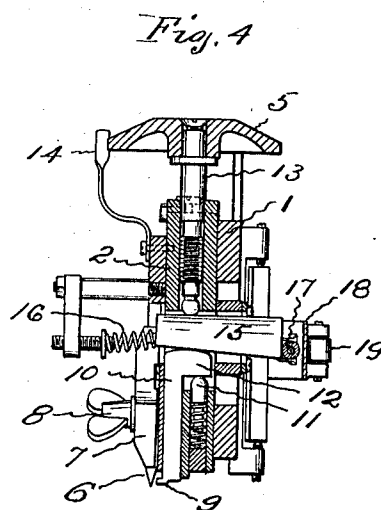
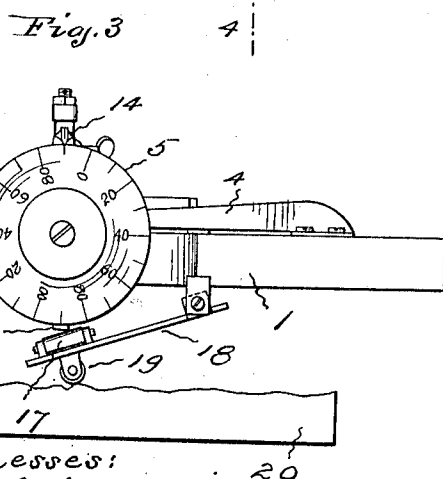
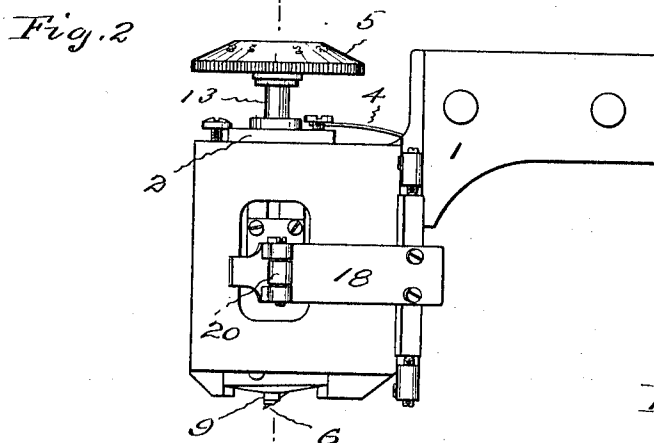
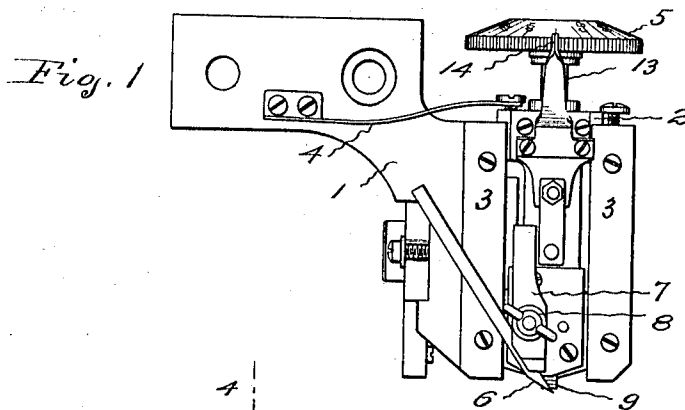


M. A. DAHL.
 ENGRAVER'S RULING MACHINE TOOL HOLDER.
 APPLICATION FILED JULY 8, 1912.

1,051,564.

Patented Jan. 28, 1913.

2 SHEETS—SHEET 1.



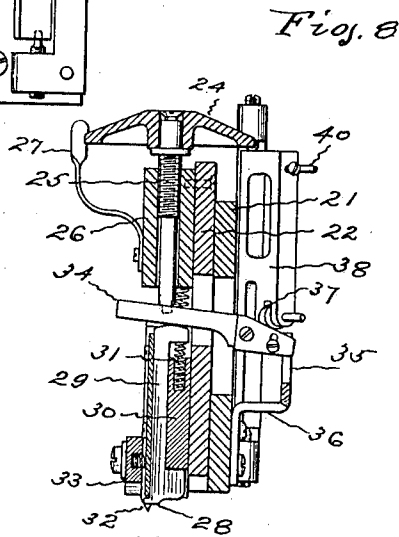
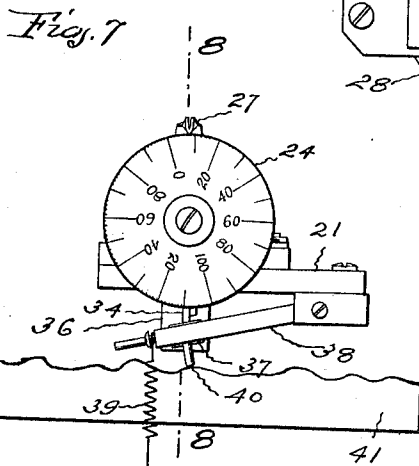
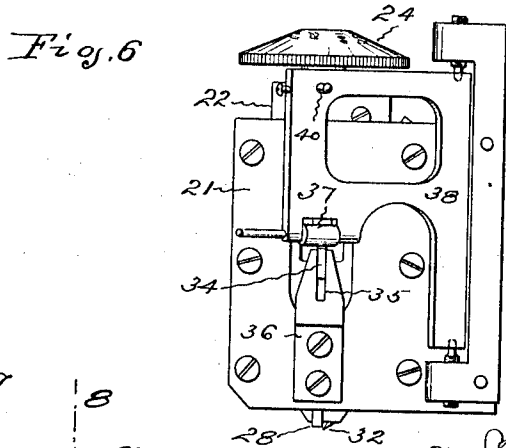
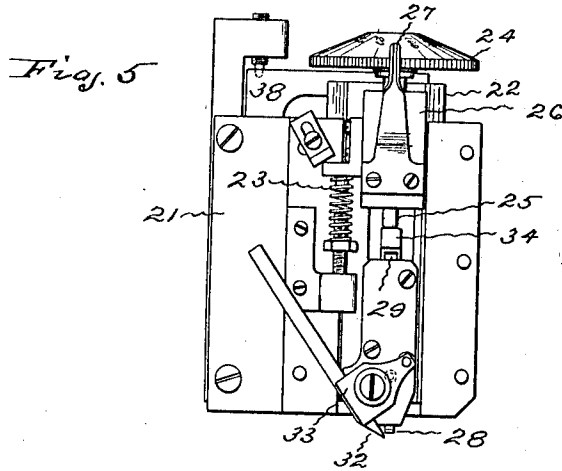
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 2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

MENS A. DAHL, OF HARTFORD, CONNECTICUT.

ENGRAVER'S RULING-MACHINE TOOL-HOLDER.

1,051,564.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed July 8, 1912. Serial No. 708,228.

To all whom it may concern:

Be it known that I, MENS A. DAHL, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Engravers' Ruling-Machine Tool-Holders, of which the following is a specification.

This invention relates to a tool holder for an engraver's ruling machine, which is so constructed that the depth of any line ruled may be uniform or may automatically be varied according to the elevations and depressions of the pattern which is provided, in order to produce the desired lights, shades, tints and tones of the picture to be reproduced.

Machines have been provided for ruling wood, metal, stone, and composition, with straight, diagonal, curved and waved parallel lines the desired distance apart. In such machines, for ruling straight and diagonal lines, the tool holder and tool are usually carried back and forth across the block and fed laterally after each line is ruled. For cutting parallel circular lines or wave lines the table and block are usually moved beneath the tool, which after each cut is fed laterally for the following cut. In making these cuts, whether straight or curved, it has been customary for the operator when starting to press the tool down by his hand and hold it down a fixed distance while the line is being ruled. At the end of the line the pressure is released and the tool is lifted by a spring, or a pattern is arranged to automatically lift the tool at the end of the cut. The depth of the cut is determined by the vertical distance between the plane of the bottom of a foot which bears on the surface of the block, and the plane of the tip of the tool which makes the cut. This foot is usually adjustably mounted in the tool carrier so that by turning a graduated hand wheel the distance between the under surface of the foot and the tip of the tool can be changed. As a line ruled by such a machine is of the same depth its entire length, in order to regulate the depth of the cut and produce tints and shadings, it has been necessary to rule each line a little heavier or lighter than the ad-

jacent line, and to accomplish this it was necessary for the operator to, according to judgment, turn the hand wheel which adjusts the relative distance between the level of the foot and the point of the tool whenever the depth of the cut was to be varied.

The object of this invention is to construct a tool holder which is under the control of the hand of the artist, in such manner that the vertical distance between the underside of the bearing foot and the cutting tip of the tool can be automatically varied according to a pattern, so that whether the line being ruled is straight, diagonal, curved, or waved, and on wood, metal, stone, or composition, the depth of the cut at any specified locality will be automatically varied in such way as to produce the desired lights, shades, tints, tones and vignettes. To accomplish this object, the tool carrier is provided with a lever, wedge, or similar element, the position of which can be automatically varied at the desired time so as to change the relative vertical distance between the under surface of the bearing foot and the cutting point of the tool, the variable element being under the control of a pattern that is fixed if the tool holder is movable, or that is movable if the tool holder is stationary.

The tool holders illustrated herein are designed to be applied to the tool carriage of such a machine as is shown and described in United States Patent to Richards No. 342,464, May 25, 1896, and as the machine is fully set forth in that patent, it is not here illustrated or described.

Figure 1 of the accompanying drawings shows a front elevation of a tool holder which embodies this invention and is adapted to be fastened to such a machine as is shown in the patent referred to. Fig. 2 shows a rear elevation of the same tool holder. Fig. 3 shows a plan, and Fig. 4 shows a vertical transverse section of the same, taken on the plane indicated by the dotted line 4-4 on Fig. 2. Fig. 5 shows a front elevation of a similar tool holder in which the variation of the distance between the bearing foot and point of the tool is accomplished by a slightly different means from that shown in the first views. Fig. 6

shows a rear elevation of the modified form. Fig. 7 shows a plan, and Fig. 8 shows a vertical transverse section of the modified form on the plane indicated by the dotted line 8—8 on Fig. 7.

The bracket 1 is designed to be fastened to the tool carriage of the machine in the usual manner. A slide 2 is arranged to move vertically in a channel formed in this bracket, gibs 3 being fastened over the edges of the channel to hold the slide in place. The slide is lifted by a leaf spring 4 and is forced down by the pressure of the hand of the operative on the hand wheel 5. The tool 6 is clamped to the slide by the block 7 that is tightened by the thumb nut 8. The bearing foot 9 is at the lower end of the leg 10 that is movable vertically in the slide. This foot is normally held raised by a spring pressed plunger 11 that is arranged in the slide in such manner as to press up against a lug 12 that projects from the upper end of the leg.

The hand wheel 5 is attached to a threaded spindle 13 that turns in the slide. The top of this hand wheel is usually graduated, and engaging its milled edge in front is a spring index finger 14. Between the lower end of the spindle and the upper end of the foot leg is a wedge 15. This wedge is normally pushed back by a spring 16. Bearing against the rear and wide end of this wedge is a roller 17 that is carried by an arm 18 that is pivotally supported on the bracket. On the back of this arm is a roller 19 that is designed to engage the edge of the form or pattern 20, which is to cause the variation in the depth of the cut necessary to produce the desired shading. This pattern may be mounted on a machine frame so as to be fixed or movable in any desired manner. The pattern illustrated is symbolical only, for of course it will differ in outline with each illustration to be ruled on the block.

The normal depth of the line to be ruled and that which produces the tone of the illustration is obtained by turning the hand wheel and screwing the spindle down or up and thus adjusting the bearing foot so that the cutting point of the tool will project below the under surface of the foot the necessary distance to produce the required depth of the cut. When the line is to be ruled, the operator by the pressure of his hand upon the hand wheel pushes the slide down until the foot engages the surface of the block, and then whether the tool moves over the block or the block moves under the tool in straight or curved lines, the cutting point rules the lines on the block to a depth equal to the distance between the tip of the point of the tool and the under surface of the foot. When the improvement which embodies the

present invention is employed, during the ruling of the line the pattern provided automatically changes the position of the wedge by pushing it in or allowing the spring to push it out. When the wedge moves one way, the foot is forced down, and this decreases the distance between the tip of the cutting tool and the under surface of the foot so as to cause a shallower cut to be made. When the wedge moves in the opposite direction, the foot rises, and this permits the tool to make a deeper cut. Thus, according to the position of the wedge as controlled by the pattern, the relative distance between the under surface of the foot and the cutting point of the tool is changed so as to vary the depth of the cut and produce the desired shading on the block. The pattern can have any desired forms, the changes being innumerable, in order to cause different variations in any line ruled.

The bracket 21 of the second form illustrated is designed to be fastened to the machine carriage in any suitable manner. The slide 22 is vertically movable in a dove-tailed way in the face of the bracket, being lifted by the spring 23 and depressed by pressure upon the graduated hand wheel 24. The hand wheel is mounted on a threaded spindle 25 which turns in a block 26 fastened on the face of the slide. This hand wheel has its edge milled, and engaging with the milled edge is the spring index finger 27. The foot 28 is formed at the lower end of a leg 29 that is movable up and down in a block 30 on the slide, being normally lifted by a spring 31. The tool 32 is fastened to the face of the block 30 by a clamp plate 33. Between the upper end of the leg of the foot and the lower end of the hand wheel spindle is a lever 34. The rear end of this lever is guided in its movement by the fork 35 at the upper end of a bracket 36. Running on the upper inclined edge of the rear end of the lever is a roll 37 that is carried by the swinging plate 38. A spring 39 is arranged to normally pull the plate and roll back. The swinging plate is provided with a feeling stud or stylus 40 that is designed to engage the pattern 41 which may be fixed or movable, according to the conditions of use.

When a cut is to be made, the slide is pressed down, and as the tool carrier moves with the machine carriage, or as the work moves under the tool carrier, the pattern causes the stylus plate to swing in and out and oscillate the lever so as to increase or decrease, according to the shape of the pattern, the distance between the lower end of the spindle and the upper end of the leg of the bearing foot. This causes the foot to be automatically lowered and raised so as to vary the vertical distance between the cutting point of the tool and the lower surface

of the bearing foot, with the result that the depth of cut is varied according to the pattern.

With both of these tool holders, the tool slide is depressed by the operator bearing down on the hand wheel at the upper end of the spindle. This pushes the slide down, and the depth of cut of the tool depends upon the relation of the bearing surface of the foot to the cutting point of the tool. The normal vertical distance between the bearing surface of the foot and the cutting point of the tool is determined by turning the hand wheel. The cut could be made when the slide is pressed down, uniformly from one end of the line to the other. However, if a pattern or form is arranged adjacent to the swinging arm or plate at the back, the means between the lower end of the spindle and the upper end of the foot leg are operated so as to change the relation of the bearing surface of the foot and the cutting point of the tool. Thus, depending upon the pattern that is employed, the depth of any line may be automatically varied at any locality for the purpose of producing such shade effects as are desired.

The invention claimed is:

1. A tool carrier for an engraver's ruling machine having a tool, a bearing foot, and means for automatically raising and lowering the foot and varying the plane of its bearing surface with relation to the cutting point of the tool.

2. A tool holder for an engraver's ruling machine having a vertically movable slide, a tool carried by the slide, a bearing foot carried by the slide, and means for automatically varying the relative height of the bearing surface of the foot and the cutting point of the tool.

3. A tool holder for an engraver's ruling machine having a vertically movable slide, a tool clamped to the slide, a bearing foot movably held by the slide, and means for automatically varying the position of the bearing surface of the foot with relation to the cutting point of the tool.

4. A tool holder for an engraver's ruling machine having a vertically movable slide, a tool clamped to the slide, a foot movably held by the slide, a threaded spindle for regulating the normal position of the foot with relation to the tool, and means arranged between the spindle and the foot for automatically varying the bearing surface of the foot with relation to the cutting point of the tool.

5. A tool holder for an engraver's ruling machine having a vertically movable slide, a tool clamped to the slide, a foot movably carried by the slide, a threaded spindle carried by the slide for determining the normal relation of the foot to the tool, a wedge

between the spindle and the foot, and means for moving the wedge and thus varying the relation of the bearing surface of the foot to the cutting point of the tool.

6. A tool holder for an engraver's ruling machine having a vertically movable slide, a tool-clamp on the slide, a bearing foot movably held by the slide, an adjustable spindle carried by the slide, movable means interposed between the end of the spindle and the foot, and a swinging plate bearing a roll in engagement with the said movable means, whereby the swinging of the plate moves the means and automatically varies the height of the foot.

7. A tool holder for an engraver's ruling machine having a vertically movable slide, a spring for lifting the slide, a tool clamped to the slide, a foot movably held by the slide, a spring for lifting the tool, a threaded spindle carried by the slide, adjustable means interposed between the spindle and the foot, and means for moving said adjustable means and altering the distance between the spindle and the foot.

8. A tool holder for an engraver's ruling machine having a vertically movable slide, a spring for lifting the slide, a tool clamped to the slide, a foot movably held by the slide, a threaded spindle carried by the slide, a wedge interposed between the spindle and the foot, a spring for pushing the wedge backwardly, and a swinging plate bearing a roll for pushing the wedge forwardly and increasing the distance between the end of the spindle and the foot.

9. A tool holder for an engraver's ruling machine having a bracket, a slide movably held by the bracket, a spring for lifting the slide, a threaded spindle carried by the slide, a graduated hand wheel for turning the spindle, a tool carried by the slide, a bearing foot carried by the slide, and means arranged to automatically vary the relation between the bearing surface of the foot and the cutting point of the tool.

10. A tool holder for an engraver's ruling machine having a tool, a bearing foot, means for positively fixing the normal relation between the bearing surface of the foot and the cutting point of the tool, and means for automatically varying the relation between the bearing surface of the foot and the cutting point of the tool.

11. A tool holder for an engraver's ruling machine having a bracket, a slide movably held by the bracket, a spring for lifting the slide, a tool clamped to the slide, a foot movably held by the slide, a spring for lifting the foot, a threaded spindle carried by the slide, a graduated head for turning the spindle, a wedge arranged between the lower end of the spindle and the upper end of the foot, a spring for retracting the

wedge, a plate pivoted to the bracket, a
roll carried by the plate and engaging the
wedge, and means for swinging the plate
and causing a movement of the wedge so
5 as to vary the distance between the lower
end of the spindle and the upper end of the
foot.

12. A tool carrier for an engraver's rul-

ing machine having a tool clamp, a bear-
ing foot, and means for automatically rais- 10
ing and lowering the foot and varying the
plane of its bearing surface.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
