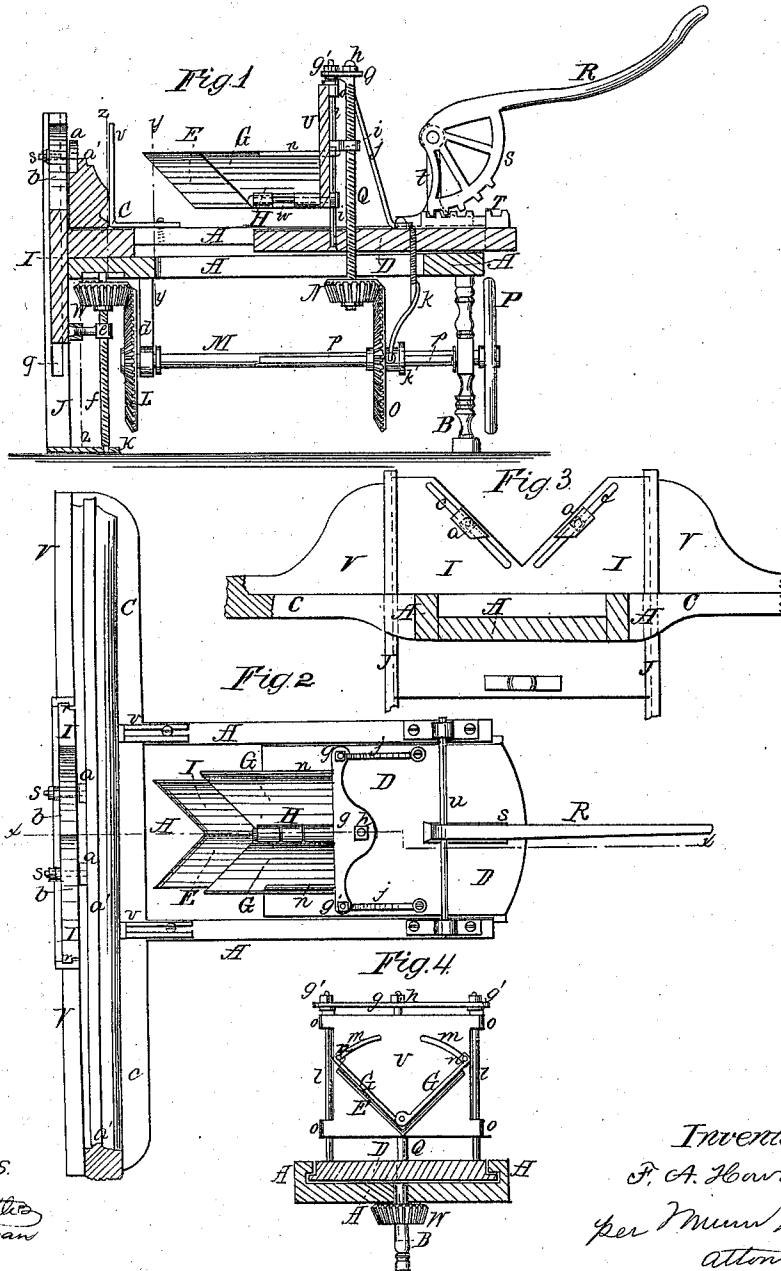


F. A. Howard,

Miter Box,

N^o 81,373,

Patented Aug 25, 1868.



Witnesses.

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United States Patent Office.

FRANK A. HOWARD, OF BELFAST, MAINE.

Letters Patent No. 81,373, dated August 25, 1868.

IMPROVEMENT IN MACHINES FOR MITRING.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, FRANK A. HOWARD, of Belfast, in the county of Waldo, and State of Maine, have invented a new and useful Improvement in Machines for Cutting Mitre-Joints; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my machine, through the line *x x* of fig. 2.

Figure 2 is a top view of the machine.

Figure 3 is a cross-section of the same, through the line *y y* of fig. 1.

Figure 4 is a cross-section of the same, through the line *z z* of fig. 1.

Similar letters of reference indicate like parts.

The object of this invention is to accomplish the cutting and fitting of mitre-joints for mouldings, picture-frames, and the like, in a perfect and expeditious manner.

This invention has, further, for its object to improve the construction of the machine for which Letters Patent of the United States were granted to me, bearing date August 21, 1866.

It consists in the manner of hinging and adjusting the blades which compose the sliding V-shaped cutter; and also in the provision of an adjustable V-shaped rest-plate, together with other devices perfecting the whole, as will hereinafter be more fully set forth.

In the accompanying drawings, the bed-frame of the machine is shown at A, being supported by a leg, B, at the rear end of the machine, and similar legs at the ends of the cross-bed C C, which latter forms part of the general frame of the machine.

The movable bed D slides to and fro in the bed-frame A, the sides of which latter are raised and grooved, as shown, to furnish guides for the sliding bed.

The sliding bed bears the cutters E E, and is actuated to and fro by means of the lever R, which is formed with a toothed sector, S, which latter engages with a rack, T, affixed to the sliding bed, as shown.

The sector oscillates on a shaft, *u*, having bearings in uprights *t t*, affixed to the bed-frame A, as shown.

By means of this lever, the bed D and its cutting-devices are actuated against the moulding or strip to be mitred.

This moulding is shown in red, and is moved across the path of the cutters upon the cross-bed C C, whereby the desired point to be cut is brought opposite the V-shaped notch in the rest-plate I, and which notch is opposite to the cutters.

The angle which the cutter-plates E E make with each other, is made variable, by a means to be described, and the V-shaped notch *b b* corresponds to the maximum angle which is permitted to the said cutter-plates, so that when the latter are adjusted to the greatest angle with each other, they will, when actuated forward, pass with easy contact into the V-shaped notch *b b*, and, in so passing, encounter the moulding-strip, and cut it in twain, leaving the severed ends with a bevel suitable for being fitted together to form a mitre-joint.

The angle of the notch is not adjustable to correspond exactly with the angle of the cutter when the latter angle is made more acute, but the small variation of the angle generally employed in practice does not require that the notch in the rest-plate conform exactly to the angle of the cutter in order to operate effectually.

The cutter-plates E E are affixed to the plates G G, which latter are united by a hinge, H.

The pintle-rod, *w*, of the hinge passes through the holder-plate U, and is affixed thereto with a nut.

The upper edges of the hinged plates are also provided with rods *n n*, the reduced ends of which work in the arched slots *m m*, and thus permit the plates G G, and consequently the cutter-plates E E affixed thereto, to be adjusted to any angle within the limit of the said slots.

The rods *n n* are provided with nuts, which are screwed up against the back of the plate U, and serve, in connection with the nut on the pintle-rod *w*, to hold the cutter-plates firmly against the plate U.

This latter plate slides up and down on the vertical rods *l l*, which rise from the sliding bed, and are connected at the top by a cross-plate, *g*, which is affixed to the said rods by nuts *g g*.

The plate U slides up and down on these rods by means of lugs *o o*, cast on or affixed to the said plate, and which work on the rods *l l* as guides.

The plate U is raised or lowered by means of the screw-rod Q, which has its upper bearing in the plate *g*, and is held in place by a nut or cap, *h*.

The lower bearing is supported by the sliding bed D, through which the rod passes.

The plate U is connected with the screw-rod by the nut *i*, which is affixed to the said plate, and is provided with a hollow thread fitting the thread of the screw-rod, whereby, when the rod is rotated in its bearings, the plate U and its cutter are raised or lowered.

The rest-plate I has a vertical movement in the slotted plates J J, which are affixed to cross-bed C and its guide-rail V V.

The lateral edges of the rest-plate are provided with tongues, *r r*, which fit with easy contact in the grooves or slots, *q*, of the plates J J.

The rest-plate is moved up or down by means of a screw-rod, *f*, which has its lower bearing in the plate K, connecting the two vertical plates J J. The upper bearing of this screw-rod is in the bed-frame A.

The rest-plate is moved, when the screw-rod *f* rotates, by means of a nut, *e*, working in the said rod, and affixed to the rest-plate.

In practice, the mitre-joint is not cut by a single movement of the cutter, but by a few successive movements, and the cutter and rest-plate must be moved down together a short distance after each cut is made.

To accomplish this uniform movement of both parts, the screw-rods are provided with bevel-pinions W and N, which are of equal diameter, and which engage with the bevel-wheels L and O on the shaft M, which latter is turned by the hand-wheel P, so that as the latter wheel is turned, the cutter and rest-plate are lowered together.

The wheel O slides on the shaft M, as the sliding bed is moved to and fro, and the said wheel is held in contact with its pinion by means of a spring, *k*, which latter is affixed to the sliding bed, and has its lower end formed with a fork, which fits loosely upon a channelled sleeve, *k'*, forming part of the wheel O.

The eye of this wheel is slotted to fit on the raised tongue *p*, formed on the shaft M, and is thereby held from turning on the shaft.

Guide-plates *v v* serve to hold the moulding (shown in red) in place. These are adjustable by slots and set-screws, as shown.

The rabbet-bead *a' a'* of the moulding is supported, and thereby prevented from splintering, by the plates *a a*, which are movable along the notch by means of set-screws and nuts *s s*, the screws passing through the slots *c c*, as shown at fig. 3. These plates *a a* slide in the slots as the rest-plate described.

The shaft M has its bearings in the upright, *d*, and part B.

Any suitable gearing may be employed to accomplish the feeding down of the cutter and rest-plate automatically.

j j are braces for the rods *l l*.

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

1. The movable V-shaped cutters E, affixed to plates G, in combination with the notched rest-plate I, operated in the manner described, for the purpose specified.

2. The cutters E E, affixed to plates G G, which are hinged together at H, and provided with rods, *n*, passing through arched slots *m*, in the vertically-adjustable holder U, whereby the said cutters are adjusted to the desired angle and there retained, substantially as described, for the purpose specified.

3. Adjusting the plate I and the cutters E E simultaneously, by means of the screw-shaft Q *f*, nuts *e i*, shaft M, bevelled gearing N O L W, substantially as herein described, for the purpose specified.

4. A V-shaped cutter, E E, when arranged to approach the wood to be mitred with a horizontal movement, and also provided with a vertical movement, substantially as shown and described, and for the purpose set forth.

FRANK A. HOWARD.

Witnesses:

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