2 Sheets--Sheet 1.

S. H. WILDER.

Mortising-Machine.

No. 162,987. Patented May 4, 1875.

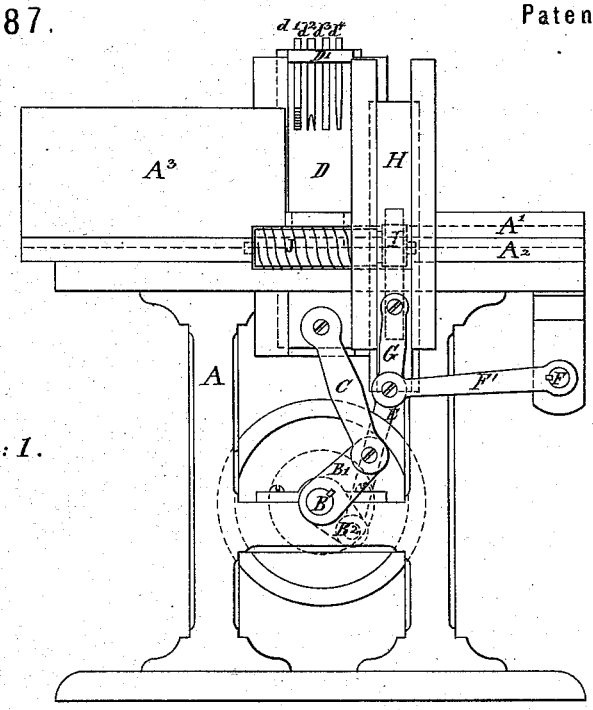

Fig: 1.

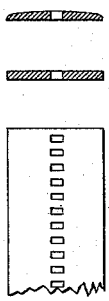

Fig:17.

Fig:16.

Fig:15.

Fig: 4. Fig:5. Fig:6. Fig:7. Fig:8. Fig:9. Fig:10.

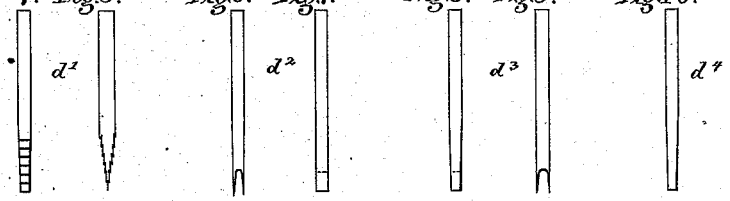

Fig: 13.

Fig:11.

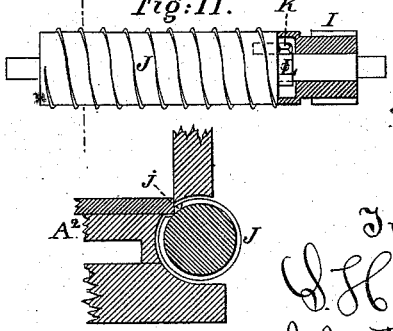

Fig:12.

Fig:14.

Witnesses:

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M. A. Van Namee

Inventor:

S. H. Wilder

by his attorney

J. L. Ellison.

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2 Sheets--Sheet 2.

S. H. WILDER.

Mortising-Machine.

No. 162,987. Patented May 4, 1875.

Fig: 2.

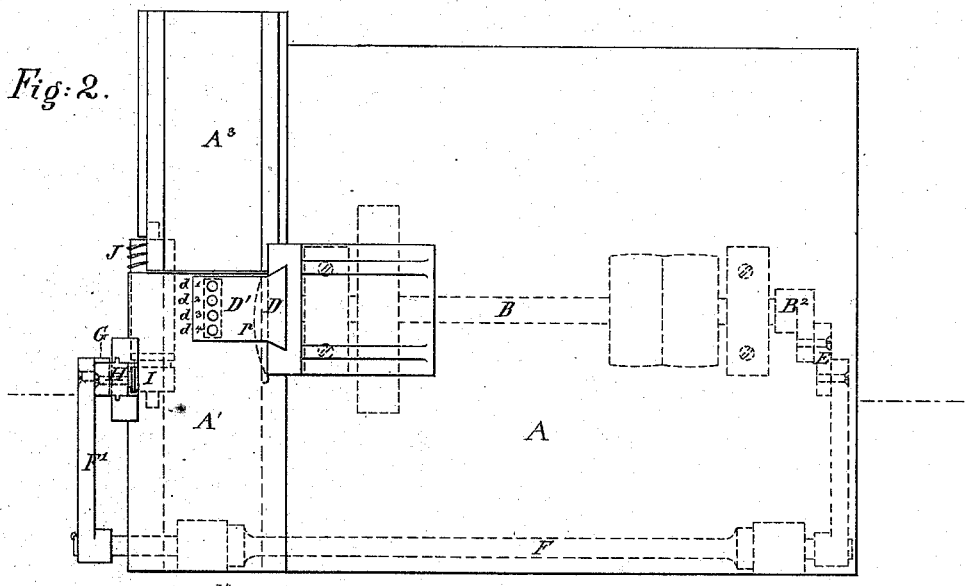
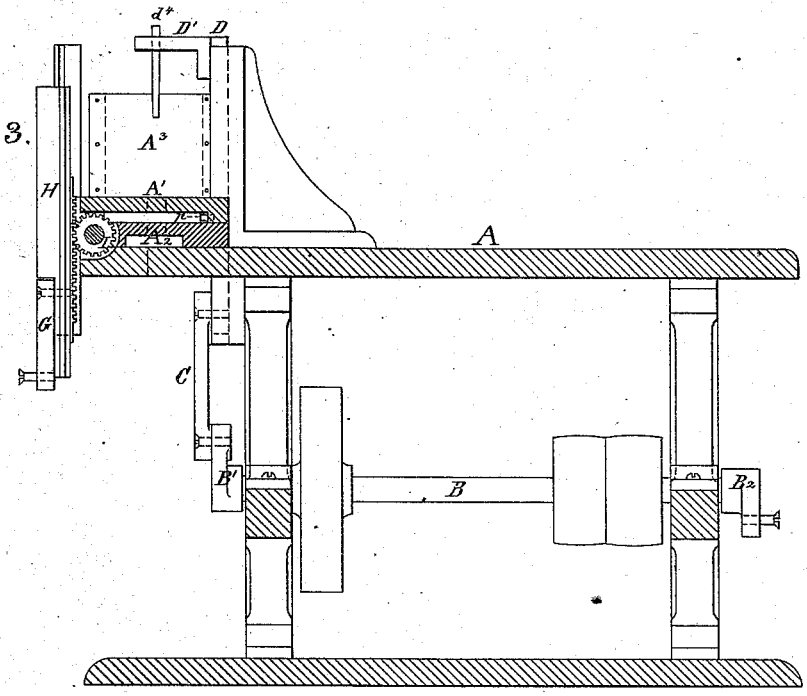


Fig: 3.



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UNITED STATES PATENT OFFICE.

SALMON H. WILDER, OF MERIDEN, ASSIGNOR TO PRATT, READ & CO., OF DEEP RIVER, CONNECTICUT.

IMPROVEMENT IN MORTISING-MACHINES.

Specification forming part of Letters Patent No. **162,987**, dated May 4, 1875; application filed March 19, 1875.

To all whom it may concern:

Be it known that I, SALMON H. WILDER, of Meriden, New Haven county, Connecticut, have invented certain Improvements in Mortising-Machines, of which the following is a specification:

The machine is particularly adapted for mortising what are termed buttons, one of which is glued upon the back of each key of a piano to hold and protect the felt which lines the hole in which the fulcrum-pin stands. Strips of wood of proper section to form the buttons are automatically fed forward to the proper extent at each reciprocation of the mortising-tools, and a series of tools are carried in a single mortising-head, so arranged that when one tool produces a rough hole of nearly the proper size at one point another tool is smoothing two sides thus roughed out at a previous stroke, and still another tool is smoothing two other sides of the one still earlier roughed out. I employ, preferably, four tools thus mounted together, the function of the last being simply to push out any chips which may remain in the hole after all the four sides have been smoothly finished. The wood is supplied in considerable quantities in a hopper, and the lowermost piece is fed forward. The feeding is performed by a screw, operated intermittently, taking hold of the wood near one edge. The threads of the screw are sharp, and adapted to act with certainty on the wood; but a portion of each thread is omitted along so much of the length as extends into the hopper, so that in one position the screw presents a smooth surface along which the wood may be readily pushed.

The following is a description of what I consider the best means of carrying out the invention. The accompanying drawings form a part of this specification.

Figure 1 is an end elevation. Fig. 2 is a plan view, and Fig. 3 a longitudinal section. (The remaining figures represent parts detached.) Figs. 4 and 5 are two views of the first or roughing tool. Figs. 6 and 7 are two views of a smoothing-tool which finishes the sides of the mortise. Figs. 8 and 9 are corresponding views of a tool which finishes the ends. Fig. 10 is a punch, of rectangular section, to remove the chips. Fig. 11 is an elevation, partly in section, representing the screw or screw-cylinder with some of the means for driving it. Fig. 12 is a cross-section of the same. Fig. 13 is an end view of the screw, with the pawl mounted thereon, and the spring which tends to press the end of the pawl outward. Fig. 14 represents the adjacent end of the gear-wheel, showing the hollow space in which the pawl may stand while the gear-wheel traverses idly backward, and the single notch in which it engages the pawl to turn the screw forward. Fig. 15 is a top view of a portion of the material after it has been mortised by this machine, and before it has been divided into separate buttons. Fig. 16 is a section representing it with both the upper and lower faces plane, the condition in which I prefer to mortise it. Fig. 17 is a section of the same after it has been rounded on the upper face by machinery, not represented, and thus prepared to better serve its purposes in a piano.

Similar letters of reference indicate like parts in all the figures.

A is a fixed frame-work, of wood or other suitable material, and B is a shaft, revolving on bearings therein, and provided with pulleys and a fly-wheel for obtaining a steady motion through the medium of a belt, not represented. B^1 is a crank, keyed on the shaft B, and communicating motion through a link or connecting-rod, C, to a vertical slide, D, which is adapted to reciprocate vertically in guides in the framing, and which has a stout overhanging arm, D′, at the top, with provisions for firmly holding the tools d^1 d^2 d^3 d^4. At each revolution of the crank B^1 these tools are caused to plunge down through holes in a covering-piece or clearing-plate, A^1, and also through corresponding holes in a bed-piece, A^2, below. The space between the bed-piece A^2 and the clearing-plate A^1 is very little more than the thickness of the buttons, or of the blanks therefor which are to be mortised. On the opposite end of the shaft B is a shorter crank, B^2, which gives motion, by means of a link, E, and an arm or lever, to a rocking shaft, F, turning in bearings in the framing. From an arm, F′, on the front end of this

shaft, the motion is communicated through a link, G, to the slide H, which is adapted to reciprocate vertically in the framing A. On one face of this slide H is a rack, which engages with a spur-gear wheel, I, and compels the latter to turn a very little more than one complete revolution alternately in opposite directions. This gear-wheel I runs loosely on the shaft of the screw J. The latter is a solid cylinder, having a sharp screw-thread projecting nearly all the way around, and with a smooth place along the line *j*. The gear-wheel I is hollowed out at one end, and in the cavity thus produced is inclosed a spring-pawl, with provisions for communicating the proper intermittent motion to the screw. In the adjacent end of the screw is a pin which carries a pawl, K, subject to the action of the spring L, which forces it constantly outward with a gentle force against the interior of the inclosing-rim of the gear-wheel. The latter is notched at one point, *i*, as shown in Fig. 14. At each revolution of the gear-wheel I, in one direction, this notch *i* receives the end of the pawl K and communicates the motion to the screw J. The threads of the screw J are of just the proper pitch to correspond with the distance between two of the mortising-chisels or the width of the button. It follows that, at each revolution of the shaft B, the mortising-tools d^1 d^2, &c., descend into and through the wood which is to form a series of buttons, and at each ascent of the mortising-tools the wood is fed forward to exactly the right extent. In case the wood, on first presenting it to the screw, is not set in exactly the right position it can be readily pushed forward on the screw, because the screw stops, after each movement, in such a position as to present only its smooth part *j* to the wood.

In practice, a deep rectangular hopper, A^3, is provided, of a width a little more than equal to the width of the strips of wood to be treated, and the wood is placed therein in considerable quantities, taking care simply to lay the pieces in the proper position upon each other. The screw J acts on the lowermost piece, seizing each piece and commencing to move it forward under the clearer A^1 as soon as the preceding piece has passed from under it, so as to allow it to drop down. A spring, *p*, is fixed in the bottom of the hopper on the side opposite to the screw. It presses the wood over hard against the screw. It may be better in most cases to mount this spring on the opposite side, so as to press the wood back from the screw. Its chief function is to produce a little friction. The omission of a portion of each thread in that screw for such portion of its length as extends into the hopper is important, not only in allowing the piece to be pushed forward by hand without resistance from the screw until it abuts against the end of the preceding piece, if ever such a movement is required, but also by letting the wood drop squarely down, so that it rests flat on the bottom of the hopper without feeling the threads of the screw. After a piece has thus dropped and the screw commences to rotate, the screw is certain to get hold of it and cut its threads properly into its corner without lifting it. To avoid splintering and leaving a rough surface around the lower edge of the mortise I fill the holes in the bed-piece A^2, below the mortising-tools d^2 d^3, with blocks of wood, preferably box-wood, placed with the grain standing vertically. This makes a firm support for the wood around the mortise, and the tools strike upon and slightly into it at each stroke, thus completing a clean cut.

I claim as my invention—

1. The gang of mortising-tools d^1 d^2, &c., elevated and depressed together, in combination with an intermittent-feed mechanism, which moves the wood between each stroke to an extent equal to the distance of the tools apart, as herein specified.

2. The hopper-box A^3, feed-screw J, intermittent impelling mechanism H I K L, and mortising-cutters d^1 d^2, combined and arranged as herein specified.

3. The feed-screw J, having a smooth place, J′, for allowing the wood to be moved forward by hand when the screw is at rest, in combination with the hopper or guide A^3 and the mortising-cutters d^1 d^2, &c., as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 28th day of November, 1874, in the presence of two subscribing witnesses.

SALMON H. WILDER.

Witnesses:

C. P. IVES,

JAMES P. PLATT.