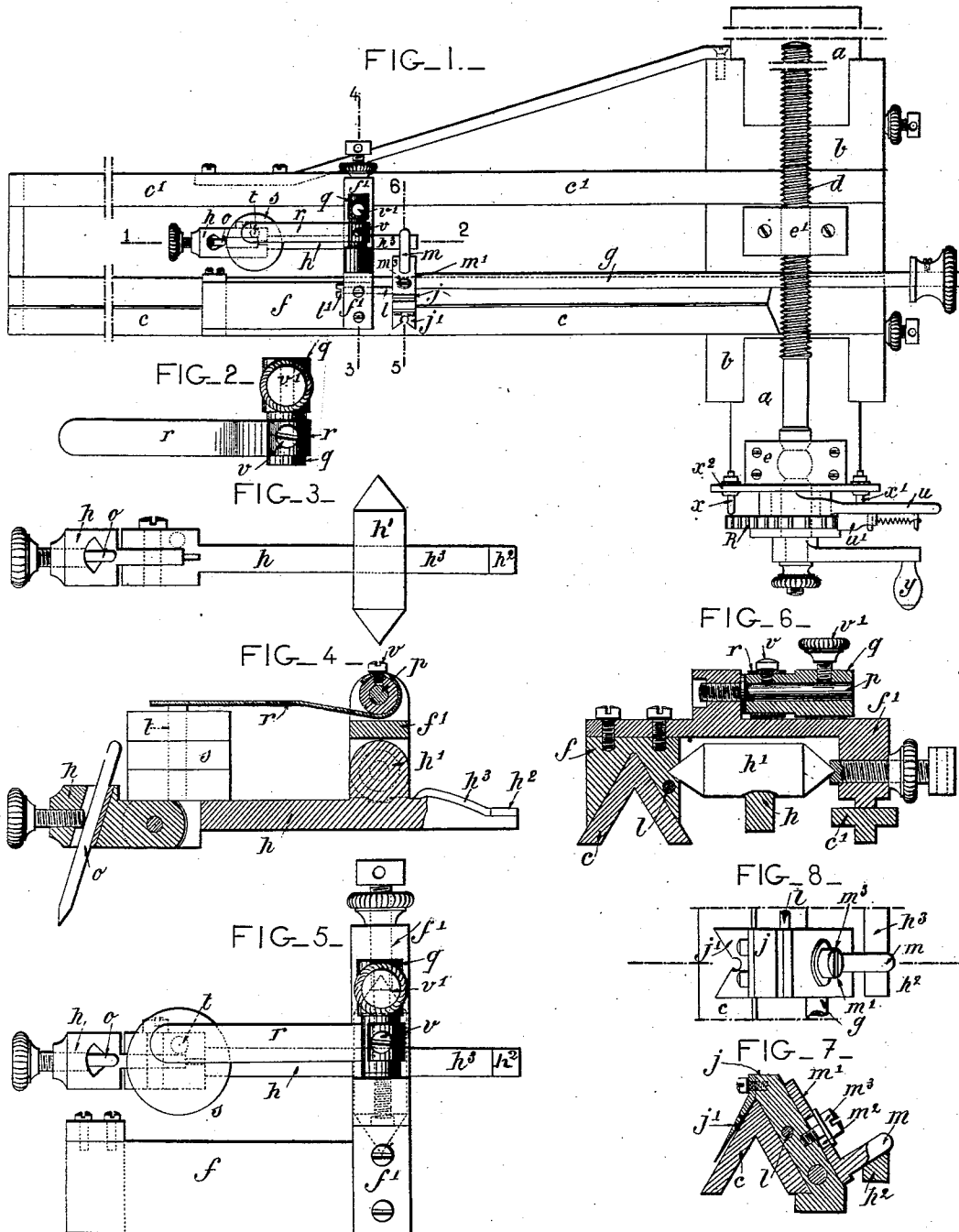


(No Model.)

PAUL-MARIE NOUEL & J. R. MARTINI.
ENGRAVER'S RULING MACHINE.

No. 564,636.

Patented July 28, 1896.



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UNITED STATES PATENT OFFICE.

PAUL-MARIE NOUEL AND JEAN RENÉ MARTINI, OF TROYES, FRANCE.

ENGRAVER'S RULING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 564,636, dated July 28, 1896.

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To all whom it may concern:

Be it known that we, PAUL-MARIE NOUEL and JEAN RENÉ MARTINI, citizens of the Republic of France, and residents of the city of Troyes, France, have invented a certain new and useful Engraving-Machine, of which the following is a specification.

Our invention has for its object improvements in machines for engraving straight lines, which improvements will permit of operating said machines with much greater speed than can be done with the machines heretofore used and without in any way detracting from the quality of the work.

In machines heretofore used for engraving straight lines it is necessary to draw the guide which carries the tool very slowly, as otherwise such tool will rebound from the surface which is being engraved upon and the lines produced will consequently be uneven. Besides, in nearly all said machines the lifting up of the tool during its return is accomplished by hand, and this further retards the work. It is true that in some of said machines such lifting up is accomplished automatically, but the appliances employed for such purpose complicate the machine materially and in reality are not practicable.

The improvements which form the subject of our invention consist in appliances which permit of producing, while the tool or diamond is moving, an adjustable pressure sufficient to keep such tool from producing these uneven lines, even when the work is being done at a high rate of speed, such appliances being combined with other novel appliances for elevating the tool after each line has been traced and for maintaining it in an elevated position while it is returning to its starting-point.

In the accompanying drawings, Figure 1 is a plan view of an entire machine for engraving straight lines constructed according to our invention and embodying the peculiar appliances invented by us. Fig. 2 is a detail view of the spring for regulating the pressure upon the tool-holder. Fig. 3 is a plan view of the tool-holder. Fig. 4 is a section along line 1 2 in Fig. 1. Fig. 5 is a ground plan of Fig. 4. Fig. 6 is a section along line 3 4 in Fig. 1. Fig. 7 is a section along line 5 6 in Fig. 1; and Fig. 8 is a plan view of Fig. 7, re-

lating to the device for automatically elevating the tool during its return movement.

The base *a*, Fig. 1, serves to direct and support the carriage *b*, as well as the slide-rails *c c'*, mounted on said carriage.

The movement of the carriage *b* upon the base *a* is produced by means of the screw-spindle *d*, which turns within the internally-threaded bearings *e e'*, one of which, *e*, is attached to the extreme end of said base *a*, and the other upon the carriage *b*. The free end of screw *d* might be made to turn in an additional support attached to base *a*.

Upon the slide-rails *c c'* the tool-carrier, consisting of the slotted bar *f*, fitted to bar *c*, and of the small cross-bar *f'*, resting upon the second slide-bar *c'*, is permitted to travel forward and backward. The tool-carrier *f f'* is controlled directly by the hand of the operator with the aid of rod *g*, and the tool-holder is articulated upon the cross-bar *f'* by means of an axle *h*, which revolves upon its pointed ends. The tool *o* must follow the forward and backward movement of the tool-carrier *f f'* when rod *g* is being moved, and is also capable of displacement in a vertical plane as may be required, owing to the articulation at *h* of the tool-holder *h* upon the cross-bar *f'* of the tool-carrier.

For the purpose of producing upon the diamond *o*, during its movement, an adjustable pressure sufficient to prevent said tool from producing uneven lines, even when the apparatus is being worked at great speed we employ the following appliances: Upon the cross-bar *f'* of the tool-carrier there is fixed a shaft *p*, forming an axle around which a sleeve *q* may revolve. Upon said sleeve *q* is mounted and fixedly secured by means of a screw *v* a leaf-spring *r*. The free end of said spring *r*, which extends in a horizontal direction, is adapted to come to rest upon the end of a vertical standard *t* on the tool-holder *h*. Weights or washers *s*, which may be of varying number, are adapted to be placed around said standard *t*, so as to produce upon the tool-carrier an adjustable pressure in addition to the pressure produced upon it by spring *r*. For the purpose of producing and regulating the required pressure upon the holder of the diamond-engraver *o* by the spring *r* and to prevent said diamond from

rebounding from the engraving-surface, the screw v' , the head of which is provided with a serrated rim, and which serves to clamp sleeve d to axle p , should be loosened. After this the sleeve q , which has thus become free, must be turned sufficiently to impart to spring r such tension as it may be desired to give to it. Finally the sleeve is secured in its new position by tightening screw v' and thereby again clamping it to axle p .

Operating-rod g , instead of being attached directly to the cross-piece f' of the tool-carrier which it is to draw, is attached to a special device constructed in two portions j, j' , which engage with slide-rail c . A second rod l , which may be of much smaller cross-section than that of g on account of its slight length, joins the parts j, j' to cross-piece f' of tool-carrier f, f' . Said rod l , which is capable of sliding with little friction in cross-piece f' , has a greater length than the thickness of such cross-piece and terminates in a head l' .

The auxiliary piece j, j' carries upon its inner face a finger m and the tool-holder h terminates in the rear in a tailpiece h^2 , having a slope h^3 placed underneath finger m . The finger m is rigidly connected with a plate m' , in the groove m^2 of which a set-screw m^3 is applied in accordance with the position which is to be given to it vertically with reference to tool-holder h .

When the finger m is above tailpiece h^2 , it does not engage with the tool-carrier until it slides over the slope h^3 to its summit, forcing during its travel the tailpiece h^2 of the tool-holder downward, and consequently forcing the tool o upward.

As the operator draws toward himself the rod g , the rod l is guided within cross-piece f' of tool-carrier f, f' until its head l' comes to rest against cross-piece f' . At that moment finger m is over the tailpiece h^2 , the tool is in its working position, and as the tool-carrier f, f' is being then drawn along the tool engraves a line. When the rod g is being pushed forward for the purpose of transferring the diamond, rod l slides within the cross-piece of tool-carrier f, f' and finger m ascends slope h^3 , forcing the tool into an elevated position. The piece j, j' comes to rest against cross-piece f' , and from this moment the whole device is again conducted forward, the tool remaining elevated, and so on, for each operation.

Our engraving-machine also contains a counter or mechanism for adjusting the distances between the lines engraved, working automatically as follows: A ratchet-wheel R is mounted upon the screw-spindle d , and the lateral displacement which it is desired to give to the carriage and thereby to the tool is obtained with the aid of a lever u , which operates the ratchet u' and which operates between two movable abutments x, x' in a graduated groove within a piece x^2 , which is attached to carriage b . For instance, abutment x' is fixedly secured and abutment x is placed

opposite to the section corresponding with the distance which it is desired to obtain between the parallel lines. After this it is only necessary to impart a forward-and-backward movement to lever u every time that the tool has returned to its point of departure. Finally, the handle y , mounted upon the shaft of screw-spindle d , serves to produce the displacements of the carriage.

The machine for engraving straight lines so constructed and characterized by the devices which permit of giving to the tool an adjustable pressure, and of elevating the tool automatically at the proper time, does work which is perfect in execution, and it permits of doing the work nearly ten times as fast as with ordinary machines.

Having thus described our invention and in what manner the same is to be performed, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for engraving straight lines, the combination with the tool-carrier and the tool-holder h articulated upon said carrier, of the spring r adapted to depress said tool-holder, substantially as set forth.

2. In a machine for engraving straight lines, in combination with the leaf-spring r , a sleeve q to which it is attached mounted upon an axle p integral with transverse piece f' of tool-carrier f, f' , the adjustment of said sleeve upon the axle being capable of modification by means of screw v' , substantially as described above and for the purposes specified.

3. In a machine for engraving straight lines, the combination with tool-holder h and a spring of adjustable tension adapted to depress said tool-holder, of a standard t on said tool-holder and weights or washers s of varying number surrounding said standard, substantially as set forth.

4. In a machine for engraving straight lines, the combination with the tool-carrier f, f' , and tool-holder h supported by said carrier and having a tailpiece provided with an inclined plane, as h^3 , of rail c , saddle j, j' , sliding upon said rail and provided with an adjustable finger m adapted to pass over the inclined plane and depress said tailpiece, said saddle having a rod l with a head l' and adapted to pass through an opening in part f' of the tool-carrier, and also provided with operating-rod g , substantially as set forth.

5. The pin l , sliding within cross-piece f' of the tool-carrier f, f' , provided with a head l' and secured at its other end to piece j, j' , in combination with rod g also attached to piece j, j' , substantially as described and for the purposes specified.

Signed at Troyes, in the Republic of France, this 11th day of September, A. D. 1895.

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Witnesses:

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