

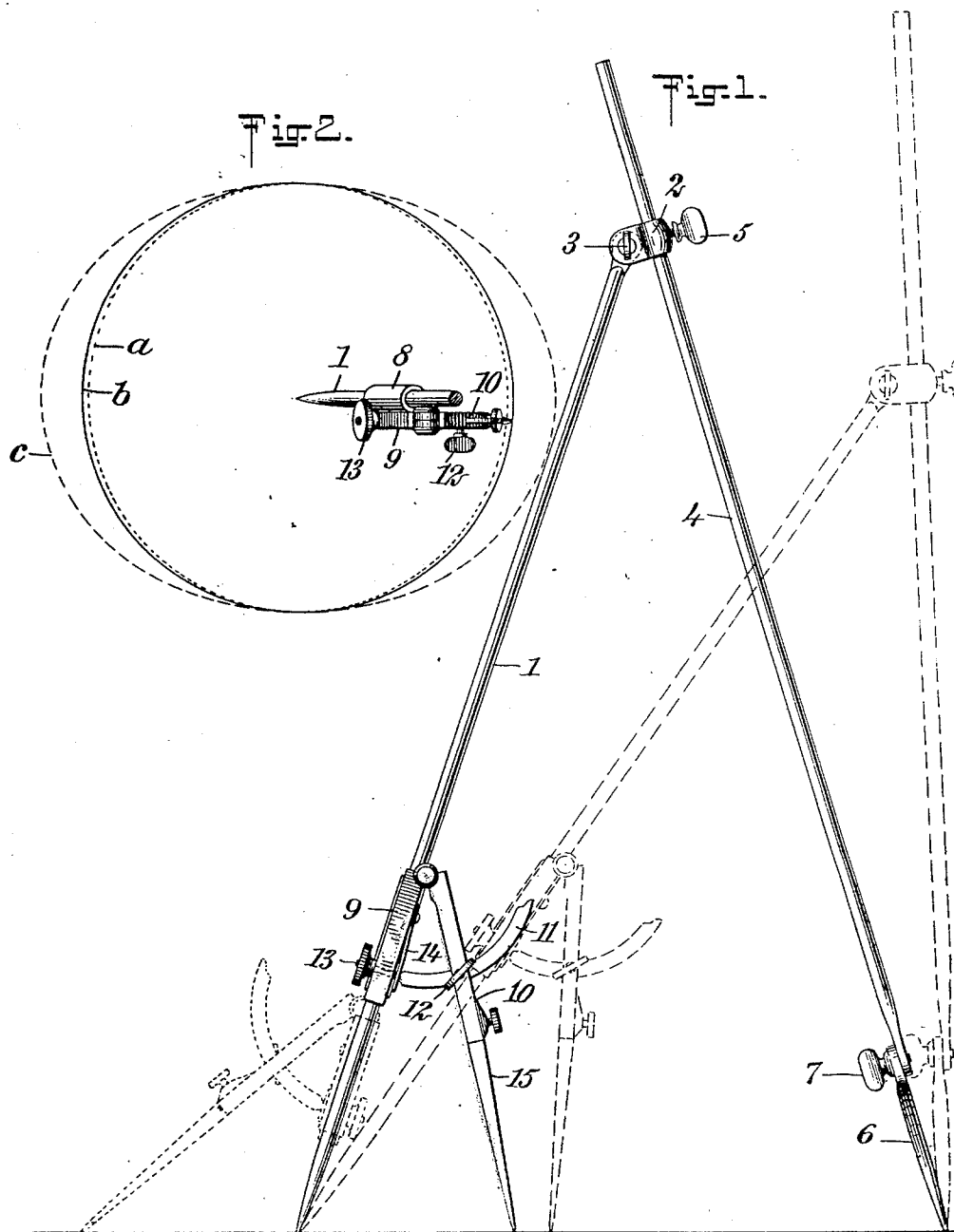
No. 861,861.

PATENTED JULY 30, 1907.

J. T. KELLEY.
ELLIPSOGRAPH.

APPLICATION FILED OCT. 9, 1906.

2 SHEETS—SHEET 1.



WITNESSES

G. L. Cheney
C. W. Fairbank

INVENTOR

James T. Kelley
BY *Mum Co*
ATTORNEYS

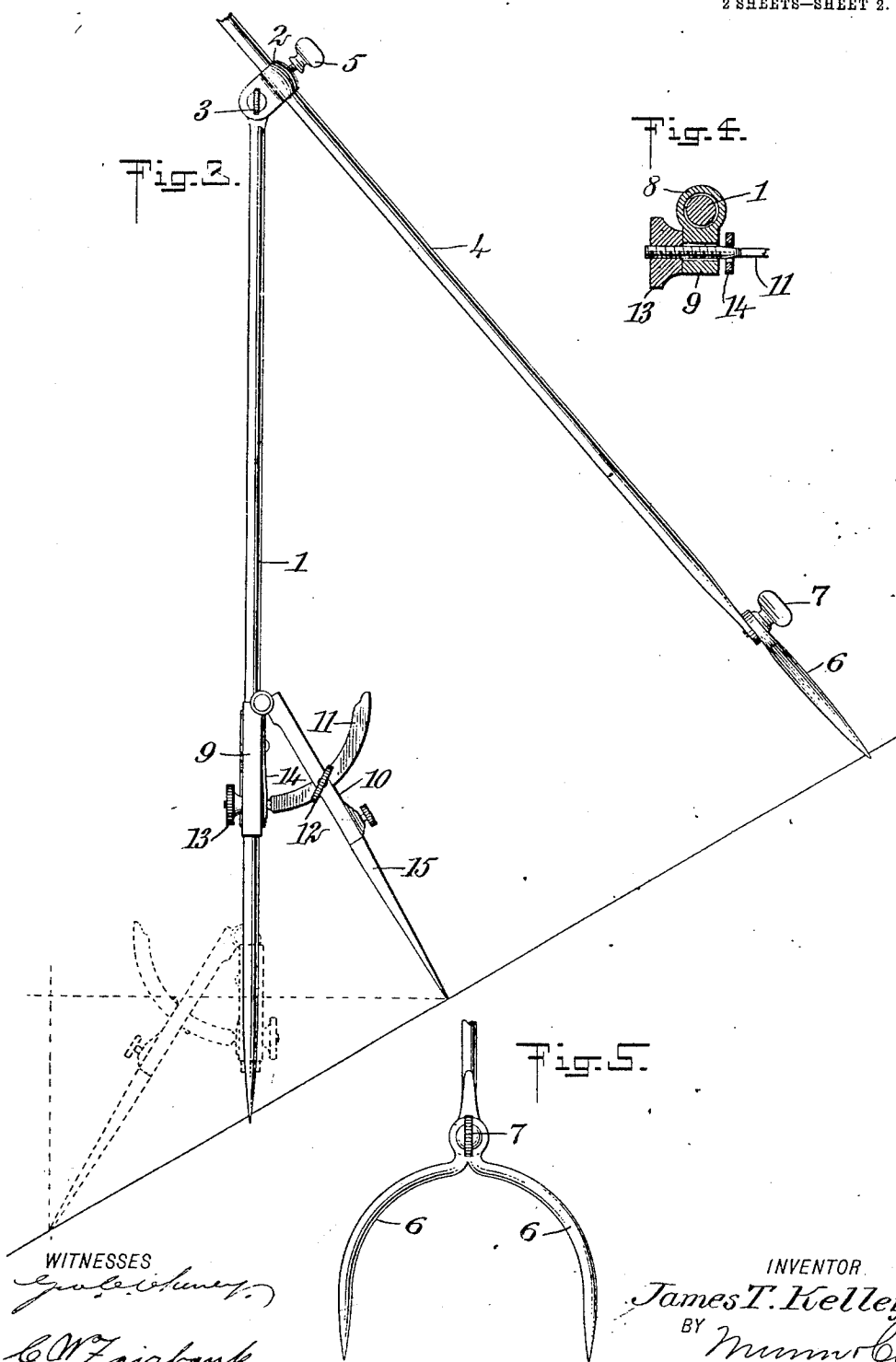
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UNITED STATES PATENT OFFICE.

JAMES T. KELLEY, OF WEST RUSH, NEW YORK.

ELLISOGRAPH.

No. 861,861.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed October 9, 1906. Serial No. 338,114.

To all whom it may concern:

Be it known that I, JAMES T. KELLEY, a citizen of the United States, and a resident of West Rush, in the county of Monroe and State of New York, have invented a new and Improved Ellipsograph, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in ellipsographs and more particularly to means whereby curves, other than arcs of circles, may be readily drawn.

My new device is particularly designed for drawing ellipses, and the compass may be set to draw an ellipse of any given major or minor axis as readily as an ordinary compass can be set for drawing a circle of a given diameter.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my complete device showing in full lines the position occupied for drawing one ellipse and showing in dotted lines the position occupied for drawing an ellipse of the same minor axis but of a greater major axis; Fig. 2 is a plan view of a portion of the apparatus shown in Fig. 1 and representing a true circle and the curves formed with the apparatus in the position shown in solid lines and also in the position shown in dotted lines in Fig. 1; Fig. 3 is a side elevation of my improved device illustrating its use upon an inclined surface; Fig. 4 is a sectional detail showing the sliding collar; and Fig. 5 is a detail showing the base of the tripod.

My invention comprises essentially two pivoted members, one of which is slidably connected to the other, and means for holding the last-mentioned member at any desired angle in respect to the plane upon which the curve is to be drawn. Preferably this stationary member of the device comprises a rod 1, pointed at its lower end and adapted to be placed at the center of the curve to be drawn. The upper end of this rod is provided with a collar 2 pivotally connected thereto and having a set screw 3 for holding the collar at any desired angle to the rod. A second rod 4 is provided, similar to the rod 1, but projecting through the collar 2, which latter is provided with a set screw 5 for rigidly holding the rod 4 within the collar. The lower end of the rod 4, instead of being pointed as is the rod 1, is provided with a base comprising two legs 6 secured together at their upper ends and pivotally connected by means of a set screw 7 to the end of the rod 4. As the parts above described have three points of support, namely, the pointed end of the member 1 and the pointed ends of the two legs 6, it is evident that this portion of the apparatus may be set up and remain in the desired position without additional support. By the adjustment of the set screws 3 and 5 the inclination of

the pointed rod 1 may be varied at will, and by tightening these set screws, it may be held at the desired angle.

Sliding on the rod 1 and closely fitting the same is an elongated collar 8 carrying a block 9 extending substantially its entire length and having a compass leg 10 pivotally secured thereto. The connection between the compass leg 10 and the block 9 may be of any suitable construction, and any suitable means, as for instance a curved plate 11 and set screw 12, may be provided for rigidly holding the compass leg 10 at the desired angle to the block 9. The curved plate 11 preferably extends through an opening in the block 9 and is provided with a thumb nut 13, by which the finer adjustment of the angle may be secured. A spring 14 acts in opposition to the thumb nut 13, as is common in the art. The compass leg 10 may be of any suitable construction and terminate either in a sharp point 15 or in a pen or pencil. Preferably the end of the leg 10 is made detachable so that various parts may be used interchangeably in connection therewith.

It is evident that if the member 1 is held at right angles to the surface upon which it is desired to describe a curve, and the compass leg 10 is revolved by the member 1, the end of the compass leg would describe a perfect circle and the collar 8 would not slide upon the member 1. But, as the member 1 is inclined at an angle, the points of the compass leg 10 will remain at the same distance from the point of the member 1, while the said compass leg lies in a plane at right angles to the plane of the member 1 and its projection upon the supporting surface, but as the compass leg 10 is moved out of this plane and moved toward the plane of the member 1 and its projection upon the surface, the collar 8 will be caused to move either up or down the member 1 and the distance between the end of the compass leg and the point of the rod 1 will be gradually increased until the compass leg 10 reaches said plane at which time it will be the maximum distance away from the point of the rod 1. By varying the inclination of the rod 1 and keeping the angle of the compass leg 10 to the rod 1 constant, the major axis of the ellipse to be drawn may be varied while the minor axis will remain the same.

In Fig. 2 I have illustrated a perfect circle *a* formed by the revolution of the compass leg 10 about the rod 1 when the latter is held in a vertical position and when the compass leg 10 is at the angle to the rod 1 represented in Fig. 1. As the pointed rod 1 is inclined to the position shown in full line in Fig. 1, and when the compass leg 10 remains at the same angle thereto, the curve formed would be a perfect ellipse *b* with the minor axis exactly equal to the diameter of the circle *a*, but the major axis somewhat greater than said diameter. As the rod 1 is moved to the

position shown in dotted lines in Fig. 1 and the angle of the compass leg 10 remains the same, an ellipse c will be formed having the same minor axis as the ellipse b but having a greater major axis. By placing
 5 the end of the pointed rod 1 at the center of the desired ellipse and holding the rod 1 in a vertical position, the angle of the compass leg 10 may be set so that the distance between the points will be exactly equal to one-half the minor axis. By then moving
 10 the compass leg 10 into the plane of the rod 1 and its projection upon the surface, the inclination of the rod 1 will then be varied until the point of the compass leg 10 is at a distance from the point of the rod 1 equal to exactly one-half the major axis. The rod 1 is then
 15 rigidly held in this position by means of the supporting rod 4 and legs 6 and the desired ellipse will be formed on the surface by revolving the compass leg 10.

By setting the pointed rod 1 in a vertical position upon an inclined surface, the curve formed on that
 20 surface by the revolution of the compass leg 10 would be a perfect circle if projected to a horizontal plane, and will therefore be the exact curve formed by the cutting of a cylinder by a flange. Thus, my improved device may be employed for determining the size and
 25 shape of the opening required for the insertion of a round pipe through an inclined roof, for instance.

The device is very useful in drafting, and due to its simplicity and ease of adjustment, it will be found to have decided advantages over any apparatus for the
 30 purpose heretofore known.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In combination, a rod, means for holding said rod at any desired angle in respect to a given plane, a collar slidably mounted on said rod, a compass leg pivotally connected to said collar, and a curved plate adjustably connected to said collar and to said compass leg. 35

2. In combination, a pointed rod, a compass leg pivotally and slidably connected thereto, a second rod, a collar pivotally connected to the upper end of one of said rods and inclosing the other rod, means carried by said collar for rigidly securing the rod therein, and two legs rigidly secured together and adjustably connected to the lower end of the second rod and in the same plane as said rod. 40 45

3. In combination, a rod, means for supporting said rod at any desired angle in respect to a given plane, a collar slidably mounted on said rod, a block carried by said collar, a compass leg pivotally connected to said block, and means for adjusting the position of said compass leg. 50

4. In combination, a pointed rod, a collar pivotally connected to the end thereof, a second rod slidably mounted in said collar, means for rigidly holding said rod within said collar, two legs secured to the lower end of said last-mentioned rod, a collar slidably mounted upon the pointed rod, a block carried by said collar, a compass leg pivotally connected to said block, and means for adjusting the angle of said compass leg and keeping it in the adjusted position. 55

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 60

JAMES T. KELLEY.

Witnesses:

JOHN COHNEY,
WALTER H. KNAPP.