March 1, 1966 R. F. VOGEL 3,237,309

EPICYCLIC COMPASS

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FIG. 1.

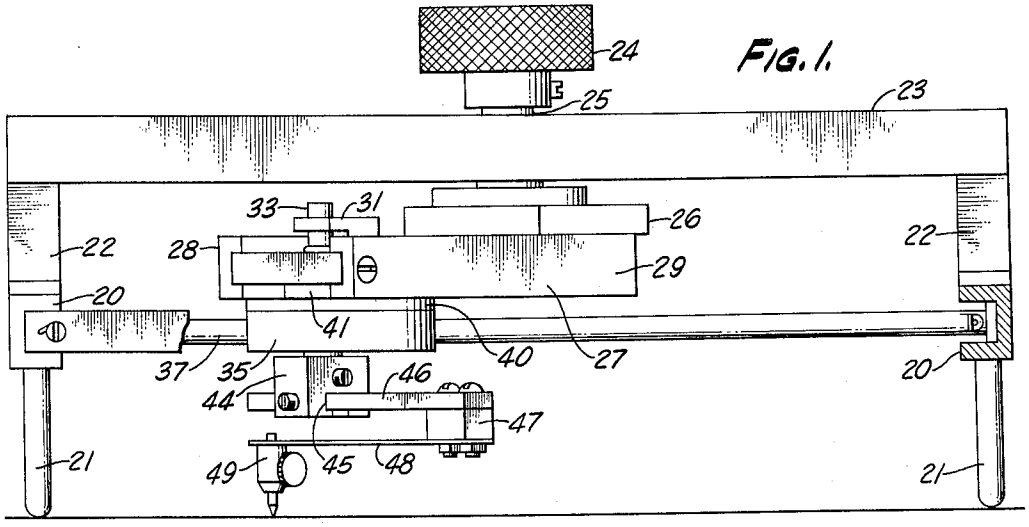
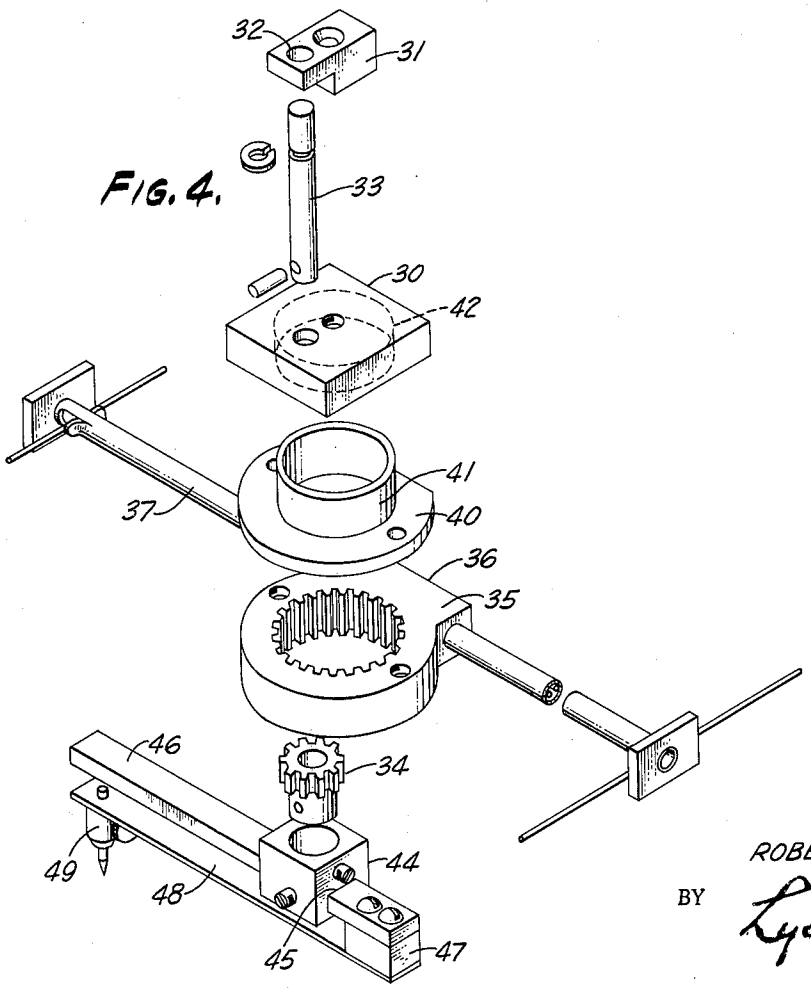


FIG. 4.



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FIG. 2.

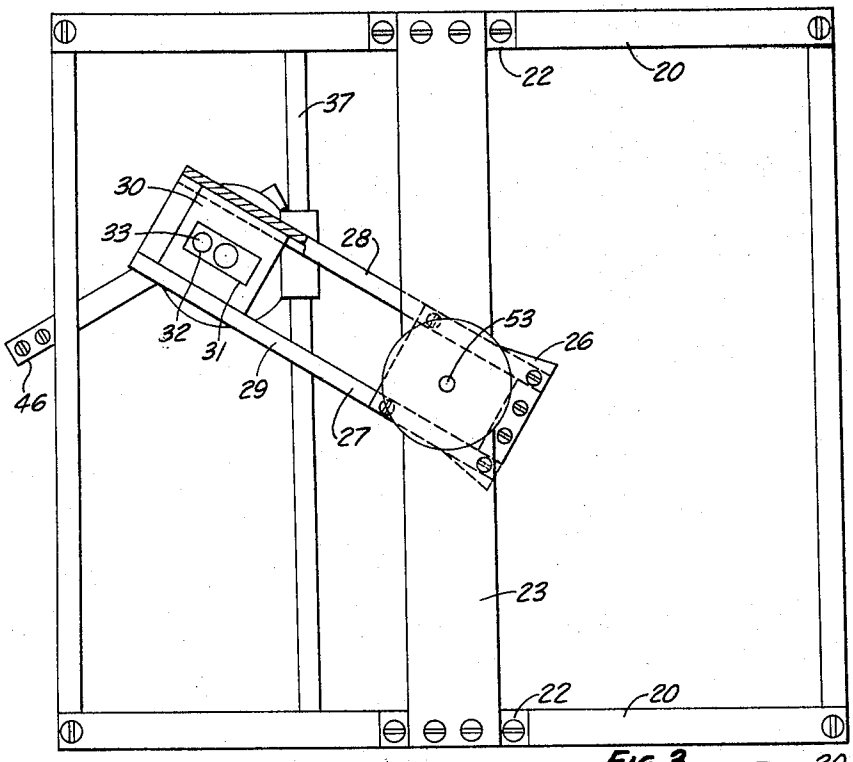


FIG. 6.

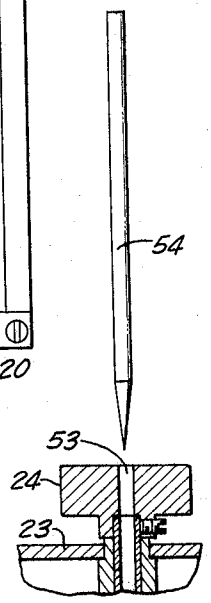


FIG. 3

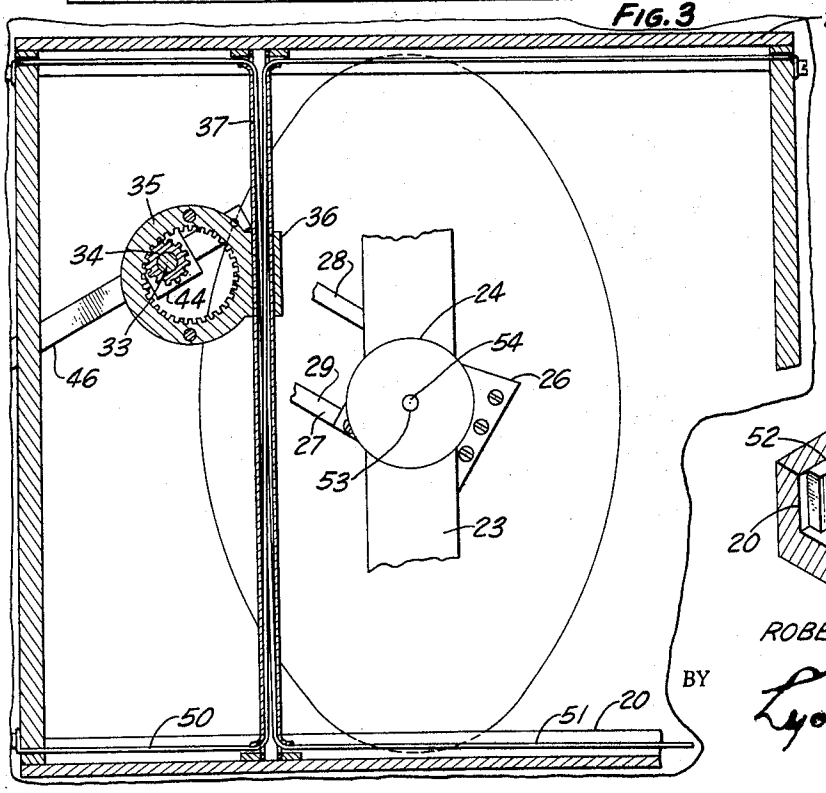
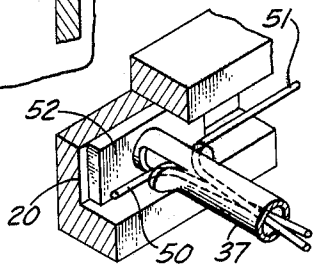


FIG. 5.



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EPICYCLIC COMPASS

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9 Claims. (Cl. 33—30)

This invention relates to an epicyclic compass or to instruments for drawing or scribing ellipses on any desired surface.

Although primarily intended as a drafting instrument it has a potential in other industries requiring accuracy in scribing eccentrics, ovals or ellipses of a predetermined size, shape or dimension. It is a feature of this invention that the device will draw or scribe a completely and mathematically precise ellipse on one complete rotation of the arm varying in scope from a straight line to all degrees of ellipses up to and including a true circle. It will also create ellipses of minute dimensions slightly larger than a dot up to ellipses utilizing the maximum physical limitations of the size of the machine.

It is a further feature of this invention that two rotatable members are connected together, one for rotation in a counterclockwise direction and the other for rotation in a clockwise direction to obtain the ellipse.

It is a further feature of this invention that each of the axes of the ellipse is separately adjustable.

A further feature of the invention resides in the simplicity of manufacture and the ease with which adjustment and alignment of the device are accomplished. These factors make it possible for this device to be manufactured economically on a large scale, thereby enabling wide distribution and usage by many craftsmen and students unable to afford more complex equipment without sacrificing any of the performance, capability or accuracy of the more costly devices.

These and other objects, features and advantages will be apparent from the annexed specification in which:

FIGURE 1 is an end view of the device embodying the present invention;

FIGURE 2 is a top plan view thereof;

FIGURE 3 is a top plan view with parts removed for clarity of illustration;

FIGURE 4 is an exploded perspective elevation through a portion of the parts;

FIGURE 5 is a perspective elevation of a fragment of the transverse tube and side rail; and

FIGURE 6 is a detail showing the centering pin and the top of the knob.

Referring now more particularly to the drawings, and particularly to FIGURE 1, the device includes a square frame made up of side angle members 20 and end cross pieces (not shown) supported by four legs 21. Posts 22 support an upper cross piece 23 in the form of a downwardly open channel. A rod 25 is journalled in the cross piece 23 and carries a knob 24 at its upper end. At its lower end the rod 25 is attached to a member 26. The member 26 in turn supports a framework 27, the side members of which are open channels 28 and 29 open inwardly. Mounted to slide in the channels 28 and 29 is an epicyclic gear member shown best in the exploded view. The sliding member is the block 30 and it carries a bearing block 31 having a bearing 32 for the upper end of the shaft 33. The lower end of the shaft 33 carries the planetary gear 34. Intermediate members are shown in the exploded view, but these are unnecessary. An internal gear or epicyclic gear 35 has mounted thereto a block 36 carrying a hollow rod 37 slidably mounted therein. Epicyclic gear 35 is affixed to plate 40 which has a boss 41 mounted in a recess 42 in block 30. A block 44 has a channel 45 in which is adjustably mounted

a blade 46 carrying a block 47 which in turn carries a leafspring 48 on which is mounted a stylus 49. The block 44 is affixed to the gear 34. A pair of wires 50 and 51 pass through the tube 37 and through the channels 20 and are adjustably fixed at the ends thereof. The wires 50 and 51 permit the tube 37 to move slidably in the channels 20, but restrain the tube from any turning movement and thus assure that the epicyclic gear 35 will not in any way be turned.

The operation of the devices is as follows: Block 30 is adjusted as desired in channels 28 and 29. This will establish the major axis of the figure to be drawn. Blade 46 is adjusted in block 44 which also adjusts the position of the stylus 49 to establish the minor axis. Knob 24 is then turned. This will cause member 27 to be swung in an arc. Preferably this motion is clockwise. The clockwise motion of the member 27 will cause counterclockwise rotation of gear 34 and thus a counterclcokwise motion is given to the stylus 49. The combination of these two motions causes the stylus to inscribe an ellipse.

The tube 37 moves forwardly and backwardly in the channels 20, but it is restrained from any other movement. As shown in FIGURE 5 the tube 37 has at its ends slide plates or shoes 52 to facilitate movement in channels 20. As shown in FIGURE 6 knob 24 (as well as shaft 25) has a central bore 53 for receiving a pin 54 to index the entire device on the desired center.

While there has been described what is at present considered the preferred embodiment of the present invention, it will be appreciated by those skilled in the art that various changes and modifications can be made therein without departing from the essence of the invention and it is intended to cover herein all such changes and modifications as come within the true spirit and scope of the appended claims.

I claim:

1. A device for forming elliptical figures comprising a frame; a rod pivotally mounted on said frame and carrying a turning knob; a member operatively connected to said rod for rotation in a horizontal plane in one direction; means carried by said member, an epicyclic gear non-rotatively mounted on said means; a planetary gear rotatively carried by said means and meshing with said epicyclic gear; a marking stylus fixedly connected to said planetary gear and means associated with said frame for preventing rotation of said epicyclic gear while permitting said epicyclic gear to be swung in a circle, whereby said planetary gear is revolved in the other direction.

2. A device for forming elliptical figures comprising a frame; a rod pivotally mounted on said frame and carrying a turning knob; a member operatively connected to said rod for rotation in a horizontal plane in one direction; means carried by said member, an epicyclic gear non-rotatively mounted on said means; means for adjusting the position of said epicyclic gear along said member; a planetary gear rotatively carried by said means and meshing with said epicyclic gear; a marking stylus fixedly connected to said planetary gear and means associated with said frame for preventing rotation of said epicyclic gear while permitting said epicyclic gear to be swung in a circle, whereby said planetary gear is revolved in the other direction.

3. A device for forming elliptical figures comprising a frame; a rod pivotally mounted on said frame and carrying a turning knob; a member operatively connected to said rod for rotation in a horizontal plane in one direction; means carried by said member, an epicyclic gear non-rotatively mounted on said means; means for adjusting the position of said epicyclic gear along said member; a planetary gear rotatively carried by said means and meshing with said epicyclic gear; a marking stylus

fixedly connected to said planetary gear; means for adjusting the position of said stylus with respect to said planetary gear; and means associated with said frame for preventing rotation of said epicyclic gear while permitting said spicylic gear to be swung in a circle, whereby said planetary gear is revolved in the other direction.

4. A device as set forth in claim 1 in which said frame includes U-shaped side members open inwardly and said means for preventing rotation includes a block affixed to said epicyclic gear and a hollow tube extending across said frame, said tube being slidably engaged in said block and the ends of said tube being slidable in said U-shaped side members.

5. A device as set forth in claim 2 in which said frame includes U-shaped side members open inwardly and said means for preventing rotation includes a block affixed to said epicyclic gear and a hollow tube extending across said frame, said tube being slidably engaged in said block and the ends of said tube being slidable in said U-shaped side members.

6. A device as set forth in claim 3 in which said frame includes U-shaped side members open inwardly and said means for preventing rotation includes a block affixed to said epicyclic gear and a hollow tube extending across said frame, said tube being slidably engaged in said block and the ends of said tube being slidable in said U-shaped side members.

7. A device as set forth in claim 1 in which said frame includes U-shaped side members open inwardly and said means for preventing rotation includes a block affixed to said epicyclic gear and a hollow tube extending across said

frame, said tube being slidably engaged in said block and the ends of said tube being slidable in said U-shaped side members and a pair of cables passing through said tube and said U-shaped side members and having their ends affixed to said frame adjacent the ends thereof.

8. A device as set forth in claim 2 in which said frame includes U-shaped side members open inwardly and said means for preventing rotation includes a block affixed to said epicyclic gear and a hollow tube extending across said frame, said tube being slidably engaged in said block and the ends of said tube being slidable in said U-shaped side members and a pair of cables passing through said tube and said U-shaped side members and having their ends affixed to said frame adjacent the ends thereof.

9. A device as set forth in claim 3 in which said frame includes U-shaped side members open inwardly and said means for preventing rotation includes a block affixed to said epicyclic gear and a hollow tube extending across said frame, said tube being slidably engaged in said block and the ends of said tube being slidable in said U-shaped side members and a pair of cables passing through said tube and said U-shaped side members and having their ends affixed to said frame adjacent the ends thereof.

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ISAAC LISANN, *Primary Examiner.*