C. J. HARDEE.

WOOD-WORKING MACHINE.

No. 193,331. Patented July 24, 1877.

Fig. 1.

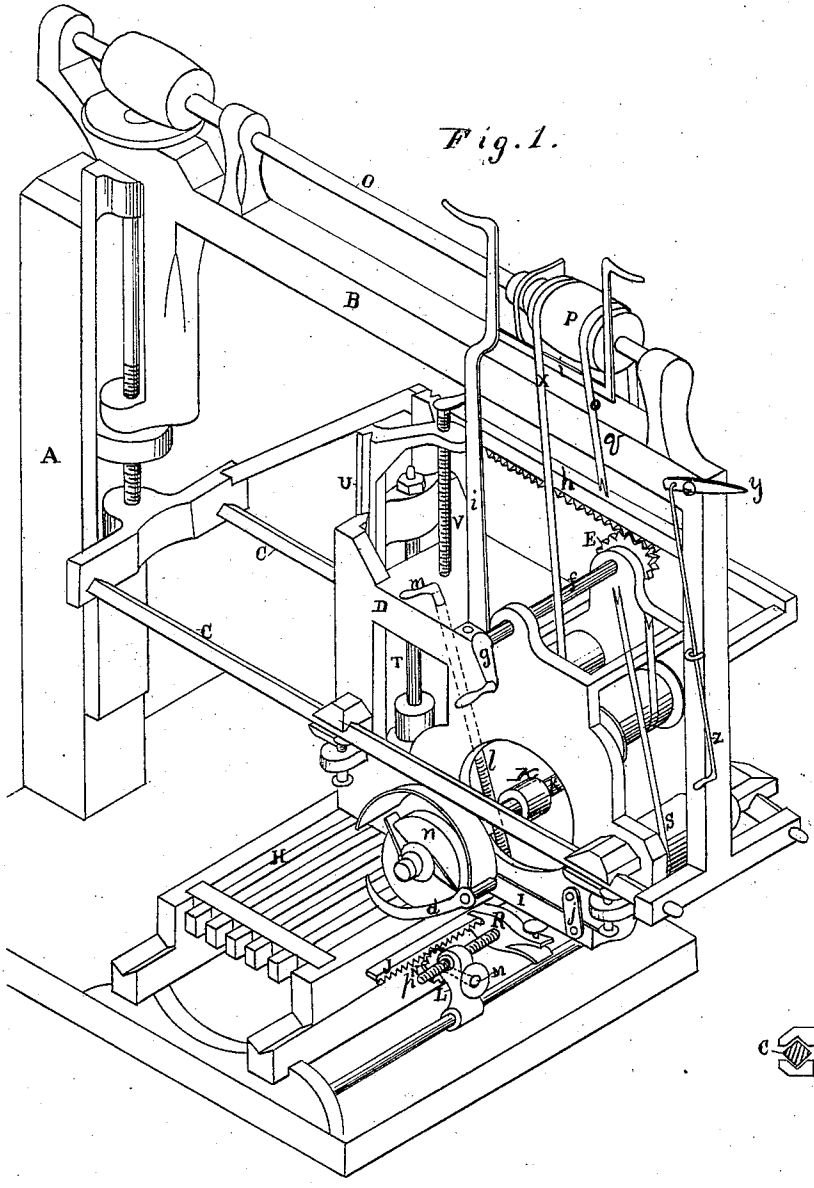
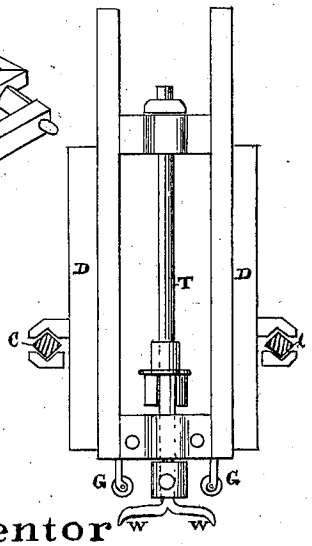


Fig. 2.



Witnesses

Geo. H. Strong.

Aldryn T. Stacy.

Inventor

Charles J. Hardee

By Dewey & Co.

Atty's

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES J. HARDEE, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN WOOD-WORKING MACHINES.

Specification forming part of Letters Patent No. **193,331**, dated July 24, 1877; application filed April 9, 1877.

To all whom it may concern:

Be it known that I, CHARLES J. HARDEE, of the city and county of San Francisco, and State of California, have invented an Improved Wood-Working Machine; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to an improved wood-working machine, and its object is to do that class of work which requires a shifting-tool, or, in other words, in which the tool requires frequent adjustment in order to obviate a frequent shifting of the board or other piece of timber to be finished.

My machine is especially adapted for doing that class of work which is known among stair-builders as "housing," the same being a groove or grooves in the stringer-board, which is secured against the wall alongside of stairs, in which grooves the ends of the "risers" and "treads" of stairs are fitted in order to conceal the joint.

My machine consists of a swinging frame which is provided with a track or tracks upon which a carriage is arranged to travel and be adjusted; this carriage carries the grooving or other cutting tool.

It also consists of an improved table for holding the work, which can be adjusted with great nicety to the position of the tools on the carriage.

Referring to the accompanying drawings, Figure 1 is a perspective view of my machine. Fig. 2 is an end view of the frame.

Let A represent a strong post or upright, to one side of which a frame, B, is hinged so that it can swing about the post as a center. The lower part of this frame consists of two parallel tracks, C C, upon which a carriage, D, is arranged to be moved by means of a pinion, E, on a shaft, *f*, and crank *g*. This shaft extends across the carriage and the pinion engages with a rack on the under side of a rail, *h*, which forms a part of the frame. By turning this crank-shaft by hand the carriage can be shifted to any desired point in the length of the tracks C C.

To the under side of the carriage and near its outer end I attach one end of a drop-frame, I, by means of links, *j*. This drop-frame extends to about the middle of the carriage and has a horizontal shaft, K, secured in boxes on its opposite or adjustable end. A screw-rod, *l*, passes down through a portion of the carriage and has a lower end attached to the adjustable end of this frame, so that by turning this rod by means of a crank, *m*, this end of a frame can be raised or lowered, as desired.

A cutter-head, *n*, is secured on one end of the shaft K outside of the carriage, or a circular saw or other rotary cutting implement can be secured to it according to the character of the work to be done, or a cutter-head can be attached to one end of the shaft on one side of the carriage, and a saw or other implement attached to the opposite end on the other side of the carriage.

The driving-shaft O is mounted in bearings on the upper timber of the frame so as to move with it, and can be driven by belt or bevel-gear connections with the main power.

P is the driving-pulley from which the power is taken by belt-connection *q* to the shaft K. This pulley slides on a feather on the driving-shaft O and is connected with the carriage by rods *i*, so that it will follow the carriage as it is moved along the track and thus preserve their proper relative positions.

The belt *q* passes down, and each side passes under a separate drum, S, on the carriage, in order to change the angle of the belt and allow it to pass around the shaft K on nearly a horizontal plane.

T is an upright spindle, which is mounted in boxes in a vertically-sliding frame, U, at the inner end of the carriage. This sliding-frame is raised and lowered by means of a screw-shaft V.

To the lower end of this spindle is secured horizontal cutting-bits W W, which serve as planers or routers for channeling or planing. This spindle is driven by a belt, X, from the driving-pulley P in the same manner that the belt *q* is driven.

When in use a circle will be secured around the outer or swinging end of the frame B, and independent of it. In the under side of this circle suitable notches will be made at suitable points. A latch-lever, *y*, is secured to the outer end of the frame, which can be operated by a rod, Z, to latch this lever into

one of the notches in the circle, and thus render it stationary after it has been once adjusted.

d is a presser, which bears upon the surface of the board which is being grooved, when the cutter-head is being used, and G G are rollers, which serve the same purpose for the cutters of the upright spindle.

The table is placed directly beneath the carriage. The top *h* of this table is arranged to slide longitudinally upon the table-frame in order to carry the board which is placed upon it to the most convenient position. A rack, J, is secured to the outside edge of this table-top. L is a standard, the upper end of which forms a box in which a short horizontal shaft, M, is mounted. The outer end of this shaft has a hand-wheel secured to it, while its inner end has a pinion, N, upon it, which engages with the rack J. By turning this hand-wheel the table can be moved endwise in either direction. As, however, the adjustment by this means is not always exact, I employ a horizontal screw, *p*, upon which a clamp, R, is arranged to travel when the screw is rotated. By fastening the clamp to the rack J, I can adjust the table with great minuteness to any line whatever by turning this screw after it has been moved to an approximately correct position. This is a very important element in doing close work, such as is necessary in fitting angular and irregular joints.

In operating the machine the board to be grooved, rabbeted, channeled, planed, or otherwise finished, is placed upon the table H. I then swing the frame B to the desired position and latch it to the encircling-ring, so as to fix it in the proper position. The board can thus be delicately adjusted to the cutter, saw, or other tool by means of the hand-wheel and pinion N and horizontal screw and clamp. I can then, by adjusting the swinging frame and table, form any desired figure or pattern in grooving, channeling, rabbeting, or other similar work.

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

1. The swinging frame B, provided with the tracks C C and rack-bar *h*, in combination with the carriage D with its cutter-heads *n* W, operated as described, and the transverse shaft *f*, with its crank *g* and pinion E, substantially as and for the purpose described.

2. In combination with the carriage D, arranged to be operated as described, the drop-frame I, hinged at one end to the carriage and having its opposite end arranged to be raised and lowered by means of the screw-rod *l*, and having the horizontal shaft K with its cutter-head *n* mounted in the adjustable end of said frame, substantially as and for the purpose described.

3. The swinging frame B, with its tracks C C, and having the pulley P mounted upon a feather on the driving-shaft *o*, in combination with the carriage D, with its spindle-shaft K and adjustable spindle-shaft T, said carriage being connected with the driving-pulley P by means of rods *i i*, substantially as and for the purpose described.

4. The sliding table-top H, with its rack J, and operated by means of the shaft M and pinion N, in combination with the horizontal screw *p*, and clamp R, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand and seal.

CHARLES JEY HARDEE. [L. S.]

Witnesses:

OLWYN T. STACY,

FRANK A. BROOKS.