

(No Model.)

F. BANGERTER.
AUTOMATIC DELINEATING MACHINE.

No. 512,089.

Patented Jan. 2, 1894.

Fig. 1.

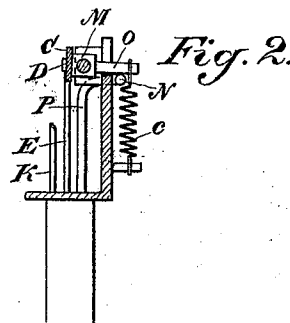
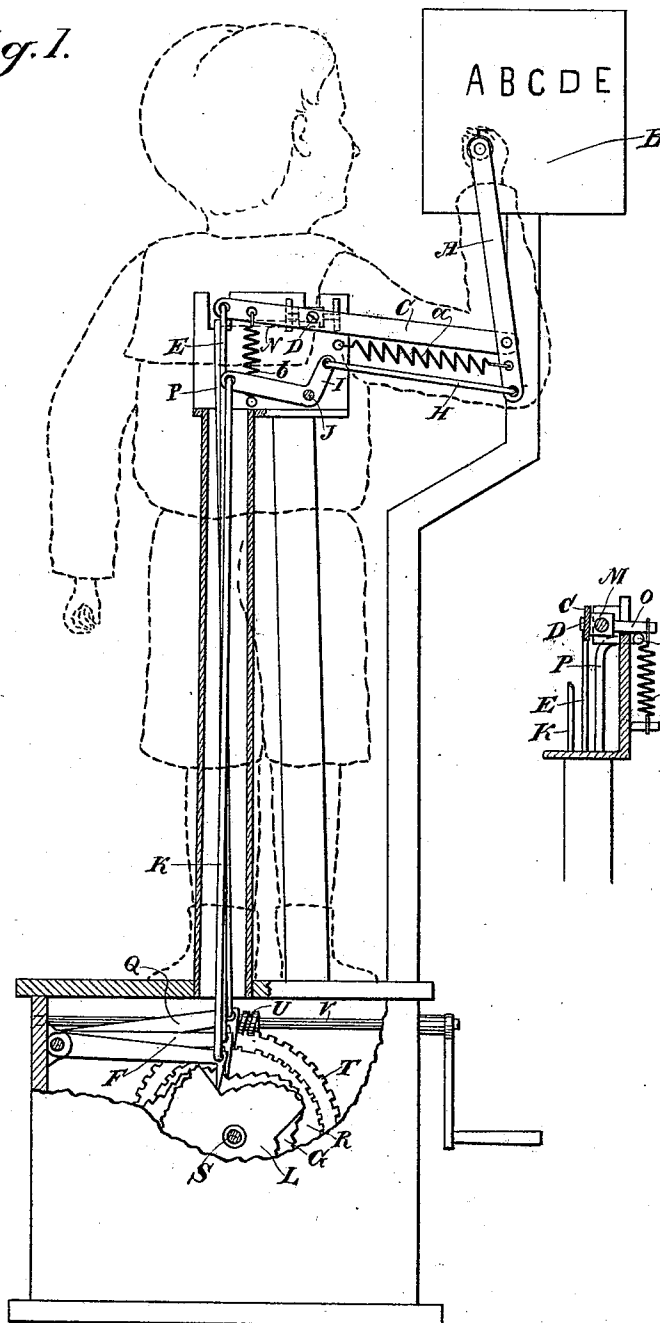


Fig. 2.

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UNITED STATES PATENT OFFICE

FRED BANGERTER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
AUTOMATIC NOVELTY MANUFACTURING COMPANY, OF SAME PLACE.

AUTOMATIC DELINEATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 512,089, dated January 2, 1894.

Application filed April 12, 1893. Serial No. 470,089. (No model.)

To all whom it may concern:

Be it known that I, FRED BANGERTER, a citizen of Switzerland, residing in the city and county of San Francisco, State of California, have invented an Improvement in Automatic Writing and Drawing Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for automatically drawing figures, or writing, engraving, or delineating upon metals and similar work.

It consists of an arm by which the drawing or engraving tool is carried, and a mechanism by which said arm is actuated so as to describe the desired letters or figures.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is an elevation of the rear of my device. Fig. 2 is an end view of the oscillating block and its connections.

The object of my invention is to provide a mechanism by which stated figures can be marked, written, drawn, or engraved, and it may be used either to make letters, draw figures, or to engrave upon surfaces, such as watch cases, &c.

In carrying out my invention I employ a lever arm A to which the pencil, pen or engraving or other tool is attached in such a manner as to move over the surface B beneath the point of the tool, or the tool may be stationary and the surface movable, the result being the same. This arm is fulcrumed to a second lever arm C so that the end opposite the one carrying the tool, projects a little beyond the arm C. The arm C is fulcrumed as shown at D to an oscillating support hereinafter described, and the end of the arm C which projects beyond the fulcrum is connected by a rod E with a lever F which is actuated by a cam G as hereinafter described.

From the lower end of the lever A a rod H connects with one of the bell crank levers I, one arm of which is fulcrumed to the stationary plate as shown at J. The other arm of the lever I is connected by a rod K with a lever actuated by a second cam L mounted upon the same shaft as the cam G.

The fulcrum pin D of the lever C is fixed to a block M which is journaled at each end

in a yoke attached to the main support, and the block M and lever C are caused to rotate slightly about the journal pins by means of a lever N engaging an arm O which connects with this oscillating block. The lever N is connected with a rod P which extends to a lever Q, and this lever is actuated by a third cam R. These cams are all mounted upon a single shaft S, and upon the same shaft is fixed a gear wheel T which is engaged by a worm U upon the shaft V, so that when the shaft is turned by a crank or any other well known and suitable means the gear and the cam wheels, before described, will be rotated simultaneously. The shaft may be turned by hand or by any mechanical power which may be found desirable. The first described lever C acts upon the arm A to move it up and down about the fulcrum point of C.

The bell crank lever I, connected with the lower end of the arm A, acts to move it in lines at right angles with the movements given by the lever C, and in the same plane, while the lever P acting upon the rotary oscillating block M, gives the lever C a slightly rotary motion transversely with the other two movements.

The surface B upon which the lines are to be formed is fixed parallel with the arm A and at such a distance therefrom that the tool or implement carried by this arm will move over and in contact with the surface when impelled by the levers C and I to produce the two first described movements; but when the rotary motion of the oscillating block is produced, it lifts the arm A away from the surface and allows it to be moved by the first two levers out of contact with the surface to the point where it is desired to again commence work, when the movement of the oscillating block again turns the arm A so as to bring the implement in contact with the surface. By the combination of these three movements I am enabled to describe any desired pre-arranged figures by cutting the cams L, G and R with such irregular depressions and elevations as will act upon the levers to which the rods E, K and P are connected, so that these rods will be moved independently, and in conjunction, to produce the various figures.

It will be manifest that the particular arrangement of levers may be varied without changing the relative movements upon which the invention depends, and for engraving, the surface to be engraved may be connected with the moving parts, and the tool remain stationary.

For engraving purposes the parts should be made quite stiff and strong so as to exert a sufficient pressure upon the tool or surface to produce the desired cut, but for lighter work, such as drawing, making letters and figures, the parts may be proportionately lighter.

a is a spring connected with the lower end of the lever *A*, so that when this lever has been moved in one direction by the action of the cam *L*, the spring will retract it when a depression in the cam allows the point to descend. A second spring *b* connected with a lever *C* in like manner returns that after it has been forced to make a movement by the cam, and a third spring *c* acts upon the oscillating block *M* to return that to its position after any rotary movement produced upon it by its cam.

It will be manifest that any figures, letter, form or design of engraving, or other marking, may be executed by this mechanism, the difference in the forms described depending upon the manner in which the cams are cut.

In the present case I have shown the mechanism adapted to be concealed in the figure of a doll or automaton, the pencil or implement being carried in the hand of the figure, which is thus represented as doing the work.

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

1. A delineating machine consisting of the movable tool carrying arm, a lever to which said arm is fulcrumed, an oscillating block upon which the second arm is fulcrumed, a bell crank lever having one arm connected with the end of the tool carrying lever, and the other connected with a cam actuated point, a connection between the rear end of the second lever and a second cam actuated point, and a connection between the oscillating fulcrum block and a third cam actuated point, whereby each of the levers and the ful-

crum are caused to act independently and in unison, substantially as herein described.

2. A device for delineating upon surfaces consisting of a tool carrying arm, a second arm *C* to which the tool carrying arm is fulcrumed, a bell crank lever and a rod by which one arm of said lever is connected with the tool carrying arm, an oscillating fulcrum block to which the arm *C* is fulcrumed, cams *G*, *L* and *R* fixed to a common shaft by which they are rotated and having irregular elevations and depressions, lever arms fulcrumed with relation to said cams and having projecting points adapted to engage the elevations and depressions upon their peripheries and rods connecting said levers with the lever *C*, bell crank lever and the oscillating fulcrum block, substantially as herein described.

3. In a machine for delineating upon surfaces, the oscillating block to which the lever *C* is fulcrumed having an arm *O* projecting at right angles with the direction of the lever *C*, a cam *R* having irregular elevations and depressions upon its periphery, a lever arm having a point adapted to engage said levers and depressions, and a rod extending from said lever arm and actuated thereby having an end adapted to engage the lever *O* whereby the fulcrum block is oscillated and the lever *C* and its connections tilted transversely to its line of movement about the fulcrum, substantially as herein described.

4. A machine for delineating upon surfaces, consisting of a delineating implement and a surface to be inscribed movable with relation to each other in consonance with the lines to be produced, a mechanism consisting of a series of irregular cams fixed to rotate simultaneously, and connecting rods and levers intermediate between the cams and the movable inscribing point whereby the latter is acted on by the cams independently and jointly, substantially as herein described.

In witness whereof I have hereunto set my hand.

FRED BANGERTER.

Witnesses:

S. H. NOURSE,
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