No. 759,023. PATENTED MAY 3, 1904.

J. B. SAUNDERS, Jr.

MITERING AND JOINING MACHINE.

APPLICATION FILED JULY 1, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

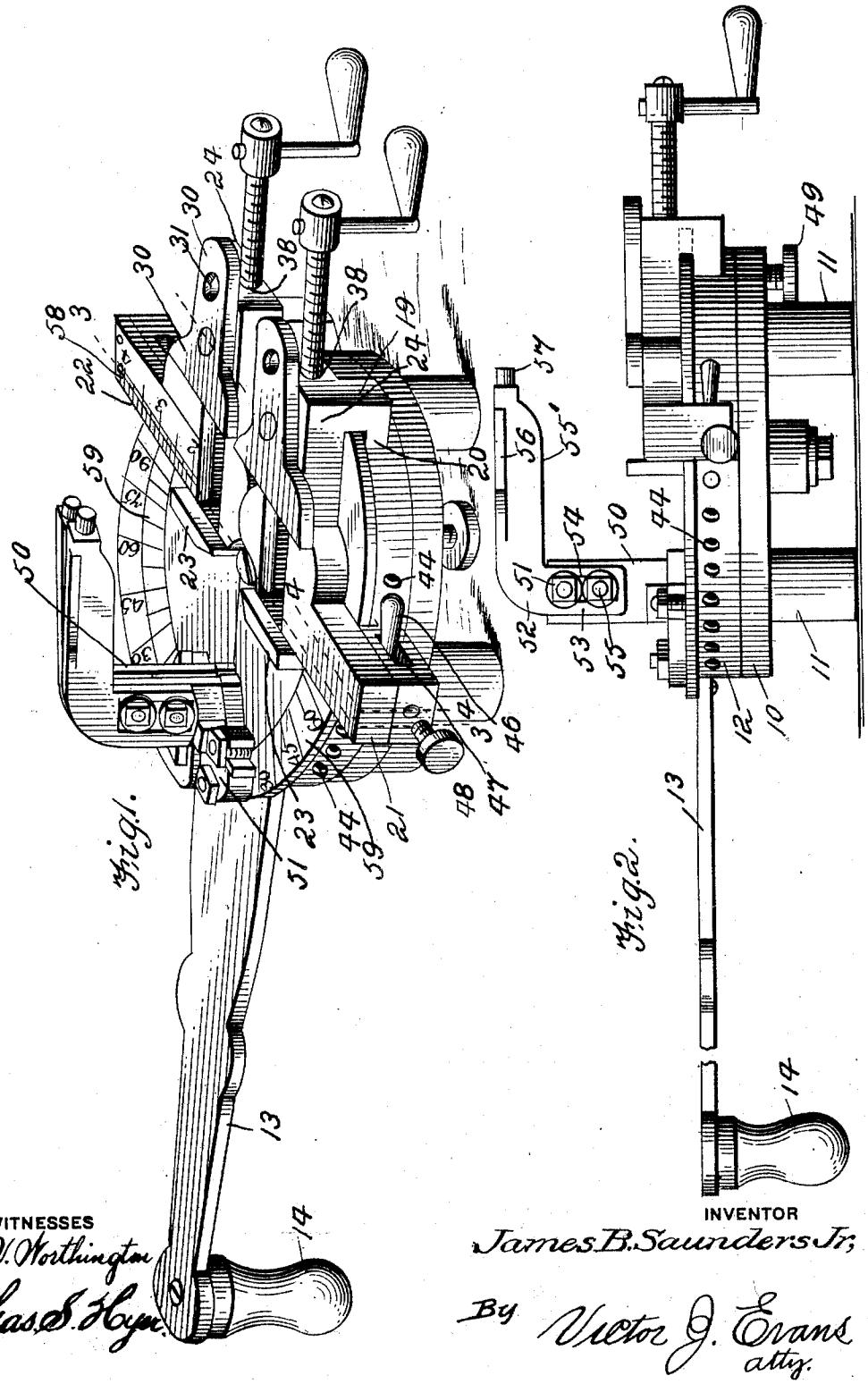


Fig. 1.

Fig. 2.

WITNESSES

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

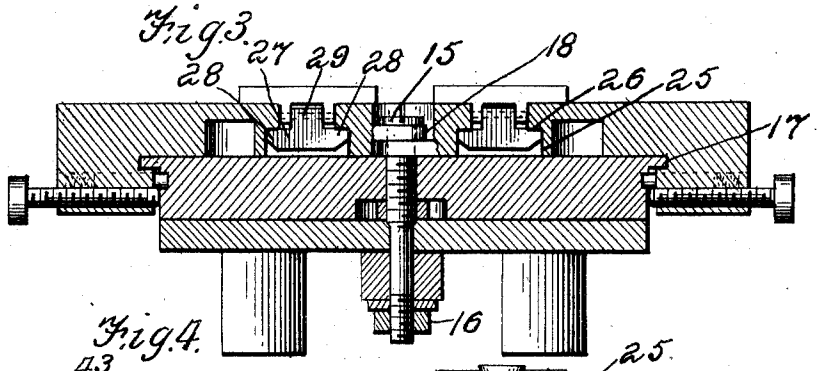


Fig. 4.

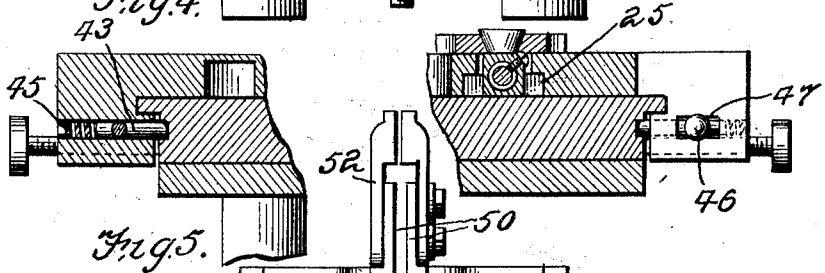


Fig. 5.

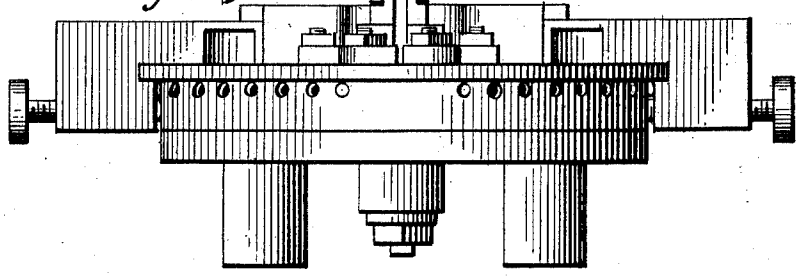


Fig. 6.

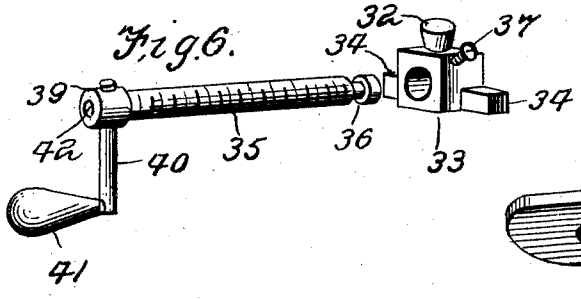
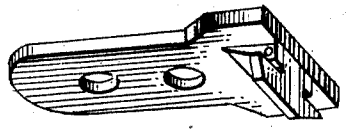


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES B. SAUNDERS, JR., OF ANN ARBOR, MICHIGAN.

MITERING AND JOINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 759,023, dated May 3, 1904.

Application filed July 1, 1903. Serial No. 163,936. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. SAUNDERS, Jr., a citizen of the United States, residing at Ann Arbor, in the county of Washtenaw and State of Michigan, have invented new and useful Improvements in Mitering and Joining Machines, of which the following is a specification.

This invention relates to mitering and joining machines, the object in view being to provide a simple, reliable, and easily-operated machine for the use of picture-framers, carpenters, and artisans generally which will enable molding or other strips to be sawed off at any desired angle and in suitable lengths and joined while clamped in the machine either by gluing, cementing, nailing, screwing, or doweling, as may be preferred.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a mitering and joining machine constructed in accordance with the present invention. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-section taken diametrically of the machine in line with the center screw on the line 3 3 of Fig. 1. Fig. 4 is a cross-section taken on the line 4 4 of Fig. 1. Fig. 5 is a front elevation of the machine. Fig. 6 is a detail perspective view of the clamp-screw and the sliding head. Fig. 7 is a detail perspective view of one of the sliding jaws of the vise.

Like reference-numerals designate corresponding parts in all figures of the drawings.

The machine contemplated in this invention comprises, essentially, a circular base 10, upheld at a suitable elevation above the table, work-bench, or other suitable support by means of supporting-legs 11. Resting directly upon the base 10 is a revoluble table 12, provided at the rear with a radially-projecting arm 13, having a pendent operating-handle 14. The table 12 and base 10 are connected by a center screw 15, which passes through both the table and base, and is held at the lower end by means of a nut 16 or its equivalent. The table 12 is provided along its upper edge with a circumferential flange 17, which serves as an anchor for the vises hereinafter described, which are mounted movably upon the upper surface of the table. Each vise is substantially L-shaped in plan and is provided at the elbow with a projecting lug or knuckle 18, the lugs or knuckles 18 of both vises receiving the center screw 15, which screw acts as a pivot about which the vises turn. Both arms of each vise are provided with pendent projections 19, having at their lower portions lips 20, which project inward beneath the flange 17, each vise being thus held at three points—namely, the extremities of the arms and the elbow at the center of the table. The arms 21 of each vise have their outer surfaces 22 exactly in line with or radial to the axis of the center screw 15, and projecting upward in line with the surface 22 on each vise is a fixed or stationary jaw 23, against which the work rests. The other arm 24 of each vise is provided with a longitudinal groove 25, which is undercut, as shown at 26, to form shoulders which are engaged by a lip or keeper 27, having oppositely-projecting wings 28, which work beneath the shoulders 26, the lip as a whole being pivotally connected by an annular joint 29 with a sliding jaw 30, which moves lengthwise of and rests upon an arm 24 of the vise, being movable toward and away from the fixed jaw 23 for the purpose of clamping and releasing the work. The jaw 30 is provided with one or more beveled openings 31, in which is received a correspondingly beveled or tapered stud 32, extending upward from the sliding head 33, which works back and forth in the groove 25, said head being provided with laterally-projecting lugs 34, which work beneath the shoulders 26 of the groove. Associated with each sliding head 33 is a clamp-screw 35, provided at its inner end with an annular groove 36, which receives the inner end of a key or screw 37, carried by the sliding head 33, thus providing a swiveled connection between the clamp-screw and the sliding head. The screw 35 is threaded through an opening 38 in the outer extremity of the arm 24 and is provided at its outer end

with an enlargement 39, having a diametrical hole for the reception of the shank 40 of a crank-handle 41, the shank 40 being secured in said opening by means of a binding-screw 42, which enables the handle and shank to be removed, so as not to interfere with the operation of the machine after the work is clamped in the vise.

The arm 21 of each vise is mortised out to receive a sliding lock-bolt 43, the inner end of which is adapted to be engaged in any one of a series of sockets 44 in the periphery of the revoluble table 12, said bolt being normally urged inward by means of a spring 45, which bears against the outer end of the bolt, as shown in Fig. 4. Extending laterally from the bolt 43 is an operating-handle 46, which works in a slot 47 in the side of the arm, thus enabling the bolt to be withdrawn in order to set or adjust the vise. Each arm 21 is also provided with a set-screw 48, which passes through the end of the arm and is adapted to bind against the periphery of the table to hold the vise properly adjusted. 49 represents another screw which passes upward through the base 10 and engages the lower side of the table 12, so as to fasten said table and prevent the same from turning accidentally.

At the rear end of the table are arranged parallel saw-guides 50, having base-flanges 51, which are bolted or otherwise secured to the table 12, as shown. Connected with the saw-guides 50 are saw-carriers 52, each of which is L-shaped, as best shown in Figs. 1 and 2, the vertical arms 53 thereof being slotted, as shown at 54, to receive a pair of clamping-bolts 55, by means of which the saw-carriers are made adjustable up and down to suit saws of different widths. The horizontally-projecting arms 55′ of the saw-guides are provided along their upper edges with laterally-projecting flanges 56, upon which the back of the saw rides, and the said arms 55′ are provided at their extremities with rubber brakes 57, which protect the saw-guide from accident in case of the saw slipping or being carried too far to the rear, said brakes serving to cushion the blow of the saw and obviating the necessity of resetting the guides and saw-carriers.

In operation the machine is fastened to a work-bench by passing the screws or other fasteners up through the bench into the supporting-legs 11. The vises are set at the desired angle and tightened by the means described. The saw is placed in the guides with the point resting on the end of the carrier. The pieces of molding or strips are laid parallel with the bench on which the machine is fastened and are kept in that position during the sawing operation. The machine is swung to the left, the molding or strip clamped firmly in the left vise, and the molding or strip cut in two by the saw. The molding or strip is then unclamped, the machine swung to the right, the molding or strip measured to the proper length, then clamped at the proper point in the right vise and sawed in two. To join two pieces, the machine is locked stationary and the two pieces of molding firmly clamped in the vise after having been glued at the joint. In case the pieces of molding are to be fastened by nails or other mechanical means they are first clamped in the vises and then nailed or otherwise fastened. By means of the vises the meeting surfaces of the pieces of molding may be firmly pressed together, so as to force the glue into the pores of the wood.

In order to assist in measuring the lengths of molding, one of the arms 21 may be provided with graduations, as shown at 58, arranged in feet, inches, and fractions thereof. The upper surface of the table 12 near its outer edge is also by preference provided with graduations, as shown at 59, representing the principal angles from fifteen to ninety degrees, corresponding with the location of the sockets 44, which receive the lock-bolts 43, carried by the vises. By the means described the vises may be set accurately at any desired angle without measuring or guessing. The machine will cut any miter or angle from fifteen to ninety degrees and will assist in joining said pieces after being cut.

The machine is mounted upon a low table which is perfectly level, thus allowing free and easy action and preventing any wabbling. The machine may be swung from right to left, or vice versa, thus allowing the molding or strips to lie parallel with the bench at all times, the saw being operated at right angles to the work-bench. In removing the saw from the machine no part of the machine is moved with it. The saw-guides are constructed in such a manner as to allow them to be adjusted for thick or thin saws, and the crank-handles are made removable, so that they may be gotten out of the way whenever necessary.

Having thus described the invention, I claim as new—

1. The combination with a supporting-base, of a revoluble table mounted thereon, saw-guides extending upward from said table, and vises pivotally connected to the center of the table in line with the saw-guides, substantially as described.

2. The combination with a supporting-base, of a revoluble table pivoted centrally thereof, saw-guides extending upward from said table at or near one edge thereof, vises pivotally mounted in line with the axis of movement of the table, and means for clamping said vises to the table and adjusting them thereon, substantially as described.

3. The combination with a supporting-base, of a revoluble table pivoted centrally thereof, a radially-projecting arm for turning said table, saw-guides extending upward from the table adjacent to the edge thereof, and a pair of vises mounted on the table and pivotally

connected therewith in line with the axis of movement of the table, each vise comprising a fixed and a movable jaw, means for operating the movable jaw, and means for clamping the vise to the table and admitting of the adjustment of the vise relatively to the table.

4. The combination with a circular supporting-base, of a circular table centrally pivoted on the base, an operating-arm for turning said table, saw-guides extending upward from the table, vises pivoted on the table in line with the axis of movement of the same and each comprising a fixed and movable jaw, means for operating the movable jaw, and a lock-bolt for adjusting and fastening each vise relatively to the table.

5. The combination with a circular supporting-base, of a circular table centrally pivoted thereon, an operating-handle for turning said table, saw-guides extending upward from the table, vises pivoted on the table in line with the axis of movement of the same and each comprising right-angularly-disposed arms, a flange on the table engaging and holding said arms, and a lock-bolt carried by each vise for adjusting and fastening the vise relatively to the table.

6. The combination with a circular supporting-base, of a circular table centrally pivoted thereon, an operating-arm for turning said table, vises pivoted upon said table in line with the axis of movement of the latter, means for adjusting and fastening the vises relatively to the table, saw-guides extending upward from the table at or near one edge thereof, and L-shaped saw-carriers adjustable vertically on the saw-guides and provided with brakes at their extremities, substantially as and for the purpose set forth.

7. The combination with a circular supporting-base, a circular table centrally pivoted thereon, an operating-arm for turning said table, saw-guides extending upward from the table at or near one edge thereof, vises pivoted upon the table in line with the axis of movement of the table, sockets in the periphery of the table, and lock-bolts carried by the vises and adapted to engage said sockets, substantially as and for the purpose described.

8. The combination with a circular supporting-base, of a circular table centrally pivoted thereon, an operating-arm for turning said table, a set-screw connected with the base for fastening said table against rotation, vises pivoted on the table in line with the axis of movement of the latter, and means for adjusting and fastening said vises relatively to the table, substantially as described.

9. The combination with a circular supporting-base of a circular table centrally pivoted thereon, an operating-arm for turning said table, saw-guides extending upward from the table, vises pivoted on the table in line with the axis of movement of the latter, lock-bolts for adjusting and holding the vises relatively to the table, and set-screws carried by the vises and adapted to be brought to bear against the periphery of the table for fastening the vises thereto, substantially as described.

10. The combination with a circular supporting-base, of a circular table centrally pivoted thereon, an operating-arm for turning said table, saw-guides extending upward from the table, and a pair of vises pivoted on the table in line with the axis of movement of the latter, each vise comprising a fixed jaw and a movable jaw, and also having an undercut groove, a keeper connected with the sliding jaw and moving in said groove, a sliding head also connected with the movable jaw, a clamp-screw having a threaded connection with the vise, and a swiveled connection with the sliding head, and a crank-handle connected with said screw, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES B. SAUNDERS, JR.

Witnesses:

WM. K. CHILDS,

GEORGE S. VANDAWARKER.