

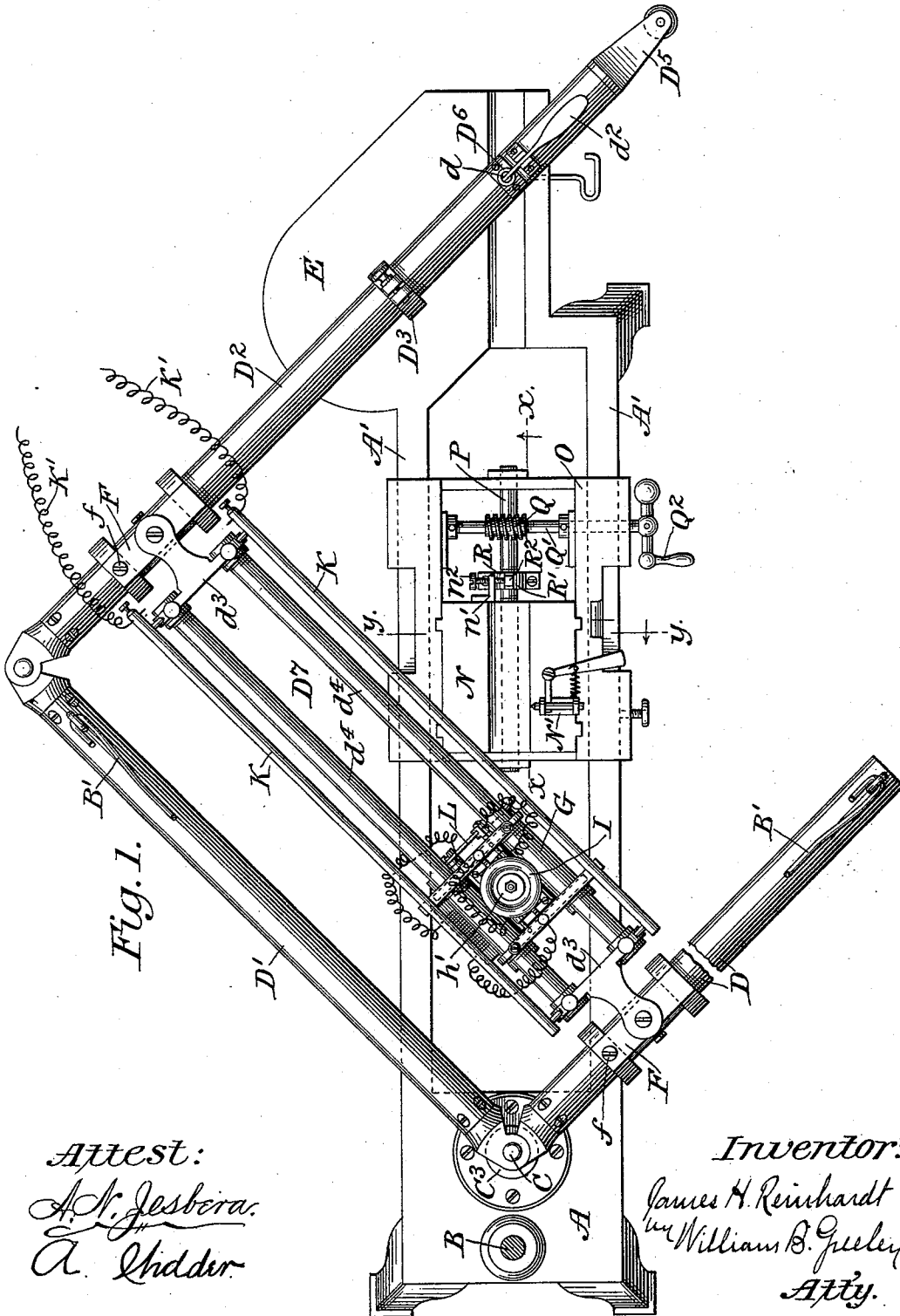
(No Model.)

3 Sheets—Sheet 1.

J. H. REINHARDT.
ENGRAVING MACHINE.

No. 539,544.

Patented May 21, 1895.



Attest:
A. N. Jesbera.
A. Lhdder.

Inventor:
James H. Reinhardt
by William B. Greeley
Atty.

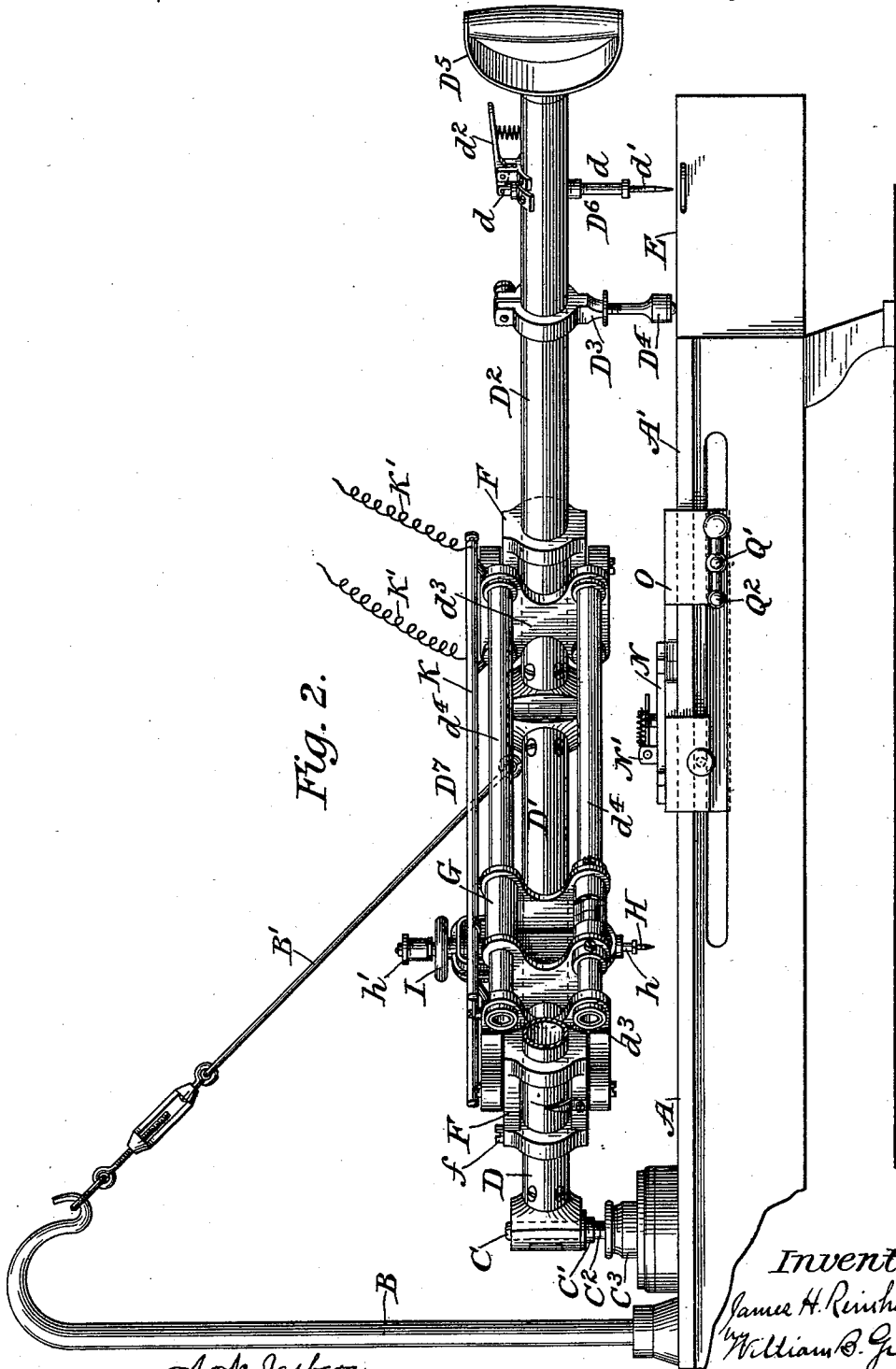
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Attest: *A. N. Jespersen,*
A. Vidder.

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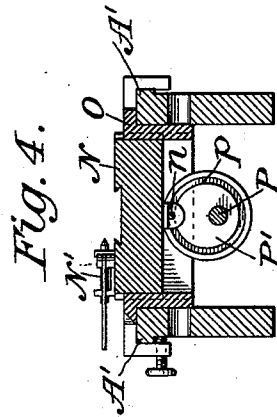
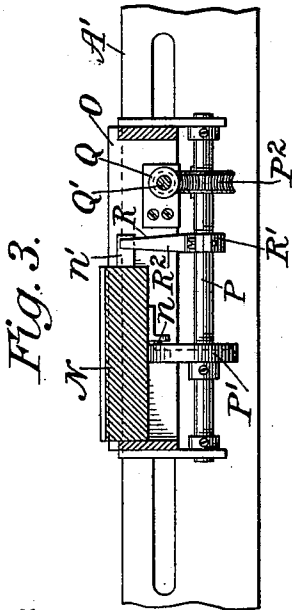
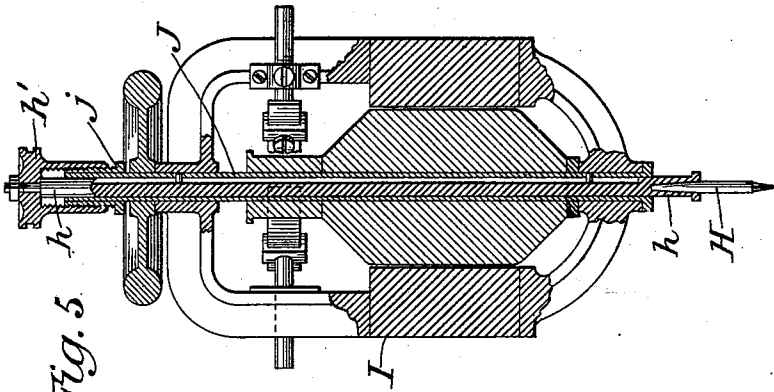
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UNITED STATES PATENT OFFICE.

JAMES H. REINHARDT, OF NEWARK, NEW JERSEY.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 539,544, dated May 21, 1895.

Application filed January 15, 1894. Serial No. 496,853. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. REINHARDT, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Engraving-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The object of this invention is to produce an improved machine for the rapid and accurate routing of dies, stamps and the like which are ordinarily cut by hand at considerable expense and with much trouble, particularly where a figure is to be produced in fac-simile, as in the cutting of blocks for autograph signatures. The improved machine which I have devised for this purpose comprises a suitable tool, means for driving or actuating the tool for cutting or routing the material operated upon, and a frame in which the tool is supported and by means of which it may be moved at the will of the engraver to follow the lines of the figure to be reproduced.

The improved construction and arrangement of the several instrumentalities employed will be set forth herein and the particular features wherein the invention consists will be pointed out in the claims.

In the drawings, Figure 1 is a plan view of the improved engraving-machine, partly broken away. Fig. 2 is a side elevation of the same, also partly broken away. Fig. 3 is a detail view of the work-holder and carriage, in section, on the line *xx* of Fig. 1. Fig. 4 is a section on the line *yy* of Fig. 1, and Fig. 5 is a vertical central section of the tool-motor on a scale larger than that of the remaining figures.

In the drawings a suitable bed-plate is represented at A as adapted to support the other parts of the machine and as having ways A', A', upon which certain portions of the machine are adjustable. At one end of the bed-plate is erected a post B for a purpose hereinafter referred to, and near the same end is

a stud C upon which the supporting frame 50 hereinafter referred to is pivoted. The stud is provided with a fixed collar C' and below the collar it is screw-threaded, as indicated at C², to permit of its vertical adjustment with respect to the bed-plate by rotation of a nut C³.

Upon the stud C are pivoted two arms D, D', of a pantograph frame which supports the cutting or routing tool, as hereinafter described. The outer ends of the arms D, D', 60 are supported by adjustable links B', B', from the upper end of the post B. To the outer end of the arm D' is pivoted the third arm D² of the pantograph which has fixed thereto an adjustable leg D³ having a roller-foot D⁴ 65 to rest upon a table E and so support the weight of the arm D² while permitting its free movement. The outer end of the arm D² has a suitable handle D⁵ by which the frame may be moved as desired, and near the free end of the arm is supported a tracer D⁶ which is 70 adapted to follow the lines of any pattern which is placed beneath it and which is to be reproduced by the tool.

The tracer D⁶ is composed of a rod *d* to 75 which a suitable pointer *d'* is adjustably secured and which is itself moved vertically through the arm D² and is connected to a spring-pressed lever or finger-piece *d²* by means of which the point of the tracer can be 80 raised readily and quickly from the pattern when required, by the pressure of a finger of the same hand that grasps the handle D⁵.

Upon the arms D¹ D², of the pantograph frame are mounted slides F, F, which may be 85 held in any desired position by set screws *f*, *f*, and to which are pivotally connected the ends of the fourth arm D⁷ which completes the pantograph frame and which carries the tool. As represented in the drawings the arm D⁷ is 90 composed of suitable end-pieces *d³*, *d³*, and four rods *d⁴* which support the carriage G for the tool, the said carriage G being adjustable to any desired position upon the arm D⁷.

The cutting or routing tool H is borne by 95 the carriage G and is moved in a horizontal plane as determined by the movements of the tracer D⁶, the amplitude of its movements be-

ing determined by the adjustment of the carriage G with respect to the pantograph frame. The tool is also made vertically adjustable with respect to its carriage, to take up wear, in a manner hereinafter described, and the whole pantograph frame with the tool carriage may be raised or lowered as required, by adjusting the stud C, the foot D⁴ and the supporting links B', B', according to the nature of the work to be done. The tool is actuated directly by a small electric motor I mounted upon the carriage G. The spindle J of the motor is made hollow and the shaft which carries the tool is extended there- through and has rotatably secured at its upper end a sleeve or nut h' which is threaded to engage a sleeve fixed to the spindle J, whereby the tool may be adjusted vertically as desired. The motor may be driven from any suitable source of power and might have the conducting wires connected directly thereto. I prefer, however, to fix two bare conducting strips or rods K, K, to the arm D⁷ upon which rest contact shoes connected respectively to the coils of the motor, a switch L being interposed in the connection for convenience in stopping and starting the tool. The conducting strips may be connected at one end by suitable wires K', K', with the source of power.

The work, that is, the plate or whatever else it may be which is to be cut or engraved, must be held firmly in a suitable holder which must be capable of adjustment according to the various adjustments of the tool with respect to the fixed pivot of the pantograph, and should also be capable of vertical adjustment with respect to the point of the tool so that the depth of the engraving or routing may be regulated and so that the point of application of the tool may be transposed from one portion of the work to another. For this purpose the work holder N, which may be of any suitable form to receive and hold the work, a fastening device being indicated at N', is mounted to move vertically on a carriage O, the latter being movable horizontally on the ways A', A'. A shaft P is mounted in bearings in the carriage O and has fixed thereto a cam P' upon which the holder N rests, a pin n being fixed to the holder and entering a cam groove p to keep the holder against the cam. The shaft P may be rotated through a worm-wheel P² fixed thereon and a worm Q on a short shaft Q' which is also supported in the carriage O and has a suitable handle Q².

An adjustable stop R is provided for limiting the vertical movement of the holder, and, as shown, may consist of a collar R' held adjustably on the shaft P and carrying an arm R², to strike against a suitable stop. The arm may be adjusted for different pieces of work to permit them to be brought to the proper level. A projection n' on the holder N bears an adjusting screw n² in the path of the arm

R² to limit its movement, whereby the position of the work-holder may be regulated with great nicety.

The mode of operation of my machine will be readily understood. The block engraved or cut having been placed in its holder, the proper adjustment of the work carriage and of the pantograph having been secured and the motor having been set in operation, the handle D⁵ is grasped by the engraver and the tracer D⁶ is caused to follow the lines of the pattern placed beneath it. The tool will follow the movements of the tracer on a reduced scale and being suitably formed for the purpose, will rout away the material of the block to form a die or stamp and will reproduce exactly, though in reduced size, the figure of the pattern. For all ordinary purposes in cutting dies, stamps, seals and other like articles this machine may be used at great economy of time and expense.

I claim as my invention—

1. The combination of a pantograph frame, a carriage adjustable upon an arm of said frame, an electric motor borne by said carriage, said motor having a hollow spindle, a tool carrying shaft extended through said spindle, a sleeve adjustably secured at the upper end of said shaft and threaded to engage a sleeve fixed to said spindle, whereby the tool may be adjusted vertically, a tracer carried by said frame, and a work holder, substantially as shown and described.

2. The combination of a bed-plate, a carriage adjustable horizontally on said bed-plate, a work holder adjustable vertically in said carriage, a shaft supported in bearings on said carriage, a cam fixed to said shaft and engaging said work holder, an arm mounted on said shaft, and a stop fixed in the path of said arm whereby the movement of said shaft, cam and holder may be limited, substantially as shown and described.

3. The combination of a bed-plate, a carriage adjustable horizontally on said bed-plate, a work holder adjustable vertically in said carriage, a shaft supported in bearings on said carriage, a cam fixed to said shaft and engaging said work holder, a collar adjustable on said shaft, an arm fixed to said collar, and a stop fixed in the path of said arm whereby the movement of said shaft, cam and holder may be limited, substantially as shown and described.

4. The combination of a bed-plate, a carriage adjustable horizontally on said bed-plate, a work holder adjustable vertically in said carriage, a shaft supported in bearings on said carriage, a cam fixed to said shaft and engaging said work holder, an arm mounted on said shaft, a projection on the holder and an adjusting screw carried by said projection in the path of said arm, whereby the movement of said shaft, cam and holder may be limited, substantially as shown and described.

5. The combination of a pantograph frame, a routing tool carried by said frame, means for actuating said tool, a tracer carried by an arm of said frame and vertically movable
5 through said arm, a spring-pressed lever to which said tracer is connected, a handle fixed to said arm, and a work holder, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES H. REINHARDT.

Witnesses:

A. N. JESBERA,
A. WIDDER.