

Oct. 29, 1940.

T. MATSON

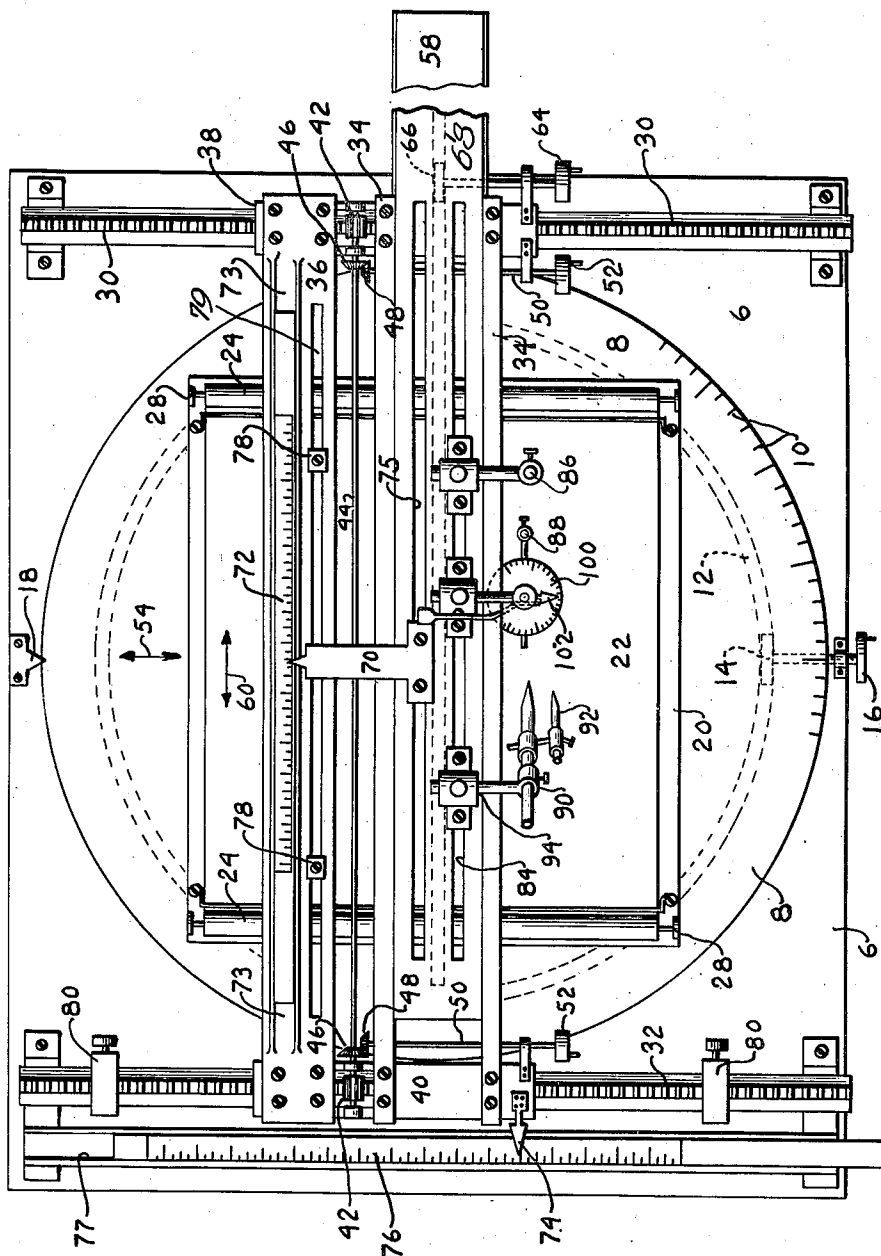
2,219,783

MECHANICAL DRAWING APPARATUS

Filed Jan. 24, 1939

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Fig. 1.



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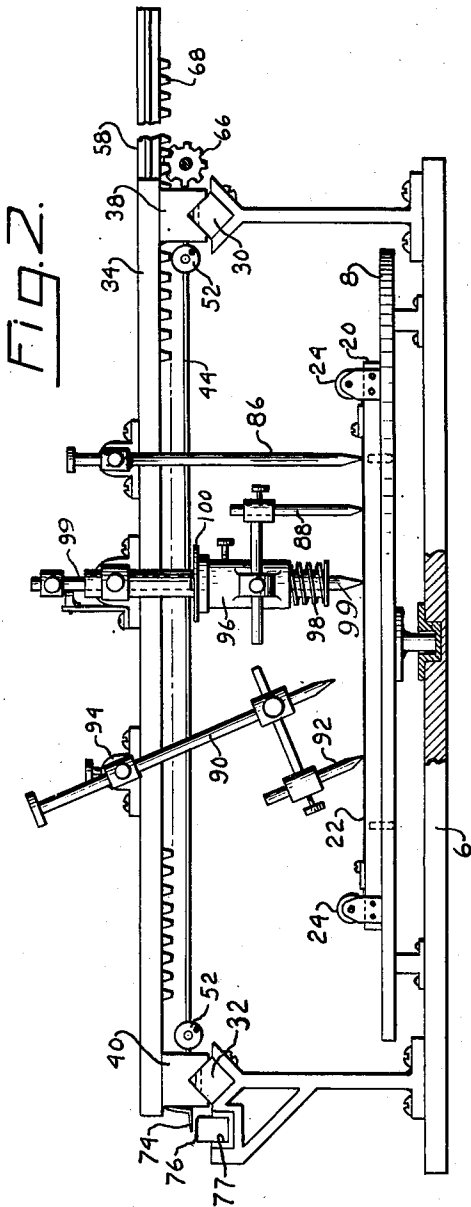


FIG. 4.



FIG. 3.

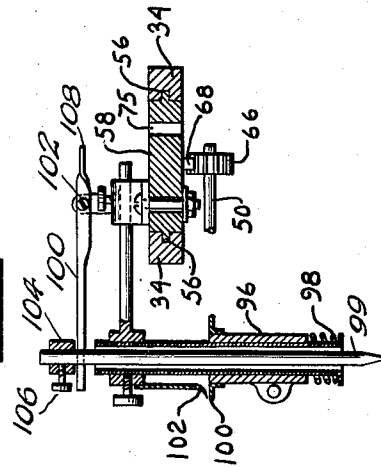
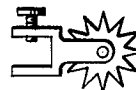


FIG. 5.



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2,219,783

MECHANICAL DRAWING APPARATUS

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Application January 24, 1939, Serial No. 252,521

2 Claims. (Cl. 33—26)

My invention relates to a new and useful mechanical drawing apparatus whereby mechanical drawings, such as architect's plans, shop drawings, and the like may be made, my invention relating more specifically to means for eliminating in some instances, and in some instances greatly minimizing, the necessity of innate ability, manual dexterity, firmness of hand, or accurate measurement.

In making mechanical drawings a certain natural aptitude is necessary together with great care for effecting accurate measurement, as well as for clear delineation whether in pencil or in ink. Furthermore, where a perspective view is being prepared and in which a completely circular object would appear in perspective more or less oval instead of circular, difficult calculation is necessary to develop or generate the oval or parabolic from the circular or vice versa, and it is further necessary in the preparation of different views of the object being illustrated to move the board or to remove the drawing paper from the board in order to shift its position as required, which makes accurate replacement of the paper or the board quite difficult.

My invention further relates to a completely equipped mechanical drawing apparatus whereby all of the foregoing objects are attained mechanically and without the necessity of expert skill, thereby enabling a draftsman to make a drawing of which he would otherwise be incapable, or greatly reducing the time and labor which would be involved even if the draftsman were capable of making the drawing in question.

Other novel features of construction and operation will be more clearly understood from the following specification and the accompanying drawings in which:

Fig. 1 represents a top plan view of a mechanical drawing apparatus embodying my invention.

Fig. 2 represents a view partly in side elevation and partly in section of my mechanical drawing apparatus.

Figs. 3, 4 and 5 represent views partly in section and partly in elevation showing details of various parts of the apparatus.

Referring to the drawings in which like reference characters indicate like parts, and more particularly to Fig. 1, 6 designates a table top, or other suitable support, on which my mechanical drawing apparatus is mounted. 8 designates a rotary board which is preferably circular and which is provided with suitable calibrations 10. The board 8 is provided with an annular rack or ring gear 12 which is adapted to be engaged by the pinion 14 which is actuated by the handle

16 whereby the board 8 may be turned about a vertical axis to bring any part thereof to any desired position with respect to the operator. 18 designates a pointer carried by the support 6 and adapted to coact with the scale or other calibration 10. On the circular board 8 is suitably fixed the drawing board proper 20 and on which a piece of the paper 22, on which the drawing is to be made, is suitably secured. If desired, I may provide means for accommodating and manipulating a roll of paper 24, said means consisting of a feed roll and a take-up roll which can be used interchangeably and which can be actuated in either direction by any suitable means 28. This construction need only be used when the drawing is to be made on a continuous strip, otherwise the individual sheet of paper 22, cut to size, can be secured to the board 20 by a thumb tack or the like. On either side of the support 6 I mount the racks 30 and 32 which movably support an overhanging structure comprising the elongated members 34 and 36 which are suitably secured to the brackets 38 and 40. Suitably secured to the brackets 38 and 40 are the pinions 42 which are mounted on the shaft 44 which also carries the bevelled gears 46. The bevelled gears 46 are adapted to be engaged by the bevelled gears 48 which are on the shaft 50 provided with the cranks 52 so that, when the cranks 52 are turned, the elongated members 34 and 36 are moved to and fro in the direction of the arrow 54 with respect to the support 6, the circular board 8, the drawing board proper 20 and the drawing paper 22. The cranks 52 need be used only when nice adjustment is required since the members 34 and 36 can be pushed to and fro in the direction of the arrow 54 by hand if desired. Within the elongated member 34 is dove-tailed or mortised as at 56, the movable, elongated member 58, which carries the drawing instruments hereinafter referred to. In order to move the elongated member 58 to and fro in the direction of the arrow 60, I provide the crank 64 which turns the pinion 66 which in turn engages a rack 68 on the underside of the elongated member 58, it being understood that the elongated member 58 can also be moved manually to and fro in the direction of the arrow 60, the crank 64 being used only when exact adjustment is necessary. Carried by the movable member 58 is a pointer 70 which is adapted to coact with the scale 72 when the elongated member 58 is moved in the direction of the arrow 60. The scale 72 is movable in the slot 73 in the member 36. Similarly, the bracket 40 is provided with a pointer 74 which coacts with the scale 76, which 55

is movable in the slot 77. In the member 36 is provided a slot 79 in which are movable the stops 78 for limiting the movement of the pointer 70 in either direction as desired. In order to limit the movement of the entire assembly in the direction of the arrow 54 the stops 80 are used. Similarly, the pointer 70, as will be seen from Fig. 1, is adjustable in a slot 75 in the elongated member 58, and in the slot 84 are adjustably mounted any desired drawing instruments such as a pencil or tracing point 86, the adjustable compass element 88 which may carry a pencil, ink pen, tracer, or the like, and the obliquely mounted instrument 90 which can be a pencil, an ink pen, a tracer, or the like, or to which can be adjustably attached the auxiliary instrument 92 to form a compass for drawing the various developments of a circle depending on the inclination of the instrument 90. It will be noted that the instrument 90 is adjustable as to its angular disposition at 94 and it follows that the more oblique or angular the instrument 90 is with respect to the perpendicular, the more parabolic or hyperparabolic will the line traced by the instrument 92 be. The compass element 88 is adjustably secured to the stationary sleeve 96 through which extends the instrument 99 which is normally urged downwardly to the spring 98. Associated with the element 96 is a circular scale 100 and the pointer 102, by means of which circular segments of a given number of degrees can be measured off.

The operation is as follows:

With the drawing paper 22, as a separate piece or as part of a roll, secured to the board 20, the desired instruments are mounted in the slot 84 and the scale 72 and pointer 70 are both adjusted in position according to what is to be drawn. If a circle is to be drawn, the pointer 88 is adjusted as to radius with respect to the stationary leg 96 and is then rotated about the leg 96. If a straight line is to be drawn through the circle or tangent to the circle, the instrument 86 is properly adjusted and the members 34 and 36 are moved back and forth in the direction of the arrow 54 or the member 58 is moved back or forth in the direction of the screw 60. If an oval or other curve is to be drawn, the inclined instrument 90 is adjusted to the desired degree and the compass element 92 is turned thereabout. Where several straight lines are to be drawn of the same length in either direction, the stops 78 or 80 or both can be adjusted as desired and then the elements 34, 36 or 58 are moved back and forth in the direction of the arrows 54 or 60. Also, once a given part of a drawing has been made, and if it is desired to reproduce that part on a different section of the same piece of drawing paper, it is merely necessary to adjust the stops 78 and 80 and then reciprocate the desired instrument accordingly. Thus, if a window, for instance, has been drawn at the left hand bottom corner of the drawing paper 22, and two or three similar windows are to be drawn next to the first window, it is merely necessary to adjust the stops 78 to the length of the top and bottom sills of the window and then to move the element 58 and the pencil or other instrument 86 horizontally, and to make the vertical sills or jams of the window it will be merely necessary to move the element 58 in the direction of the arrow 60, and, in order to draw the vertical sills

or walls of the window, it is merely necessary to adjust the stops 80 and move the members 34 and 36 in the direction of the arrow 54. The measurements for the top and bottom horizontal sills will be taken on the scale 72 and the measurement for the vertical walls on the scale 76. While I have set forth only a few examples, it will be seen that by the circular, oblique, as well as the rectilinear movements which are possible, and by virtue of the adjustments and stops cooperating with the various scales including the scale 102, any desired drawing can be prepared and I personally have prepared architectural plans and mechanical drawings by means of my instrument, whereas, without its aid, I am entirely unable to make any kind of drawing.

Inasmuch as normally the point 99 is in contact with the drawing paper 22, and since it is sometimes necessary to take it out of contact with the paper 22, I have provided a lifting mechanism in the nature of an arm 100 which is held in position by a spring-pressed screw 102 so as to retain any position it is moved into, the end of the arm 100 engaging the bushing 104 which is secured to the instrument 99 by the set screw 106. When it is desired to elevate the point 99 from contact with the paper, the thumb piece 108 is depressed and vice versa.

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

1. A mechanical drawing apparatus comprising a stationary support, a rotary platform mounted on said support, a drawing board carried by said platform, a pair of parallel racks on the opposite sides of said support, a carriage overhanging said board transversely of said racks, pinions carried by the opposite ends of said carriage engaging said racks for moving said carriage to and fro over said board in one direction, a clamp slidable in said carriage and adapted to carry a drawing instrument, means for limiting the movement of said clamp on said carriage, a scale also slidable in said carriage, said clamp and said scale being movable jointly and independently in a direction laterally of the direction of the movement of said carriage, a second scale carried by and slidable longitudinally of one of said racks, and means for limiting the movement of said carriage on said racks.

2. A mechanical drawing apparatus comprising a stationary support, a rotary platform mounted on said support, a drawing board carried by said platform, a drawing paper feed roll on one side of said board, a take-up roll on the other side of said board, a pair of parallel racks on the opposite sides of said support, a carriage overhanging said board transversely of said racks, pinions carried by the opposite ends of said carriage and engaging said racks for moving said carriage to and fro over said board in one direction, a clamp slidable in said carriage and adapted to carry a drawing instrument, means for limiting the movement of said clamp on said carriage, a scale also slidable in said carriage, said clamp and said scale being movable jointly and independently in a direction laterally of the direction of the movement of said carriage, a second scale carried by and slidable longitudinally of one of said racks, and means for limiting the movement of said carriage on said racks.

TAYLOR MATSON.