E. G. Allen,

Wood Planing Machine.

No. 6,365. Patented Apr. 17, 1849.

Fig 1.

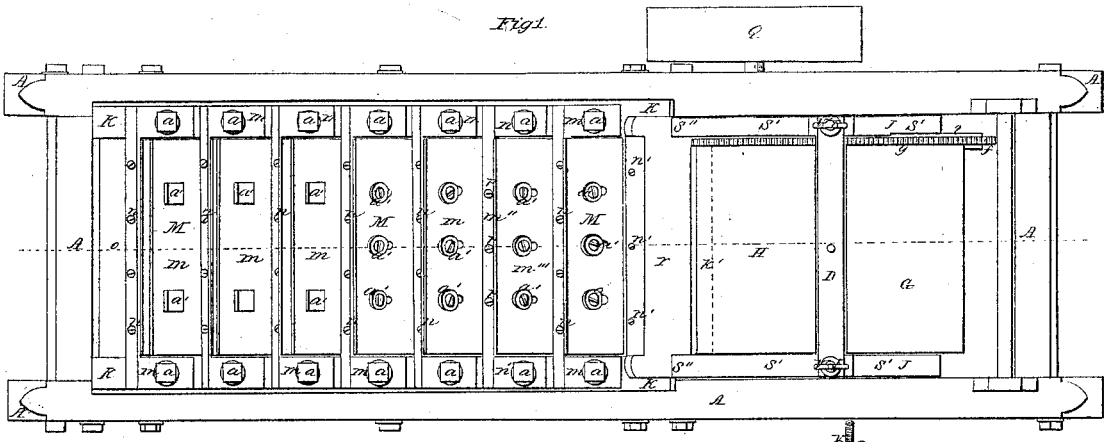


Fig 4.

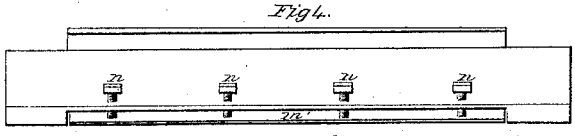


Fig 2.

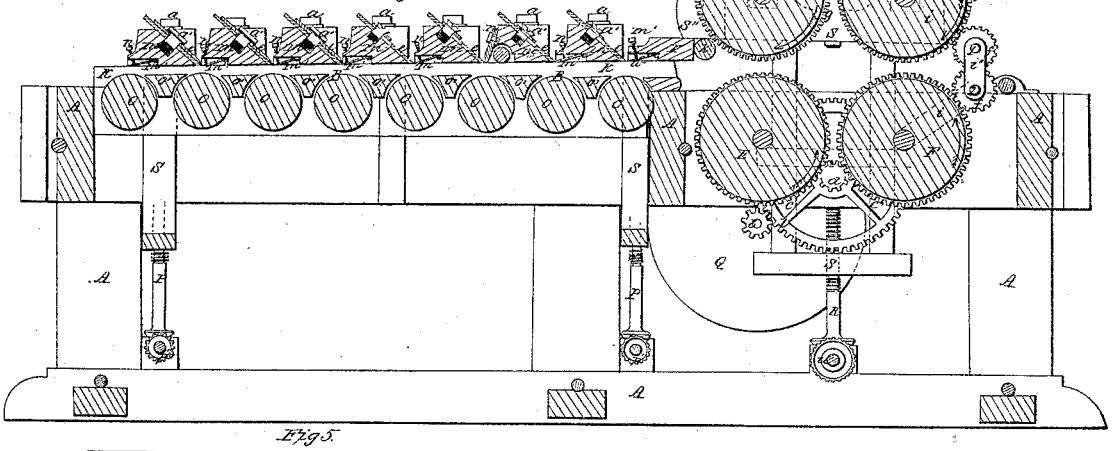


Fig 5.

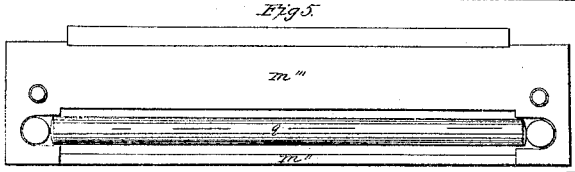


Fig 3.

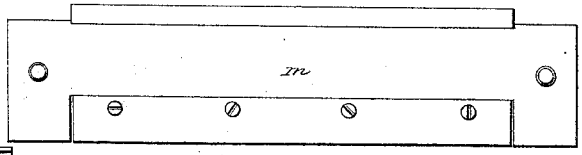
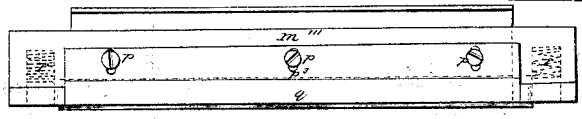


Fig 6.



UNITED STATES PATENT OFFICE.

ENOS G. ALLEN, OF BOSTON, MASSACHUSETTS.

PLANING-MACHINE.

Specification of Letters Patent No. 6,365, dated April 17, 1849.

To all whom it may concern:

Be it known that I, ENOS G. ALLEN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Planing Boards and for other Purposes, of which the following is a full, clear, and exact description, reference being had to the annexed drawings of the same, making part of this specification, in which—

Figure 1 is a top view, Fig. 2 is a vertical longitudinal section through the line *x x* of Fig. 1, Fig. 3 is a plan of the bottom of one of the planes, and Fig. 4 is an elevation of the back of the same, Fig. 5 is an elevation of the back of a plane stock (or Figs. 1 and 2) having the mouth piece or shaving gage placed in nearly an upright position, instead of nearly horizontal as in the others, and Fig. 6 is a bottom view of the same, with a pressure roller (held down by a spring Fig. 5 or weight) placed immediately before the mouthpiece to relieve it of some of the friction.

The same letters of reference indicate the same parts in all the figures.

In the accompanying drawings A is the frame which may be made of either wood or metal, and should be strong and solid to prevent yielding or vibration, and of sufficient breadth to admit the widest boards that are required to be dressed. The bed B for supporting the lumber while being acted upon by the planes is composed of alternate anti-friction rollers *o* and flat bars *o'* both permanently fixed in, and placed transversely across the upper part of the frame A the bars nearly filling the interstices between the rollers, so as to present a continuous surface for the boards to pass over. The top of the rollers *o* are slightly elevated above the surface of the transverse bars *o'* to prevent the boards ordinarily from rubbing upon the latter as they pass over; but this elevation is so slight, that if the board should be deflected downward in any degree, from inequalities in its surface, by meeting with an obstruction to its passage, vibration of the roller, or otherwise, it will strike the bar, which will arrest its further descent, and guide it steadily along beneath the planes. The rollers *o* and bars *o'* of the bed, may be made of such relative and absolute size, as may be deemed most suitable for the particular kind of lumber they are mainly designed to plane.

Boards are planed in this machine by forcing them endwise between the bed (B) and a series of stationary planes (M) secured above it. The planes (M) may be indefinite in number, but I prefer to employ from six to eight, so arranged that each successive plane will take a shaving deeper than that which preceded it, those in front where the board enters cutting a coarse shaving for the rapid reduction of the board to the required thickness, while those in the rear cut a fine shaving to render the finished surface smooth. The planes (M) are firmly secured (by screws *a* or otherwise) to a frame K which is capable of being raised and lowered by means of screws P or otherwise, to adapt them to planing boards of different thicknesses. And the height of the front end of this frame, above the rear end, can be raised so as to make the shavings of the first planes relatively coarse or fine as may be desired. As the edges of the plane irons (*e*) are placed parallel to, and directly above the axes of the rollers (*o*) upon which the board rests, it has a firm and unyielding support while being cut, which insures a smooth and even surface, and uniformity in its thickness when dressed. Each pair of the screws P which raise and lower the frame K are connected together by the gear *p'* so that they may operate to raise or lower both sides of the frame simultaneously, and thus prevent it from twisting.

Each plane is made separate from the others, but to the back edge of the stock *m* of one plane, the mouth piece *m'* for the plane next behind it is secured by screws or otherwise, in such a manner as to render it adjustable, for the purpose of adapting the size of the mouth to the thickness of the shaving. The plane stocks *m* are of the form represented, having the cutter or iron (*e*) secured to them by screws (*a'*) passing through slots formed in them for the purpose. The cutter is made like the iron of a common joiners plane, with the exception that it is wider in proportion to its length. For the front planes the iron should be single, but for the last two or three planes it should be double or capped.

To the back edge of the under side of the stocks (*m*) a mouth piece (*m'*) consisting of a plate of steel or other suitable material, is well secured by its front edge while its rear edge is left free to be depressed by means of set screws (*n*) for the purpose of regulating

the thickness of the shaving. This mouth piece may be hinged to the stock by its front edge and should in all cases be a non-elastic bar.

Instead of placing the adjustable mouth-piece (m') on the bottom of the stock, it may be placed on its back side, as represented at m'' in the stock marked m''' in Figs. 5 and 6 when it is adjusted by set screws (p) passing through slots (p' Fig. 6) which admit of its being raised and lowered. Immediately in front of this mouth piece m'' an antifriction roller (q) is placed, which is pressed down below the edge of the mouth piece by means of springs, weights or otherwise, for the purpose of relieving the mouth piece from all the friction that would be produced by its indentation into the board, the roller being indented therein in its stead.

The boards to be dressed are forced between the planes (M) and bed (B) by means of the feed rollers G H and E F the latter being stationary and mounted in the frame A with their tops parallel to and in the same plane with the tops of the rollers o of the bed B. The upper feed rollers G H are mounted in a frame S which moves up and down in suitable slides formed in the frame A being raised and lowered by the screws R one of which is placed in each side of the frame, and both connected together and turned simultaneously by the wheels and shaft u. That part S′ of the frame S in which the boxes of the rollers H G rest, is capable of being raised and lowered on the bolts I through a space equal to the greatest inequalities in the thickness of the lumber to be dressed, these rollers are pressed down upon the lumber by the forked spring D the ends of which slide upon the bolt. The tension of this spring is regulated by means of the nuts V so that the feed rollers G H can be made to compress the lumber between them with any degree of force required to push it through the planes. These rollers may be made of any convenient diameters, but I have found in practice sixteen inches to be a very good size.

The rollers may be smooth, fluted, or otherwise roughened on their surface, at the option of the builder, and are all geared together as represented in Fig. 2, and put in motion by the pulley Q which is mounted on the axis of the wheel b and receives its motion from a steam engine or other source of power. The wheel b drives the wheel l upon whose axis is mounted a smaller wheel d which gears into the wheels c c' placed upon the respective axes of the rollers E F turning them both in the same direction, as indicated by the arrows. Upon the axes of the wheels c' and g' the radial arms i i' are respectively placed, on which they are free to turn in an arc concentric with the wheels. On the outer ends of these arms respectively, the wheels f f' are secured on pivots on which they are free to turn, at such distance from the center of the wheels g' and c' that they will gear therein, and the arms, in whatever position placed, will keep them so geared. The arms i i' are brought toward each other, until the wheels f, f', upon their respective ends, gear together, they are then connected by a link i'' which is secured so that it will turn upon the projecting ends of the axes of the wheels f f', a strap being secured to the back of the arm i', which extends to the pivot of the wheel f which passes through it making this pivot the only hinge of the arms. On the axes of the upper rollers the wheels g, g' are mounted which are connected by the small wheel h these wheels agree exactly in their diameters, and in the size and numbers of their cogs with the corresponding wheels on the axes of the lower rollers E and F and the suspended connecting wheels f, f', being of equal diameter, and gearing into each other, and into the wheels c' g' it follows that the upper rollers G H will turn with precisely the same velocity as the lower rollers E F and toward the board, which runs through between them, as represented by the arrows, which show the direction of the motion of all the moving parts. It is plain that whether the upper and lower rollers be nearly or quite in contact, and the wheels which connect them deflected to one side as seen in Fig. 2, or separated to such a distance as will bring the wheels f f' into a line with them; that the motions of all will be continued and regular, this arrangement of the connecting wheels accommodating themselves to any changes in the position of the rollers. The boards are drawn in between these rollers, one after another, every succeeding board pushing through that which preceded it, and this is much more certainly and effectually accomplished by means of the four rollers E, F, G, H, arranged as represented, than could be done by two, because if two only were used a board with a thin end, could not be entered after one with a thick end, without difficulty, for the reason, that it would strike against it, but with four rollers the two front ones serve to force the board between the next two, and if necessary to push forward the preceding board, which under ordinary circumstances either pair of rollers is capable of doing.

The manner in which the upper rollers H G are held down by the spring D allows them to turn so as to accommodate themselves to the shape of the board to be passed through between them, so that a board with its opposite sides inclined will be held as firmly as one with parallel sides.

To render the entrance of the board under the planes more certain and to prevent the

first plane from splintering or tearing a cross-grained board by cutting too rank a shaving, I secure to the pendent part S″ of the frame S′ which projects down at the rear of the upper rollers G and H a yielding adjustable mouth-piece consisting of a rigid bar *w* secured to a stock *r* in either of the modes in which the mouth pieces are secured to the planes. I also attach a friction roller *k* to this part of the frame, to assist in guiding the board to the planes, this mouth piece being attached to the frame S′ which is governed by the spring D it, of course moves with the frame and rollers and conforms its position to the shape of the board, so as to form a throat suited to the shape and thickness of the first shaving.

The apparatus just described is capable of planing one side of a board only, but by attaching another set of planes and bed in a reversed position to the rear end of these the opposite side of the board can be planed at the same time, and also its edges by planes suitably arranged for the purpose, the manner of doing which is too obvious to require description, as it is merely a multiplication of the parts already described.

Having thus described the construction and operation of my improved planing machine, I wish to make known, that I do not claim the employment of one pair of feed rollers, nor the employment of feed rollers, nor stationary planes in themselves nor a bed composed of alternate friction rollers, and flat bars, when the rollers are made yielding by springs, or otherwise, as these things have before been used by others; but

What I do claim as of my invention, and which I desire to secure by Letters Patent, is:

1. The combination of the non elastic mouth piece *w* with the upper feed rollers H, G, it being attached to the frame in which they are mounted, and by which its position is so governed, that it accommodates itself to the surface and thickness of the first shaving cut off the board, substantially in the manner herein set forth.

2. I claim the combination of the series of stationary planes M, with the bed B composed of alternate unyielding anti-friction rollers *o* and flat cross bars *o′* the axes of the rollers being in the same vertical plane with the edges of the irons, so that their periphery may afford a constant support to one side of the board directly opposite to the point at which the iron is cutting the other, whereby the surface of the board, especially when it is thin, is rendered smoother, and its thickness more uniform, than if it were not thus firmly supported.

Boston, January 29th, 1849.

ENOS G. ALLEN.

Witnesses:

JOHN T. TASKER,
GEO. GREENLEAF.