

(No Model.)

A. MARICHAL.
ELLIPSOGRAPH.

No. 324,395.

Patented Aug. 18, 1885.

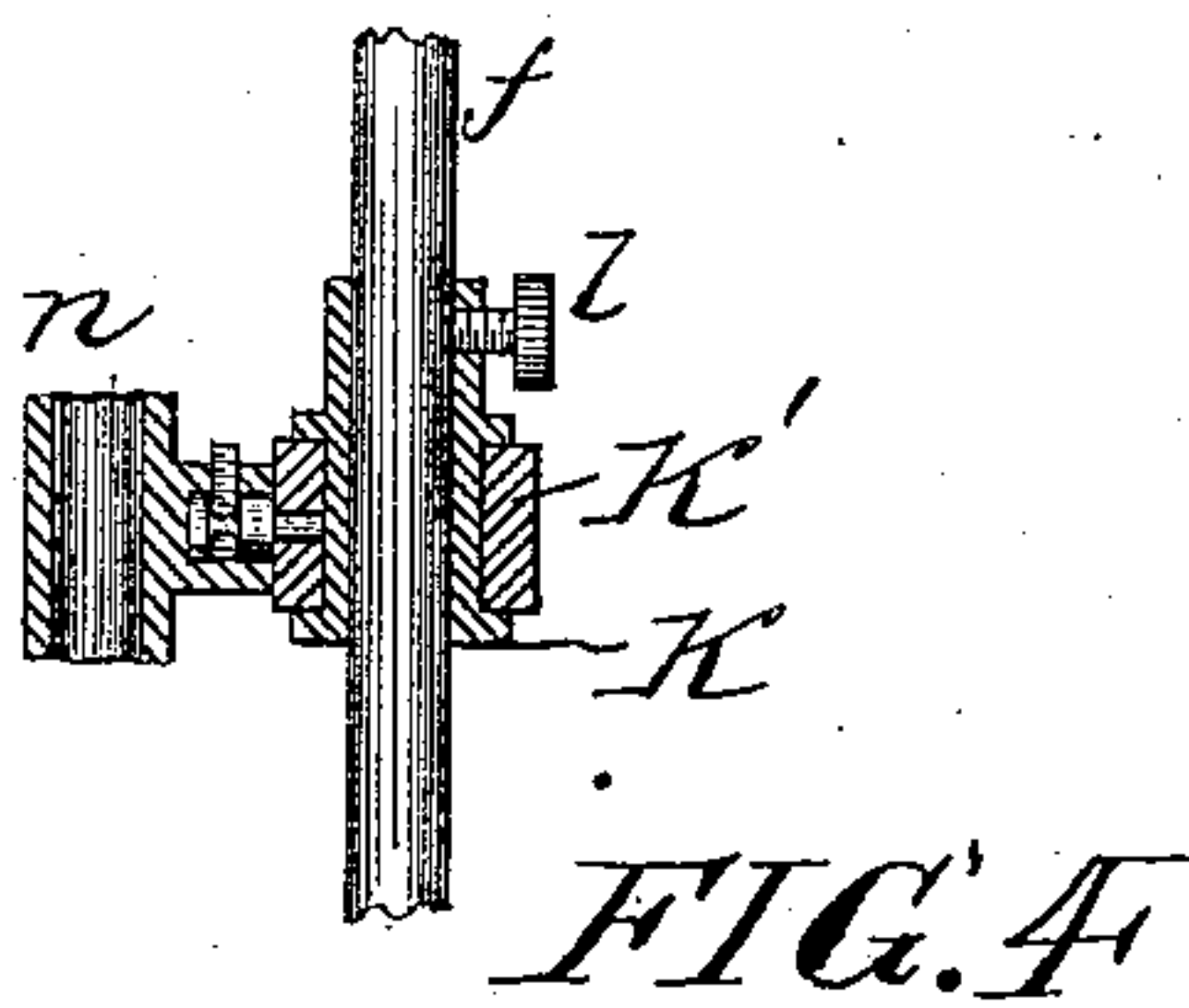
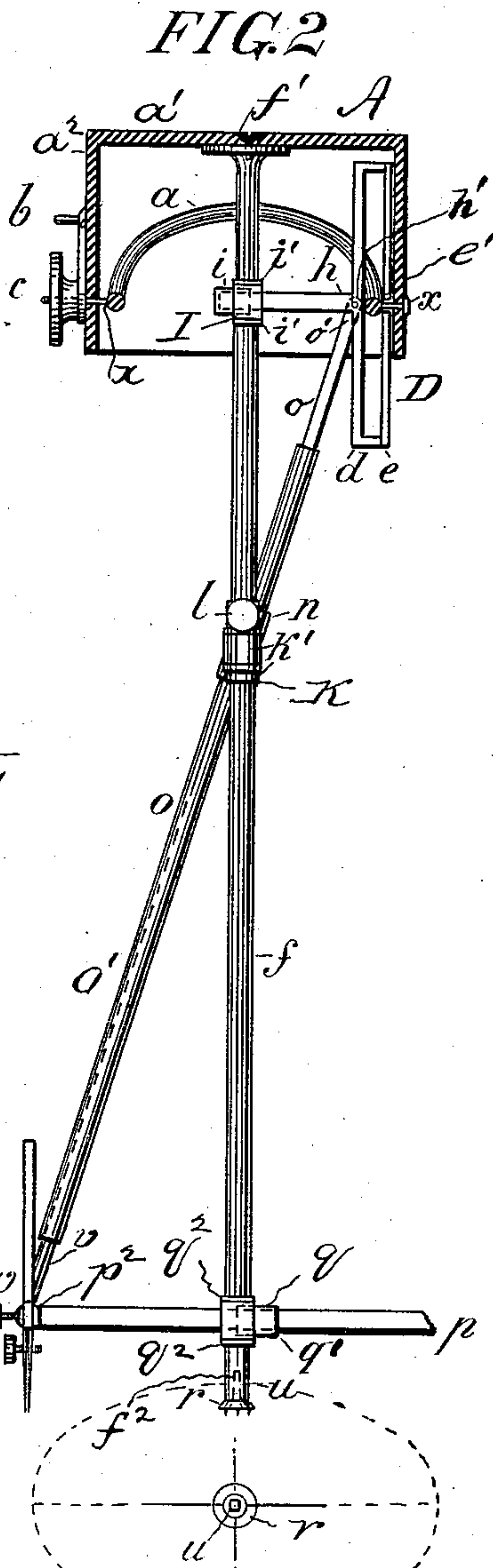
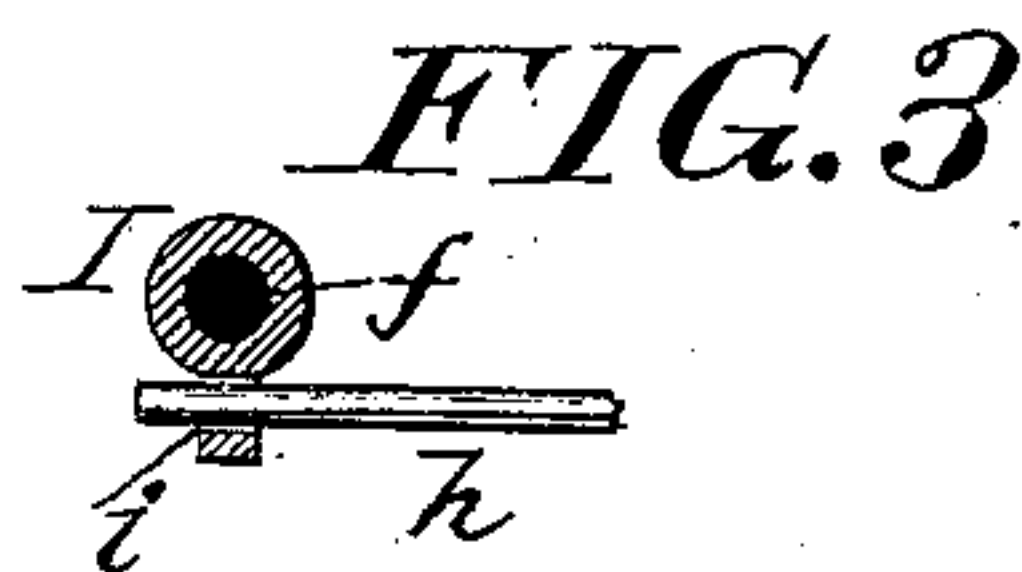
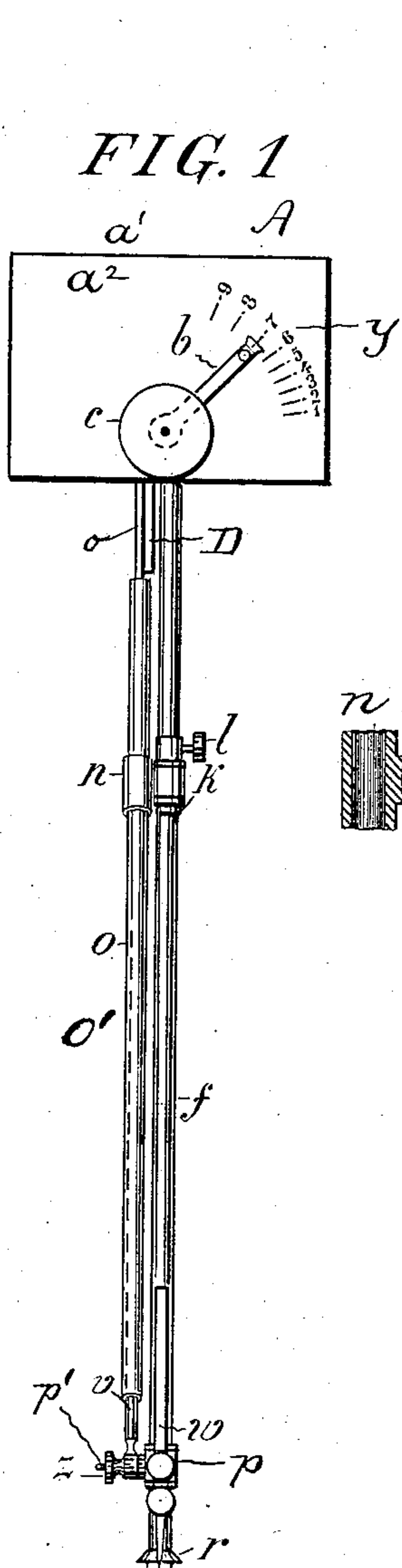


FIG. 5

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UNITED STATES PATENT OFFICE.

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ELLIPSOGRAPH.

SPECIFICATION forming part of Letters Patent No. 324,395, dated August 18, 1885.

Application filed June 9, 1885. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR MARICHAL, a subject of the King of Belgium, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ellipsographs, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is a front elevation of an ellipsograph embodying my improvements. Fig. 2 is a side elevation, partly in section, of same. Figs. 3 and 4 are enlarged sectional views of detailed parts, and Fig. 5 is a diagram of an ellipse, showing a center located at the intersection of its diameters for locating and supporting the compass.

My invention has relation to ellipsographs; and it has for its object simplicity and durability of construction, whereby an efficient elliptical compass is provided, which can be easily manipulated by one continuous motion of the hand, to cause it to accurately draw any size ellipse within its range or scope.

My invention accordingly consists of the combination, construction, and arrangement of parts comprising an ellipsograph, as hereinafter more particularly described and claimed, the construction of the instrument being based upon the principle or fact that a circle has for its projection an ellipse when the plane thereof is not parallel to the plane of projection.

In the drawings, *a* represents a ring of metal or other suitable material, which is provided with or is supported upon journals or gimbals *x x*, having their bearings in an inverted square, oblong, or other suitably-shaped box, *A*, or a box having a closed top, *a'*, and an open bottom, as shown. Box *A* is supported upon or affixed to a leg, *f*, by means of a screw, *f'*, passing through the top *a'*, as shown; or said box and leg may otherwise be secured together, as desired. One of the journals *x*, outside of box *A*, may, if desired, be provided with a handle, *b*, for moving ring *a* from a horizontal plane to one of any desired inclination thereto, or vice versa, and also with a set or clamping nut, *c*, for locking or holding ring *a* in the desired plane, or that in which

it is placed or adjusted to, the end of said journal *x* being suitably threaded to receive said nut.

To move or adjust the ring *a* from one plane to another, the nut *c* is first loosened and the adjustment made, whereupon said nut is screwed up to clamp or lock said ring in position.

Ring *a* passes between the bars or sides *d* and *e* of a yoke, *D*, which is maintained in a position parallel to the main leg *f* of the instrument by means of a bar, *h*, secured to or forming part of said yoke, and which freely slides in a slot, *i*, formed in one side of a sleeve, *I*. (See Fig. 3.) Sleeve *I* is loosely secured to leg *f*, between suitable collars or pins, *i'*, as shown in Fig. 2, and is so located on leg *f* that yoke *D* is maintained in such position that an opening, *e'*, in its bar or side *e*, at or near its middle, is in the same plane as that of journals *x*.

This described construction of said parts admits of the yoke passing by said journals as it rotates with the sleeve *I*.

K is a sleeve adapted to slide up and down on leg *f*, and is locked in any desired position thereon by means of a set-screw, *l*. (Seen more plainly in Fig. 4.) Upon sleeve *K* is supported a loose collar, *K'*, on one side of which is suitably swiveled or pivoted a sleeve, *n*, which is extended, if desired, or is provided with a tube, *O*, to the upper end of which is affixed or is continued to form a rod, *o*, loosely pivoted or hinged at its end *o'* to bar *h*, near its outer end, by means of a pin, *h'*.

In the lower end of tube *O* is loosely inserted a rod, *v*, the lower end of which is loosely secured to a pin, *p'*, (see Fig. 2,) extending laterally from a bar, *p*, said pin *p'* being provided with a set-nut, *z*, for holding the rod *v* in position on pin *p'*.

The rods *o* and *v* and tube *O* comprise the second leg, *O'*, of the compass, and the provision of the rod *v*, sliding in tube *O*, admits of lengthening and shortening leg *O'*, as required, in drawing the ellipse or in moving the pen from the large to the small diameter of the ellipse, or vice versa.

The bar *p* freely slides in a slot, *q'*, formed

in a sleeve, q , loosely supported on leg f near its lower end between suitable collars or pins, q^2 , as above described for sleeve I. In the end of bar p to which rod v is attached is a vertical slot, p^2 , in which is inserted a pencil or pen, w , for scribing the ellipse when leg O' and pen or pencil are rotated about leg f . The lower end of the latter is preferably formed with an angular socket, f^2 , to receive or fit over a correspondingly-shaped pin, u , projecting upwardly from a copper or other center plate, r , which is adapted to be placed at the intersection of the diameters of the ellipse to be drawn. This center piece, r , when the leg f is placed thereon, maintains it in a fixed position, and neither it nor box A and ring a rotate.

To use the instrument I first mark on paper or other surface used the central longitudinal and transverse diameters of the ellipse. The center r , with corresponding lines marked thereon, is placed at the intersection of said diameters, so that the lines on said center will coincide exactly with the diameters of the ellipse, as illustrated in Fig. 5. The leg f is then placed in position upon center r , first loosening all the set-screws and nuts of the instruments. The pen or pencil w is then placed at one of the extreme ends of the large or longitudinal diameters of the ellipse. This adjustment determines the height of the sleeve K upon leg f , or proportions the bases of the two right-angle triangles $K w q'$ and $K i h$, formed by the legs of the instruments and the bars p and h in respect to one another, and determines the position of the pivot or swinging point for leg O' , to give a limit of motion to pen w in one direction equal to the longitudinal diameter of the ellipse to be drawn. When said adjustment is made, it is maintained by tightening or screwing up set-screw l , to lock sleeve K on leg f . The pen or pencil w is then placed at one of the extreme ends of the transverse diameter of the ellipse. In doing this the bars p and h and yoke D are rotated, and as the latter rotates the ring a is caused to assume an inclination to its horizontal plane. When the desired inclination of ring a is obtained, which result is effected as soon as pencil w reaches or is placed at said end of the transverse diameter, the set-nut c is screwed up to maintain such inclination, which gives a limit of motion to pen w in another direction equal to the short diameter of the ellipse to be defined, and the compass is then ready for use. The compass, during the time of making such described adjustment, is supported by the operator or draftsman placing one hand on the top of the instrument. Now, by taking hold of pen w and moving it around to rotate leg O' about leg f , the sides of the yoke-bars $d e$, as they rotate with leg O' , impinging against the inclined ring a , will cause said yoke or its bar h to slide freely in the sleeve-slot i , which move-

ment of bar h swings leg O' upon its pivoted or swiveled sleeve n , to slide bar p in its sleeve-slot q' , and cause pen w to scribe an ellipse about the diameters laid out upon the paper, as above described. It will be noted, therefore, that the inclination of leg O' gives to pen w a limit of movement in one direction equal to the longitudinal diameter of the ellipse scribed, and the inclination of the ring a gives said pen a limit of movement in another direction equal to the transverse diameter of the ellipse drawn, and also the proper curvature or periphery between said boundaries or the ends of said diameters to form or scribe the ellipse desired, or that the circle or ring a has for its projection an ellipse when its plane is not parallel with the plane of projection.

If desired, the side a^2 of box A may be provided with a graduated scale, Y, (see Fig. 1,) to be used in connection with the handle b , for inclining the ring when the proportion between the small and large diameters of the ellipse is known.

With a compass constructed and operated as above described an ellipse of any size within the scope of the instrument may be drawn by one continuous motion of the hand.

By removing set-nut z from pin p' of bar p it may be removed from its collar-slot q' , and by then loosening set-screw l to unlock sleeve K the leg O' may be folded to leg f , to reduce the size of the instrument or make it more compact for placing it in special boxes of small dimensions.

What I claim is—

1. An ellipsograph having a fixed leg and a circle or ring adapted to be inclined to the plane of projection, a rotating leg pivoted to a sleeve sliding or adjustable on said fixed leg, and having connection at one end with a yoke engaging with said ring, and at the other with a bar adapted to hold a scribing pen or pencil, substantially as shown and described.

2. In an ellipsograph, substantially as herein shown and described, the pivoted or swinging ring a , adapted to be inclined to the plane of projection, as set forth.

3. In an ellipsograph, the combination of non-rotating leg f , having box A, pivoted or swinging ring a , having set or locking nut c , the adjustably pivoted or swinging and rotating leg O' , yoke D, and bar p , arranged for operation substantially as shown and described.

4. In an ellipsograph, the combination, with pivoted or swinging ring a , provided with handle b and locking-nut c , of the graduated scale y , substantially as and for the purpose set forth.

5. The combination, with an ellipsograph having swinging or pivoted ring a , legs f and O' , yoke D, and bar p , of a center, r , having a stud adapted to fit in a socket in the end of

leg *f*, to hold it in a fixed position, substantially as shown and described.

6. An ellipsograph comprising a leg, *f*, having box A and pivoted or swinging ring *a*,
5 yoke D, engaging with said ring and a rotating leg, O', pivoted to leg *f*, and a pen or pencil bar, *p*, in engagement with leg O', substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR MARICHAL.

Witnesses:

S. J. VAN STAVOREN,
CHAS. F. VAN HORN.