

UNITED STATES PATENT OFFICE.

AUGUSTUS E. ELLINWOOD, OF GARRETTSVILLE, ASSIGNOR TO HIMSELF
AND ROBERT IRWIN, OF SAME PLACE, AND W. W. HARRIS, OF CLEVELAND, OHIO.

IMPROVEMENT IN ENGRAVING-MACHINES.

Specification forming part of Letters Patent No. 192,907, dated July 10, 1877; application filed July 15, 1876.

To all whom it may concern:

Be it known that I, AUGUSTUS E. ELLINWOOD, of Garrettsville, in the county of Portage and State of Ohio, have invented a new and Improved Engraving-Machine, of which the following is a specification:

Figure 1 is a side elevation with a portion cut away on line *ww* in Fig. 2, to show the construction of some of the parts more clearly. Fig. 2 is a plan. Fig. 3 is a detail view in section on line *xx* in Fig. 1. Fig. 4 is a detail view of the tracer, with a portion cut away to show its internal construction. Fig. 5 is a sectional view of the lever-connections taken on line *yy* in Fig. 1. Fig. 6 is a section on line *zz* in Fig. 2. Fig. 7 is a section on line *z'z'* in Fig. 2. Fig. 8 represents a detail view of the slitted socket and conical screw.

Similar letters of reference indicate corresponding parts.

This invention relates to that class of engraving-machines used by jewelers for engraving silver-ware, rings, coffin-plates, &c., in which the combination of levers known as the pantograph is used to direct the graver, the tracing-point being guided by patterns, forms, or templets.

The invention consists of an arrangement of jaws for clamping and holding the work to be engraved, and also for holding the templets or forms.

It further consists of a device for cutting inscriptions on a curved line while the tracer works on a straight line, all arranged and operating as hereinafter more fully described.

In the drawings, A is the supporting-frame, adapted to hold the various parts of my machine in their proper relative positions.

The legs B B at the rear extend above the body of frame, and join in a common standard, C, which supports the arms *a a'*.

A pantograph, consisting of the arms D E F G, is pivoted between the arms *a a'* on the pointed screws *b b*, which engage with the arm D. The pantograph-arms E, F, and G, where they are pivoted together, are formed into yokes or forks *c c'*. The yoke *c* embraces the yoke *c'* and the pointed screws *d d*, which pass through the yoke *c* and into the yoke *c'*, com-

plete the joint. The object in making the joint in this way is to permit the joining of a pair of levers, K L, carried by the arms, by a joint having the same center as the joint in the arms.

H is a socket carrying the graver-stock *e*, which holds the graver *f*. The said socket is supported by the arm E, and is provided with conical screw-threads *p'*, and corresponding caps *q'* to insure a close fit and to take up the wear.

I is a mandrel, fitted to guides *g* in the end of the arm G, and carrying a tracing-point, *h*, the lower end of the mandrel being drilled to receive it. A head, *i*, is placed on the end of the mandrel for convenience in handling, and is drilled to correspond with the end of the mandrel, forming an additional guide for the tracing-point.

j is a spring, which rests in the bottom of the hole in the mandrel and bears against the end of the tracer *h*.

k is a screw, that passes through the side of mandrel and engages with a slot in the tracer *h*, thus securing it to the mandrel and limiting its motion.

A lever, K, is pivoted to the side of the arm G at *l*, and connected to the mandrel I at *m*, and, by means of a double ball-and-socket connection at *n*, is connected with a similar lever, L, which is pivoted to the arm F at *o*, and connected, by means of a double ball-and-socket joint, to a connecting-rod, *p*, which is attached to the upper end of the graver-stock *e* by means of a screw, *e'*. The double ball-and-socket joint is clearly shown in Fig. 5.

To the front part of the supporting-frame A a frame or templet-holding table, *q*, is attached, which is rabbeted to receive a panel or block, *r*. The said block is provided with arms *s s*, which are pivoted to the sides of the frame A.

M is a cam-lever, supported by the stirrups *t*, and bearing against a concave plate attached to the bottom of the panel *r*.

The patterns, templets, or forms *r'*, representing the letters or other design to be put on the article to be engraved, are placed in the rabbet in the frame *q* and securely held

by the panel *r*, which is forced upward by turning the cam-lever *M*. The panel *r* is made slightly concave on its upper surface, in the direction of its length, to insure a firm bearing at the ends.

The arms *D*, *E*, and *G* are each made in two sections, one being V-shaped in cross-section, and the other being grooved correspondingly to fit it. The parts of each arm are held together by the screws *u*.

The work-supporting device consists of jaws *v v'* sliding in a slot in a tubular arm, *w'*, which are operated by a screw, *N*, provided with a right and left hand thread.

The tubular arm *w'* is attached to a sleeve, *O*, which is placed on a stud, *P*, that projects downward from the arm *a'* parallel to the stock *e*. The sleeve *O* is split, and provided with a binding-screw, *x'*.

The parts of the jaws *v v'* that come in contact with the work are pivoted at *z² z²* so that they may readily adapt themselves to various articles. A narrow face is provided on each jaw at *d'*, arranged at right angles with the wider face, for holding small work, such as rings, &c.

A semicircular flange, *j'*, is formed on the pivoted portion of each jaw to insure a firm bearing. A bolt, *e''*, is placed in the jaw *v*, with its head inside the arm *w'*, and with the nut arranged to prevent the pivoted portion from turning, and also to tighten the jaw on the arm at one operation.

An auxiliary support for holding coffin-plates and similar articles is placed between the jaws *v v'* when required. It consists of a bar, *f'*, having a lug on one side to engage with the jaws *v v'*, and an annular support, *g'*, for holding four radial arms, *h'*, arranged at right angles to each other, and forming a support for the coffin-plate or other article to be engraved. Clamps *i'* are placed in these arms for holding the work.

A curved lever, *j''*, is pivoted at the end of the bar *f'*, and is provided with a series of holes in each end, and also with a slotted arm, *k'*. One of the arms *h'* is a little longer than the others, and has a pin, *l'*, projecting downward from it, which engages with the slot in the arm *k'*.

Q is a connecting-rod, supported by a pin, *m'*, which projects downward from a lug on the socket *H*. This connecting-rod is slotted at *h''* to receive an adjustable stud, *o'*, which engages with the holes in the ends of the curved lever *j''*.

R R' are clamps attached to the jaws *v v'* by dovetailed slides *s'*, and are used for holding cups and other articles of that class.

The operation of my invention may be described as follows: The work to be engraved is placed in the appropriate support or clamp on the arm *w'*, and arranged at the proper height, and also in such a position as to locate the inscription as may be desired. The arms of the pantograph are adjusted by loosening the screws *u* to such lengths as will give the required size to the letters to be cut. The templet or pattern is secured in the frame *q*, and is traced by the point *h*, the graver *f* copying the pattern on the article being engraved, but on a smaller scale. The depth of the lines and shading are regulated by the amount of downward pressure exerted on the mandrel *I*, the motion and pressure being transferred to the graver *f*. The spring *j* keeps the tracing-point *h* in the templet whether more or less pressure is exerted on the mandrel.

When it is desired to cut an inscription on a curve with a straight pattern, the auxiliary holding device is used, and the connecting-rod *Q* is made to engage with the lever *j''*, causing the article operated on to turn on the support *g'* as the work progresses.

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

1. The combination of the tracing-mandrel *I*, levers *K L*, double ball-and-socket joints *n n*, connecting-rod *p*, graver-stock *e*, and the pantograph-arms of an engraving-machine, substantially as shown and described.

2. The adjustable socket *H*, having the conical screws *p'* and corresponding caps *q'*, in combination with the graver-stock *e* and arm *E*, as specified.

3. The combination of the frame *q*, concave panel *r*, pivoted arms *s*, and cam-lever *M*, substantially as specified.

4. The combination of the stud *P*, arm *w'*, arm *a*, and jaws *v v'*, as shown and described.

5. The combination of the arm *w'*, jaws *v v'*, pivoted as described, the bolt *e'*, and screw *N*, as specified.

6. The clamps *R R'*, in combination with the jaws *v v'*, as shown and described.

7. The bar *f'*, annular supports *g'*, arms *h'*, and clamps *i'*, in combination, as shown and described.

8. The combination of the bar *f'*, annular support *g'*, arms *h'*, lever *j''*, and pin *l'*, substantially as shown and described.

AUGUSTUS E. ELLINWOOD.

Witnesses:

O. S. FERRIS,
ROBERT IRWIN.