(No Model.)

L. ABBOTT.

ELLIPSOGRAPH.

No. 296,100. Patented Apr. 1, 1884.

Fig. 1.

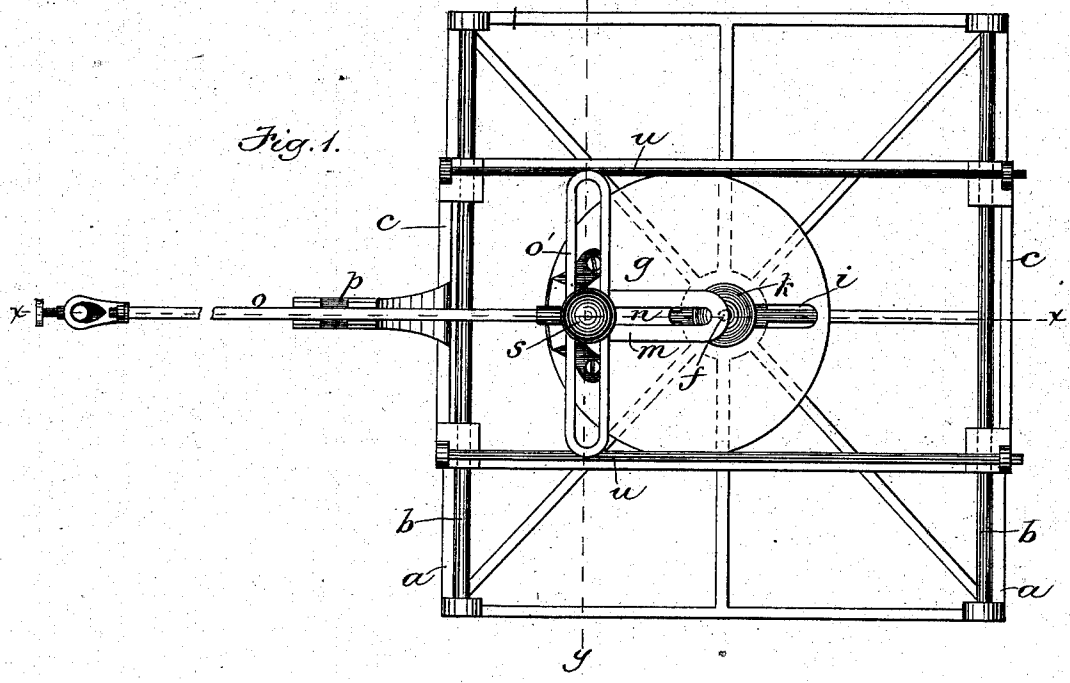


Fig. 2.

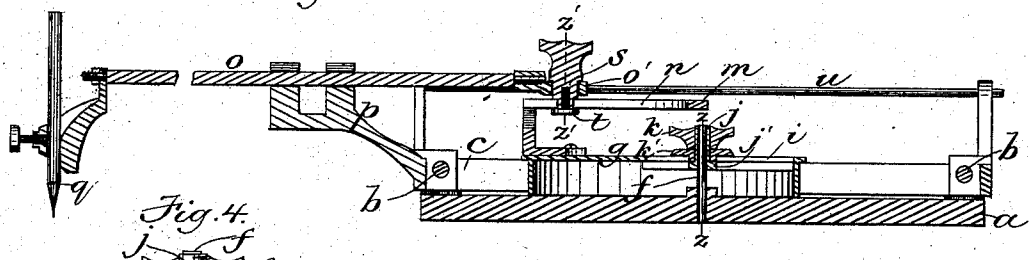


Fig. 4.

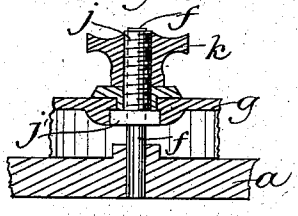


Fig. 5.

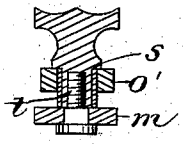
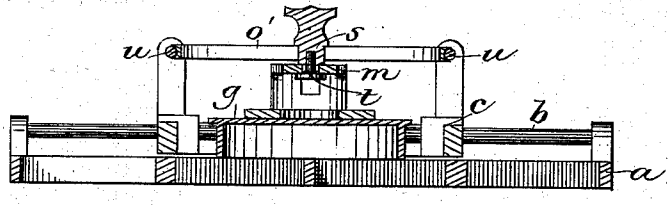


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

LEVI ABBOTT, OF CAMBRIDGEPORT, ASSIGNOR TO E. T. SNOW AND H. P. STEVENS, BOTH OF CHELSEA, MASSACHUSETTS.

ELLIPSOGRAPH.

SPECIFICATION forming part of Letters Patent No. 296,100, dated April 1, 1884.

Application filed February 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, LEVI ABBOTT, of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Ellipsographs, of which the following is a specification.

This invention has for its object to provide an improved instrument for describing ellipses, curves, or circles of any desired proportions; and it consists in a base or support adapted to rest on the paper to be marked, a frame adapted to slide laterally on guides attached to said support, a disk adjustably pivoted to said support and provided with an adjustable crank-pin, and an arm carrying a marker at its outer end and provided at its inner end with a transverse slotted head, in which said adjustable crank-pin is free to slide, said parts operating in the manner hereinafter described to produce the desired figure.

The invention also consists in the provision of parallel guide-rods for the transverse slotted head, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a plan view of my improved instrument. Fig. 2 represents a section on line *x x*, Fig. 1. Fig. 3 represents a section on line *y y*, Fig. 1. Figs. 4 and 5 represent, respectively, enlarged sections on lines *z z* and *z' z'*, Fig. 2.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a frame or base adapted to rest on the sheet of paper or other surface to be marked, said base being preferably of open-work or skeleton form for lightness, and to enable it to be laid upon a drawing without entirely covering the portion under it. The base *a* is provided with parallel guide-rods *b b*, on which a frame, *c*, is adapted to slide. The center of the base *a* is provided with an upwardly-projecting pivot, *f*. On said pivot is pivoted a disk, *g*, which bears against opposite sides of the frame *c*, and is free to rotate in said frame on the pivot *f*. The disk *g* has a radial slot, *i*, through which the pivot *f* passes, said pivot being surrounded by an externally-threaded sleeve or socket, *j*, which has a head, *j'*, wider than the slit *i*, and bearing against the under side of the disk *g*. A clamping-nut, *k*, is screwed upon the threaded sleeve *j*, and bears upon a washer, *k'*, resting upon the upper surface of the disk *g*. The sleeve and nut enable the disk to be adjusted on the pivot, so as to make the periphery of the disk more or less eccentric to said pivot. When the pivot is eccentric to the center of the disk, a complete rotation of the latter will cause the frame *c* to move first in one direction and then in the other on the guide-rods *b b*, the extent of said movement depending upon the degree of eccentricity of the pivot. To the upper side of the disk *g* is attached an overhanging arm or plate, *m*, in which is formed a slot, *n*, which is radial from the center of the disk, and is provided with an adjustable crank-pin, *s*, which is adapted to be moved along said slot, and secured at any point at which it may be adjusted by means of a screw, *t*, having an enlarged head bearing against the under side of the arm *m* and a squared shank entering the slot in said arm, and prevented by its form from rotating in said slot, so that the pin may be turned to tighten or loosen its connection with the slotted arm.

o represents an arm adapted to slide longitudinally in guides in a bracket, *p*, on the frame *c*, and provided at its outer end with a pencil or marker, *q*, and at its inner end with a transverse slotted head, *o'*, which receives the crank-pin *s*, said pin being adapted to slide therein.

It will be seen that when the disk *g* is eccentric to its pivot and is rotated the frame *c* is reciprocated on its guides *b b*, while the play of the crank-pin *s* in the slotted head of the arm *o* reciprocates said arm longitudinally, or in a direction at right angles to the movement of the frame *c*. The two movements thus imparted to the arm—viz., the lateral movement caused by the frame *c* on the guides *b b* and the longitudinal movement caused by the crank-pin *s*—produce a compound or elliptical movement of the marker *q*, which therefore marks an elliptical figure on the paper on which it rests. The proportions of the ellipse, and the relative lengths of its major

and minor axes depend upon the adjustment of the disk *g* on its pivot and the adjustment of the crank-pin *s* relatively to the center of the disk; hence an ellipse of any desired form, and as small as may be desired, can be produced, the marker being entirely at one side of the mechanism that operates it, so that it is not prevented thereby from making very small figures. It is obvious that curves or parts of ellipses may be made with equal facility. The disk *g* may have suitable marks or graduations by the side of the slot *i*, and the arm *m* may have similar marks to guide the operator in adjusting the disk on its pivot and the crank-pin on the slotted arm. When the disk *g* is adjusted so that it is concentric with its pivot, the rotation of the disk will not move the frame *c;* hence the reciprocating movement of the arm *o* will produce a straight line. An ellipse can thus be readily bisected.

u u represent guide-rods supported by standards affixed to the corners of the frame *c*, and arranged parallel with the marker-carrying arm *o*. The ends of the slotted head *o'* are grooved, and bear against the inner sides of said rods, as shown in Figs. 1 and 3. The arm *o* is thus steadied in its reciprocating movements, and prevented from wabbling. The slotted overhanging arm *m* may be omitted; and the slot *n*, in which the crank-pin *s* is adjustably held, may be formed directly in the disk *g*, either as a continuation of the slot *i* or independently thereof. This change would involve the lengthening of the crank-pin.

I claim—

1. The improved ellipsograph composed of a base or support, a disk adjustably pivoted thereto, a frame, *c*, adapted to slide on guides on the base and inclosing the disk *g*, a marker-carrying arm adapted to slide in a guide formed on the frame *c* and provided with a transverse slotted head, and an adjustable crank-pin connecting said head with the disk or with an attachment thereof, as set forth.

2. The combination of the base or support *a*, having a fixed pivot-pin, *f*, the threaded socket on said pivot, the slotted disk adjustable on said socket, means for positively securing said disk to the socket in any position to which the disk may be adjusted, the slotted arm secured to said disk, the sliding frame *c*, surrounding said disk, the marker-carrying arm having the slotted transverse head, and the adjustable crank-pin, all arranged and operating substantially as described.

3. The combination of the frame *c*, having the guide-rods *u u*, the marker-carrying arm *o*, adapted to slide in guides formed on said frame, and provided with the slotted transverse head supported and guided by said rods, and means, substantially as described, for reciprocating said frame and arm each in a direction at right angles to the reciprocating movement of the other, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 1st day of February, 1884.

LEVI ABBOTT.

Witnesses:

C. F. BROWN,

A. L. WHITE.