

No. 758,839.

PATENTED MAY 3, 1904.

E. JACKSON.
MACHINE FOR CUTTING DOVETAILS.

APPLICATION FILED NOV. 20, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

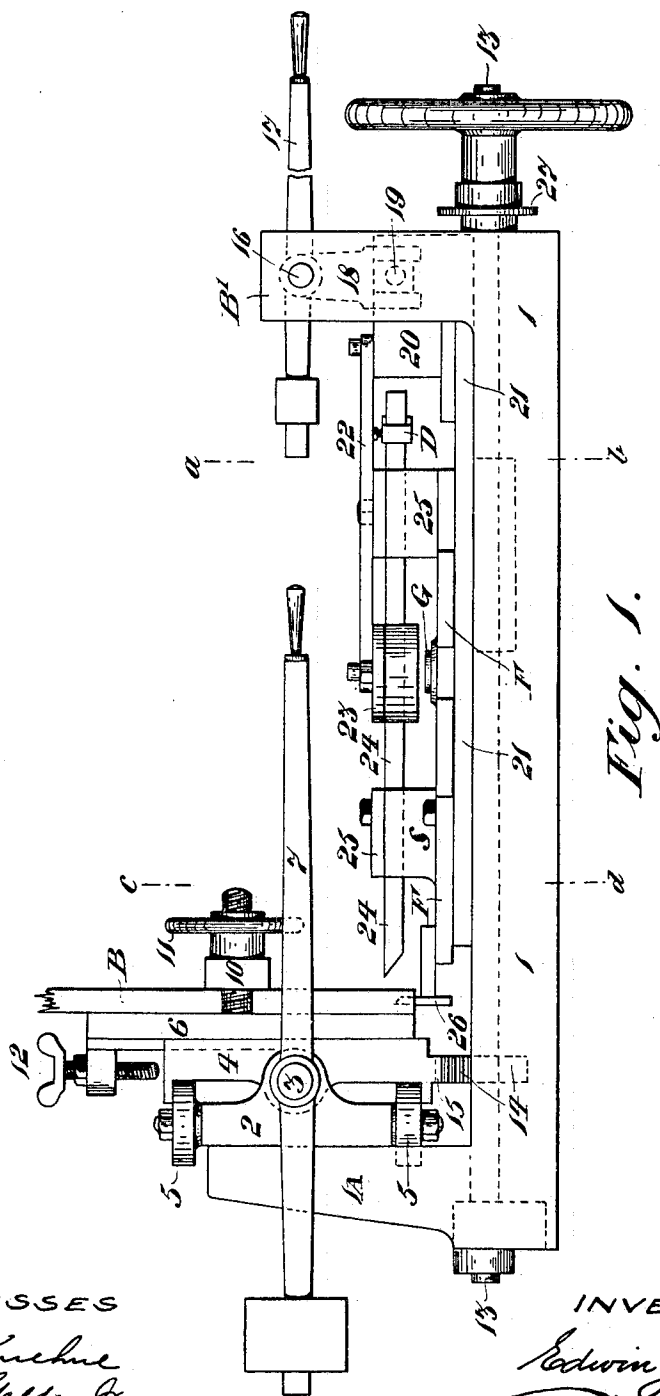


Fig. 1.

WITNESSES

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Wm. M. Golden

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Edwin Jackson

BY

Richard H. Jackson

ATTORNEYS

No. 758,839.

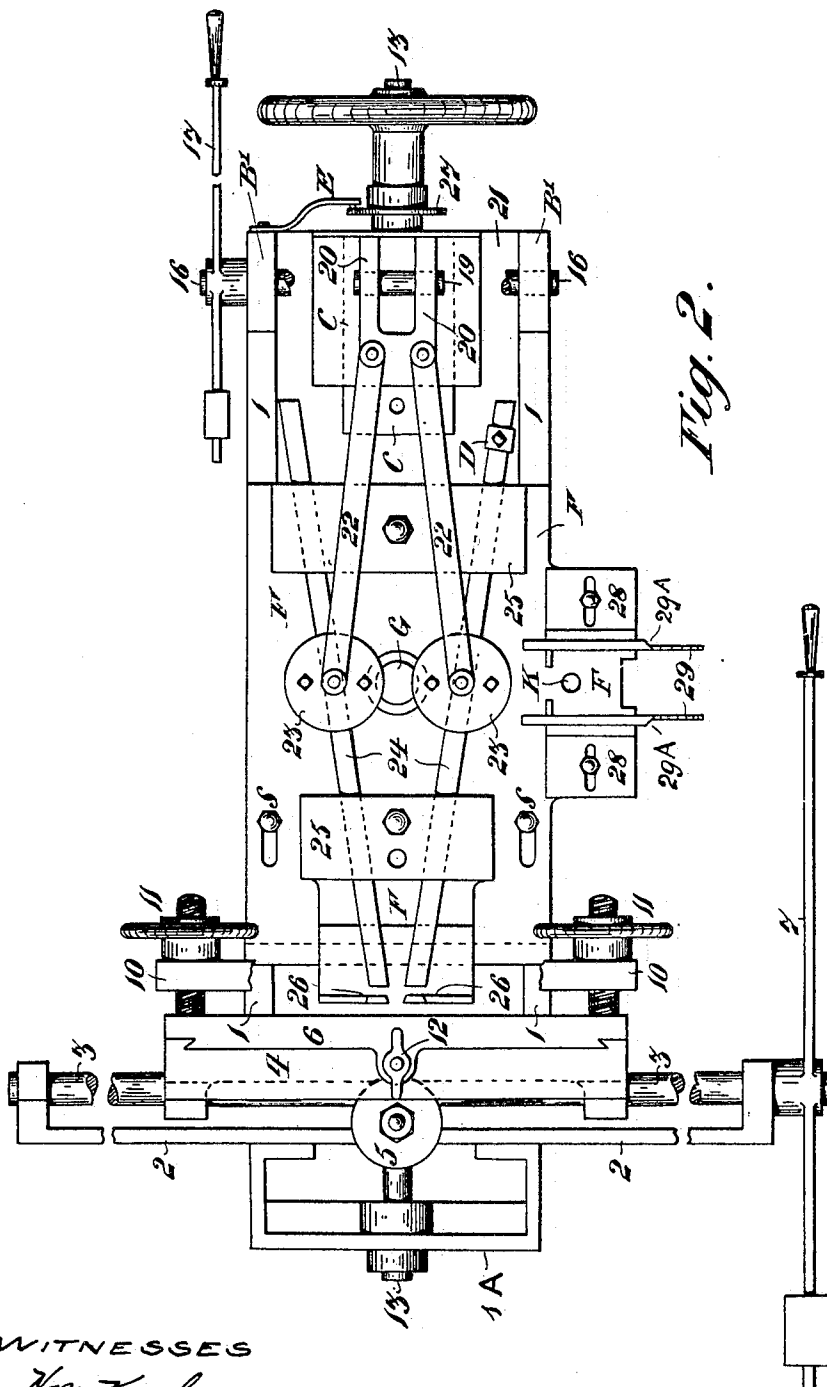
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4 SHEETS—SHEET 2.



WITNESSES

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4 SHEETS—SHEET 3.

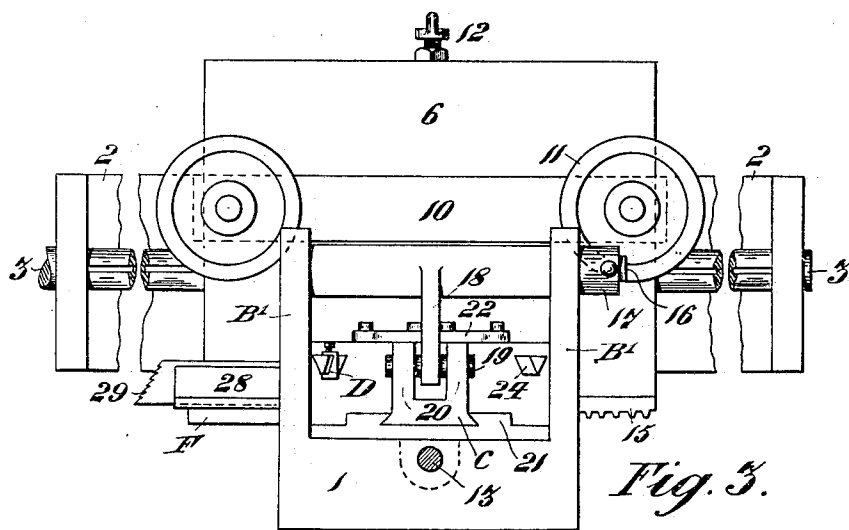


Fig. 3.

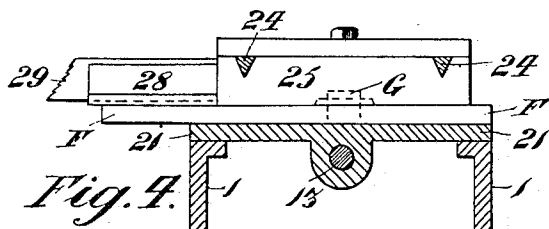


Fig. 4.

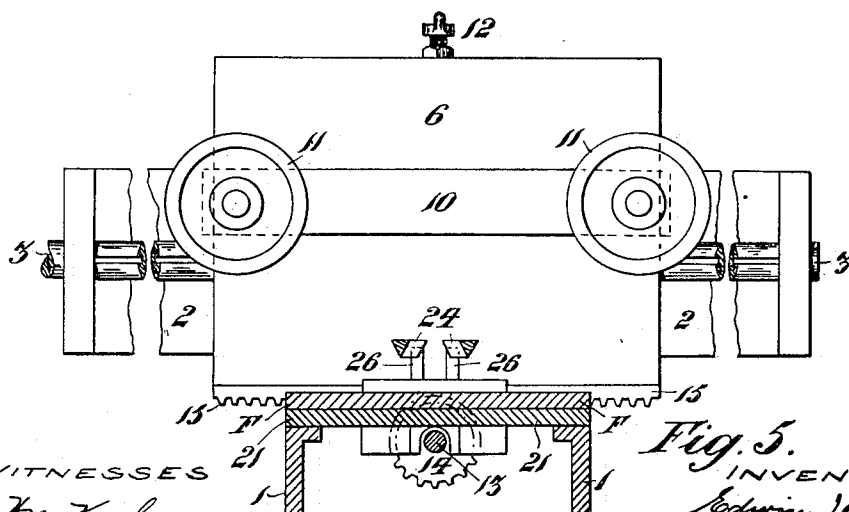


Fig. 5.

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4 SHEETS—SHEET 4.

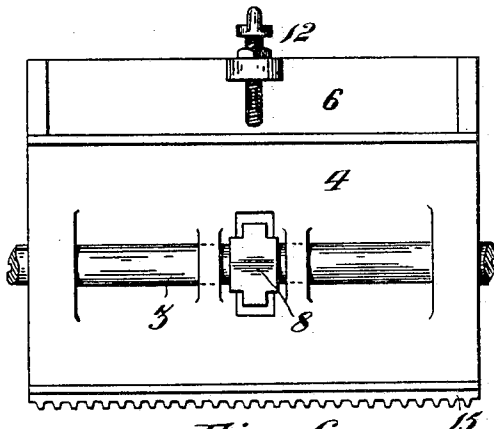


Fig. 6.

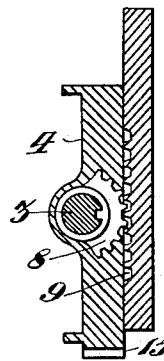


Fig. 7.

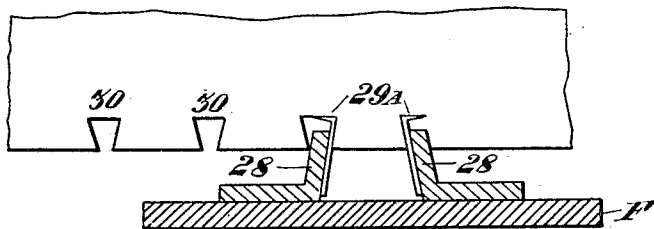


Fig. 8.

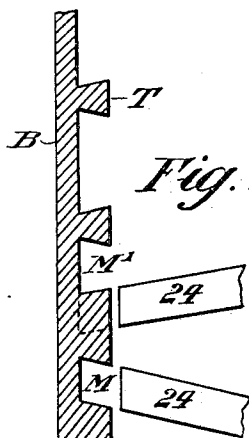


Fig. 10.

WITNESSES

H. M. Kuehne
W. M. Golden Jr.

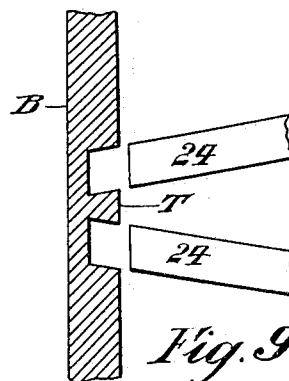


Fig. 9.

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UNITED STATES PATENT OFFICE.

EDWIN JACKSON, OF MANNINGHAM, BRADFORD, ENGLAND, ASSIGNOR
OF ONE-HALF TO WILLIAM HENRY JACKSON, OF MELROSE, ENGLAND.

MACHINE FOR CUTTING DOVETAILS.

SPECIFICATION forming part of Letters Patent No. 758,839, dated May 3, 1904.

Application filed November 20, 1903. Serial No. 182,002. (No model.)

To all whom it may concern:

Be it known that I, EDWIN JACKSON, a subject of the King of Great Britain and Ireland, residing at 81 Oak Lane, Manningham, Bradford, in the county of York, England, have invented certain new and useful Improvements in and Relating to Machines for Cutting Dovetails, (for which I have made application for a patent in Great Britain, No. 13,697, dated June 19, 1903,) of which the following is a specification.

This invention relates to certain improvements in machines for cutting dovetail mortises in the ends of boards such as are used in the construction of drawers, boxes, and the like; and the object is to so arrange the machine that it is particularly adapted for cutting to the required size and angle mortises known as "blind" dovetailed mortise-grooves, but is also applicable for cutting grooves through the entire thickness of the boards and leaving suitable dovetail tenons thereon, also to adapt the machine that corresponding dovetail openings for the reception of the tenons may be cut through the companion piece of timber in such a manner that when the mechanically-cut recesses and openings in the two pieces of wood are put together good and perfect dovetailed joints are formed.

In carrying out my invention reference is made to the accompanying drawings, in which—

Figure 1 represents a side elevation of a dovetail-cutting machine made in accordance with my invention. A pair of cutting-saws are removed from the turret-plate. Fig. 2 is a plan showing the angular direction in which the chisels employed for cutting dovetailed mortise-grooves so as to leave a tenon or locking-piece between each mortise. A forked arm is removed from the drawings and the operating-shaft for same broken away for more clearly showing the parts below. Fig. 3 is an end view with hand-wheel removed for more clearly showing the parts behind. Fig. 4 is a section through line *a b* of bed-plate and movable base-plate with a turret-plate mounted thereon. The back portion of the machine is not shown. Fig. 5 is a section through line

c d of bed-plate and base-plate, showing cutters utilized for clearing in a vertical direction the back surface of blind dovetailed mortise-grooves. Fig. 6 is a back elevation of a horizontal cross-slide, showing how the same is supported on an oscillating shaft. Fig. 7 is a vertical section through cross-slide, showing means by which the front plate of said slide may be moved vertically. Fig. 8 is a section through the turret-plate, drawn to a larger scale, showing the saws for cutting narrow dovetailed openings in the companion boards for the reception of the tenons or locking-pieces; and Figs. 9 and 10 are details hereinafter referred to.

The operative parts of the machine are supported by a bed-plate 1 and are shown to be actuated by hand; but after the construction of the machine is explained it will be readily understood that motive power may be applied for actuating the cutting-tools of the machine.

At one end of the bed-plate 1 is a vertical extension 1^A, to which is bolted a horizontal plate 2, arranged for supporting a grooved shaft 3, upon which is mounted a cross-slide plate 4, held in a vertical position by the back surface coming in contact with antifriction-rollers 5, mounted on pins secured to the fixed horizontal plate 2. The cross-slide plate 4 is adapted to receive a front plate 6, arranged to slide vertically. Such vertical motion may be accomplished by the oscillation of lever 7 and shaft 3, upon which a toothed segment 8 is mounted, provided with a feather-key fitting a horizontally-slotted keyway in shaft, and by the segment gearing with a toothed rack 9, cut in or secured to front plate 6, the latter is vertically operated on the partial rotation of shaft 3, or like well-known means may be employed for the purpose.

To the front plate 6 the boards B to be dovetailed are secured by clamp-bar 10, operated by the threaded hand-wheels 11, as will be clearly understood, and at the top of said plate is a projection provided with a gage-screw 12 for limiting the downward movement of said plate by the end of screw coming in contact with cross-slide 4, to which a horizontal movement is given on the rotation

of shaft 13 and pinion 14, the latter gearing into toothed rack 15, cut on the under side of cross-slide 4.

At the opposite end of bed-plate 1 and at each side of same is a vertical extension B', supporting a shaft 16, to which is attached a lever 17, and on the said shaft is secured a forked arm 18, engaging with a square block free to move in the forked arm and on a pin 19, secured in the vertical lugs 20 of upper slide C, adapted to move in guideways formed in the base-plate 21, arranged to slide on bed-plate 1 when required. The slide C and plate 21 when connected together are both operated by lever 17.

The upper slide C is connected by links 22 to movable clips 23. As clearly shown, these clips grip the respective cutting-bars or chisels 24 of suitable section, guided by ways of corresponding section cut through the blocks 25, attached to turret-plate F, and provided with movable caps, so that, as will be readily understood, on the oscillation of shaft 16 the upper slide C and cutting-tools 24 are caused to reciprocate independently of the base-plate 21, which when the tools 24 are in use is secured to bed-plate 1 in any convenient manner, such as by screws S.

The board B to be dovetail-mortised is clamped to the front plate 6, and by the reciprocation of cutting-tools acting on and piercing the wood at an angle parings are cut from the wood a predetermined distance into same, the distance being controlled by a stop placed in a convenient position, such as by a collar D fixed to one of the tools 24. The reciprocations of tools 24 are continued until the vertical depth of cut is obtained, accomplished by the partial turning of grooved shaft 3 operating the front plate 6 in a downward direction until stopped by gage-screw 12.

It will be obvious that as the cutting-tools 24 advance toward the front plate 6 the two inner or adjacent edges of said tools will move toward each other as they pierce the boards B and leave a wedge-shaped tenon or locking-piece T between the two mortised holes, as shown by enlarged sectional detail plan, Fig. 9, and by the lowering of front plate 6 and board B, clamped thereto, the adjustable vertical cutters 26 will pare or clean-cut the back of blind-mortised detailed recesses. Thus by the combined and separate cutting operations of the cutters 24 and 26 dovetailed mortised recesses are cut into boards in a manner requiring little if any after-dressing by hand-tools.

On the final withdrawal of cutting-tools 24 the front plate 6 is raised and cross-slide 60 moved horizontally a distance so that the edge of the reciprocating tools 24 when advanced to the clamped board B are in the position as shown by sectional detail, Fig. 10, so that on the next series of reciprocations 65 when one of the tools 24 is cutting another

narrow mortised hole M the other tool is undercutting away one side of the unfinished mortise by making the recess M' wider—that is, the portion shown by dotted lines in Fig. 10—thus completing the width of the wedge-sectioned mortised recess M' and tenon or locking-piece T.

By unloosing the screws S and sliding the base-plate 21 toward or away from the front plate 6 the distance between the ends of cutting-tools 24, and thereby the width of the tenons or locking-pieces T, may be varied and the pitch of same regulated by the horizontal movement of the cross-slide 4, controlled by the application of an ordinary and suitable index, such as by a divided perforated disk plate 27, shown secured on hand-wheel boss, and in conjunction therewith a spring-stop E, adapted to engage with perforations in said plate in a well-known manner.

In order that dovetailed openings may be cut through the drawer sides or like companion pieces of timber, links 22 are removed, the turret-plate F liberated and turned a distance of ninety degrees around center supporting-pin G, and again secured to base-plate 21 in a convenient manner, such as by a bolt or pin through hole K in turret-plate F and a corresponding hole through base-plate 21. The upper slide C is also secured to the base-plate 21 by a bolt or the like, so that on the oscillation of shaft 16 both the upper slide C and base-plate 21 are reciprocated.

The brackets 28 are bolted to turret-plate F the requisite distance apart, and to these brackets are secured saw-plates 29, inclining at an angle to the vertical, the blades projecting beyond the brackets and turret-plate and the outer ends cut at an inclination and provided with serrated saw-teeth.

The drawer side or like timber is clamped to the front plate 6 in a manner to leave sufficient space at the bottom between the board to be cut and plate 6 for clearance of the serrated ends of saw-plates 29 when forced through the board on the operation of shaft 16.

On moving the connected upper slide C and base-plate 21 toward the board on front plate 6 the saws 29 are forced through the timber, each saw cutting one side of a dovetailed opening at an angle, as shown by Fig. 8, and on the withdrawal of the saws the cross-slide 4 is moved the necessary distance horizontally and other two cuts made through the timber forming narrow openings 30 of a width and in positions corresponding to the tenons T on the other or companion board to which it is to be dovetail-jointed, the cross-slide plate 4 being horizontally operated for each cutting and the top of each opening 30 cut through by the diagonal sharpened edge 29^A of the respective saw-plates 29.

The machine is shown to be operated by hand; but it will be obvious that on connecting a mechanically-operated reciprocating rod

to the lever 17 the lever and connections will be operated also.

What I claim as my invention is—

1. In a machine of the class described, the combination with a base-plate, a vertical cutter thereon, a work-holder having both vertical and horizontal movement, and converging cutters mounted on said base-plate, of a shaft mounted at the rear end thereof, means for rocking said shaft and links connecting said shaft to said cutters, said work-holder coming in contact with the vertical cutter during its vertical movement, substantially as described.

2. In a machine of the class described, the combination with a base-plate, a vertical cutter adjustably mounted thereon, converging cutters slidably mounted thereon and means for reciprocating said cutters, of a laterally-movable vertically-extending plate secured at one end of said base-plate, a vertically-moving work-holder slidably secured thereto, and means for operating said plates, said work-holder coming in contact with the vertical cutter during its vertical movement, substantially as described.

3. In a machine of the class described, the combination with the base-plate and a vertically-movable work-holder, of a turret-plate rotatably mounted on said base-plate, reciprocating cutters carried by said turret-plate, cutters adjustably secured thereto at an angle to said reciprocating cutters and means for imparting motion to said base-plate, substantially as described.

4. In a machine of the class described, the combination with the vertically-movable work-holder, of a slidable base-plate, reciprocating cutters secured to said plate, said cutters being mounted at an angle to their longitudinal movement, guide-blocks for said cutters, a vertically-extending cutter at the forward end of said plate, angle-cutters adjustably secured to one side of said plate and means for operating said cutters, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

EDWIN JACKSON.

Witnesses:

ALFRED DEAN,
E. A. WELLS.