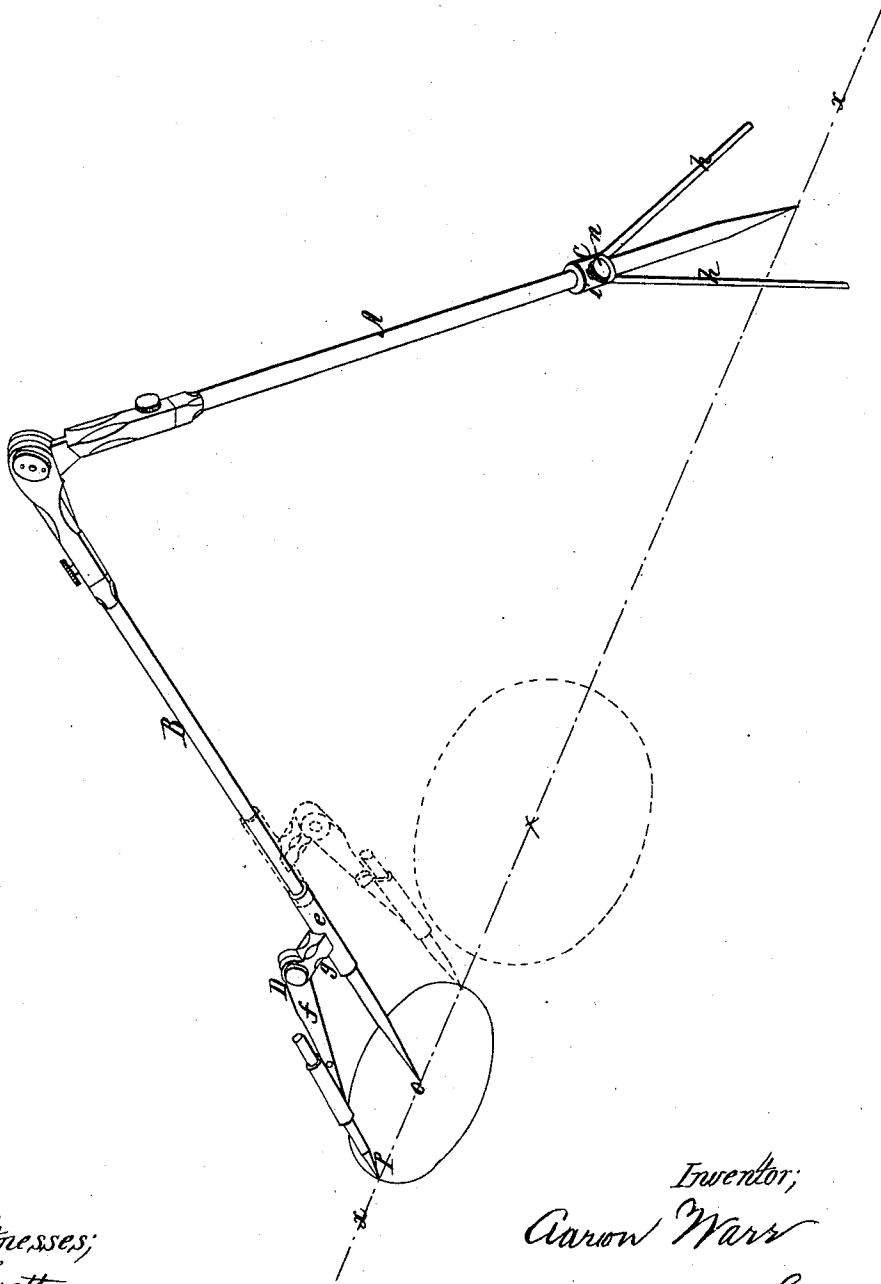


A. WARR.  
INSTRUMENT FOR DRAWING ELLIPSES.

No. 63,123.

Patented Mar. 19, 1867.



*Witnesses;*  
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*by J. Fraser & Co. attys*

# United States Patent Office.

AARON WARR, OF LOCKPORT, NEW YORK.

Letters Patent No. 63,123, dated March 19, 1867.

## IMPROVEMENT IN INSTRUMENTS FOR DRAWING ELLIPSES.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, AARON WARR, of Lockport, in the county of Niagara, and State of New York, have invented a certain new and improved Instrument for Drawing Ellipses; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, which is a perspective view of my instrument in the position for drawing an ellipse.

The object of my improvement is the construction of an instrument for the use of draughtsmen and others, by which ellipses of different sizes and of varying eccentricity can be readily described; and the invention consists of a pair of dividers, one leg of which is provided with a device for keeping the instrument, while it is being operated, in an upright position, while the other leg is provided with a sliding sleeve or collar, to which is jointed a suitable arm for holding the pen or pencil.

In the drawing, A B represent the two legs of an ordinary pair of compasses or dividers; C the double-bracing device attached to the former; and D the marking and operating device, consisting of the sliding sleeve *e*, and the pen and pencil-holder *f*, which is jointed to the sleeve *e*, or to a short arm, *g*, extending from the same, as represented. If required, this joint may be provided with any suitable attachment or set-screw for rendering it rigid, so as to prevent the possibility of any movement of the same as the ellipse is being drawn. The device C consists of two diverging legs *h h*, preferably attached to a collar, *i*, provided with a set-screw, *n*, for securing the same in place. These legs should be so adjusted that their feet will be in a line at right angles with the line *x x*, which connects the points of the legs A B of the dividers. If preferred, these braces may be rigidly attached, by welding or otherwise, to the leg A, in the position above described.

My improved instrument is operated as follows: From the centre *o*, of the ellipse to be described, a line, *x x*, is first drawn in the direction of the major or conjugate axis. The point *p*, of the pen or pencil, is next adjusted at a distance from the foot of B equal to half the minor or transverse axis of the ellipse. The foot of the leg D is then placed at the centre, *o*, and the foot of leg A adjusted along the line *x x*, at such a distance from the point *o* as will incline the leg B till the point *p* of the pencil, when brought in contact with the paper in the line *x x*, will be at one of the extremities of the major axis, as shown. The foot of A being fixed in this position, the braces *h h* prevent the top of the instrument from inclining to either side from a perpendicular. By turning the device D about its inclined axis B, the pen or pencil being kept in contact with the paper, will describe the required ellipse, the sleeve *e* sliding freely up and down its axis, as required, and represented in red lines.

From the above it will be readily perceived that an ellipse of any size that the dimensions of the instrument will allow (which may be of different sizes) may be readily drawn, and of an eccentricity that may be varied by inclining the leg B (as before described) more or less from a perpendicular, the ellipse approximating to a circle as the leg B becomes less inclined, as shown by the ellipse in red lines. The leg B and arm *f*, if desired, may either or both be provided with another joint similar in construction and use to that in common circular pens. The sleeve *e* should be of sufficient length to hold the pencil steadily, and should be loose enough upon the axis B to allow it to easily slide up and down the same.

The advantages of my improvement are obvious to those accustomed to drawing ellipses, the amount of time, labor, and vexation that is saved thereby, rendering the invention one of great importance. The instrument is also simple of construction. Besides, it is of such a nature as adapts it to drawing ellipses of much smaller size than the instruments now in use, and the ease with which the eccentricity can be varied is an advantage which has not, that I am aware of, been attained by any other instrument.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, with a pair of dividers, of the pen and pencil-carrier *f*, jointed to a sleeve *e*, or equivalent, which enables the device to slide up and down and turn upon the inclined bar or leg B of the dividers, arranged and operating substantially as set forth.

I also claim, in combination therewith, the double brace C, consisting of the legs *h h*, collar *i*, and set-screw *n*, substantially as and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

AARON WARR.

Witnesses:

WILLIAM MORSE.

SAML. MORSE.