E. M. SHAW.

TENONING MACHINE.

No. 7,549. Patented Aug. 6, 1850.

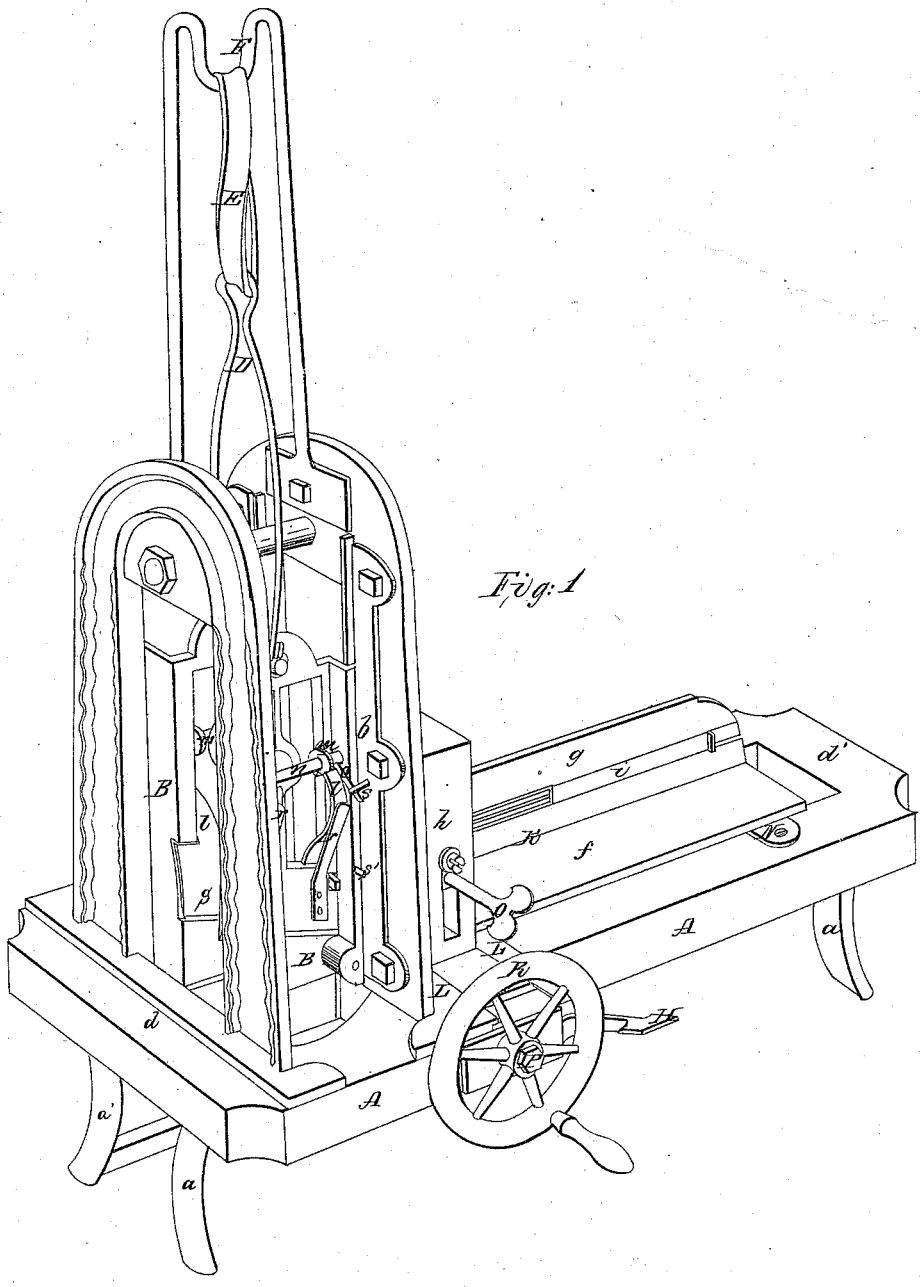

Fig. 1

2 Sheets—Sheet 2.

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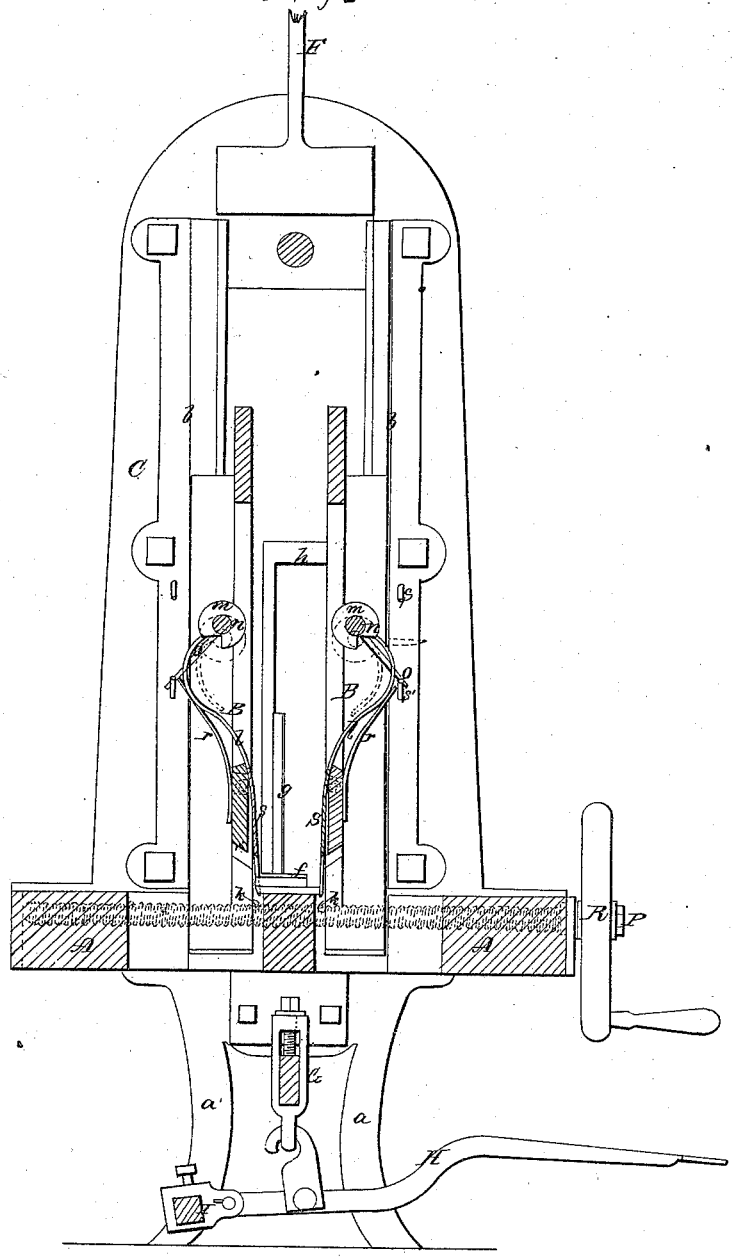
Fig. 2



UNITED STATES PATENT OFFICE.

E. M. SHAW, OF BALTIMORE, MARYLAND.

TENONING-MACHINE.

Specification of Letters Patent No. 7,549, dated August 6, 1850.

To all whom it may concern:

Be it known that I, E. M. SHAW, of the city of Baltimore and State of Maryland, have invented a new and useful Improvement in Machines for Tenoning Lumber, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1, represents a view in perspective of my tenoning machine complete, and Fig. 2 a vertical section of the same at the line *x x* of Fig. 1.

My machine is constructed to cut a tenon by removing the wood from either or both faces of the piece of wood on which the tenon is to be made by means of two reciprocating planes whose irons are connected in such manner with their respective stocks that they act upon the wood during their direct stroke, while during their retrograde stroke their cutting edges are moved back from the surface from which the shaving has been removed by their direct stroke, thus preventing the edges of the plane irons from being dulled by rubbing or grinding over the surface of the timber in the retrograde stroke of the planes.

The machine consists of a strong frame or bench on which the cutting apparatus is supported together with the carriage, to which the wood to be tenoned is secured. The bench A is supported at a convenient distance from the ground by strong legs *a*, *a'*. The cutting apparatus is composed of two planes B sliding vertically in guides *b* secured to two parallel upright guide frames C, which are mounted upon one extremity *d* of the bench and firmly secured to it and to each other by bolts. The two planes face each other; they are connected at their upper extremities by a yoke D which is suspended by a strong spring E from a gallows frame F erected upon the guide frames. The lower extremities of the planes are connected by link-bars with the front extremity of a lever G, whose hinder extremity is pivoted to that end *d'* of the bench most distant from the planes. This lever is connected at a point intermediate between its two ends with a treadle H whose hinder extremity is secured to a rock shaft I pivoted in the hinder legs *a'* of the bench, and whose front extremity projects at the front side of the bench. A sliding adjustable carriage K is mounted upon the top of the bench; this carriage consists of a bottom *f*, and back plates *g* secured at their extremities nearer the planes to a rectangular frame *h* large enough to admit the largest timber which the machine is to tenon. The lower side of this frame *h* is elongated beyond its upright sides and is constructed to slide across the bench in guides L. The opposite end of the carriage is supported upon a friction wheel which runs upon a plate N secured to the top of the bench. The back of the carriage is slotted to receive an adjustable stop *i* which prevents the timber from moving endwise under the action of the planes. A clamp screw O is also fitted to the front side of the rectangular frame *h*. A transverse feed screw P is secured to the bench immediately beneath, the rectangular frame *h* which is fitted with a nut in which the screw acts; the outer end of the screw being fitted with a hand wheel R by means of which it can be conveniently turned to screw the carriage transversely toward either side of the bench.

The planes B are each fitted, at the side nearer the carriage, with a spur *k* by which the shoulder of the tenon is cut; they are also each fitted with an oblique edged plane iron S by which the faces of the tenon are formed. This plane-iron is not fixed rigidly to its plane stock but is pivoted to it in such manner that its cutting edge can be turned either from or toward the face of the stock. Each plane iron has two curved shanks *l* projected from its upper edge; the upper extremities of these shanks bear against the peripheries of two cams *m* secured to a rock shaft *n* from which an arm *o* is projected. The plane stocks are fitted with two springs *r* which acting upon the curved shanks force their upper extremities against the cams. Two pins *s*, *s'*, are projected from the guide frame in such positions that as the plane is drawn down by means of the treadle toward its lowest position, the arm of the rock shaft strikes the lower pin *s'* and turns the cams to the positions in which they are represented in dotted lines in Fig. 2, thus allowing the springs *r* to force the upper extremities of the shanks *l* into the recesses of the cams, and consequently to turn the cutting edge of the plane-iron toward the face of the plane stock; and as the plane is raised by the action of the spring E toward its highest position the arm of the rockshaft strikes

the upper pin *s* and turns the cams back to their first position, thus forcing the cutting edge of the plane iron outward from the faces of its stock.

Timber is tenoned with this machine in the following manner; it is placed upon the carriage and is shoved endwise between the planes until the point at which the shoulder of the intended tenon is to be cut corresponds with the cutting edges of the spurs; it is then made fast by means of the stop *i* and the clamp screw O. The feed screw is then turned to move the carriage transversely until the timber secured to it is brought within the range of action of one of the plane irons; the foot of the operator is now applied to the treadle and, the planes being depressed, the spur of the one nearer the timber cuts the shoulder of the tenon while the plane iron removes a shaving from its face. As the plane reaches the limit of its down stroke the cams are turned by the action of the rock-shaft, arm, and lower pin, and the springs acting upon the curved shanks of the plane-iron turn its cutting edge toward the plane-stock and consequently away from the timber, so that as the plane is drawn up by the spring E, on the slacking of the pressure of the treadle, the cutting edge shall not rub or grind against the surface of the timber which it has just cut in descending. As the plane reaches the upper limit of its stroke the rock shaft arm (*o*) striking the upper pin (*s*) turns the cams (*m*) which, acting upon the shanks (*l*), turn the cutting edge of the plane iron toward the timber. As soon as the plane-iron in ascending has cleared the timber, the latter is fed again beneath the track of the plane iron by the feed screw, and a second shaving is removed in the same manner as the first. The operation is continued until one side of the tenon is formed; its opposite side is then cut, in the same manner, by the other plane to which the lumber is shifted by the feed screw.

Having thus described my improved tenoning machine, what I claim therein as new, and desire to secure by Letters Patent is—

The planes for cutting the tenon whose irons are made to turn alternately from and toward the faces of their respective stocks, so as alternately to cut and clear the lumber on which they are acting.

In testimony whereof I have hereunto subscribed my name.

E. M. SHAW.

Witnesses:
H. R. ROBBINS,
N. V. SAUMENIG.