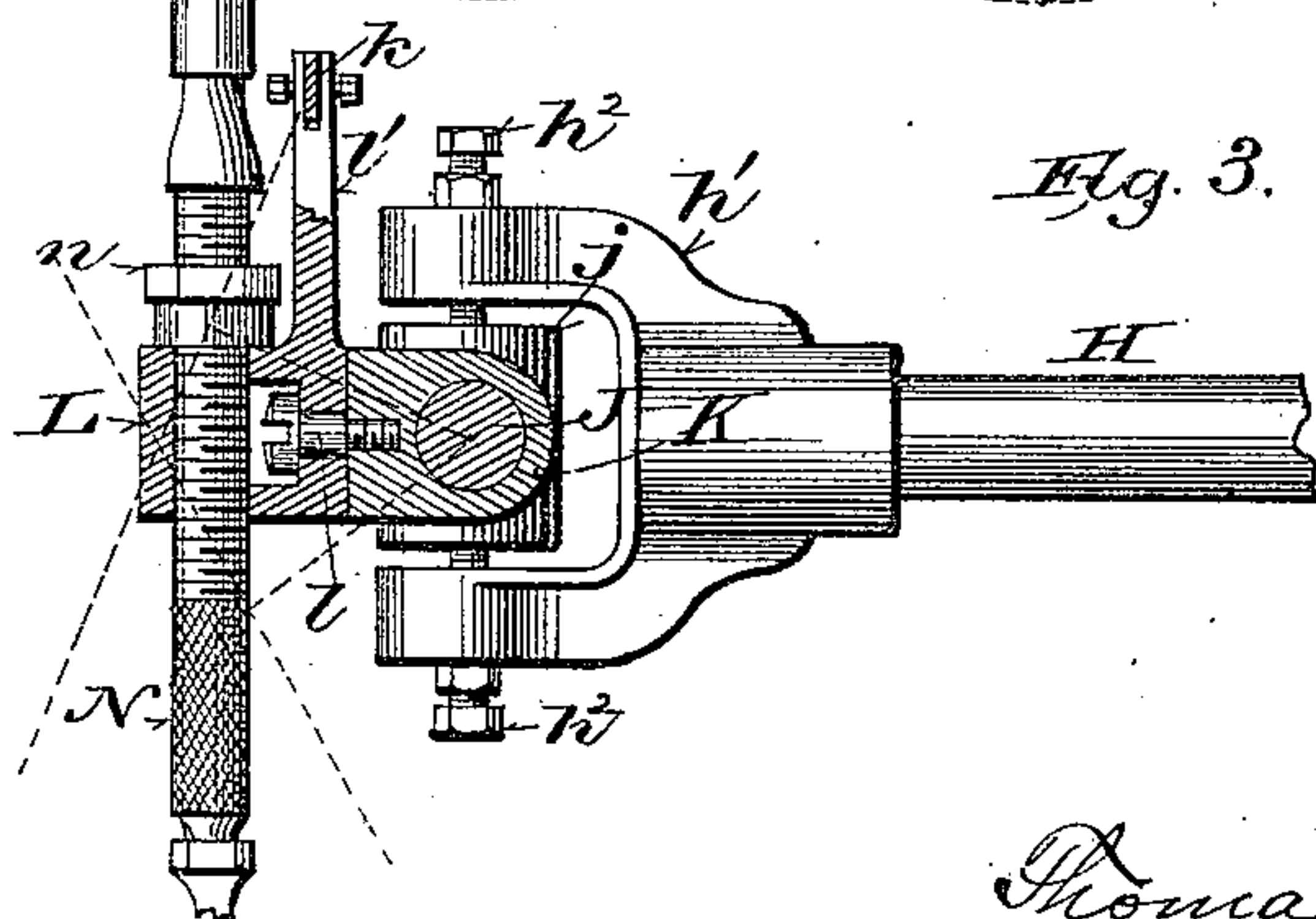
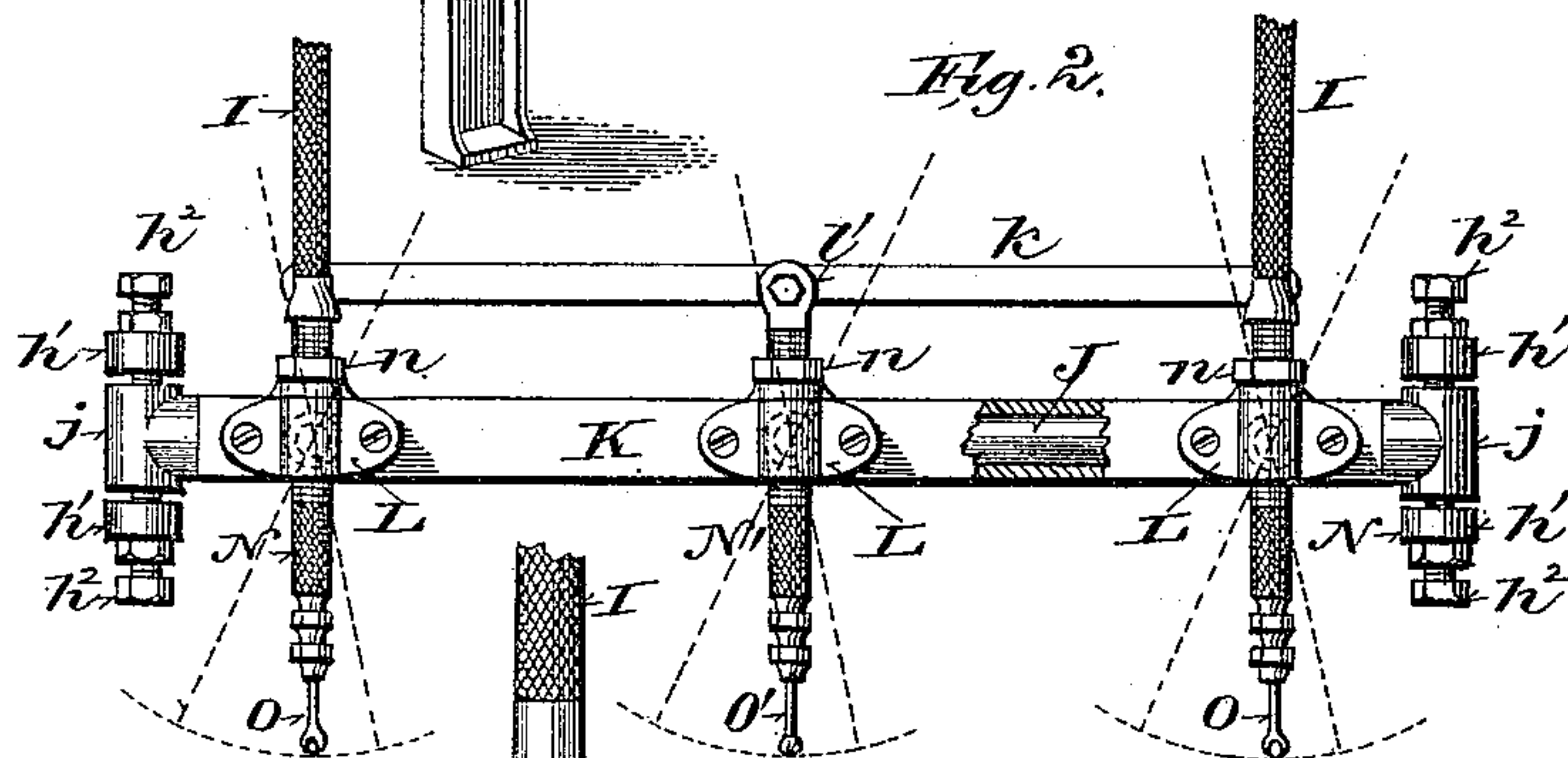
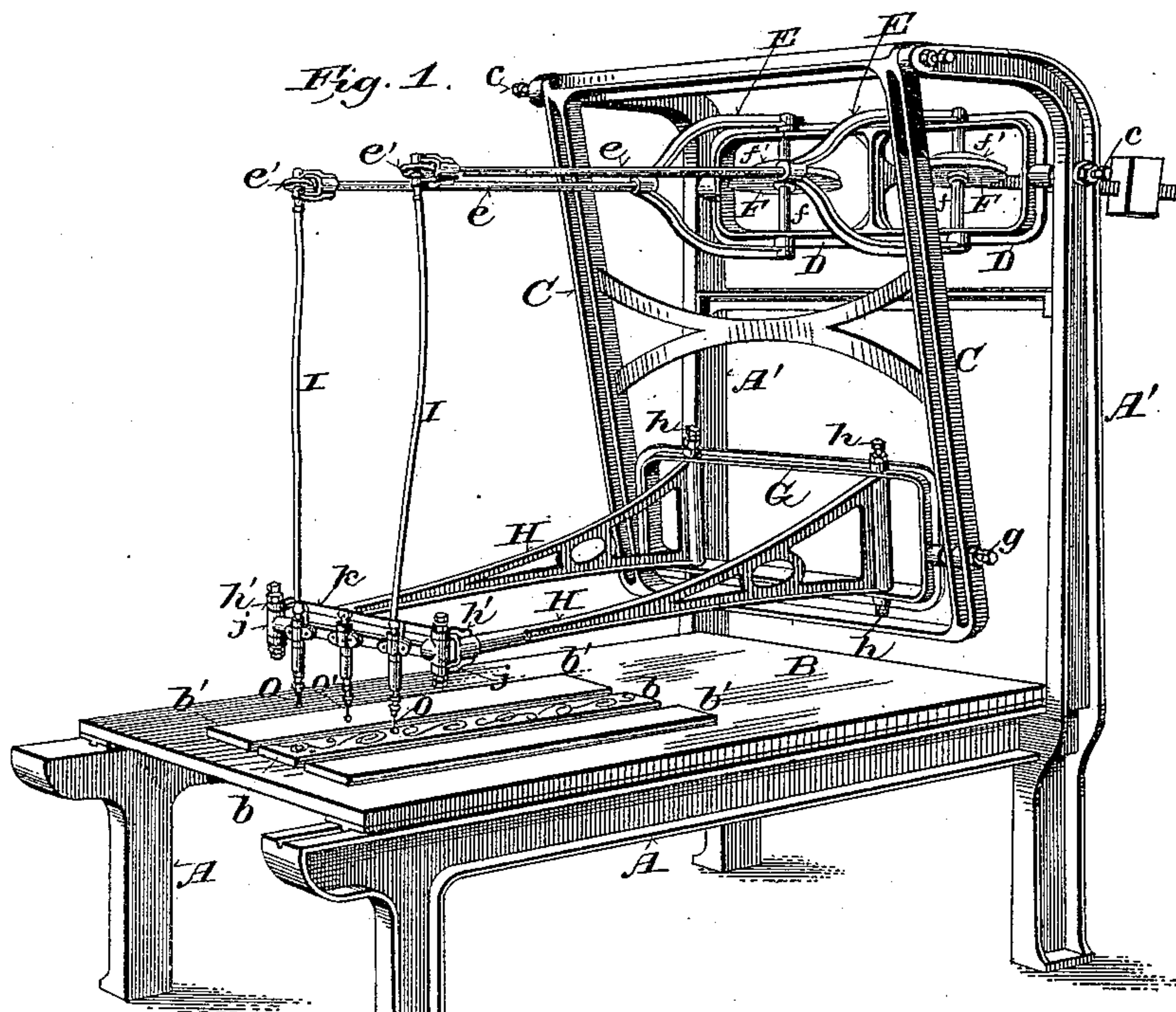


(No Model.)

T. L. SMITH & P. W. POST.
CARVING MACHINE.

No. 447,796.

Patented Mar. 10, 1891.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS L. SMITH AND PAUL W. POST, OF REEDSBURG, WISCONSIN.

CARVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 447,796, dated March 10, 1891.

Application filed April 9, 1888. Serial No. 270,072. (No model.)

To all whom it may concern:

Be it known that we, THOMAS L. SMITH and PAUL W. POST, both of Reedsburg, in the county of Sauk and State of Wisconsin, have
5 invented certain new and useful Improvements in Carving-Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable
10 others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of our invention is to duplicate
15 carvings and to produce carvings from a pattern by tracing the pattern with a guiding-tool which controls and imparts a similar movement to the cutting or carving tool or tools.

20 It consists, essentially, of certain peculiarities in the construction and arrangement of the tool supporting and guiding mechanism and of the mechanism driving the cutting tool or tools, hereinafter specifically set forth,
25 and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a perspective view of our improved carving-machine complete. Fig. 2 is
30 a front elevation, on an enlarged scale, of the tool-carriage and its connections; and Fig. 3 is a cross-section of the same in a plane intersecting one of the cutting-tool holders axially when the same is in a position at right
35 angles to the axis of the carriage.

A is the frame of the machine provided with ways upon which the work-table B is supported and arranged to slide. It is provided
40 at its rear end with an upright frame or standards A' A', which are turned forward at their upper ends and form overhanging brackets or arms.

C is a stiff quadrangular frame suspended
45 at one side on cone-pointed bolts *c c* from the upper overhanging ends of the standards A' A'.

G is quadrangular frame or yoke swiveled at the ends in the lower part of frame C upon
50 cone-bearings *g g*.

H H are vibratory arms expanded, and there-

by stiffened, vertically at their ends, which are pivoted in the frame or yoke G near its ends on cone-bearings *h h*.

J is a round cross shaft or rod formed or
55 provided at its ends with cross-heads *j j*, which are pivoted between the bifurcated front ends *h' h'* of the arms H H on cone-pointed bolts *h² h²*. The yoke G, arms H H, and rod or shaft J together constitute a jointed parallelogram, in which the shaft J is capable
60 of free endwise and vertical movement, but is constantly held parallel with the axis of yoke G. By connecting this jointed parallelogram with the free side of the suspended vibratory frame
65 C the shaft is rendered capable of free lateral movement in all directions as well as vertically.

Upon the rod J is mounted the sleeve K, which is revoluble thereon and bears at its
70 ends against the cross-heads *j j*, as shown most clearly in Fig. 2. The rod J and sleeve K together constitute a tool-carriage.

N N' are tool-holders provided with jaws or other suitable fastening devices (not shown
75 in detail) for securing the tools therein, and externally screw-threaded to engage and work with corresponding internally screw-threaded boxes L L, which are pivoted on screws *l l* to the revoluble sleeve K, as shown in Fig. 3, so
80 as to permit of their inclination at any desired angle thereto. The tool-holders N N' are thus made adjustable axially with reference to the sleeve K, and they are furnished with jam-nuts *n n*, by which they are locked
85 in place when properly adjusted. These boxes L L are made with caps or in halves to permit of the insertion of the pivot-screws *l l*, by means of which they are secured to the revoluble or oscillatory sleeve K, and they are
90 formed with upwardly-projecting arms *l' l'*, which are connected by a rod *k* with each other, thus causing the inclination of either tool-holder to produce a like inclination of the other to the tool-carriage, as indicated by
95 dotted lines, Fig. 2.

In the machine illustrated in the drawings, two cutting-tool holders N N are located one at each end of the carriage, and the guiding-tool holder N', connected with both by the
100 rod *k*, is located for convenience of manipulation midway between them.

It is obvious that the carriage supporting and guiding mechanism, consisting of the frame C, yoke G, and arms H H, hereinbefore described, permits of the free universal movement of the front ends of the arms H H, while the rod J connecting them is constantly maintained by the same means parallel with a certain fixed line.

Between the uprights A' A', at or near the top of the same, a quadrangular frame D is pivoted at its ends on cone-bearings *d*. This frame D is furnished with bearings for and carries two vertical driving-shafts *f f*, each provided with a larger and smaller pulley F and *f'*. Upon the extended ends of the shafts *f f* are hinged the forked or bifurcated yokes D D, which are formed at the junction of their converging limbs with sleeves for the reception of rods *e e*, longitudinally adjustable therein. These rods *e e* carry at their front ends in suitable heads provided for the purpose sheaves *e' e'*, to the lower extended journals of which are attached flexible shafts I I, connecting them with the rotary spindles in tool-holders N N. The arm *d'* extends rearwardly from the pulley-frame D, and is provided with an adjustable weight which counterbalances the weight of the arms *e e* and shafts I I on the opposite side of said frame.

The weight of the tool-carriage and its carrying-arms H H may be supported, if desired, by any suitable counterbalancing device which will not interfere with the freedom of their movement.

The pulleys F F are connected by belts (not shown) with the sheaves *e' e'*, and the pulleys *f' f'* are in turn connected in like manner with any suitable source of power, so as to rotate the cutting-tools in opposite directions, and thereby balance the tendency of said tools to creep along the work and move the carriage from any given position or line in which it is held or directed by the operator. The several cone-bearings employed in the machine are made adjustable to take up wear.

b represents a pattern, and *b' b'* blanks to be carved secured to the sliding bed B in any suitable manner in the proper position to be operated upon by the guiding-tool O' and the cutting-tools O O.

The operation of our improved machine may be described as follows: The pattern and blanks having been properly secured to the bed B, as hereinbefore described, and the proper tools secured in the several tool-holders N N N', and the latter adjusted so as to bring the working portions of the tools in the same line, the driving mechanism actuating the cutting-tools O O is set in motion and the guiding-tool O' moved by the operator over the pattern. The guiding-tool traversing the pattern *b* produces simultaneously like or similar movements of the cutting-tools O O over the work. By turning the sleeve K upon the rod J and swinging the tool-holders laterally on their bearings *l l* the tools may be

inclined in any direction from a perpendicular to the work and pattern, so as to produce under-cuts in the carving.

A universal movement of the several tools by which the surface of the pattern and work is traversed laterally in all directions and elevations and depressions therein are followed is permitted by the jointed connections of the tool supporting and guiding mechanism.

Various sizes and kinds of tools may be used to advantage in producing different kinds of carvings or in different stages of the same piece of work.

By moving the table B on its ways the tracing of a long pattern is facilitated.

We claim—

1. In a carving-machine, the combination of a rigid vibratory frame suspended on suitable bearings, an oscillatory yoke supported in said suspended frame by bearings in a line parallel with the bearings of said frame, vibratory arms hinged in said yoke on axes transverse to its axis of oscillation, and guiding and cutting tools connected with said vibratory arms, substantially as and for the purposes set forth.

2. In a carving-machine, the combination of a tool-carriage revoluble upon its axis, a guiding and a cutting tool connected therewith, and guiding mechanism connected with said tool-carriage, substantially as and for the purposes set forth.

3. In a carving-machine, the combination of a tool-carriage capable of oscillation upon its axis, tool-holders having a jointed connection with said carriage, a guiding and a cutting tool adapted to said holders, and guiding mechanism connected with said carriage, substantially as and for the purposes set forth.

4. In a carving-machine, the combination, with a supporting-frame and work-table, of a rod connected at its ends with said frame by jointed guiding mechanism, a sleeve supported and capable of oscillation upon said rod, tool-holders pivotally connected with said sleeve, and a guiding and a cutting tool carried by said tool-holders, substantially as and for the purposes set forth.

5. In a carving-machine, the combination, with a suitable supporting-frame, of a tool-carriage composed of a shaft, and a sleeve capable of oscillation thereon, jointed guiding mechanism having jointed connections with the ends of said carriage-shaft and with said frame, screw-threaded boxes pivotally attached to said sleeve, screw-threaded tool-holders adjustable axially in said boxes, and guiding and cutting tools adapted to said tool-holders, substantially as and for the purposes set forth.

6. In a carving-machine, the combination, with a suitable supporting-frame, of a frame suspended by suitable bearings thereon, an oscillating yoke supported in said suspended frame on suitable bearings, vibratory arms supported by and having jointed connections

with said oscillating yoke, a shaft parallel with the axis of said yoke and hinged to the free ends of said vibratory arms, tool-holders mounted upon said shaft, and a guiding and a cutting tool adapted to said tool-holders, substantially as and for the purposes set forth.

7. In a carving-machine, the combination, with two or more cutting-tools, of a guiding-tool connected therewith so as to control the movements of said cutting-tools, guiding mechanism connecting said tools with a suitable fixed support so as to permit them to be moved in any direction and at the same time to maintain them in the same relative position to each other and to the pattern and work, and driving mechanism arranged to rotate said cutting-tools in opposite directions, whereby the tendency of each cutting-tool to crawl over the work and to move away from a given position is balanced by the other tool tending in the opposite direction, substantially as and for the purposes set forth.

8. In a carving-machine, the combination, with a rigid vibratory frame hinged in a horizontal line at one side to a suitable support, of a jointed parallelogram having a jointed connection with said vibratory frame in a line parallel with the axis on which said frame swings, and a guiding and a cutting tool connected with the free side of said jointed parallelogram, substantially as and for the purposes set forth.

9. In a carving-machine, the combination, with a suitable supporting-frame, of a vibratory frame suspended therefrom by one side, a jointed parallelogram hinged at one side to said vibratory frame in a horizontal line parallel with that on which said frame swings, a tool-carriage connected with the opposite free side of said parallelogram, and a guiding and a cutting tool supported by said carriage, substantially as and for the purposes set forth.

10. In a carving-machine, the combination, with a rigid vibratory frame, of a jointed parallelogram having a jointed connection therewith in a line parallel with that on which said frame swings, an oscillatory tool-carriage mounted upon the free side of said parallelogram, and a guiding and a cutting tool connected with said carriage, substantially as and for the purposes set forth.

11. In a carving-machine, the combination, with a rigid vibratory frame hinged in a horizontal line to a fixed support, of a jointed parallelogram having a jointed connection therewith in a parallel line, an oscillatory tool-carriage mounted upon the free side of said parallelogram, and connected guiding and cutting tools having jointed connections with said carriage, substantially as and for the purposes set forth.

12. In a carving-machine, the combination, with a rigid swinging frame having a jointed connection with a suitable fixed support, of vibratory arms having a universal-joint connection with said swinging frame, a tool-car-

riage hinged to the free ends of said vibratory arms, and a guiding and a cutting tool, substantially as and for the purposes set forth.

13. In a carving-machine, the combination, with a universally-movable tool-carriage provided with a guiding and two or more cutting tools, of a pulley-yoke capable of oscillation on a horizontal axis and provided with a weighted arm, two or more vertical pulley-shafts journaled in said yoke, and forked arms hinged at their forked ends to said pulley-yoke concentrically with said pulley-shafts and provided at their free ends with sheaves which are connected with said cutting-tools, substantially as and for the purposes set forth.

14. In a carving-machine, the combination of a rigid frame capable of oscillation on a horizontal axis, a tool-carriage provided with a guiding and one or more cutting tools, and vibratory arms having jointed connections at opposite ends with said oscillatory frame and with said carriage, substantially as and for the purposes set forth.

15. In a carving-machine, the combination of a rigid frame capable of oscillation on a horizontal axis, vibratory arms having jointed connections with said frame, a tool-carriage having jointed connections with the opposite ends of said arms, a guiding and a cutting tool carried by said carriage, and driving mechanism connecting the cutting-tool with a suitable source of power, so as to conform to the movement of said carriage, substantially as and for the purposes set forth.

16. In a carving-machine, the combination, with a rigid frame capable of oscillation on a fixed horizontal axis, of a tool-carriage connected with said frame by vibratory arms, tool-holders provided with a guiding and a cutting tool and having jointed connections with said carriage, and driving mechanism connecting the cutting-tool with a suitable source of power in such manner as to conform to the movement of said carriage, substantially as and for the purposes set forth.

17. In a carving-machine, the combination of a frame capable of oscillation on a horizontal axis, a yoke carried by said frame and capable of oscillation on an axis parallel to that upon which said frame swings, a tool-carriage connected with said yoke by vibratory arms which have jointed connections therewith, and a guiding and a cutting tool carried by said carriage, substantially as and for the purposes set forth.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

THOMAS L. SMITH.

PAUL W. POST.

Witnesses as to Thomas L. Smith:

GEORGE M. GOLL,

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E. R. CURTISS,

E. C. TOURTELOT.