3 Sheets—Sheet 1.

J. C. & G. M. GUERRANT
Engraving-Machine.

No. 212,927. Patented Mar. 4, 1879.

Fig. 1.

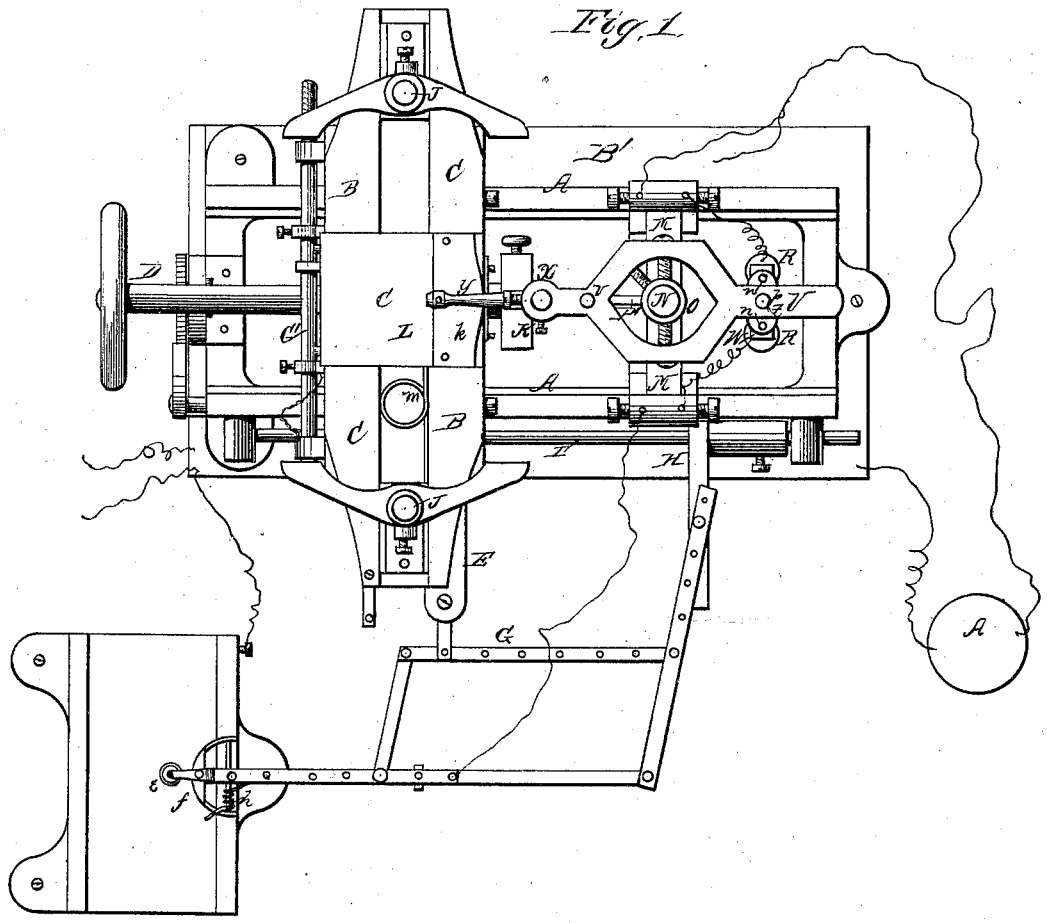

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Fig. 2.

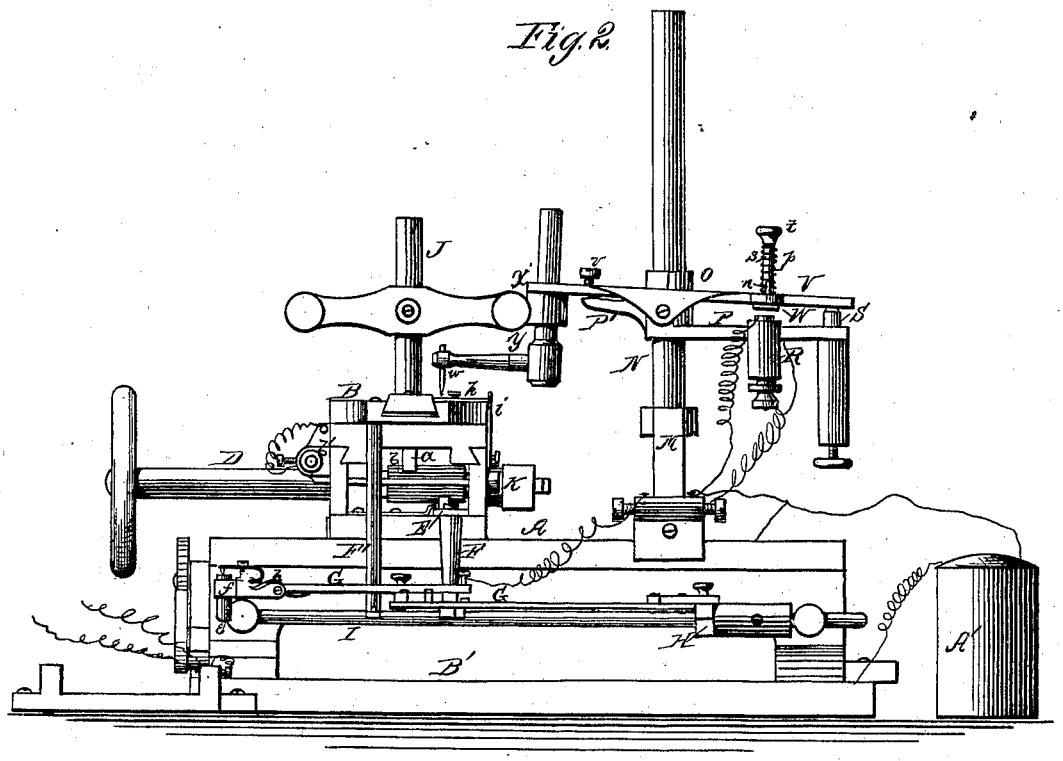

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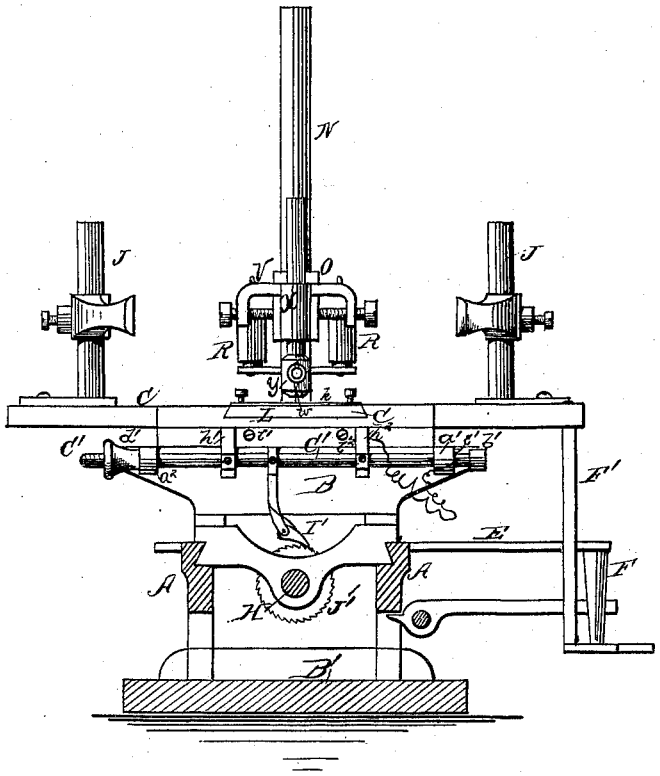
Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN C. GUERRANT AND GEORGE M. GUERRANT, OF DANVILLE, VIRGINIA.

IMPROVEMENT IN ENGRAVING-MACHINES.

Specification forming part of Letters Patent No. **212,927**, dated March 4, 1879; application filed January 4, 1879.

To all whom it may concern:

Be it known that we, JOHN C. GUERRANT and GEO. M. GUERRANT, of Danville, in the county of Pittsylvania and State of Virginia, have invented certain new and useful Improvements in Engraving-Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

Our invention relates to electro-magnetic machines, used for engraving or cutting letters, figures, or other characters on wood, metal, or other material, and particularly to that class of such machines as is shown and described in Letters Patent No. 183,920, granted to J. C. Guerrant October 31, 1876; and the nature of our invention consists in the construction and combination of parts, as will be hereinafter more fully set forth, and pointed out in the claims.

In order to enable others skilled in the art to which our invention appertains to make and use the same, we will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a plan view, Fig. 2 a side elevation, and Fig. 3 an end view, of our engraving-machine.

A represents the bed-frame of the machine, in suitable ways upon which moves the carriage B. On the carriage B is the engraving-table C, movable on a line at right angles with the line of motion of the carriage. On the under side of the table C is a rack-bar, *a*, into which takes a pinion, *b*, upon the operating-shaft D, said shaft having its bearings in the carriage. The pinion *d* also meshes with a sliding rack-bar, E, arranged in suitable ways in the carriage. This latter rack-bar is placed under the shaft D, and hence when the shaft is turned the table C and slide-rack E will be moved in opposite directions. To one end of the slide-rack E is attached an arm, F, to which the movable portion of a pantograph, G, is connected, the stationary arm of said pantograph being firmly secured after adjustment to a bar, H, sliding on a rod, I, connected to the frame A.

e is the tracer, constructed in the same manner as described in the former patent above referred to, and connected to the pantograph by a hinged yoke, *f*. In the former case the weight of the tracer and yoke was depended upon to keep the former in contact with the pattern, but in practice we have found this insufficient, and therefore have added a spring, *h*, as shown, for pressing down the tracer.

An arm, F′, is attached to the end of the table C, to which the movable part of the pantograph is connected for certain work, the tracer and table then moving in the same direction instead of in opposite directions. The table C is provided with adjustable standards J J, provided with suitable adjustable arms or clamps for holding the article to be engraved when such article is a flat surface. When the engraving is to be made on a convex or concave surface, the article is held in a suitable clutch, K, attached to the inner end of the operating-shaft D.

Across the center of the table C, in a dovetailed recess therein, is placed a slide, L, having a plate or pattern, *k*, secured along its inner end, which plate bears against a pointer, *i*, fastened to the inner side of the carriage. The object of this part of our invention is to make the engraving on any desired curved or wavy line by making the edge of the plate *k* of the desired curvature. The slide L being pushed forward by means of a spring, *m*, and the article to be engraved being fastened to the slide, it follows that as the table is moved from side to side the slide will move back and forth, according to the curvature of the edge of the plate *k*, acting on or against the pointer *i*.

M represents an arch or frame adjustable upon the main frame A, and provided with a central upright post, N. On this post is secured a hub or collar, O, having arms P P′ projecting in opposite directions. The arm P is provided with suitable pendants for supporting the electro-magnets R R, and at the extreme end of said arm is formed a suitable casing for a spring-bolt, S, which operates upward against the end of the armature-lever V. This lever is formed with a yoke to straddle and be pivoted to the hub O.

W is the armature, which we have made detached from the lever V. This armature is

provided with a center-pin, p, and two end guide-pins, $n\,n$, which all pass upward through holes in the lever V. On the upper end of the center-pin p is screwed a nut, t, between which and the lever is placed a spiral spring, s, surrounding the pin. The spring s keeps the armature up against the lever, while at the same time it allows the armature to tilt to either side, so as to come down full upon both magnets, if from any cause they should not be perfectly level.

v is an adjusting-screw through the forward end of the lever V, operating against the arm P′ on the hub O. In the extreme forward end of the lever is a socket, X, in which the holder Y is adjusted, said holder carrying the engraving-tool w.

A′ represents the battery, connected by electric wires with the electro-magnets and other parts of the machine, with the pantograph, and with the stationary bed B′, upon which the type or pattern is to be secured, so as to form a complete circuit.

Heretofore, in engraving-machines of this character, it has been necessary to raise the engraving-tool by hand while the table is returned back, as the tool will only cut in one direction. We provide our machine with an automatic circuit breaker and closer, so arranged that when the table moves in one direction the circuit is closed, and when it moves in the opposite direction the circuit is broken.

This device is constructed in the following manner: In bearings a^1 a^2 upon the carriage B is placed a sliding rod, C′, provided at one end with a head, b', and at the other end with an adjustable nut, d', for regulating the length of travel or stroke of the rod. The rod C′ is insulated in the bearing a^1, (which is next to the head b',) and this bearing is provided with a metallic pin, e', to come in contact with the head b' and form the connection. On the rod C′, between the two bearings, are two stops, h^1 h^2, adjustable thereon by means of set-screws, and on the side of the table C are two projecting pins, i^1 i^2, to form electric connection respectively with the stops h^1 h^2. Electric wires in the circuit connect with the stop h^1 and the bearing a^1.

When the table moves to the left the pin i^2 comes in contact with the stop h^2, and draws the rod C′ to the left until the head b' on the rod comes in contact with the pin e', and thus completes the circuit. The table now is started to the right, the circuit remaining closed, and as the pin i^1 comes in contact with the stop h^1 and commences to carry the rod C′ to the right, the connection at b' e' is severed, but the circuit is not broken, as it is continued through h^1 i^1. When the table has completed its movement to the right and commences to start back to the left, the circuit is at once broken at h^1 i^1, and remains so until it is closed at b' e' again. Thus it will be seen that we automatically raise the engraving-tool from the work while the carriage moves in one direction, thus obviating the necessity of manipulating the tool by hand.

The machine is fed by means of a pawl, I′, connected to the rod C′, and operating upon a ratchet-wheel, J′, on a screw-shaft, H, which passes through the carriage, and thus moves the same a certain distance for each stroke of the table.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an engraving-machine, the combination, with the reciprocating table carrying the article to be engraved, of an automatic circuit breaker and closer, adapted to be operated by the movement of the table, substantially as and for the purposes herein set forth.

2. The combination of the rod C′, insulated at a^1, and provided with head b' and nut d', the pin e', adjustable stops h^1 h^2, and the pins i^1 i^2 on the reciprocating table, substantially as and for the purposes herein set forth.

3. In an engraving-machine, the bed or table C, provided with the slide L, having plate k attached thereto, the spring m, and pointer i, all substantially as and for the purposes herein set forth.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

JOHN C. GUERRANT.
GEORGE M. GUERRANT.

Witnesses:
O. W. BARROW,
H. D. GUERRANT.