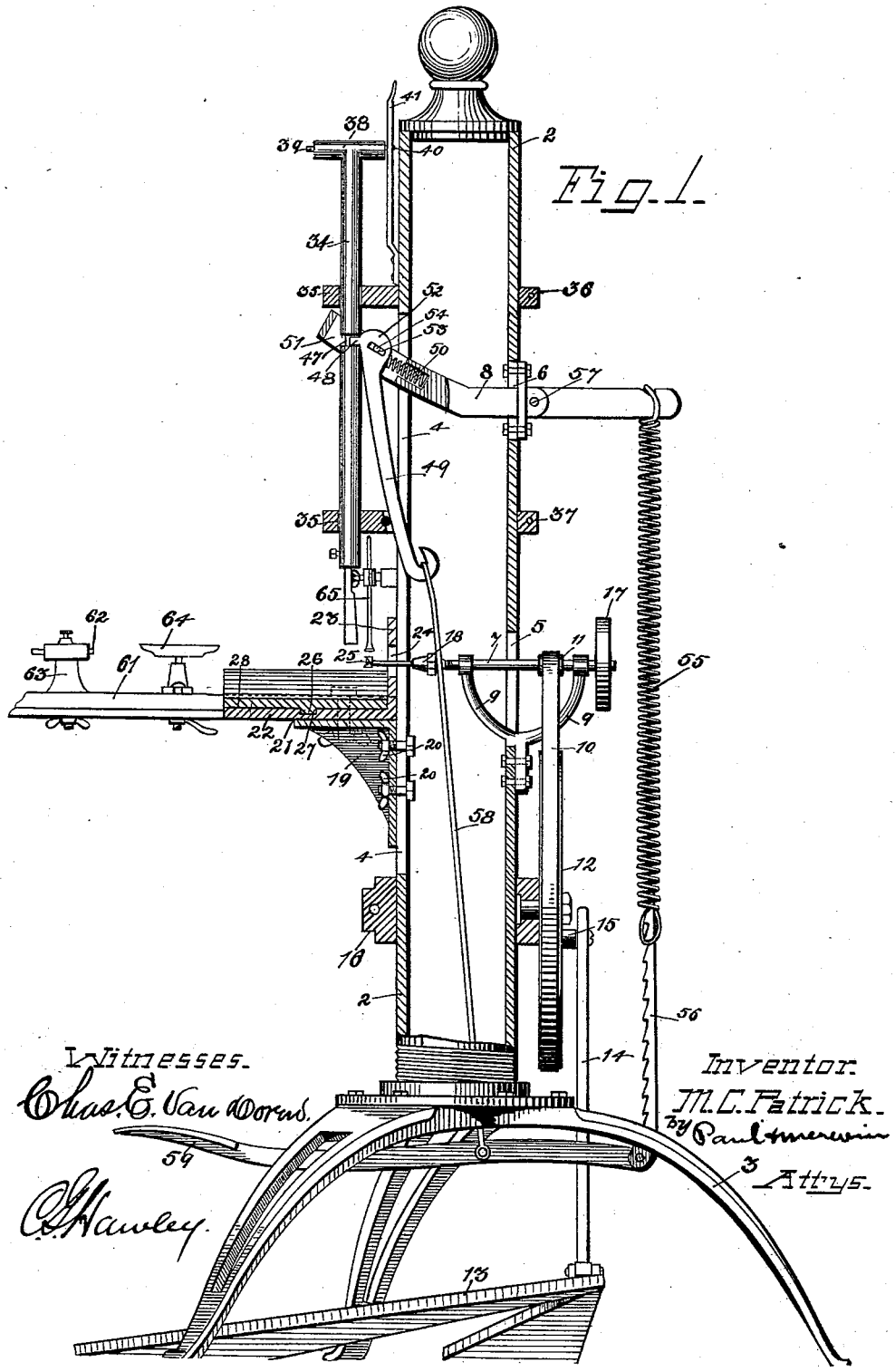
(No Model.) 2 Sheets—Sheet 1.

M. C. PATRICK.

COMBINATION WOOD AND METAL WORKING MACHINE.

No. 465,493. Patented Dec. 22, 1891.

Fig. 1.



Witnesses.
Chas. E. Van Dorns.
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(No Model.) 2 Sheets—Sheet 2.

M. C. PATRICK.

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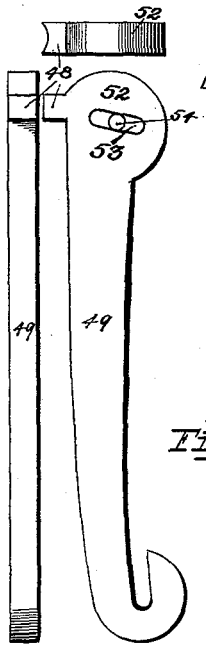
Fig. 4.



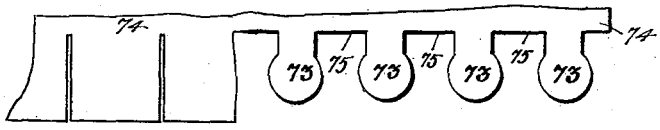


Fig. 10.

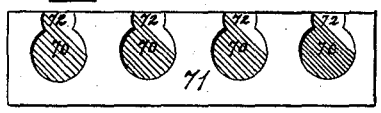


Fig. 8.

Fig. 6.

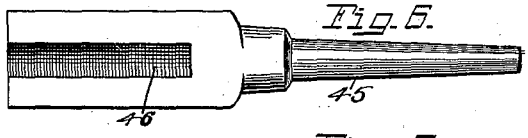


Fig. 9.

Fig. 7.

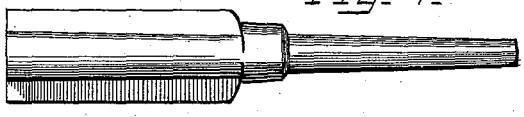


Fig. 2.

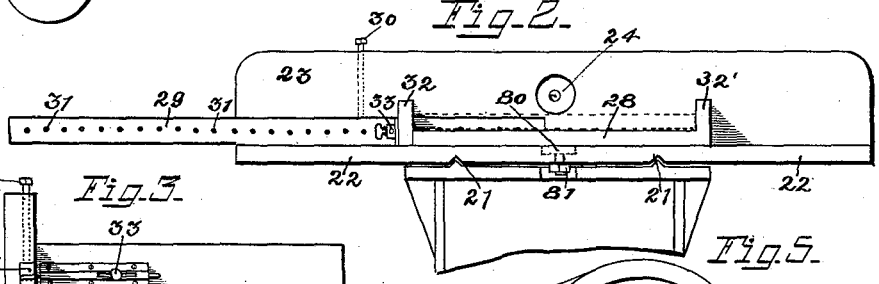


Fig. 3.

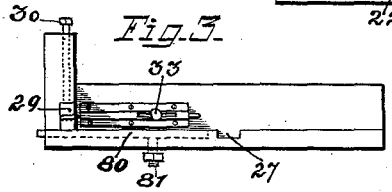
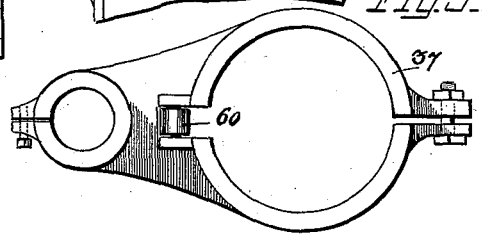


Fig. 5.



Witnesses.
Chas. E. Van Dorus.
C. J. Hawley.

Inventor.
M. C. Patrick.
By Paul & Attys.

UNITED STATES PATENT OFFICE.

MARCUS C. PATRICK, OF MINNEAPOLIS, MINNESOTA.

COMBINATION WOOD AND METAL WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,493, dated December 22, 1891.

Application filed August 12, 1890. Serial No. 361,782. (No model.)

To all whom it may concern:

Be it known that I, MARCUS C. PATRICK, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Combination Wood and Metal Working Machines, of which the following is a specification.

My invention relates to a combination-machine adapted for use in mortising, dovetailing, boring, turning, sawing, grinding, drilling, &c.; and the object is to provide a machine which, while adapted to the above-named uses, will be of a cheap and economical construction, easy of manipulation, and accurate in its work.

My invention consists, in the combination, with a suitable hollow supporting-pillar and its base, of an adjustable bracket projecting therefrom, said bracket being adapted to support a sliding table or a turning-lathe, as desired, a suitable spindle adapted to carry a clutch, spur-center, emery-wheel, auger, drill, or other revolving tool, said spindle and tool extending through diametrically-placed openings or slots in said pillar, means for revolving said spindle at a high rate of speed, and a reciprocating plunger supported above said table and adapted to carry the mortising-tool, said plunger, with the tool, being reversible and adapted to be reciprocated by a novel link-and-lever device, through the medium of which the force is applied to the plunger in the direct line of the axis.

My invention consists, further, in various details of construction hereinafter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a full vertical sectional side elevation representing a combination-machine embodying my invention. Fig. 2 is a detail front elevation of the sliding plate and the hand-feed. Fig. 3 is an end or side view of the same. Fig. 4 shows a front, side, and top view of the link through which power is applied to the plunger. Fig. 5 is a plan view of one of the supporting and guide yokes used in connection with said plunger. Fig. 6 is a view of my novel dovetailing-tool designed for use in connection with the plunger. Fig. 7 is a view of the same in a reversed position. Figs. 8 and 9 are views of the lower cutting-edges of the tool. Fig. 10 shows the form of the mortises and tenons made by my machine.

In the drawings, 2 represents the hollow supporting-pillar, and 3 a suitable base, into which the pillar 2 is preferably screwed, as shown. The pillar 2 is preferably made of large gas-pipe or other tubing, and is provided with the long slot 4 in the front portion thereof, as shown, and with the openings or slots 5 and 6 in the rear part thereof, through which the spindle 7 and the lever-arm 8 are respectively adapted to pass. These slots are placed diametrically opposite. The spindle 7 is supported by suitable bearings 9, bolted upon the standard 2, and is driven by the belt 10, passing over a small pulley 11 upon the spindle and over the large drive-wheel 12, which is adapted to be driven by means of the treadle 13, connected thereto by the pitman 14, secured to the crank-pin 15. I preferably provide the bearing for the wheel 12 upon the clamp ring or yoke 16, thereby making the same vertically adjustable, whereby the belt 10 may be readily tightened or loosened.

The balance-wheel 17 is provided upon the rear end of the spindle 7 and the chuck 18 upon the forward end. This chuck or clutch 18 stands, preferably, within the hollow of the standard 2, access being had to the same through a suitable opening in the standard, through which a wrench may be inserted to tighten or loosen the chuck. In case grinding is to be done the balance-wheel 17 would be displaced by a suitable emery-wheel.

Below the line of the spindle and adjustably fixed to the standard by the bolts and thumb-nuts 20 is the bracket 19, having a cylindrical surface adapted to fit upon the standard 2. This bracket 19 is provided with V's adapted to engage with the grooves 21 in the lower surface of the movable table 22, whereby lateral movement of the table is prevented, while the table is still left movable in lines parallel to the lines of the spindle 7. This table is provided with the side piece 23, having the opening 24, through which the auger 25 or other revolving tool is adapted to extend. The rectangular groove 26 is provided in the upper surface of the table 22, and is adapted to engage with the long bead

27, provided on the lower surface of the laterally-sliding feed-plate 28, upon which the board to be mortised or tenoned is placed. I provide the stationary notched or perforated strip 29 upon the table 22, the inner surface of the same being flush with the inner surface of the angle-plate 23. This strip 29 is made adjustable in the plate 23 by means of the set-screw 30, and is provided with suitable holes or notches 31, placed at regular distances from each other in the inner side of the strip 29.

On the end of the block 32, formed on the plate 28, I provide the spring locking device 33, adapted to engage with the holes 31 to hold the plate 28 in position. A block 32′ is provided at the end of the plate 28 and corresponds to the block 32 thereon. When it is desired to move the plate 28, the locking-bolt 33 is withdrawn from engagement with the strip 29 and the plate moved along until the bolt enters the next hole 31.

As shown, the plunger 34 is held in position against lateral movement by suitable guides 35 in the yokes 36 and 37, and is provided with the head 38, having the projecting studs 39 and 40, adapted to engage the spring-lever 41, attached to the standard 2, through the medium of a suitable slot in said lever 41, said slot being of a length equal to the vertical throw of the plunger. By pushing back the top of the spring-lever 41 the head of the plunger may be released, after which the same may be turned half around to change the position of the mortising-tool. The lever 41 then being released and the pin on the head 38 placed in the slot therein, the plunger is prevented from turning.

The mortising-tool is secured in the lower end of the plunger by any suitable means, as by a set-screw or chuck. This tool may be of any desired form; but I have designed as especially applicable for use in my machine the tool shown in Figs. 6 to 9, inclusive, and consisting in the circular portion 42 and the angle portions 43 and 44, formed upon a suitable shank 45, the slot 46 between the sides of the tool being of such height as to accommodate the thickness of the board desired to be cut. The plunger 34 is provided with the smaller portion 47, against which the lug 48 upon the link 49 is adapted to be pressed by the spiral spring 50, provided in the lever 8. This lever 8 is provided at its forward end with the eye 51, the same being of such length as to readily admit the plunger and the end 52 of the link 49. This head 52 is provided with the slot 53, adapted to engage with the pin 54, provided between the sides of the eye 51, as shown, whereby the head is prevented from slipping out to such a distance as to disengage the lug 48 from the shoulders at 47 in the plunger. The long spiral spring 55 is adjustably attached to the base 3 by means of the notched piece 56, and is also secured over the rear end of the lever 8, as shown. The lever 8 being pivoted at 57, the plunger is held normally in its upper position by the tension of the spring 55 drawing down upon the lever 8. The tension of this spring 55 is such as to support the weight of the plunger 34 and to withdraw the tool from the block after a cut has been made. The rod 58 extends from the lower hooked end of the link 49 and is pivoted upon the foot-lever 59, whereby upon pressing down on the lever 59 the plunger is brought down with the tool to force the mortising tool or chisel into the block of material laid upon the plate 28.

The links 48 and 59, though shown separate, are sometimes made in one piece, forming one long link, provided with a head similar to 52. I preferably provide a small friction-roll 60 in the yoke 37, as shown, to prevent unnecessary friction between the link 49 and the yoke 37. The lever 8, the link 49, and the auger 25 are thus all seen to operate through the slot 4 in the front of the standard 2.

In connection with the auger-spindle 7 I provide the lathe 61, supported upon the bracket 19 in any suitable manner, the table 22 being removed when the lathe is in use. When using the lathe, the bracket 19 is so adjusted as to bring the center spindle 62 in the forward standard 63 into exact line with the axis of the spindle 7, a chuck, spur-center or center spindle, and dog being substituted in place of the auger 25.

The adjustable tool-rest 64 is of the usual form used upon wood-turning lathes, but may be replaced by a suitable tool-rest and feeding mechanism, such as is employed upon a metal-turning lathe, when it is desired to turn down a piece of material which cannot be conveniently shaped with hand tools.

I preferably provide suitable adjustable presser-feet 65, one on either side of the plunger, to prevent the raising of the block of material from the plate when the mortising-tool is withdrawn from the same.

I will now describe the operation of my machine in its several uses. I will say that it is desired to mortise the ends of the drawer-front. The bracket carrying the table 22 and the feed-plate 28 will be placed at a height sufficient to bring the block of material against the end piece 32 or 32′ and opposite the auger 25. The machine will now be started up by means of the treadle 13 and the power-wheel 12, and the table pushed in so as to bring the block against the auger to be cut by the same. As each hole is finished the locking-bolt is withdrawn from engagement with the notched bar 29 and the feed-plate moved along a distance of one notch, thus any number of holes equidistant from centers may be bored in the ends of the block. The depth of the holes is regulated by any suitable means, as by the adjustable gage 80, consisting in the slotted strip adapted to be held in place by the bolt 81 in the lower side of the table. I will say that the row of holes thus bored out corresponds to the holes 70 in the end of the block or board 71. Now, in order to make an open

mortise adapted to receive the dovetailed tenon, I lower the bracket a short distance and bore out the smaller holes 72 with a smaller auger used in place of the first auger. I will now say that it is desired to cut the tenons 73 upon the ends 74 of the board, which is to form the side of the drawer supposed. In the first place the cut 75 will be sawed out at regular distances across the end of the board 74. This sawing may be done either by a circular saw secured upon the spindle or upon a separate arbor attached in the lathe, or it may be done by a hand-saw. The board will now be placed flat on the feed-plate 28 and beneath the mortising-tool in the plunger, the feed-plate being so placed as to bring the board in position, so that the tool will cut out a tenon from between each of the saw-cuts in the end of the board as the feed-plate is moved step by step. By now forcing down the lever 59 the plunger, with the tool, is brought down upon the board and forced through the same to cut out a tenon. As the foot-lever 59 is released the plunger will be drawn back by the tension of the spiral spring 55 acting through the medium of the lever 8. The board is held down and prevented from following the tool either by hand or by the adjustable feet 65. The locking-bolt 33 will now be withdrawn from the hole 31 in the strip 29 and the feed-plate 28 moved along one notch, so as to bring the board in position for the tool to cut a second tenon, and so on. I preferably provide several of the strips 29, having holes at greater or less distances apart, thereby allowing variations in the distance between the mortises or tenons. As will be seen, if it is desired mortises may be cut in the board of the form of the tenon 73 by merely reversing the position of the tool in the plunger. In this case unless the wood is very soft it is preferable to make a saw cut down through the middle of the waste portion to be cut out.

In case it is desired to use the machine for turning out a cylindrical article the table 22, with the feed-plate, &c., will be removed from the bracket and the turning-lathe attachment secured thereto. The bracket is then raised so as to bring the center spindle 62 into line with the spindle 7 and a suitable clutch or center placed on the spindle. The material, which may be either of wood or metal, will then be placed in the lathe and operated upon in the ordinary manner, power being applied to the same through the treadle 13 and power-wheel 12.

It is obvious that various parts of my machine may be driven by hand, foot, steam, or other power, as circumstances admit, without departing from my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the standard secured in an upright position upon a base, with the plunger adapted to work vertically in guides secured upon said standard, a table secured on said standard beneath said plunger, said plunger adapted to receive a mortising-tool, the link 49, provided with the lug 48, adapted to engage said plunger, the foot-lever 59, the rod 58, connecting said foot-lever and said link 49, the lever 8, provided with the eye 51, carrying the spiral spring 50, and the pin 54, adapted to engage with said link, as described, and the spiral spring 55, adapted to draw down upon the rear end of said lever 8, substantially as described.

2. The combination of the standard 2, having a base, with guides on said standard, a plunger adapted to be vertically reciprocated therein, an annular shoulder or groove provided on said plunger, the link 49, provided with the lug 48, adapted to engage said shoulder, means for holding the same in engagement therewith, means for normally supporting said plunger in its upper position, the foot-lever 59, pivoted on said base, a link-connection 58, the bracket 19, bolted on said standard, the longitudinally-movable table provided thereon, means for locking the same on said bracket, the laterally-movable plate 28, provided on said table, and means for locking the same thereon in predetermined positions, substantially as and for the purpose specified.

3. The combination, with a standard provided with guides arranged to receive a vertically-moving plunger and with the slots or openings adapted to receive a boring-tool, of the adjustable bracket secured upon said standard, and a table supported upon said bracket and arranged to support material in position to be acted upon either by the boring-tool or by the tool carried by said plunger.

4. The combination, with a standard 2, provided with a suitable base and with the slots 4 and 5, whereby a boring-tool may be arranged to pass through said standard, and with the guides 35, whereby a reciprocating plunger carrying a mortising-tool may be arranged upon said standard, of an adjustable bracket 19, secured upon said standard, and a table arranged upon said bracket and adapted to support material in position to be operated upon either by said boring-tool or said mortising-tool.

5. The combination, with the standard 2, secured upon the base 3, of the bracket 19, movably secured thereto by adjustable bolts extending through the bracket and through a slot in said standard, the spindle 7, extending through said standard, bearings 9, supporting said spindle, a power-wheel 12, and a treadle 15, adapted to operate said power-wheel and said spindle through the medium of the belt 10, pitman 14, and crank-pin 15, substantially as described.

6. The combination, with the standard 2, having the slot 4, of the shelf-bracket 19, having a cylindrical surface fitting said standard, bolts passing through said shelf into said slot and holding said bracket in position on said standard, bearings parallel with said

standard, a plunger secured in said bearings, the link 49, the rod 58, the lever 54, and means whereby said plunger is prevented from turning in said bearings, substantially as described.

7. The combination, with the plunger 34, of the clamping rings or brackets 35, the shoulders in said plunger between the same, the angled lever 8, provided in bearings 57, the eye in said lever, the link 49, the lug thereon engaging the shoulder in said plunger, the spring in said eye adapted to hold said lug and plunger in engagement, said plunger being cylindrical, means whereby the same is held from turning, and a treadle 59, connected with said link 49, substantially as described.

8. The combination, in a wood-working machine, of the tubular standard having the slots 4 and 6, the plunger having the shoulder portion 47, the link 58, the link 49, having the lug 48 in engagement with the said shoulder on said plunger, the foot-lever 59, the connection between the lugged end of said link and said foot-lever being direct, and means whereby said plunger is normally held in its raised position.

9. The combination, with the standard 2, having the slot 4, of a base, the bracket 19, bolts and thumb-nuts securing said bracket on said standard, the longitudinally-movable table 22, having the vertical part 23, the V's on said bracket and V-grooves in the under surface of said table 22, the laterally-slidable plate 28, the bead thereon adapted to fit the lateral groove 27 in the table-top, the rod 29, having the holes or notches 31, and the locking device carried on said plate 28 and adapted to engage said rod 29, substantially as described.

In testimony whereof I have hereunto set my hand this 8th day of August, 1890.

MARCUS C. PATRICK.

In presence of—
C. E. VAN DOREN,
C. G. HAWLEY.