

(No Model.)

3 Sheets—Sheet 1.

A. D. LINN.

WOOD WORKING MACHINE.

No. 359,453.

Patented Mar. 15, 1887.

Fig. 1

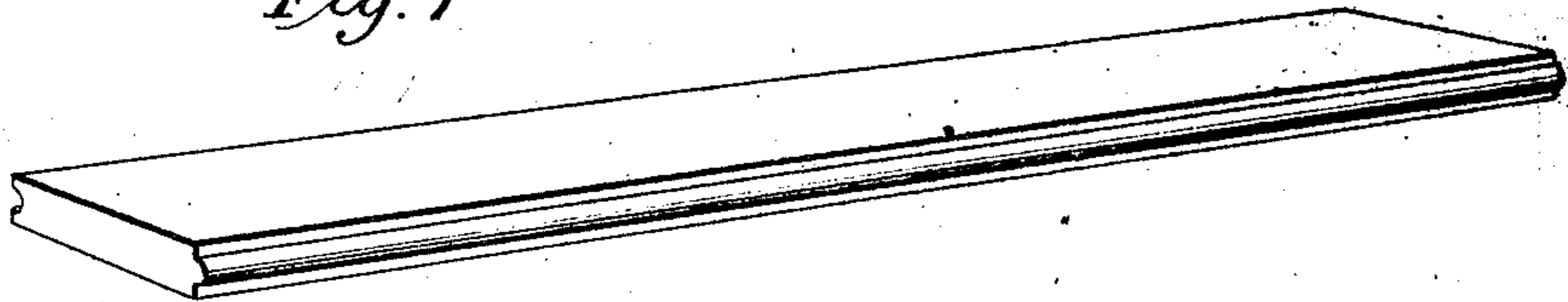


Fig. 2.

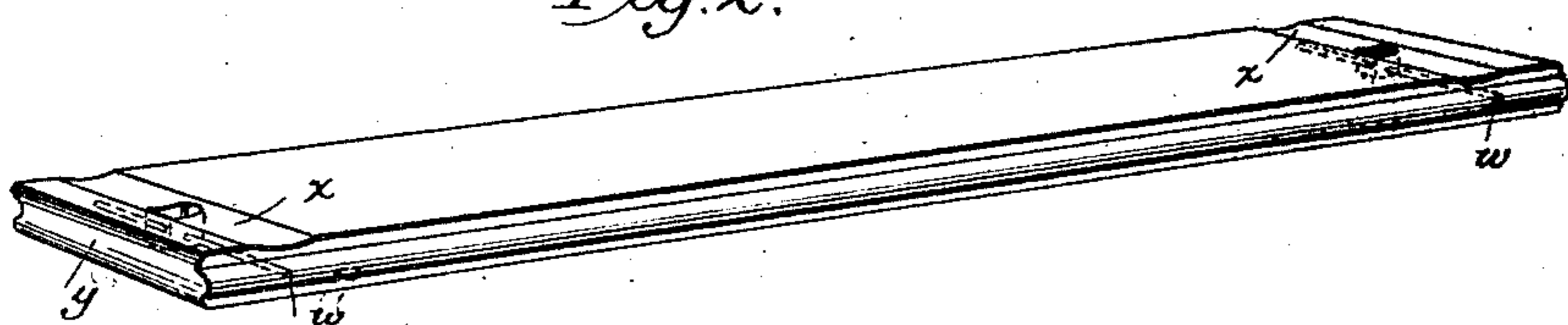
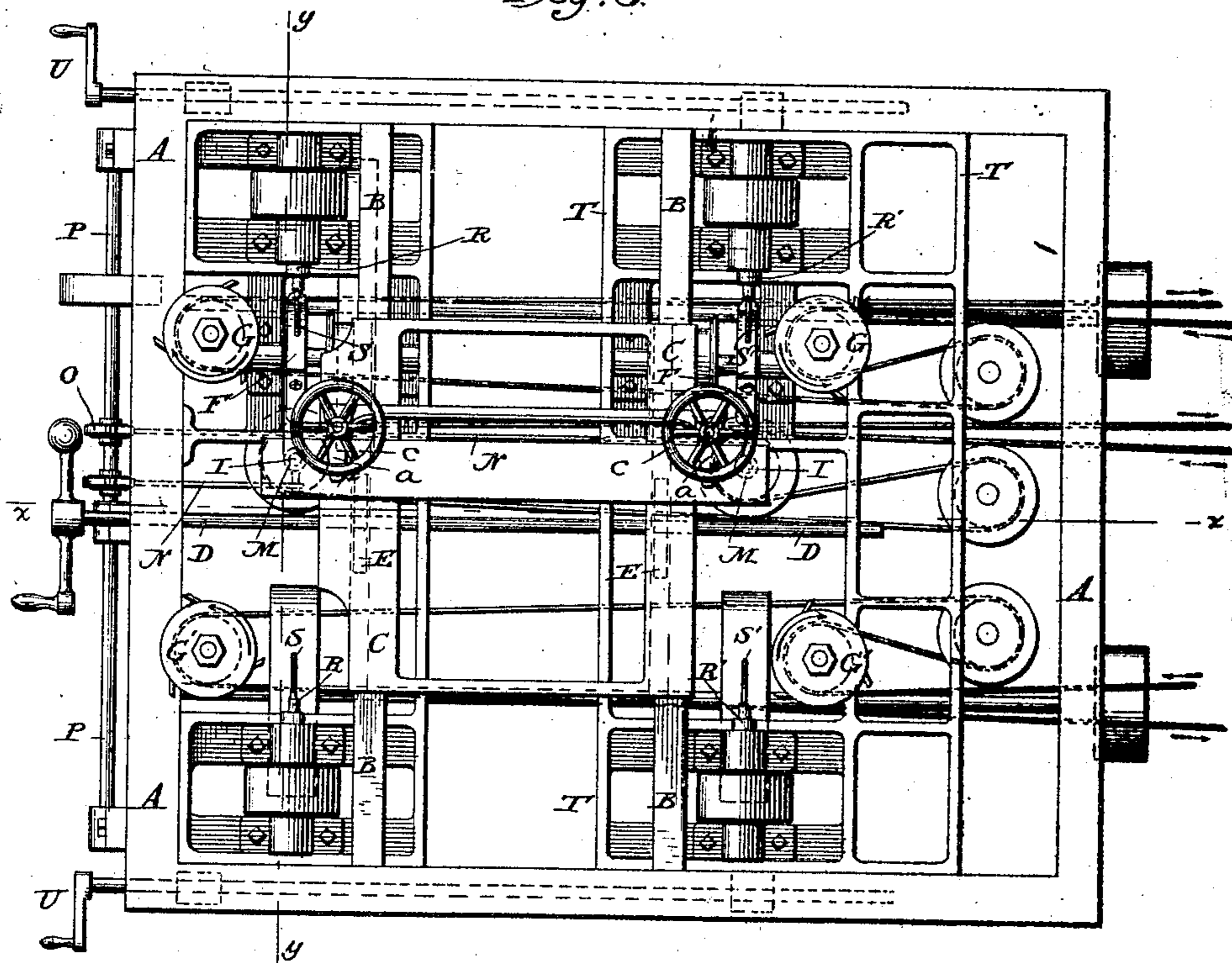


Fig. 3.



Attest.

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Fig. 4.

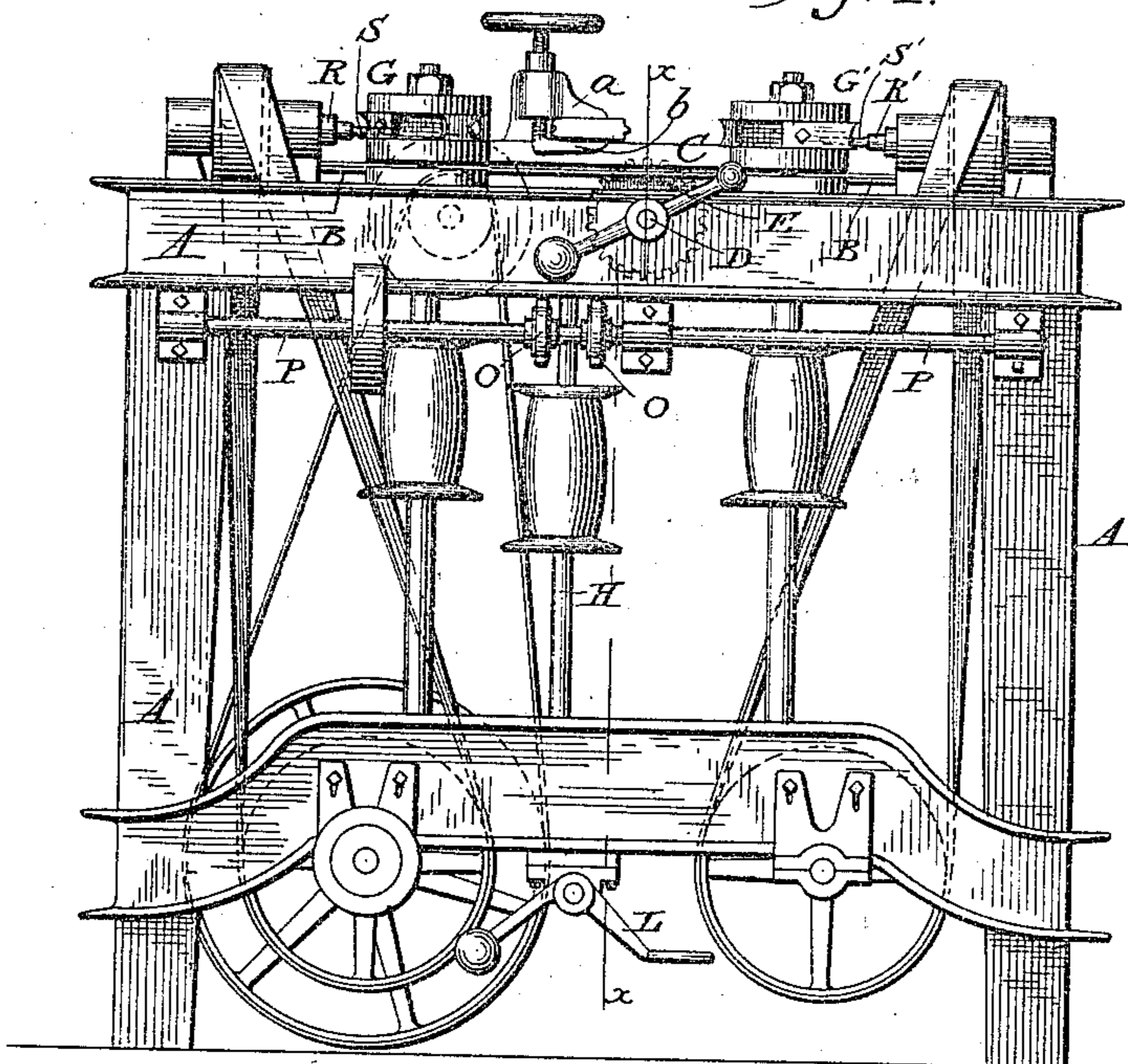
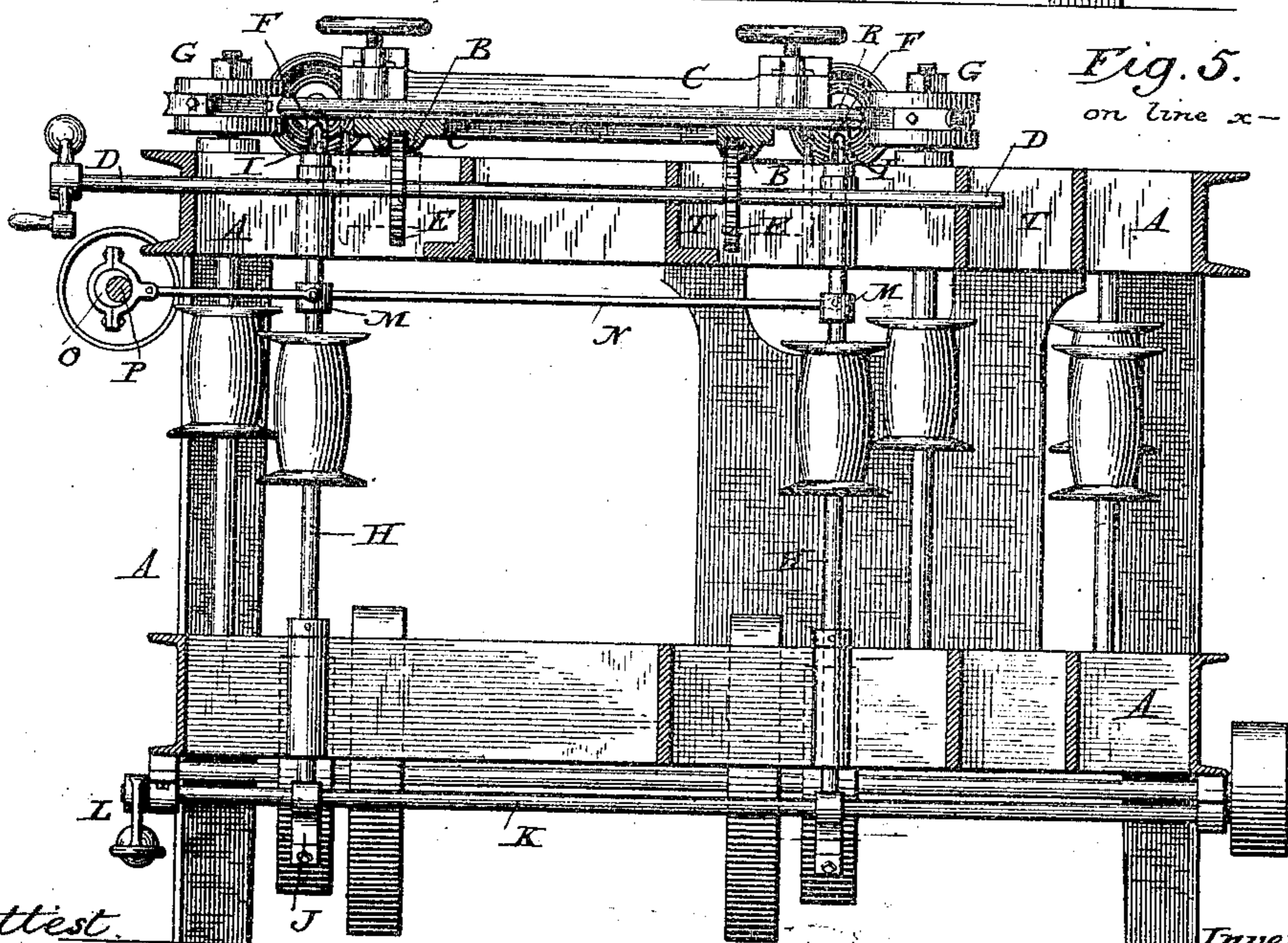


Fig. 5.

on line x-x



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(No Model.)

3 Sheets—Sheet 3.

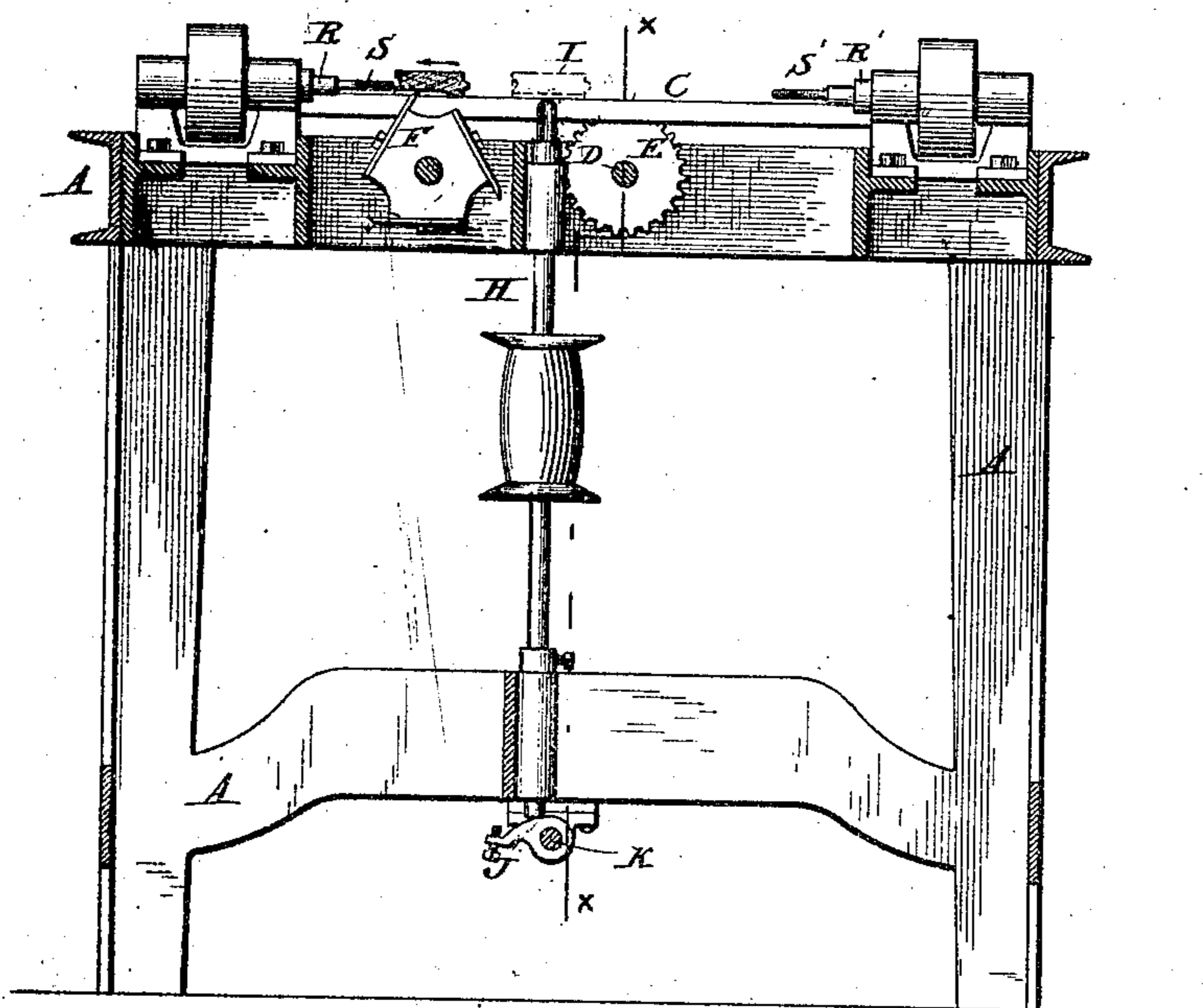
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Fig. 6.

ON LINE Y-Y



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UNITED STATES PATENT OFFICE.

ALLEN D. LINN, OF RACINE, WISCONSIN, ASSIGNOR TO THE RACINE HARDWARE MANUFACTURING COMPANY, OF SAME PLACE, AND THOMAS KANE, OF CHICAGO, ILLINOIS.

WOOD-WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 359,453, dated March 15, 1887.

Application filed April 20, 1886. Serial No. 199,497. (No model.)

To all whom it may concern:

Be it known that I, ALLEN D. LINN, of Racine, in the county of Racine and State of Wisconsin, have invented certain Improvements in Wood-Working Machines, of which the following is a specification.

This invention relates to a machine especially adapted for shaping and finishing wooden slats to be used in the backs and seats of school furniture, settees, and other furniture.

The slats which it is the design of this machine to complete are used in connection with supporting arms or frames having ears which enter the slats and are secured therein by transverse pins.

The machine is designed to perform the several operations of rounding the ends of the slats, of forming a score or depression in their under side, of forming a mortise or recess to receive the ear, and of boring holes to receive the fastening-pins or dowels.

To this end it consists in the peculiar construction and organization of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view showing one of the slats upon which my machine is designed to operate. Fig. 2 is a perspective view of the same when completed. Fig. 3 represents a top plan view of my machine. Fig. 4 is an end elevation of the same. Fig. 5 is a vertical cross-section on the line $x x$. Fig. 6 is a vertical cross-section on the line $y y$.

A represents the rigid main frame, which may be of any suitable form and construction adapted to sustain the various parts hereinafter described. On suitable horizontal guides, B, at the top of the frame I mount a sliding carriage, C, designed to hold and carry the slats in a horizontal position while the various cutting-tools are acting thereon. At each end this carriage has an overhanging arm, a , to bear on top of the slat, and an underlying clamp, b , which rises beneath the slat to hold the same in position. This clamp is connected by a screw with a hand-wheel, c , by which it is actuated. The slat being introduced, as shown in Figs. 4, 5, and 6, and secured by the clamps, is held firmly in place on the carriage, so that it may

be moved horizontally across the top of the machine in a direction transverse to its own length, its ends projecting beyond the clamping devices in position to be operated upon by the various devices hereinafter described. For the purpose of moving the carriage to and fro, I mount on the top of the frame a horizontal shaft, D, provided with a hand-clamp and with two pinions, E, which engage racks on the under side of the carriage.

At each side of the machine I mount on a horizontal shaft or arbor a vertically-revolving cutter-head, F, having peripheral knives of a form adapted to cut the score or groove x in the under side of the slat as the latter is carried over the head by the movement of the carriage.

For the purpose of rounding the ends of the slats, as shown at y , Fig. 2, I mount at each end of the machine two horizontally-revolving cutter-heads or shapers, G and G', having their edges and knives of concave form. The heads G and G' are separated horizontally to a considerable extent, and are in such position that as the carriage is moved to and fro it will be presented to the two heads successively, each head acting to cut half-way across the end of the slat from the outer edge inward. By thus using two heads, each acting inward toward the middle of the slat, I avoid the chipping or splintering of the edge of the slat which would occur were the slat carried entirely past either head.

It is obvious that the cutters of the heads G G' may be given any form or curvature desired, according to the shape demanded for the end of the slat.

For the purpose of forming the mortises on the under side of the slat, I mount in each end of the frame a vertical spindle, H, provided with a boring-tool, I. Each spindle is free to slide vertically to a limited extent, and is supported at its lower end on an eccentric, J, secured to a horizontal rock-shaft, K, which is mounted on the main frame and provided at one end with a weighted foot-lever, L, as shown in Figs. 4 and 6. The spindle stands normally in a lowered position, with the point of the boring-tool below the path of the slat, so that

the carriage and slat may be moved freely thereover; but the operator may, by depressing the hand-lever, lift the spindle and boring-tool at will until the latter enters the slat above.

In order that the boring-tools may form the elongated openings or mortises, they are given a lateral vibratory motion by connecting their upper boxes or bearings, M, to rods N, the outer ends of which are carried by eccentrics O on a constantly-revolving shaft, P, mounted horizontally in bearings on the main frame. It will be observed that the boring-tools receive, first, a rotary motion; second, a lateral motion, and, third, a vertical motion at the will of the operator. Owing to these three movements, they act when the slat is brought thereover to form the elongated opening or mortise in its under side.

For the purpose of forming the pin-holes in the slats from their outer edges inward to the mortise, I provide the top of the machine at each end with two horizontal spindles, R R', separated a considerable distance from each other, and provided, respectively, with boring-tools S S', projecting inward and arranged directly opposite each other. These tools are in such position that they will alternately enter the slot from opposite edges as the slats are moved to and fro past the shaping-heads G G'.

In order to impart motion to the various mechanisms, I secure the shaping-heads G G' and the boring-spindles H to vertical shafts mounted in the frame, and provide them with pulleys to receive driving-belts. The horizontal boring-spindles R and the horizontal shafts for the cutter-heads F and the shafts P are also provided with pulleys. Driving-belts may be applied to these various pulleys either in the manner represented in the drawings or in any other appropriate manner, this arrangement of the belting, which is susceptible of many modifications, falling within the province of the skilled mechanic.

In order to adapt the machine for operating on slats of different lengths, I propose to mount the three boring-spindles, the cutter-head F, and the two shaping-heads at one end of the machine in a secondary frame, T, arranged to slide horizontally in the main frame. This sliding frame I connect with hand-screws U, or equivalent devices, by which it may be adjusted and fixed in position.

In order to permit the rising motion of the mortising-tool, and thus regulate the depth of the mortise, I propose to provide the eccentric J, by which the spindle is lifted, with a stop-screw in its end, as plainly shown in Fig. 6.

Having thus described my invention, what I claim is—

1. In a machine for finishing furniture-slats, the combination of two widely-separated shaping-heads to act on one end of the slat, and an intermediate carriage movable from one head toward the other, as described and shown, whereby each shaping-head may be caused to

act partly across the end of the slat from its outer edge inward, thus finishing the entire end of the slat and avoiding the splintering of its edges.

2. In a machine for finishing furniture-slats, the combination of the horizontally-reciprocating carriage to sustain the slat, the horizontal boring-tool S, arranged in position to enter the edge of the slat as it is advanced by the carriage, and a shaping-head revolving about a vertical axis in position to act against the outer end of the slat as the latter is carried past it by the carriage.

3. In a machine for finishing furniture-slats, the combination of two opposing boring-tools, S and S', two shaper-heads, G G', arranged adjacent to the respective boring-tools and in the described relation thereto, to act upon the ends of the slats, and an intermediate reciprocating carriage, whereby the slats may be presented to the respective boring-tools and shapers successively.

4. In a machine for finishing furniture slats, the combination, substantially as described and shown, of two opposing boring-tools, an intermediate reciprocating carriage for presenting the slats to the respective tools in succession, the two shaper-heads arranged adjacent to the boring-tools and in position to act upon the ends of the advancing slats, and the intermediate mortising-tool I, acting in a direction at right angles to the boring-tool, whereby the machine is adapted to finish the end of the slat, to mortise its under side, and form a hole therethrough.

5. In a machine for finishing furniture-slats, the combination of two opposing boring-tools, an intermediate reciprocating carriage, two shaping-heads arranged adjacent to the boring-tools in position to act upon the ends of the slats, an intermediate scoring or grooving-head, F, to act on the under side of the slats, and the mortising-tool I, arranged between and in line with the boring-tools.

6. In a machine for finishing furniture-slats, the combination, substantially as described and shown, of the reciprocating carriage to support the slats, the four shaper-heads G G', arranged in the position described and shown, to act on the ends of the slats, the two pairs of opposing boring-tools, and the two mortising-tools located between the boring-tools.

7. In combination with the rotary boring-spindle H, the adjustable eccentric J, and its operating-lever for moving the spindle endwise, the movable bearing for the upper end of the spindle, and the eccentric O, connected therewith.

In testimony whereof I hereunto set my hand in the presence of two attesting witnesses.

ALLEN D. LINN.

Witnesses:

FRANK CLYDE KELLER,
JOHN F. BICKEL.