Oct. 26, 1948. K. B. NOBLE 2,452,484

ELLIPSOGRAPH

Filed April 15, 1944

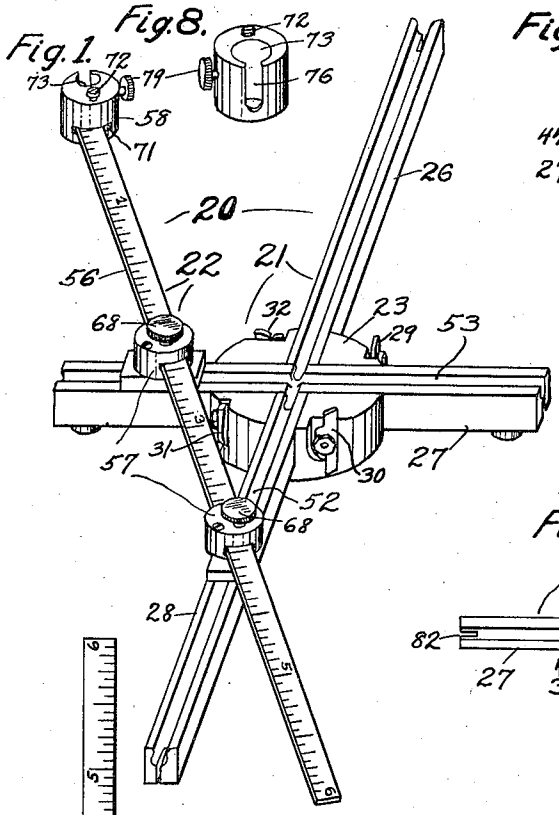


Fig. 1.

Fig. 8.

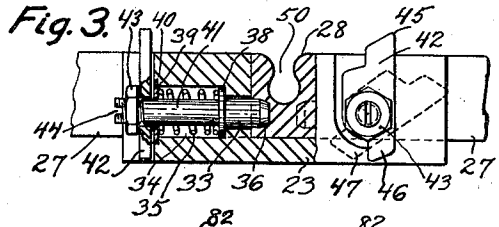


Fig. 3.

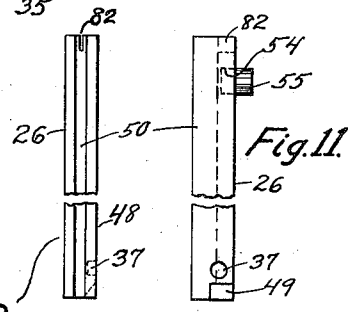


Fig. 11.

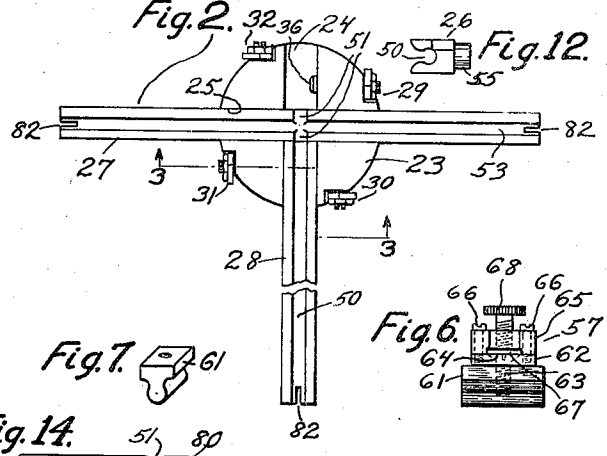


Fig. 2.

Fig. 12.

Fig. 6.

Fig. 7.



Fig. 14.

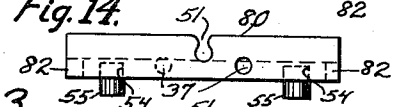


Fig. 13.

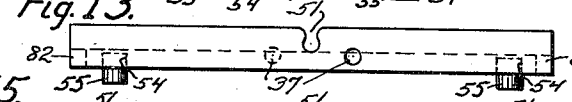


Fig. 15.

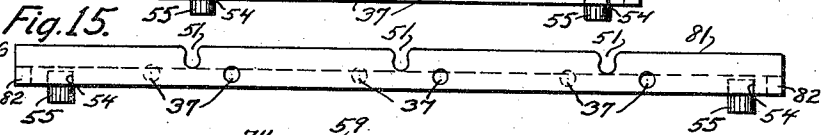


Fig. 9.

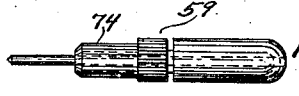


Fig. 10.

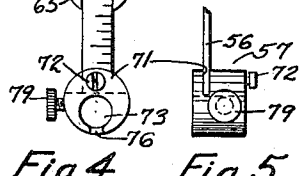


Fig. 4.

Fig. 5.

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ELLIPSOGRAPH

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4 Claims. (Cl. 33—31)

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This invention relates to improvements in ellipsographs.

One object of this invention is to provide an improved ellipsograph of simple construction whereby ellipses can be completely scribed without employing any supplemental device.

Another object of this invention is to provide an improved ellipsograph formed of simple elements readily manufactured to produce an efficient construction at moderate cost.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings forming part of the present disclosure, in which certain ways of carrying out the invention are shown for illustrative purposes:

Fig. 1 is a perspective view of an ellipsograph made in accordance with the present invention;

Fig. 2 is a top plan view of the track-construction portion of the ellipsograph, with one of the track-members shown in detached but adjacent position;

Fig. 3 is a sectional view on an enlarged scale, taken on line 3—3 of Fig. 2;

Fig. 4 is a top plan view of the scriber-bar construction;

Fig. 5 is a side elevation of a fragmental end-portion of Fig. 4;

Fig. 6 is a front elevation of one of the scriber-bar pivot-members;

Fig. 7 is a perspective view of the slide of Fig. 6;

Fig. 8 is a perspective view of the scriber-holder;

Fig. 9 is a front elevation of a pencil-scriber;

Fig. 10 is a side elevation of a pen-scriber;

Fig. 11 is a side elevation of the detached track-member forming the upper part of Fig. 2;

Fig. 12 is an end view of Fig. 11;

Fig. 13 is a front elevation of the horizontal track-member shown in Fig. 2;

Fig. 14 is a view similar to Fig. 13 of a shorter track-member; and

Fig. 15 is a view similar to Fig. 13 of a longer track-member adapted to be removably secured to the center-hub in three different longitudinal positions.

Referring to the drawings, the ellipsograph 20 includes a relatively-fixed track-construction or -means 21 and a relatively-movable scriber-construction or -means 22. The track-construction 21 includes a center-hub 23 having transverse slots 24 and 25 extending entirely thereacross at

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right angles to one another, each of said slots being of rectangular cross-sectional form of the same width and depth and of a size to have a neat sliding-fit with any of the track-members or -bars 26, 27 and 28. Spring-pressed latches or locks 29, 30, 31 and 32 serve to removably secure the track-bars in their proper positions in the slots 24 and 25 of the center-hub 23.

Each of the four latches includes a latch-bolt 33 (Fig. 3) longitudinally slidable in a hole 34 in the center-hub 23 and normally pressed inward by a coil-spring 35 to cause the inner end 36 of the bolt to be engaged in one of the latching-recesses or -sockets 37 of the track-bars, the spring 35 having one of its ends pressing against the flange or washer 38 on the bolt, and having its other end pressing against the washer 39, which is fixedly secured in an annular shallow recess 40 in the center-hub 23. The shank 41 of the latch-bolt 33 extends through a latch-operating member 42 which is freely pivoted thereon, and is held in properly-adjusted position by suitable adjustment of a nut 43 upon the threaded end of the shank 41. A slot 44 in the end of the latch-bolt 33 serves to permit of holding the bolt against rotation by a screw driver while the nut 43 is being forcibly screwed onto its desired adjusted position.

The latch-bolt 33 can be operated to release its engagement with any of the track-members by engaging the upper end-portion 45 of the latch-operating member 42 (Fig. 3) with a finger or fingernail and pressing it to swing it downward toward the broken-line position shown in Fig. 3, to cause the lower end-portion 46 of the operating-member 42 to ride along the cylindrical surface 47 of the center-hub 23, to thus produce a camming action to force the latch-bolt 33 to move longitudinally of itself outward against the action of the spring 35 until the inner end 36 of the latch-bolt 33 is drawn back at least as far as the side-face 48 of the track-bar in which the latching-recess 37 is formed, whereupon the track-bar can be withdrawn from its location in the slot 24 or slot 25 in which it may be located in the center-hub 23. The combined action of the spring 35 and the cam-surface 47 restores the parts 42 and 33 to the original locking position.

To replace a track-bar in its position in a slot in the center-hub 23, as for example in the case of the track-bar 26 shown in Fig. 2, it can be moved longitudinally from its position shown in Fig. 2 into the slot 24 until the cam-face 49 of the track-bar engages the end 36 of the latch-

bolt 33 of the latch 29, to thus force the end 36 backward as far as the face 48 of the track-bar 26, thus permitting the track-bar 26 to be pushed longitudinally inward to its proper position, whereupon the bolt-end 36 is snapped automatically into the recess 37 by the spring 35. Of course, the track-bar 26 can be inserted in its latched or locked position by movement in any direction as, for example, by moving it transversely of the slot 24, but in this case it is necessary to operate the latch-operating member 42 by pressing it with a finger, as previously described, in order to retract the latch-bolt 33.

The track-bar 27 (Figs. 2 and 13) has latching-recesses 37 in its opposite sides to be engaged by the latches 30 and 32 when the track-bar 27 is moved into the slot 25 of the center-hub 23 while the latch-operating members 42 are held in unlatching position, after which they are moved to latching position to permit the latch-bolt ends 36 to engage in the latching-recesses 37, as previously described with regard to track-bar 26. The track-bar 28 is identical with track-bar 26 and, therefore, is removable and replaceable in its latched position in the center-hub in the same manner as previously described concerning the track-bar 26.

It will be noted that the track-bar 27 extends horizontally clear across the center-hub 23, whereas the two track-bars 26 and 28 when in their assembled position, as in Fig. 1, will abut against the opposite side-faces of the track-bar 27.

Each of the track-bars 26 and 28 is provided with a track-way portion 50 which, together with the track-way slots 51 formed in the track-bar 27, together constitute one track-way 52 of the ellipsograph. Another track-way 53 in the track-bar 27 forms the other track-way extending at right angles to the first track-way 52. Each track-bar 26 and 28 has a recess 54 in which is secured a foot- or support-member 55 which may, for example, be of soft rubber or may be a needle-point member. And the track-member 27 has two of these feet 55 (Fig. 13) adjacent its opposite ends. The feet 55 are of a length to support the track-construction portion 21 of the ellipsograph upon four feet 55, with the bottom-surface of the center-hub 23 preferably spaced up somewhat from the surface on which the ellipse is to be scribed.

The scriber-construction portion 22 includes a scriber-bar 56, two pivot-slides 57, and a scriber-holder 58 in which is mounted any suitable scriber or scribing-member such, for example, as the pencil-scriber 59 shown in Fig. 9 or the pen-scriber 60 shown in Fig. 10.

Each pivot-slide 57 includes a slide-bar or slide 61 shaped to have a neat sliding-fit in the various trackways. A pivot-disk 62 is connected to the slide-bar 61 by means of a screw 63 threaded into the slide and having its countersunk head 64 serving to pivot the disk 62 relatively to the slide-bar 61. A cap-disk 65 is secured to the disk 62 by the screws 66. A recess 67, which extends entirely across the lower face of the cap-disk 65, in conjunction with the upper face of the disk 62 constitutes a channel or passage through which the scriber-bar 56 is slidable for adjustment, it being secured in any desired position of adjustment by means of the screw 68 mounted in the disk 65 by screwing it downward to clamp the scriber-bar 56 in its desired position of adjustment. A recess or cut-away-portion 69 (Fig. 4) in the cap-disk 65 permits of visual observation of the graduations of the scale on the upper face of the scriber-bar 56, the rear face 70 of the slot 69 intersecting the pivot-center of the scriber-bar 56 and the disks 65 and 62, thus serving as the points of observation in determining the distance between the pivots of the two pivot-slides 57. The scriber-holder or -head 58 has a cross-slot 71 in which one end of the scriber-bar 56 is clamped in position by means of a screw 72. The scriber-holder 58 has a cylindrical hole 73 which extends vertically downward, and in which the cylindrical surface 74 of the pencil-scriber 59, and the cylindrical surface 75 of the pen-scriber 60 have a neat sliding-fit. When the pen-scriber 60 is to be used, the slot 76 provides a clearance-way to accommodate the shank 77 of the adjusting-screw 78. If desired, the scriber-member used may float by sliding up and down in the cylindrical hole 73, or it may be firmly secured in a given position therein by means of a clamping-screw 79.

With the distance relations between the center of the hole 73 of the scriber-holder and the pivot-center of each of the pivot-slides 57 suitable to scribe a given ellipse, in accordance with well-known principles, the clamping-screws 68 are clamped down to hold the pivot-slides 57 in the desired selected positional relations with regard to the scriber-bar 56. Assuming the size of the ellipse to be drawn to be large enough so that as the scriber, such, for example, as the pencil-scriber 59, can pass beyond the ends of all the track-bars, it is merely necessary to move the scriber-member in a direction transverse of the scriber-bar 56 to scribe an ellipse, the pivot-slide 57 mounted in the trackway 52 moving back and forth along the trackway while the other pivot-slide 57 moves back and forth along the other trackway 53 in a well-known way. If, however, the size of the ellipse to be scribed is such that the track-bars 26 and 28 are too long to permit of the passage of the scriber past these track-bars, then before the scriber reaches a position near the bar 26, the latch 29 is actuated to release the bar 26, which is thereupon removed and the scriber is continued in its elliptical path until it passes beyond the place which had been occupied by the bar 26, whereupon the latter is replaced in its original position in the center-hub 23 in a manner previously described, and the scriber is continued in its elliptical rotation past the right end of the track-bar 27, whereupon the track-bar 28 is removed from its position in the center-hub 23 in the same fashion as previously described concerning the track-bar 26, until the scriber has been caused to travel past the position previously occupied by the track-bar 28, whereupon the latter is replaced in its position shown in Fig. 1 and the scriber is continued in its rotation until it completes the ellipse at the position from which it originally started.

If it happens that the track-bar 27 is too long to permit of the scribing of a given desired ellipse, then a shorter track-bar, such as the track-bar 80 of Fig. 14 is substituted in place of the track-bar 27. The track-bar 81 of Fig. 15 could be employed in place of either of the track-bars 27 or 80 of Figs. 13 and 14. If track-bar 81 of Fig. 15 were in position in the center-hub 23 in place of the track-bar 27, and it were desired to draw an ellipse smaller than could be drawn with the track-bar 27 in place, for example, then it would not be necessary to remove the track-bar 81 to

substitute the track-bar **80** of Fig. 14 in place thereof, but it would only be necessary to unlatch the two latches **30** and **32** and shift the track-bar **81** longitudinally of itself to bring the locking-holes **37** adjacent one of its ends in position to be latched or locked by the latches **30** and **32**, in which position the scriber could be moved past that end of the track-bar **81**. When the scriber-member had been swung around to near the other end of the track-bar **81**, then the track-bar **81** could again be unlatched and slid back longitudinally of itself in the opposite direction to bring the holes **37** adjacent such other end of the bar in latching position with the latches **30** and **32**, whereupon the scriber could be passed beyond this end of the bar **81** to make the ellipse in the manner more fully previously described.

In making ellipses with any of the constructions previously described, it will be noted that the outside-ends of all track-bars are provided with slots **82** which extend downwardly through the outer end-portion of each outer end of each track-member, to provide means by which the eye may readily align the track-ways with the pair of cross-lines customarily drawn by draftsmen, which lines pass through the center of the ellipse that is to be drawn.

The cross-sectional contour of the track-way is free of sharp edges and with the distance between the outer edges of the track-way, smaller than the maximum distance across the inner portion of the track-way, thus providing a smooth track-way slot which will hold the slides **61** from rising up out of the slots and also, due to the absence of sharp edges, avoiding any binding action, thus bringing about very smooth action in the scribing of the ellipse with consequent perfection and speed of drawing of the latter. The track-bars are preferably made by extruding or drawing them to finished cross-sectional shape and size, thus making the shape and size of the trackway absolutely uniform. They can be satisfactorily extruded or drawn from brass, for example.

While the particular scribing means illustrated and described heretofore consists of means for drawing ellipses by pencil or ink, it will be appreciated that any suitable scribing-means may be employed with this device, such as gasket cutters, glass cutters, or other instruments, to mark or cut shapes in the form of an ellipse.

One can readily acquire sufficient skill in the removal and replacement of the track-bars **26** and **28** so that an ellipse can be scribed quickly in a continuous motion and in one uninterrupted line to completion.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. An ellipsograph including: a center hub; track-members forming track-means which is provided with two trackways extending transversely of one another; at least one of said track-members being removably securable to said center hub by means of a latch which is spring-pressed to latched position and which is provided with an operating-member extending upwardly above the top of the ellipsograph adjacent said operating member; and scribing means including slides slidable in said trackways for scribing an ellipse.

2. An ellipsograph including: a center hub; track-members forming track-means which is provided with two trackways extending transversely of one another; at least one of said track-members being removably securable to said center hub by a latch having an operating member extending upwardly above the top of the ellipsograph adjacent said operating-member; and scribing means including slides slidable in said trackways for scribing an ellipse.

3. An ellipsograph including: a center hub; track-members forming track-means which is provided with two trackways extending transversely of one another; at least one of said track-members being removably securable to said center hub by means of a latch which is spring-pressed to latched position; said removable track-member having a cam-face adjacent one end for forcing the latch back against the action of the spring; and scribing means including slides slidable in said trackways for scribing an ellipse.

4. An ellipsograph including: a center-hub; a first track-member provided with a first trackway and with a plurality of spaced-apart trackway slots extending transversely of said first trackway and being removably securable to said center-hub in different longitudinal positions; second and third track-members removably securable to said center-hub at opposite sides of said first track-member and providing a second trackway extending transversely of said first trackway; one of said trackway-slots being in alignment with said second trackway, in each of the said different longitudinal positions of said track members forming track-means which is first track-member; and scribing means including slides slidable in said trackways for scribing an ellipse.

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