2 Sheets—Sheet 1.

E. G. ALLEN.

PLANING MACHINE.

No. 181,893. Patented Sept. 5, 1876.

Fig. 1.

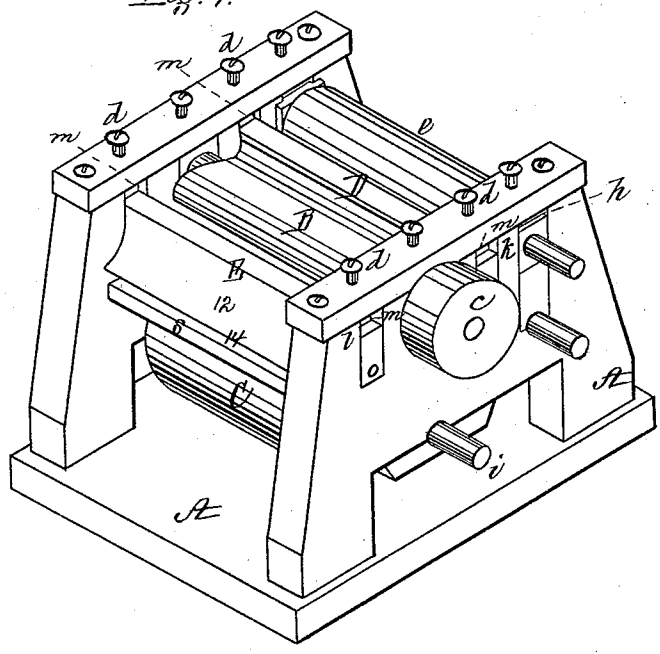
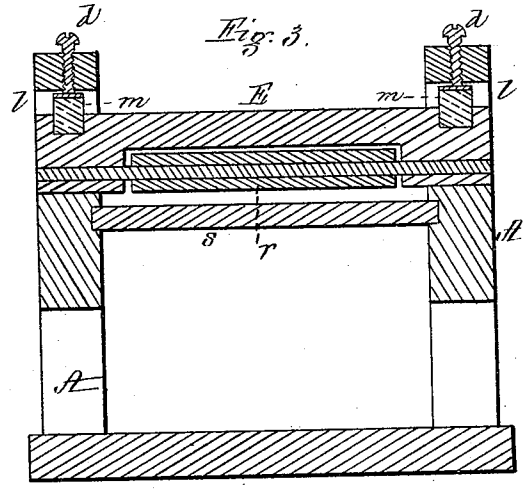


Fig. 3.



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2 Sheets—Sheet 2.

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PLANING MACHINE.

No. 181,893. Patented Sept. 5, 1876.

Fig. 2.

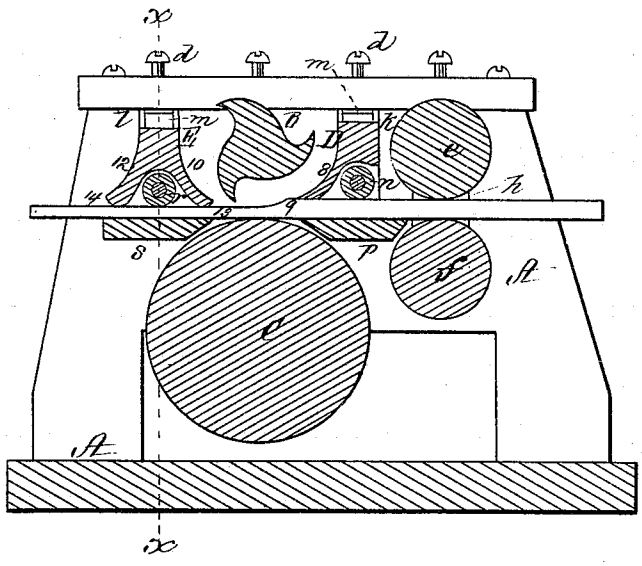


Fig. 5.

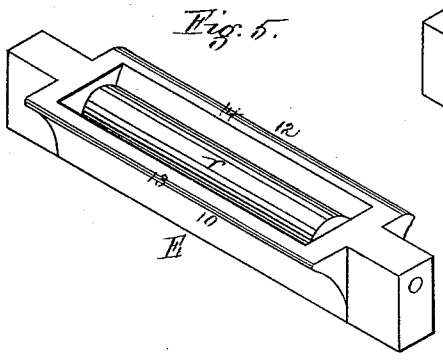
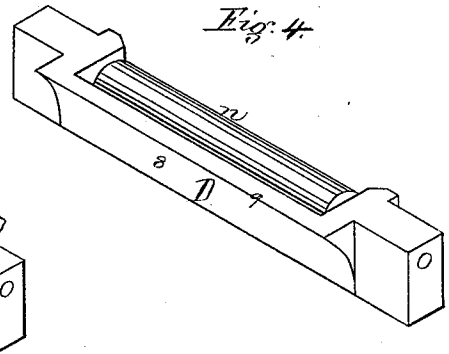


Fig. 4.



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UNITED STATES PATENT OFFICE.

ENOS G. ALLEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO EDWARD F. KENDALL, TRUSTEE, OF SAME PLACE.

IMPROVEMENT IN PLANING-MACHINES.

Specification forming part of Letters Patent No. **181,893**, dated September 5, 1876; application filed January 3, 1876.

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 Improvements in Planing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a planing-machine having my improvements applied thereto. Fig. 2 is a longitudinal vertical section through the center of the same. Fig. 3 is transverse vertical section on the line *x x* of Fig. 2. Figs. 4 and 5 are perspective views of the pressure-bars inverted.

My present invention relates particularly to the construction of pressure devices for holding the material to be planed firmly down upon the bed of the machine; and consists in a yielding pressure-bar having two bearing-edges and an intermediate friction-roller, in combination with other mechanism, as will be hereafter more fully set forth and claimed.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the frame-work of the machine, in which are placed the boxes of the journals of the cutter-cylinder B, which is rotated by a belt (not shown) passing over the pulley *c*. *e f* represent the feed-rolls, which are intended to be revolved by gears on the ends of their shafts, the boxes of their journals resting in slots *h* in the frame-work A. C is a cylinder or large roll, the shaft *i* of which runs in bearings in the frame-work, and is revolved by suitable connections. (Not shown.) The shaft of the cylinder C is situated in a vertical line under the axis of the cutter-cylinder B, the cylinder C serving as a bed for supporting the material along a single line only, immediately under the point where it is subjected to the action of the cutters; and by this means the friction is reduced to a minimum, as it is nearly all transferred to the journals of the cylinder C, and consequently much less power than heretofore is required to operate the machine; furthermore, the cylinder C acts as a feed-roll, and assists in drawing and forcing the material through the machine. D is a pressure-bar, placed in front of the revolving cutter-cylinder B, and E is a pressure-bar placed in the rear of the same, the ends of these bars resting in slots *k l* in the frame-work, and within these slots are placed springs *m*, which bear on the ends of the bars and serve to keep them firmly down upon the material, to hold it steadily during its passage through the machine, and also allow them to yield to conform to any inequalities in the surface of the material or variations in its thickness. Above each of the springs *m* is a screw, *d*, and by means of these screws the force of the springs and the consequent pressure of the bars D E upon the material is regulated as desired. The pressure-bar D, which is placed in front of the cutter-cylinder B—that is, between it and the feed-rolls—extends down on one side only at 8, this portion being curved in toward the cutter-cylinder, as shown in Fig. 2, its lower edge 9 bearing on the material in close proximity to the line along which the cutters are operating, and being placed at such a height that the material to be planed, as it comes under it, will raise it slightly against the resistance of the springs *m*, to produce the desired downward pressure to keep the material steady. The front or opposite side of the bar D is open, and within this bar is placed a friction or pressure roll, *n*, the journals of which revolve freely in the ends of the bar, the bottom of the roll *n* and the bearing-edge 9 of the bar being both in the same horizontal plane, and bearing with equal force upon the surface of the material, thus forming two separate parallel bearings, which exert a strong pressure upon the material, and hold it firmly down upon its bed against the lifting tendency of the cutters, the bearing-edge 9 serving as a chip-breaker, to prevent the tearing of the fibers and the dislodgment of knots and shakes.

The office of the roll *n*, besides that of exerting pressure, is to facilitate the entrance of the material thereunder, and to relieve friction—advantages not possessed by an ordinary flat pressure-bar. In a line vertically beneath the roll *n* is a stationary bar, *p*, which serves to support the material immediately

under the yielding pressure-bar D. The pressure-bar E, which is placed in the rear of the cutter-cylinder, extends down on each side at 10 12, the lower edges 13 14 of these portions or sides 10 12 being slightly rounded to facilitate the entrance and passage of the material thereunder. The side 10 extends under the path of the cutters, and bears on the material being planed in close proximity to the line along which the cutters are operating, being placed at such a height that the material, as it comes under the rounded edge 13, will raise it slightly against the resistance of the springs *m*, to produce the desired downward pressure to keep the material steady. The other side, 12, of the bar E is curved outward, its lower edge 14 resting on the smooth surface of the planed material. Between the two sides 10 12 of the bar E is placed a friction or pressure roll, *r*, the journals of which revolve freely in the ends of the bar, the bottom of the roll *r* and the bearing-edges 13 14 of the bar being all in the same horizontal plane, and bearing with equal force upon the surface of the material, the roll serving to relieve friction, three separate parallel bearings being thus formed, which exert a strong pressure upon the material, whereby the latter is kept squarely down upon its bed at all times, and its end prevented, after it has left the front pressure-bar D, from being tipped up, which would cause it to be chamfered off and spoiled by the cutters; and I am thus enabled to utilize this portion or end of the material, which has heretofore in many cases been imperfectly planed. In a line vertically beneath the roll *r* is a stationary bar, *s*, which serves to support the material immediately under the yielding pressure-bar E. If desired, friction-rolls may be substituted for the bars *p s*.

By the employment of the yielding pressure-bars D E, constructed as above described, the tremulous motion of the material under the rapid and powerful blows of the cutters is avoided, for the reason that the rolls and bearing-edges exert a strong pressure on the material being planed at various points, and it is thus held firmly down upon its bed close to the cutting-line, thereby preventing the dislodgment of knots or shakes, while the sides 10 12 of the bar E shield the roll *r*, and prevent chips and other small fragments from being caught under it and pressed down into the planed surface of the wood. Furthermore, by combining one or more bearing-edges with a friction-roll, the latter can be of much smaller diameter, and can consequently be placed much nearer to the path of rotation of the cutters than would be the case if a pressure-roll alone was employed.

I do not, broadly, claim a yielding pressure-bar, as I am aware that such a bar is described in the United States Patent of Joseph P. Woodbury, No. 128,462, dated April 29, 1873; but this bar affords an extended bearing-surface, and exerts a pressure on the material in close proximity to the line along which the cutters operate. There is no roll to relieve friction. I am also aware that a friction-roller has been used with one bearing point or line next to the cutter, as shown in the patent to S. W. Nelson, September 16, 1873. This I do not claim, broadly, such bearing allowing some vibration of the boards around the friction-roll as a fulcrum; whereas my pressure-bar possesses the combined advantages of a friction-roll and two separate bearings on the material, which hold it down close to the line in which the cutters operate, as firmly and with much less friction than a bar having an extended bearing-surface, or one with a friction-roller and a single other bearing point or line.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of a yielding pressure bar or bars, constructed as above described, the stationary bars or supports *p s*, placed immediately beneath them, and the rotating cutter, as described.

Witness my hand this 28th day of December, A D. 1875.

ENOS G. ALLEN.

In presence of—
P. E. TESCHEMACHER,
N. W. STEARNS.