2 Sheets—Sheet 1.

F. A. GLEASON.

Miter-Dovetailing Machine.

No. 213,329. **Patented Mar. 18, 1879.**

Fig. 4.

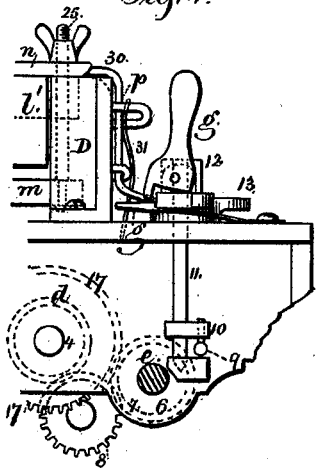


Fig. 2.

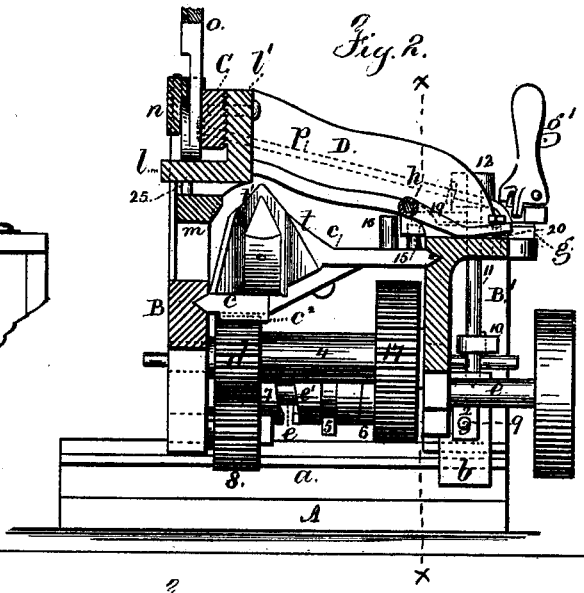


Fig. 7.

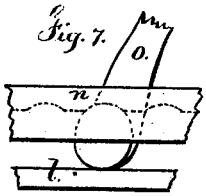


Fig. 5.

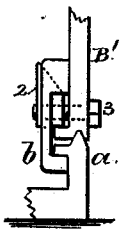


Fig. 1.

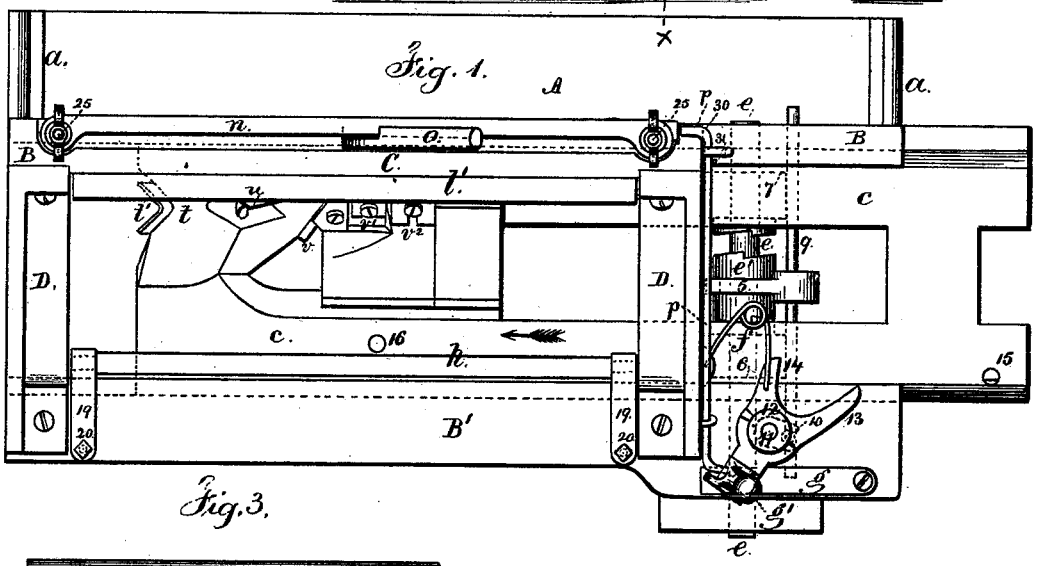


Fig. 3.

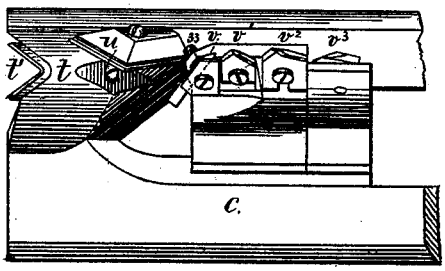
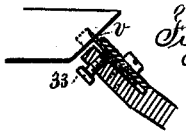


Fig. 6



Witnesses

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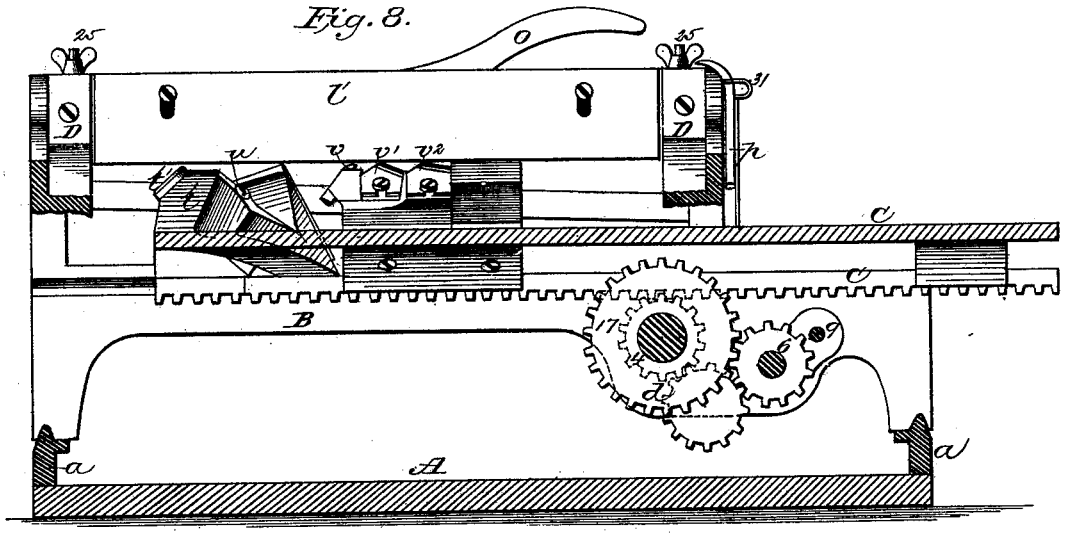
2 Sheets—Sheet 2.

F. A. GLEASON.

Miter-Dovetailing Machine.

No. 213,329. **Patented Mar. 18, 1879.**

Fig. 8.



Witnesses:

Chas. A. Smith
Geo. T. Pinckney

Inventor:

Franklin A. Gleason
per Lemuel W. Serrell
Atty.

UNITED STATES PATENT OFFICE.

FRANKLIN A. GLEASON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MITER-DOVETAILING MACHINES.

Specification forming part of Letters Patent No. **213,329**, dated March 18, 1879; application filed January 2, 1879.

To all whom it may concern:

Be it known that I, FRANKLIN A. GLEASON, of Brooklyn, in the State of New York, have invented an Improvement in Miter-Dovetailing Machines, of which the following is a specification:

In Letters Patent issued to me March 17, 1863, reissued August 30, 1864, No. 1,754, means are shown for cutting dovetailed grooves and ribs in the miter edges of wood-work for boxes, &c.; and in the Patent No. 43,767, also granted to me, devices are shown for cutting the two edges simultaneously.

My present invention being an improvement upon the aforesaid Letters Patent, it is only necessary to point out the especial features of the present invention, as a reference is hereby made to the said Letters Patent for a description of the dovetail-miter and the general construction and operation of the machine.

In the drawings, Figure 1 is a plan of the machine. Fig. 2 is a cross-section of the same. Fig. 3 represents the cutters detached, and Fig. 4 is a detached view of the stopping and starting devices. Figs. 5, 6, and 7 are details; and Fig. 8, a view, partly in section, on line *x x*, Fig. 2.

There are ways or rails *a* upon the bed A, that support the end frames, B B′, and these frames B B′ can be moved upon the rails, so as to determine the distance between the cutters, and consequently the length of the piece of wood that is cut, as in said Patent No. 43,767; and in the drawings, I have only shown one frame and set of cutters and one sliding carriage, the other being simply duplicated.

The device for clamping the machine in place when adjusted consists of the hook *b*, (see Fig. 5,) taking beneath the head of the rail *a*, and a wedge-block, 2, acting between an offset upon the frame B′ and the inclined body of the hook, said block 2 being moved by the screw 3, to clamp or release the parts.

The frames B B′ are made with V-shaped grooves for the edges of the carriage *c* to slide in. This carriage receives the cutters, and is moved endwise by the gear-wheel *d* on the shaft 4, such wheel *d* acting upon rack-teeth, at c^2, on the under side of the carriage *c*.

In my aforesaid patent the grooves in which the carriage slides are horizontal on the top, and at about an angle of forty-five degrees on the under surface.

By experience I have found that the carriage is liable to be forced down by the action of the inclined cutters, and if the bevel is reversed the carriage is liable to be forced upwardly by the action of the rack and pinion by which it is moved endwise. I have therefore made the bevel at the edges of the carriage equal, or nearly so, as shown, and the groove of corresponding shape, so as to insure accuracy and allow freedom of movement.

I remark that where the machine is made double, as in Patent No. 43,767, the part of this shaft 4 which extends into the movable machine is square, and passes through a square hole in the wheel *d;* or the wheel may be set upon a feather, so that the two carriages *c* will be moved back and forth simultaneously.

The driving-shaft *e* rotates constantly in one direction. It has upon it a coupling, *e′*, that can be moved either way by the fork 5, to connect the shaft with the loose pinion 6, that gears to the wheel 17 and revolves the shaft 4, and drives the carriage *c* forward in performing the cutting; or else such coupling may be held central and the carriage remain stationary; or it may be moved the other way into contact with the loose pinion 7, and give motion to the intermediate wheel, 8, and the wheel *d*, and move the carriage back to the point of beginning.

The fork 5 is upon a sliding rod, 9, and the crank 10 on the vertical shaft 11 is employed to give end motion to the rod 9 and shift the coupling.

At the upper end of the shaft 11 is a fixed hub, 12, and a loose fork, 13 14, that has a limited movement before coming into contact with stops on the hub 12 and turning the same. Upon the carriage *c* there are stops 15 and 16.

When the cutting has been performed, the stop 15 has passed beneath 13 and moved 14, so as to shift the coupling and cause the carriage to be run back, and near the end of its movement the stop 16 comes in contact with 13 and shifts the coupling to the middle, and the machine stops.

The expansive spring *f* is made with right-

angle ends, entering vertical holes in a part of the frame and the fork 14, and the position of the parts is such that the stop 15, as the cutting is completed, moves the forks 13 and 14 and the end of the spring *f* sufficiently far for the expansion of the spring to complete the movement and slide the coupling *e'* into contact with the pinion 7, and cause the bed to run back, as aforesaid; but when the stop 16 acts on the fork 13 it carries the spring the other way, and its expansion would complete the movement of the coupling and connect *e'* with 6; but the latch *g* catches the arm upon the hub 12 and arrests the further movement of the machine, and it stops, as aforesaid. After the cut plank has been removed and adjusted in position for another cut, the latch *g* is depressed by the attendant moving a lever, *g'*, on the hub 12, and the spring *f* completes the movement and couples *e'* to the pinion 6, so that the operations are repeated. This latch *g* may also be operated automatically, as hereinafter described.

The plank or wood to be operated upon is passed transversely of the machine upon the roller *h*, that is set in adjustable bearings 19, that have convex lower faces, so that by the screws 20 the roller can be raised or lowered to adapt the same to the varying thickness of the plank.

The frame B and the longitudinal bar C are cast in one, and the arch-pieces D, extending from the sides of the frames B to the tops of the frame B', connect the parts together. In this mode of making the frame of the machine, the V-grooves for the carriage can be planed out with facility, and also the under surface of the bar C, against which the board may be clamped, so that its surface is exactly parallel with the carriage that sustains the cutters.

I have, however, introduced an adjustable inverted bed, *l*, with a vertical flange, *l'*, that is secured to the side of the longitudinal bar C by bolts that pass through slots, so that the inverted bed can be raised and lowered. This allows for the introduction of thicker material, such as drawer-fronts, where the miter is only upon the under or back edges, and does not extend to the surface. In this case the material has to be sawed off to length, instead of being separated by the cutters, as in aforesaid patent.

It is preferable to employ longitudinal grooves and ribs in the surfaces of the bar C and flange *l'*, planed at about an eighth of an inch apart, so that the inverted bed may be varied in its position, and at the same time be exactly parallel with the carriage.

The clamping-bar *m* is suspended by the rods 25 at the ends, which pass through holes in the frame B, and also through the head-bar *n*; and there is also a lever, *o*, with an elliptical cam, between the head-bar *n* and the top of the inverted bed *l*, to apply a clamping force to hold the board up against the under side of the inverted bed, and these parts are similar to those in said Patent No. 43,767, except that in said bar *n* there are cavities or recesses on the under surface, as seen in Fig. 7, in order that the said lever may be changed in its position and made to act above the middle part of the board widthwise, and thereby hold the same firmly, whether of one width or another.

The bolts that connect the clamping-bar *m* with the head-bar *n* are not screwed into the clamping-bar, as in the aforesaid patent; but the heads of said bolts are in the clamping-bar *m*; and there are thumb-nuts above the head-bar *n*, so that the screws last much longer, and can be changed, if they wear, without replacing the bars.

I make the head-bar *n* the means of actuating the shifting motion and starting the machine automatically, and for this purpose employ the small shaft *p*, with an arm at one end resting upon the latch *g*, and an arm, 30, at the other end, adjacent to the head-bar *n*, so that when this bar *n* is raised in clamping the board the latch will be depressed and the shifter liberated. In order to allow this bar *n* to be depressed as the board is liberated, I make the end of such bar an incline to press the shaft *p* back against the spring 31, after which the end of the arm upon *p* springs back over the end of the bar *n*.

The cutters made use of for cutting the ribs and grooves are substantially the same as those in the before-mentioned patents, with the exception that the stock *t* for the V-shaped scoring-knife *t'* is above and at the back of such scoring-knife, which enables me to fasten and support the same more firmly than it could be when the V-knife was upon the stock. It also enables me to bolt the inclined finishing and separating cutter *u* upon the surface of the stock close to the V-shaped scoring-cutter, thereby making the parts more compact.

The first scoring-knife, *v*, that cuts the wood at one side of the groove, is provided with a screw, 33, by which its position can be varied to cut the straight side of the groove, as seen in Fig. 6. The scoring-cutter *v* and the cutter v^1 remove the core and form a groove in the wood, and the next cutter, v^2, finishes the lower dovetail angle, and the last cutter, v^3, finishes the upper dovetail angle. The object of using the screw 33 is to vary the width of the groove first cut, so that it may be proportioned to the finished groove and give the required space in which the dovetail-cutters will act in finishing the groove.

It is to be understood that the cutters v^2 and v^3 are changed to cut wide or narrow dovetailed grooves according to the thickness of the material, and that by adjusting the cutter *v* by the screw 33 the first groove can be of a proper width without requiring a change of the cutter itself.

I claim as my invention—

1. The combination, with the movable mi-

ter-dovetail machine, of supporting-rails *a*, hooks *b*, wedge 2, and bolt 3, substantially as set forth.

2. In combination with the cutter-carriage *c*, the driving-shaft *e*, sliding coupling *e'*, coupling-gears 6 and 7, gear-wheels *d*, 8, and 17, and shifting devices 5, 9, 10, 11, 13, 14, 15, and 16, substantially as set forth.

3. The combination, with the miter-cutters and their sliding carriage, of the shifting mechanism for changing the direction of motion of the carriage, and the latch *g* for stopping the movement, substantially as set forth.

4. The combination, with the miter-dovetailing cutters and their carriage, of the driving, shifting, and stopping mechanism and the automatic starting mechanism, consisting of the shaft *p* and arm 30, operated by the clamping mechanism, substantially as set forth.

5. In the miter-dovetailing machine, the clamping-bar *m*, head-bar *n*, and lever *o*, in combination with the bolts 25, having thumb-nuts on their upper end, substantially as set forth.

6. In combination with the miter-dovetailing cutters and their carriage, the inverted bed *l*, vertical flange *l'*, and longitudinal bar C, to which the flange *l'* is bolted, substantially as set forth.

7. In a miter-dovetailing machine, the V-shaped scoring-cutter secured beneath the stock *t*, (that is, upon the cutter-carriage *c*,) and the separating-cutter *u*, that is bolted upon the outside of the same stock *t*, substantially as set forth.

8. In a miter-dovetailing machine, the scoring-cutter *v*, provided with the adjusting-screw 33, in combination with the cutter v^1 and dovetail-cutters v^2 and v^3, substantially as set forth.

Signed by me this 20th day of December, A. D. 1878.

FRANKLIN A. GLEASON.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.