July 28, 1953 J. C. COATS 2,646,623

ELLIPSOGRAPH

Filed May 1, 1951 3 Sheets-Sheet 1

Fig 1

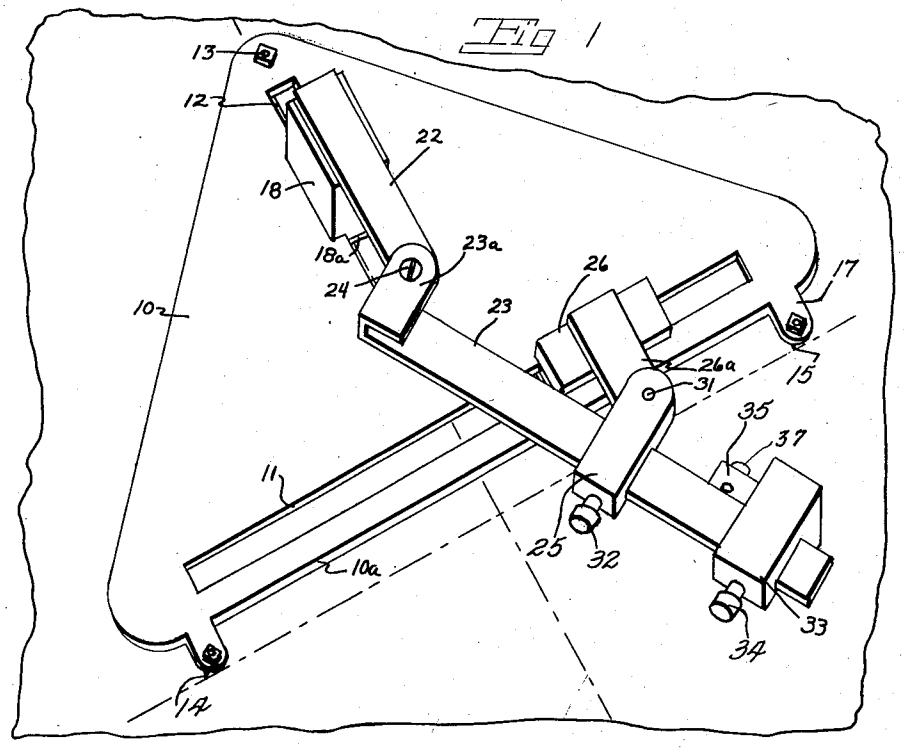
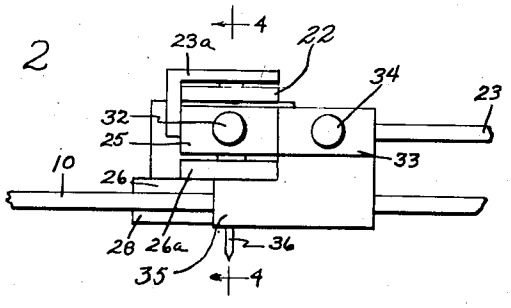


Fig 2



INVENTOR.
Jesse C. Coats
BY Greek Wells
Atty.

July 28, 1953 J. C. COATS 2,646,623

ELLIPSOGRAPH

Filed May 1, 1951 3 Sheets-Sheet 2

Fig 3

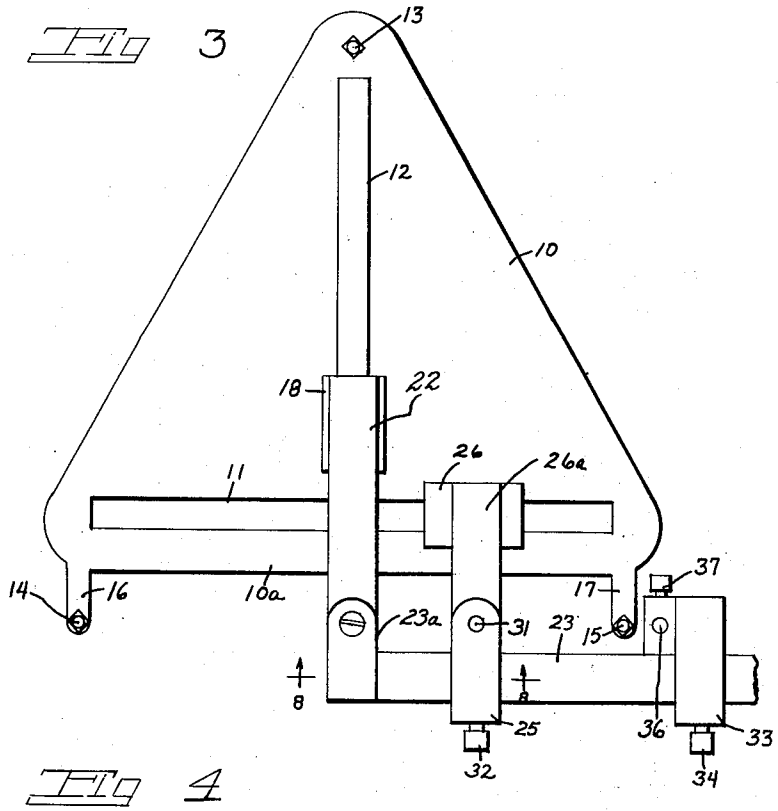
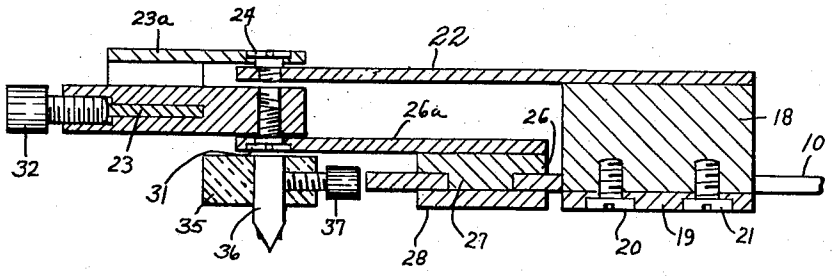


Fig 4



INVENTOR.
Jesse C. Coats
BY Greek Wells
Atty.

July 28, 1953 J. C. COATS 2,646,623

ELLIPSOGRAPH

Filed May 1, 1951 3 Sheets-Sheet 3

Fig. 5

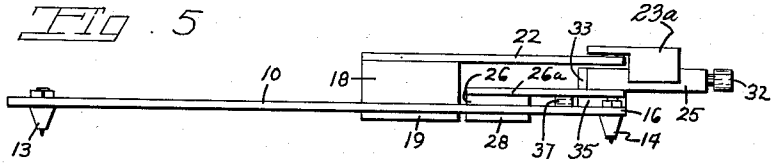


Fig. 6

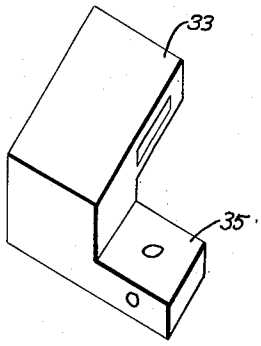


Fig. 7

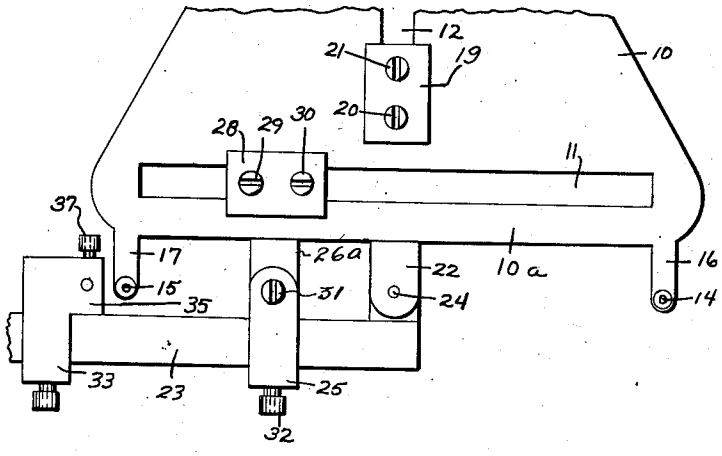
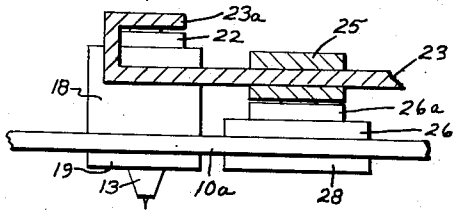


Fig. 8



INVENTOR.
Jesse C. Coats
BY Greek Wells
Atty.

Patented July 28, 1953

2,646,623

UNITED STATES PATENT OFFICE

2,646,623

ELLIPSOGRAPH

Jesse C. Coats, Pocatello, Idaho

Application May 1, 1951, Serial No. 223,918

2 Claims. (Cl. 33—31)

1

My invention relates to improvements in an ellipsograph.

It is the principal purpose of the present invention to provide an ellipsograph in which the moving parts of the device are all carried on a triangular plate in such a fashion that it is a simple matter to set the ellipsograph in position with respect to the major and minor axes and thereafter draw the ellipse of the proper size. I am aware that there have been a number of prior devices patented for the purpose of making curved figures such as ellipses. The present device however, is particularly novel in the parts construction whereby an ellipse of an extremely small size can be drawn with an instrument which also will make quite large figures.

My invention is embodied in an ellipsograph which utilizes a triangular base plate with two slots, one extending parallel to the base side of the triangle and the other extending perpendicular to the base side of the triangle. The base plate has two guide point mounting arms offset outwardly from the base edge of the triangle and a third guide point in line with the slot that is perpendicular to the base edge of the triangle. The scribing arm is laterally offset from the line which passes through the pivotal connections to the minor axis guide and the pivotal axis of the scribing arm. This construction leaves the major axis line in plain view and furthermore makes it simple to align the device so that the scribing tool can be set at the center of the ellipse.

The nature and advantages of the invention will appear more fully from the following description and the accompanying drawings. It should be understood however, that the drawings and description are illustrative only and are not intended to limit the invention except insofar as it is limited by the claims.

In the drawings:

Figure 1 is a perspective view showing the ellipsograph as it is positioned on a sheet having the major and minor axes marked thereon;

Figure 2 is an enlarged side view showing the guides and the scribing tool as they appear when brought into position to align the pivotal connections of the scribing arm and the scribing tool vertically with respect to the plane of the sheet;

Figure 3 is a plan view of the ellipsograph showing the scribing arm positioned at the beginning of the drawing operation with the scribing tool on the major axis;

Figure 4 is a sectional view on the line 4—4 of Figure 2;

Figure 5 is a view in side elevation of the ellipsograph looking at Figure 3 from the left side;

Figure 6 is a perspective view of the tool holder that mounts the scribing tool;

Figure 7 is a bottom view of the ellipsograph

2

with a portion of the triangular base broken away; and

Figure 8 is an enlarged fragmentary sectional view taken on the line 8—8 of Figure 3.

Referring now in detail to the drawings, my improved ellipsograph comprises a plate 10 of sheet metal or the like. The plate is in the form of an isosceles triangle with one side, marked 10*a*, being the base side of the triangle. A guide way slot 11 extends parallel to the base side of the triangle and a second guide way slot 12 is perpendicular to the base side of the triangle through the apex of the triangle. The center line of the guide way 12 bisects the guide way 11. The plate 10 is supported by three needle point supports 13, 14 and 15. The support 13 is on a line bisecting the triangular plate 10. The supports 14 and 15 are mounted on projecting arms 16 and 17 which project equal distances beyond the base side 10*a* of the triangle. A guide runner 18 in the form of a rectangular block has a reduced portion 18*a* seated in the guide way 12. A plate 19 is secured to the reduced portion 18*a* by screws 20 and 21. The guide runner 18 has a projecting arm 22 parallel to the guide way 12. The arm 22 provides the pivot for a scribing or drawing arm 23. The arm 22 is spaced above the plate 10 for a purpose which will presently appear. A shouldered screw 24 is the pivot member connecting the arms 22 and 23.

It will be noted that the arm 23 has a raised and laterally offset portion 23*a* which receives the pivot pin 24. The raised and offset portion 23*a* cooperates with a minor axis adjustment bar 25 and a runner 26 that is mounted in the guide way 11 to permit the minor axis adjustment bar 25 to be moved into position to align its pivotal connection to the runner 26 with the pivotal connection between the arms 22 and 23.

The runner 26 has a reduced portion 27 in the guide way 11. A plate 28 is secured to the reduced portion 27 by two screws 29 and 30. The runner 26 has a laterally extending arm 26*a* to which the bar 25 is pivoted by a pivot member 31. The bar 25 is slotted so that the arm 23 slides through it. A set screw 32 is utilized to lock the bar 25 at the desired position on the arm 23.

A tool holder 33 is also slotted to receive the arm 23 and is secured thereon by a set screw 34. This tool holder has a downwardly and laterally offset tool mounting portion 35 which has means for securing a scribing tool 36 in position. The scribing tool 36 may be a pencil, pen or other suitable marking device. A set screw 37 secures the scribing tool in place.

The way in which the ellipsograph is used may be briefly described as follows:

After the major axis and minor axis lines of the proposed ellipse are drawn and the lengths

of the axes are marked off on the drawn axis lines, the ellipsograph is placed on the drawing in such a manner as to cause the needle point support **13** to rest on the minor axis line. The set screw **34** on the tool holder **33** is then loosened and the arm **23** is swung to a position parallel to the major axis line. The tool holder **33** is moved along the arm **23** until the scribing tool **36** lies directly over the mark drawn on the major axis line to denote the length of the major axis. The set screw **34** on the tool holder is then tightened to prevent further movement of the tool holder **33** along the drawing arm **23**. The drawing arm is then swung into position parallel to the minor axis line. This position will be indicated when the scribing tool **36** lies directly over the extended minor axis. The set screw **32** on the minor axis adjustment bar **25** is then loosened and the arm **23** is moved endwise until the scribing tool rests directly on the mark drawn on the minor axis line to indicate the length of the minor axis. The set screw **32** on the minor axis adjustment bar **25** is then tightened to prevent any further movement of the arm **23** through the bar **25**.

The adjustments having been made as described above, the arm **23** is again swung to bring the scribing tool **36** directly over the mark on the major axis line that indicates the length of the major axis. The scribing tool **36** is then lowered and the arm **23** is swung through its full travel to draw one half of the ellipse. In order to draw the opposite half of the ellipse, the plate **10** is lifted and turned around so that the needle point support **14** seats in the hole made by the needle point support **15** and the needle point support **15** seats in the hole previously made by the needle point support **14**. The arm **23** is then swung through its complete travel to complete the second half of the ellipse.

This device is particularly advantageous in making small ellipses. The raised and offset portion **23***a* of the scribing arm **23** accommodates the bar **25** so that the pivotal connections between the arms **22** and **23** on the one hand and between the bar **25** and the arm **26***a* on the other hand can be brought completely into alignment if desired. When the pivots are aligned the arm **23** will move the scribing tool in a circle. Also the scribing tool **36** can be brought as close to the center of the ellipse as necessary. As illustrated in Figure 2 and in Figure 4 of the drawings, the tool **36**, the pivot screw **31** and the pivot screw **34** are axially aligned. This is made possible by the construction of the portion **23***a* and the offset part **35** of the tool holder. The bar **25** and the arm **26***a* are of such length that their pivotal connection lies in a plane vertical to the plate **10** through the pivot screw **24** and the scribing tool **36**. The offset portion **35** may be so constructed as to make the tool point visible through or beneath it in order to facilitate positioning of the tool point on the marks indicating the lengths of the major and minor axes. This may be done by making the offset portion **35** transparent. A suitable material such as glass or a transparent plastic composition can be used. The arm **23** does not obstruct the view of the major and minor axis lines because it is offset by the portion **23***a*.

It is believed that the nature and advantages of my invention will be clear from the foregoing description. Having thus described my invention, I claim:

1. An ellipsograph comprising a base plate having a long guide way and a short guide way therein, the short guide way being perpendicular to the long guide way on a line bisecting said long guide way, a needle point support secured to said base on said line adjacent to the end of the short guide way most remote from the long guide way, said base having projections adjacent to the ends of said long guide way, needle point supports at the free ends of said projections on a line parallel to said long guide way, a runner slidably mounted in the short guideway and having an arm thereon spaced above the plate, a scribing arm having a U-shaped end and a laterally offset portion on said end above the arm, a pivot member connecting the offset portion to the arm on said runner, a second runner slidably mounted in the long guide way and having an arm extending over the plate, and over a straight line connecting said last named needle point supports, a bar adjustably mounted on said scribing arm, a pivot member connecting said bar to said last named arm on an axis intersecting the straight line between said last named needle point supports, and a scribing tool holder adjustably mounted on said scribing arm, said tool holder having a tool holding socket located in a common plane with said pivot members and offset laterally and downwardly from the scribing arm below the level of said bar.

2. In an ellipsograph, a base plate, three needle point supports for said base plate positioned at the corners of an isosceles triangle so that the two supports at the base of the triangle may be set upon the major axis line with the third support on the minor axis line of an ellipse to be drawn, a runner slidably mounted on said base for movement parallel to a line connecting said two supports, a second runner slidably mounted on said base for movement along a line through the third support and perpendicular to the path of movement of the first named runner, said second runner having a pivot thereon spaced above the base plate, a scribing arm having a laterally offset, raised portion connected to the pivot of the second runner, a bar adjustable lengthwise of said scribing arm and having a pivot connected to said first named runner, said last named pivot being spaced the same distance from the scribing arm as the first named pivot but below the level of the first named pivot and above the base plate so that the pivots may be moved into vertical alignment, and a scribing tool holder adjustable lengthwise on said scribing arm, said tool holder having a tool mounting socket offset laterally and downwardly with respect to the scribing arm to lie in a common vertical plane with said pivots but below the levels of said pivots.

JESSE C. COATS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,422,345	Douglas	July 11, 1922

FOREIGN PATENTS

Number	Country	Date
80,177	Germany	Mar. 7, 1895
173,465	Canada	Nov. 28, 1916
218,013	Germany	Jan. 18, 1910
584,011	Great Britain	Jan. 6, 1947
608,944	Great Britain	Sept. 23, 1948