

No. 673,483.

Patented May 7, 1901.

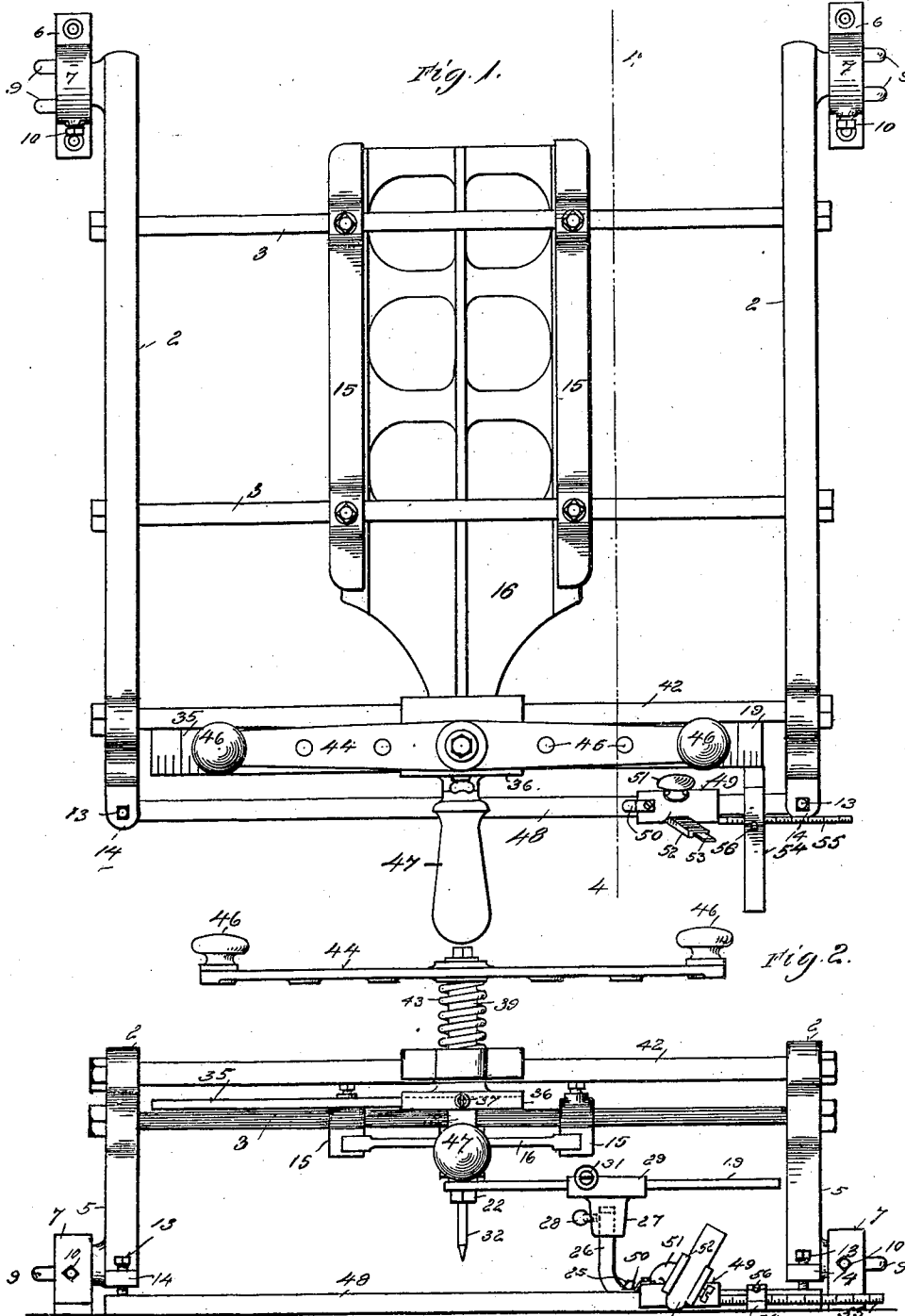
C. I. SHAWVER.

MACHINE FOR CUTTING PICTURE MATS.

(Application filed Nov. 28, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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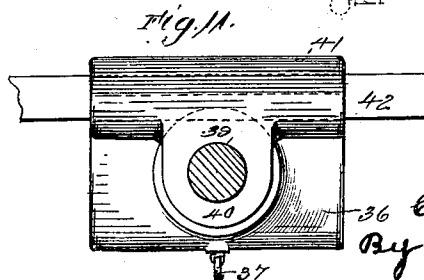
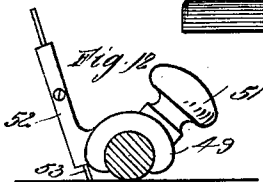
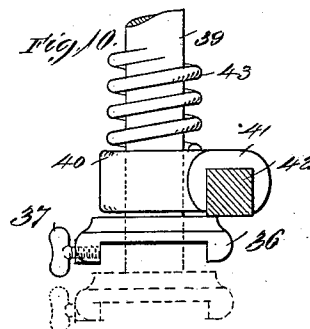
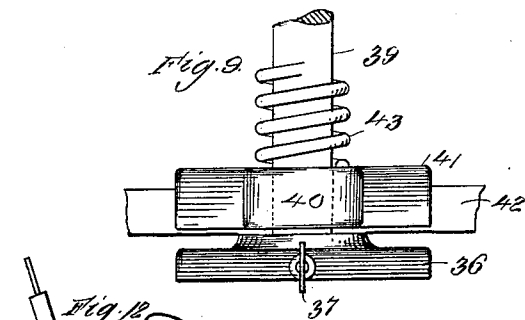
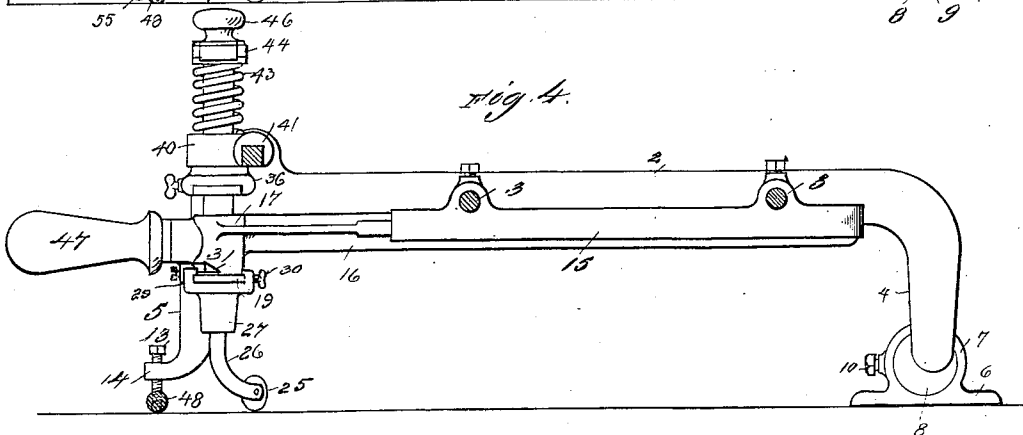
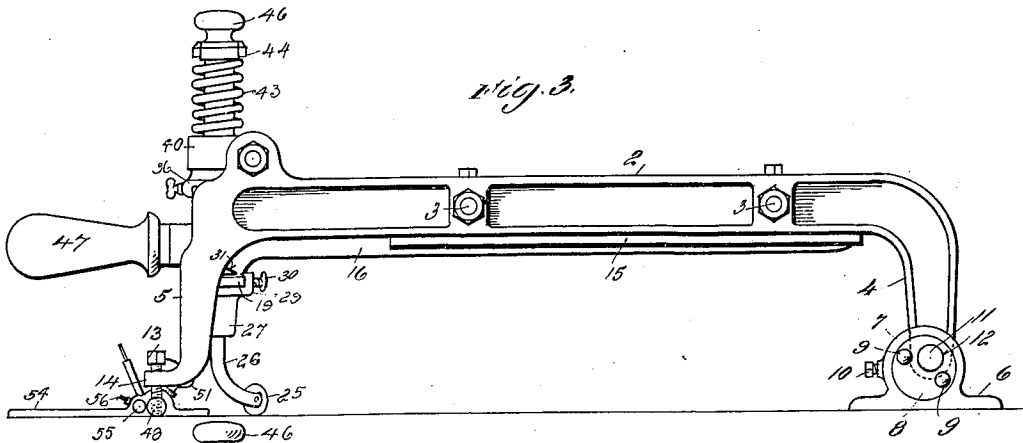
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(Application filed Nov. 28, 1900.)

(No Model.)

3 Sheets—Sheet 2.



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No. 673,483.

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3 Sheets—Sheet 3.

Fig. 5.

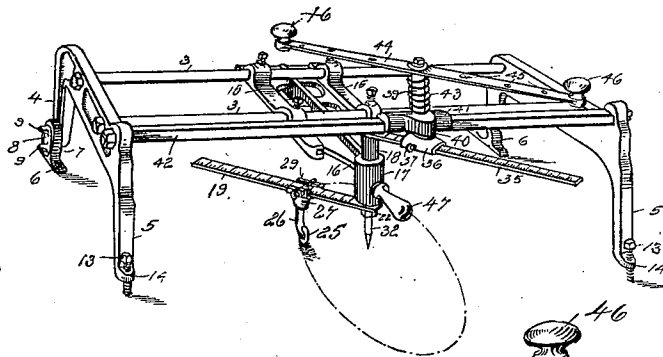


Fig. 6.

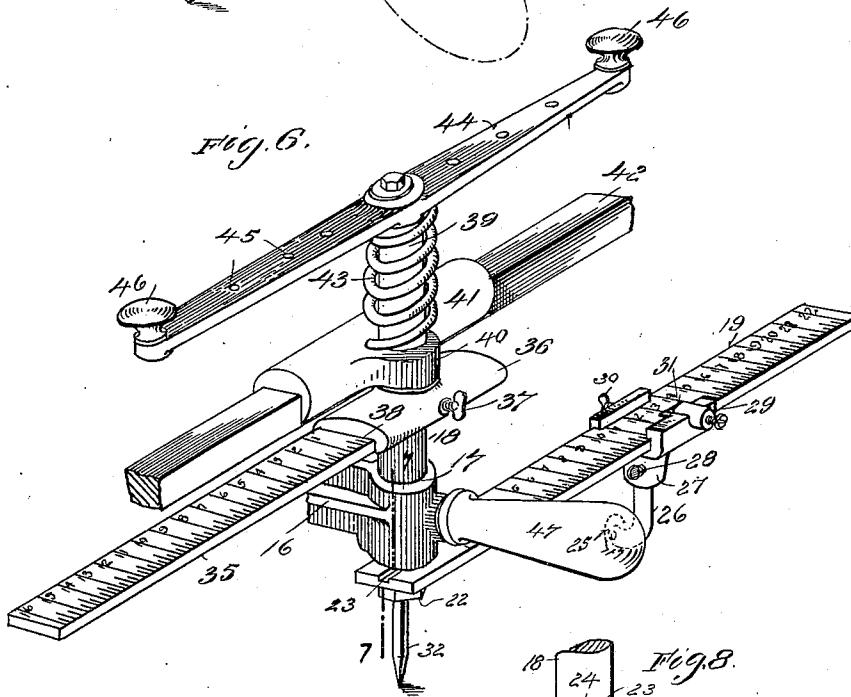
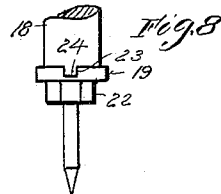
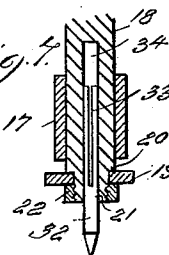


Fig. 7.



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# UNITED STATES PATENT OFFICE.

CHARLES I. SHAWVER, OF SPRINGFIELD, OHIO.

## MACHINE FOR CUTTING PICTURE-MATS.

SPECIFICATION forming part of Letters Patent No. 673,483, dated May 7, 1901.

Application filed November 28, 1900. Serial No. 38,012. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES I. SHAWVER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Machines for Cutting Picture-Mats, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for cutting picture-mats and for other purposes, being designed particularly for use in cutting circular or elliptical openings in mats used in the framing of pictures, but being also capable of use in scribing or marking circles or ellipses. In its preferred form the machine is also adapted for use in cutting square openings in such mats.

The object of the present invention is to provide a machine by means of which such mats may be automatically cut to form apertures either circular, elliptical, or of other form and of varying dimensions.

To this end the invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a plan view of an apparatus embodying my invention in one form. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation. Fig. 4 is a sectional view taken on the line 4-4 of Fig. 1. Fig. 5 is a perspective view of the apparatus. Fig. 6 is an enlarged perspective view of a portion of the device. Fig. 7 is a detail sectional view taken on the line 7-7 of Fig. 6. Fig. 8 is a detail elevation of that part of the device shown in section in Fig. 7. Fig. 9 is a front elevation of the transverse side and parts of the associated members. Fig. 10 is a side elevation of the same. Fig. 11 is a plan view of the same, and Fig. 12 is a detail view of a portion of the mechanism employed in cutting square openings. This latter mechanism is shown in Figs. 1, 2, 3, and 4, but is omitted in Fig. 6.

In the said drawings the machine is shown as mounted upon a suitable table or support and comprises a frame composed of side members 2 and cross-bars 3. The side members 2 are extended downward at right angles at their rear ends, as indicated at 4, and are

similarly extended downward at right angles at their front ends, as indicated at 5. The connection between the frame of the machine and the table or support is a hinged connection, and to this end there is secured to the table, by screws or otherwise, near the back thereof, at each side of the machine, a hinge-plate 6, to which plates the lower ends of the extensions 4 are pivoted. In order to provide for the adjustment of the frame in such a way that the cutter or tool in its operation will always be at the same distance from the surface over which it moves, I provide independent adjusting devices at each corner of the frame. Those at the rear corners consist in each case of a circular bearing or box 7, mounted on or forming part of the hinge-plate 6, in which bearing or box is mounted a revoluble disk 8, provided with projections 9 or other means by which it may be readily grasped by the operator for the purpose of turning it. A set-screw 10, passing through the box or bearing 7, is adapted to bear upon the periphery of the disk and lock it in position after adjustment. The stud 11 on the arm 4, which forms the pintle of the hinge connection between the frame and table, is mounted in a bearing-aperture 12, formed eccentrically in the disk 8. It will be seen that by rotating the disk the part of the frame connected therewith may be raised or lowered, as desired, this adjustment being independent at each side of the rear of the machine. The adjustment at the front ends of the frame is obtained by means of screws 13, which pass vertically through threaded apertures in lugs 14 on the lower ends of the extensions 5. The lower ends of these screws bear upon the surface of the table or upon some intervening part and serve to independently adjust the front corners of the frame.

Upon the cross-bars 3 there are mounted at the center of the machine longitudinal ways 15, and in these ways there is mounted a longitudinally-movable slide or carriage 16. This carriage is provided at its front end with a vertical bearing 17, in which is mounted, so as to be capable of rotation and vertical movement therein, a vertical shaft 18. To the lower end of this vertical shaft is secured an arm 19, on which the cutter is mounted.

The preferred manner of constructing and connecting these parts is that shown in detail in Figs. 6, 7, and 8 of the drawings, in which the shaft 18 is shown as provided immediately below the bearing 17 with a shoulder 20 and a threaded downward extension 21. The arm 19 is apertured for the passage of this threaded extension and is clamped in position against the shoulder 20 by a nut 22 on said threaded extension. In order to prevent slipping of the arm on the shaft, the arm is provided on its upper face, immediately under the shoulder 20, with a groove 23, and the shoulder is provided with a corresponding tongue 24, which fits in said groove. The arm 19 extends horizontally or at right angles from the shaft 18 and is preferably divided or provided with a scale upon its upper face, as shown more particularly in Fig. 6. The cutter, which is indicated at 25, may be of any suitable character, but is preferably a rotating or disk cutter, and is supported by means of a curved shank 26, which is secured at its upper end in a collar 27 by means of a set-screw 28. The collar 27 is mounted on an adjustable clip 29, and this clip is in turn mounted so as to slide upon the arm 19 in such a way as to leave the scale thereon exposed. This clip is provided with a set-screw 30, by means of which it may be secured upon the arm 19 after adjustment, and is further provided with a pointer or index 31 to cooperate with the scale on the arm 19.

In order to provide means for properly centering the mat to be operated upon relatively to the machine, I provide the shaft 18 with a vertically-movable centering-pin 32. This pin is split at its upper end, as indicated at 33, and said split end is inserted in a hole or bore 34, extending upward from the bottom of the shaft 18, centrally thereof. The split end of the centering-pin bears against the wall of the bore with sufficient friction to hold the pin in any position to which it may be adjusted, while at the same time permitting the pin to be readily moved vertically relatively to the shaft in which it is mounted.

At the upper end of the shaft 18 there is secured to said shaft a second horizontal arm 35, extending in the opposite direction to the arm 19 and being similarly divided or provided with a scale on its upper surface. Upon this arm 35 is adjustably mounted a clip 36, provided with a set-screw 37, by means of which it may be secured on said arm after adjustment. In this case the front edge of the clip 36 (indicated at 38) serves as an index to cooperate with the scale on the arm 35. The clip 36 is secured on the lower end of a vertical shaft 39, and said shaft is mounted so as to be capable of rotary and vertical motion in a bearing 40, carried by a slide or carriage 41, mounted on a cross-bar 42, which is preferably square in cross-section, as shown. A spring 43 serves to force the shaft 39 normally upward, and in the present instance I

have shown for this purpose a spring coiled around the body of the shaft and bearing at its lower end against the top of the bearing 40, while its upper end bears against a cross-bar or operating-lever 44, secured to the upper end of the shaft 39. This operating-lever is preferably constructed in the manner shown, being secured at its center to the upper end of the shaft and being provided with a plurality of apertures 45, into any of which the operating handles or hand-grasps 46 may be inserted. By this means the leverage may be increased by moving the handles outward toward the ends of the bar when large and heavy work is being performed, while at the same time in case of light small work these handles may be moved inward toward the center of the bar to permit the machine to be operated at a greater speed.

It will be noted that the spring 43 serves to hold the upper edge of the clip 36 against the under surface of the cross-bar 42, and therefore serves to hold the slide 41 firmly in position on the bar.

The machine so far as thus described is more particularly adapted for the cutting of circular and elliptical openings and operates in the following manner: The mat to be cut is secured to the table or support 1 by means of thumb-tacks or in any other suitable manner, and as a preliminary to thus securing the mat it is centered upon the table with respect to the machine by means of the centering-pin 32. The center of the mat having been previously marked, it is placed on the table in such a position that the centering-pin 32 when depressed will strike the center of the mat. The centering-pin is then raised so as to permit freedom of movement of the parts to which it is attached. If it is desired to cut a circular opening, the clip 36 is secured with its index at the zero-mark of the scale on the bar 35, in which position of the parts the shafts 39 and 18 are in line with each other and the cutter will describe a circle. By adjusting the cutter carrying the clip or slide 29 on the arm 19 the diameter of this circle may be varied as required, and the scale thereon facilitates the determination of the size of the circle in an obvious manner. If it is desired to cut an elliptical opening, the cutter carrying clip 29 is adjusted upon the arm 19 to a point corresponding with the minor axis of the ellipse, while the clip 36 is adjusted on the arm 35 to a point corresponding with the excess in length of the major axis of the ellipse over the minor axis. For instance, in setting the machine to cut an oval having a minor axis of seven inches and a major axis of ten inches the clip 29 is set to a point where its index is opposite the figure "7" on the scale on the arm 19, while the clip 36 is set to a point where its index coincides with the number "3" on the scale on the arm 35. The machine is then operated by rotating the shaft 39 by means of the operating-lever 44, at the same time exerting a downward pres-

sure upon said lever to cause the cutter to properly engage the mat. The rotary movement thus imparted to the operating-lever will cause the cutter to describe an ellipse of the desired character, the slide 16 moving longitudinally in the ways 15 and the slide 41 moving transversely on the way during this movement of the parts. It will be understood, of course, that the handles on the operating-lever will be adjusted in accordance with the character of the work and that the frame will be so adjusted relatively to the table that the cutter will always be at an equal distance from the surface of the table throughout its range of movement.

It is found in actual practice that the cutters vary in dimensions, chiefly owing to the variations of the bevel of the cutting edge, and such variations may be accommodated by a proper adjustment of the clip 29 on the arm 19. The pointer 31, in connection with the minutely-subdivided scale on said arm, serves to facilitate this adjustment to compensate for such variations.

When not in use, the entire machine may be swung up into a vertical position upon the hinge connections at the rear of the frame and will rest upon the arms or extensions 4. In this position free access may be had to the table or support in order that it may be used for other purposes, if desired. The slide 16 is provided with a handle 47 to facilitate this swinging up of the frame.

The mechanism for cutting circular and elliptical forms, with the exception of the slideways, may be removed from the frame, if desired, such removal being accomplished by reason of the fact that the slide 41 may be moved upward against the action of the spring 43 to an extent sufficient to cause it to clear or become disengaged from the bar 42, whereupon the slide 16, carrying with it all the operative parts, may be withdrawn from the frame.

In connection with the mechanism for cutting circular and elliptical openings I may employ an attachment by means of which square openings may be readily cut, this attachment being illustrated in Figs. 1, 2, 3, 4, and 12 of the drawings. Said attachment comprises a round bar 48, which is secured to the front of the machine by means of the screws 13, and on which bar is mounted a slide 49, which is held in position on the bar by reason of the fact that it embraces a greater portion than one-half of the bar, as shown in Fig. 12. This slide is provided with a spring 50, which bears upon the bar 48 and which serves to hold the slide firmly relatively to the bar. The slide 49 is provided with an operating-handle 51 and with a socket 52, in which is mounted a cutter 53. Near one end of the bar there is mounted thereon a gage-plate 54, extending at right angles to the bar, in such a position that the edge of the mat may be brought into contact with said gage-plate, and thereby insure that the mat will be cut along a line par-

allel with its border as the cutter is moved along the bar 48. In order to adapt the device to cut openings of a given size without necessitating the marking on the mat of the point where the cut shall terminate, I employ an adjustable stop 55, which is mounted in the gage-plate 54 in a position parallel to the bar 58 and in the path of the slide 49. This gage-plate is graduated or provided with a scale and is adjustable lengthwise in the gage-plate 54, being secured in position after adjustment by a set-screw 56. It will be seen that as the cutter-slide is drawn along the bar from left to right, in Figs. 1 and 2 of the drawings, its movement will be positively arrested by its contact with the end of the stop-rod 55, and the adjustment of said rod by means of its scale will determine the margin left between the end of the cut and the edge of the mat, so that all marking of the mat may be dispensed with.

As a matter of convenience it is found desirable to remove the circular and elliptical cutting mechanism when the mechanism for cutting square openings is in use, and it may also be found convenient to remove this latter mechanism when the first-mentioned mechanism is in use, such removal being readily accomplished by unscrewing the screws 13 from the bar 48.

I do not wish to be understood as limiting myself to the precise details hereinbefore set forth, and shown in the accompanying drawings, as they may obviously be modified without departing from the principle of my invention. For instance, although the machine is described as one primarily designed for the purpose of cutting openings in mats it is obvious that it may be used for the purpose of cutting circular, elliptical, or rectangular bodies. It is also obvious that by substituting for the cutter a suitable marking-tool the machine may be used for scribing or drawing such figures instead of cutting them.

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

1. A machine of the character described, comprising a longitudinally-movable slide, a revoluble shaft carried by said slide and provided with an arm having a suitable operating-tool, a second arm carried by said shaft, and a transversely-moving slide adjustably mounted on said second arm, said slides being mounted on suitable fixed ways arranged at right angles to each other, substantially as described.

2. In a machine of the character described, the combination, with a frame having ways arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides and vertically movable therein, an arm adjustably connecting said slides, and a tool-carrying arm secured to one of said shafts, substantially as described.

3. In a machine of the character described, the combination, with a frame having ways

thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides and vertically movable therein, a spring for normally lifting said shafts, an arm adjustably connecting said shafts, and a tool-carrying arm connected with one of said shafts, substantially as described.

4. In a machine of the character described, the combination, with a frame having ways thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides, an arm adjustably connecting said shafts, a tool-carrying arm secured to one of said shafts, and a tool adjustably mounted on said tool-carrying arm, substantially as described.

5. In a machine of the character described, the combination, with a frame having ways thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides and vertically movable therein, an arm adjustably connecting said shafts, an operating-lever secured to one of said shafts, a tool-carrying arm secured to the other one of said shafts, and a spring for normally lifting said shafts, substantially as described.

6. In a machine of the character described, the combination, with the frame, the slides thereon to move at right angles to each other, and the adjustably-connected shafts mounted in said slides, one of said shafts being provided with a tool-carrying arm, of an operating-lever secured at its middle to the other one of said shafts and having operating-handles adjustably mounted thereon, substantially as described.

7. In a machine of the character described, the combination, with a frame having longitudinal ways, and a slide removably mounted in said ways and carrying a tool-shaft, of a cross-bar on said frame, a slide seated on said cross-bar, a spring-controlled shaft mounted in said slide and provided with a clip, bearing against the under side of the cross-bar, and an arm secured to said clip and to the tool-shaft, substantially as described.

8. In a machine of the character described, the combination, with a frame having ways thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides, a graduated arm adjustably connecting said shafts, a graduated tool-carrying arm secured to one of said shafts, and a tool-carrying clip adjustably mounted on

said tool-carrying arm, substantially as described.

9. In a machine of the character described, the combination, with a frame having ways thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides and adjustably connected to each other, one of said shafts being provided with a tool-carrying arm, and a centering-pin adjustably mounted in said last-mentioned shaft, substantially as described.

10. In a machine of the character described, the combination, with a frame having ways thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted in said slides, an arm adjustably connecting said shafts, a graduated tool-carrying arm secured to one of said shafts, and a tool adjustably mounted on said graduated tool-carrying arm, substantially as described.

11. In a machine of the character described, the combination, with a frame having ways thereon arranged at right angles to each other, of slides mounted on said ways, shafts mounted on said slides, a graduated arm adjustably connecting said shafts, said arm being secured to one of said shafts and having the other shaft longitudinally adjustable thereon, and a tool-carrying arm secured to the last-mentioned shaft and provided with a tool, substantially as described.

12. In a machine of the character described, the combination, with a table or support, of hinge-pieces secured thereon, disks revolubly mounted in said hinge-pieces, means for securing said disks, mechanism for describing circular and elliptical figures, and a frame carrying said mechanism and eccentrically pivoted in said disks, substantially as described.

13. In a machine of the character described, the combination, with a frame, of a cross-bar connected therewith, a gage-plate arranged at right angles to said cross-bar, a slide mounted on said cross-bar and provided with a cutter, and a stop-arm adjustably mounted in the gage-plate and arranged parallel to the cross-bar and in the path of the slide, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

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Witnesses:

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