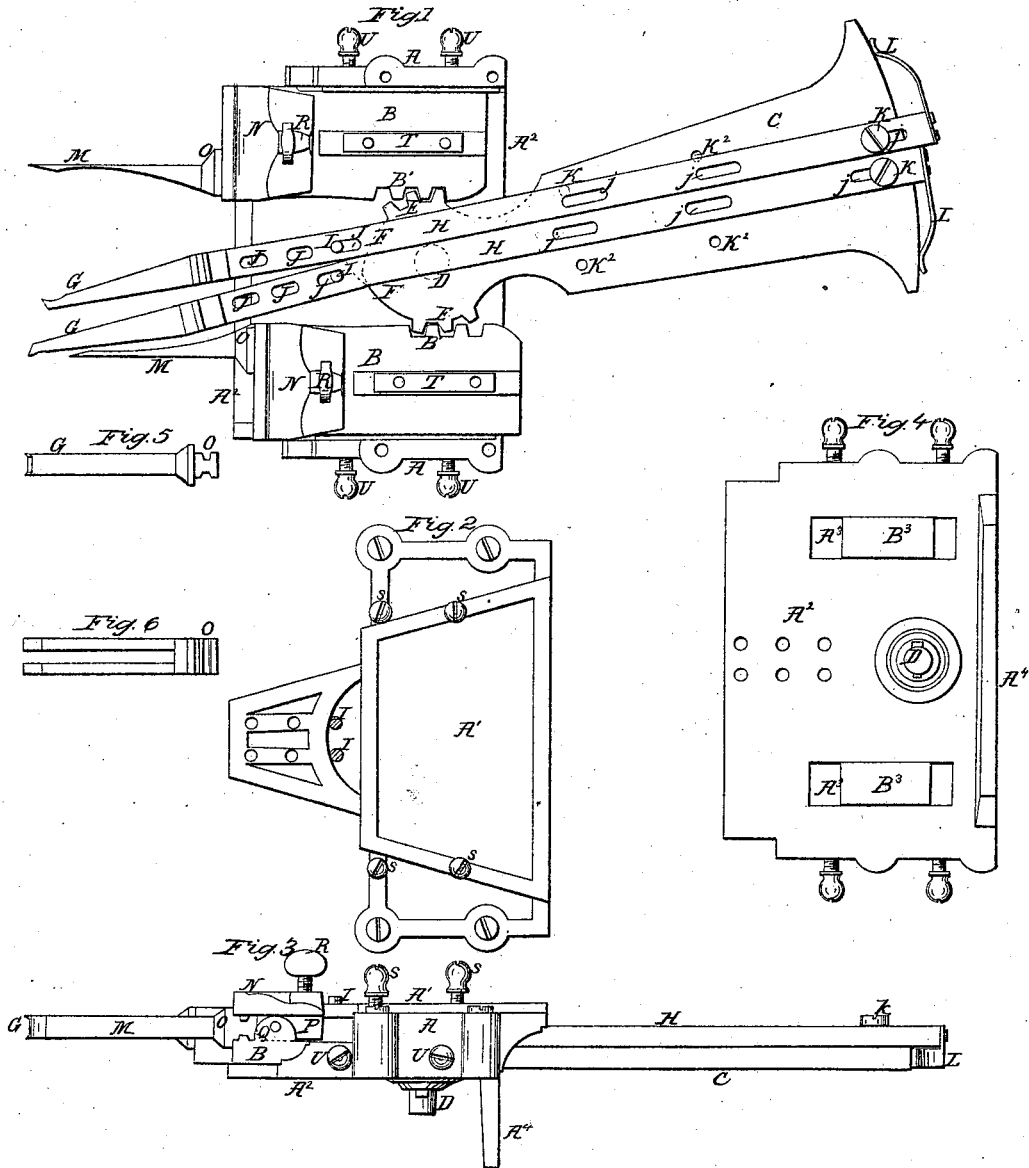


T. A. Chandler,

Mortising Machine,

No. 4,876,

Patented Dec. 9, 1846.



UNITED STATES PATENT OFFICE.

THOMAS A. CHANDLER, OF ROCKFORD, ILLINOIS.

MORTISING AND TENONING MACHINE.

Specification of Letters Patent No. 4,876, dated December 9, 1846.

To all whom it may concern:

Be it known that I, THOMAS A. CHANDLER, of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Machine for Cutting Mortises and Tenons in Wood and Metal, Planing Metals and Woods, and Performing other Descriptions of Work, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a plan of the machine showing the right header and the left plane in a position to cut the wood or metal and the left header and right plane drawn back from the wood or metal, the front plate being removed or detached from the back plate for that purpose. Fig. 2 is a plan of the front plate. Fig. 3 is a side elevation of the machine. Fig. 4 is a view of the underside of the back plate showing the mortise. Fig. 5 is a plan of one of the vibrating cutters showing the side trimmers. Fig. 6 is a plan of a forked cutter for making tenons.

The nature of this invention and improvement consists in combining with the mortising machine having two ordinary parallel cutters or headers moved alternately by racks and pinions or segments two alternate vibrating planes or cutters that are caused to cut from the center of the mortise (when mortising) toward each end thereof alternately in the manner of planes with side cutters—the cutting being performed in parallel right lines and immediately succeeding the operation of the parallel cutters or headers while the levers to which said vibrating cutters are affixed have a compound motion from and around their fulcra caused by the end of the pendulum which is made with eccentrics that act against shoulders on the levers of said combined planes and side cutters and connecting said levers to the pendulum by oblong mortises and adjustable screw pins inserted into the pendulum the said levers moving loosely over their fulcra and over the shanks of said screw pins when pressed forward by the aforesaid eccentrics and when drawn back by springs which are connected to the levers the fulcra of the levers being bolts inserted into the parallel plates over which fulcra the said levers have a sliding movement by means of other slots in them and the action of the eccentrics and openings hereafter more particularly described.

A' A² are the stationary parallel plates containing the cutters consisting of a front and a back plate held together by screw bolts the back plate having a flange A on each side to which the top plate is bolted and another flange A⁴ by which it is bolted to the bench or other place. A³ are the mortises in the back plate to admit tenons forward on the back of the slides.

B B are two slides to which the cutters for cutting the heads of mortises are attached moved alternately by racks and cogged segments the racks being formed on the inner edges of the slides and the segments on the convex edges of the pendulum.

B' B' are the racks.

B³ B³ are the tenons formed on the under side of the slides C the pendulum. D the axle on which it vibrates inserted into the back plate A². E the cogged segments formed on segments of a circle described around a center which is the center of the axle of the pendulum.

F are the eccentrics formed on the end of the pendulum for moving the cutters simultaneously from the center of the mortise to one end thereof in a right line.

G are the planes made with side cutters or spurs for trimming the sides of the mortise the planes cutting out the bottom of the mortise in right parallel lines.

H are the vibrating levers to which the said cutters are attached containing oblong mortises to allow them to move over their fulcra and the pins that connect them with the pendulum.

I are the fulcra of said levers inserted into the parallel plates A' A².

J are the aforesaid oblong mortises in the levers to admit said fulcra and allow the levers to move longitudinally back and forth over the same. These fulcra are to be withdrawn from the plates and levers and inserted into other holes in the front and back plates and into the mortises J in said levers nearer to the cutters in order to reduce the sweep of the cutters for making smaller mortises. When larger mortises are to be made the fulcra must be removed farther from the cutters. At the same time the position of the longer ends of the levers must be changed—that is to say—they must be placed wider apart when small mortises are to be made, and brought nearer together when larger mortises are required to be cut. K are screw bolts for connecting the levers

to the pendulum passed through oblong mortises *j* in the levers and screwed into the pendulum so that the levers shall move longitudinally back and forth over said screws *j* and over their fulcras as described. *K*² are other holes in the pendulum to admit the screws *K* when the position of the levers is to be changed.

L are springs attached to the levers *H* and bearing against pendulum *C*. These springs contact when their respective cutters *G* are pushed outward toward the article to be cut which takes place when the pendulum is vibrated and causes the levers *H* to move on their fulcras *I* in the arc of a circle while the cutters move in straight lines from the center toward the ends of the mortise.

When one of the planes is advancing toward the article to be cut the other is receding from it by which operation there is an alternate operation of cutting from the center toward the extremities of the mortise kept up by the planes or cutters caused to act by the vibration of the pendulum. At the same time there is an alternate cutting operation performed by the end cutters or headers produced by the motion of the slides to which they are attached for cutting down the ends of the mortise. *M* are the said end cutters, or headers, made in the usual manner. The shanks of these cutters are inserted into sockets made in sliding stocks *O* grooved on the upper and under sides. The groove on the under side of the stock is to receive a tongue on the upper side of the sliding rack plate *B*. The groove on the upper side of the stock is to receive a tongue formed on the under side of a vibrating clamp plate *N*, between which the sliding stock is clamped. On the under side of the clamp plate are two ears *P* which come between two ears *Q* on the upper side of the sliding plate *B*. The aforesaid ears of the vibrating plate are connected to the ears of the sliding plate by pins on which the upper plates vibrate or turn. The edge of the vibrating plate is brought nearer to or receded farther from the sliding plate in order to clamp or release the stock of the cutters by means of a screw *R*, placed in a corresponding female screw in the vibrating plate and screwed against the sliding plate so that by turning said screw to the right or to the left it will cause the clamp plate to vibrate on the aforesaid pins. Both headers or cutters are provided with similar stock, plate, and screw. By thus arranging the stocks of the headers between adjustable clamp plates they can be brought to any required distance apart for cutting or heading long or short mortises with great ease and despatch. The combined vibrating cutters for cutting out the material between the heads of the mortise may be provided with

similar stocks and plates, tongues and grooves and clamp screw for the facility of holding and setting said vibrating cutters.

The eccentrics *F* are shaped to act against the shoulders of the levers of the combined cutters to cause them to cut the wood or iron in a tangential or straight line, that is to say to recede gradually from the center to its fulcrum simultaneously with its movement toward the end of the mortise—the radial lines drawn from the fulcrum of the lever increasing with the lengthening of the tangential line on which the cutters move.

By altering the form of the eccentrics the cutters may be made to move in a curved line—either convex or concave.

To cut tenons the cutters above described must be removed and others adapted for the purpose intended put in their places, such as that represented at Fig. 6 which is made forked for cutting the shoulders and removing the material from the sides of the tenon.

The cutters must be adapted to perform the work required to be done. They are all however to be operated on the same principle as above described, that is to say while the header (in mortising) is cutting in a straight line from the operator, the opposite vibrating cutters are to move in a straight line at right angles thereto (or in a curve line) from the center to the opposite end of the mortise for cutting the sides and bottom thereof and by reversing the position of the pendulum causing the other cutters to act in a similar manner. The pendulum may be vibrated by hand, by manual, steam, water, or any convenient power applied to it, in any convenient way or manner.

The article to be acted upon, or to be cut, must be applied to the cutters by hand or by machinery. The cutters however may be applied to the substance to be cut, the latter being held stationary.

The size proportion and material of the machine may be varied to suit the views of the constructor.

S are set screws for adjusting the slides to the back plate or for keeping them against raised ways or ribs formed on the upper surface of the back plate. *T* steel plates placed between the points of the set screws *S* and raised ways or projections formed on the slides for preventing the formation of cavities therein by the points of the screws. *U* other set screws passing through the parallel side flanges *A* of the back plate *A*² and screwed against steel plates placed against the straight edges of the rack slides for keeping the tenons on the backs of the said slides against the sides of the mortises in the back plate and the racks in proper gear with the cogged segments.

What I claim as my invention and desire to secure by Letters Patent is—

Combining with the two parallel alternate moving headers, two alternate vibrating cutters connected to and moved by the cogged and eccentric pendulum that moves the headers whether the several parts be con-

structed, arranged and operated in the manner and for the purposes above described or other mode substantially the same.

THOS. A. CHANDLER.

Witnesses:

WM. P. ELLIOT,

ALBERT E. H. JOHNSON.