(No Model.) 2 Sheets—Sheet 1.

M. P. BROWN.

COMBINED MORTISER, GROOVER, RABBETER, AND BORER.

No. 458,613. Patented Sept. 1, 1891.

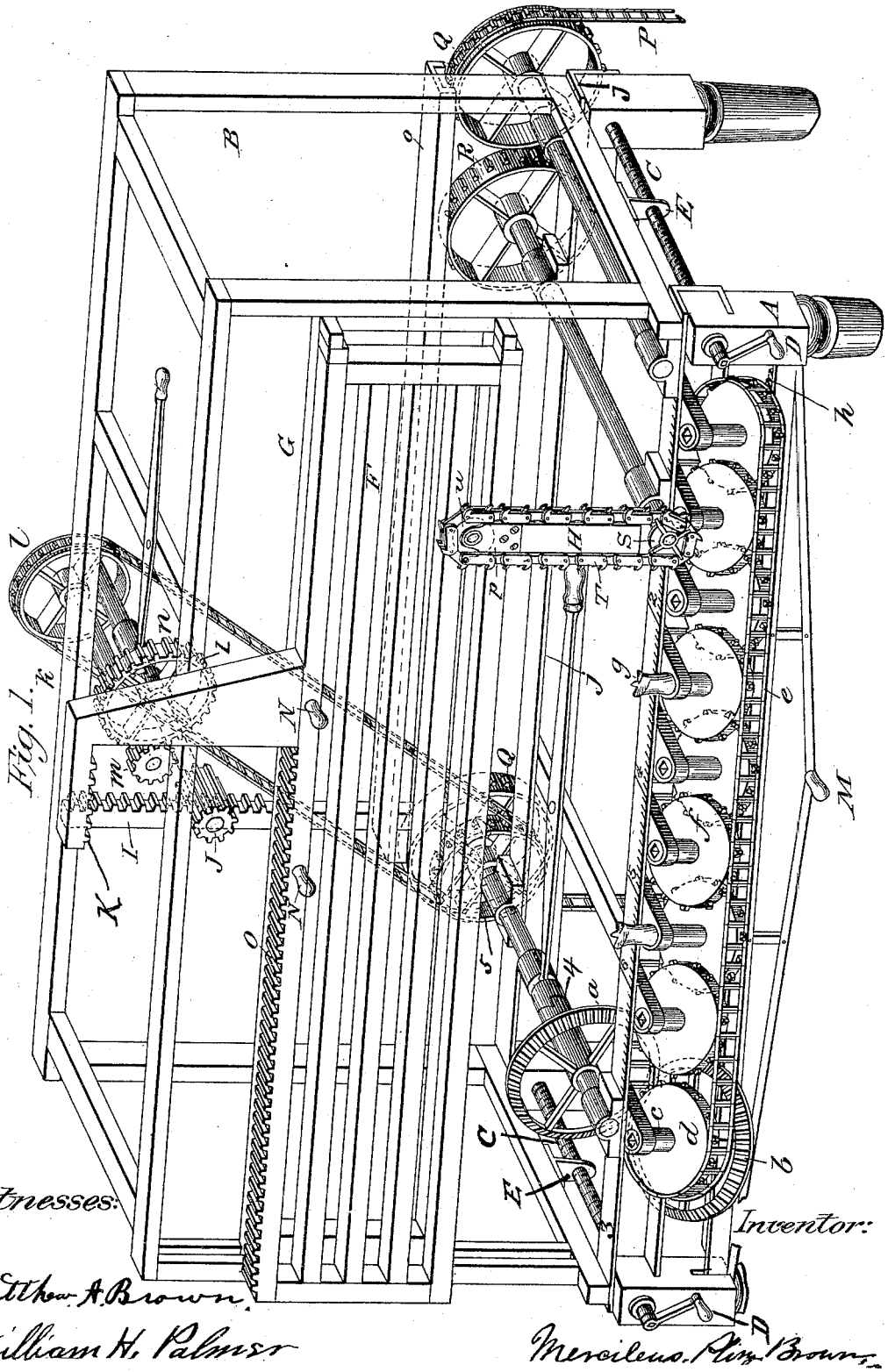

Fig. 1.

Witnesses:

Matthew A. Brown.

William H. Palmer

Inventor:

Mercilens. Pius Brown.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

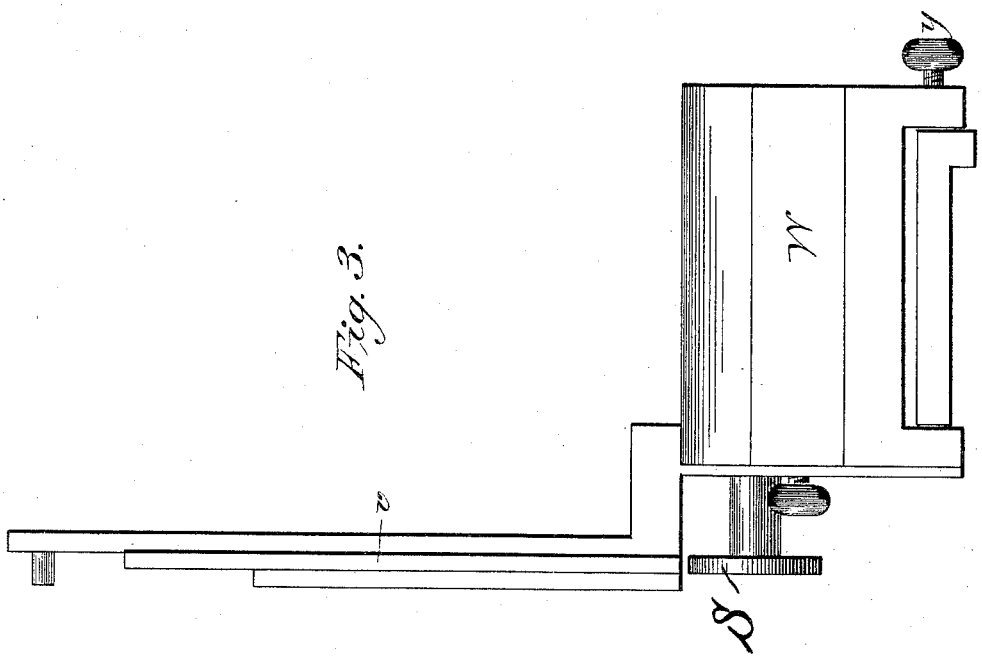


Fig. 4.

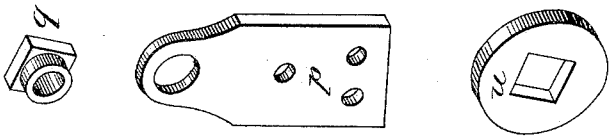
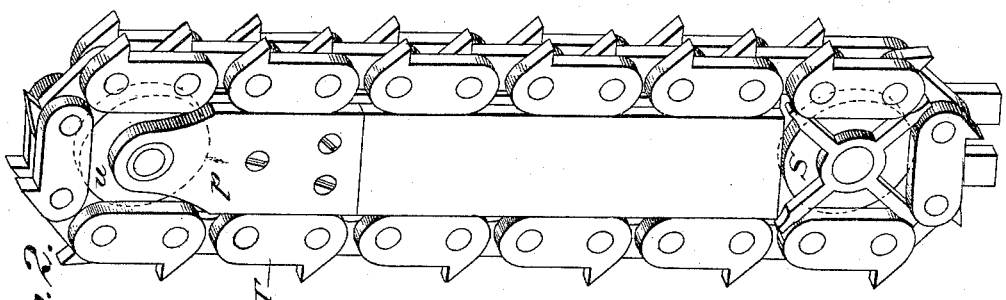


Fig. 2.



Witnesses:
Matthew H. Brown
William H. Palmer

Inventor:
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UNITED STATES PATENT OFFICE.

MERCILEUS PLINY BROWN, OF FORT SCOTT, KANSAS.

COMBINED MORTISER, GROOVER, RABBETER, AND BORER.

SPECIFICATION forming part of Letters Patent No. 458,613, dated September 1, 1891.

Application filed May 10, 1889. Serial No. 310,352. (No model.)

To all whom it may concern:

Be it known that I, MERCILEUS PLINY BROWN, of Fort Scott, Bourbon county, and State of Kansas, have invented a new and useful Combined Mortiser, Groover, Rabbeter, and Boring-Machine, of which the following is a specification, reference being had to the accompanying drawings, forming parts of the same.

My invention relates to mechanism for mortising, grooving, rabbeting, and boring either in combination or separately, and is designed to be used in the manufacture of furniture, sash, doors, window-shutters, and various other things, especially where many mortises, grooves, rabbets, and holes are to be made in one piece at various distances apart. By the use of this machine it is all done simultaneously. It will drill all the holes in one edge of a boiler-sheet.

In the drawings, Figure 1 is a perspective view of my combined mortiser, groover, rabbeter, and borer proper. Fig. 2 represents, by perspective view, the mortiser, showing all its parts complete. Fig. 3 shows end view of the upright plate sliding cap W and thumb-screw *y*. Fig. 4 is a perspective view of the upper thin plate-wheel *u* and hub *q* and screw-plate *p*.

The operative members of my machine are placed upon a suitable table A, upon the top of which a sliding frame B is placed, which is made to slide forward or rearward by the operation of two screws C C, placed one at each end of table A. The screws C C are so arranged to the front table-legs A that they can neither move forward nor rearward when turned by the screw-crank D, the screw-block E being solidly attached to the under side and center of the end sills of the sliding frame B, through which blocks the screws C C pass. Then by a turn of the screw-crank D the sliding frame B is moved forward or rearward. Upon the front of this sliding frame is attached a double table F and G, upon which the timber rests to be mortised, grooved, rabbeted, or bored, and immediately in front of this double table F and G stands the upright plate band-saw mortiser H. By a turn of the screw-crank D the timber is brought nearer to or farther from the mortiser or mortisers, thus cutting a mortise or mortises, grooves, rabbets, or boring the holes any desired distance from the edge of the timber. The table F G is composed of two frames, the rear frame G playing in a groove up and down the inner side of the front posts of the sliding frame B, in which the ends of the rear table G slide, on the rear side of which extends a rack-cog I perpendicular above the frame G as far as the width of the frame, into which the pinion J gears, which gives the frame action upward and downward when the table F and G descends to the top of table A. The pinion J, gearing in rack-cog K under the horizontal bar attached to front table F, propels table F, on which the timber is placed, to the left, and when the mortises are cut the desired length clutch L is thrown out of gear and it ceases to operate. Then the operator raises knob M, which forces the boring-bits up in the timber. He then takes hold of the knobs N and raises table F and G until the plate band-saw mortiser H is as near out of the mortise as he desires the grooves to be cut. Then pinion J comes in gear with rack-cog O, which extends along the top of front table F. Now move clutch L. Table F is then propelled to the right, while the plate band-saw mortiser H cuts the groove or rabbets. The link-band P, passing from the propelling-power, passes up and over the sprocket-wheels Q Q at each end of the table A, gearing in all the sliding sprocket-wheels R, to whose axles are attached the thin plate-wheels S, with flanged ribs on each side, the plate-link band-saw being made of steel plates. Each end of two of those plates laps on each end of one center plate. A rivet through all the laps unites the link-band T. The flanged ribs on each side of the thin plate-wheel S gear in the space between the ends of the two outside plates, the center plates being the same thickness of the wheel S, thus propelling the plate band-saw, each plate having one saw-tooth on its outer surface. The upper end of this plate band-saw passes around a thin plate-wheel *u*, the same size and thickness of the one described below, but has no flanged ribs on either side. It revolves on an axle supported by the steel plate V any desired width, whose thickness is

precisely the width of the combined thickness of the plates of the plate band-saw. The lower end of this plate V is attached to the front side of sliding caps W, through which caps W the axles pass, on which the sprocket-wheels R, that propel the plate band-saw, and the thin plate-wheels S, with flanged ribs on each side, are attached near the lower end of this plate V, and just above the thin flanged rib-wheel S the upright plate V turns back far enough to be in rear of the band-saw, then turns down, forking in the center sufficient to give space for the axle that propels the plate band-saw to pass through, each fork uniting with a dovetail groove made on front side of caps W. Thus arranged the band-saw can be brought to any desired tension and then set by the thumb-screw *y*. This plate V has two rabbets cut front and rear of each edge, forming a tongue in the center of each edge, the tongue and rabbets being the exact thickness of the plates of the plate band-saw, the plates of the plate band-saw being just enough narrower than the two outer plates as to allow the outer plates to touch the bottom of the rabbets when the center plates rest on the top of the tongue, thus preventing the plate band-saw from being pushed back while cutting the mortises to their desired length. The center plates on the inner edge have a curve corresponding with the round of plate-wheels S, which, while passing around the wheels, rests upon the surface of the wheels, while the two outer plates press against the sides of the wheels, thus producing a perfect circular cut of the teeth of the saw while passing through the timber. The hub *q* of the plate-wheel *u* has a round hole through its center, through which the axle at the top of upright plate V passes. The outer surface of the hub is square, the thickness of thin plate-wheel *u*, and the outer surface of front of the hub is round, the thickness of the screw-plate *p*. The plate-wheel *u* has a square hole in its center fitting the square on hub *q*. Being thus arranged, when one hub wears out a new one can be placed on at once. The hub *q*, not being fastened to the wheel, is held in place by the shoulders of the squares coming in contact with the inner surface of the screw-plate *p*, which is screwed to the upright plate V. The wheel *u*, not being fastened to its hub *q*, is held in position by the front and rear plates.

On the top of front rail Z of table A feet and inches are made, and the caps W, through which the axles pass that propel the sliding mortises, are attached. Those caps have flanges extending down on the sides of rail Z to hold them in place when slid to any desired distance apart the mortises may be required, and then made fast with thumb-screw *y*; also, inches are made on the front legs of table A, so that the holes can be bored the depth desired, and as the journal-boxes, through which the axles of the sprocket-wheels *f* revolve, pass back through parallel slots made lengthwise through the front rail Z of table A the screw-taps rear of the rail can be loosened and the sprocket-wheels *f* be slid any distance apart desired.

The axle of sprocket-wheel Q Q at the left rear corner of table A has the miter cog-wheel *a* attached to it just rear of table-rail Z, which gears in miter cog-wheel *b*, attached to a perpendicular axle *c* just in front of rail Z, attached to the same axle *c*. Just above is a sprocket-wheel *d*, which gears in and propels the link-band *e*, which band extends parallel to the right the whole length of the line of sliding sprocket-wheel *f*, passing around the stationary right-hand wheel and coming back in the rear, revolving many sliding sprocket-wheels, whose rims have an odd number of sprockets, so that when on one side of the wheel, as one sprocket is entering the link and the other just passing out on the opposite side, a sprocket will be in the center of action. All of those wheels have a square hollow passing through their axles. The square shank of a bit of any kind passes through the hollow. The lower end of the shank has a round tap screwed on, so that the lower part of the shank passes just through the tap and rests upon the flange of a bar *h*, that passes the whole length of a table A. This bar also has another flange, which is not so wide as the lower flange, on which the lower end of the shanks of the bits rests. It only only extends so far out from the bar as to touch the shanks of the bits just above the round taps 3, a portion of the round taps being between the two flanges on bar *h*. The bits are pressed into the timber by taking hold of knob M and raising it, and also drawing bits from bored holes by pressing down on knob M. The rear rail *j* of table A has a flange at the top. The front rail has a flange at the bottom and top also. Those flanges on front rail project forward sufficient for the action of the rear part of the sprocket-wheels and link-band to pass in front of the upright plate of the rail when the bits are placed in line with the mortises. A sprocket-wheel is placed on the axle of the left-hand sprocket-wheel Q Q, between the front and rear rail of table A, from which a link-band passes to band-wheel *l*, on the axle of which cog-wheel *m* is attached, gearing into cog-wheel *n*, on the axle of which pinion J is attached. The rear end of pinion J gears in rack-cog I, and the front end interchangeably gearing in rack-cogs K and O. Pinion J can be made having no cogs in its center, or two pinions can be made, one placed in front and the other in the rear of the caps that hold the axle to the front top rail of sliding frame B.

This machine is so constructed as to create a machine, as herein shown, that cuts any number of mortises, cuts and grooves or rabbets, and bores any number of holes any depth or distance apart desired simultaneously, either in combination or separately, constructed,

arranged, and operated in the manner and for the purpose substantially as specified.

What I claim as my invention is—

The combination of table A, sliding frame B, and tables F and G with rack-cogs I, K, and O and pinion J, gearing interchangeably in them, producing six different automatic movements on feed-table F, and for sliding mortisers, groovers, rabbeters, and borers, producing combined action of only the parts required to do the work, for the purpose substantially as specified.

MERCILEUS PLINY BROWN.

Attest:

GEORGE W. MATTHEWS,
VALENTINE L. COOK.