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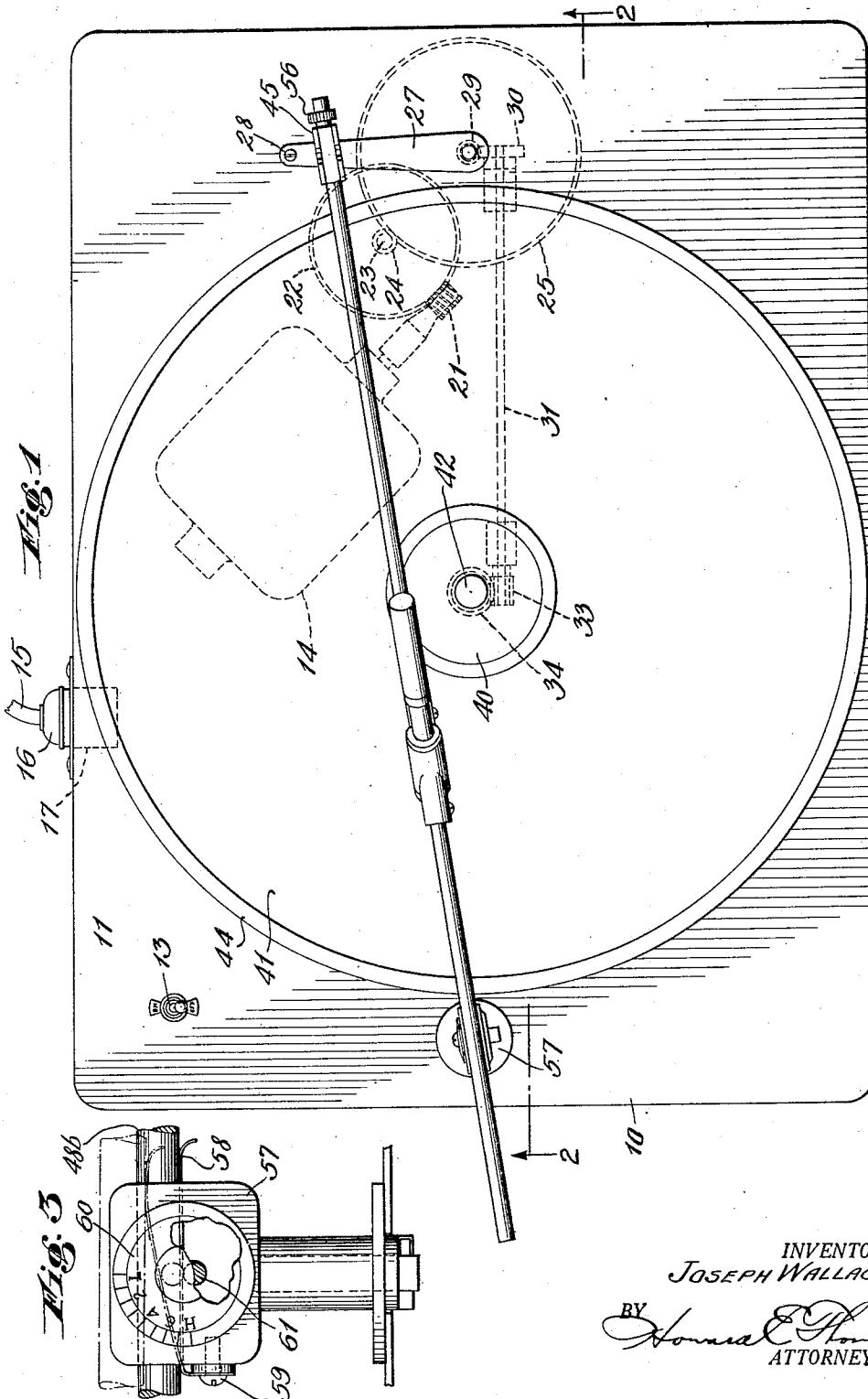
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DISPLAY APPARATUS

Filed June 24, 1930

2 Sheets-Sheet 1



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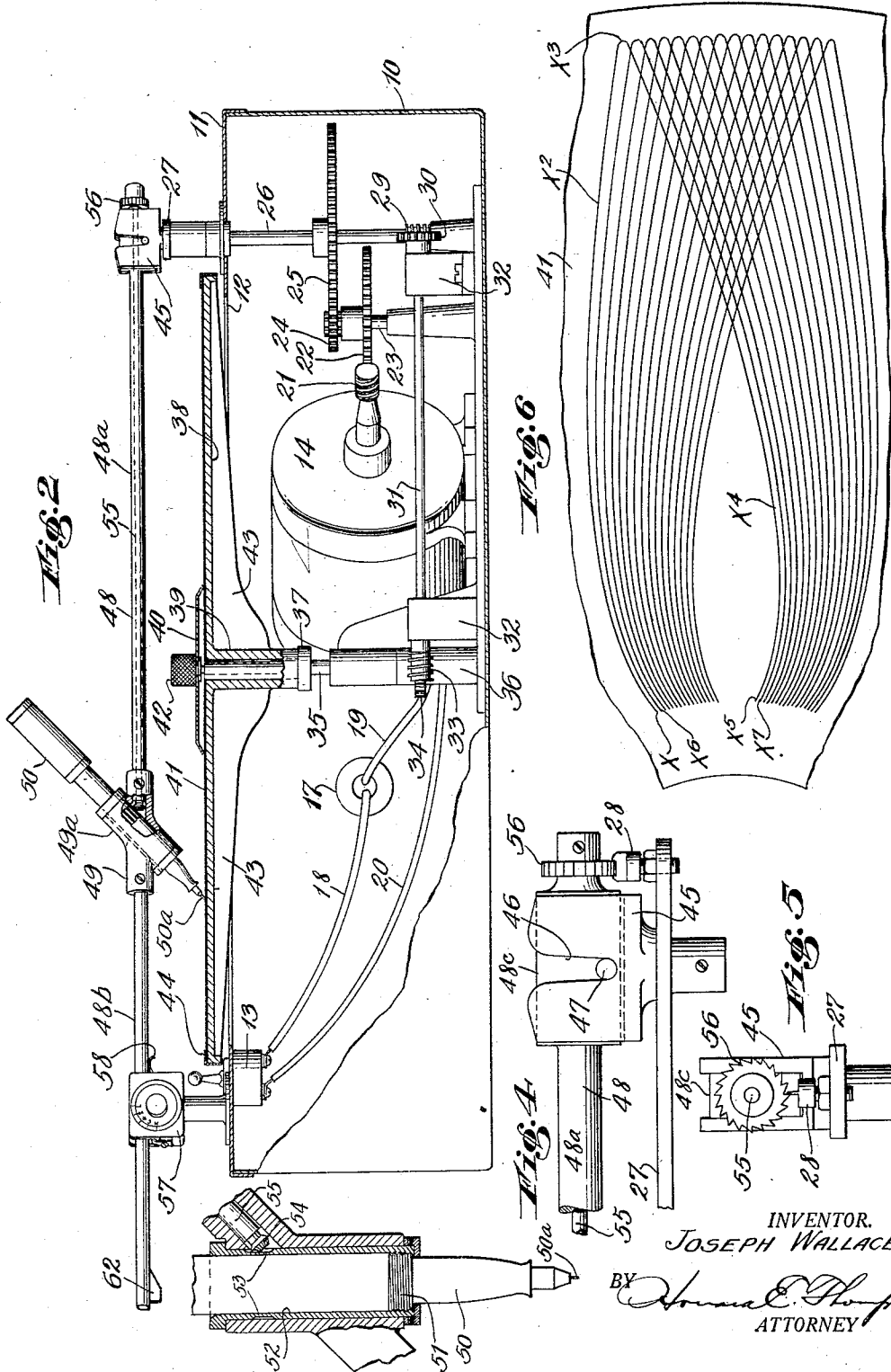
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DISPLAY APPARATUS

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2 Sheets-Sheet 2



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DISPLAY APPARATUS

Application filed June 24, 1930. Serial No. 463,468.

This invention relates to display apparatus and particularly to apparatus of this class for displaying the use of fountain pens and similar articles, and which may be used for other purposes; and the object of the invention is to provide an apparatus of the class specified employing a rotatable table upon which a sheet of paper or other workpiece is adapted to be placed, means being provided to secure a workpiece in position on said table; a further object being to provide means for supporting a tool such for example as a pen, over said table and for actuating said supporting means to move the tool through a series of predetermined paths with respect to the workpiece on said table; a further object being to provide means for relatively moving the table and said tool actuating means so as to form a series of similar markings or impressions on the workpiece in close proximity to each other to produce a predetermined pattern or design on the workpiece; a further object being to provide a tool operating means which will guide the tool intermittently over the workpiece from the central portion to the periphery thereof, means being provided to control the movement of the tool toward and from the workpiece on said table; a still further object being to provide means for adjusting the position of the tool in its support during its movement relatively to the workpiece; and with these and other objects in view, the invention consists in an apparatus of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a plan view of an apparatus made according to my invention and illustrating one method of its use.

Fig. 2 is a partial section on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged, detail view of a part

of the structure shown in Fig. 2, with part of the construction broken away.

Fig. 4 is an enlarged, detail view of a part of the construction shown in Fig. 2.

Fig. 5 is an end view of the structure shown in Fig. 4; and,

Fig. 6 is a plan view of a part of a workpiece illustrating one method of moving the tool with respect thereto.

For the purpose of illustrating one method of carrying my invention into effect, I have shown an apparatus provided with means for supporting what is known as a fountain pen, but it will be understood at this time, that any suitable tool may be employed in connection with the apparatus.

In Figs. 1 and 2, I have shown at 10, a box or case preferably made from sheet metal and upon which is mounted a removable cover 11 having a relatively large opening formed centrally thereof. Supported in the cover 11 adjacent one corner portion thereof is a switch 13 controlling the electric circuit to the electric motor 14 supported in the case 10, the circuit wires 15 from a source of supply being placed in circuit through a usual electric plug 16 adapted to fit in the corresponding socket 17 supported in one side wall of the case 10. Connected with the socket 17 are wires 18 and 19, the wire 18 leading to the switch 13 and the wire 19 to the motor 14, and another wire 20 from the switch leads to said motor to complete the circuit.

Supported on the shaft of the motor is a worm gear 21 which meshes with a relatively large gear 22 secured to a shaft 23 supported in the case. On said shaft is a pinion 24 which meshes with a slightly larger gear 25 secured to a shaft 26, the latter shaft projecting upwardly through the cover plate 11. Secured thereto, above and in spaced relation to the cover 11, is a crank arm 27, the free end of which carries a trip pin 28.

Mounted on the shaft 26 at the lower end thereof, is a worm 29 meshing with a gear 30 secured to one end of a shaft 31 arranged horizontally of the case 10 and supported in bearings 32. The other end of the shaft 31 has a worm 33 which meshes with a gear 34 on the lower end portion of a vertical shaft 35

arranged centrally of the case 10 in a suitable bearing 36. A collar 37 is arranged on said shaft, approximately centrally thereof, to form a backing for the rotatable table 38 of the apparatus, the central hub portion 39 of the table resting upon said collar.

Said table is secured in position by a removable cap 40 which also serves to hold a sheet of paper or other workpiece 41 in engagement with the top of the table. The cap 40 has a milled nut 42 swivelled thereon and in screw threaded engagement with the upper end of the shaft 35. In clamping the table in position, the peripheral edge thereof is arranged above and in spaced relation to the cover 11 of the case, as clearly seen in Fig. 2, to provide free rotation of the table over said case. The table is reinforced by a plurality of radially arranged ribs 43 disposed on the under face thereof. It will also be seen that an annular workpiece retaining ring 44, which is L-shaped in cross sectional form, is supported on the outer and upper surfaces of the table, and under which the peripheral edge of the workpiece or sheet 41 is placed. Said sheet of paper is in the form of a disk having a central aperture, sufficiently large, to clear the shaft 35, but of less diameter than the diameter of the cap 40.

Pivotaly supported on the crank arm 27, inwardly of the trip pin 28, is a U-shaped block 45 shown in Figs. 1, 4 and 5 of the drawings, the side walls of said block having vertically arranged apertures 46 to receive a key pin 47 mounted in one end portion of a tool operating bar 48. The bar 48 is divided into two parts, namely a tubular part 48a and a solid rod part 48b, which parts are joined together by a tool supporting block 49 having an angularly disposed portion 49a in which the tool 50 is adapted to be supported, said tool being in the form of a fountain pen in the construction shown.

The lower end portion of the pen barrel is threaded as seen at 51 to engage a sleeve 52 arranged in the block, said sleeve having a threaded peripheral portion 53 with which a beveled pinion 54 on the end of a shaft 55 is adapted to operate, said shaft being arranged in and extending longitudinally through the tubular part 48a and is provided at its outer end with a ratchet 56 in connection with which the trip pin 28 is adapted to operate. The part 48a of the bar 48 has an enlargement 48c arranged in the channel of the block 45, in connection with which the pin 47 is mounted. It will thus be seen that this end of the bar 48 may be readily raised in detaching the same from the block 45 and the other end 48b may also be raised out of engagement with another U-shaped block 57 which is rotatably mounted upon the cover 11.

Arranged within the block 57 is a long, flat spring 58 secured to the block as seen at

59; and rotatably mounted on one side of the block is a dial 60 which carries an eccentric pin 61 arranged below the spring 58 and adapted to raise and lower said spring in said block to gage the height of the end 48b of the bar 48 to control and regulate the engagement of the end of the tool with respect to the workpiece or sheet 41, such for example as the pen point 50a. The spring serves a further purpose in taking up the shock in the sudden lowering of the bar in the operation of the apparatus, especially in the passage of a cam member 62 on the end of the part 48b of the bar over said spring in the several cycles of operation of the apparatus as later described.

The operation of my improved apparatus will be readily understood from the foregoing description when taken in connection with the accompanying drawings, and the following statement. The workpiece or sheet 41 is first mounted upon the table and securely clamped in position, which operation also clamps the table into firm engagement with the shaft 35, after which the bar 48, previously removed, is now placed in position with the fountain pen set in the holder 49.

In starting the operation of the machine, the pen is first positioned with the cam 62 resting upon the spring 58 which supports the pen above the workpiece when in its innermost position with reference to the central part of the workpiece. The motor 14 is now put in operation through the action of the switch 13, and the rotation of the shaft 26 through the gearing disclosed, will cause the crank arm 27 to be rotated in such manner as to advance the bar 48 in the direction of the block 57, and the cam 62 will be moved out of engagement with the spring. When so disengaged, the point 50a of the pen will be brought into engagement with the workpiece as indicated at the point x in the diagrammatic illustration of the course or path of travel of the pen with reference to the workpiece, as shown in Fig. 6, the point x indicating the first engagement with the workpiece or sheet 41. As the operation of the machine continues, the pen point is passed through a curved path, represented by the line $x2$ which is marked on the sheet 41 by the ink within the pen, until the pen point reaches the outer peripheral edge portion of the workpiece where the pen makes a relatively small curve indicated at $x3$ and travels backwardly through another curved path indicated at $x4$, terminating at the point $x5$, at which point, the pen is again raised by the cam 62 and moved out of engagement with the sheet 41.

In returning to the sheet for the second successive stroke, the pen will re-engage the same at the point $x6$, the latter complete stroke terminating at the point $x7$, and so on, until the entire sheet has been covered through a complete revolution of the table

38, during which revolution, the pen or tool has traveled through a multiplicity of back and forth intermittent movements through paths which are governed by the structural arrangement of the apparatus employed, one form of which is disclosed in Fig. 6 of the drawings.

It will thus be apparent that the ratio of gearing to the rotatable table 38 will be such as to turn said table around slowly, and this turning operation in the construction shown is constant, but the ratio of gearing and the specific manner of rotating the table may be varied in the production of different designs or paths of travel of the tool. In employing a tool of the class described, and especially a fountain pen having a pin-shaped writing point, it is also preferable to rotate the pen intermittently so as to prevent wear of the point in such manner as to form a sharp edge. It will thus be seen that, as the crank arm 27 completes each cycle of revolution and the trip pin 28 passes beneath the ratchet 56, said ratchet will be engaged and rotated a fraction of a revolution to correspondingly rotate the pen 50 through the shaft and gearing employed. The engagement of the trip pin 28 with the ratchet is illustrated in Fig. 5 of the drawings.

Whenever desired, the fountain pen may be detached from the holder 49 by simply disengaging the threaded portion 51 thereof from the sleeve 52 and drawing the same upwardly through the holder, especially when it is desired to refill the pen. In like manner, a new workpiece or sheet 41 may be replaced for an old sheet by simply removing the ring 44 and the cap 40.

It will be understood that while I have illustrated one method of carrying my invention into effect and have shown and described a certain type of tool and workpiece, and have further illustrated a specific manner of travel and operation of the tool and the workpiece supporting table, that my invention is not limited to these structural arrangements or manners of use of the invention, and various changes therein and modifications thereof, may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

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

1. A machine of the class described comprising a workpiece supporting member, a tool supporting part disposed over said member, means for moving said part relatively to said member and for controlling the path of movement of a tool supported in said part with respect to said member, means for moving said member relatively to the path of movement of the tool supported in said part, and automatically actuated means for inter-

mittently moving said part toward and from said member in each cycle of operation of the part with respect thereto.

2. A machine of the class described comprising a workpiece supporting member, a tool supporting part disposed over said member, means for moving said part relatively to said member and for controlling the path of movement of a tool supported in said part with respect to said member, means for moving said member relatively to the path of movement of the tool supported in said part, automatically actuated means for intermittently moving said part toward and from said member in each cycle of operation of the part with respect thereto, and adjustable means cooperating with said last named means for gaging the spacing of said part with respect to said member.

3. A machine of the class described comprising a workpiece supporting member, a tool supporting part disposed over said member, means for moving said part relatively to said member and for controlling the path of movement of a tool supported in said part with respect to said member, means for moving said member relatively to the path of movement of the tool supported in said part, said part having tool supporting means with which a tool may be detachably coupled, and means for intermittently rotating said tool supporting part.

4. An apparatus of the class described, comprising a rotatable workpiece supporting table, means for rotating said table, a bar adapted to be arranged over said table, a rotatable block supporting one end of said bar, a crank arm supporting the other end of said bar and by means of which said bar is moved transversely with respect to said table, the axis of said block and crank arm being disposed vertically with respect to the plane of rotation of said table, a tool supporting member on said bar whereby a tool supported therein may engage and move over a workpiece supported on said table, means for raising said bar to move the tool supported therein out of engagement with the workpiece, during each cycle of revolution of said operating crank, and means for intermittently rotating said tool supporting member.

5. An apparatus of the class described comprising a tool supporting bar, means for supporting a tool in connection therewith, two rotatable yoke-shaped blocks arranged in spaced relation to each other, one of said blocks being rotated on a fixed axis and through which the bar is slidably mounted, a crank arm in connection with which the other block is pivotally mounted and by means of which said bar is moved relatively to the first named block, and the axis of said blocks and crank arm being disposed vertically with respect to the longitudinal plane

of said tool supporting bar, means for actuating said crank arm to move a tool arranged in said supporting means through predetermined paths during each cycle of revolution of said crank, and means on said bar cooperating with the first named block for intermittently raising said bar and the tool supported therein.

6. In an apparatus of the class described, means for supporting a work sheet, means for supporting and operating a fountain pen intermittently back and forth with respect to the work sheet through predetermined paths to trace on the work sheet, by the point of said pen, the path of movement traversed thereby, means for moving the work sheet during the movement of the pen with respect thereto, means for intermittently moving the pen out of engagement with the work sheet, and means for rotating said pen.

7. An apparatus of the class described comprising a rotatable workpiece supporting table, means for rotating said table, a rotatable block supported outwardly of said table, a crank arm arranged in opposed relation to said block, and the axis of which is disposed outwardly of said table, said block and arm each having an upwardly directed channel portion arranged vertically with respect to the plane of rotation of said table, a bar adapted to be arranged over the table and seating in the channel portion of said block and of said arm, means for keying one end of the bar to the channel portion of said arm, the other end of the bar being movable longitudinally of the channel in said block, said bar being readily attachable and detachable with respect to the arm and block by vertical movement toward and from the channels thereof, and a tool supporting member on said bar whereby a tool supported therein may engage and move over a workpiece supported on said table.

8. An apparatus of the class described comprising a rotatable workpiece supporting table, means for rotating said table, a rotatable block supported outwardly of said table, a crank arm arranged in opposed relation to said block and the axis of which is disposed outwardly of said table, said block and arm each having an upwardly directed channel portion arranged vertically with respect to the plane of rotation of said table, a bar adapted to be arranged over the table and seating in the channel portion of said block and of said arm, means for keying one end of the bar to the channel portion of said arm, the other end of the bar being movable longitudinally of the channel in said block, said bar being readily attachable and detachable with respect to the arm and block by vertical movement toward and from the channels thereof, a tool supporting member on said bar whereby a tool supported therein may engage and move over a workpiece supported

on said table, and means on said bar cooperating with said block for automatically raising said bar to move the tool supported therein out of engagement with the workpiece during each cycle of revolution of said crank arm.

9. An apparatus of the class described comprising a rotatable workpiece supporting table, means for rotating said table, a rotatable block supported outwardly of said table, a crank arm arranged in opposed relation to said block and the axis of which is disposed outwardly of said table, said block and arm each having an upwardly directed channel portion arranged vertically with respect to the plane of rotation of said table, a bar adapted to be arranged over the table and seating in the channel portion of said block and of said arm, means for keying one end of the bar to the channel portion of said arm, the other end of the bar being movable longitudinally of the channel in said block, said bar being readily attachable and detachable with respect to the arm and block by vertical movement toward and from the channels thereof, a tool supporting member on said bar whereby a tool supported therein may engage and move over a workpiece supported on said table, means on said bar cooperating with said block for automatically raising said bar to move the tool supported therein out of engagement with the workpiece during each cycle of revolution of said crank arm, and means on said block for adjusting the position of the bar with respect to the workpiece.

10. An apparatus of the class described comprising a tool supporting bar, means for supporting a tool in connection therewith, two rotatable blocks arranged in spaced relation to each other, one of said blocks being rotated on a fixed axis, a crank arm arranged in spaced relation to the first named block, the other block being rotatably supported in the free end portion of the crank arm, each of said blocks having a channel opening outwardly through the upper end thereof and arranged at right angles to the longitudinal plane of said bar in which the end portions of said bar are adapted to be supported, said bar being detachable with respect to said blocks, means for keying one end portion of the bar to the block on said crank, the other end portion of the bar slidably engaging the first named block, means for actuating said crank arm to move said bar and a tool arranged in said supporting means through predetermined paths during each cycle of revolution of said crank, and means for moving said bar vertically for a predetermined interval during each cycle.

11. An apparatus of the class described comprising a casing, a disk supported to rotate over the top of said casing, a tool supporting bar arranged over said disk, means for supporting a tool in connection therewith,

two rotatable blocks arranged in spaced relation to each other, one of said blocks being rotated on a fixed axis, a crank arm arranged in spaced relation to the first named block, the other block being rotatably supported in the free end portion of the crank arm, each of said blocks having a channel opening outwardly through the upper end thereof and arranged at right angles to the longitudinal plane of said bar in which the end portions of said bar are adapted to be supported, said bar being detachable with respect to said blocks, means for keying one end portion of the bar to the block on said crank, the other end portion of the bar slidably engaging the first named block, means for actuating said crank arm to move said bar and a tool arranged in said supporting means through predetermined paths during each cycle of revolution of said crank, means for moving said bar vertically for a predetermined interval during each cycle, an electric motor supported in the casing, and a gear chain including worm gears for placing said disk and crank arm in operative engagement with said motor in order to rotate said disk at a very low rate of speed as compared with the rotation of said crank.

12. An apparatus of the class described comprising a casing, a disk supported to rotate over the top of said casing, a tool supporting bar arranged over said disk, means for supporting a tool in connection therewith, two rotatable blocks arranged in spaced relation to each other, one of said blocks being rotated on a fixed axis, a crank arm arranged in spaced relation to the first named block, the other block being rotatably supported in the free end portion of the crank arm, each of said blocks having a channel opening outwardly through the upper end thereof and arranged at right angles to the longitudinal plane of said bar in which the end portions of said bar are adapted to be supported, said bar being detachable with respect to said blocks, means for keying one end portion of the bar to the block on said crank, the other end portion of the bar slidably engaging the first named block, means for actuating said crank arm to move said bar and a tool arranged in said supporting means through predetermined paths during each cycle of revolution of said crank, means for moving said bar vertically for a predetermined interval during each cycle, an electric motor supported in the casing and a gear chain including worm gears for placing said disk and crank arm in operative engagement with said motor in order to rotate said disk at a very low rate of speed as compared with the rotation of said crank, and manually adjustable means for regulating the position of a tool supported in the bar with respect to a workpiece arranged on said disk.

13. An apparatus of the class described

comprising a work sheet supporting table, means for supporting a disk-like sheet upon the upper face of said table, a fountain pen supporting and operating bar arranged centrally and horizontally over the table of the apparatus, a crank arm rotatably supported outwardly of said table, means for actuating said arm and table, a block rotatably supported outwardly of the table and in opposed radial alinement with respect to the axis of said crank arm, said block slidably supporting one end portion of said bar, another block pivotally supported upon said crank arm and to which the other end portion of said bar is keyed whereby the fountain pen on said bar may be moved through predetermined paths over the work sheet on said table through the operation of said crank arm and table, and manually adjustable means on said first named block for controlling the relative position of the fountain pen point with respect to the work sheet.

14. An apparatus of the class described comprising a work sheet supporting table, means for supporting a disk-like sheet upon the upper face of said table, a fountain pen supporting and operating bar arranged centrally and horizontally over the table of the apparatus, a crank arm rotatably supported outwardly of said table, means for actuating said arm and table, a block rotatably supported outwardly of the table and in opposed radial alinement with respect to the axis of said crank arm, said block slidably supporting one end portion of said bar, another block pivotally supported upon said crank arm and to which the other end portion of said bar is keyed whereby the fountain pen on said bar may be moved through predetermined paths over the work sheet on said table through the operation of said crank arm and table, manually adjustable means on said first named block for controlling the relative position of the fountain pen point with respect to the work sheet, and means for automatically moving the fountain pen out of engagement with the work sheet during each cycle of revolution of said crank arm.

15. An apparatus of the class described comprising a work sheet supporting table, means for supporting a disk-like sheet upon the upper face of said table, a fountain pen supporting and operating bar arranged centrally and horizontally over the table of the apparatus, a crank arm rotatably supported outwardly of said table, means for actuating said arm and table, a block rotatably supported outwardly of the table and in opposed radial alinement with respect to the axis of said crank arm, said block slidably supporting one end portion of said bar, another block pivotally supported upon said crank arm and to which the other end portion of said bar is keyed whereby the fountain pen on said bar

5 may be moved through predetermined paths
 over the work sheet on said table through the
 operation of said crank arm and table, man-
 ually adjustable means on said first named
 10 block for controlling the relative position of
 the fountain pen point with respect to the
 work sheet, means for automatically moving
 the fountain pen out of engagement with the
 work sheet during each cycle of revolution
 15 of said crank arm, and means for automati-
 cally rotating said fountain pen in said bar
 during each cycle of revolution of the crank
 arm.

15 In testimony that I claim the foregoing as
 my invention I have signed my name this 20th
 day of June, 1930.

JOSEPH WALLACE.

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