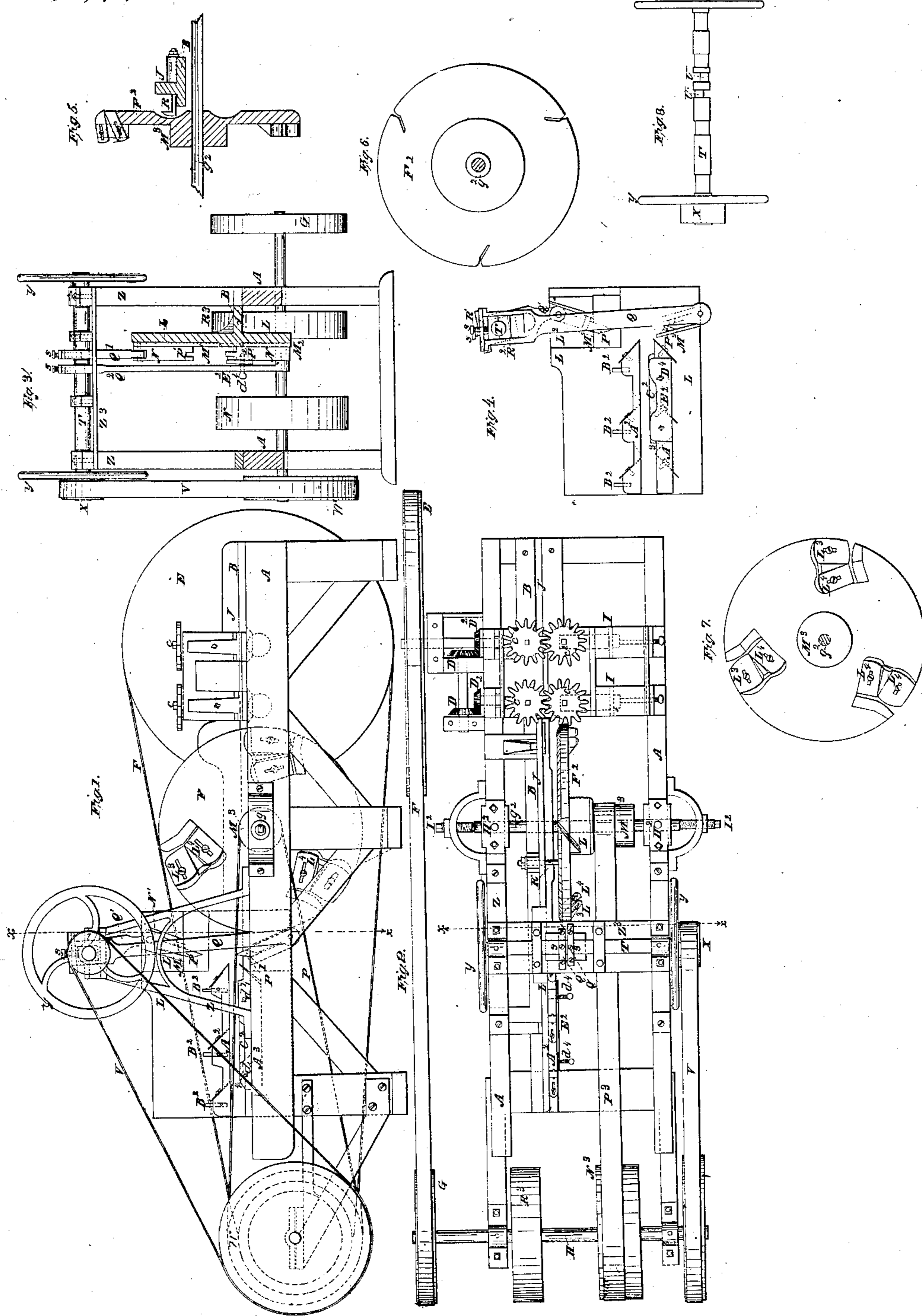


*P. Emmons,  
Wood Planing Machine.*

*No. 9,443.*

*Patented Dec. 7, 1852.*



# UNITED STATES PATENT OFFICE.

PHINEAS EMMONS, OF NEW YORK, N. Y.

## TONGUING AND GROOVING APPARATUS.

Specification of Letters Patent No. 9,443, dated December 7, 1852.

*To all whom it may concern:*

Be it known that I, PHINEAS EMMONS, of the city, county, and State of New York, have invented a new and useful Improvement in Machinery for Planing and Tonguing and Grooving Boards, Planks, &c.; and I do hereby declare the following to be a full and exact description of the same.

10 The nature of my invention consists in combining with the frame and feed gear of a planing machine—first a vertical cutting wheel, having a series of divided knives for reducing and finishing the planing of the board, secured to the same by 15 adjusting screws so that the reducing knife or finishing knife may be set or taken out separate from each other; also in combination with the wheel a pressure hook connected by a set screw to the guide strip, to 20 hold the plank firmly against the guide strip; second a shaft supported on standards extending across the frame of the machine having two cranks or eccentrics 25 on the line of it, to operate in opposite directions two connecting rods, attached to two cutters working in slides, for the purpose of cutting or scoring the edges of the board or plank so that the stationary 30 tongues and grooves may move easily and perfectly make the tongue and groove of the board or plank and prevent the choking of thin throats, as would be the case were the tongue and groove made by them 35 by taking a long shaving from end to end of the plank or board. But to describe my invention more particularly I will refer to the accompanying drawings forming a part of this schedule the same letters in 40 the several drawings referring to the same parts whereon they occur.

Figure 1, is a side elevation of the planing machine. Fig. 2, is a plan view of the same. Fig. 3 is a cut section of the same 45 through the lines  $x, x$ , of Figs. 1 and 2. Fig. 4 is a detached view of the tongues and grooves and cutters for scoring or chipping the edges of the plank or board. Fig. 5, is a cut section of the planing wheel, and 50 guide strip of the machine, and showing the hook for holding the plank or board against it, while the board or plank is being reduced by the planing wheel. Fig. 6, is a front view of the planing wheel. Fig.

7, is a back view of the same. Fig. 8, is a 55 detached view of the shaft, showing the eccentrics or cranks, to which the connecting rods are attached for operating the cutters for scoring or chipping the edges of the plank or board. 60

Letters A, A, is the frame of the machine, made of wood or metal as circumstances may require. Lengthwise of this frame is arranged a frame B, which is secured to the upper rails of the frame A. On the 65 front end of it is arranged a set of feed rollers C, C, and C', C<sup>2</sup>, in a vertical position, and geared together by a series of bevel pinion wheels D, D, &c., on the spindles of these feed rollers, and on spindles 70 placed at right angles to them, and extending to the outside of the upper rail of the frames, so that by means of a pulley E on the end of one of the spindles D<sup>2</sup> and a belt F, passing around a pulley G, 75 on the main driving shaft H, a uniform feed motion is given to rollers to carry the board or plank through the machine. To the back of the rollers C', C<sup>2</sup>, are arranged a pair of springs I, I. These 80 springs are for the purpose of holding the carrying rollers C' and C<sup>2</sup>, firmly against the plank, and may be made in any of the usual ways of making elliptic or spiral springs necessary for such purposes. 85

Letter J, is the guide strip for regulating the width of stuff to pass through the machine. This guide strip is secured by means of adjusting screws to the frame B, so that by the set of it boards or planks of any 90 thickness may be allowed to pass through the machine. Attached to this guide strip is a pressure hook K, which passes through the side of the guide strip, a sufficient distance to allow the plank or board to pass between 95 the hook and face of the strip, so as to hold it firmly in contact with the strip while under the action of the reducing or planing wheel—on the back end of the pressure hook where it passes through the guide strip is a 100 screw nut, so as to allow of regulating the set of the hook to different thicknesses of planks or boards passing through the machine. Under the screw nut a piece of india rubber may be placed if thought necessary 105 to afford a little yielding to the pressure of the hook against the board so as not to crease or make too much friction. Also to the back

end of this guide strip is a raised or elevated back L. On this back are arranged slide-ways M' and M<sup>2</sup>, for the edge cutters to work in. The upper slideway M', is attached to an adjustable back piece L<sup>2</sup>. The object of this is to allow of elevating the slide M', so as to preserve the proper pitch of the slide, when the upper cutter has been elevated to allow of wider planks or boards passing through the machine. The mode of elevating this adjustable back piece L<sup>2</sup>, is by screws or other well known device for such purposes. The lower slide ways M<sup>2</sup>, is made permanently fast to the lower edge of the back L, which extends below the line of the guide strip for that purpose. In these slide ways are two stocks N' and N<sup>2</sup>, each having a cutter P' and P<sup>2</sup> secured to them by a set screw, for the purpose of holding them firmly to the stock. These cutters are made in the form of a tongue and groove—the upper one, P', having a piece cut out of it corresponding to the width of the groove to be cut, which is left on the edge of the board or plank, and the lower one P<sup>2</sup>, having a tongue piece extending from the cutting edge of the cutter, so as to cut the groove in the edge of the plank of a corresponding depth with the tongue cut on the upper edge of the plank. Attached to the ends of the cutter stocks are the ends of connecting rods Q', Q<sup>2</sup>. In the upper ends of these connecting rods are adjustable boxes R' and R<sup>2</sup>, having set screws S, S, &c., working through caps, on the upper ends of the connecting rods, for the purpose of adjusting the length of the connecting rods, between the shaft T, on which they work and the cutter stocks, when any variation is required to accommodate boards, &c., of different widths. On the shaft T, are cut two eccentrics U' and U<sup>2</sup>, having a throw of half an inch more or less, and around which the boxes R' and R<sup>2</sup>, in the upper or forked end of the connecting rods, work, so that as the shaft is rotated by the belt V, running around the pulley W, on the main driving shaft H, and pulley X, on the end of the shaft T, the eccentrics through the connecting rods communicate a reciprocating motion to the cutters P' and P<sup>2</sup>, which cut or chip the edge of the plank as they approach each other, and in drawing back allow the plank to pass in far enough, by the time the shaft T, has made another revolution to cut another chip. Upon the ends of the shaft T, are also two balance wheels Y, Y. This shaft is supported on standards Z, Z, which are bolted to the side rails of the frame A, and at the top joined together by a cap plate Z<sup>3</sup>, having openings in it for the ends of the connecting rods to pass.

Letters A<sup>2</sup> and A<sup>3</sup>, are two sets of stationary tonguers and groovers, which are secured to the back L, through which, for the

upper set of tonguers A<sup>2</sup>, are cut, slots B<sup>2</sup>, B<sup>2</sup>, &c., for set screws to pass, and screw into the stock A<sup>2</sup> holding the tonguer blades, so that the stock holding the tonguers may be shifted up or down as may be required to accommodate the various widths of boards that may be run through the machine. The lower grooving stock A<sup>3</sup> is secured to the back by fixed screws or bolts, and is not adjustable. On the side of it (A<sup>3</sup>) is however a shoulder piece C<sup>2</sup>, through which are two set screws D<sup>4</sup>, D<sup>4</sup>, having thin ends working into an adjusting plate E<sup>2</sup>, resting against the outer face of the groover stock A<sup>3</sup>. The object of this plate is to regulate the pressure against the side of the plank, and also accommodate the different thicknesses of boards and planks. These stocks A<sup>2</sup> and A<sup>3</sup>, are made of iron, and are made so as to hold three cutters each, though more or less may be used.

Letter F<sup>2</sup>, is the reducing or planing wheel, arranged on a shaft G<sup>2</sup>, running across the frame of the machine A, and supported in boxes H<sup>2</sup>, H<sup>2</sup>, on the side rails of the frame, and having adjusting screws I<sup>2</sup>, I<sup>2</sup>, working through brackets secured to the frame, and against the end of the shaft G<sup>2</sup>, for the purpose adjusting the cutting wheel. From out of the face of the cutting wheel, near the center, a portion of the metal is taken so as to leave a hollow, of sufficient depth to allow the pressure hook K, to lay in it, (see Fig. 5) to hold the plank while under the action of the reducing wheel firmly against the guide strip J. In the face of this reducing wheel are arranged a series of cutters L<sup>3</sup>, L<sup>3</sup>, L<sup>3</sup>, and L<sup>4</sup>, L<sup>4</sup>, L<sup>4</sup>, for reducing and finishing the surface of the boards, &c. The cutters L<sup>3</sup>, &c., are the reducing cutters, which are flat cutting irons, having one corner ground rounding up a little, so as by the angle of its set, to conform to the rounding up edges of the face of the cutting wheel, and thereby taking a reducing shaving from the surface of the board, while the straight plane irons L<sup>4</sup>, &c., arranged to the inner side of the irons L<sup>3</sup>, make a perfectly level and finished surface of the plank or board. These plane irons are secured to the cutter wheel by set screws in the common way of adjusting plane irons. On the shaft G<sup>2</sup>, is also a pulley M<sup>3</sup>, around which, and also around a pulley N<sup>3</sup>, on the main driving shaft H, a band P<sup>3</sup>, passes to propel the cutter wheel.

Letter R<sup>3</sup>, is the main driving pulley.

The operation of the machine is that when the power is applied to set it in motion, the operator feeds the board or plank in between the feed rollers, which carry it forward to the cutter wheel, between which and the guide strip it passes, and is acted upon by the cutters, and as it passes along

through the machine is held against the guide strip by the pressure hook. As it passes beyond the cutter wheel the end of the plank is brought under the action of the  
5 reciprocating cutters, which chips or scores its edges, so that as it passes forward through the stationary tonguers and groovers the chip is cut out, and thereby leaving a perfectly finished tongue and groove  
10 on the edges of the board or plank, as well as planed surface.

Having now described my invention and its operation I will proceed to state what

I claim and desire to secure by Letters Patent; what I claim therefore is— 15

The shaft T, connecting rods Q', Q<sup>2</sup>, cutter stocks N' and N<sup>2</sup>, and cutters P' and P<sup>2</sup>, and slides M' and M<sup>2</sup>, in combination with the stationary tonguers and groovers for the purpose of tonguing and grooving boards 20 &c., as set forth.

PHINEAS EMMONS.

Witnesses:

A. SPENCER,  
CHARLES L. BARRITT.