

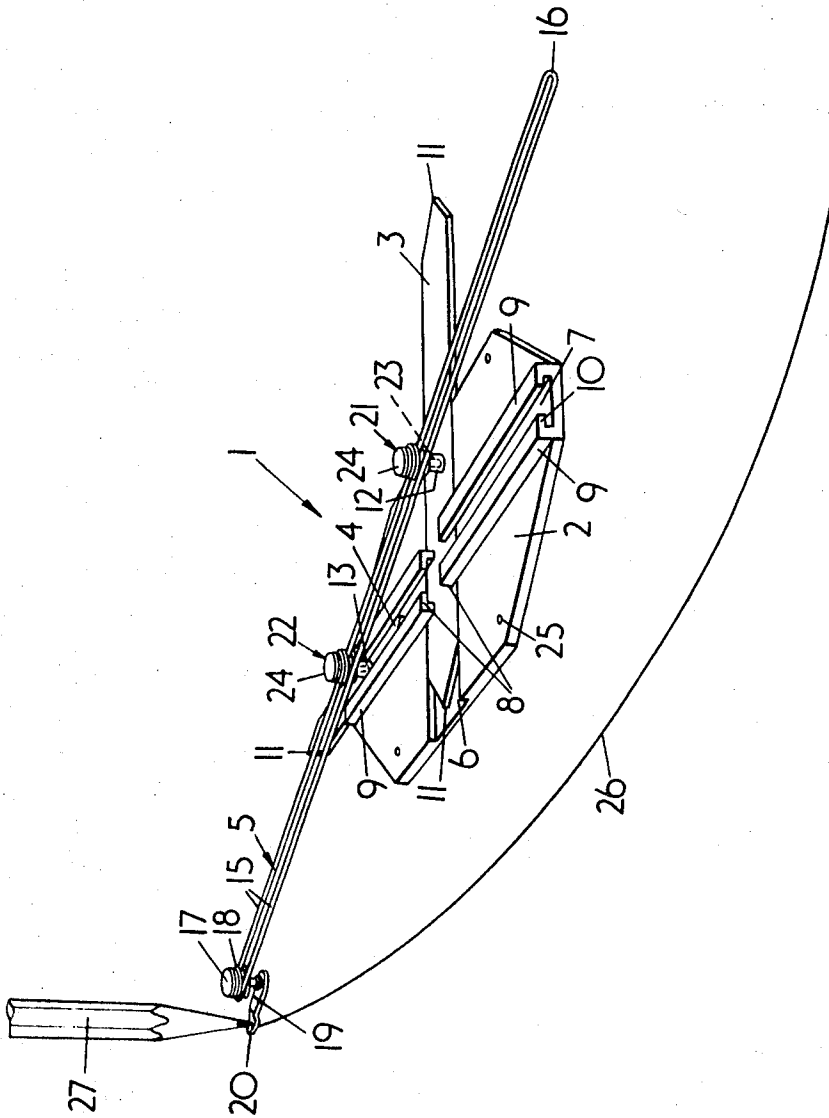
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DEVICE FOR DRAWING ELLIPTICAL PATHS

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**DEVICE FOR DRAWING ELLIPTICAL PATHS**  
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2 Claims

## ABSTRACT OF THE DISCLOSURE

An ellipse drawing instrument having two sliding members slidable longitudinally in crossing slots. The sliding members are pivotably connected to a single drawing arm, so that as said members reciprocate in their respective slots, a point on the arm describes an elliptical path.

The present invention relates to an instrument for facilitating the drawing of ellipses, and elliptical paths.

In, for example, technical and geometrical drawings it is frequently necessary to construct an ellipse, in part or whole, and to accurately relate the size and position of the ellipse to the rest of the drawing.

There are several known drawing procedures for constructing such an elliptical path but they are generally painstaking, time consuming and, unless great care is taken, inaccurate.

There are also known devices for aiding the drawing of an ellipse, for example the well known piece of string or cord looped around a pair of spaced pins, but they are mostly clumsy to operate and it is difficult to accurately reproduce an ellipse of a required size.

An object of the present invention is to provide a device or instrument for drawing ellipses which is simple to use and which can be easily and readily adjusted to reproduce an ellipse of a required size.

The present invention consists in an ellipse drawing instrument comprising a drawing arm, and a pair of members adapted to be pivotably connected to said drawing arm at two spaced points on the drawing arm, one of said members being constrained to move along a first path and the other of said members being constrained to move along a second path crossing the first path so that in use, as said members reciprocate along their respective paths, a point of said arm describes an elliptical path.

Preferably, said paths are linear and perpendicular to each other, and are provided in two spaced parallel planes by guide slots in a common base. The members slide in said slots.

A drawing instrument can be guided by said arm to construct an elliptical path or drawing means can be attached to said arm.

Said points on said drawing arm can be infinitely adjustable to construct an ellipse of a given size within a range determined by the size of the instrument.

The invention will now be described by way of example with reference to the accompanying drawings which shows a perspective view of an instrument according to the invention.

Referring to the drawing, an ellipse drawing instrument 1 comprises a base 2 on which move sliding members 3, 4 for guiding a drawing arm 5.

The base 2, preferably of plastics material, is provided with a first retaining slot 6 which extends transversely of the base. Slot 6 accommodates member 3 and the relative sizes of the member 3 and slot 6 are such that member 3 is freely slideable longitudinally in the slot with a minimum of lateral play.

Extending longitudinally of the base 2 is a second retaining slot 7, which accommodate sliding member 4. However, whereas slot 6 is formed in the base 1 so that member 3 when in the slot is substantially flush with the upper surface of the base 1, slot 7 is defined by projections 9, of generally inverted L shape in cross-section, attached to said upper surface so that the plane of movement of sliding member 4 is above the base 2. Thus the sliding member 4 is constrained from all but longitudinal sliding movement when in slot 7, being held in said slot by overhang 10 of projections 9. Projections 9 are arranged in two pairs, one pair on each side of the transverse slot 6 so that there is a central gap in slot 7 where it crosses over slot 6. However, the projections 9 extend over the edges of the slot 6, as at 8, sufficiently to retain sliding member 3 in slot 6.

Projections 9 are preferably formed integral with the base 2, the base with the projections 9 and slot 6 being, say, moulded by any convenient known method. However the projections 9 can be formed by building up the required cross-section on an already formed base.

Sliding members 3, 4 are preferably of plastics material and are a close sliding fit in their respective slots 6 and 7. Both members 3 and 4 are pointed at their ends 11 to assist initial setting of the device on a drawing board as will be outlined hereinafter. Centrally disposed on each member 3 and 4 is a cylindrical projection 12, 13 respectively, of such different heights that the tops of said projections 12 and 13 are in the same horizontal plane when the device is assembled. Each projection 12 and 13 is provided with an axial bore 14.

In this embodiment the member 4 is considerably smaller in size than the member 3. This is not imperative to the working of the invention but is a preferred feature, the point being to minimise the width of member 4 so as to give a minimum of interference between the projection 12 of member 3 and the body of member 4 when member 4 is in a position bridging slot 6.

Apart from this interference, members 3 and 4 are free to move independently in their respective guide slots.

Drawing arm 5 comprises two spaced parallel track members 15 formed from a length of stiff steel wire which is bent through 180° at a point intermediate its ends, which point then forms one end 16 of the arm 5. At the other end of arm 5, the free ends of the length of wire are clamped by an arrangement 17 which comprises two clamping washer plates 18 and a drawing extension 19, held together by a threaded pin and nut or by any other equivalent means for example riveting.

Drawing extension 19 extends downwardly from the arm 5, the tip 20 of the extension being parallel to the plane of the base 2 and having a small aperture formed therein through which the point of a drawing instrument can project.

Intermediate the ends of arm 5 are mounted two elements 21 and 22, each having a pin 23 extending downwardly from arm 5 between track members 15. Each element comprises a pair of washers between which pass the track members 12 of arm 15, and pin 23 extends up through the washers to terminate in a cap 24. The lower washer is fixed to the pin and the other upper washer is biased away from cap 24 by a coil spring. Thus the washers are forced towards each other to clamp said track members 15 therebetween. It will be realised that each element 21 and 22 can be moved longitudinally of arm 5 but that when in a required position on the arm each element will be effectively held against any accidental movement by the spring-biased washer clamping action.

The downwardly projecting pins 23 of elements 21, 22 engage in the axial bores of projections 12, 13 respectively on sliding members 3, 4. To achieve maximum

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accuracy from the device play between said pins and bore should be kept to a minimum.

The base 2 is provided with four through apertures 25 by means of which it can be pinned to, say, a drawing board to facilitate use of the ellipse drawing instrument.

To draw an ellipse of a given size the instrument is used as follows.

Elements 21 and 22 are adjusted on arm 5 so that the distance between the aperture in tip 20 of the arm and element 21 equals half the length of the major axis of the required ellipse, and the distance between said aperture and element 22 equals half the minor axis of said ellipse. It follows that element 22 will always be that element nearer the extension 19.

The instrument is preferably pinned down to a drawing board by pins extending through apertures 25 of the base. As this is done the pointed ends 11 of sliding member 3 are aligned with the direction of the minor axis of the ellipse to be drawn and the pointed ends of sliding member 4 with the direction of the major axis of said ellipse. With the instrument thereby correctly placed, as required, on the drawing board, an elliptical path 26 is drawn by inserting the drawing point of a pencil 27 or other drawing instrument in the aperture of drawing extension 19 and moving the pencil so as to rotate arm 5. As the arm 5 is rotated, sliding members 3 and 4 reciprocate in their respective slots and constrain the pencil, via arm 5, to move in an elliptical path.

It will be realised that a complete ellipse can be drawn in one movement or only part of one, as desired. Further, if no measurements are known of the axes of an elliptical path to be drawn the position of elements 21 and 22 of the instrument can of course be set by a trial and error method.

The instrument can be readily dissembled into separate component parts, namely the base, two sliding members and drawing arm, for packing and storage purposes.

An instrument according to the invention need not have the slots of the sliding members at right angles to one another. However, if said slots are inclined relative to one another at some angle other than 90° the geometrical axes of an ellipse drawn by the instrument will not be in the same direction as the axes of the slots.

Various modifications are possible within the scope of the invention, for example a drawing instrument, say

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a piece of lead, could be permanently attached to the end of said drawing extension, or the drawing extension made adjustable in position on arm 5.

I claim:

5 1. An ellipse drawing instrument comprising a relative-ly small base, means defining a first linear path in said base, means defining a second linear path on said base crossing said first path and being disposed in a separate horizontally extending plane relative to the plane of said first path, a first elongated sliding member slidably accom-10 modated in said first path, and being longer than said first path, a second elongated sliding member slidably accom- modated in said second path and being shorter than said first member, the ends of each member being pointed for alignment with ellipse major and minor axes, projection means upstanding from each of said members intermed-15 iate its ends, an elongated, longitudinally-slotted drawing arm receiving said projection means, resiliently-urged clamping means on each of said projection means, resil-20 iently engaging said arm whereby said arm is readily slidably maintained in a plane parallel to said base as said sliding members are reciprocated in said paths, and mount- ing means at one end of said arm adapted to receive a pencil tip.

25 2. An instrument according to claim 1 wherein said paths are mutually perpendicular and said mounting means positions said pencil tip in the plane of said base.

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