

(No Model.)

A. L. GRINNELL.
MORTISING MACHINE.

No. 365,065.

Patented June 21, 1887.

Fig. 1

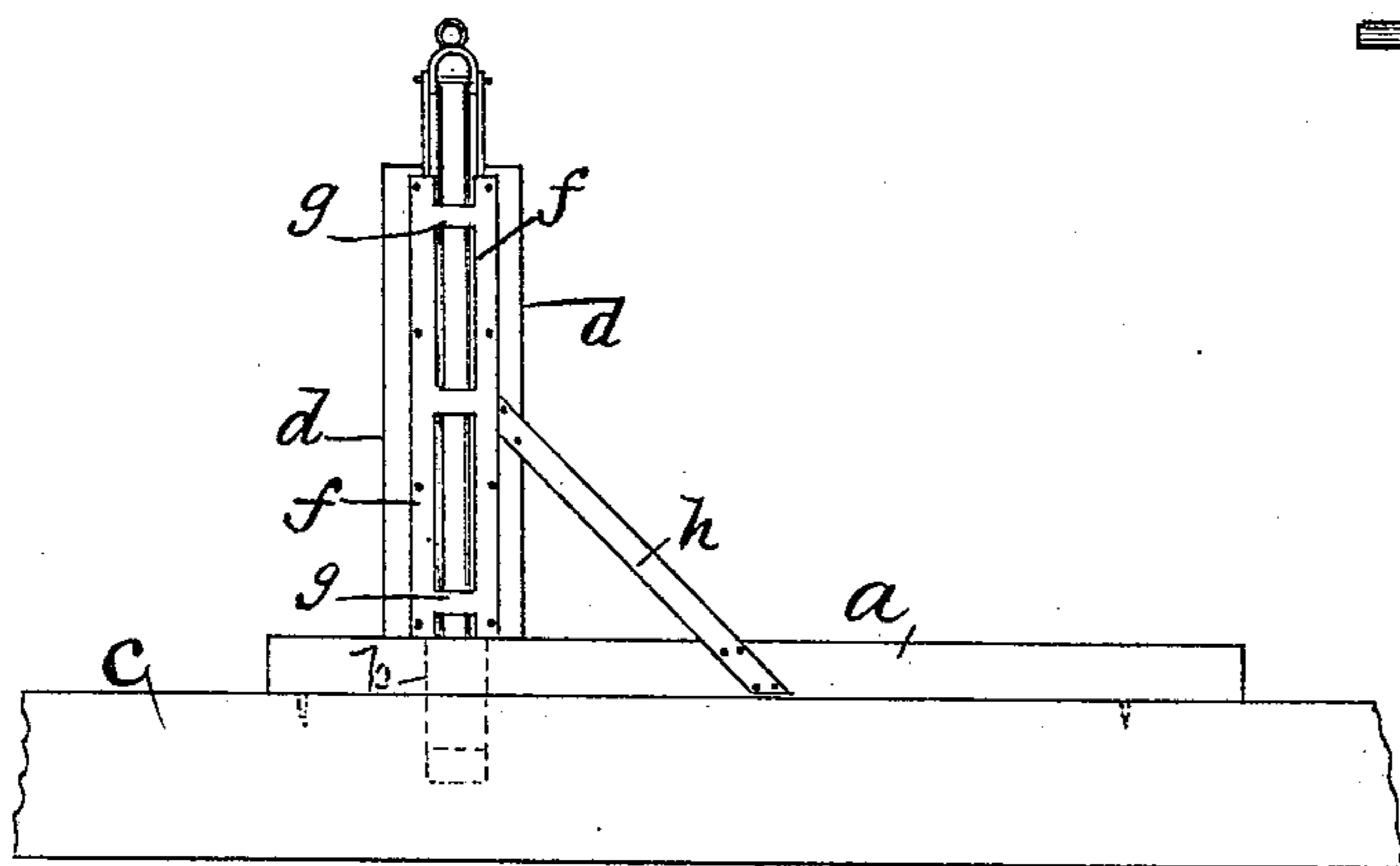


Fig. 2

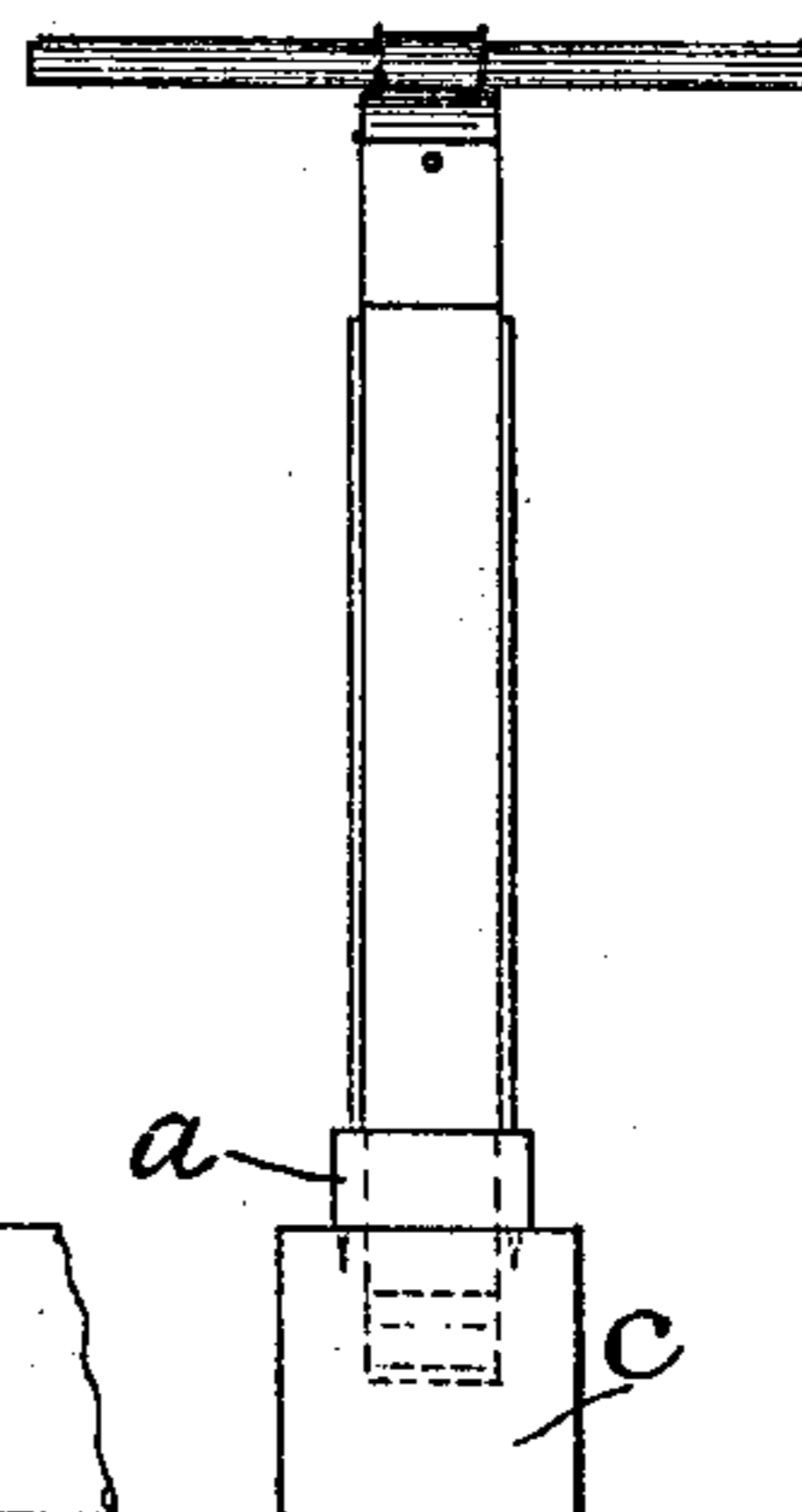


Fig. 3

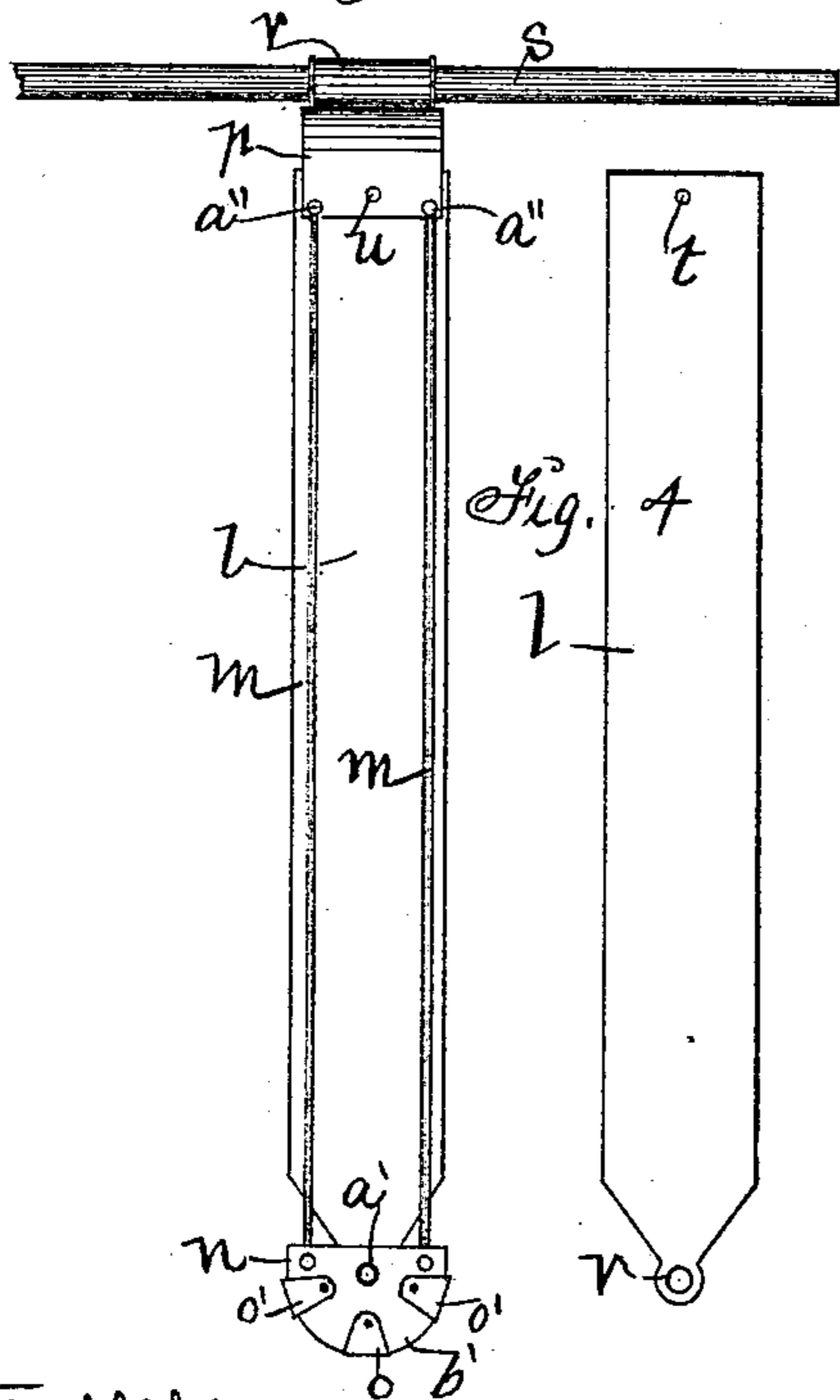


Fig. 5

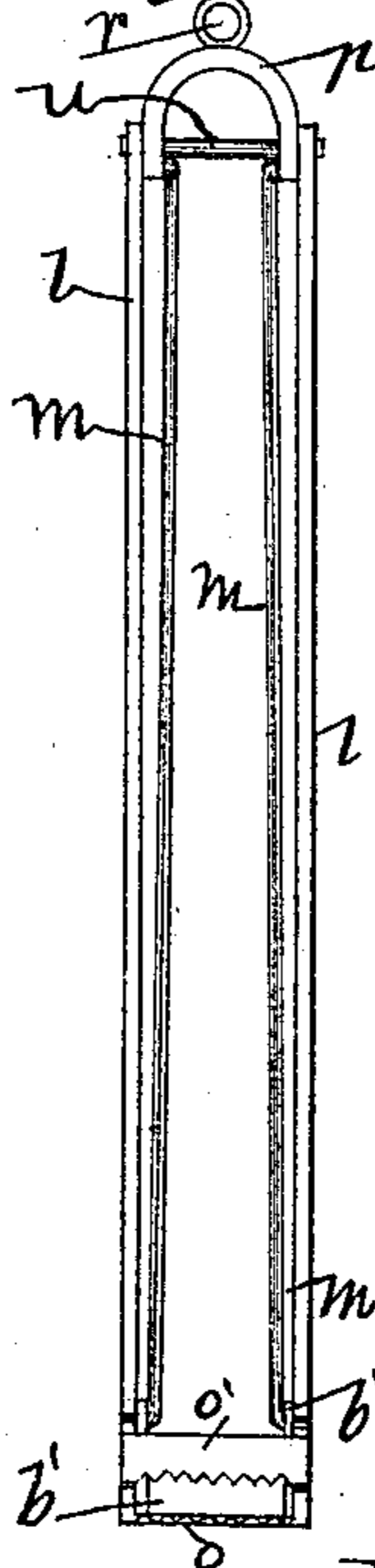


Fig. 6

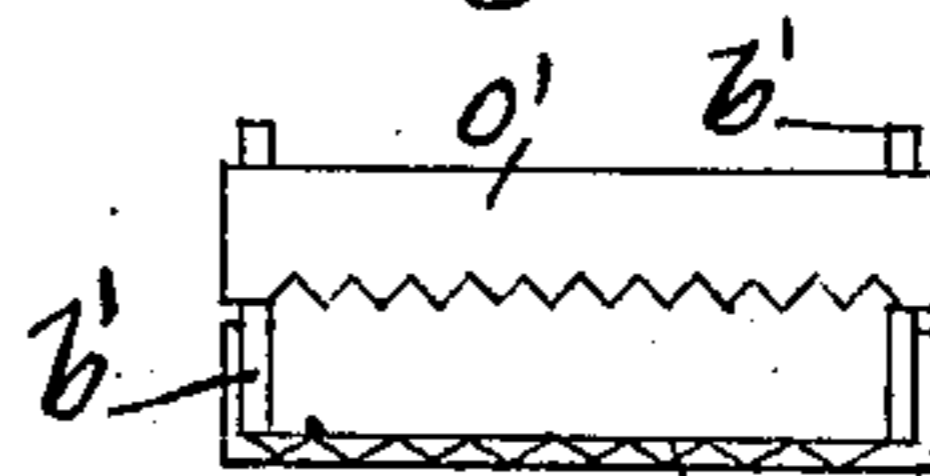


Fig. 7

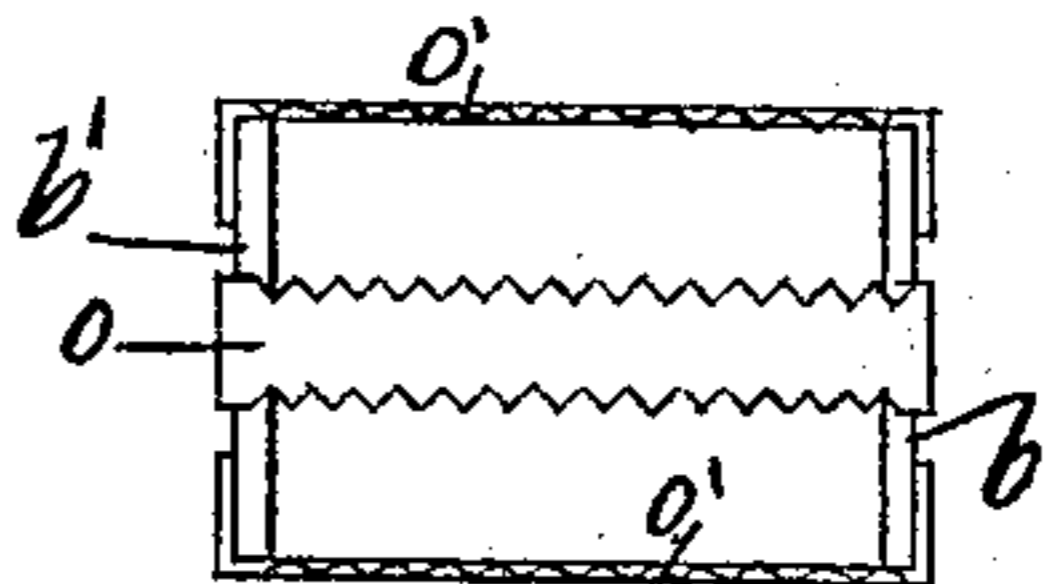
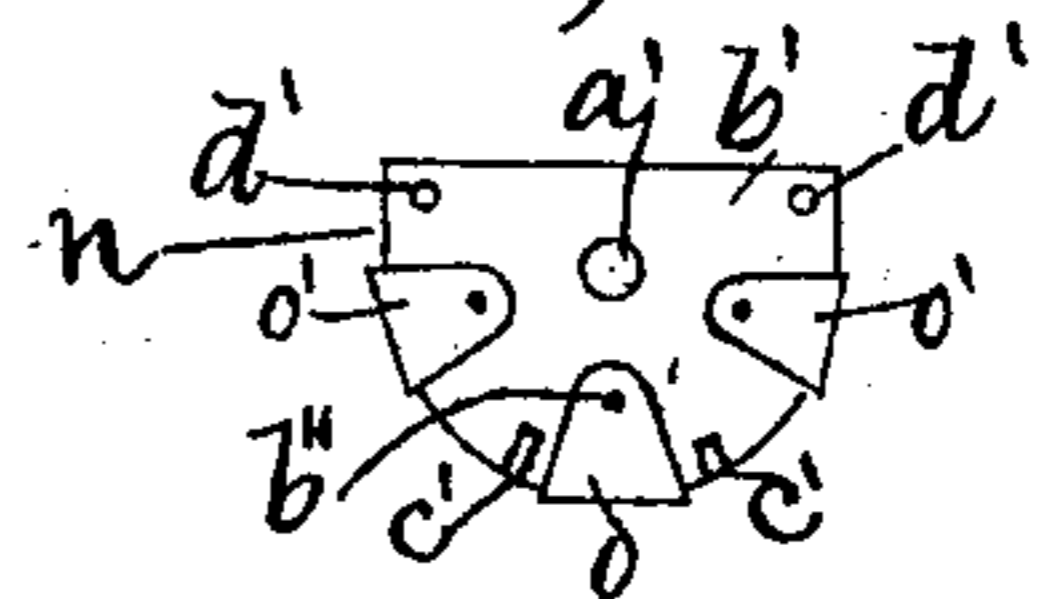


Fig. 8



Witnesses:

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UNITED STATES PATENT OFFICE.

AMOS L. GRINNELL, OF CAMPBELL, IOWA.

MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 365,065, dated June 21, 1887.

Application filed August 19, 1886. Serial No. 211,332. (No model.)

To all whom it may concern:

Be it known that I, AMOS L. GRINNELL, a citizen of the United States, residing at Campbell, in the county of Polk and State of Iowa, have invented a new and useful Machine for Boring Angular Holes, of which the following is a specification.

The object of my invention is to provide a machine for cutting mortises, gains, or any rectangular hole without the use of chisel and bit; and it consists of a stool having upright posts or guides, which carry a frame having at its lower end an arrangement of vibrating knives operated by rods extending upward, which are attached to a vibrating lever at the upper end of the frame. Rectangular holes may be cut with greater speed and accuracy by these combined parts than by the ordinary method.

My device is illustrated in the accompanying drawings, in which Figure 1 is a side view of the complete machine; Fig. 2, an end view of the same; Fig. 3, an end view of the frame carrying the knives, (or cutter,) with the end plate of the frame removed to show the connection of the rods; Fig. 4, the end plate removed; Fig. 5, a side view of the frame carrying the knives or cutter; Fig. 6, a side view of the cutter, showing the serrated knives; Figs. 7 and 8, bottom and end views of the cutter.

In Figs. 1 and 2, *a* is a flat strip or sill having a rectangular hole, *b*, near one end for admitting the cutter and frame attached, and allowing it to pass through and into contact with the timber *c*. From the front and rear sides of the hole *b* are set two vertical posts, *d*, with their inner faces flush with the sides of the hole. On the inner edges of the posts *d* are fastened the strips or guides *f*, with cross-stays *g*, for holding the posts *d* parallel, and from the posts *d* a brace, *h*, extends rearward to the sill *a*, for steadying the entire vertical frame-work. The sill *a* is provided with spurs *k* on its bottom surface, which are driven into the timber *c* to hold the entire frame still relative to the timber *c* and prevent it from slipping about by the movement of the cutters.

The sill *a*, together with the posts *d* and strips *f*, constitutes a frame or guide for the cutting device. (Shown in detail in the subjoined figures.)

Fig. 3, an end view of the cutting device, is composed of the two flat strips or plates *l*, (one of which is removed and shown in Fig. 4,) the four rods *m*, the cutter *n*, with knives *o* and *o'*, and the pivoted arch-shaped piece *p*, with integral handle socket *r* and handle *s*. The strips *l* are made with the holes *t* at their upper ends for admitting the pin *u*. The lower ends are tapered, and at their extremity provided with the holes *v*, for admitting the pins *a'* of the cutter.

Between the upper ends of the strips *l* the arch-shaped piece *p* is placed, as shown in Figs. 3 and 5. This piece *p* has the holes *t'*, through which the pin *u* passes into the holes *t* of the strips *l*, forming a pivot and allowing the piece *p* to vibrate laterally when force is applied to the handles *s*. Integral with the piece *p* is the sleeve or socket *r*, for admitting the handles *s*, used for operating the machine. At each of the four lower corners of the piece *p* are the holes *a''*, into which the upper ends of the rods *m* are pivoted.

The cutter at the lower end of the machine (shown in Figs. 6, 7, and 8) is constructed of two semicircular plates, *b'*, to the sides of which are riveted the knives *o'*, serrated on their lower edges, and at the bottom of plate *b'* is pivoted the knife *o*, with its two horizontal edges serrated. This knife *o* is pivoted at *b''* and has a lateral vibrating movement between the lugs or stops *c'*, thus throwing the edges of the knife alternately at a greater cutting angle as the cutter *n* vibrates backward and forward. The plates *b'* are provided with the pins or posts *a'*, which are admitted into the holes *v* of the strips *l*, thus forming a pivot. At the four upper corners of the plates *b'* are the holes *d'*, for admitting the lower ends of the rods *m*, forming pivots. By these united parts, when the cutter and frame (shown in Figs. 3, 4, 5, 6, 7, and 8) are placed in the guide (shown in Figs. 1 and 2) and force applied to the handles *s* and an upward-and-downward vibrating motion given them, a vibrating motion is also given the piece *p* over the pin *u*, and an alternate reciprocating motion given to the rods *m*, which again transmit a rocking motion to the cutter *n*, and which, by the described arrangement of the knives *o* and *o'*, cuts the wood from beneath, and accurately and rapidly cuts its way through the material operated upon, the

entire cutting device descending between the posts *d* and strips *f* as fast as the wood is cut away.

I am aware that a cutter has been vibrated to form a square hole by means of a rotating shaft; but my manner of constructing and combining a vibrating cutter and a vibrating lever with a portable frame to cut angular bores in wood is novel and greatly advantageous.

I claim as my invention—

1. In a mortising-machine, a sill or base, *a*, having an opening, *b*, posts *d*, fixed to said base, rigid strips *l*, an arched piece, *p*, having a fixed handle, *s*, and a semicircular cutter pivoted to the lower ends of said strips *l* and connected with the piece *p* by means of rods, to operate in the manner set forth.

2. The combination of the cutting device, consisting of the strips *l*, the arched piece *p*, having a handle, *s*, the cutter *n*, and the rods *m*, with the frame *a b b*, having fixed guides *f*, substantially as shown and described, for the purposes stated.

3. The semicircular cutter comprising the plates *b'*, having pins *a'* and lugs *c'*, and the serrated knives *o* and *o'*, in combination with the parallel strips *l*, substantially as and for the purposes stated.

4. A machine for making square holes, comprising a frame made of a horizontal base and two parallel posts fixed to said base and on opposite sides of an opening in said base, a cutter of semicircular shape pivoted to the bottoms of two rigid bars that are pivoted at their top ends to a yoke or frame having a fixed handle extending horizontally in opposite directions, and rods connecting the four corners of the cutter with the four corners of the said yoke or frame, to operate in the manner set forth.

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Witnesses:

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