

(No Model.)

2 Sheets—Sheet 1.

G. WELDON.
MORTISING MACHINE.

No. 517,906.

Patented Apr. 10, 1894.

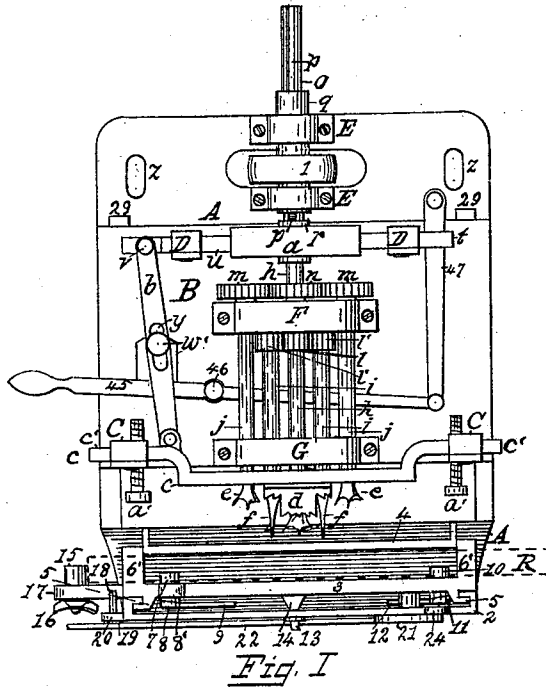


Fig. I

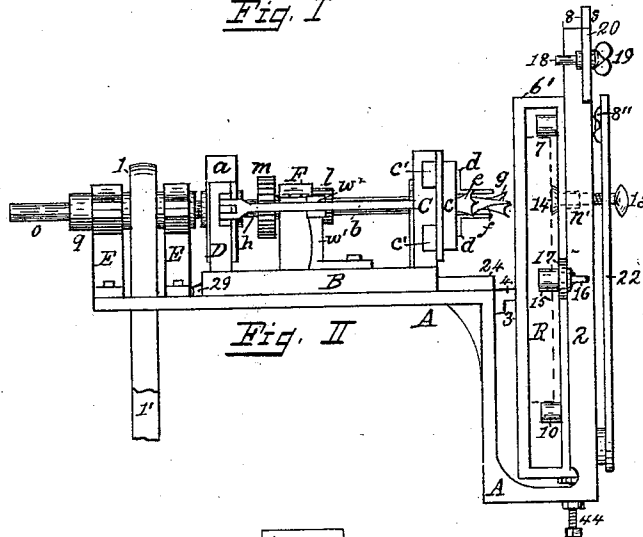


Fig. II

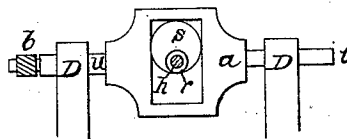


Fig. III

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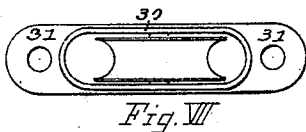
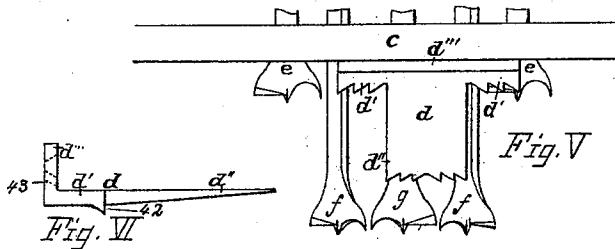
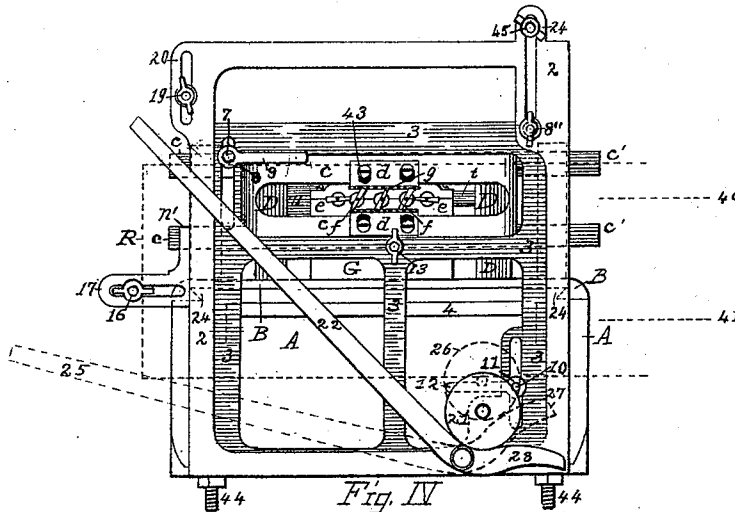
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2 Sheets—Sheet 2.

G. WELDON.
MORTISING MACHINE.

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Patented Apr. 10, 1894.



UNITED STATES PATENT OFFICE.

GEORGE WELDON, OF MOUNT VERNON, NEW YORK.

MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,906, dated April 10, 1894.

Application filed September 13, 1893. Serial No. 485,435. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WELDON, a citizen of the United States, and a resident of Mount Vernon, in the county of Westchester and State of New York, have invented a certain new and useful Mortising-Machine, of which the following is a specification.

My invention relates to the class of machines designed for cutting mortises in window frames to receive sash pulleys, and has for its objects a construction that may be operated by power, or it may be attached to the tables of machines designed to be operated by hand or foot power, such as saw-tables; the mortising machine being complete in itself, having all the essential appliances attached to a single bed plate. These objects are attained by the means herein described, and set forth by the accompanying drawings, in which—

Figure I represents the plan of the machine. Fig. II is a side elevation of the same. Fig. III represents a cam employed to impart motion to a pair of saws. Sheet 2, Fig. IV is a front elevation of the machine. Fig. V is an enlarged view of the cutting appliances. Fig. VI is an edge view of one of the saws employed. Fig. VII is a bottom view of a form of sash pulley for which the machine will cut mortises. Fig. VIII shows the mortise as cut by the bits. Fig. IX shows the form of mortise as completed by the combination of bits and saws. Fig. X is an enlarged view of a stop. Fig. XI shows an arrangement of spindle-bearings by which the outside spindles may be spread from those next to them.

The frame of the machine consists of two parts A and B, and Figs. I, II, and III, show that the frame B is arranged to slide on the frame A by means of a dove-tail 24. The backward movement of said frame B is limited by the stops 29 on the base A. Its forward movement is limited by the stops a' , a' , in the posts C, Fig. I. Holes z , z , are for bolting the machine to any suitable frame or machine.

Power is transmitted to the machine through the pulley 1 which drives a hollow spindle q . A spindle o passes through the spindle q , and by the common means of a keyway p and a fixed key in the hollow spindle, the spindle o revolves and is also movable laterally. The

inner end of the spindle o enters the hub r of a cam s , Fig. III, which is within the yoke a , Fig. I. A spindle h enters the hub on the other side of the cam, the cam and its hubs serving as a coupling connecting the spindles o and h . The latter has bearings in posts F and G, and the end is adapted to receive a boring bit g . The hollow spindle q is supported in bearings E, E. The bearings F, G, give support to four other spindles j , j , i , i . These spindles, with the central spindle h , form a series which lie in a common plane, and at their outer extremities are provided with boring bits as shown. The central spindle is provided with a gear wheel n and a pinion l . The wheel n meshes with wheels m , m , of like size on the spindles j , j . The pinion l meshes with pinions l' , l' , the three being of the same size. Thus the spindles are all run with the same and uniform velocity, although if the direction of motion of the central bit is suitable for a right handed bit the other four bits will require to be left handed, and vice versa.

The three interior bits f , f , g , will cut a mortise through a board as at I', I', I', Fig. VIII, and the outer bits e , e , are made short so as to cut mortises as I, I, only deep enough to receive the flanges of a pulley as in Fig. VII. The depth of the shallow mortise is regulated by the adjustable stops a' , a' , through the posts C, C.

The yoke a , Fig. I incloses a cam s as in Fig. III. The cam gives a lateral reciprocating motion to the yoke, which has bearings u , t , in posts D, D. At one end this yoke, at v is connected with a lever b fulcrumed at w' and connecting at its lower end with a frame c . The motion of the yoke a is by this means imparted to the frame c , but the amount of movement of the frame may be regulated by means of the adjustable fulcrum w' . By moving the fulcrum toward or from the yoke the throw of the frame c may be increased or diminished. The frame c finds bearings in the posts C, the ends c' being shown as bifurcated as in Fig. IV.

As will be observed by reference to Fig. II, the forward end of the ball A is formed into a U shaped projection 2, the outer limb of which rises to form a rectangular frame in front of the machine, and at right angles to

the axis of the boring bits. The skeleton frame 3, by means of interlocking flanges 5, Fig. I, at the ends, is adapted to slide vertically on the frame 2. By means of a lever 22, 28, Fig. IV, fulcrumed to the bottom of the frame 2, and a roller 21 pivoted on the frame 2, the frame 3 may be raised, the short end 28 of the lever giving a quick upward movement of the roller, as indicated by broken lines 25, 26, 27. A rolling movement is obtained by employment of the roller, avoiding friction on the lever.

The broken lines R, Figs. I, II, IV and X represent a side of a window frame, commonly called a "stile." In placing a stile for mortising, it is passed through the frame 3 as in Figs. II and III, and it is held against the forward part 6' of the frame by means of the clamping screw 13, 14, as in Fig. II. A stop 16 for the end of the stile is provided in a slotted projection 17 from the side of the frame 3. On the lower right hand side of the frame 3, see Fig. IV, a slot is provided for a stop 10. This stop may be adjusted vertically. On the upper left hand corner of the frame, see Fig. IV, a slot is provided for a stop 7, Fig. I. Stops 7 and 10 are operated by cams 8, 11, Fig. IV, for fastenings, and are provided with convenient handles 9 and 12 as shown. By means of the three stops 10, 15 and 7 adjustments are made for the proper setting of the stile to be mortised for the upper hole, which in Fig. IV would be opposite the boring bits, in line with the broken line 40. For this mortise the frame would occupy its depressed position as in Figs. II and IV, such position being regulated by the screw stops 44 Fig. IV, which may have heads on their upper ends as shown in Fig. II. By depressing the lever 22, the frame will be elevated until it is stopped by the projection *n'* on frame 3, Figs. I and II, impinging against the stop 18, which is held by a nut, 19, in a slot in the projection, 20, on the frame 2. This stop is adjustable so as to locate a precise position for the second mortise, which, in the stile, would occur in line with the broken line 41, but of course opposite the boring bits. An additional stop 45 may be used in the slot occupied by the screw 8", Fig. IV, for the purpose of balancing the stop 18. By means of a nut Fig. IV, the screw through which is fast to the frame 3, said frame may be quickly secured in position and steadily held during the operation of mortising. R, Fig. IV, represents a stile in position for receiving a mortise. When the first mortise is made, the stile is lifted by a depression of the lever 22 and is brought into position to receive the second mortise, parallel with the first.

In order to prevent a stile coming in contact with the bits when it is being hastily inserted in the frame, a guard 4, Figs. I, II, and III, is secured to the main frame A, and extend parallel with the path traversed by the end of the stile during its insertion in place. To

further facilitate the introduction of the stile I make the stop 7 preferably as shown in Fig. X, having a beveled face of some extent so it may facilitate quickly entering the stile.

To move the frame carrying the bits forward so as to bring the bits into action on the piece to be mortised, a hand lever 45, Fig. I, is provided. Its fulcrum is shown at 46, and by means of a link 47, one end of the lever is connected with the fixed base A. The outer end of the lever provides a hand-hold, and by pulling it forward or backward the bits are advanced to or are withdrawn from action. It is plain that this may be accomplished as readily with a foot treadle connection.

In Fig. XI the bit-spindle bearings F, G, are shown to be divided, so that the two outside spindles may be adjusted to suit the length of sash pulley flanges.

The machine as thus described will cut a mortise as in Fig. VIII, which shows that the three inner bits travel close together, and that the two outer ones cut within the periphery of the bits next to them. To accomplish this the outer bits must have their cutting edges in a plane differing from that of their neighboring bits enough to prevent contact between them, and to maintain such positions, as is shown in Fig. V, it is essential that there shall be no variation in their times of revolution, hence the arrangement of the gearing as shown in Fig. I, and already described herein.

Referring again to Fig. VIII, which represents the shape of the mortise as left by the boring bits *f, g, f*, it is necessary to remove the projecting wood 33, 34 to the lines N, N. This is accomplished by means of the saws *d*, Figs. I, III, IV and V. They are attached to the vibrating frame *c* by means of the flanges *d'''*. The saws have three cutting edges, the long portion *d''*, Figs. V and VI, is thin at the toothed edge; and from the center of the cutting edge the teeth are made with cutting points turned in opposite directions. To give stiffness to the saw it thickens toward the cutting edge *d'*. The distance traversed by the saws in their vibratory movement is from center to center of the outer bits. The long cutter removes the points 33, and the edges *d'* remove points 34. To effectually perform this duty the edges *d'* may be broadened with a lip as 42, Fig. VI. These cutters leave a flat surface corresponding with that made by the bits *e, e*. As shown, the cutting edges *d'* are set in line with the cutting edges of the bits *e, e*. By reference to Fig. II it will be seen that the distance between the outer cutting edges of the saws just equals the diameter of the boring bits, hence the central bits are longer than the saws, as shown, and the lipped saw edges are adapted to do their work at the periods when the cutting edges of the bits are out of a vertical plane. Thus, by the aid of the saws, which advance with the bits, a clean mortise is made

as represented in Fig. IX, which will neatly receive the sash pulley shown in Fig. VII.

I reserve the right to vary the construction of the several parts of my machine so long as I adhere to the principles of my invention.

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

1. In a mortising machine the combination of the base A, sliding plate B, vertically sliding frame 3, lever 22, 28, sleeve *q*, spindle *o*, *h*, cam *s*, yoke *a*, lever *b*, plate *c*, and saws *d*, pinions *l'*, *l*, *l'*, spindles *i*, *i*, *i*, with bits *f*, *f*, *g*, wheels *m*, *n*, *m*, spindles *j*, *j*, with bits *e*, *e*, lever 45 and connection 47, all substantially as herein shown and described.

2. The combination in a machine for cutting mortises for sash pulleys, of boring bits arranged substantially as herein described, consisting of a central spindle *h*, driving spindles *i*, *i*, by means of the pinion *l* meshing into pinions *l'*, *l'*, on said spindles *i*, *i*, the said spindle *h* also driving spindles *j*, *j*, by means of a wheel *n* on said spindle *h*, meshing into wheels *m*, *m*, on said spindles *j*, *j*, all of the said spindles carrying boring bits moving with equal velocities with their axes lying in a common plane.

3. In a mortising machine the combination with a series of boring bits substantially as shown, of a vibrating frame *c* carrying saws *d*, *d*, substantially as shown and described.

4. In a mortising machine the combination with a series of boring bits and their spindles as shown, a vibrating frame *c* supported in posts C, C, carrying saws *d*, *d*, and driven by means of a cam *s* on spindle *h*, yoke *a* supported in bearings D, D, and lever *b*, substantially as shown and described.

5. In combination with the boring bits and their spindles the vibrating frame *c* provided with saws *d*, *d*, and its operating mechanism as described, the adjustable bearing *w'* for the connecting rod *b* substantially as shown.

6. The combination with a series of boring bits substantially as shown, of saws *d*, *d*, whose outside edges coincide with the outer cutting edges of the bits, substantially as shown and described.

7. In combination with a series of mortising bits arranged as shown, the inner ones for deep cutting and the outer ones for shallow cutting, saws *d* having a long cutter *d''* and shallow cutters *d'*, substantially as shown and described.

8. In a combination of mortising bits and saws as described, the saws arranged to travel to a line perpendicular to the plane of the saws passing through the centers of the cuts made by the bits at a period when the flat shanks of the bits do not occupy a vertical plane, or one at right angles to the plane of the saws, substantially as herein described.

9. A saw for the purpose described having a long cutter *d''* provided with saw teeth, and short cutters *d'* on each side of the long cutter, substantially as shown and described.

10. A saw substantially as described having its short cutters widened into a lip for cutting away the solid wood left in the mortise by the outer bits substantially as shown and described.

11. Saws as and for the purpose described, having a long central cutter *d''*, short cutters *d'*, *d'*, lips 42, flange *d'''* and slotted holes 43 substantially as shown.

Signed at Mount Vernon, in the county of Westchester and State of New York, this 2d day of September, A. D. 1893.

GEORGE WELDON.

Witnesses:

A. S. LUCAS,
MICHAEL F. CANNODY.