

JOHN WESTWORTH.

Improvement in Wood Carving Machines.

No. 115,669.

Patented June 6, 1871.

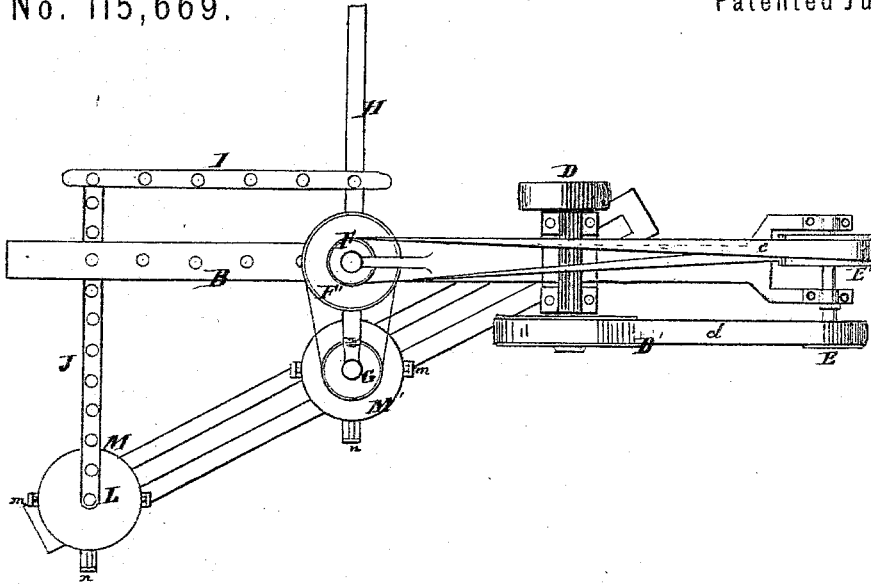


Fig. 1.

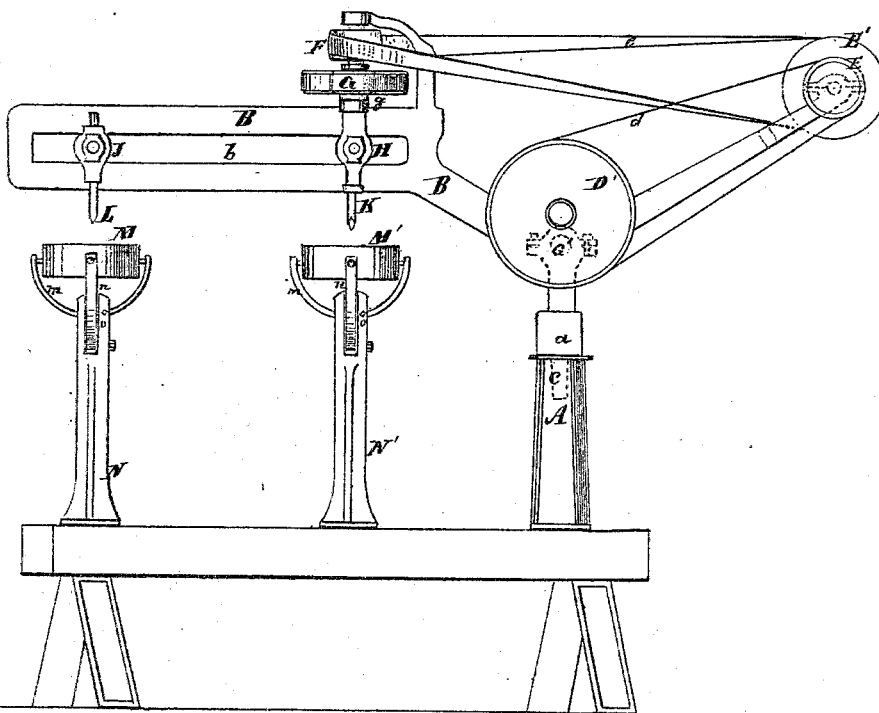


Fig. 2.

Witnesses:  
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## UNITED STATES PATENT OFFICE.

JOHN WESTWORTH, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN WOOD-CARVING MACHINES.

Specification forming part of Letters Patent No. 115,669, dated June 6, 1871.

*To all whom it may concern:*

Be it known that I, JOHN WESTWORTH, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Wood-Carving Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, which, together with the letters and figures marked thereon, forms part of this specification, and in which—

Figure 1 is a top or plan view of my invention, and Fig. 2 is a side elevation of the same.

Like letters of reference made use of in the several figures indicate like parts.

*General Description.*

My invention relates to a machine for copying and reproducing wood-carvings: and consists of a cutting-bit carried upon a pivoted arm, which also carries a tracing-point, the bit and point being both carried by a pantograph apparatus, and so arranged that any motion of the tracing-point moves proportionately and correspondingly the cutting-bit, which is rapidly revolved by appropriate mechanism. The model, of wood, or plaster, or clay, is placed beneath the tracing-point, and the wood to be carved beneath the bit. The tracing-point is made to follow the outlines and irregularities of the pattern, and the motion is reproduced by the bit, which cuts away the wood to correspond with the pattern, in such a manner that a slight finishing or smoothing up with ordinary carving-tools is all that is necessary to produce a perfect copy of the original, differing in size only.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with particularity, making reference in so doing to the aforesaid drawing.

A is an upright pillar, having a pivoted cap, *a*, so arranged as to turn horizontally. To this cap is pivoted the carriage or frame B, so arranged as to be movable in any direction by reason of the two pivots aforesaid, which, for the sake of description, are marked *c c'*. D is the driving-pulley, carried upon a shaft which has bearings upon the frame B, immediately above the pivot *c'*. At the opposite end of the shaft which carries the driving-pulley D is carried a larger pulley, D', which communi-

cates by the belt *d* with a smaller pulley, E, carried at the outer extremity of the frame B upon a shaft which carries also a larger pulley, E', which communicates by means of belt *e* with the smaller horizontal pulley F, carried upon the frame B by a vertical shaft, which also carries the larger pulley F', which communicates by a belt with the pulley G, carried upon a vertical mandrel or shaft, *g*, which is borne upon an adjustable arm, H, being one of three bars, H I J, which, together with the slotted portion *b* of the frame B, forms a pantographical device, as will be presently explained. The pulleys above enumerated are arranged with a view to accelerate the speed, so that the greatest speed is at the object-pulley G, the shaft of which carries a vertically-dependent bit or revolving cutter, K, which moves at great speed. The frame B is made with a horizontal slot, *b*, through which pass the bars H and J, the said bars being connected by a pivoted tie-bar, I, pivoted to the bars H J, and lying parallel to the slotted portion of the frame. L is a tracing-point attached to the end of the bar J. M M' are two stands swinging in gimbal-supports, consisting of the arcs *m n* playing through slots in the pillars N N', and provided with set-screws *o o*, by means of which they may be fixed in any desired position, the arcs being graduated each to a corresponding scale. The supports or stands may be placed in any desired position, so that one will exactly correspond to the other. The stand M is placed immediately beneath the tracing-point and holds the model or pattern, while the stand M' is placed immediately under the revolving cutter or bit K, and holds the wood to be carved. The pillars N N' rest upon the platform of the machine, over a slot, through which slot project downward from said pillars bolts fitted with a screw-thread and hand-nuts, by means of which the pillars are secured at any desired position along the slot in the platform.

The operation of my machine is as follows: The model or pattern is placed upon and secured to the adjustable stand M, and the wood to be carved upon the stand M'. The machine, as shown in the drawing, is arranged to produce a reduced copy. The frame B moves upon the two pivots *c c'* placed one vertically over the other, so that in effect it is

the same as though the frame were supported at  $c'$  by a ball-and-socket or universal joint, and the motion of a point at the cutter K will be to the motion of the tracing-point L as the radius from the center  $c c'$  to the cutter K is to the radius from the said center to the tracing-point L. The centers  $c c'$ , being a horizontal and a vertical pivot, allow of both a horizontal and vertical motion of the frame B, and consequently of the point L and cutter K. But it is necessary that there should be still another motion, so as to allow of the point L being traced over all portions of the pattern, and this is accomplished by the pantograph device, consisting of the bars H I J, which are arranged so that the length of the arm  $j$  of the bar J is to the arm  $h$  of the bar H as the radius  $L c c'$  is to the radius  $K c c'$ . Now, it will be readily understood that any movement of the tracing-point L will be exactly reproduced upon a proportionally smaller scale by the revolving bit K, which cuts away the wood to correspond with the pattern. The bars H I J, and also the slotted portion of the frame B, are provided with a series of adjusting-holes so arranged and numbered that to change the proportion between the model and the carving

to be produced it is only necessary to change the pivoting of the bars H I J from one series of holes to another.

The machine may be made to enlarge the carving by reversing the position of the cutter K and point L, and by changing the model or pattern from the stand M to the stand M'. This reproduces an enlarged copy.

#### *Claims.*

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

1. The combination of the frame B, pivoted to move both horizontally and vertically, with the pantograph device H I J carrying a tracing-point and a revolving bit or cutter, substantially as and for the purpose specified.

2. The frame B balanced upon a double pivot and carrying pulleys D D' E E' F F', in combination with the pantograph device H I J carrying the pulley G, substantially as and for the purpose specified.

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Witnesses:

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