

No. 157,309.

FIG. 1.

FIG. 2.

FIG. 3.

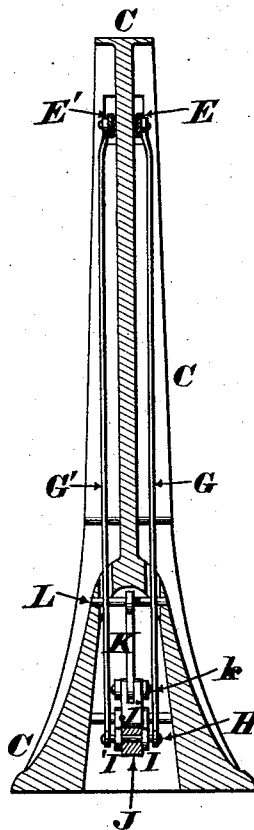
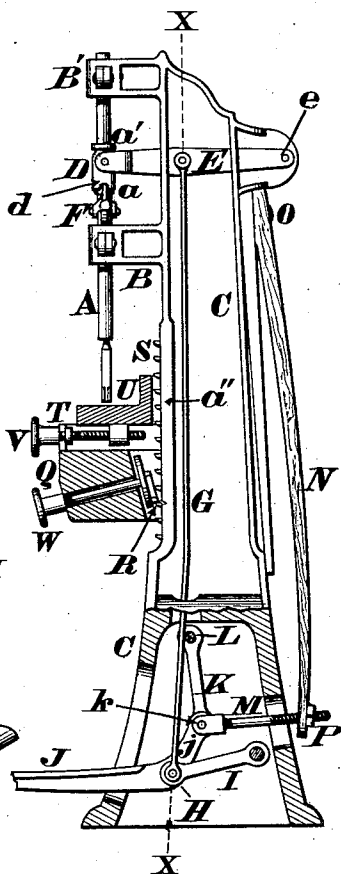
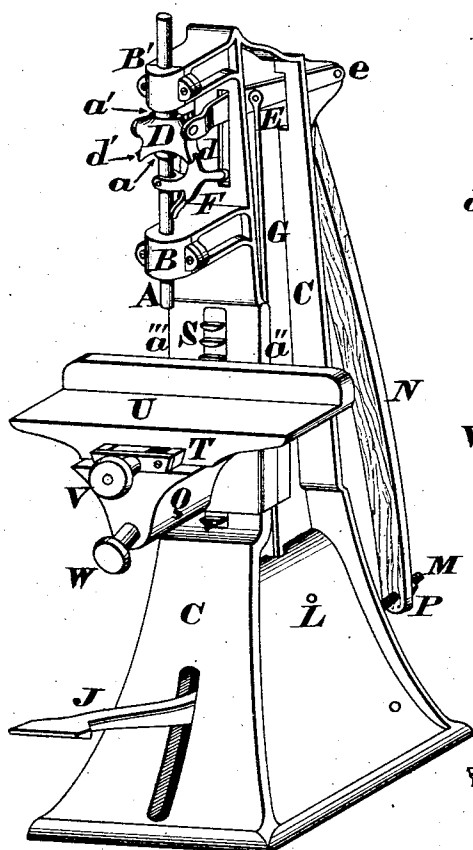
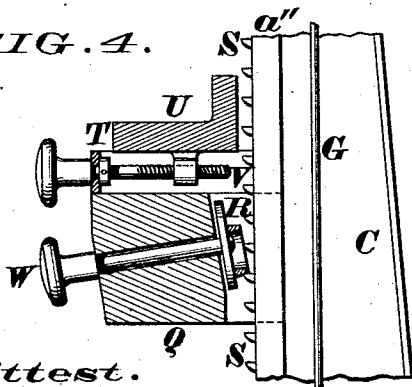


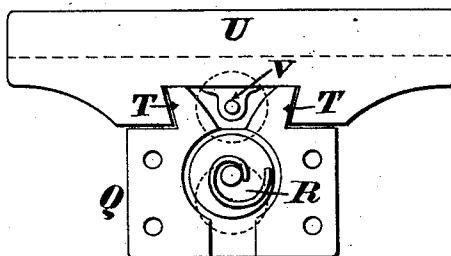
FIG. 4.



Attest.

Walter Allen

FIG. 5.



Geo. W. Bugbee.

Geo. W. Bugbee.
By Knight Bros.
Att'ys.

UNITED STATES PATENT OFFICE.

GEORGE W. BUGBEE, OF CINCINNATI, OHIO, ASSIGNOR TO J. A. FAY & CO.,
OF SAME PLACE.

IMPROVEMENT IN MORTISING-MACHINES.

Specification forming part of Letters Patent No. **157,309**, dated December 1, 1874; application filed
May 18, 1874.

To all whom it may concern:

Be it known that I, GEORGE W. BUGBEE, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Mortising-Machines, of which the following is a specification:

My invention has for its object a compact and effective mortising-machine operable by the human foot through the instrumentality of a treadle, which is connected with the chisel-mandrel by means of an arrangement of toggle connecting-rods and vibrating beams, so as to secure the greatest leverage as the chisel approaches the end of its stroke, when the most force is required.

My invention further comprises an arrangement of cam and rack for elevating and depressing the head, and devices for the lateral shift or adjustment thereof, as herein specified.

Figure 1 is a perspective view of a mortising-machine embodying my improvements, the chisel-mandrel being elevated. Fig. 2 is a partly-sectioned side elevation thereof with the chisel-mandrel depressed. Fig. 3 is a section at the line X X, Fig. 2. Fig. 4 is a vertical section, and Fig. 5 is a rear view, of my bed elevating and shifting mechanism to double the scale of the preceding figures.

The chisel-mandrel A occupies the customary bearings B B', which project horizontally forward from the frame C. Secured between collars *a a'* on the mandrel is a head, D, to which are pivoted two beams, E E', whose rear extremities are hinged or pivoted to the frame at *e*. A spring-catch, F, pivoted to the mandrel and engaging alternately in one of two notches, *d d'*, in the head, serves both to enable the reversal of the mandrel, and its secure retention to either the right or the left position. Pivoted to the beams E E', at or about midlength thereof, are two rods, G G', which are connected by pivot H with vibrating arms I I', and with a bent treadle, J, whose short member *j* forms the lower member of a toggle, *j K*, whose upper member, K, is secured to the frame by means of a pivot, L. The pivot *k* of toggle *j K* occupies the fork end of the rod M, which passes through a wooden spring, N, secured to the rear side of the frame by bolt O, as shown in Fig. 2. Said rod, being screw-

threaded, receives a nut, P, by means of which any desired spring-tension can be put upon the rod M, and thence upon the toggle *j K*, to retract the same, and thus to elevate the mandrel the moment the treadle is released.

It will be perceived that the treadle acts, through the medium of the toggle, with a powerfully-increasing purchase or leverage as the chisel passes downward into the stuff; and that the spring, then reaching its greatest tensile force, acts to promptly release the chisel the instant that the treadle is relieved from the pressure of the operator's foot. This result is accomplished by the peculiar manner in which the treadle and its immediate accessories are arranged; and it will be understood, by referring to Fig. 2, that, when the chisel-mandrel A is retracted, the free ends of links or radius-rods I I' are elevated, and the entire treadle lifted accordingly by the stress exerted by spring N upon the coupling-rod M. By thus elevating the treadle its members *j K* are inclined toward the rear of the housing or frame C, and as soon as pressure is applied to the outer end of said treadle this angular position of the devices *j K* is gradually overcome until they assume a vertical, or nearly vertical, condition. The movement which initiates this change of the toggle commences as soon as the mandrel A begins to descend, and it is not completed until the chisel has entirely penetrated the stuff placed upon the rest U, by which time the devices *j K* have assumed an almost vertical position, and consequently the full power of the operator is exerted to the greatest advantage. When the treadle is fully depressed and the members *j K* are almost vertical, the spring N exerts its greatest force to withdraw the chisel, at the very moment when the latter is most firmly embedded in the stuff; and as the mandrel is elevated and the toggle again restored to its normal or angular position, the stress of the spring gradually diminishes until the head D is brought in contact with the supporting-bracket B'. In this completely elevated condition of the mandrel the spring exerts comparatively little stress, on account of the angular position of the toggle. Owing to this arrangement of the toggle or knuckle joint, a light spring will ex-

ert as much power in retracting the chisel as the very stiff ones in ordinary use, with the additional advantage that the light spring enables the operator to force the chisel into the wood with the least amount of exertion.

Q is a bracket, adapted to be slid up or down along the dovetail edges a'' a''' of the frame by means of a segment-gear or volute, R, which operates upon a rack, S, fastened to the front of the frame. The bracket Q is surmounted by a dovetail tongue, T, which occupies a corresponding groove on the under side of a sliding bed or rest, U, capable of being adjusted forward or backward by means of screw V. W is the hand-wheel, that serves to rotate the volute cam or eccentric R.

By simply making the main frame C hollow, or by providing it with suitable vertical and transverse slots, a single beam, E, and connecting-rod G may be employed, the lower end of the latter being forked, so as to be pivoted to the treadle.

A single radius-rod, I, may be employed instead of two, as shown in the drawing.

I claim herein as new and of my invention—

1. The frame C, treadle J j , arms I K, rods G G', beams E E', head D, mandrel A, and spring N, combined, substantially as herein described, to constitute a foot mortising-machine.

2. In a foot mortising-machine, the toggle or knuckle jointed treadle J j K and described connecting devices, constructed, arranged, and adapted to operate substantially as set forth.

3. The combination, in a foot mortising-machine, of one or more beams, E E', rods G G', arms I I', retracting-rod M and spring N, and the bent treadle J j , forming parts of the toggle j K, the whole being constructed and operating as set forth.

4. The bed or rest U, adjustable by means of the cam R W, rack S, and screw V, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

Attest: GEORGE W. BUGBEE.

GEO. H. KNIGHT,

JAMES H. LAYMAN.