

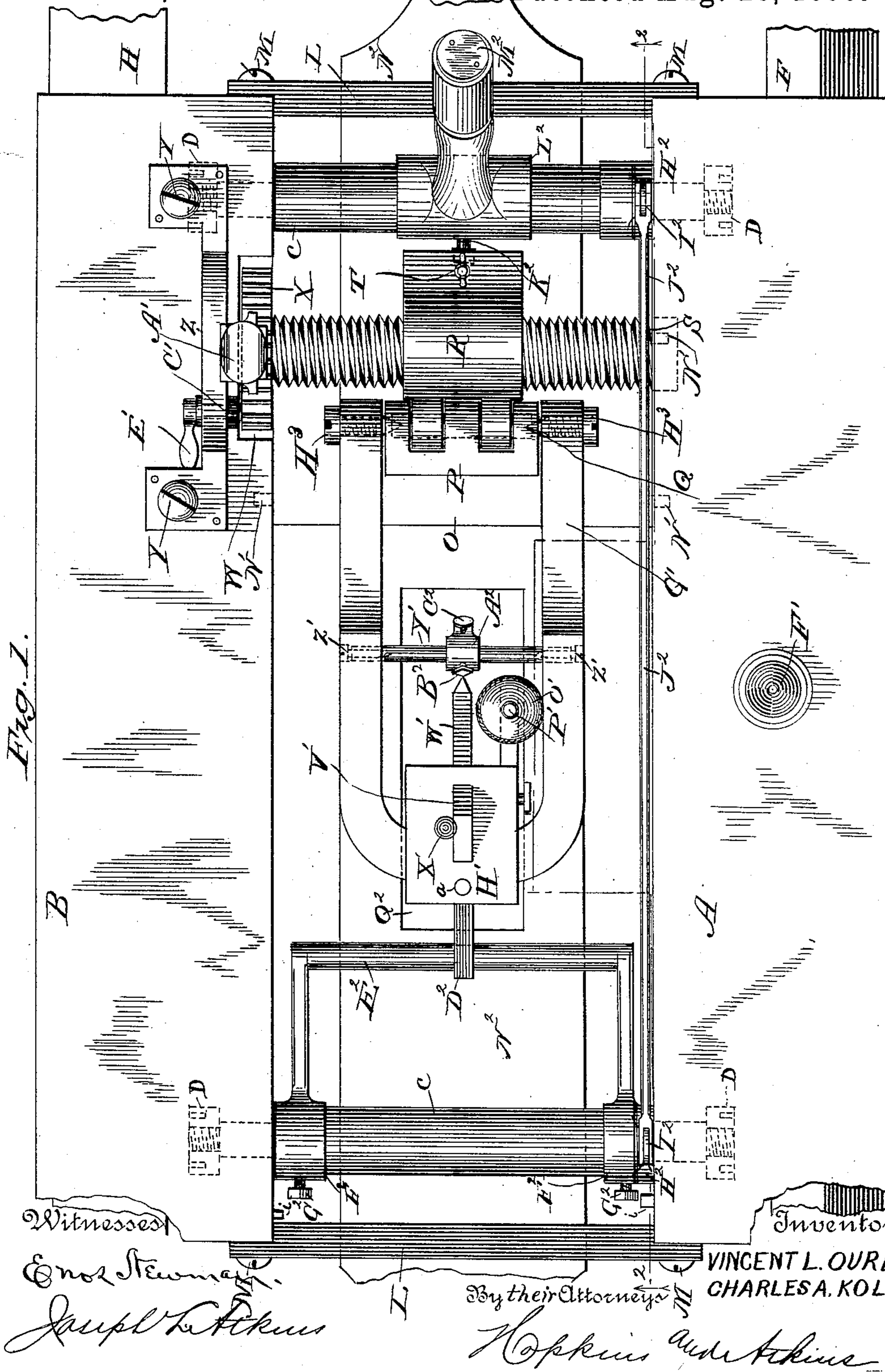
(No Model.)

4 Sheets—Sheet 1.

V. L. OURDAN & C. A. KOLB.  
ENGRAVING MACHINE.

No. 435,245.

Patented Aug. 26, 1890.



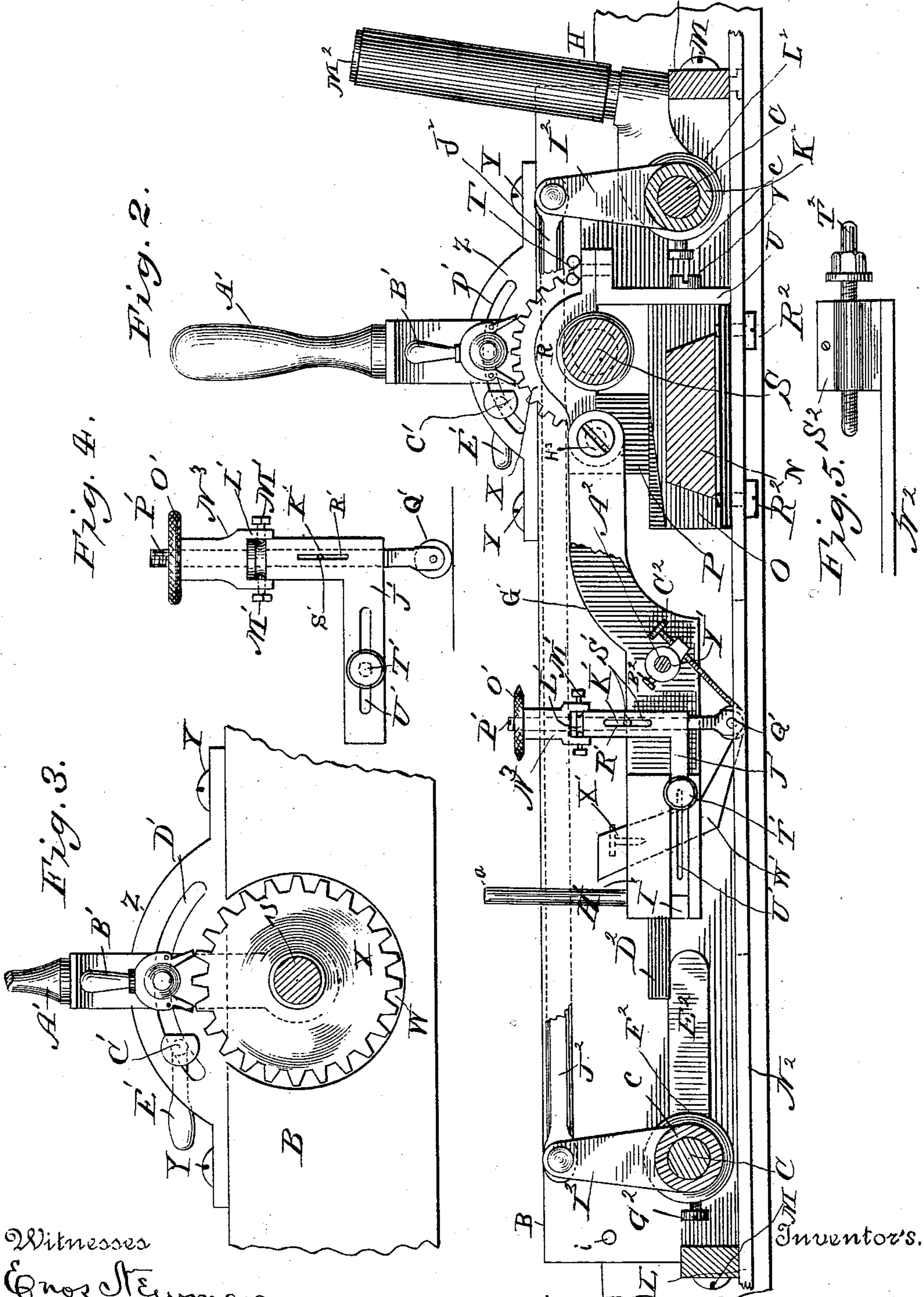
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4 Sheets—Sheet 2.

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Witnesses  
Enos Steuman,  
Joseph L. Atkins

By their Attorneys  
VINCENT L. OURDAN.  
CHARLES A. KOLB.  
Happus & Atkins

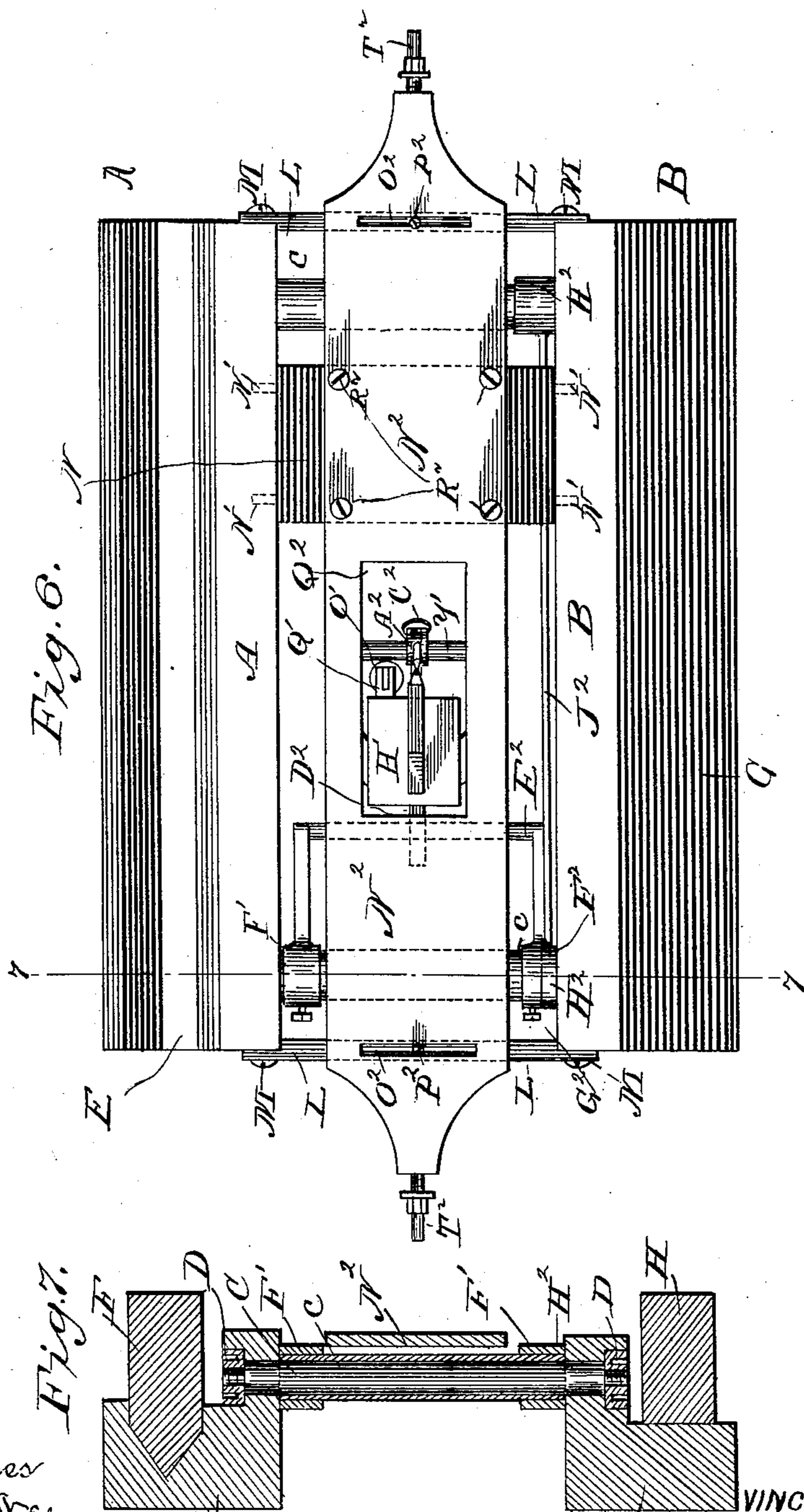
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Witnesses  
Enos Stebbins,  
Joseph L. Atkins

Inventors.  
VINCENT L. OURDAN,  
CHARLES A. KOLB.  
By their Attorneys  
Hopkins & Atkins

(No Model.)

4 Sheets—Sheet 4.

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Fig. 8.

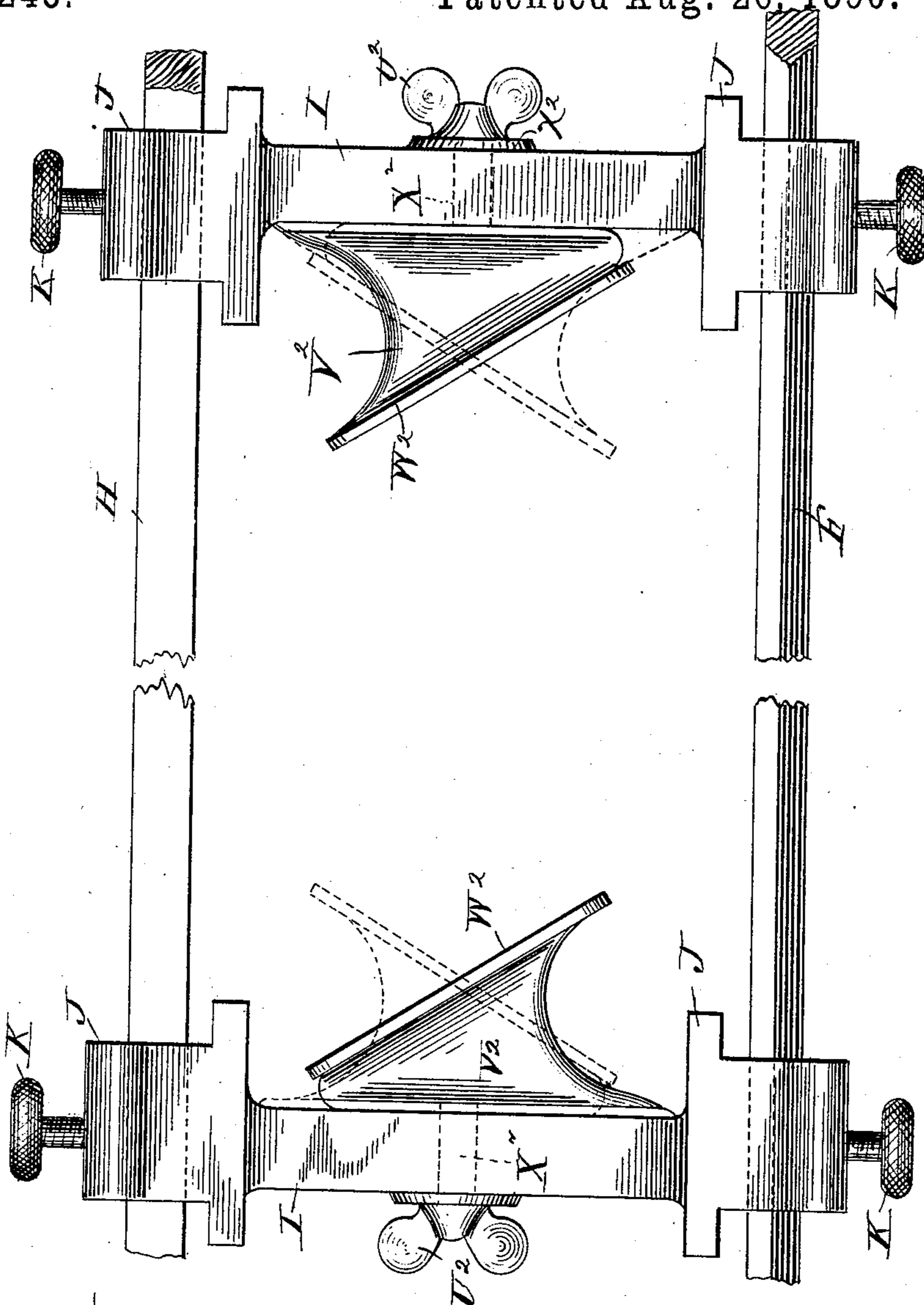
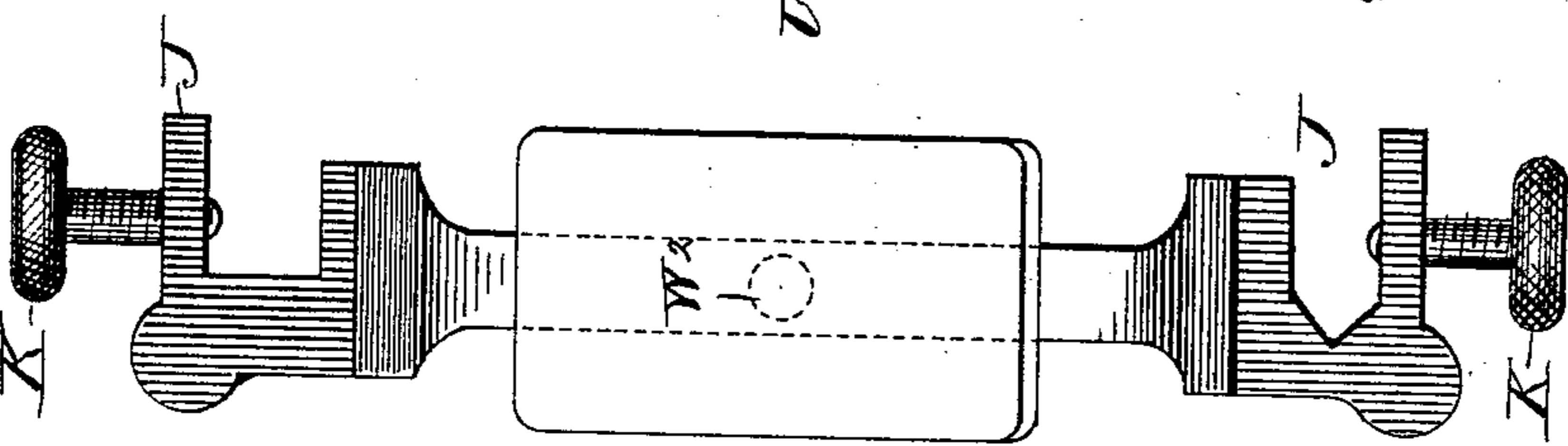


Fig. 9.



Witnesses

Ernest Steiman.  
Joseph L. Atkins.

By their Attorneys

Hopkins and Atkins

Inventor's,  
VINCENT L. OURDAN,  
CHARLES A. KOLB.

# UNITED STATES PATENT OFFICE.

VINCENT L. OURDAN AND CHARLES A. KOLB, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO THE OURDAN & KOLB ENGRAVING MACHINE, ENGRAVING AND MERCANTILE COMPANY, OF VIRGINIA.

## ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,245, dated August 26, 1890.

Application filed April 3, 1890. Serial No. 346,456. (No model.)

*To all whom it may concern:*

Be it known that we, VINCENT L. OURDAN and CHARLES A. KOLB, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Engraving-Machines, of which the following is a specification, reference being had to the accompanying drawings.

The object of our invention is to provide a machine for engraving on a copper plate, or the like, a series of long parallel lines, for uniting the lines where they meet in a corner in a mitered joint, and for distributing the spaces between them at the will of the operator.

Our invention consists of the combination and arrangement of the parts hereinafter described in the specification and set forth in the claims.

In the accompanying drawings, Figure 1 is a plan view of our machine, showing the ends of its tracks and the ends of the machine cut away. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a detached view of part of the spacing mechanism. Fig. 4 is a detailed view of the caster and bracket for supporting a tool-carriage, and Fig. 5 a detailed detached view of one end of the machine. Fig. 6 is a bottom plan view of our machine, and Fig. 7 a section of the same on the line 7 7 of Fig. 6. Fig. 8 is a plan view of the tracks upon which the machine moves, showing the ends attached; and Fig. 9 is a front elevation of one of the ends.

Referring to the letters upon the drawings, A and B indicate, respectively, the two sides of the frame that are rigidly united by the rods C, each one of which is screw-threaded at each end to carry the nuts D, whose heads are sunk flush with the sides of the sides A and B. This rod is very slightly tapered between the sides A and B and is surrounded by a sleeve c, that is tapered in the opposite direction. By means of the tapers wear occasioned by the rotation of the sleeve upon the rod may be taken up by loosening the nut D at the larger end of the taper and tightening the nut at the opposite end, so that the taper on the rod is drawn into the taper on the sleeve. The bottom of the side

A is provided with a V-shaped channel E, that slides upon the track F, and the bottom of the side B is provided with a flat surface G, that slides upon the track H. These tracks are secured together at their ends in parallel relations by end pieces and support movable cross-pieces I, that are provided with clamping ends J and thumb-screws K, for fastening them to the tracks.

L L indicate cross-bars that are secured to the ends of the sides of the frame by screws M. Near one end of the frame is secured, by lugs N', between the sides A and B, a dovetailed track N, upon which travels the block O, which is fitted to it. Upon a projection P, upon top of the block, by means of the pin Q, is pivotally carried a half-collar R. The interior of the collar R is screw-threaded, to fit the endless screw S, which is carried in suitable bearings in the sides A and B. By means of the thumb-screw T the loose end of the collar may be fastened to the angular plate U, which is secured by the screw V to the block O. When the collar is secured to the plate U, the screw-threads upon its interior are in engagement with the screw S. By unscrewing the thumb-nut T the collar may be released, and may be turned back upon its pivot. In a recess W, in the inner edge of the side A is secured to the screw S a ratchet-wheel X. To the top of the same side, by screws Y, is fastened a guide-piece Z. Upon a smooth journal on one end of the screw S, is collared a handle A', that is provided with a tilting pawl B', which engages with the notches in the ratchet-wheel W.

C' indicates a pin, which passes through the slot D' in the guide-piece Z, to which it may be secured at any position by the handle E' that is screwed upon its outer end. It projects at its other end through the slot in the path of the handle A', and serves as a set-guide in working in equal spaces by regulating the swing of the handle A'.

F' indicates an oil-cup, which carries the oil for lubricating the track.

G' indicates a bifurcated tool-carriage, which is hinged at its divided end to the block O by abutment-screws H<sup>3</sup>, that are secured

to the ends of the carriage and set into the pivot-pin Q. By this means the half-collar R and the tool-carriage are hinged to the same part, but independently of each other.

5 In the opposite end of the tool-carriage is the block H', which is preferably made integral with the carriage. The lower part of this block is provided upon each side with a longitudinal groove I'. Only one groove is shown

10 in the drawings, but the other is exactly the same as the one shown. In one of these grooves is provided a sliding bar J', that carries on its inner end, at right angles to it, a cylindrical cover K'. Upon the upper end

15 of this cover is provided an annular groove L', in which work the ends of set-screws M', which are attached to the rotatable head N<sup>3</sup>, that is provided with the thumb-piece O'. This head is internally screw-threaded to receive the screw-threaded end of the vertical

20 rod P', that carries, in suitable bearings on its opposite end, the wheel or caster Q'. The two grooves I' are provided so that the caster may be shifted from one side to the other.

25 R' indicates a vertical slot in the side of the cover, in which plays a pin S', that projects from the side of the rod P' to prevent it from turning. By turning the head N<sup>3</sup> the wheel Q' may be raised or depressed, as desired.

30 T' indicates a thumb-screw that is screwed into the block H', and passes through the slot U' in the bar J'. By means of this thumb-screw the bar J' may be secured in any position upon the block H'.

35 V' indicates a central vertical slot in the block H', which is adapted to receive and carry the graver W'.

40 X' indicates a set-screw screwed into the block H' and provided with a beveled end to wedge against the side of the graver and hold it in place.

a indicates a vertical rod adapted to carry weights for pressing the graver into the plate.

45 Y' indicates a rod secured between the arms of the tool-carriage by means of screws Z' on its ends. Upon this rod is provided a collar A<sup>2</sup>, which is adjustable by means of a set-screw B<sup>2</sup>.

50 C<sup>2</sup> indicates a screw-threaded engraving-point that is screwed into a projection in the collar.

D<sup>2</sup> indicates a projection which extends longitudinally from the end of the block H'. It rests lightly so as to be easily moved from side to side upon a rectangular frame E<sup>2</sup>, which is secured to the sleeve c by the collars F<sup>2</sup>, which surround the sleeve and the abutment-screws G<sup>2</sup> that are adapted to press

60 against it. Upon one side of the frame, around each of the sleeves c, are secured by any suitable means—such, for instance, as shrinking—the collars H<sup>2</sup>, each of which is provided with arms I<sup>2</sup>. The ends of these

65 arms are joined together by a pitman J<sup>2</sup>, which is pivoted at each end to the arms. To the sleeve c, that is nearer the screw S, is secured,

by an abutment-screw K<sup>2</sup>, a collar L<sup>2</sup>, which carries a handle M<sup>2</sup>.

Extending longitudinally the whole length 70 of the bottom of the machine and projecting at each end is a bottom plate N<sup>2</sup>, which is provided near its ends with transverse slots O<sup>2</sup>, through each of which is screwed into one of the end pieces L a guide-screw P<sup>2</sup>.

75 Q<sup>2</sup> indicates an oblong rectangular aperture in the bottom plate N<sup>2</sup>, to allow room for the cutting parts. The bottom plate is firmly secured to the block O by the screws R<sup>2</sup>. In internally screw-threaded bearings S<sup>2</sup> on each 80 end of the bottom plate is screwed a bumper T<sup>2</sup>.

Upon each of the end pieces I, by means of a thumb-nut U<sup>2</sup>, is secured a swivel abutment V<sup>2</sup>, which is provided with an obliquely-in- 85 clined face W<sup>2</sup> on its inner edge, and the bolt X<sup>2</sup> to which the thumb-nut is attached.

The operation of our machine is as follows: Suppose the tracks to have been properly located upon the plate to be engraved, the 90 graver W' to have been set properly, the rod P' bearing the caster Q' at its lower end to have been properly adjusted to regulate the depth of the cut to be made by the graver, and the machine to be set in position upon 95 the tracks, then grasp the handle M<sup>2</sup>, and, supposing the machine to be in position to require it, push the handle M<sup>2</sup> toward the end of the machine opposite to that to which it is pivoted, and so push the machine to the 100 place from which the cut should begin. The force applied to the handle M<sup>2</sup> will first produce a partial rotation of the sleeve c to which it is attached, and that by means of its arm I<sup>2</sup> the pitman J<sup>2</sup> and the other arm I<sup>2</sup> will 105 produce a corresponding rotation of the other sleeve c, whereupon the frame E<sup>2</sup> will be tilted, and it in turn will raise, by means of the projection D<sup>2</sup> resting upon it, the loose end of the tool-carriage and the engraving-tools carried by it. This operation will allow the machine to slide freely over the tracks without 110 scratching the plate. When the point has been reached from which the operator desires to cut, that in practice is fixed by the position 115 of one of the end pieces I upon the tracks, he pulls upon the handle M<sup>2</sup>, whereupon by an operation the reverse of that just described the graver is set into the surface of the metal and a continued pull upon the handle 120 M<sup>2</sup> will draw the machine along the tracks and cause it to cut a clean smooth straight line in the face of the plate. It will be observed that when the handle M<sup>2</sup> has caused the frame E<sup>2</sup> to tilt, the arm I<sup>2</sup> farther from 125 the handle will strike the projections i in the sides A and B, so that all strain in driving the machine will be taken up by it instead of being laid upon the movable parts. When the pull upon the handle M<sup>2</sup> is made, the base 130 of the handle strikes against one of the end pieces L, and is supported by it when the machine is cutting. When the end of the line is reached, the bumper T<sup>2</sup> strikes the oblique

surface of one of the abutments  $V^2$ . Then by pushing the handle as above described, the operator should lift the graver free from the plate, and, holding it in that position, give the screw  $S$  a turn by means of the handle  $A'$ , the pawl  $B'$  connected therewith, and the ratchet-wheel upon the screw. The rotation of the screw will cause the half-collar  $R$  to travel upon it a certain distance, determined by the distance the screw is revolved. The half-collar carries the carriage and the engraving-tool with it, so that when the machine has been pushed back to position for another cut and the tool let down upon the metal the space between the lines will have been provided for. Repeating the operation of cutting a line by drawing the machine along the tracks when the end of the line is reached the bumper  $T^2$  will again come in contact with the face of the abutment. This time the line will be shorter or longer according to the position upon which it strikes the oblique face  $W^2$ . By setting the abutment so that its face bisects the corner of the copper plate, each succeeding line will be shorter than its predecessor, so that when the tracks are again set and the cutting is begun from the corner a perfect mitered joint between the lines will be effected. Of course when the cutting is to be begun from a corner one of the abutments from which the start is made should be set, as above suggested, across the corner, so that the commencement as well as the ends of the lines may be regulated by the mitering device.

It is well known to those skilled in the art that inequalities occur in the face of copper plates, which have heretofore interfered with the correct working of engraving-machines of this kind. In order to carry the tool over the inequalities, we have prepared upon the pivoted tool-carriage the adjustable wheel  $Q'$ , which is located near the point of the tool, and carries it to suit the inequalities of the surface over which it travels.

To regulate the depth of cut at all times, and also to provide means for lifting the tool free of the track when the machine is to be set in position, we provide the frame  $E^2$  and means for setting it upon the collar  $F$ . The relation of the frame  $E^2$  and the projection  $D^2$  should always be such that the pressure against the handle  $M^2$  shall cause the frame to lift the projection such a distance as to raise the graver free from the plate.

While it is entirely practicable, by the means just referred to, to regulate the cut of the graver for all lines of any considerable depth of cut, it is usual in map-engraving to have parallel with the border-lines one or more fine hair-lines. To produce this the faintest scratch of the tool upon the plate is required. We find that for this purpose the engraving-point  $C^2$  is desirable in addition to the ordinary graver. We have provided means for carrying and adjusting it independently of the graver, so that the point may be set

down against the metal and the graver raised above the surface by properly adjusting the caster. By this means the machine may be made to execute all kinds of border-lines without change of parts.

The collar  $R$  is pivoted to the block  $O$ , in order that when the operator desires to shift the position of the carriage rapidly he may swing back the collar from engagement with the screw and push the carriage to the desired position instead of working it across by the rotation of the screw.

The tool-carriage is pivoted to the rear of the handle by which the frame is drawn along the tracks, and the machine is adapted to execute its functions by drawing the frame instead of pushing it upon the tracks, as has been done heretofore. The graver also is set at an angle in the tool-carriage, so that if in cutting it should strike an obstruction, instead of throwing the frame off the track or digging into the metal, which has heretofore been an objection to machines designed to do this kind of work, it will throw the arm up and relieve itself without any injury to the plate or any interruption of the work.

What we claim is—

1. An engraving-machine consisting of the combination, with a pair of parallel tracks, of a frame adapted to move thereon and a tool-carriage provided with a cutting-tool and pivotally carried upon the frame, as set forth.

2. In an engraving-machine comprising a pair of tracks, a frame adapted to move thereon, and a tool-carriage upon the frame, the combination, with the frame, of an endless screw, means for rotating the screw, and a transversely-movable post operatively connected with the screw and secured to the carriage for the purpose of shifting its position transversely, substantially as set forth.

3. In an engraving-machine adapted to travel above the surface of a plate and provided with a pivoted tool-carriage, the combination, with the carriage, of an adjustable caster adapted to be carried close to the point of the tool upon the carriage, as and for the purpose set forth.

4. In an engraving-machine adapted to travel above the surface of a plate and provided with a pivoted tool-carriage, the combination, with the movable handle of the machine, of a movable frame in operative contact with the tool-carriage and means of connection between the frame and the handle, whereby force applied to the handle to set the machine in position for work will automatically lift the tool-carriage and force applied to cause the machine to cut will automatically drop the carriage and set the tool into the metal, substantially as and for the purpose specified.

5. The combination, with a pair of tracks and an engraving-machine adapted to travel thereon, of cross-pieces on both ends of the tracks and swivel oblique-faced abutments on each of the cross-pieces adapted to cause

the ends of the series of engraved lines to conform to a miter, substantially as set forth.

6. In an engraving-machine, the combination, with its frame, of a tool-carriage pivoted thereto, a fixed graver in the carriage, and another engraving-tool transversely adjustable upon the carriage, substantially as set forth.

7. In an engraving-machine comprising a frame and a tool-carriage adapted to be carried thereon, the combination, with a transverse track in the frame and a block secured to the carriage and adapted to travel on the track, of an endless screw journaled in the frame and a half-collar pivotally secured to the block and adapted to be engaged with or disengaged from the screw, substantially as set forth.

8. In an engraving-machine adapted to travel above the surface of a plate and provided with a frame and a tool-carriage pivotally borne thereby, the combination there-

with of the frame  $E^2$ , adjustably secured to the frame of the carriage and adapted to support the free end of the carriage for the purpose of regulating the depth of cut of the tool that it carries, substantially as set forth.

9. In an engraving-machine adapted to travel above the surface of a plate, the combination, with its track, of a frame adapted to move thereon, a carriage pivotally secured to the frame, a handle upon the frame, and a graver borne in the loose end of the carriage with its point set toward the handle, so that the cutting operation is performed by drawing upon the handle, substantially as set forth.

In testimony of all which we have hereunto subscribed our names.

VINCENT L. OURDAN.  
CHARLES A. KOLB.

Witnesses:

JOSEPH L. ATKINS,  
THOS. S. HOPKINS.