

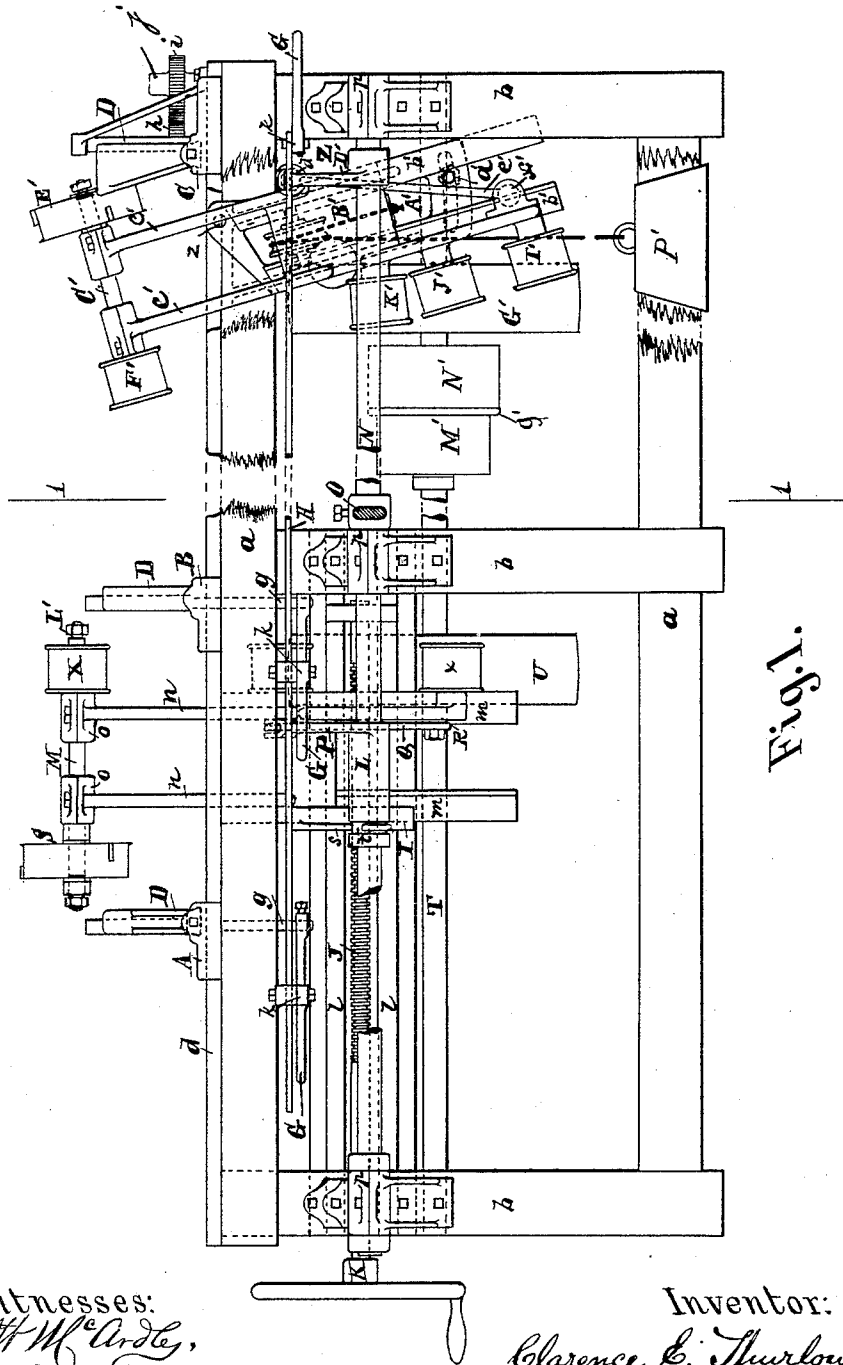
(No Model.)

3 Sheets—Sheet 1.

C. E. THURLOW.
GROOVING MACHINE.

No. 460,803.

Patented Oct. 6, 1891.



Witnesses:
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J. F. Bryant.

Inventor:
Clarence E. Shurlow,
per Edw. Summer, atty.

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3 Sheets—Sheet 2.

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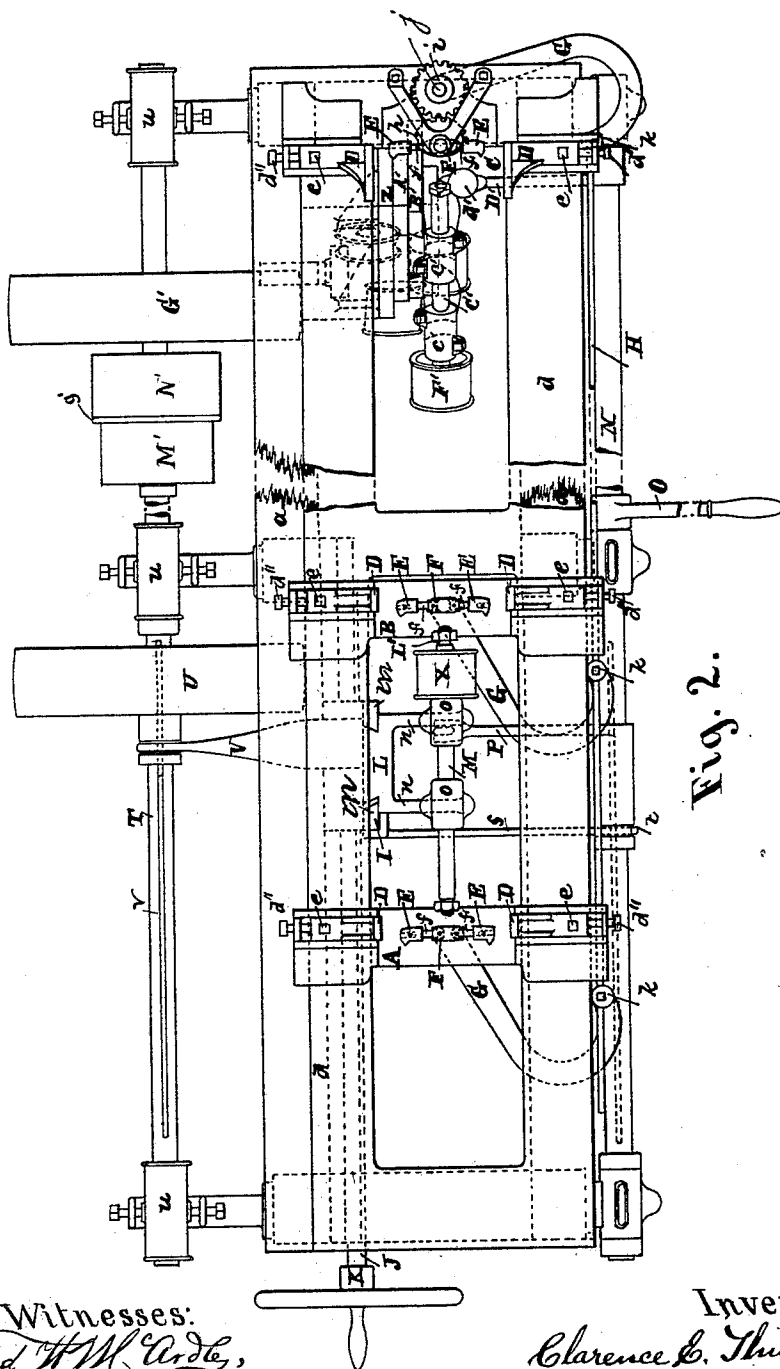


Fig. 2.

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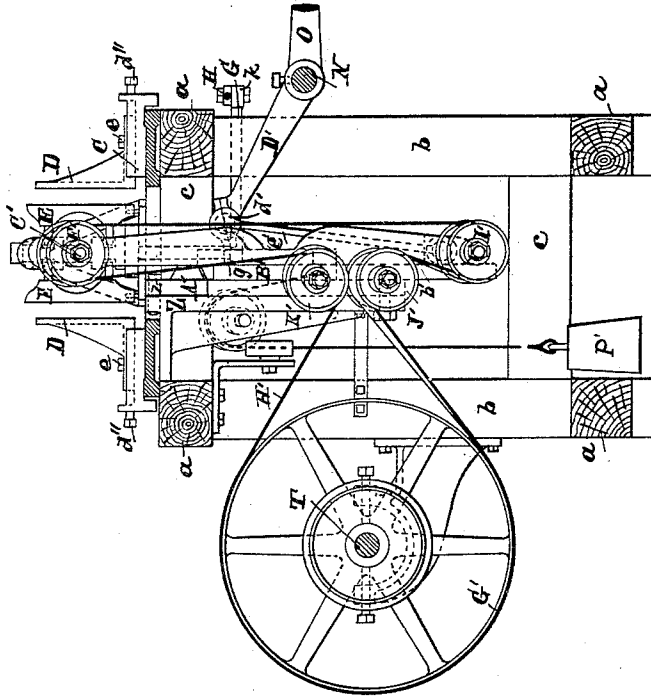


Fig. 4.

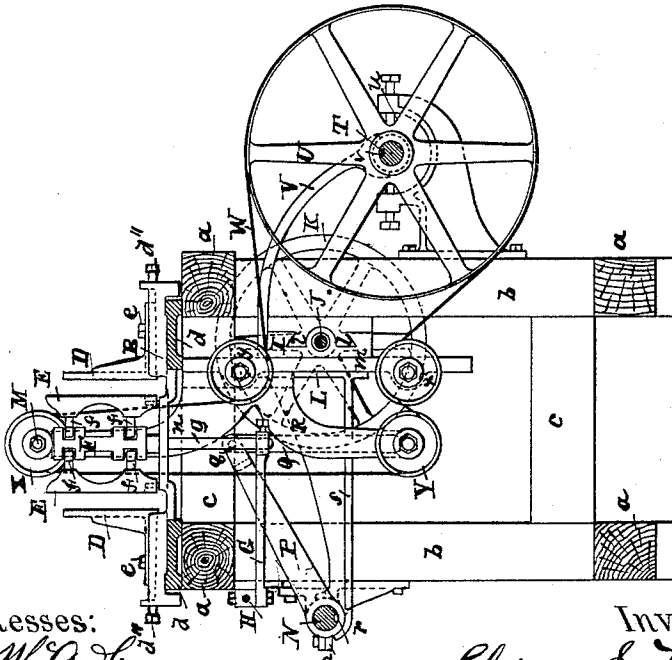


Fig. 3.

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UNITED STATES PATENT OFFICE.

CLARENCE E. THURLOW, OF LEWISTON, MAINE.

GROOVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,803, dated October 6, 1891.

Application filed January 26, 1891. Serial No. 379,162. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. THURLOW, a citizen of the United States, residing at Lewiston, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Grooving-Machines, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is a wood-working machine embodying such means for ready adjustment and such mechanism for movement of the cutters in the required direction that by it grooves may be rapidly cut in a strip at any desirable angle, the particular and immediate use for the machine being to cut the necessary grooves in the side pieces for window-frames.

The invention consists in the devices and combination of devices hereinafter set forth, and specifically pointed out in the claims.

In the drawings, three sheets, Figure 1 is a front elevation; and Fig. 2, a plan of so much, parts being broken away, of a grooving-machine embodying my invention as is sufficient for illustration of the same. Fig. 3 is a vertical section showing parts to the left of line 1 1 in Fig. 1, and Fig. 4 is a vertical section showing parts to the right of said line.

On the frame-work of the machine, formed of the longitudinal pieces *a*, uprights *b*, and the transverse pieces *c*, is the plate having the longitudinal parts *d*. On this plate are two cross-pieces A B, on each of which and at the right-hand ends of the parts *d* is a pair of angle-irons or brackets D. These cross-pieces may be adjusted on the plates, and the angle-irons may be adjusted and fixed on the cross-pieces by means of screws *e* and screws *d''*.

Between each pair of angle-irons is a pair of vertical jaws E, there being a jaw opposite each angle-iron to co-operate therewith as a clamp. Each of these jaws is loosely held or guided by a pin at the lower end, as shown, and hinged to an upright or swivel F by means of two links *f*. Each of these swivels is pivoted by means of a vertical pivot and rod *g*, fixed thereto, which extends through and moves in a cross-piece. Each of the two rods *g* (shown on the left part of the machine) is fixed at the lower end to the inner end of

a lever G. To the swivel F, on the right hand, is fixed a segment of a gear *h*, which engages with a gear *i*, which is on the upper end of a pivot or shaft *j*, the lower end of which is fastened to a lever G. Each of these levers G is pivoted at the outer end *k* to a rod H, which may have an endwise movement.

To slide on horizontal ways *l* is a saddle I, movable on said ways by means of a horizontal screw J, having a hand-wheel K, which may revolve in bearings, as shown. On vertical ways *m* on said saddle may slide a carriage L, which supports by means of standards *n* and suitable bearings *o* a shaft M.

A shaft N at the front of the machine and in bearings *p* may be oscillated by means of a hand-lever O.

On the shaft N is fixed an arm P, which is pivoted at its inner end to a connecting-rod Q at *q*, the lower end of this connecting-rod being pivoted to an arm R, fixed to the carriage L. The arm P is caused to oscillate in a vertical plane and is caused to move with the shaft N by means of a spline *r*. The arm P will move in a horizontal direction with the carriage L and saddle I, owing to an arm *s*, fixed to said saddle, and which extends into a groove *t* in a hub of arm P.

On the shaft M is fixed a cutter S. (Shown only in Fig. 1.)

At the rear of the machine is a shaft T, which revolves in bearings *u* and is driven as required. On this shaft, to revolve therewith, is a pulley U. This pulley is movable lengthwise on the shaft, there being a spline *v*. An arm V, fixed to the saddle I, causes this pulley to move horizontally with this saddle and carriage thereon.

A belt W extends around the pulley U, a pulley X on the cutter-shaft, two pulleys *x* and *y* on studs fixed to the saddle I, and a pulley Y, fixed to the arm R, and hence to the carriage L. Hence the cutter S may be revolved by means of the pulley U, whatever may be the position of the saddle or carriage thereon—that is, whatever may be the position of the cutter.

Pivoted at *z* to an apron Z, fixed to the frame of the machine, is a plate A'. The apron has a curved slot, through which extends a screw *a'*, which screws into the plate

A'. Thus the plate may be swung as required on the pivot z , and fixed rigidly in position by the screw a' .

On ways b' , fixed to the plate A', slides a carriage B', which supports a shaft C' by means of standards c' .

On the shaft N is fixed an arm D', which is pivoted at d' to a connecting-rod e' , which is also pivoted at f' to an arm on the carriage B', the connections at d' and f' being universal joints. Thus the carriage B' may be moved along the ways b' , according as the shaft N is turned in its bearings.

On the shaft C' is fixed a cutter E' (shown only in Fig. 1) and a pulley F'.

On the shaft T is a pulley G', about which is a belt H', which extends around the pulley F', a pulley I' on a stud fixed to the carriage B', and two pulleys J' and K' on studs fixed to the pivoted plate A'.

On the shaft T are two pulleys, one M' being loose on, while the other N' is fixed on the shaft. The loose pulley is somewhat smaller in diameter than the fixed pulley, with the exception of a narrow part thereof or flange g' , which is of the same diameter as the fixed pulley. These pulleys are to receive the driving-belt, which will cause operation of the cutters, as above set forth, but which will simply cause the rotation of the pulley M' when thereon. Owing to the smaller diameter of the latter, there will arise the advantage of less strain on the belt when thereon, while the flange g' will render the passage of the belt from pulley M' to pulley N' easy.

The angle-irons D and jaws E being located as desired, a strip of wood or side piece for a window-frame may be placed so as to set up edgewise between the angle-irons D and the opposite jaws E at the front of the machine and another strip or side piece between the angle-irons D and the opposite jaws E at the rear of the machine. These strips will then be clamped upon an endwise movement of the rod H, the levers G and the swivels F being thus swung, and therefore the jaws E caused to approach the angle-irons and pinch the strips between. The saddle I and vertical ways m , and hence the carriage L, having been moved into the required position by means of the screw J, on the upward movement of the carriage L by means of the hand-lever O, shaft N, arm P, and connecting-rod Q the cutter S, being revolved by means above set forth, will cut the required groove in each strip or side piece at this part thereof. The plate A' having been swung on the pivot z and set as required on the apron Z, then upon swinging the hand-lever O and shaft N, as above stated, the carriage B' will be moved along the ways b' by means of the arms D' and connecting-rod e' , and the cutter E' will cut a groove in such strip or side piece at this part thereof. Of the grooves in each side piece of a window-frame the one which is made by the cutter S is intended to be at right angles with the longitudinal edges of

the strip, which would be the case if these edges be placed horizontally in the machine, the ways m being vertical, while the groove made by the cutter E' will be inclined, as required.

Of course the cutters at S or E' may be of any desired form, or more than one cutter may be fixed on either of the shafts M and C', and there may be more of these shafts, the carriages and guides therefor being duplicated, as required, so that any number of grooves may be cut at any desired angle.

I have shown at L' means for fastening on the shaft a cutter or a circular saw, the latter being desirable for a certain class of work.

I claim as my invention—

1. In a grooving-machine, the combination of a vertical apron fixed to the machine, a plate pivoted thereto and adapted to be secured in position thereon, ways fixed to said plate, and a carriage supporting a shaft for a rotary cutter to move on said ways, substantially as set forth.

2. In a grooving-machine, the combination of a plate pivoted to the machine, ways fixed to said plate, a carriage supporting a shaft for a rotary cutter to move on said ways, a hand-lever, shaft, and arm fixed on the same, and a connecting-rod pivoted to said carriage and said arm, substantially as set forth.

3. In combination with a shaft and a hand-lever for rocking the same, two sets of ways, one set being fixed in a vertical position and the other set adjustable for any inclined position, a carriage for each set of ways supporting a shaft for a rotary cutter, and an arm and connecting-rod by which each of said carriages is moved on its ways on the oscillation of said hand-lever, substantially as specified.

4. In a grooving-machine and in combination with two angle-irons or brackets opposite to each other, a vertical swivel and means for swinging the same between said angle-irons or brackets and having linked thereto two jaws, whereby two clamps are formed, substantially as described.

5. In combination with two angle-irons or brackets, a swivel and jaws linked to the same between the angle-irons or brackets, a lever fixed to the shaft or pivot of the swivel, and a sliding hand-rod to which said lever is pivoted, substantially as described.

6. In a grooving-machine and in combination with two rotary cutters, pulleys and belts for revolving said cutters, a carriage for each of said cutters which moves on ways which are adjustable, one at least of said carriages being pivotally adjustable, a rock-shaft and hand-lever therefor, arms fixed on said shaft, and connecting-rods between said arms and said carriages, whereby said cutters while rotating may be simultaneously moved to cut grooves at different angles, substantially as set forth.

7. In combination with two rotary cutters, carriages and ways therefor, rock-shaft and

hand-lever, and connecting devices between said rock-shaft and carriages, clamps formed of two or more sets of angle-irons or brackets, and swivels having jaws linked thereto, there being two jaws for each set of angle-irons or brackets, whereby two strips may be held to be simultaneously operated on by said cutters, substantially as specified.

8. In a grooving-machine provided with longitudinal plates, two or more sets of adjustable clamping angle-irons or brackets, a swivel between the same, and two jaws linked to said swivel, longitudinal ways on which is a saddle, a screw for moving said saddle, vertically-movable carriage on said saddle, a rotary cutter mounted on said carriage, pulleys for revolving said cutter, and a hand-lever and rock-shaft connected with said carriage by which the same is moved on its ways, substantially as described.

9. In a grooving-machine, the combination of clamps adjustable thereon, each clamp adapted to hold two strips to be operated on,

two rotary cutters, carriages for supporting the shafts of said cutters, and adjustable ways for said carriages, the ways for at least one of said carriages being pivotally adjustable, whereby the cutters pass between the strips to operate upon both at the same time and cut grooves at any desired angle, substantially as set forth.

10. In a grooving-machine, the combination of two clamps adapted to hold two strips or sides of window-frames vertically, leaving a space between the same, a rotary cutter, a carriage supporting the shaft of said cutter, and ways for said carriage adjustable at any inclination and located with reference to said clamps so that the cutter will pass between the strips to operate on both simultaneously, substantially as set forth.

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