J. D. KEPPY.

INSTRUMENT FOR DRAFTING CONIC SECTIONS.

APPLICATION FILED JUNE 10, 1914.

1,139,298. Patented May 11, 1915.

Fig. 1

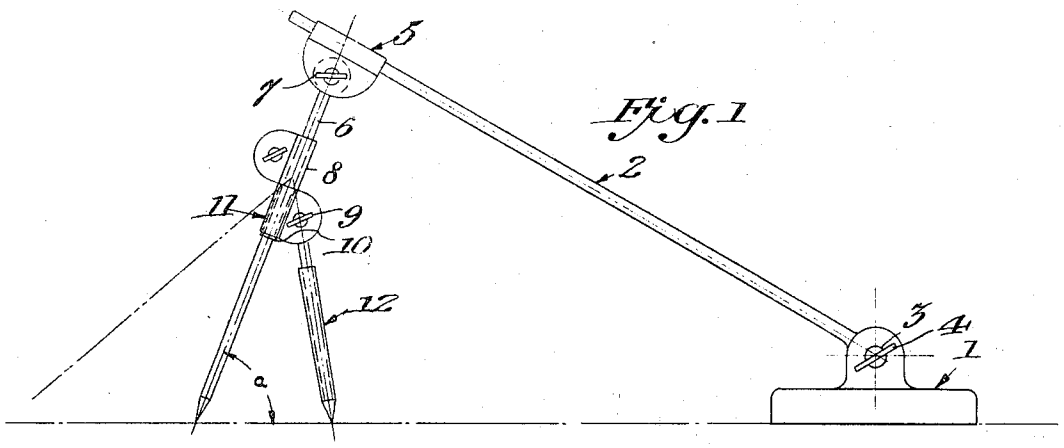


Fig. 2

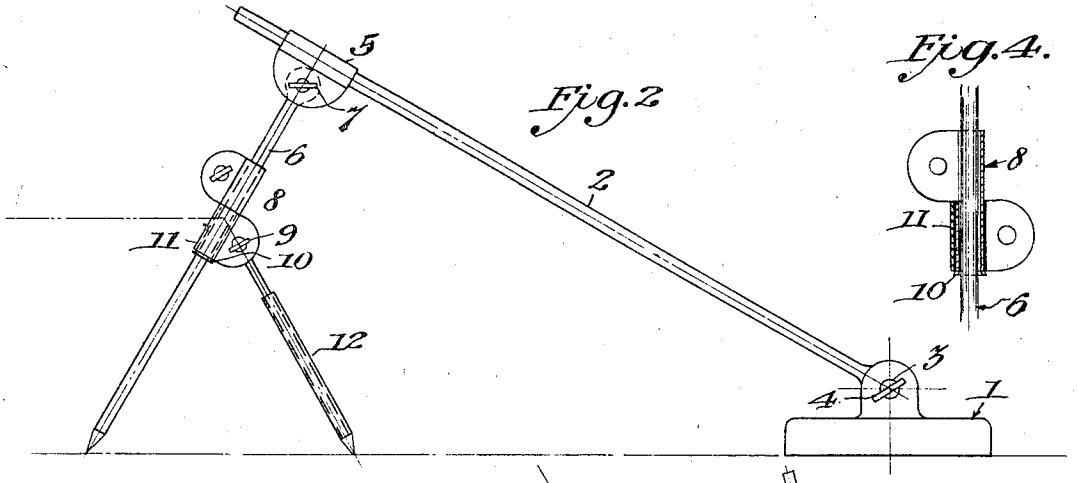


Fig. 4.

Fig. 3.

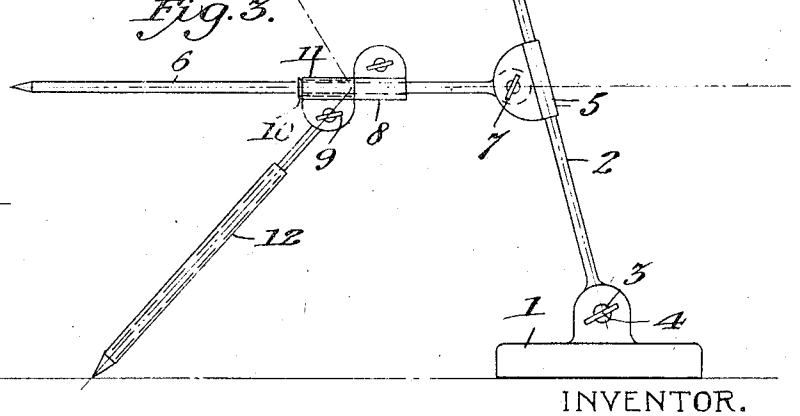
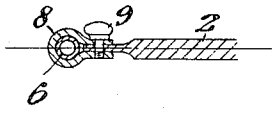


Fig. 5.



WITNESSES.

N. R. Tyndall.

E. P. Hall.

INVENTOR.

J. D. Keppy.

BY J. Edward Maybee.

ATTY.

UNITED STATES PATENT OFFICE.

JOHN D. KEPPY, OF TORONTO, ONTARIO, CANADA.

INSTRUMENT FOR DRAFTING CONIC SECTIONS.

1,139,298. Specification of Letters Patent. **Patented May 11, 1915.**

Application filed June 10, 1914. Serial No. 844,220.

To all whom it may concern:

Be it known that I, JOHN D. KEPPY, of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Instruments for Drafting Conic Sections, of which the following is a specification.

My object is to devise an instrument whereby conic sections such as the ellipse, parabola and hyperbola may be readily drawn of any desired dimensions, and whereby the nature of the conic sections may be graphically demonstrated. I attain my object by providing means whereby a leg corresponding to the axis of a cone may be supported at any desired angle to the surface on which the curve is to be drawn. A telescopic scribing arm is provided which may be clamped at any desired angle to the axis of a sleeve journaled on a slide adjustable lengthwise of the aforesaid leg. Thus the scribing arm, when the apparatus is in use drawing a given curve, rotates with its axis always intersecting the axis of the leg at the same point and also extends or contracts as it rotates to maintain its point in contact with the paper to trace out the desired curve.

The apparatus is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of my instrument set to draw an ellipse. Fig. 2 is a similar view showing it set to draw a parabola. Fig. 3 is a similar view showing it set to draw a hyperbola. Fig. 4 is a sectional detail showing the method of varying the telescopic scribing arm on the leg representing the axis of the cone. Fig. 5 is a cross section of one of the clamps.

In the drawings like numerals and letters of reference indicate corresponding parts in the different figures.

1 is a weighted base adapted to rest on the surface on which the curve is to be drawn or an extension thereof. On this base the arm 2 is pivoted to swing in a vertical plane, the pivot 3 being of an ordinary clamping type, being provided with the wing nut 4 by means of which it may be tightened up.

5 is a slide movable freely longitudinally of the arm 2. On this slide is pivoted the leg 6, which leg will thus swing in the same plane as the arm 2. The pivot of the leg 6 is of the same type as that of the arm 2 and is provided with the thumb nut 7, by means of which the leg may be clamped at any desired angle to the arm 2, and the slide clamped in any desired position longitudinally of the arm 2.

The leg 6 is provided with a slide 8 which may be clamped in any desired position thereto by means of the bolt and wing nut 9, The lower end of this slide has the flange 10 formed thereon, and journaled on the slide above the flange is the sleeve 11, the construction being such that the sleeve may turn freely on the slide, but cannot move endwise thereof.

The upper end of the telescopic scribing arm 12 is pivoted on the sleeve 11 in the same manner that the arm 2 is pivoted to the base 1, a wing nut being provided by means of which the scribing arm may be clamped at any desired angle to the sleeve. It is essential, of course, that the scribing arm swing in a plane intersecting the axis of the leg 6.

In describing an ellipse, the leg 6 and scribing arm 12 are set so that the angle subtended by the dotted arc *a* in Fig. 1 is greater than the angle between the scribing arm and the leg, (see Fig. 1.) If the relation between the angle subtended by the arc *a* and the angle between the leg 6 and the scribing arm 12 be such that the scribing arm will just rise to the horizontal at its extreme upward swing, a parabola will be described, (see Fig. 2.) If the leg 6 is supported in a horizontal position, the scribing arm will describe a hyperbola, (see Fig. 3).

The instrument is readily set to draw curves of different dimensions by varying the angle of the leg 6 to the surface on which the curve is to be drawn by adjusting the leg 6 to and from said surface if it be parallel thereto by the adjustment of the slide 8 on the leg and by varying the angle between the scribing arm and the leg according to rules and tables which may be drawn up for the draftsman's guidance.

What I claim as my invention is:—

1. A curve drafting instrument comprising a leg; means for supporting the leg at any desired angle in a plane at right angles to the surface on which the curve is to be drawn comprising a base, an arm pivoted on the base to swing in a vertical plane, means for clamping said arm to the base, a slide movable on the arm, and means for clamping the leg to the slide and the slide to the arm, the aforesaid leg being pivoted on the

slide; a telescopic scribing arm; and means for journaling the scribing arm on said leg so that during the tracing of a given curve the axis of the scribing arm intersects the axis of the leg at the same point.

2. A curve drafting instrument comprising a leg; means for supporting the leg at any desired angle in a plane at right angles to the surface on which the curve is to be drawn; a telescopic scribing arm; a bearing for journaling the scribing arm on said leg so that during the tracing of a given curve the axis of the scribing arm intersects the axis of the leg at the same point; and means for holding the bearing at any desired position longitudinally of the leg.

3. A curve drafting instrument comprising a leg; means for supporting the leg at any desired angle in a plane at right angles to the surface on which the curve is to be drawn; a telescopic scribing arm; a bearing for journaling the scribing arm on said leg so that during the tracing of a given curve the axis of the scribing arm intersects the axis of the leg at the same point; means for holding the bearing at any desired position longitudinally of the leg; and means for holding the scribing arm at any desired angle relative to the axis of said leg.

4. A curve drafting instrument comprising a leg; means for supporting the leg parallel to a given plane surface; a telescopic scribing arm; and means for journaling the scribing arm on said leg so that during the tracing of a given curve the axis of the scribing arm intersects the axis of the leg at the same point.

5. A curve drafting instrument comprising a leg; means for supporting the leg parallel to a given plane surface; means for varying the distance of the leg from said surface; a telescopic scribing arm; and means for journaling the scribing arm on said leg so that during the tracing of a given curve the axis of the scribing arm intersects the axis of the leg at the same point.

Signed at Toronto, Ontario, Canada, this 7th day of May 1914, in the presence of the two undersigned witnesses.

JOHN D. KEPPY.

Witnesses:
J. EDW. MAYBEE,
E. P. HALL.