No. 695,069. Patented Mar. 11, 1902.

J. H. MARTIN.

ENGRAVING MACHINE.

(Application filed Apr. 6, 1901.)

(No Model.) 2 Sheets—Sheet 1.

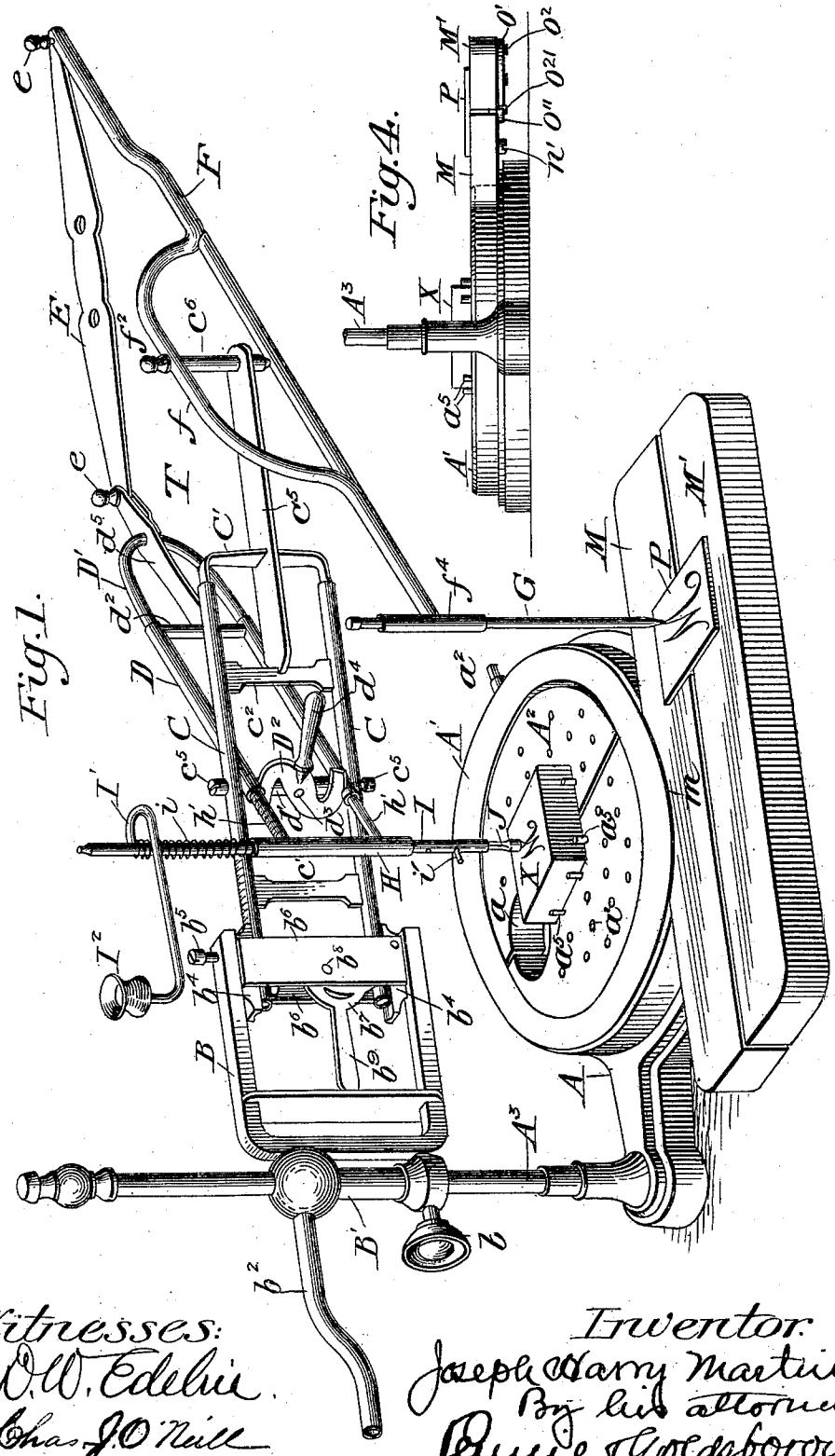


Fig. 1.

Fig. 4.

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Fig. 2.

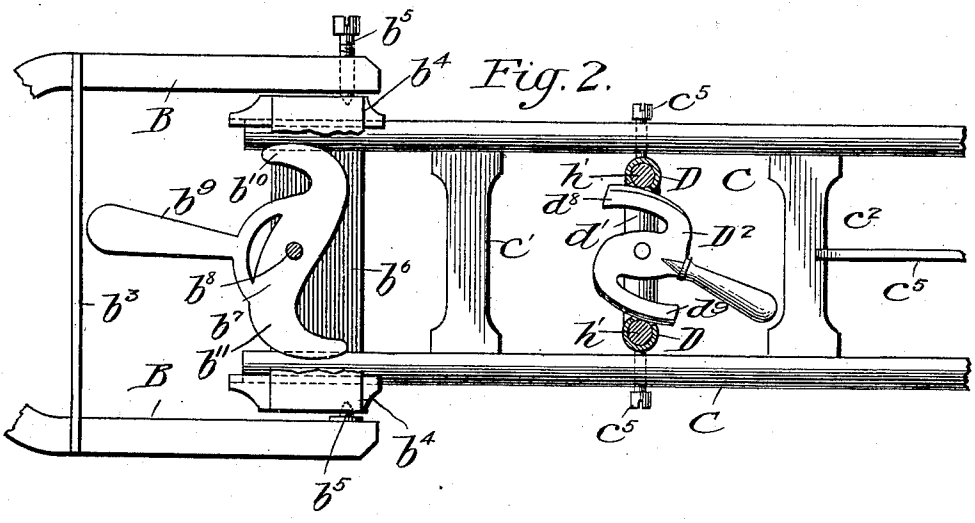
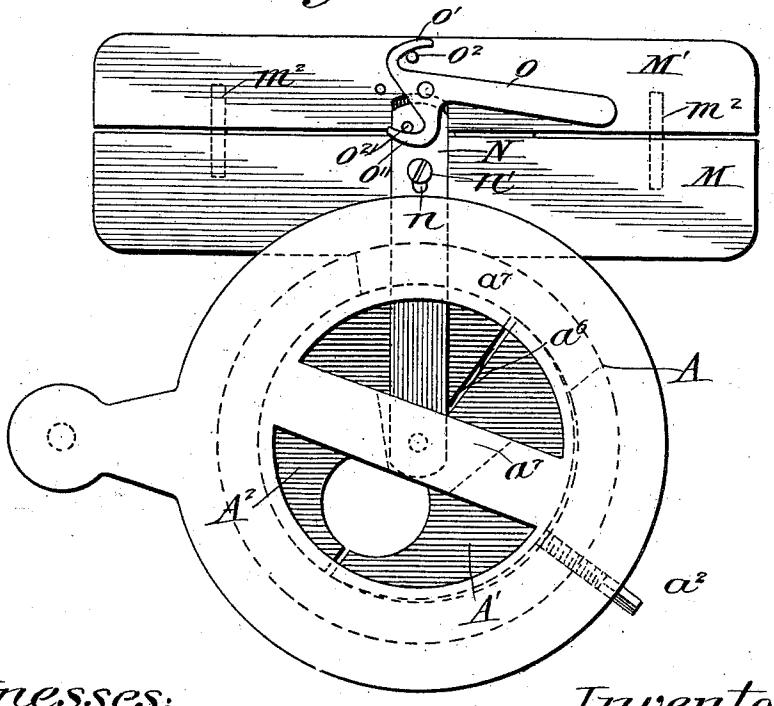


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH HARRY MARTIN, OF ROANOKE, VIRGINIA, ASSIGNOR OF ONE-HALF TO JAMES S. PERSINGER, OF ROANOKE, VIRGINIA.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 695,069, dated March 11, 1902.

Application filed April 6, 1901. Serial No. 54,688. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HARRY MARTIN, a citizen of the United States, residing at Roanoke, county of Roanoke, State of Virginia, have invented certain new and useful Improvements in Engraving-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to engraving-machines, and more particularly to pantographic engraving-machines, in which a pantograph is provided with a tracer and a graving-tool, which operate on the type or pattern and the article to be engraved, respectively.

This invention is designed to provide a simple and efficient machine having comparatively few and ready adjustments to accommodate a wide range of action; and to this end it comprises a base provided with an adjustable work-table and a coöperating clamping-pattern table capable of circumferential adjustment with respect to the base, a vertically and radially movable bracket in which the pantograph is adjustably supported by one of its arms, a tool-holding bracket adjustably mounted on another arm, a tracer carried by a third arm of the pantograph, all so arranged that the figure may be engraved on the work with any desired variation as to size and shape from the pattern.

The preferred form of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the machine. Fig. 2 is an enlarged detail showing the clamping adjustment between the pantograph-frame and its support and said frame and the graver-bracket, respectively. Fig. 3 is a view of the under side of the base, showing the means for adjusting and locking the work-table and the pattern-table. Fig. 4 is a fragmentary side view showing the relation of the pattern-carrying table and the base.

Referring to the drawings, A is the base or support, which is generally circular in form and is provided with an annular rim or flange A′, in which are adjustably mounted two segmental blocks or bed-pieces A^2, adapted to hold the work. Each block has a series of orifices a' to receive suitable pins or dogs a^5, which serve to hold the work in position. The blocks are normally held apart by a spring a^6 between their engaging faces and are forced together to cause the pins a^5 to lock the work firmly in place by a set-screw a^2, mounted in the rim A′ and engaging the periphery of one of said blocks.

The pattern-table comprises a flat piece M, secured by a slot n and pin n' to a radial arm N, which is pivoted to the center of the base A and has a limited circumferential movement in a segmental slot a^7 in the base. A second piece M′ is movably secured to M by dowels or other appropriate guides m^2 in such relation that the two pieces constitute the jaws of a clamp or vise for the pattern P. To the under side of jaw M′ is loosely pivoted a locking-dog O, having two oppositely-disposed hooks o' o'', which engage pins o^2 o^{21} on the jaw M′ and the radial arm N, respectively. The hook o' is substantially concentric with the pivot-pin, while the hook o'' is eccentric thereto and the parts are so related that when said hooks engage their respective pins the pin o^{21} rides up the hook o'' and draws the jaw M′, by means of hook o' and pin o^2, toward the jaw M, and subsequently moves both jaws in parallelism toward the rim A of the base. The jaw M has a rabbet m, conforming to the periphery of flange A′. When the pattern is inserted between the distended jaws of the clamp, the dog O is turned to cause the cam-hooks o' o'' to engage the pins o^2 o^{21}. This causes the jaws M M′ to close on the pattern and at the same time forces the part M along the radial arm N to the extent of the movement of pin n' in slot n until the rabbet m engages the rim A′ of the base, so that the pattern is locked in the clamping-table and the entire table is locked to the base.

A vertical column or support A^3, rising from the base A, carries a U-shaped bracket B, which is adjustably secured to said column by sleeve B′ and set-screw b'. A handle b^2, projecting from said sleeve, affords means for adjusting the latter vertically or radially on said column. To the outer ends of the bracket B is pivoted a clamp by means of two cone-studs b^5, the upper one of which is adjustable

in the bracket end. Said clamp comprises two shoes b^4, rigidly connected by distance-pieces b^6, between which is pivoted at b^8 a latch b^7, having a handle b^9 and two oppositely-disposed cams b^{10} b^{11}.

The shoes b^4 are grooved on their inner faces to provide bearings for the fulcrum end of the parallelogrammatic pantograph-frame T, which is locked against the shoes b^4 by the cams b^{10} and b^{11} of latch b^7, as clearly indicated in Fig. 2. The pantograph-frame is constructed as follows: The fulcrum-arm consists of two sections C, preferably tubular in section, united by an end piece C′ and held rigidly in parallelism by cross-braces c' and c^2. A flat section C^5, secured to C′ and c^2, forms a connecting-piece between the fulcrum-arm and the tracer-arm. Pivoted about midway of the length of the sections C, by means of pins c^5, is the graver-arm, consisting of two tubular sections D, united by an end piece D′ and cross-braces d' d^2 and provided with a clevised end piece d^5.

The rear ends of the tracer-arm and the graver or tool arm are connected by a rod or bar E, which is pivoted to each by a suitable pin e. The tracer-arm consists of a tubular section F, having an offset f, forming a yoke in which is pivoted the end C^5 of the fulcrum-arm by means of the sleeve c^6 and pin f^2. To the outer end of arm F is fixed a sleeve f^4, in which is reciprocably mounted a tracer or stylus G, provided with a suitable point to engage the pattern P.

The tool or graver J, which may be of any preferred type, is suitably secured to the end of a rotatable and reciprocable spindle I, which in turn is mounted in a bracket or support consisting of a tubular section H and two rearwardly-projecting pins h h', which engage the open tubular ends of sections D D. Mounted on the upper part of the spindle I is a hand-lever I′, terminating in a rotatable button or finger-piece I^2. The spindle I is normally held away from the work by a spiral spring i, which engages the upper end of the part H and the handle I′, and the upward movement of said spindle is limited by a pin i', projecting laterally therefrom. A rocking-cam latch d^3 is pivoted at d^3 to the cross-brace d', and when said latch is turned by handle d^4 the cams d^8 and d^9, passing through transverse grooves in the sections D D, engage the pins h' h' of the graver-bracket and lock it rigidly in its adjusted position.

It is to be particularly noted that the lengths of the sides of the parallelogram formed by the members C D E F are definitely determined by the pivots c^5, e, and f^2. For purposes of convenience I prefer to make the several sides of said parallelogram of equal length between pivot-points. The adjustments to secure variation in size and shape of the engraving are made by changing the pivotal point of fulcrum-arm C in bracket B and the distance of spindle I from the pivots c^5. This is accomplished by releasing the cam-latches b^7 and D^2 and moving the sections C and pins h' toward or from the pivots b^5 and c^5, thereby varying the relative positions of the fixed or fulcrum point of the pantograph and the graver with respect to the pivots c^5. For example, if the fulcrum-arm and the graver-arm be so adjusted that the distances between the axes of pivots c^5 and b^5 and c^5 and I are varied to preserve the alinement of the fulcrum, the tool, and the tracer the engraved figure will vary only in size from that of the pattern; but if the distance c^5 I only be increased the engraving will be enlarged in the direction of its width, and if c^5 b^5 only be increased the engraving will be lengthened, while its width will remain unchanged. I am thus enabled to vary the engraved figure in size—viz., in length and width, in length only, or in width only—at pleasure without departing from the characteristic configuration of the pattern. The advantages of this capability of action are manifest, as a single pattern may serve as a guide in engraving figures on articles of widely-different dimensions, and by two simple adjustments of the graver-support and the fulcrum-point the pattern may be reproduced on the work larger or smaller in size or relatively long and narrow or short and broad, whereby the engraving may be most economically and artistically applied to the available space on the work to be operated upon.

By adjusting the sections A^2 of the work-table about the center of the base it is possible to change the position of the figure without readjusting the work in the clamp a^5, and by rotating the bracket B on the column A^3 and moving the pattern in the clamp M M′ and shifting the work-table about the base A the point of the graver can be brought to the exact position desired to begin the work of engraving.

In operating the machine the work, as X, is clamped in place on the table A^2 and the parts of said table brought together by set-screw a^8. Bracket B is then adjusted on the column a^3. The pantograph ratio is adjusted by moving the arms C and the graver-support toward or from the pivots b^5 and c^5, respectively. The pattern P is placed on table M M′ and said table is moved about its pivot until a selected point on the pattern engaged by the tracer corresponds with a desired point on X engaged by the graver. The latch O is then operated to lock both the pattern and the table in position. Having fixed the position, size, and shape of the figure to be engraved, the tracer is placed on the pattern and the graver held down on the work, after which as the tracer moves over the pattern the figure is cut into the work by the corresponding movement of the graver.

Having thus described my invention, what I claim is—

1. In an engraving-machine, a parallelogrammatic pantograph-frame, a tracer carried by said frame, a tool, and means for con-

trolling the range of operation of said tool, comprising a pivotal support in which said frame is adjustably mounted, and a support for said tool having an extensible connection with said frame.

2. In an engraving-machine, a parallelogrammatic pantograph-frame, an adjustable support for said frame, a tracer carried by said frame, a tool, and means for controlling the range of operation of said tool, comprising a pivotal adjustable connection between said frame and said support, and a support for said tool having an extensible connection with the frame.

3. In an engraving-machine, a work-holding table, a pattern-carrying table adjustable circumferentially around the work-table, a parallelogrammatic pantograph-frame adjustable vertically and angularly with respect to the work-table, a tracer carried by the pantograph-frame, and a tool having an extensible connection with the pantograph-frame.

4. In an engraving-machine, a base, a work-table and a pattern-table having adjustable connections with said base, a column secured to said base, a vertically and angularly adjustable bracket supported on said column, a clamp pivoted in said bracket, a parallelogrammatic pantograph-frame adjustably supported in said clamp, a tracer carried by said frame, a tool, and a support therefor having an extensible connection with said frame.

5. A work-table for engraving-machines and the like comprising a flanged base forming the support of said machine, a sectional work-table fitted loosely in said flanged base, means on said table to retain the work in approximate position, and means carried by the flange and engaging one of said table-sections to force the sections together and thereby lock the work in position.

6. A work-table for engraving-machines and the like comprising a base provided with an annular flange, said base forming the support of said machine, a work-table comprising two segmental blocks loosely fitted in said flange, means on said blocks to secure the work in approximate position, and means carried by said flange and engaging one of said blocks to force said blocks together and thereby lock the work in position.

7. A pattern-table for engraving-machines and the like comprising two parallel clamping-sections, a pivotal arm connecting said sections to a base, and a locking-clamp comprising a locking-dog engaging said arm and one of said sections and adapted to simultaneously close said clamping-sections on the pattern and lock said table to the base.

8. In an engraving-machine, an annular base, a pattern-table comprising two parallel clamping-sections, an arm pivoted to said base, a sliding connection between said table and said arm, and a locking-clamp engaging said arm and said table and adapted to simultaneously close said clamping-sections on the pattern and lock said table to said base.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH HARRY MARTIN.

Witnesses:
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