J. C. GUERRANT.

ENGRAVING-MACHINES.

No. 183,920. Patented Oct. 31, 1876.

Fig. 2.

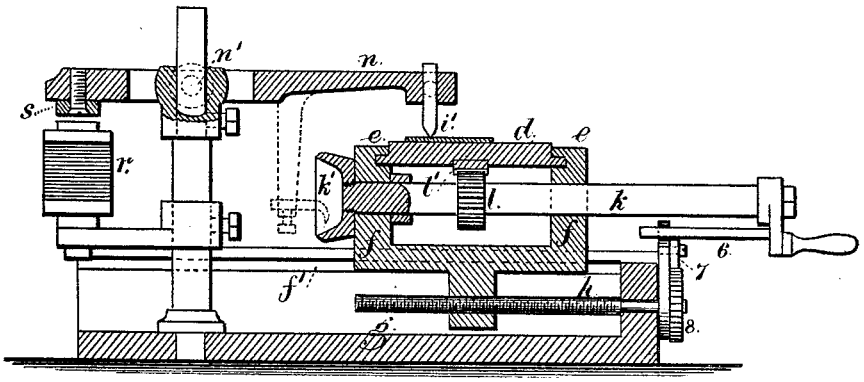


Fig. 1.

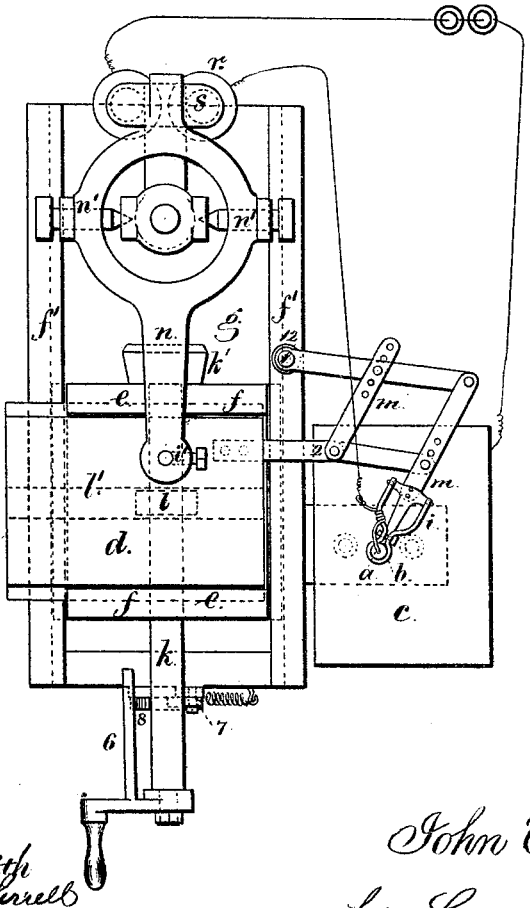
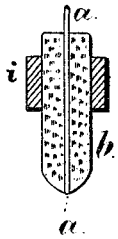


Fig. 3.



Witnesses

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Inventor.

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(46)

UNITED STATES PATENT OFFICE.

JOHN C. GUERRANT, OF DANVILLE, VIRGINIA, ASSIGNOR TO HIMSELF AND COLLETT LEVENTHORPE, OF RUTHERFORDTON, NORTH CAROLINA.

IMPROVEMENT IN ENGRAVING-MACHINES.

Specification forming part of Letters Patent No. **183,920**, dated October 31, 1876; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, JOHN C. GUERRANT, of Danville, in the State of Virginia, have invented an Improvement in Engraving-Machines, of which the following is a specification:

Machines for engraving have been made with a bed that is moved beneath the engraving-tool and carries the article to be engraved, and in Letters Patent No. 172,426, granted to me, a tracer is used to close a circuit to an electro-magnet, that lifts the engraving-tool when the tracer comes into contact with the metallic surface of the form or pattern. In this instance the plaster or other non-conducting material inserted in the spaces between the types is apt to be injured, and the point of the tracer to accumulate particles of such plaster and prevent the electrical action. Besides this, the electrical contact is not sharp and reliable, in consequence of the junction of the conducting and non-conducting portions not being sharp and uniform; hence there will be imperfections in the engraving.

My invention relates to a tracer formed of a fine wire of conducting material, surrounded by a non-conducting case having a tapering end, that prevents the tracer falling into the spaces between the types, but which tracer is efficient in closing the circuit to the electro-magnet when the fine wire comes into contact with the metallic surface of the types; and I combine with such circuit-closing tracer a pantograph and a bed, upon which the material to be engraved is placed.

In the drawing, Figure 1 is a plan of said machine. Fig. 2 is a vertical section of the same; and Fig. 3 is a section, in larger size, of the tracer.

The conductor *a* of the tracer is a fine wire, preferably platina, and the same passes through a case or stock, *b*, of ivory or other non-conducting material, and the tracing-point comes at the apex of an obtuse cone, so that the tracer will run freely over the surfaces of types without catching, thereby dispensing with any non-conducting filling in the faces of the types or pattern. A stationary bed, *c*, is provided for the reception of the pattern, and a bed, *d*, for the article to be engraved. This bed *d* is movable in the ways *e*, that form part of the carriage *f*, which carriage can be moved endwise in the slides *f'* upon the bed *g* by revolving the screw *h*.

There is a shaft, *k*, passing through the slideways *e*, and provided with a pinion, *l*, acting upon the rack *l'* beneath the bed *d*, and to this bed *d* one joint, 2, of the pantograph *m* is connected. The stationary fulcrum 12 of this pantograph is upon the bed *g*, and the tracer *a b* is connected at the moving end of the pantograph by the hinged yoke *i*, so as to rest upon the surface as it is moved over the pattern by the motions given to the bed *d*, in one direction by the rack *l'* and pinion *l*, and in the other direction by the carriage *e f* and screw.

The engraving-tool *i'* is upon the arm *n*, pivoted at *n'*, so as to be moved up and down slightly. The pressure upon the engraving-tool to cause it to cut is derived from a weight or spring, and the tool is raised by the electro-magnet *r* acting upon the armature *s* of the lever *n*, when the circuit is closed from a battery through said electro-magnet by the contact of the tracer with the metallic surface of the pattern. If the electro-magnet is the other side of the pivot *n'*, it may bring the engraving-tool to its work, and a spring or weight will be employed to raise it.

The article to be engraved is secured to the bed *d*, if it is flat; but if it is circular, it is attached to the shaft *k*, either upon the surface thereof, if convex, or within a chuck, *k'*, if concave; and the engraving-tool is located accordingly, so as to reach the surface to be engraved.

It will be apparent that the shaft *k*, being partially or entirely revolved, moves the rack *l'*, the tracer, and pantograph at the same time that the article is moved. Thereby a flat pattern is transferred to the convex or concave engraved surface.

The pin 6 upon the shaft *k* gives motion to the pawl 7, and moves the ratchet-wheel 8 and screw *h* each revolution or oscillation of the shaft *k*, and moves the carriage *f* the distance required between one engraved line and the next.

I claim as my invention—

1. In an engraving-machine, a tracing-point made of metal, surrounded with a case of non-conducting material, with a slightly conical surface, in combination with an electro-magnet and engraving-lever, substantially as set forth.

2. The combination, in an engraving-machine, of a reciprocating bed carrying the article to be engraved, a pantograph and tracer connected with and moved by that bed, a stationary pattern, an engraving-tool, moving vertically, and a lever and electro-magnet for operating such engraving-tool, substantially as set forth.

3. The combination, in an engraving-machine, of a revolving chuck holding the article to be engraved, a rack and pinion, or their equivalents, a pantograph and tracer receiving motion from the mechanism that revolves the chuck, a stationary pattern, an engraving-tool, and a lever and electro-magnet for operating the same, substantially as set forth.

Signed by me this 26th day of February, 1876.

JOHN C. GUERRANT.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.