

E. R. Loughhead,

Boring and Mortising Blinds.

N^o 38,590.

Patented May 19, 1863.

Fig 2

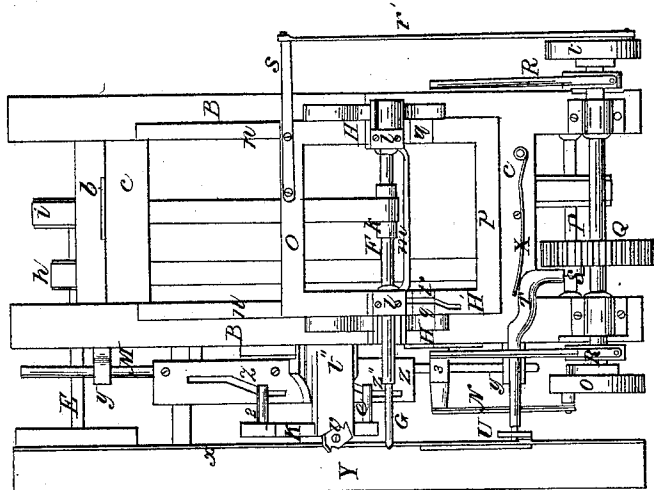


Fig 3

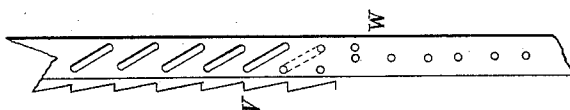
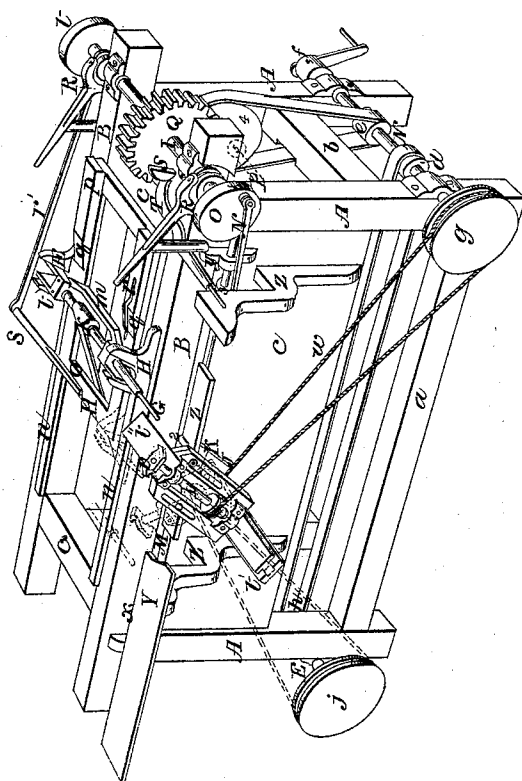


Fig 1



Witnesses:

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UNITED STATES PATENT OFFICE.

E. R. LOUGHEAD, OF CINCINNATI, OHIO.

IMPROVED MACHINE FOR BORING AND MORTISING BLIND-STILES.

Specification forming part of Letters Patent No. **38,590**, dated May 19, 1863; antedated December 11, 1861.

To all whom it may concern:

Be it known that I, E. R. LOUGHEAD, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Machines for Mortising or Boring Venetian-Shutter Stiles; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and letters of reference marked thereon, which form part of this specification.

My invention has for its object the cutting of mortises or the boring of pivot-holes in the stiles of shutters to receive the ends or pivots of slats or louvers; and it consists of the several parts hereinafter to be described.

In order that others duly skilled may be enabled to understand and construct and use my invention, I shall proceed to describe it in detail.

In the accompanying drawings, Figure 1 is a perspective view of the entire machine, a portion of the bench on which the stile to be mortised lies being cut away for the greater convenience of showing other portions of the machinery. Fig. 2 is a plan looking down on top of machine. Fig. 3 is an elevation of the side of a shutter-stile, showing the mortises and pivot-holes in progress and finished.

Like letters designate like parts in all the drawings.

The frame-work of machine consists of four or more uprights, (marked A,) connected together at top by two longitudinal pieces, B B, and two cross pieces, C C, and strengthened below by two longitudinal rails, *a a*, and by two cross-rails, *b b*, the whole being secured together by mortise and tenon and made sufficiently firm. On the near side of bench a solid side, *c*, is mortised between the uprights, in the manner of a joiner's bench, for the purpose of sustaining several of the working and passive parts of the machine.

Z Z are two adjustable skeleton brackets, secured adjustably to solid side of bench *c* and supporting the narrow bench Y, on which the stile or rail to be mortised is laid. This bench is provided with a ledge, *x*, on the inside, which serves as a stop-gage.

D is the driving-shaft, furnished with four pulleys, *d*, *e*, *f*, and *g*, and working in proper journal-boxes. Motion is communicated from

some contiguous source of power by belt passing round the pulley *f*.

E is a secondary driving-shaft at the opposite end of machine, provided with two drum-pulleys, *h i*, and a grooved pulley, *j*. A belt passes from pulley *d* on shaft D to pulley *h* on shaft E, and another belt passes from pulley *i* to the pulley *k* on arbor F, which carries the boring-tool G. This arbor F is journaled in two movable and sliding boxes, *l l*, which are held in the guides H H, secured to the frame-work B B. In these guides the boxes *l l* can slide back and forth laterally and within limits up and down. The guides have a slight inclination backward, in order to give the proper and desired lap of the slats. They are also reversible, as will hereinafter be more particularly set forth. The boxes *l l* are connected together laterally by the yoke *m*, and from the lower surface of one of said boxes a pin (not shown in drawings) projects into the slot of guide-frame H', just now to be described.

H' is a frame made to reciprocate horizontally and longitudinally on the frame-work B B, and between two slides, *n n*, fastened thereon, two corresponding slips or slides on under side of frame, dovetailing therewith. This guide-frame is thin or low at one end, *o*, and thick or high at the other end, *p*, the change from thin to thick taking place somewhere near the middle of frame and by a rather sudden incline, as at *q*. In one of the sides of frame a cam-groove, *r*, is formed, going inward toward the machinery by an incline, then continuing straight for a short distance longitudinally, and returning outward by an incline equal to the first one by which it came in. In this groove the projecting pin in lower surface of journal-box *l* slides, and as the frame H' reciprocates back and forth the boxes *l l* are regularly lowered and raised and moved side-wise in and out, carrying with them, of course, the arbor F and tool G. A pitman, *r'*, from crank-wheel *t* on shaft I, and connected by projecting arm *s* with guide-frame H', causes the latter to reciprocate. Here it is proper to remark that the amount of lateral traverse of the arbor F and tool G determines the depth of the mortise or pivot-hole in shutter-stile.

J is a block, secured by screw-nuts to the solid side *c*, having projecting-arms *t' t''*, in

which the frame K slides, the said frame being provided with corresponding projecting parts, which slide in dovetail grooves in projecting arms t' t'' of bracket J. The motion of frame in said grooves is out toward bench Y and inward from the same to frame-work B B. The block J is reversible in direction, as will be more particularly explained below, and as shown by red lines on Fig. 1.

L is an arbor journaled in boxes on frame K and carrying a grooved pulley, u , and a cutter head or tool, v . The arbor is inclined to the horizon from back to front, but is parallel to the bench considered laterally. A cord, w , passes over the grooved pulley g on shaft D, and over grooved pulley u on arbor L. Thus motion from the driving-shaft D is communicated to cutter-head v .

y y are two box-brackets secured to near side of frame-work, and the rod M rests in the two boxes, reciprocating longitudinally therein. On this rod a horizontal cam-plate, z , is secured, said plate being pierced with two cam-slots, z' z'' , similar in horizontal direction to one-half of groove r on frame H, before described. To frame K two projecting arms, 2 2, are fastened, having each a small pin at the end, which pins pass through slots z' z'' in plate z . A collar, 3, fastened to rod M, gives attachment to pitman N, which pitman, being connected with crank-wheel O, gives reciprocating motion to rod M and, of course, to cam-plate z . The effect of reciprocation of cam-plate z is to alternately move the cutter-head v to and from the bench Y, on which the stile to be mortised is laid.

P is a shaft journaled in boxes attached to uprights A A. A pulley, 4, and a toothed pinion, 5, are keyed to this shaft. A belt passes over pulley e on shaft D, and over pulley 4 on shaft O, for the communication of motion from the former to the latter. I is another shaft, journaled in boxes resting on frame-work B B. A toothed wheel, Q, is keyed on this shaft, and is in gear with pinion 5 on shaft P. The crank-wheels t and O are slipped loosely on the end of shaft I, and, being each formed with stops on their inner bosses, may either of them, separately or both together, be temporarily geared to shaft by the clutches R R, provided for that purpose.

On the outer side of wheel Q is a cam, S. A bent lever, T, is pivoted horizontally on cross-pieces C C. As the wheel Q revolves, the cam S, striking the projecting end of lever T, pushes it back, and the free end of same lever, acting on another vertical lever and feed-finger or pawl, U, feeds the stile on along the bench Y as each mortise is completed. A notched strip, V, is tacked on top

of stile W for the purpose of feeding. A spring, X, returns the lever T and finger U for another feed-motion.

The guides H H, in which journal-boxes l l are held, are made reversible for the purpose of guiding the boring-tool G when mortising either right or left hand stiles. The block J and frame K on near side of frame-work is likewise made reversible as to its inclination for the same reason. When this frame K is reversed, the cord w from pulley u passes over pulley j on shaft E, as shown on Fig. 1 in red lines.

The guide-frame H', as before described, being thicker at one end than at the other, is likewise adjustable as to the inequality of thickness, the thick end p being merely a piece screwed on, and several pieces may be provided of different thicknesses to suit the size of stile to be mortised, the difference between one end, o , and the other end, p , being equal to the width, vertically measured, between the holes Δ and ψ , Fig. 3, which form the extremities of the slanting mortises. When it is desired merely to bore pivot-holes, as shown at ϕ , Fig. 3, the thick end is taken off from H', and the tool merely traverses laterally back and forth, as in boring and withdrawing. It is well here to remark, also, that the tool G makes two entrances into the stile for every single entrance of the cutter-head v . The double cam-groove r in frame H' provides for this, while the single cam z' z'' in plate z provides for that of the cutter-head v .

The operation of my invention has been set forth incidentally as much as is requisite for its full understanding during the description of its parts.

The advantages of my machine over hand and disconnected work will be obvious and need not be dwelt upon.

Now, I claim as my invention and desire to secure by Letters Patent—

1. Forming by machinery oblique mortises, in blind-stiles, &c., by the conjoint operation of a boring-bit and a rotating cutting-tool, substantially as specified.

2. Communicating to the boring-bit G a horizontal reciprocating motion in connection with an oblique vertical motion by means of the reciprocating guide-frame H' and guides H, in the manner substantially as specified, for the purpose of boring a double row of holes, as set forth.

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Witnesses:

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