(No Model.) 3 Sheets—Sheet 1.

V. L. OURDAN.

ENGRAVING MACHINE.

No. 435,244. Patented Aug. 26, 1890.

Fig: 1.

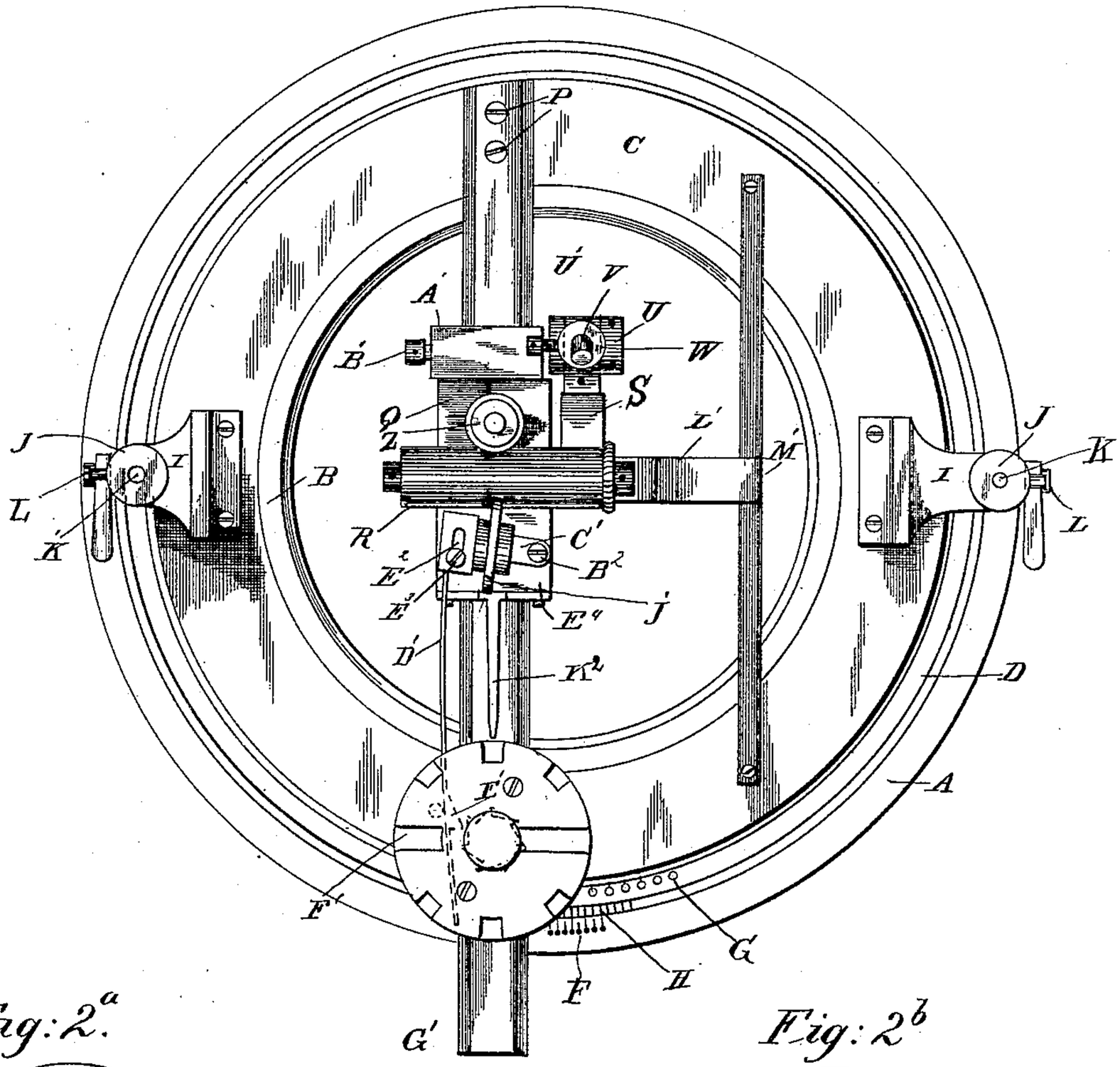


Fig: 2ª.

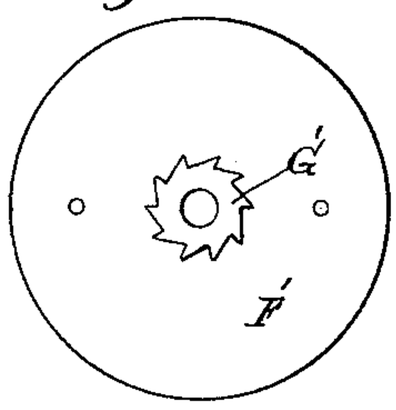


Fig: 8

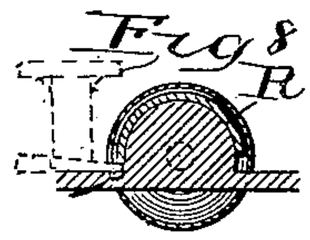


Fig: 9

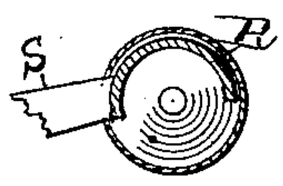
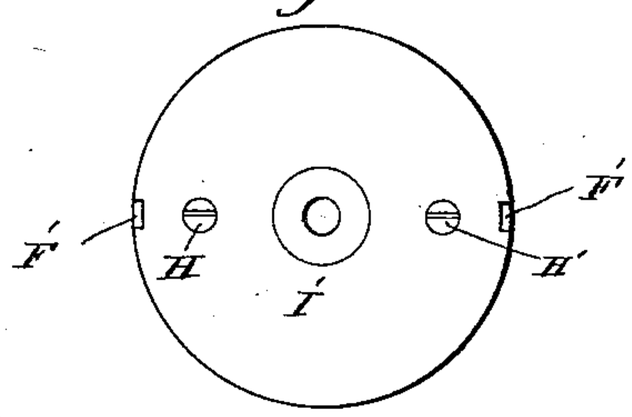


Fig: 2ᵇ



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ENGRAVING MACHINE.

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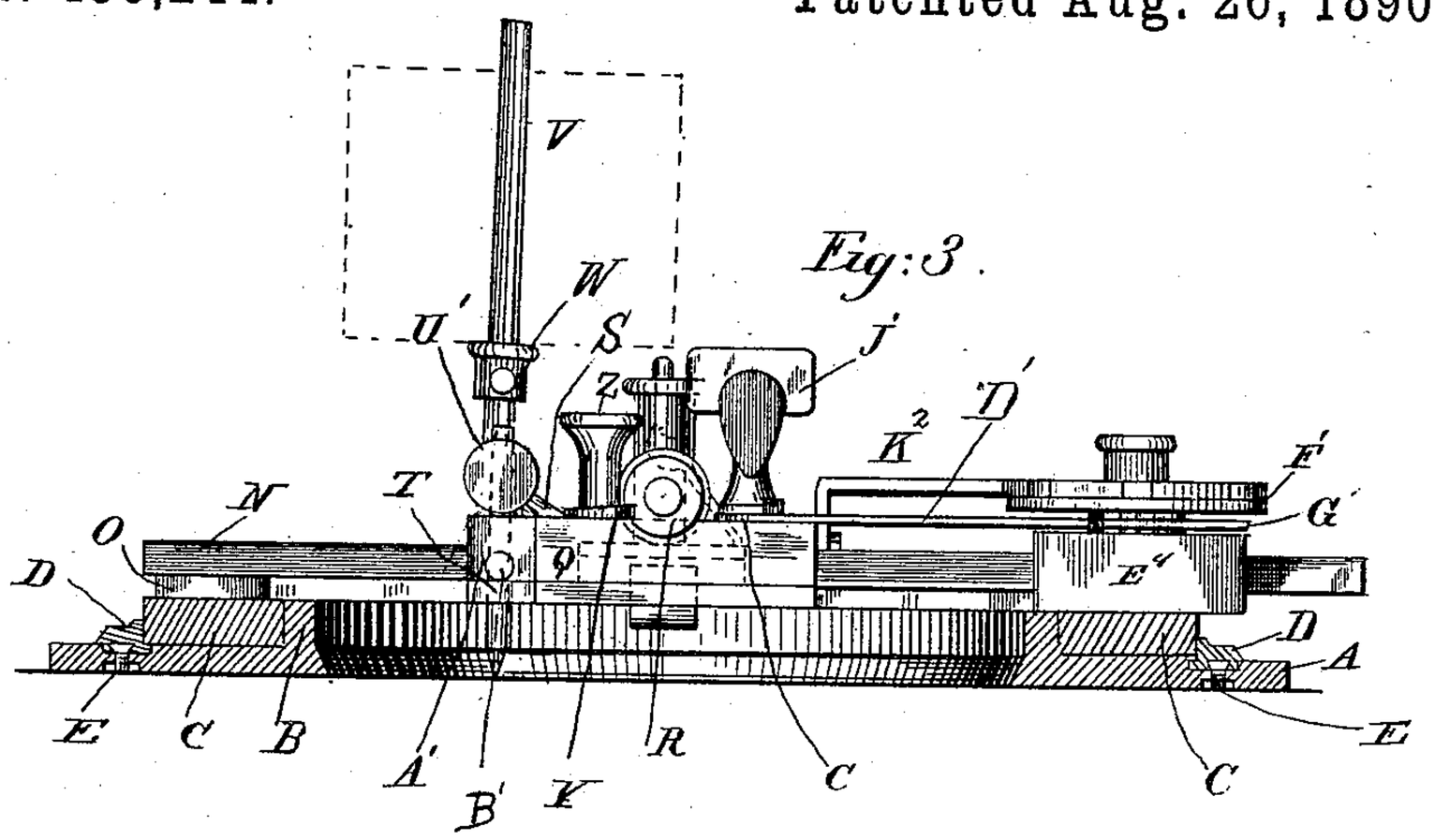


Fig: 3.

Fig: 4

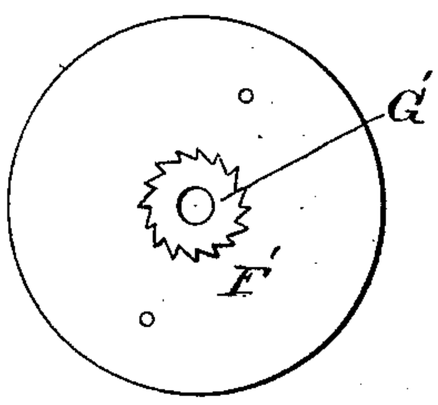
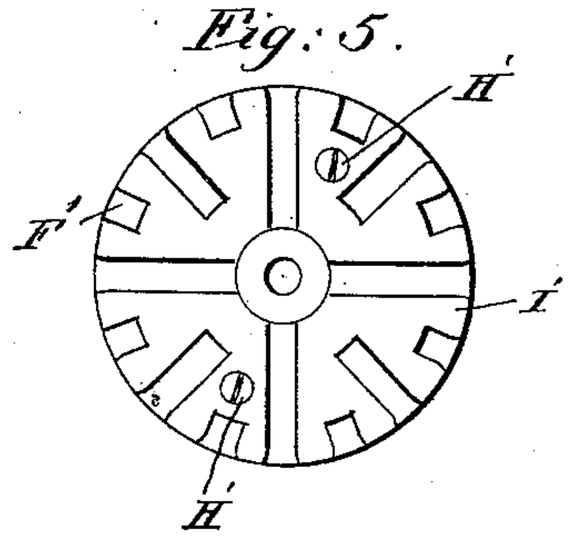


Fig: 5.



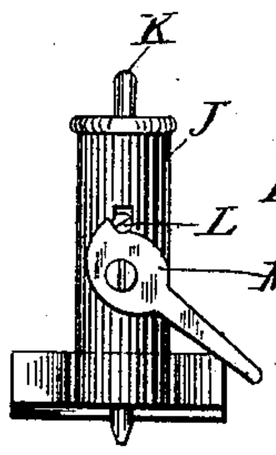


Fig: 6.

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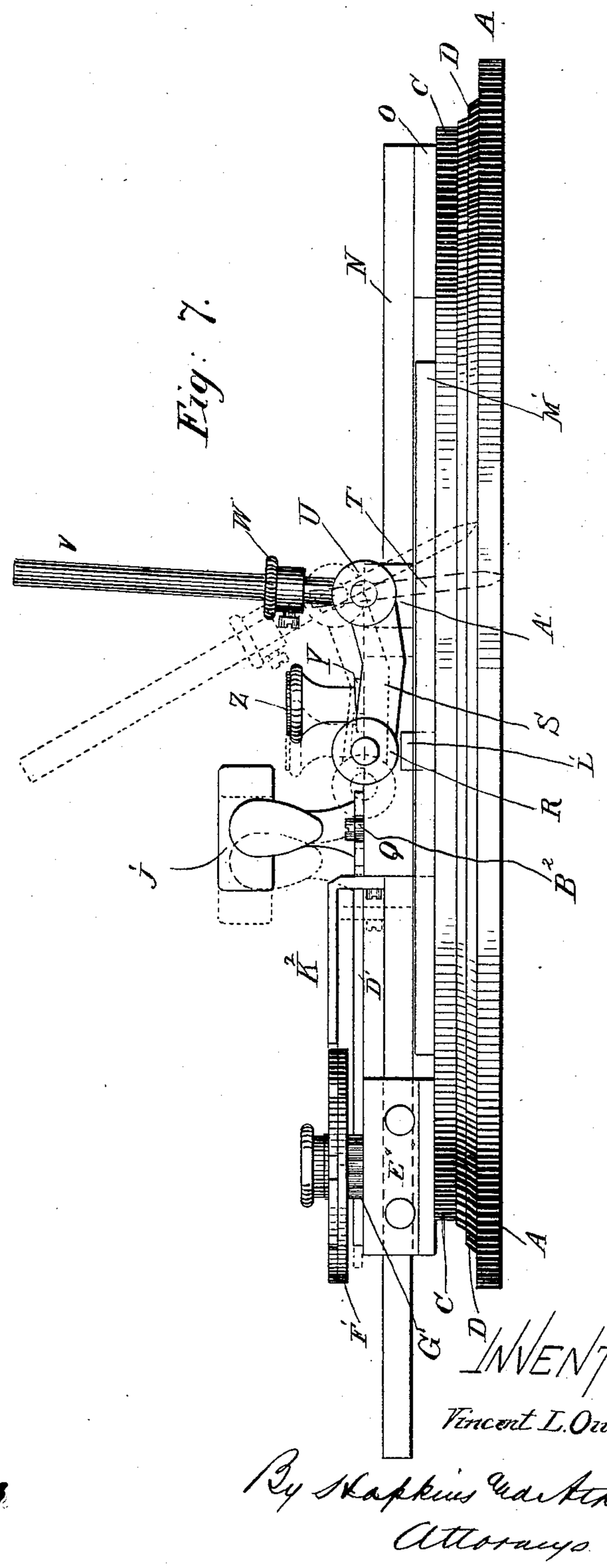
ENGRAVING MACHINE.

No. 435,244. Patented Aug. 26, 1890.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,244, dated August 26, 1890.

Application filed March 26, 1890. Serial No. 345,411. (No model.)

To all whom it may concern:

Be it known that I, VINCENT L. OURDAN, of the city 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.

My invention relates to machines for engraving compass-faces, such as are used upon ordinary nautical charts for indicating the variations of the compass in different localities.

The object of my invention is to produce certain improvements upon the device shown and described in my patent, No. 344,676, issued June 29, 1886; and it consists in the combination and arrangement of parts hereinafter described for regulating the length of cut of the engraving-tool.

In the accompanying drawings, Figure 1 is a top view of my machine. Fig. 2ª illustrates the under side of the ratchet-bearing plate that carries the regulating-plate. Fig. 2ᵇ is a top view of the same with the regulating-plate attached. Fig. 3 is a longitudinal central vertical section of Fig. 1. Fig. 4 is a bottom view of a ratchet-carrying plate provided with a ratchet having greater number of teeth than that illustrated in Fig. 2ª. Fig. 5 is a regulating-plate having a greater number of slots than is shown in Fig. 2ᵇ. Fig. 6 is a detailed view of the cam-operated plunger for securing the carrier of the machine in fixed relations to its base; and Fig. 7 is a side elevation of my machine, showing in dotted lines the comparative relations of the movable parts in different positions. Fig. 8 is a vertical section of the tool-carriage, showing the relation of it to the half-cylinder that is pivotally carried upon it. Fig. 9 is an end view of the half-cylinder detached, showing one of the overhanging ends.

Referring to the letters on the drawings, A indicates an annular base, which is adapted to be set upon the plate to be engraved in any suitable manner. I have generally found it desirable, however, to fix it upon a cushion of wax, which holds it firmly in position and prevents the scratching of the plate. The inner edge of the base is provided with an annular flange B. Closely fitted around the flange and resting upon the base is an annular carrier C. The carrier is adapted to be rotated, and by its weight and nice fit will hold its position without mechanical means to secure it in place, although of course they may be used where they are found to be necessary. Outside of the edge of the carrier C, in an annular groove in the base A, is provided a ring D, that is susceptible of being rotated upon the base. It is secured to the base by screws E, (see Fig. 3,) whose heads move in a dovetailed annular groove on the under side of the ring D, and whose nuts are countersunk in the bottom of the base A.

F indicates holes of uniform size in the edge of the base A, and G indicates corresponding holes in the ring D. The holes F are, preferably, three hundred and sixty in number, one for each degree of the circle, and the holes G are one hundred and twenty-eight in number, one for each point of the compass. Only a few of each series of holes are illustrated in the drawings.

At H, Fig. 1, is indicated a vernier for setting the position of the ring D with reference to the base A.

Upon opposite sides of the carrier are secured brackets I I′, that carry within covers J plungers K K′. From each side of these plungers project pins L, that engage with the surfaces of cam-levers M, that are pivoted to the sides of the covers. Within each case is secured a spring which projects the plunger downwardly. The spring is not illustrated in the drawings, because this device is well known and may be varied in many ways. The cam-lever is adapted to lift the plungers and hold them in the raised position. One plunger is located over the holes F, and is adapted to fit into them. The other is located over the holes G, and is adapted to fit into them. By means of these plungers the carrier may be locked to the base or to the ring D alternately.

To the carrier C is secured, at one side of the center, the dovetailed track N, that rests

upon blocks O, and is held in place by screws P, having countersunk heads. (See Fig. 1.) Only one end of the track is shown uncovered, so as to exhibit the screws; but the other end is attached in the same manner, except the block at that end is made narrower, so as to allow the carrier E^4 to slip over it. Upon the track N slides a carriage Q, in the middle of which is pivoted upon lugs projecting from the carriage, a hollow half-cylinder R, that carries upon one end, by means of the arm S, the engraving-tool T. This tool is held in place upon the arm by the bolt U and nut U′, and is adapted to be moved radially, or may be made to describe a circle by rotating the carrier C.

V indicates a rod, which projects upwardly from the free end of the arm S, and is provided with an adjustable sliding collar W, upon which is adapted to be loosely seated a weight (indicated by dotted lines in Fig. 3) to press upon the engraving-tool. Weights of different sizes may be employed to regulate the depth of cut made by the tool.

The cam Y that is pivoted to the carriage projects under one edge of the cylinder R, and is operated by the thumb-piece Z. When the cylinder rests against the lowest part of the cam Y, as shown in Figs. 3 and 7, the engraving-tool is in position to cut. By rotating the cam the cylinder is gradually turned by the incline of the cam until the engraving-tool is lifted clear of the plate, as shown in dotted lines in Fig. 7. In the main, the construction above described corresponds with that shown in my patent above referred to.

Coming now to what constitutes my present invention, A′ indicates an adjustable stop adapted to be secured to the track by means of the set-screw B′. The motion of the carriage in one direction is limited by this stop, and the carriage is always in contact with it when it is to be moved for making a cut. Consequently the size of the compass to be cut is determined by the position of this stop upon the track. Pivoted at B^2 on one side of the end of the carriage opposite to that which carries the tool is an arm C′, that carries the spring-arm D′, upon the free end of which is provided the pawl E′.

E^2 indicates a slot in the arm C′, and E^3 a guide within the slot secured to the carriage. The spring-arm, as shown, is made integral with the pivoted arm C and the pawl is made integral with the spring-arm; but these details, like many others, may be varied to suit convenience.

Centrally pivoted to the adjustable carrier E^4 is a circular plate F′, that carries upon its under side the ratchet G′. Upon the top of this, by means of the screws H′, is removably secured the regulating-plate I′. The number of teeth of the ratchet is made to correspond to the number of graduations to be cut in each subdivision of the circle. The regulating-plate is usually provided with two or more radial slots, and the number of slots and their depth may be varied at will, the depth of the slots and the position of the carrier E^4 determining the length of the cut of the engraving-tool. In Fig. 1 is illustrated a regulating-plate with six radial slots of the same depth and two of greater depth. In Fig. 2^b only two radial slots are shown, and in Fig. 2^a ten ratchet-teeth are shown. When this regulating-plate is used, the circle on the engraved plate will be divided into a series of graduations, of which every fifth one will be a short line and the others little more than points. The pawl upon the spring-arm engages with the ratchet-teeth G′. The pivoted arm C′ carries a hand-piece J′, by which it may be turned upon its pivot and motion communicated to the ratchet G′, and thereby to the regulating-plate. Then by the same hand-piece the carriage may be moved along the track toward the regulating-plate until the finger K^2 that is secured to the carriage strikes the regulating-plate, when further motion is prevented. It will be understood from this description that a cut may be made scarcely longer than a point, or nearly as long as the radius of the circular regulating-plate, or the relative lengths of the cuts may be increased by increasing the distance between the stop A′ to the carrier E^4. If the finger strikes no radial slot in the regulating-plate the relatively smallest mark is made by the engraving-tool; but if it striks a slot the carriage may be moved and the tool will cut until the bottom of the slot is reached. The length of cut that is made by the tool while the carriage is being moved from the stop A′ to the place at which the finger hits the circumference of the regulating-plate may be determined by the position of the adjustable carrier E^4 with reference to the stop A′.

L′ indicates a supporting-arm projecting from the carriage, and is adapted to slide upon the way M′, secured to the carrier C. This means of support is provided in order to allow the carriage to move properly upon its base, and to prevent the binding which would otherwise be occasioned by the weight upon the engraving-tool.

The operation of my invention is as follows: The ring D is first set by means of the vernier to indicate the variation of the magnetic compass at the place on the map, and is firmly secured to the base. Then the base is centered upon the plate to be engraved, so that its north and south line corresponds with the north and south line of the plate. Then to engrave the outer circle, which corresponds to a compass pointing to the true north and south, the plunger K is set into the zero-hole F′. Then the adjustable stop A′ is secured to the track N, and the carriage is moved up against it. Next, the engraving-tool, which is always held suspended except when cutting, is let down against the metal. Then, by turning the hand-piece J′ a partial rotation of the regulating-plate is imparted by means of the spring-arm connected with the hand-

piece, and the ratchet G′ connected with the regulating-plate. Next, without releasing the hand-piece, move the carriage down toward the regulating-plate until the finger upon the carriage strikes against it, when further motion in that direction is prevented. Then release the hand-piece, lift the engraving-tool, slide the carriage back to its first position, and having advanced the plunger K one degree or more repeat the operation described as before. The length of cut of the engraving-tool, as will be readily seen, is automatically determined by the operation of the regulating-plate. When the outer circle has been engraved, and the inner one, which shows the variation of the magnetic needle, is to be engraved, release the carrier from the base A by withdrawing and locking the plunger from the holes F, and set the other plunger into the zero-hole G. Then repeat the operation above described for cutting the outer circle, having first set the adjustable block upon the track so as to limit the inner circle to the desired size, and also, if desired, having changed the regulating-plate to suit the lengths of cuts to be made.

What I claim is—

1. In an engraving-instrument, the combination, with an annular base, a rotating carrier, a transverse track, and a tool-carriage adapted to be moved upon the track, of a regulating-plate adapted to be revolubly fixed to the track, a hand-piece upon the tool-carriage, and a connection between the hand-piece and regulating-plate, so that the said plate may be rotated and the carriage moved upon its track by means of the same hand-piece, substantially as set forth.

2. In an engraving-instrument, the combination, with an annular base, a rotating carrier, a transverse track, and a tool-carriage adapted to be moved upon the track, of an adjustable carrier E^4, provided with a revoluble regulating-plate, and a ratchet combined therewith, a pawl-connection between the carriage and the ratchet of the regulating-plate, and a pivoted hand-piece carried upon the carriage to operate the pawl-connection between it and the ratchet of the regulating-plate, substantially as and for the purpose set forth.

In testimony of all which I have hereunto subscribed my name.

VINCENT L. OURDAN.

Witnesses:

JOSEPH L. ATKINS,

MARCUS S. HOPKINS.