

(No Model.)

2 Sheets—Sheet 1.

W. C. LAYER & E. N. TAYLOR.
CARVING MACHINE.

No. 460,340.

Patented Sept. 29, 1891.

Fig. 1.

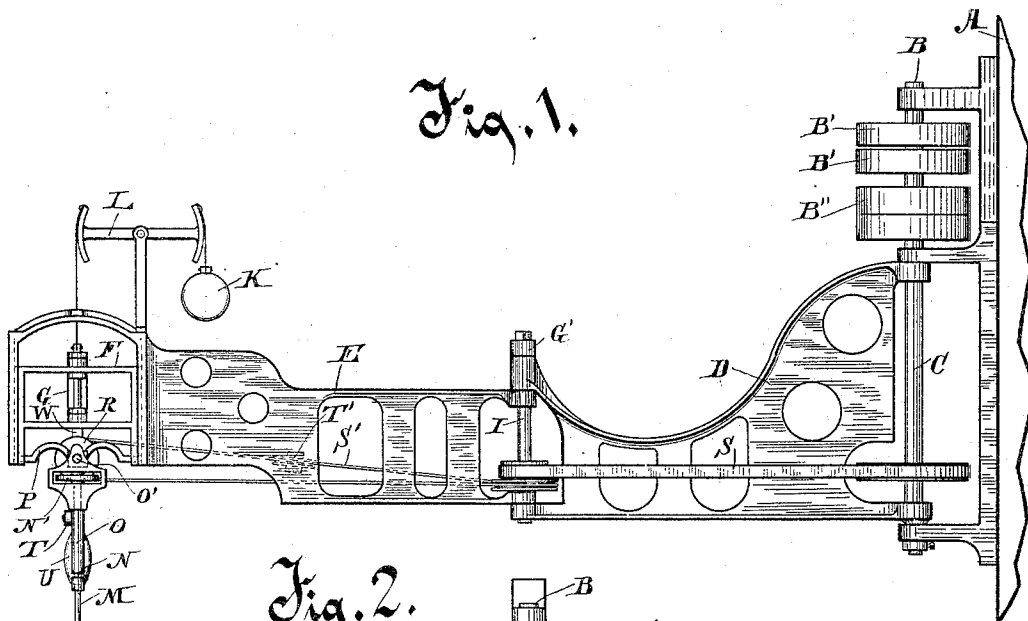
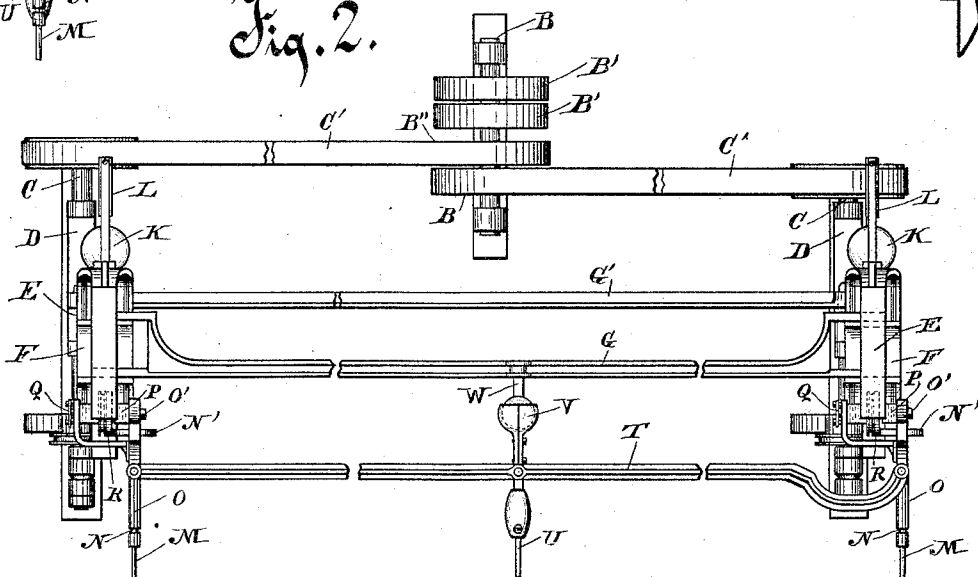


Fig. 2.



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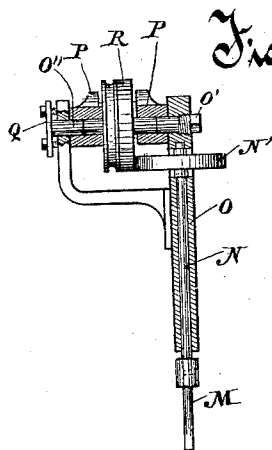
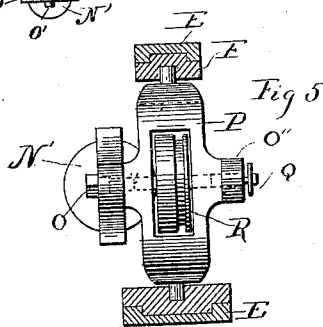
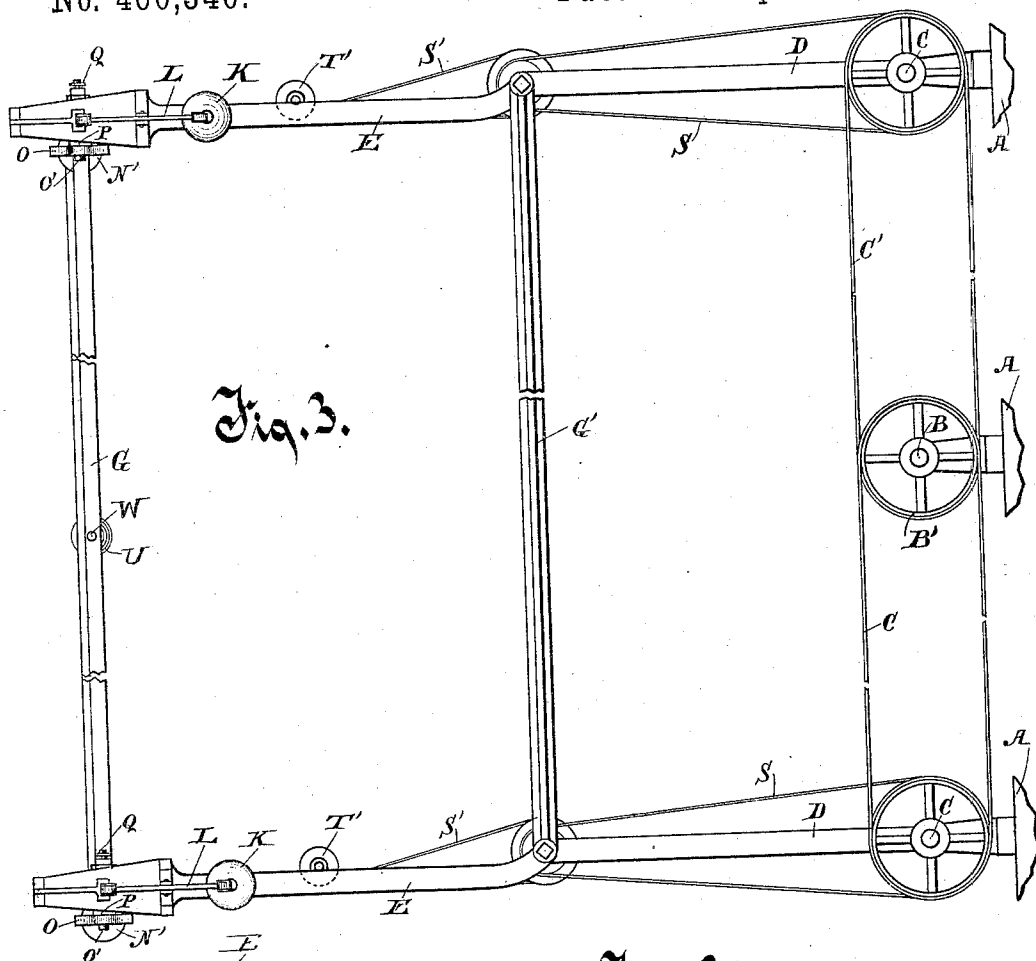
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

WILLIAM C. LAYER AND EDWARD N. TAYLOR, OF MILWAUKEE, WISCONSIN.

CARVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,340, dated September 29, 1891.

Application filed February 16, 1891. Serial No. 381,691. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM C. LAYER and EDWARD N. TAYLOR, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Carving-Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

Our invention relates to improvements in that class of carving-machines in which a guide or tracer bearing on the surface of a pattern or model is used to direct and control the movements of one or more cutting-tools having simultaneous and corresponding motion to cut or carve articles in the same form as the pattern.

A principal object attained by our improved machine is the capability of making an undercut, thus forming an overhanging ledge or projecting part in the article carved.

In the drawings, Figure 1 is a side elevation of the complete device. Fig. 2 is a front elevation of the same, parts being broken away for convenience of illustration. Fig. 3 is a top plan view of the complete device, parts being broken away for convenience of illustration. Fig. 4 is a detail of the tool-operating mechanism, parts being shown in section. Fig. 5 is a top plan view of the spindle-carrying yoke and thereon-supported mechanism, the side rails of the sash in which the yoke is pivoted and portions of the arm being shown in cross-section.

Ordinarily our mechanism is attached to and supported on a vertical wall A. A driving-shaft B, journaled in a bracket affixed to the wall, carries thereon the fast and loose pulleys B', on which the power-supplying belt runs. The shaft B also carries the fast power-transmitting pulleys B'' B''. Power-transmitting belts C' run on the pulleys B'' and also on pulleys therefor on the counter-shafts C. The counter-shafts C are advisably located one on each side of the shaft B and are journaled in brackets fixed to the wall A. Swinging arms D are pivoted at their inner ends on the shafts C and arms E are pivoted to the arms D at their outer ends. Frames or sashes F reciprocate vertically in ways therefor in the outer ends of the arms E. A connecting-rod G is pivoted at its ends to the respective

sashes F in the ends of the arms E, and the connecting-rod G' is pivoted at its ends on the pivot-pins I, which connect the arms D and E. The arms E are of equal length, and the rods G and G' are also of equal length, so that the arms E E and rods G G' form a parallelogram hinged at its corners. The sashes F are counterpoised by weights K, both the weights and sashes being supported by straps secured to the upper ends of segmental heads on tilting beams L, pivoted medially on posts projecting upward from the arms E. Each of the sashes F carries a revolving cutting-tool M, operated by mechanism supported on the sash. The cutting-tools M are each secured to a spindle N, having its bearing in the spindle-frame O, which spindle-frame O is pivoted by the pins O' O'' on the yoke P, which yoke is journaled at its extremities in the sash F, the axis of the yoke being at right angles to the axis of the spindle-frame O. A friction-gear N', fixed on the spindle N, bears frictionally against the pulley R, journaled in the yoke P in the axis of the pivot-pins O' O''. These pivot-pins O' and O'' are made adjustable endwise in the spindle-frame to take up any wear between the gear N' and the pulley R, the pin O' being therefor provided with a screw-thread, which turns in the spindle-frame, and the pin O'' being held in place by a plate-cap Q, secured adjustably to the spindle-frame by screws. Belts S, running on pulleys therefor on the shafts C and I, respectively, and belts S', running on pulleys on the shafts I and pulleys R, transmit the required rotary motion to the cutting-tools. Pulleys T', journaled in the arms E, guide the belts S'. A connecting-rod T is pivoted at its respective ends to the spindle-frames O and serves to hold the spindle-frames to concurrent movement. A guide or tracer U is pivoted to the connecting-rod T, and is also connected by a universal joint V to a stud W on the connecting-rod G.

By the construction and arrangement of the arms D and E and the connecting-rods G and G' the cutting-tools M are permitted to move in any direction in a horizontal plane, and by the vertical movement of the sashes F the tools are raised and lowered any desired distance within the limit of their travel, and by the additional universal movement permitted

to the spindle-frames by reason of the two hinged joints at right angles to each other, by which they are each connected with the sashes, the tools are capable of being tilted to any desired angle, and, being connected by a rod on which the tracer is pivoted and supported in such manner as to have concurrent movement therewith, the tools are adapted to cut or carve material like any pattern or model, either in relieve or intaglio, and to the extent of making an undercut, as desired.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a carving-machine, the combination, with two horizontally-swinging arms, one arm pivoted to the outer extremity of the other arm, of a counterpoised sash moving vertically in ways therefor in the outer extremity of the outer arm, and a cutting-tool supported on the sash in a frame having two pivotal motions, one at right angles to the other, substantially as described.

2. In a carving-machine, sets of horizontally-swinging arms, as D, thereto-pivoted horizontally-swinging arms, as E, sashes moving vertically in the outer ends of the arms E in ways therein, a connecting-rod uniting the vertical-moving sashes in the respective arms, whereby the sashes are moved vertically coincidently and independently of any movement of the swinging arms, combined substantially as described.

3. In a carving-machine, a yoke journaled in the sash, a spindle-frame pivoted on the yoke at right angles to its axis, a driving-pulley journaled in the yoke, the axis of which

pulley is in the axis of the spindle-frame, a spindle having its bearings in the spindle-frame, and a friction-gear on the spindle bearing against the pulley in the yoke, all combined substantially as described.

4. In a carving-machine, the combination, in the tool carrying and operating mechanism, of a swinging yoke, a spindle-frame pivoted on the yoke at right angles to the axis of the yoke, a pulley journaled in the yoke, the axis of which pulley is in the axis of the spindle-frame, a tool-carrying spindle in the spindle-frame, and a wheel or gear fixed on the spindle, which wheel is in frictional contact with the pulley in the yoke in such manner that its contact is constant and equal in all movements of the spindle, substantially as described.

5. In a carving-machine, the combination of a swinging arm D, a thereto-pivoted swinging arm E, a therein-supported movable sash, a therein-journaled yoke, a spindle-frame journaled therein at right angles to the yoke, a pulley in the yoke, the axis of which is in the axis of the spindle-frame, a spindle having its bearings in the frame and provided with a gear bearing against the pulley in the yoke, and a belt running on the pulley in the yoke, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM C. LAYER.
EDWARD N. TAYLOR.

Witnesses:

C. T. BENEDICT,
ANNA V. FAUST.