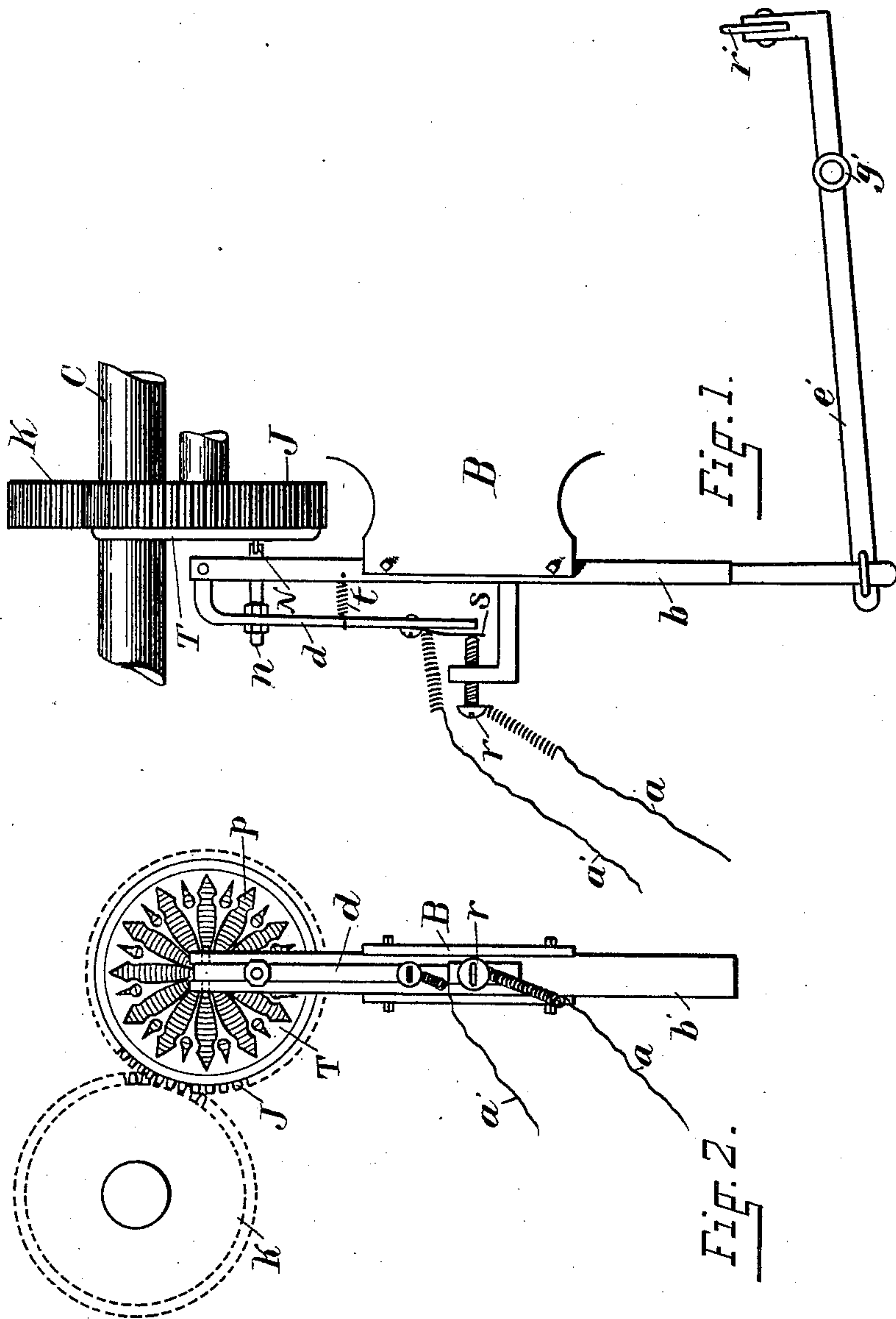


(No Model.)

C. H. FIELD, Jr.
ENGRAVING MACHINE.

No. 428,770.

Patented May 27, 1890.



WITNESSES:

James E. Arnold

W. A. Shove

INVENTOR

Chas H Field Jr

BY

Benj Arnold

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES H. FIELD, JR., OF PROVIDENCE, RHODE ISLAND.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 428,770, dated May 27, 1890.

Application filed February 6, 1890. Serial No. 339,458. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. FIELD, Jr., of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Engraving-Machines; and I 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 a part of this specification.

These improvements relate to that class of engraving-machines that are automatic in their operation and that use electro-magnetic force to operate the engraving-tool—as, for example, the United States Patent to Charles H. Field, April 30, 1889, No. 402,316, upon which these improvements are based. In the invention as described in that patent the engraving-tool is operated by an electro-magnet produced by a current of electricity from a dynamo, and another electric current of much less intensity controlled by the pattern-plate is used to govern the electric current between the dynamo and the electro-magnet that operates the engraving-tool. By the use of the lighter current to be operated by the pattern-plate, as above stated, the greater part of the injurious effects of the sparks produced between the tracer and the pattern-plate were avoided, but enough still remained to make an improvement in that respect desirable, which is the object of this invention. It is accomplished by using an arrangement of mechanical devices operated directly by the pattern-plate to control the operation of the electric current between the dynamo and the electric magnet operating the engraving-tool.

In describing my improvements I will premise that all parts of the engraving-machine are constructed and operated as described in the patent above cited, excepting those devices used in connection with the pattern-plate to control the current between the dynamo and the electro-magnet operating the engraving-tool.

Figure 1 shows in elevation that part of the engraving-machine comprising the pattern-plate and the devices used to control the current from the dynamo to the electric magnet. Fig. 2 is a front view of the pattern-plate

and the tracing devices connecting it with the electric wires.

C is the main shaft of the machine, carrying the gear-wheel K, which engages with the wheel J, to which the pattern-plate T is attached. An arm B, extending out from the stand supporting the gear-wheel J and shaft C, has a dovetailed groove made in its face, in which the bar *b* is fitted to slide smoothly and easily up and down by means of the lever *e*, which is operated as described in the patent previously cited. A lever *d*, having its upper end curved in and pivoted in the upper end of the bar *b*, has a stud *n* secured to it near its upper end. This stud *n* projects in through the bar *b* toward the pattern-plate T and has a small friction-roll N in its inner end, which bears on the pattern plate T. The roll N is held up against the plate by a close spiral spring *t*, placed between the lever *d* and bar *b* and arranged to draw the two together. The lower end of the lever *d* has a spring *s* attached to it, so placed as to bear against a screw *r*, held in an arm attached to the bar *b*, when the lever *d* is thrown back. The screw *r* is insulated from its arm and the spring *s* from the lever to which it is attached, so that a current of electricity from the wire *a'*, connected with the spring *s*, will pass directly through that spring and screw *r* to the wire *a*, attached to the screw, when contact is made between the spring and screw.

The pattern *p* to be engraved may be made of paper or other suitable material and attached by gumming or otherwise to the face of the pattern-plate T, and no insulation is required, as the action is entirely mechanical, the operation being that when the roll N is on that part of the plate not covered by the pattern, the spring *s* will be held just out of contact with the screw *r* by the spring *t*, and the circuit through the wires *a' a* from the dynamo to the electro-magnet will be open; but when the plate T is revolved in manner as stated in said patent, and a part of the pattern *p* comes under the roll N, the lever *d* will be thrown out, the spring *s* brought in contact with the screw *r*, and the circuit between the dynamo and electro-magnet thereby closed, which will cause the electro-magnet to operate the engraving-tool, and when the

pattern *p* passes out from under the roll *N* it will allow the lever *d* to be drawn back by the spring *t* and the circuit broken at the end of the screw *r*, throwing out of action the
5 electro-magnet and leaving the engraving-tool to be controlled by its spring, as set forth in said patent.

Having thus described my improvements, what I claim as my invention is—

10 1. In an engraving-machine operating its engraving-tool by means of an electro-magnet, a mechanical device operated, substantially as shown, by the surface of the pattern for controlling the connections of the electric

current that operates said electro-magnet, in 15 combination with a pattern-plate, as and for the purpose set forth.

2. In an engraving-machine operating its engraving-tool by means of an electro-magnet, the sliding bar *b*, lever *d*, stud *n*, springs 20 *s* and *t*, and screw *r*, in combination with the pattern-plate *T* and wires *a'* and *a*, substantially as and for the purpose specified.

CHARLES H. FIELD, JR.

Witnesses:

CHARLES H. FIELD,
BENJ. ARNOLD.