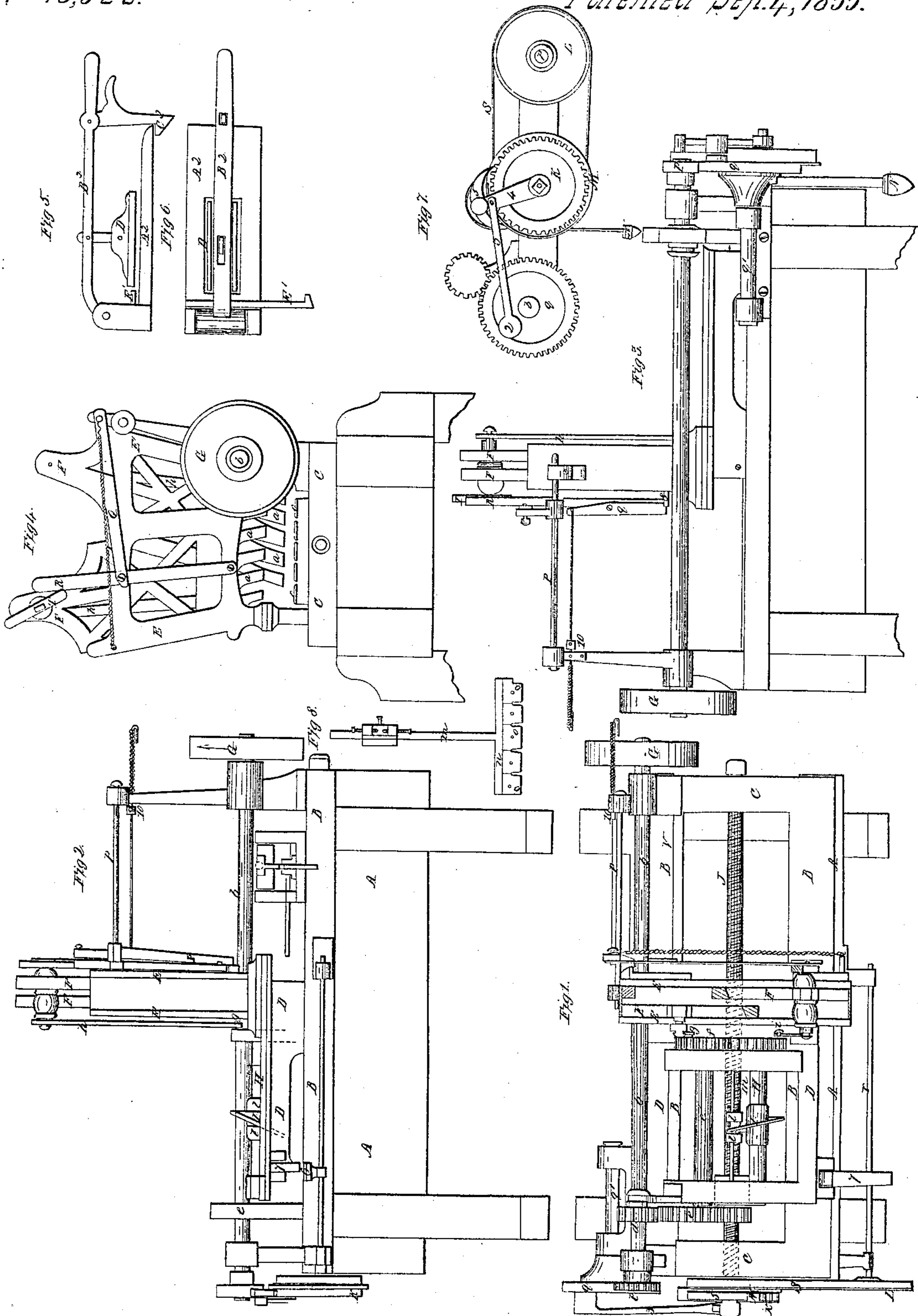


*J. J. Haley,
Dovetailing Machine.*

N^o 13,522.

Patented Sep. 4, 1855.



UNITED STATES PATENT OFFICE.

JOHN J. HALEY, OF PHILADELPHIA, PENNSYLVANIA.

DOVETAILING-MACHINE.

Specification of Letters Patent No. 13,522, dated September 4, 1855.

To all whom it may concern:

Be it known that I, JOHN J. HALEY, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machinery Adapted to Dovetailing in Wood, &c.; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, of which—

Figure 1, is a plan; Fig. 2, a side elevation in front; Fig. 3, elevation in the rear; Fig. 4, an end view in elevation; Figs. 5, 6, and 7, sections.

The nature of my improvement consists in so constructing a machine, and arranging the several operations of the parts comprising it, that a perfect dovetail may be made in the thickness of the wood operated on; for instance in a drawer front, where it is desirable that the mortise by not extending through the thickness shall preserve the face of the same.

In the drawings and arrangement of the device I have shown it as applied to but one end of a piece for a front, but to mortise both ends it is only necessary to introduce upon the same frame a duplicate of the one described, as by such an arrangement both ends of the piece of wood may be dovetailed at the same operation.

The general characteristic of the improvement consists in angularly operating chisels, by which the undercutting required in a dovetail is made in connection with the horizontal chisels, by which the flat of the mortise is effected, so that at a single handling of the material a perfect dovetail shall be produced in the thickness thereof.

To enable others skilled in the art to make and use my improvement, I will describe it as follows.

A A, represents the side pieces of a heavy frame, supported at a suitable height by legs; B B, the side of a second frame, or ways above A A, and connected therewith; C, C, the ends of the second frame; D D, the sides of a sliding or 3d frame moving on guides or V's secured to B B. Upon the 3d frame and extending from side to side are raised the guides E E, for giving obliquity to the cut of the chisels requisite in forming the dovetail. It will be noticed that the

guides for the set of chisels on the left of the machine or the front ones, (see end view Fig.—) are for directing them in cutting the right side of the mortise, while the guides immediately behind direct the chisels at an opposite angle and side.

F, F, are the chisel-stocks sliding in the guides E, E. The chisels *a a* may be secured to the lower ends of said stocks in any suitable manner.

G is a pulley to which the power is applied and moves by means of the long shaft *b*; the pinion *d* actuating the spur *e* upon the short shaft *e'*, said shaft having on its end the pinion *f*, in whose face the crank pin *g*, is affixed, the purpose of which is to move the pitman rod *h*, in elevating the chisel stock on the right side (of Fig. 4). This pinion also drives another by its side on the shaft H in whose face the other crank pin *i* is secured, whose purpose like the one described, is to raise the chisel stock on the left side, the chisels instead of being ground square are formed as shown in Fig. 4, viz having their edge at angle to their sides other than a right angle.

Upon the shaft H is placed a snail cam I; working between a pair of jaws *l l* raised upon the sliding bar *m*; on the outer end of the bar is secured a cross piece (likewise sliding) and it is upon this cross piece *n*, Fig. 8, that the horizontal chisels *o o* are fastened.

The operation of the machine, so far as the mortise is concerned is as follows. Upon moving the crank or pulley G in the direction of the dart the pinion and gear drive the crank, pinions, and pitman rods, thus elevating and depressing the upright chisels, and forming the cut across the grain, in an oblique direction or angle to the plane of the bed or horizontal framing. The same gear by operating at the same time through the snail cam I, gives a reciprocatory movement to the horizontal chisels *o o*, and thus every chip or cut is removed. The underside of the piece to be mortised is sustained by a bed piece, which slides with the framing D; and passes under the piece to be mortised.

To feed up all the chisels to the work, is as follows: On the end of the shaft *b* is a pinion *p*, meshing into spur *q*, carried on the shaft *q'*. In the face of *q*, is a crank pin 2 upon which the rod 3 is secured (Fig. 7).

4, is a swing arm pivoted on pin in the end of the feed screw rod, and carries on its upper end the ratchet or double pawls 5.

J is a long feed screw passing through the ends *c c* of the second frame. Upon its outer end is secured the ratchet wheel K. On the upper side, and embracing about one third of the periphery is a turning shield M, centered upon, though not secured to the axis of K, viz: the end of the screw J.

L is a large pulley on shaft *r*.

s is a drawing band confined to L by a pin in the periphery of L, but having a free motion around the shield pulley M, which it actuates, not only in the feed, but in the counter movement required in relieving the chisels from the work when the mortise is finished.

N is a weight connected with a second strap lying on strap *s*; being secured to the pulley L with the same pin in its periphery. Its object is to draw the straps, and by them the shield M, so as to arrest the pawl on the feed side and expose the cogs of K to the pawl of the relieving motion when the catch handle 6 is released from the catch 7.

The operation of the feed is as follows: The pinion *d* driving *g* brings into play the dog or pawl on the left of Fig. 5 and turns the wheel K toward *g*, thus driving forward the sliding frame D, and with it the several chisels, when the frame D carrying on its side the catch 7, moves away from and releases the catch handle 6 (Fig. 2) from the catch.

The weight N, is permitted to draw the shield toward *g*, arresting the dog or pawl, on that side, and bringing the other pawls in play, which falling on the side of K toward L, the counter movement is produced.

In arresting the feed as when changing the piece to be mortised, it is only necessary to so place the shield by moving the pulley L, that neither pawl is brought into play in the ratchet. The front chisel stock instead of being connected like the rear one by a plain pin, it is united to the rod by an eccentric, passing through the upper end of the stock, which at a required period is tripped and the chisels of this stock are shortened in depth of their cut, and overhangs the work while the rear set of chisels square up the mortise. This trip is effected by a catch 8 Fig. 3 upon the right of the frame, holding the latch *g*, in its place until the stop 10, and its rod release the latch from 8, and the helical spring connected with the arm of the rock shaft P, draws the pitman lever Q, and upright lever R toward the left (of Fig. 4) bringing it in contact with the striker T, of the eccentric pin and thus throws the eccentric pin downward and thus shortens the descent of the chisels.

The clamp (see Figs. 5 and 6) for holding the piece to be mortised is constructed as

follows: A' is an iron plate secured to the frame B; B² is a swing lever provided at a point near its end with a catch C² locking under the plate A². At another point is the swing platen D', by which the work is held or clamped. E' is a guide, and also an end holder of the piece to be mortised, as it prevents the chisels driving the wood endwise.

To use the machine thus described; for mortising a piece of plank designed for a drawer front; the lever B² is raised, and with it the platen D². The piece is then laid on the plate A², the lever and platen depressed by hand, and the catch O² secures it in the clamp. This may be done while the chisel frame is on its retrograde movement or while the feed is suspended by the proper position of the shield. The feed is now permitted and the upright chisel advances, cutting into the end of the wood, across the grain, and removing the chip, while the horizontal ones cut the wood with the grain. Repeated strokes of the several chisels in the gang cut and clear the mortise to the required depth and length, but as one set of upright chisels work slightly in advance of the other, it becomes necessary to prevent their cut when the length of the mortise they are to cut is obtained. This is done, not by throwing out of gear or suspending the movements of the chisel stock, but by shortening the distance the chisels have previously descended by the movement of their eccentric pin. The rear chisels then coming forward and making their cut, completes the mortise, by squaring the line across the grain.

I am aware that it has been essayed to mortise dovetails by machinery, but heretofore no perfect one has been produced, either in operation or device, as the frequent handling of the material in presenting it to saws and chisels, without more than adverting to the damage done the dovetail by cutting a line at the narrow side thereof have rendered all attempts nearly useless. The specimens of work submitted made by this invention show its superiority over all others.

Having described my improvement in dovetailing machines, what I claim as my invention, and desire to secure by Letters Patent is—

1. The forming of a dovetail, either as a mortise or a tenon at a single operation by angularly placed reciprocating chisels *a a*, in combination with horizontally placed chisels *o o*, arranged substantially as set forth.

2. I claim giving a reciprocating motion to the chisels O O by the snail cam I on shaft H in combination with chisels *a a*, gear *d, e, f*, and pitman rods *h h*, for the purpose of actuating the chisels in unison with each other in the manner described.

3. I claim the arrangement of the angular guides E, E, in combination with the guides E', for the purpose of effecting the under cut or side of the dovetail.

5 4. I claim the arrangement and combination of the angular guides E E, and chisels *a a*, on stocks F, F, with the horizontal chisels *o o*, and guides *m* and snail I on shaft H, for producing the dovetail and

completing the mortise in the manner set 10 forth.

In testimony whereof I have signed my name before two subscribing witnesses.

JOHN J. HALEY.

Witnesses:

JOHN F. CLARK,
L. W. MAXE.