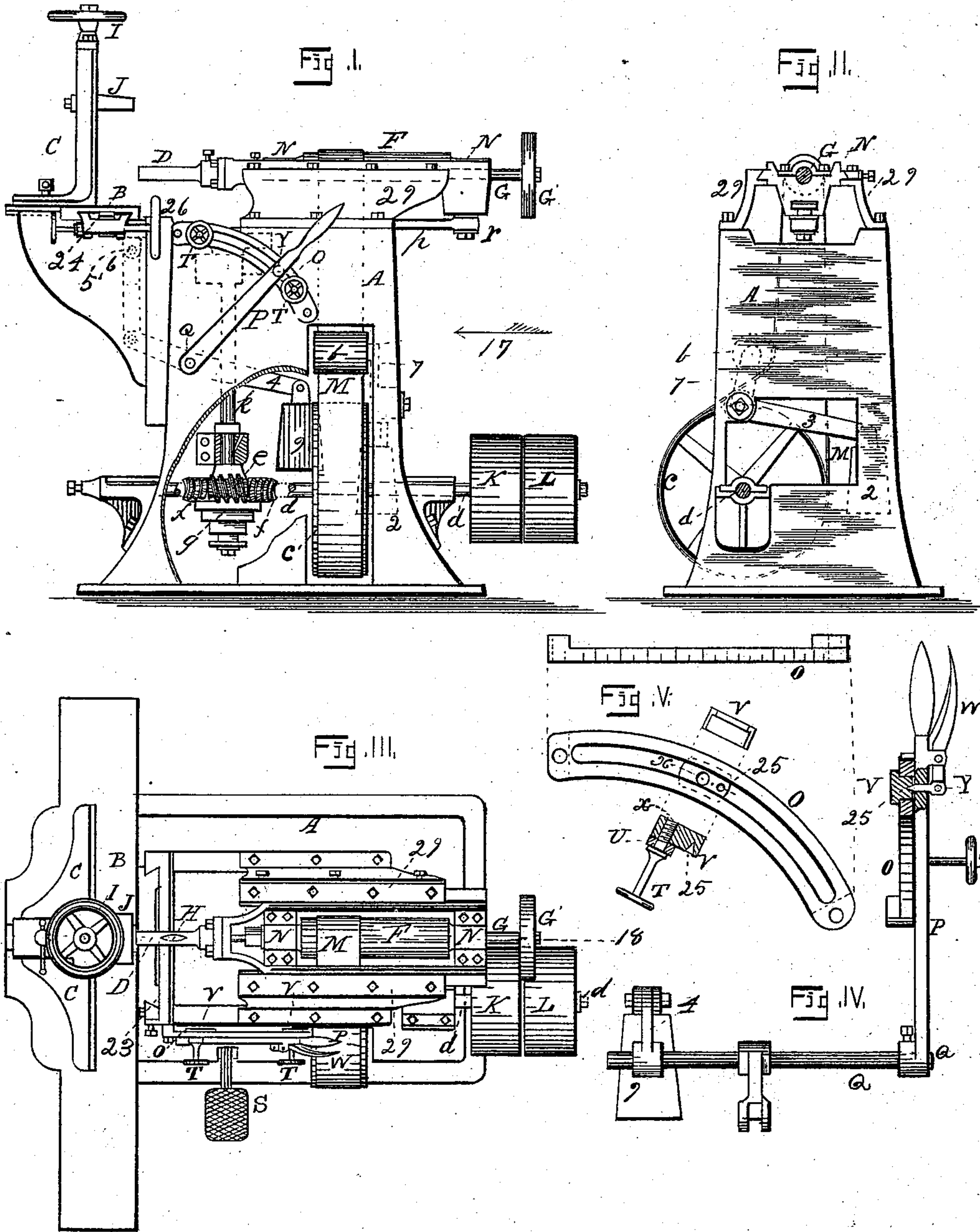
(No Model.)

2 Sheets—Sheet 1.

R. S. GREENLEE.  
MORTISING MACHINE.

No. 377,749.

Patented Feb. 14, 1888.



WITNESSES:  
*S. M. Strong*  
*William Olney*

INVENTOR  
*Ralph S. Greenlee*  
BY *G. L. Chapin*

ATTORNEY

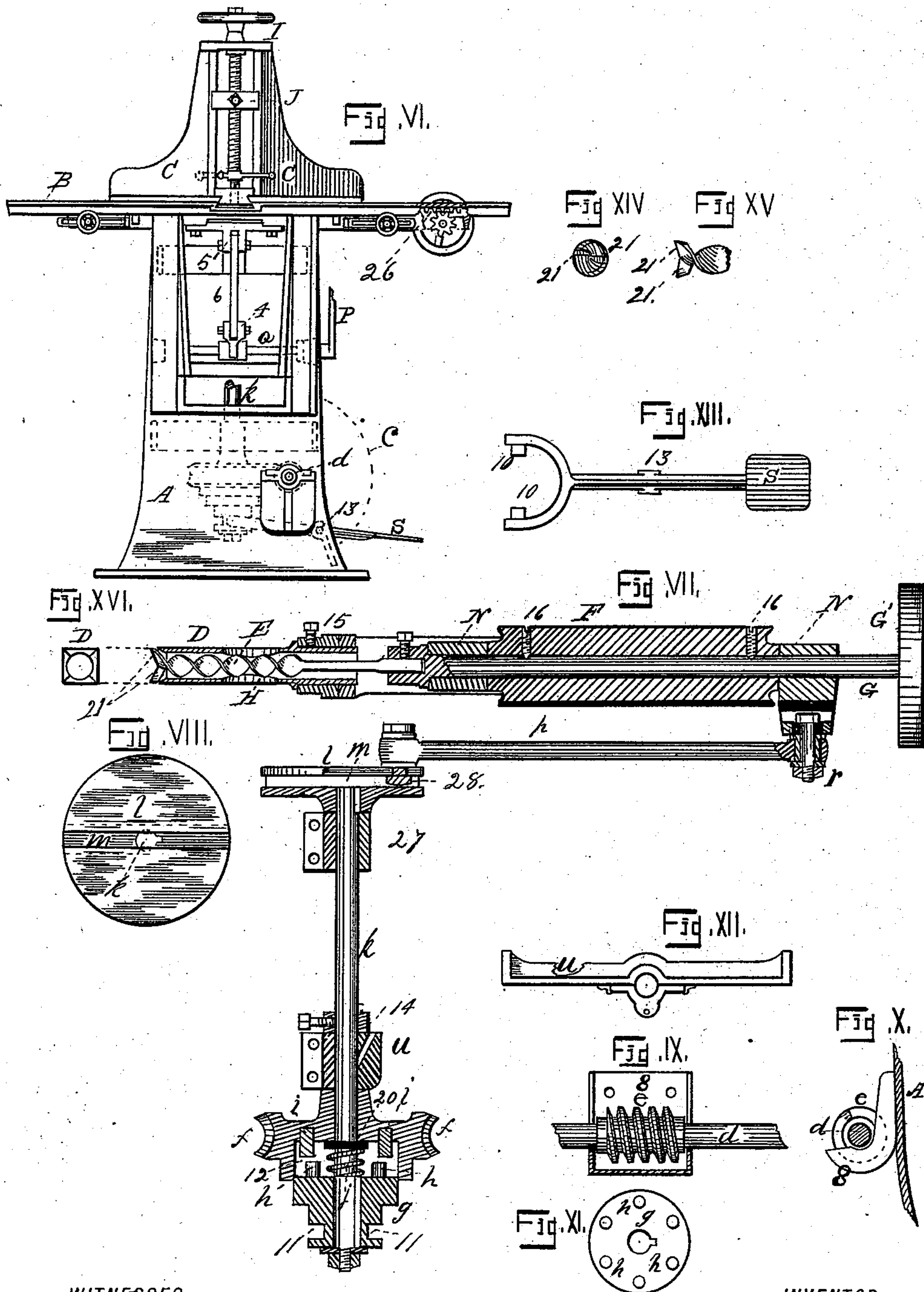
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# UNITED STATES PATENT OFFICE.

RALPH S. GREENLEE, OF CHICAGO, ILLINOIS.

## MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 377,749, dated February 14, 1888.

Application filed May 9, 1887. Serial No. 237,545. (No model.)

*To all whom it may concern:*

Be it known that I, RALPH S. GREENLEE, a citizen of the United States, and a resident of Chicago, Cook county, and State of Illinois, have invented new and useful Improvements in Mortising-Machines, of which the following is a specification, reference being had to the accompanying drawings, (two sheets,) in which—

Figure 1, Sheet 1, is a side elevation of a machine in which is embodied my invention, a portion of the frame being broken away better to show the interior parts; Fig. 2, a rear end view of Fig. 1, looking in the direction of dart 17, with some of the detail parts removed; Fig. 3, a top or plan view of Fig. 1; Fig. 4, an enlarged detached view of the mechanism for elevating and depressing the table to the machine; Fig. 5, an enlarged elevation of the segment attachment and the devices operating therewith removed from the other parts; Fig. 6, Sheet 2, an elevation of the front of the machine; Fig. 7, an enlarged vertical central longitudinal sectional elevation of Fig. 3 on line 18; Fig. 8, a top or plan view of the grooved crank-disk to the feed devices removed; Fig. 9, an enlarged elevation of the worm driving-gear and section of its oil-cup removed; Fig. 10, an end view of the worm driving-gear and elevation of its oil-cup; Fig. 11, a top view of the clutch to the feed devices, also enlarged and removed; Fig. 12, an enlarged top view of the bracket which supports the lower portion of the shaft of the worm-gear; Fig. 13, the treadle for putting the feed mechanism in gear enlarged; Fig. 14, a view of the end of the bit enlarged; Fig. 15, a side elevation of the end of the bit; Fig. 16, the end of the chisel.

This invention relates to improvements in machines by which mortising is done by a hollow chisel and bit; and the improvements, in brief, consist, first, of worm-gear, one part of which is on a horizontal drive-shaft and the other part on a vertical crank-shaft which runs continuously, and which operates in connection with the crank-shaft and a vertically-operating clutch, whereby the hollow chisel has given to it the necessary horizontal reciprocating movement, and in novel means for elevating and depressing the table which supports the material to be mortised; and, further, in the novel construction of the bit or auger

which operates in the hollow chisel, as the whole is herein fully shown and described.

A represents what is generally known as a "housing-frame," made convenient for supporting the mechanism.

B represents the table for supporting the material to be mortised, and C J I the ordinary mechanism for clamping the material to the table. This table is supported so as to have a vertical reciprocating movement by means of ordinary guides, 23, Fig. 3, and so as to have a longitudinal movement by means of ordinary guides, 24, Fig. 1. The means for elevating and depressing the table consists of a shaft, Q, pivoted to the frame A and supporting a lever, 4, and a hand-lever, P, the former being inside of the frame, the latter outside thereof. The inner end of the lever 4 supports a counterbalancing-weight, 9, and the outer end connects with a link, 6, the upper end of the link being jointed to the underside of the table by a joint, 5, Fig. 1.

Attached to the outside of the frame A is a slotted segment, O, on the top of which is marked a scale, by which the height of the table may be known by the position of the lever P on the segment. The lever P is connected with the slotted segment by means of a block, v, which slides in the slot of the segment, and it is clamped to the segment by the hand-wheel T, a collar, U, being interposed, if desired, between the shoulder on the shank of the wheel and the block. The screw-hole in the block is shown at X, Fig. 5, and the hole for the stop-pin Y on the spring-catch W to the lever P is shown at 25. I prefer two hand-wheels T, each with a block attachment, as at v, so that the lever P may be connected with either block to hold the table in any vertical position required to make any given mortise. The ordinary means for moving the table B longitudinally consists of a rack and pinion, 26.

e shows a drive-worm on shaft d, meshing into a worm-gear, f f, which is hung loose on shaft k and supported thereon by a collar, 20, Fig. 7. To the lower end of the shaft k is feathered a sliding clutch, g, which operates in a recess, 12, in the worm-gear f f, and the top of clutch g is provided with pins h h, which are made to engage depending pins i i on the



gear *ff* by means of a treadle, *S*, which is pivoted to the frame *A* at 13, and has prongs 10 10, engaging notches 11 11 in the clutch *g*. A spring, *j*, is placed around the shaft *k* and  
 5 between the collar 20 and clutch *g*, whereby so soon as the foot is removed from the treadle *S* the feed of the chisel will cease.

*u* is a bracket supporting the lower portion of the shaft *k*, and a bracket, 27, supports the  
 10 upper portion.

*lm* is a grooved crank-disk, which is attached to and rotates with the shaft *k*, and in its groove *m* is placed an adjustable wrist-pin, 28, connecting with a rod, *p*, which is connected  
 15 with the sliding box *N* by means of an adjustable wrist-pin, *r*. The adjustment of the wrist-pin 28 governs the depth the chisel is to cut, and the adjustment of the pin *r* is to compensate for the wear of the chisel or for chisels  
 20 of different lengths.

*F* is a long driven pulley secured to the bit-shaft *G* by means of screws 16 16.

*G'* is an ordinary balance-wheel on shaft *G*.

It will be seen at Figs. 1, 2, and 3 that the  
 25 boxes *N* run in ways 29 29.

*c* is a drive band-wheel on shaft *d*, a band, *M*, running from it to long pulley *F*.

*b 7 2 3* is a suitable tightening device for belt *M*.

30 *K L* represent a tight and loose pulley on shaft *d*.

The bit is fed by pressure and has no screw-point to draw it in, and to make it clear the chips better its cutting-edges are inclined forward from the end of the axial line thereof, and extend on radial lines beyond the other  
 35 portions of the twist, so as to come quite closely to the cutting-edges of the chisel *D*, the orifice *H* in which being quite large for  
 40 the discharge of the chips.

The movements of the chisel and bit are as follows: The shaft *d* is in constant motion, so that by depressing the treadle *S* the clutch *g*, by means of the pins *i i*, will engage the gear  
 45 *ff* and put the shaft *k* and disk *lm* in rotation. This will, by a half-rotation of the disk,

feed the bit *E* and chisel *D* forward to cut a mortise of a depth corresponding to the distance the wrist-pin 28 is adjusted from the center of the disk, and the other half-rotation of  
 50 the disk will withdraw the chisel and bit by means of the connecting-rod *p*, jointed to one of the sliding boxes *N*, which supports the frame to which the chisel *D* is affixed, and to which the bit is journaled, the bit being  
 55 driven by a belt, *w*, on the long pulley *F*.

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

1. An improvement in mortising-machines, 60 consisting of the shaft *Q*, placed parallel with the table *B*, in combination with the lever 4, made rigid on the shaft, the counter-balance 9, link 6, table *B*, lever *P*, made rigid to the shaft *Q*, spring-stop *W Y*, and the slotted  
 65 segment *O*, carrying two blocks, *v*, notched at 25, fitted to slide on the segment, and the hand-wheels *T T*, with the screws for clamping the blocks *v* at two given points on the segment, as specified. 70

2. The worm drive-gear *e* and shaft *d*, in combination with the worm *ff*, clutch *g*, spring *j*, shaft *k*, grooved crank-wheel *lm*, the connecting-rod *p*, adjustably connected with the wheel *lm*, and sliding frame *N*, for operating  
 75 the chisel *D*, as specified.

3. The horizontal shaft *d* and the worm driving-gear *e* thereon, in combination with the vertical shaft *k* and the worm-gear *ff* thereon, the vertically-operating clutch *g*, the  
 80 disk-wheel *lm*, treadle *S*, and pitman *p*, as specified.

4. The twisted bit *E* without a screw-point, and with the cutting-edges inclined forward from the end of the axial line of the same, 85 and extending radially beyond the other portions of the twist, as specified.

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Witnesses:

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