I Hall
Carving in Wood
No. 75413 Patented Mar 10 1868

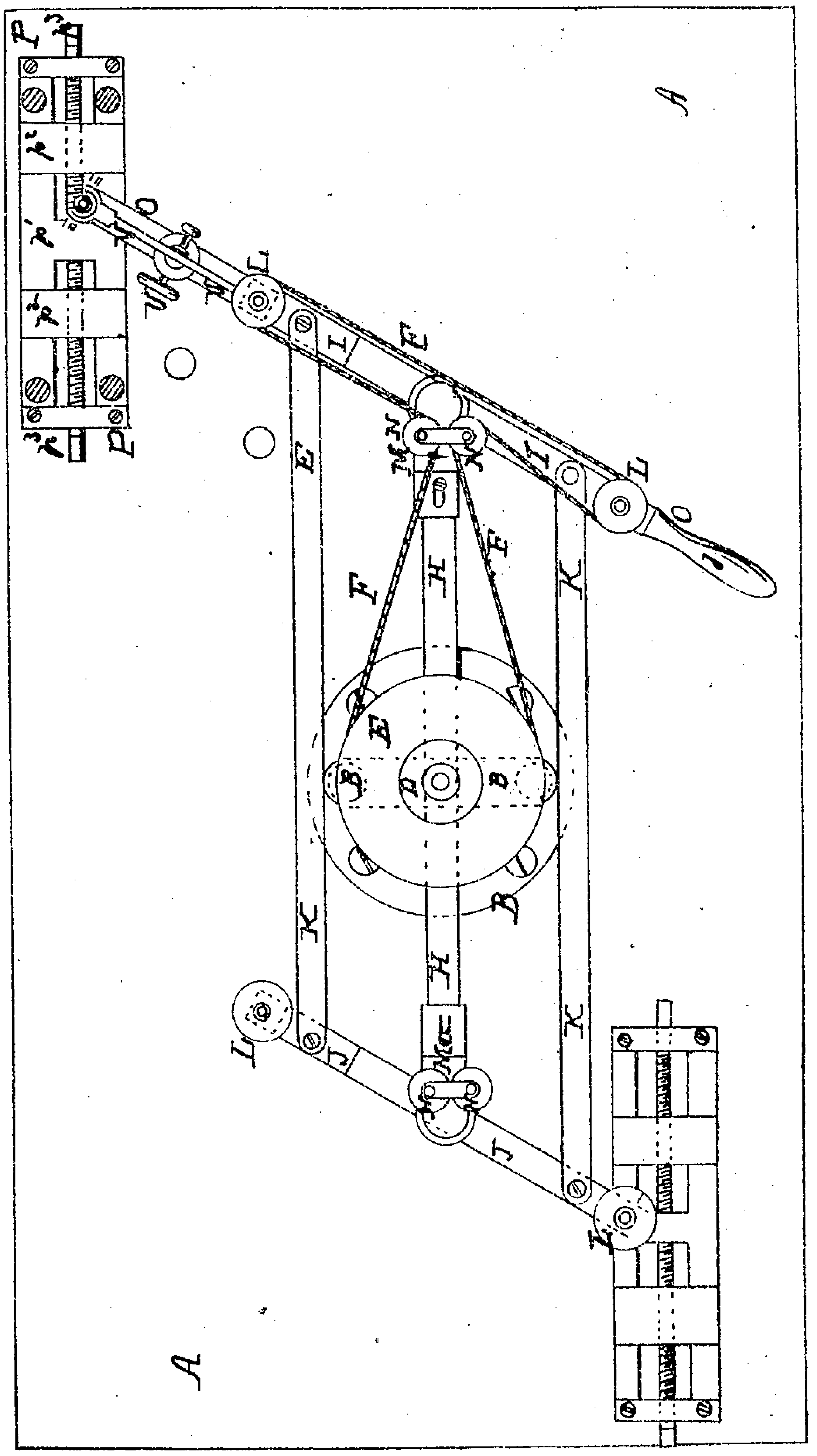

Fig. 1.

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2 Sheets. Sheet 2.

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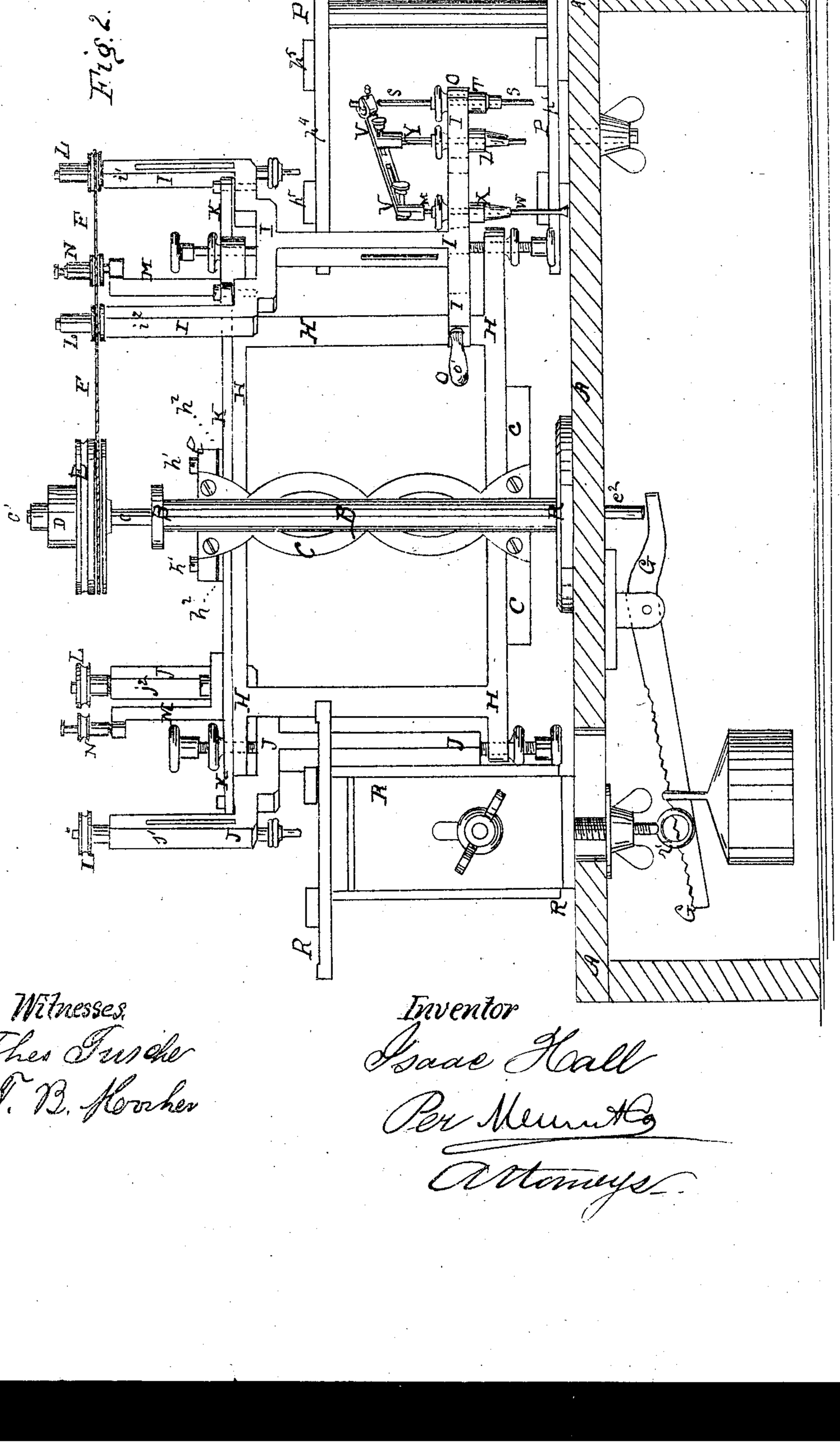
Fig. 2.



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ISAAC HALL, OF NEW YORK, N. Y.

Letters Patent No. 75,413, *dated March* 10, 1868.

IMPROVEMENT IN MACHINES FOR CARVING IN WOOD.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ISAAC HALL, of the city, county, and State of New York, have invented a new and useful Improvement in Cutting and Carving-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top or plan view of my improved machine.

Figure 2 is a side view of the same.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved machine, by means of which any desired design or pattern may be cut or carved upon ivory, wood, stone, metal, or other suitable substance; and it consists in the construction, combination, and arrangement of the various parts, as hereinafter more fully described and set forth.

A represents the table to which the machine is attached.

B is a frame, securely attached to the table A, and having holes through its base and top bar for the passage of the spindles of the pivoted frame.

C is a frame, having spindles, c^1 and c^2, attached to its top and bottom bars, which pass through the holes in the base and top bar of the frame B, pivoting the frame C to the said frame B.

Upon the upper end of the spindle c^1 is placed the loose drive-pulley D, to which motion is communicated from the power, and also the loose pulley, E, which is rigidly connected to the pulley D, and by which, by means of a band, F, the motion is transferred to the cutter. The lower end of the spindle c^2 rests upon the short arm of the lever G, or upon some equivalent counterpoise.

The lever G is pivoted to some suitable support, and has a movable weight suspended from its long arm, so that the pivoted parts of the machine may be exactly balanced.

H is a frame, which slides back and forth within the frame C, and which, when adjusted, is secured in place by the set-screws h^1, which pass through the top bar of the frame C, and press against the shoe or plate h^2, clamping the frame H between the said plate or shoe and the bottom bar of the said frame C. The base or lower horizontal bar of the frame H has a scale or division-marks formed upon it for convenience in adjusting the position of the frame, so that the work may be in the desired proportion to the pattern. The horizontal bars of the frame H project beyond the vertical end bars of said frame at one or both ends; and between the said projecting ends are pivoted the swinging frames I and J, by means of set-screws and binding-nuts, as shown in fig. 2.

The top bars of the frames I and J, when both frames are used, are connected to each other by the parallel horizontal bars K, so that the said frames may always be parallel, however they may be moved about during the progress of the work.

Upon the ends of the top bars of the frames I and J are formed upwardly-projecting arms, i^1 i^2, j^1 j^2, to the upper ends of which are pivoted loose pulleys, L, around which pass the bands F; and in one arm of each frame, upon opposite sides of the machine, are formed cutter-holders, the shafts of which pass up through the said arms i^1 and j^1, and are rigidly connected to the pulleys L.

M are arms, adjustably attached to the top bar of the frame H by set-screws, passing through slots in the bases of the said arms, and screwing into the said frame, so that the said arms may be adjusted, as required, to tighten or slacken the bands F.

To the upper ends of the arms M are pivoted two pulleys, N, between which the bands F pass, as shown in fig. 1.

O is a horizontal bar or arm, formed upon or rigidly attached to the lower part of one of the swinging frames, as I. The bar O is slotted vertically, as shown in dotted lines in fig. 2, for the reception of the adjustable tracer; and upon its rear end is formed a handle, o', by means of which the tracer is moved over the pattern.

P is a frame or holder, which is secured in place by a washer and hand-nut, screwing upon the lower end of a screw attached to the frame P, and passing down through a hole in the table A, several holes being formed in said table for this purpose, so that the position of said holder may be adjusted as required. The pattern is

placed upon the bed-plate p^1 of the frame P, where it is secured in place by the sliding blocks p^2, which are adjusted by the set-screws p^3.

When the copy is to be of the same size as the pattern, the block may be placed upon the top plate p^4 of the frame P, where it is secured in place by the sliding blocks p^5, operated by set-screws, as before described.

R is a holder, which is secured to the table A, beneath the cutter of the frame J, and which is secured in place by a washer and hand-nut, screwing upon the end of a screw attached to the holder R, and passing down through a slot in the table A, so that the said holder may have a lateral adjustment. The standard of the holder is made in two parts, sliding vertically upon each other, and secured in place, when adjusted, by a thumb-nut, screwing upon a screw attached to one of said parts, and passing through a slot in the other part. The sliding part of said holder is moved up and down by a set-screw, r', passing up through the bed-plate of the standard, and pressing against the end of the said sliding part. This gives the holder R a vertical adjustment.

S is the tracer, which is secured in the adjustable socket T by a set-screw, U, and which, in carving a copy of the exact size of the pattern, should be adjusted directly beneath the cutter. In this case, the sliding frame H should be so adjusted that its central point may be exactly in line with the pivoting-points of the frame C. With this adjustment, two exact copies of the pattern may be carved at the same time.

In case it is desired to cut a copy larger or smaller than the pattern, and in exact proportion to it, as, for instance, twice or one-half as large, the frame H must be so adjusted that one or the other of its ends may project twice as far as the other; but, as the cutter and tracer are secured in frames which are also pivoted, a still farther adjustment is necessary to cause the tracer and cutter to describe proportional curves of exactly the same form. This adjustment is effected by moving the tracer outward or inward from the vertical line of the cutter of the frame I a proper distance. To enable this to be done with accuracy, a scale or division-marks are formed upon the bar O, said scale being so formed that, when properly adjusted, the cutter of the frame J, the pivoting-point of the frames C H, and the tracer S, may all be in the same straight line. These two adjustments will cause the cutter to describe the curves and outlines of the copy proportional to and of the same form as those of the pattern, but the projections and depressions of the copy will be of the same height and depth as those of the pattern, thus destroying the symmetry of the work. To remedy this, another adjustment is necessary, so that the tracer-point, in moving over the pattern, may move vertically through a greater or less space than the cutter in carving the copy, said spaces having the same ratio to each other as the pattern and desired copy. To accomplish this, the tracer is released from its set-screw, so that it may slide freely up and down through its socket; and to its upper end is pivoted the end of a slotted bar, V, the other end of which is pivoted to the upper end of a rod, W, which passes down through and works freely up and down in a socket, X, adjustably attached to the bar or arm O, and which has a foot formed upon its lower end, which slides over the surface of the table A at the same time that the point of the tracer is passing over the pattern. The middle part of the slotted bar V is pivoted to the upper end of the rod Y, which passes down through and is adjustably secured to the socket Z by a set-screw.

If the rod Y is pivoted midway between the tracer S and the rod W, as the tracer S rises and descends in moving over the pattern, the rod W will descend and rise, the said tracer and rod moving through equal spaces in opposite directions; and, if the rod Y is pivoted unequally distant from the tracer S and rod W, the said tracer and rod will move vertically through unequal spaces. This enables the bar V to be so adjusted that the cutter, in carving the copy, shall move vertically through spaces having any desired proportion to the spaces through which the tracer moves in passing over the pattern, so that the copy may be proportional in every respect to the pattern.

If desired, the frame J may be omitted, and the frame H pivoted directly to the frame B. In this case, the carving will all be done by the cutter attached to the frame I, and the tracer will necessarily be placed in the same vertical line with said cutter, so that the copies must all be of the same size as the patterns.

I claim as new, and desire to secure by Letters Patent—

1. The combination of one or more pivoted or swinging frames, I J, constructed substantially as herein shown and described, with the pivoted frame H, as and for the purpose herein set forth.

2. The frame H, adjustable with relation to the pivoting-frame C, for the purpose of carving two exact copies of the pattern at the same time, or increasing or diminishing the size of the copy in exact proportion to the pattern, substantially as herein shown and described.

3. The tracer S, adjustably secured to the slotted bar or arm O of the swinging or pivoted frame I by means of the slotted bar V, rods W Y, and sockets T Z X, substantially as herein shown and described, and for the purpose set forth.

4. The combination of the slotted bar V, pivoted rod W, and adjustable pivoting-rod Y, with each other and with the tracer S and slotted bar or arm O of the pivoted frame I, substantially as herein shown and described, and for the purpose set forth.

5. The combination and arrangement of the pulleys L and N with the pivoted frame or frames I and J, frame H, and driving-pulleys D E, for the purpose of keeping the band or bands F taut while operating the cutters, whatever may be the relative positions of the said frames, substantially as herein shown and described.

6. The arrangement of the holder and frame P with relation to the pivoted frame I, tracer S, and cutter in the arm *i*, substantially as described, for the purpose specified.

The above specification of my invention signed by me, this 1st day of August, 1867.

ISAAC HALL.

Witnesses:

JAMES T. GRAHAM,

ALEX. F. ROBERTS.