

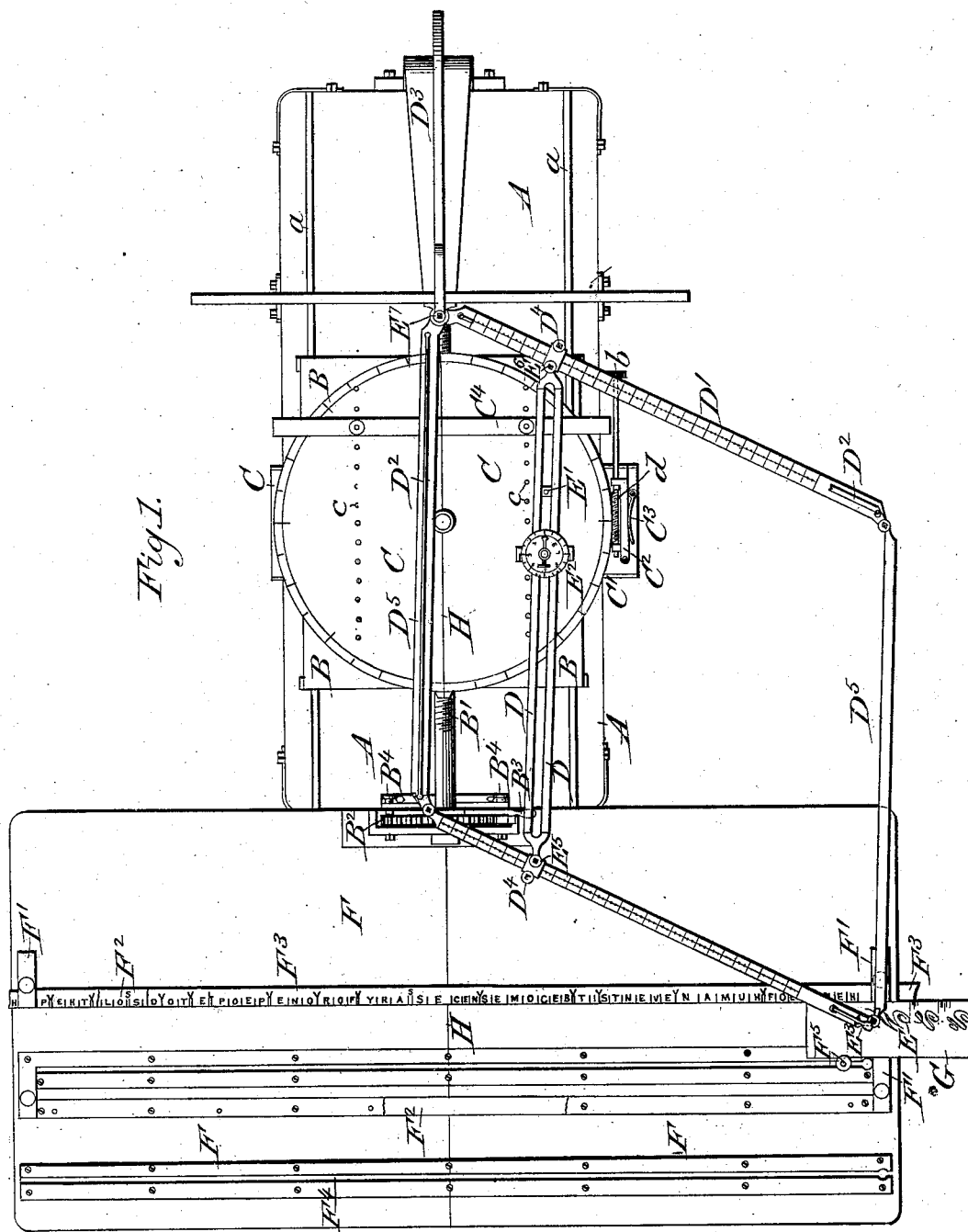
(No Model.)

3 Sheets—Sheet 1.

J. EARLE.  
ENGRAVING MACHINE.

No. 260,463.

Patented July 4, 1882.



WITNESSES

*H. H. Schott.*  
*A. R. Brown*

INVENTOR

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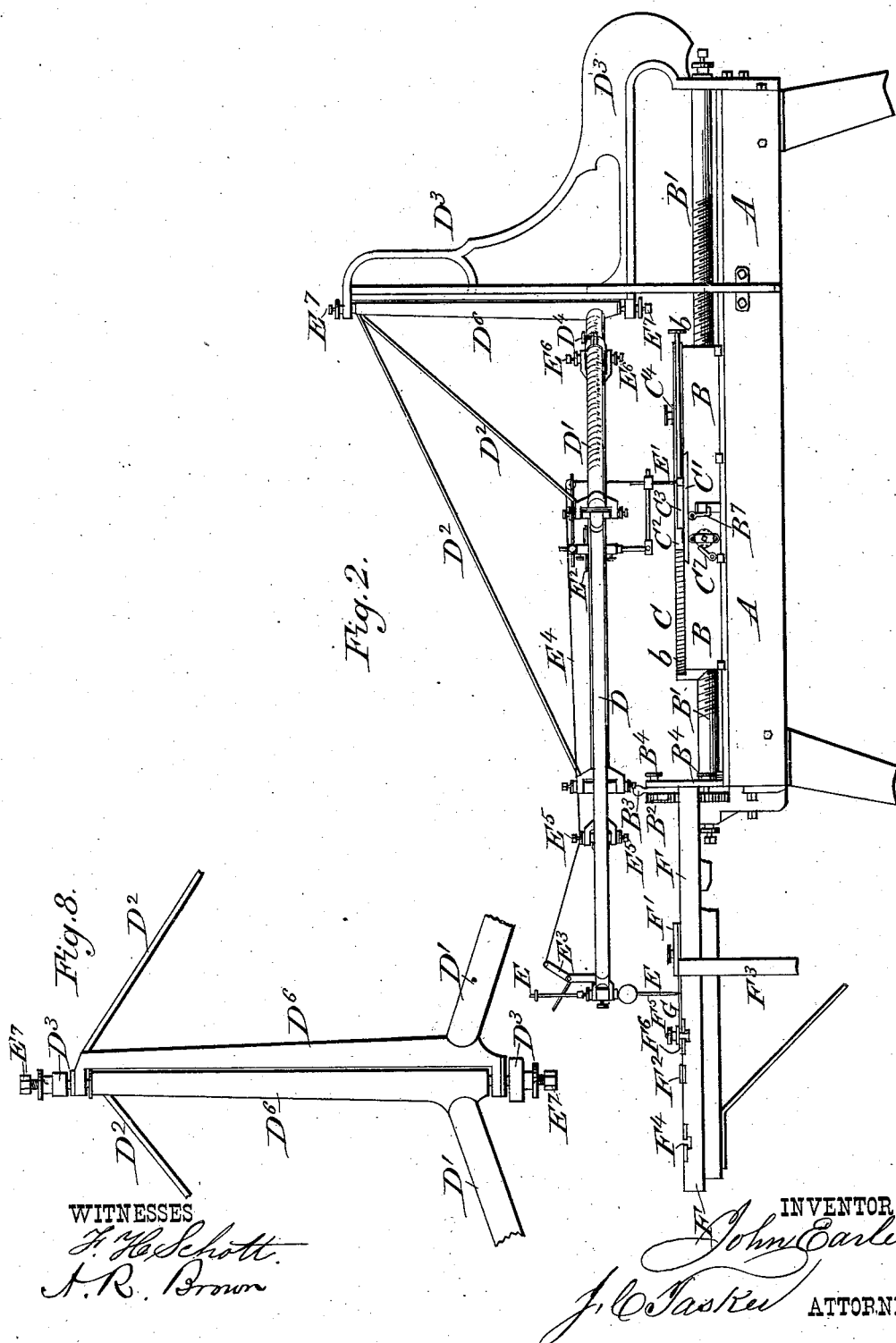
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3 Sheets—Sheet 3.

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Fig. 3.

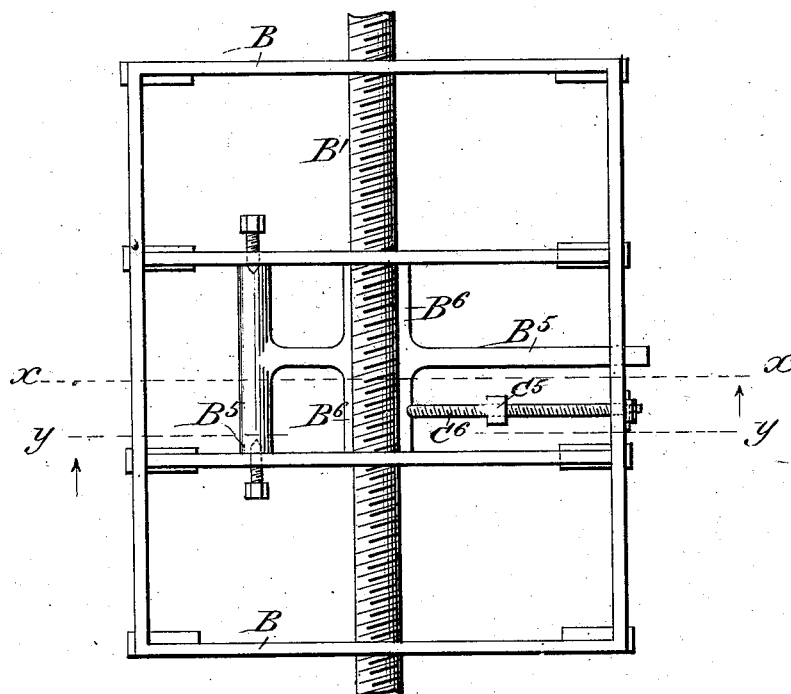


Fig. 4.

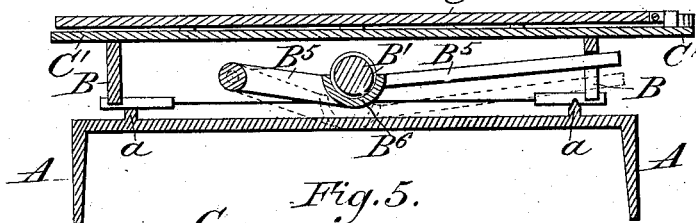


Fig. 5.

Fig. 7.

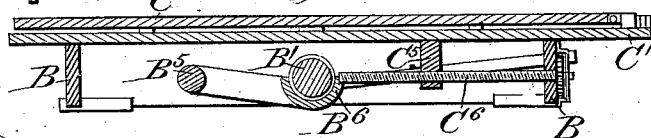
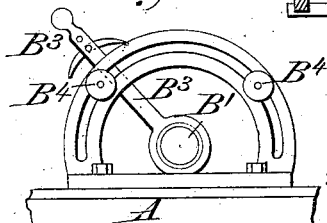
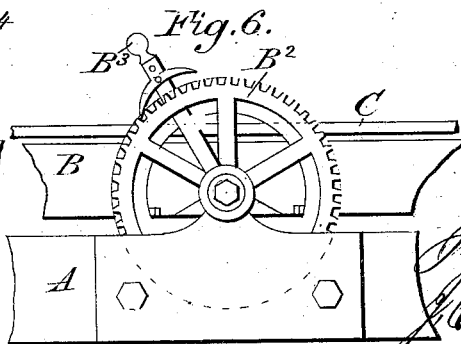


Fig. 6.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN EARLE, OF DARBY, PENNSYLVANIA.

## ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 260,463, dated July 4, 1882.

Application filed December 29, 1881. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN EARLE, a citizen of the United States, residing at Darby township, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Engraving-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of engraving-machines which are arranged to operate on the principle of the pantograph; and the invention consists in the construction and combination of devices, as hereinafter more fully described and claimed.

In the annexed drawings, which illustrate the invention, Figure 1 is a top plan view of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a view of the interior arrangement of the carriage. Fig. 4 is a section on the line *xx* of Fig. 3. Fig. 5 is a section on the line *yy* of Fig. 3. Fig. 6 is an end elevation of carriage and ratchet-wheel. Fig. 7 is a reversed view of ratchet-wheel. Fig. 8 is a detail view of main operating mechanism.

Similar letters indicate like parts in the several views.

A represents the frame of the machine, upon which are two parallel longitudinal rails, *a a*. These rails support a carriage, B, which is moved thereon to any desired position by means of the screw B', toothed wheel B<sup>2</sup>, and ratchet B<sup>3</sup>. The carriage B supports a circular bed, C, having a transverse straight-edged bar, C<sup>4</sup>, which is arranged at right angles with the rails *a a* and line of motion of the carriage. This bar C<sup>4</sup> may be adjusted and secured in any required position upon the bed C by means of pins or set-screws engaging with the perforations *c* in the bed-plate. The plate to be engraved upon is placed on the bed C, against the straight-edged bar C<sup>4</sup>. This straight edge is perfectly parallel with a straight edge, F<sup>2</sup>, on the table F and at right angles with the movements of the carriage B. Consequently any series of tracings with the diamond-point E' on a plate arranged on the bed C must be straight and parallel with both right-angled edges of the plate and as long as the sweep of the machine along the straight edge F<sup>2</sup> from end to end.

A circular movement may be imparted to the bed C by means of a worm, *d*, which is operated by a thumb-button, *b*, so as to engage with the cogged periphery of the bed, and thus adjust it to any desired position, as indicated by a scale upon the edge of its upper face. The shaft of the worm *d* is journaled in a bracket, C<sup>2</sup>, which is pivoted at one end to the slide C', and the worm *b* is thus held in frictional contact with the circular bed C by means of an eccentric, C<sup>3</sup>. It will be seen that this eccentric is pivoted at one end, so that it can be drawn out, thereby liberating the bed C from engagement with the worm or screw *d* and allowing the circular bed to be rotated by hand, the screw *d* being only used for obtaining nice adjustments.

B<sup>5</sup> is a lever which engages with the screw B' by means of a half-nut, B<sup>6</sup>, as shown in Figs. 3, 4, and 5, the half-nut being held to its engagement with the screw by means of a hook, B<sup>7</sup>, in which the outer end of the lever is supported.

The slide C' is provided on its under side with a nut or lug, C<sup>5</sup>, through which passes a screw, C<sup>6</sup>, thus enabling the slide to be operated by means of a key engaging with the square end of the screw which projects beyond the side of the carriage, a ratchet and pawl, C<sup>7</sup>, being arranged to assist in holding the slide to its adjustment.

The screw B' is operated by means of the ratchet-wheel B<sup>2</sup>, which is keyed thereto, and the ratchet-pawl B<sup>3</sup>, which moves freely on the shaft of said screw, movable stops B<sup>4</sup>, between which the pawl moves, being provided for regulating any desired degree of revolution of the screw. The movement of the carriage B by means of the screw B' enables the operator, when one line of lettering is completed, to move the plate lying on the bed C the requisite distance to trace another line, and so on until the desired number of lines are completed and all equally spaced.

D is a double central bar, which is adjustable upon the graduated arms D' D', that are supported by means of steel rods D<sup>2</sup> D<sup>2</sup>, attached to vertical rotating bars D<sup>5</sup> D<sup>6</sup>, supported in the bracket D<sup>3</sup> by means of the pivotal connections E' E'. These graduated arms are connected at their ends by arms or bars D<sup>5</sup> D<sup>5</sup>, the whole forming a pantograph-frame

for the support of the double bar D, tracing-point E, and engraving-points E'.

To set the machine true, place the tracing-point E in the line H, near the outer edge of the table F. Then slide the center bar, D, along the graduated arm D' to the proper dot or line for the size required, and secure it with the binding-screws D<sup>4</sup>. Then move the diamond-point E', with its disk E<sup>2</sup>, along the center bar, D, until the point E' drops into the line H on the circular bed C and secure it by means of its binding-screws. The line H is drawn from the center of the lower main pivot, E<sup>7</sup> in bracket D<sup>3</sup>, and is continued from the circular bed C across the table F, and is at right angles with the straight edges C<sup>4</sup> and F<sup>2</sup>. The diamond-point E' is always in its correct position in regard to the pivots E<sup>5</sup> and E<sup>6</sup> of the center bar, D, when the hand of the disk E<sup>2</sup> is on the figure 1.

To engrave script or any other kind of lettering, the position of each of the letters, with its proper space, is first laid out upon a continuous strip of paper or other suitable material, F<sup>3</sup>. The paper or other material is then stretched upon the straight edge F<sup>2</sup> and secured beneath the flat clamps F'. The plate G, containing the pattern, is then placed against the edge F<sup>2</sup>, with its proper spacing-line agreeing with its corresponding line drawn upon the paper, and secured by screwing down the sliding clamp-screw F<sup>5</sup>, said clamp being held by the rubber spring F<sup>6</sup> a sufficient height above the table F to admit of the pattern-plate passing readily under it, after which proceed to trace the letter, first lowering the diamond-point E' by means of the lever E<sup>3</sup> and cord E<sup>4</sup>. When the tracing is finished the clamp-screw is slackened and the pattern-plate moved along the straight edge to the next letter; or another plate containing the letter to be used may be substituted, and the operation continued until the whole line is finished, the clamp-screw F<sup>5</sup> following up the plate along the slot F<sup>4</sup> to any position desired. There are two sets of slots and two positions for the straight edge F<sup>2</sup>, which is interchangeable.

By means of this machine engravings on steel, copper, and other metal plates are obtained with great facility. The plate to be engraved upon is under complete control, and can be moved with great nicety in any desired direction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an engraving-machine, the double central bar, D, or its equivalent, for retaining the

diamond tracing-point E' constantly in line with the pivot-centers E<sup>5</sup> E<sup>6</sup>, substantially as described.

2. In an engraving-machine, the combination, with the double bar D and diamond tracing-point E', of the graduated disk E<sup>2</sup>, having a hand for ascertaining the exact position of the diamond-point, substantially as described.

3. In an engraving-machine, the combination of the bracket E<sup>3</sup>, arms D<sup>5</sup> D<sup>5</sup>, graduated arms D' D', and double bar D, having tracing-points E' and graduated disk E<sup>2</sup>, substantially as described.

4. In an engraving-machine, the combination, with the carriage B and circular bed C, of the slide C', having spring-bracket C<sup>2</sup> and worm d, substantially as described.

5. In an engraving-machine, the combination, with the circular bed C, of the adjustable straight-edged bar C<sup>4</sup> and the slide C', having spring-bracket C<sup>2</sup> and worm d, substantially as described.

6. In an engraving-machine, the combination of the table F and circular bed C, having a central line, H, extending longitudinally through said table and bed for adjusting the positions of the tracing-points, substantially as specified.

7. In an engraving-machine, the combination, with the slotted table F, of the straight-edged bar F<sup>2</sup>, arranged at right angles with the movement of the carriage B, substantially as described.

8. In an engraving-machine, the combination, with the table F, of the straight-edged bar F<sup>2</sup> and clamps F', for holding the strip F<sup>3</sup>, substantially as described.

9. In an engraving-machine, the slotted table F, having clamps F' F', straight-edged bar F<sup>2</sup>, sliding clamps F<sup>5</sup>, and rubber springs F<sup>6</sup>, substantially as described.

10. In an engraving-machine, the combination of a reciprocating carriage, a circular bed supported thereon, a slotted table, adjustable straight-edged bars arranged at right angles with the line of the movement of the carriage, a bracket supporting a series of pantograph-arms, a double bar adapted to be adjusted on the graduated arms of the pantograph-frame, tracing and engraving points suspended from said double bar, and a graduated disk for regulating the position of the diamond engraving-point, substantially as described.

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

JOHN EARLE.

Witnesses:

JNO. TAYLOR,  
A. B. EARLE.