

(No Model.)

S. HARDING.
ELLIPSOGRAPH.

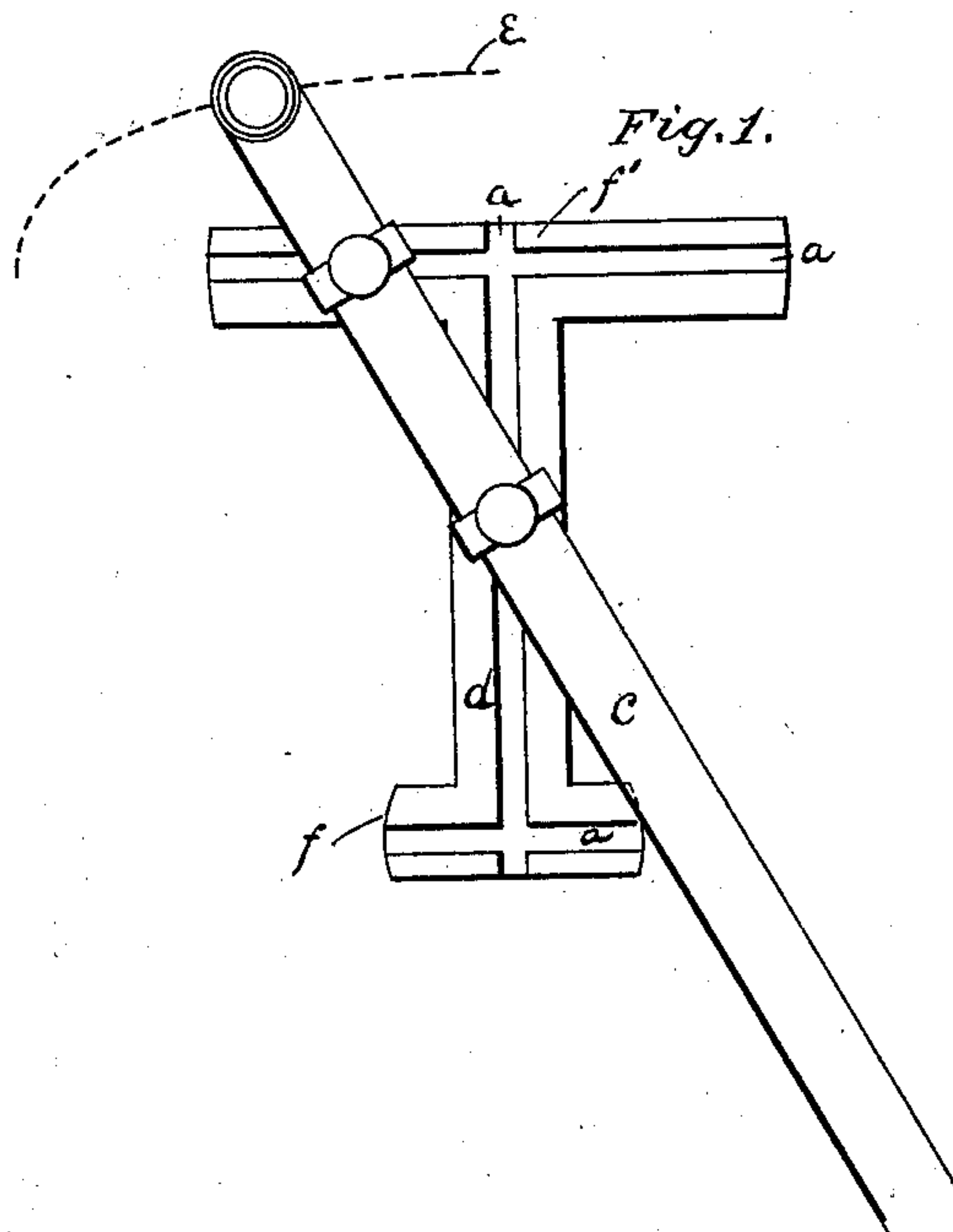
No. 364,758.

Patented June 14, 1887.

Fig. 2.



Fig. 3.



Witnesses:

J. A. Mudd

John P. Wright

Inventor:

Samuel Harding

by his attorney,

Edward P. Thompson

UNITED STATES PATENT OFFICE.

SAMUEL HARDING, OF ANSONIA, CONNECTICUT.

ELLIPSOGRAPH.

SPECIFICATION forming part of Letters Patent No. 364,758, dated June 14, 1887.

Application filed January 3, 1887. Serial No. 233,189. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HARDING, a citizen of the United States, and a resident of Ansonia, New Haven county, and State of Connecticut, have invented certain new and useful Improvements in Ellipsographs, of which the following is a specification.

My invention relates to an improvement in the mechanical construction of ellipsographs.

10 In the accompanying drawings, Figure 1 is a full view of the instrument. Fig. 2 is a view of the swivel-guides which operate in the grooves of the instrument; and Fig. 3 is a sectional view of that part of the instrument
15 which contains the grooves.

The instrument consists of a piece, *d*, containing three connecting-grooves, *a*, two of which are parallel to each other and the third of which is perpendicular to the other two, one
20 of the parallel grooves being considerably shorter than the other—*i. e.*, about one-half its length—and the said third groove connecting the two other grooves at their middle points. In these grooves the bar of the ellip-
25 sograph operates, the said bar carrying slides *b*, which slide in the grooves. The end of the arm *c* carries either a lead-pencil or a draftsman's pen adapted to make an elliptical curve, *e*.

30 This instrument is employed in a similar man-

ner to that of other ellipsographs. If the bar is mounted in the grooves, as shown in Fig. 1, an ellipse of comparatively small minor axis and comparatively large major axis may be drawn. By placing that slide nearer the mark-
35 ing-instrument in the groove shown in the lower part of Fig. 1 a very small ellipse may be drawn, much smaller than could be drawn by employing the groove in the upper portion of the figure.

The piece *d* may conveniently be called a
40 "frame" or "guide-support" for the pencil-bar.

I claim as my invention—

In an ellipsograph, the combination of a
45 frame containing two parallel grooves of unequal length and a third groove connecting their central points, and a pencil-bar having one of its slides fitting into said third groove and its other slide into one of the remaining
50 grooves, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 23d day of December, 1886.

SAMUEL HARDING.

Witnesses:

EDWARD P. THOMPSON,
JOHN P. WRIGHT.