April 16, 1935. P. F. DUBOIS 1,997,814

ELLIPSOGRAPH

Filed June 18, 1934

Fig. 1.

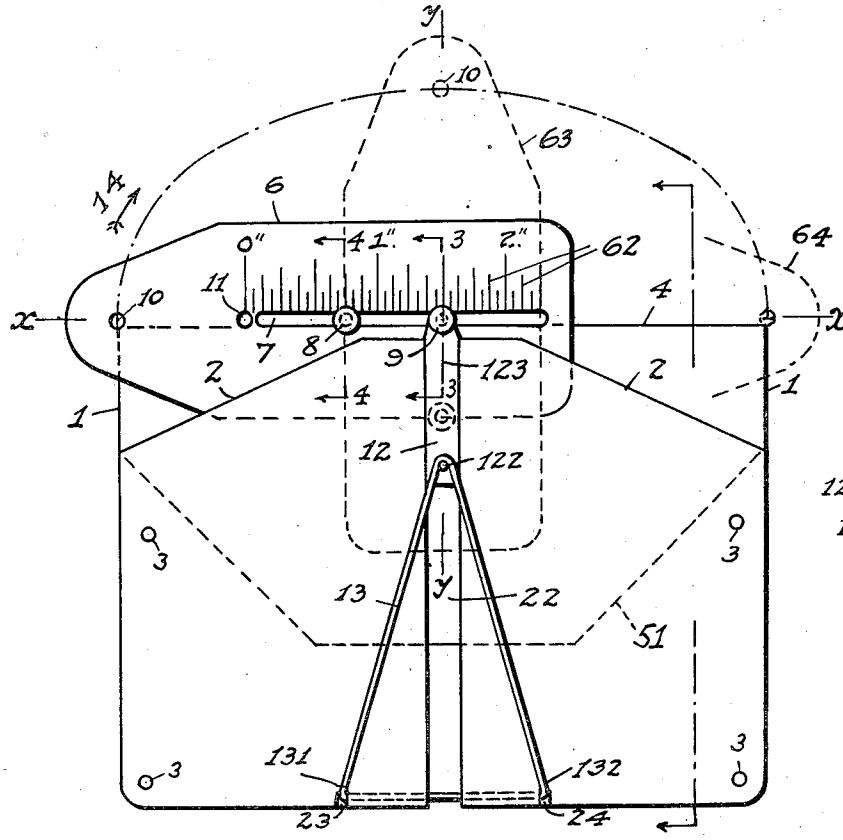


Fig. 2.

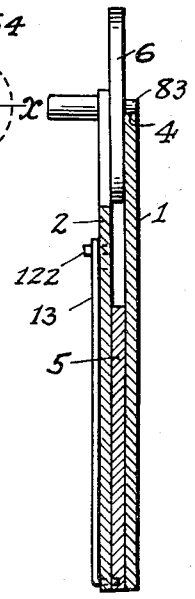


Fig. 3.

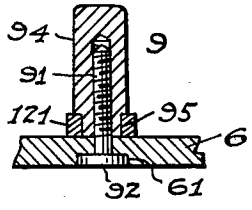
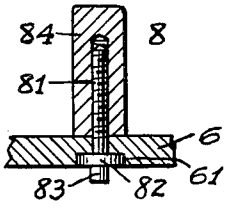


Fig 4



WITNESSES:—

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UNITED STATES PATENT OFFICE

1,997,814

ELLIPSOGRAPH

Peter F. Dubois, Detroit, Mich.

Application June 18, 1934, Serial No. 731,124

3 Claims. (Cl. 33—31)

My invention relates to ellipsographs, and its principal object is to provide an apparatus which can be easily and quickly adjusted to describe ellipses of any desired size from the largest for which the apparatus is designed down to the smallest which would be of any practical use, as well as ellipses having any desired proportion between the major and minor axes within the predetermined range of the apparatus.

Ellipsographs of the type at present in use consist in general of a pair of trackways arranged in right angle relation and a pair of trammels having two adjustable heads adapted to engage the said trackways and a third head for holding a pencil or other instrument by which the desired curve is marked or impressed upon a sheet of paper or other material.

Such devices have the inherent disadvantage that the trackways extend to a certain distance in the path of the marking instrument so that it is impossible to describe ellipses of very small dimensions, and further, the movable trammels possess very little stability, so that even with the greatest care in operation the accuracy of the curve produced is indifferent.

According to the present invention I have provided a unitary, self-contained structure in which the working parts are so combined that its operation is independent of the skill of the operator, and which is quickly and easily adjusted to produce an ellipse of any desired proportions within the range of the instrument.

With these and other objects in view, the invention consists in the improved construction, arrangement, and combination of parts which will be hereinafter fully described, reference being had to the accompanying drawing, in which drawing—

Figure 1 is a plan view.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a fragmentary section on line 3—3 of Figure 1, enlarged, and

Figure 4 is a fragmentary section on line 4—4 of Figure 1, enlarged.

Like characters designate corresponding parts throughout the several views.

1 is the base, of celluloid or other suitable material, adapted to rest upon the surface of a drawing table or other support, and 2 is a cover plate of celluloid arranged in parallel spaced relation with the base and connected thereto by studs 3 or other means. The base 1 is preferably of rectangular shape, as shown, and is provided with a working edge 4 which forms part of the generating mechanism of the device. Between the base 1 and the cover 2 is a spacer 5 which consists of a flat plate of celluloid or other suitable material cut away at 51 to provide clearance for the movable element or scriber 6 by which the desired ellipse is generated. The member 6 consists essentially of a rectangular plate of celluloid or other material of such thickness as to be capable of moving freely between the base plate 1 and the cover 2 and is provided with a slot 7 adapted to receive a pair of fulcrum pins 8, 9, one edge of the said slot being graduated in inches or fractions thereof or in any suitable manner adapted to facilitate adjustment of the fulcrums to produce the desired result. In the member 6, and in alignment with the slot 7 are a pair of openings 10, 11 adapted to receive a stylus, pencil or other marking instrument by which the ellipse is to be impressed upon the paper or other desired surface.

The fulcrum 8 consists essentially of a screw threaded member 81 having a flange 82 adapted to slide within a recess 61 in the other side of the member 6. Below the flange 82 is a projection 83 adapted to engage the working edge 4 of the base plate while upon the upper threaded portion 81 is screwed a nut 84 of elongated form which serves as a handle for the operator. The fulcrum 9 is of similar construction to the fulcrum 8, having the screw threaded member 91, flange 92, and handle 94, but in this case there is no projection below the flange 92. The handle 94 is provided with a journaled portion 95 which is rotatably mounted in a bearing 121 formed in the sliding member 12, the said member being adapted to slide back and forth within a slot 22 in the cover plate 2. Projecting upwardly from the member 12 is a pin 122 with which engages a resilient band of rubber or other suitable material 13 which is in general of triangular shape, as shown in Figure 1, the apices 131, 132 of which engage in slots 23, 24 in the cover plate.

It will be observed from the foregoing description and by reference to the drawing that, when the parts are in the relative position shown in Figure 1 and the pencil or stylus is inserted into the opening 10, movement of the stylus in the direction indicated by the arrow 14 will cause the same to describe an ellipse having major and minor axes dependent upon the relative positions of the fulcrums 8 and 9 and the opening 10. During this movement, the member 12 will be drawn inwards by the resilient member 13 until the slot 7 comes into alignment with the slot 22, the member 6 being then in the position shown in broken lines at 63 in Figure 1, after which the slide will

be withdrawn against the action of the member 13 until the member 6 arrives at the position shown in broken lines at 64 in Figure 1. During these movements the projection 83 is maintained at all times in sliding contact with the working edge 4 upon the base, as a result of which the pencil will have described one-half of the desired ellipse upon the major axis x—x which is marked upon the surface at the commencement of the operation.

The apparatus is then turned around through 180 degrees and the working edge 4 is re-aligned with the axis x—x while at the same time the fulcrum 9 is aligned with the minor axis y—y, this being facilitated by the centerline 123 upon the member 1. The second half of the ellipse is then traced in the same manner as above described with regard to the first half.

Adjustment of the fulcrums 8 and 9 is facilitated by the graduations 62 upon the member 6 and in order that the said graduations may be equally useful whether the stylus is inserted into the opening 10 or into the opening 11, the distance between the two openings is made a unit of the graduations 62, in the present case, one inch. It is contemplated that the opening 11 will be used more commonly and the opening 10 only for larger ellipses.

While I have herein described and shown a preferred embodiment of my invention, it will be readily understood by those skilled in the art that the same may be modified in various ways to meet any particular or peculiar requirement, without departing from the spirit of my invention. For example, instead of the rubber band 13, I may employ a spring or other resilient member of metal. Similarly, in place of the studs 3 for holding the parts together, I may employ any well known form of cement for this purpose.

Having thus described my said invention, what I claim and desire to secure by Letters Patent of the United States is:

1. An ellipsograph comprising a base plate having a rectilinear guiding surface along one edge, a cover plate arranged in parallel spaced relation with said base plate and having a slot extending from the mid-point of said guiding surface and at right angles thereto, a sliding member within said slot having a bearing in one end, a scriber-carrying member positioned between said base plate and said cover having a slot therein and an opening in alignment with said slot adapted to receive a scriber, a fulcrum pin journaled in said bearing and provided with means for clamping it adjustably in the slot of said scriber-carrying member, a second fulcrum pin adapted to be clamped adjustably in said last-mentioned slot and having a downward extension for engaging the guiding edge of the base plate, and means for maintaining said extension in contact with said guiding edge.

2. An ellipsograph comprising a base plate having a rectilinear guiding surface along one edge, a cover plate arranged in parallel spaced relation with said base plate and having a slot extending from the mid-point of said guiding surface and at right angles thereto, a sliding member within said slot having a bearing in one end, a scriber-carrying member positioned between said base plate and said cover having a slot therein, and an opening in alignment with said slot adapted to receive a scriber, said member having a graduated scale thereupon extending along said slot, a fulcrum pin journaled in said bearing and provided with means for clamping it adjustably in the slot of said scriber-carrying member, a second fulcrum pin adapted to be clamped adjustably in said last-mentioned slot and having a downward extension for engaging the guiding edge of the base plate, and means for maintaining said extension in contact with said guiding edge.

3. An ellipsograph comprising a base plate having a rectilinear guiding surface along one edge, a cover plate arranged in parallel spaced relation with said base plate and having a slot extending from the mid-point of said guiding surface and at right angles thereto, a sliding member within said slot having a bearing in one end, a scriber-carrying member positioned between said base plate and said cover having a slot therein and an opening in alignment with said slot adapted to receive a scriber, a fulcrum pin journaled in said bearing and provided with means for clamping it adjustably in the slot of said scriber-carrying member, a second fulcrum pin adapted to be clamped adjustably in said last-mentioned slot and having a downward extension for engaging the guiding edge of the base plate, and means for maintaining said extension in contact with said guiding edge, said means including a band of resilient material one end of which engages the sliding member while the other end is anchored to the cover plate.

PETER F. DUBOIS.