No. 82,113. PATENTED SEPT. 15, 1868.

J. P. GROSVENOR.

MACHINE FOR PLANING AND MOLDING.

Fig. 1.

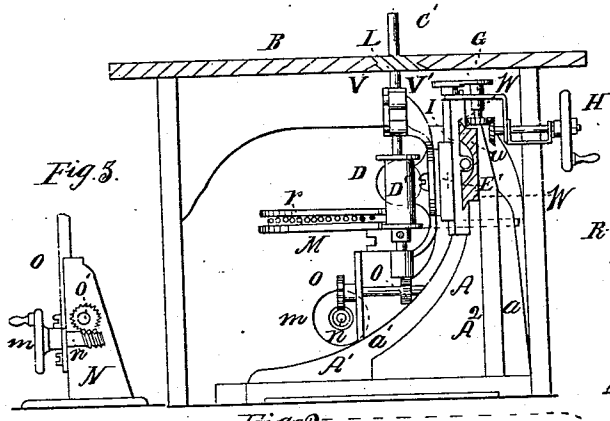


Fig. 3.

Fig. 4.

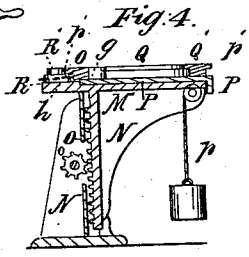
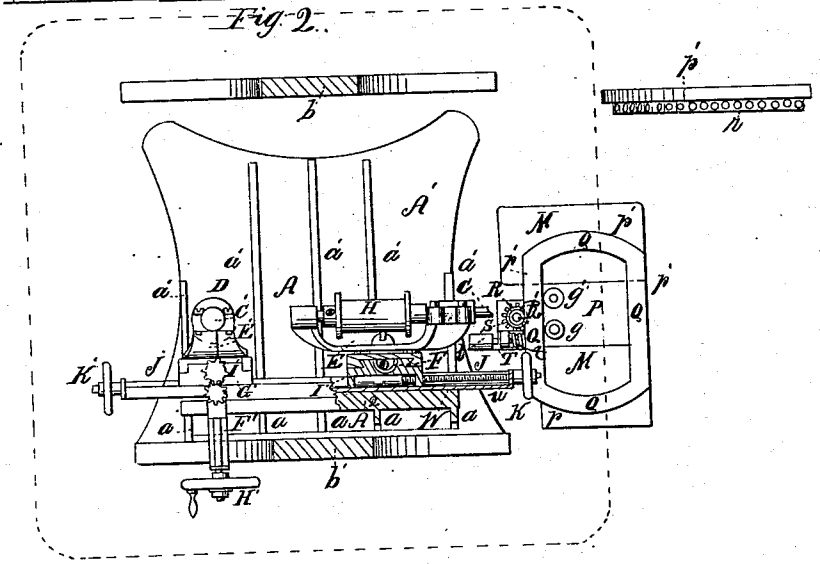


Fig. 2.



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United States Patent Office.

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Letters Patent No. 82,113, *dated September* 15, 1868.

IMPROVEMENT IN MACHINES FOR PLANING AND MOULDING.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. P. GROSVENOR, of Lowell, in the county of Middlesex, and State of Massachusetts, have invented a new and improved Machine for Moulding and Planing Irregular Forms and Curved Surfaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical cross-section.

Figure 2 is a horizontal section through the line *x x* of fig. 1, and a detached section of the pattern and rack.

Figure 3 is a detached view of the apparatus for regulating the height of the table M.

Figure 4 is a vertical section of the table M and its attachments through the line *y y* of fig. 2.

In this machine there are several improvements upon those heretofore in use, including a new method of constructing the table to prevent its jarring and vibrating, a new feeding-device for the manufacture of curved frames, and a new method of adjusting the cutters.

In the drawings, A represents the pedestal or frame, which supports the mandrels, cutters, shafting, pulleys, and belts, apparatus for adjusting the cutter-heads, &c.; and B is the working-table, upon which the materials lie during the operation of the machine.

The working-table is supported upon independent standards, *b b'*, and is not in any way connected with the pedestal A, whereby the vibrations of the latter, from the working of the machinery which it supports, are not communicated to the frames.

C C′ are the cutter-spindles or mandrels, driven by pulleys, D D′, which can be adjusted vertically by means of screw-rods, F F′, gearing G G′, and hand-wheels H H′, and laterally by means of sliding supporting-frames, I I′, screw-rods, J J′, and hand-wheels, K K′. The cutter-mandrels are supported by the vertically-sliding frames, and the latter by the laterally-sliding frames, so that the cutter-heads can be adjusted both vertically and laterally to any extent desired.

Inasmuch as the mandrels and cutter-heads are capable of moving laterally, the table B must have some provision to accommodate this motion. I accordingly cut gains or slots, *v v'*, in said frame, in which the mandrels may move, and I provide a dove-tailed slide, L, to fill so much of such slots as is not occupied by the mandrel, so as to furnish, as far as possible, a smooth, even surface upon which to do the work conveniently.

In connection with the machine, as thus far described, I employ, for the purpose of moulding or cutting curved frames, such as picture-frames, &c., a table, M, supported upon a standard, N, and capable of being adjusted vertically by means of a slide, O.

The adjusting-apparatus consists of a small shaft having a spur-wheel, *a*, working in a vertical rack on the back of the slide O, and operated by a spur-wheel, *o'*, and worm-shaft, *n*, the latter having a hand-wheel or crank, *m*, in a convenient position for the operator to reach during the progress of his work. The table M is arranged directly under the cutter-head C.

P is a horizontal slide in the centre of the table M, capable of working back and forth across the table in a line with the cutter-mandrel, and having a cord, pulley, and weight, *p*, by which it is kept in position when not moved by other force. This slide supports two vertical guide-rolls, *g g'*, which direct the motion of the pattern Q of the article to be moulded. These guide-rolls may be nearer together, or farther apart, according to the width of the pattern, and any adjusting-apparatus may be employed in connection with the slide P to vary at pleasure the distance between the guide-rolls which it supports.

The pattern itself is of a new form, having a rebated periphery, as seen in figs. 1 and 5, the outer portion or flange, *p'*, of which is smooth. the inner portion having a rack, *r*, around it. This rack may be permanently attached or made rigid, or it may be made in the shape of an elastic or flexible perforated band, as seen in figs. 1 and 4, and slipped upon the rebated portion of the edge of the pattern.

The advantage of using an elastic or flexible band as a removable or adjustable rack is that such a band can be applied to a pattern of any form, oval, elliptical, circular, &c., &c., thereby obviating the necessity of having a rack cast upon every pattern that may be used, and greatly diminishing the expense of the apparatus.

The pattern thus constructed is placed upon the table M, under the cutter-head, and with the two guide-rolls $g\,g'$ bearing against its inner surface, as seen in fig. 2. In that situation a small spur-wheel, R, bears against the outer edge of the pattern, the spurs of the wheel entering the rack r, and, when the wheel is put in motion, feeding the pattern and material to be moulded to the action of the cutter-head. Were the spurs of the wheel R the only thing that came in contact with the outer edge of the pattern, the motion of the latter would be irregular and vibrating, the action of the spurs themselves having a tendency to produce that effect. To counteract such tendency, as far as can be done, I provide a roll, R′, rigidly attached to the upper side of the spur-wheel R, and revolving with it, and so much smaller in size than the spur-wheel, that while the spurs of the latter are in contact with the rebated edge of the pattern, or the rack upon it, the perimeter of the former will bear against the outer edge of the flange at p', and thus, in connection with the inner guides $g\,g'$, will give the pattern an even, uniform movement as it travels round on the table.

It will be noticed, from the above description, that the perforated strap does not govern the position of the pattern with relation to the moulding-cutters, but serves only to feed the pattern forward. Any irregularity in the strap or its perforations would cause the pattern to be thrown farther from the wheel R at one time than at another, and, as a consequence, the cutters would form an irregular and uneven moulding. The flange p' of the pattern overcomes this difficulty effectually, as it bears with an even and constant pressure against the smooth roller R′. When the front surface of the frame has been properly planed or cut, it is transferred with the pattern to the table B and its edges dressed. Here again the utility of the rebated pattern is shown, in holding the perforated strap out of contact with the cutters. If the pattern were not rebated, the frame to be dressed would have to be removed to prevent the revolving guide of the cutter-head from coming in contact with the metal strap.

The combined feed and guide-wheel R R′ is attached to a vertical shaft, S, to which motion is communicated from a pulley, t, on a horizontal shaft, T, the horizontal and vertical shafts being connected by means of a worm-screw, t', on the former, gearing into a spur-wheel, s, on the latter.

I have employed many different devices for operating the feed-apparatus above described, but have found none which combine power, with easy, uniform action, to such a degree as the worm-screw and pinion.

It will be observed that the standard b, which supports one end of the table B, is of such a form as to leave an open space, in which the driving-belts that operate the mandrel C and the pulley t can work freely, and without coming in contact with any part of the machinery or the tables. It will further be observed that the ways $w\,w$, on which the lateral slides I I′ run, are attached to or form a portion of a horizontal plate, u, which extends transversely across the upper end of the frame or pedestal A, projecting so far beyond the side of that pedestal which is adjacent to the moulding-table M, that the latter can easily operate beneath the projecting portion. This enables the cutter-head C to be adjusted to better advantage, inasmuch as its movement outward is not limited by the proximity of the table. The transverse plate or beam u will, of course, be made very strong and firm, as it supports all the working-machinery. The form of the pedestal or frame A, to which it is attached, is such as to hold it firmly, and yet to leave nearly all the space under the table B open, such space being entirely unobstructed by the complication of cross-beams, braces, &c., that are usually to be found in devices for this purpose. It is intended that this pedestal or supporting-frame shall be cast in one solid piece.

The pedestal, it will be observed, is composed of a horizontal bed, A^1, having an upright plate, A^2, cast near one of its edges, and having narrow buttresses, $a\,a\,a\,a\,a$, supporting the plate on one side, and thin but wider ones, $a'\,a'\,a'\,a'\,a'$, on the other side, the outer edge of the central buttresses on this side extending in a graceful curve from the lower edge of the plate u, to the outer edge of the bed-plate, while that of the end buttresses extends only to the middle of the bed-plate. This forms a very firm and substantial support for the working-machinery, much superior, in the practical working of the machine, to the old frames employed for a similar purpose.

It may be mentioned here that when it is desired to trim the edges of the picture-frame, or other article which has been moulded, the form of the pattern having the smooth flange p' is peculiarly adapted to the purpose. In this operation, the vertical cutter C′ is employed. The pattern having the moulded article attached is removed from the table M, and when applied to the vertical cutter-head the smooth perimeter of the flange p' moves round in contact with the cylindrical portion or guide of the cutter-head, guiding the article evenly and uniformly around the cutter-head, while the cutters are applied to its edge, giving the latter a smooth and uniform curve, the counterpart of that formed by the upper edge of the pattern.

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

1. The combination of the swinging-mandrel frame with the vertically-adjustable slide E and laterally-adjustable slide I, substantially as described for the purpose specified.

2. The pattern, constructed, as described, with a rebated outer edge, in combination with the perforated rigid or flexible rack r, substantially as described for the purpose specified.

3. The rigid or flexible rack r, constructed as described, and adapted to be applied to a pattern to be used in cutting irregular forms, substantially as herein shown and described.

4. A pattern, Q, provided with a rack, r, around its outer edge, to assist the process of feeding the wood to the cutter-head.

5. The feed-wheel R R′, when constructed of the two parts R R′, so as to operate, in connection with a pattern having a rebated outer edge, in the manner described.

To the above specification of my invention, I have signed my hand, this 13th day of April, 1868.

J. P. GROSVENOR.

Witnesses: