

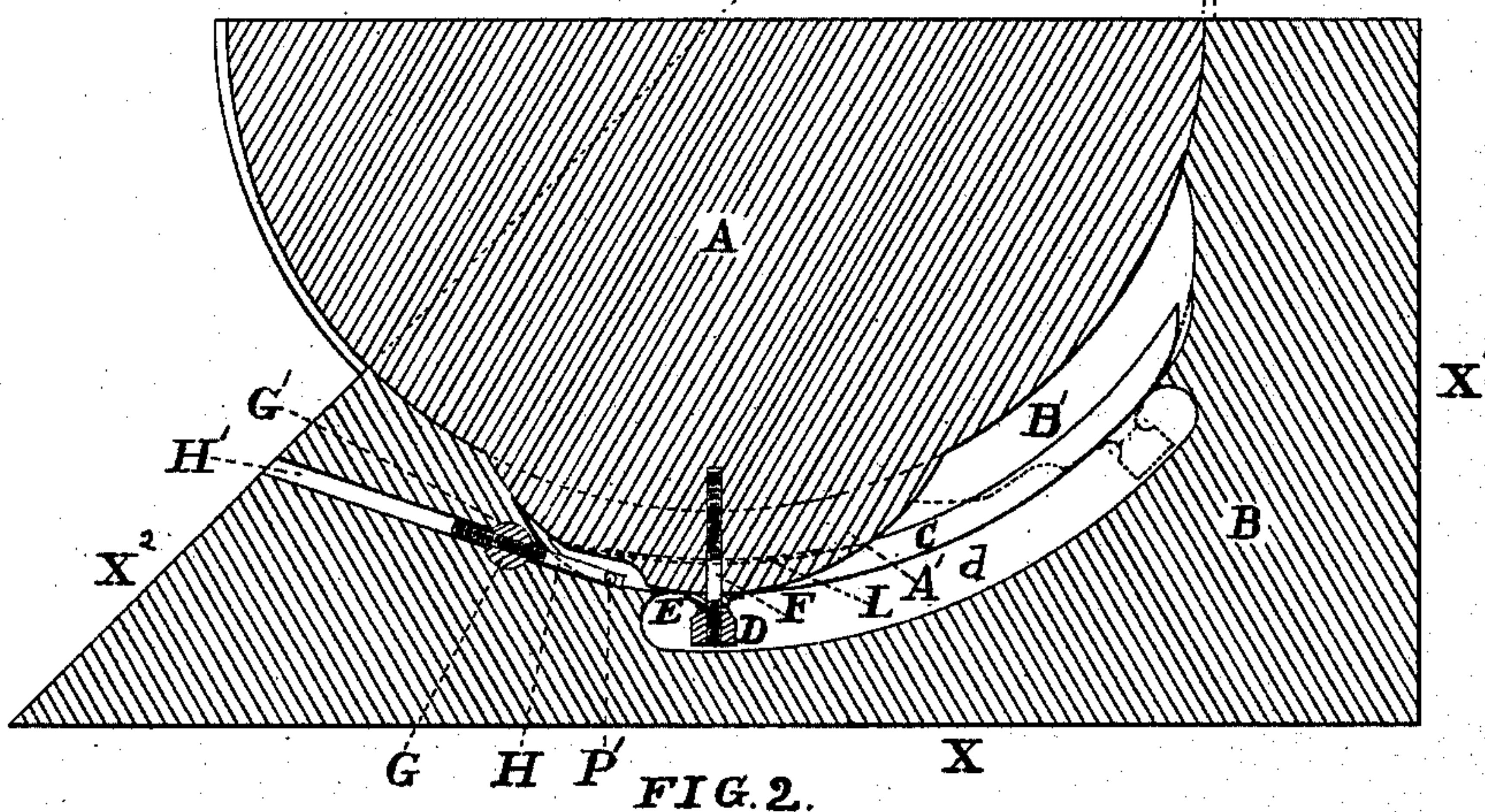
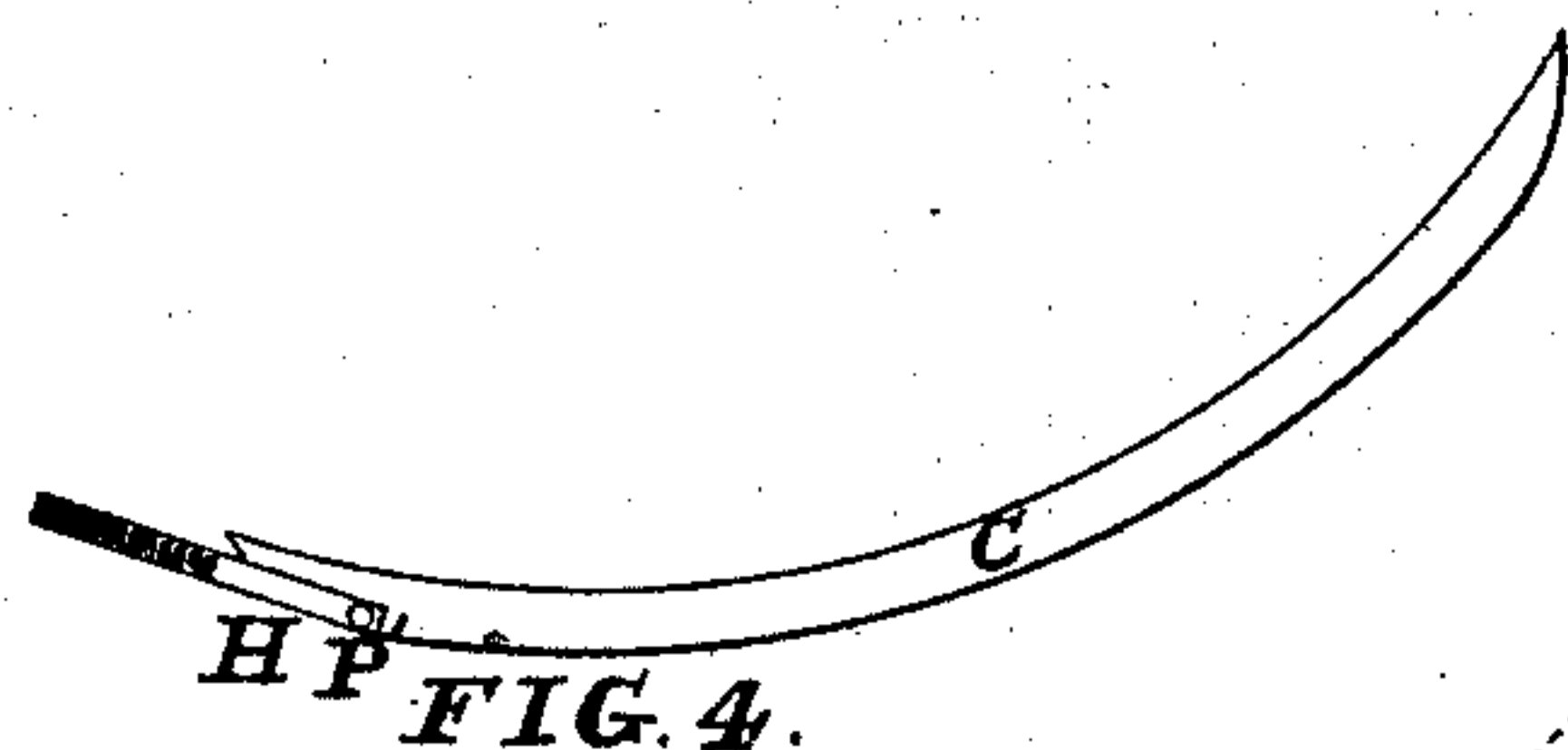
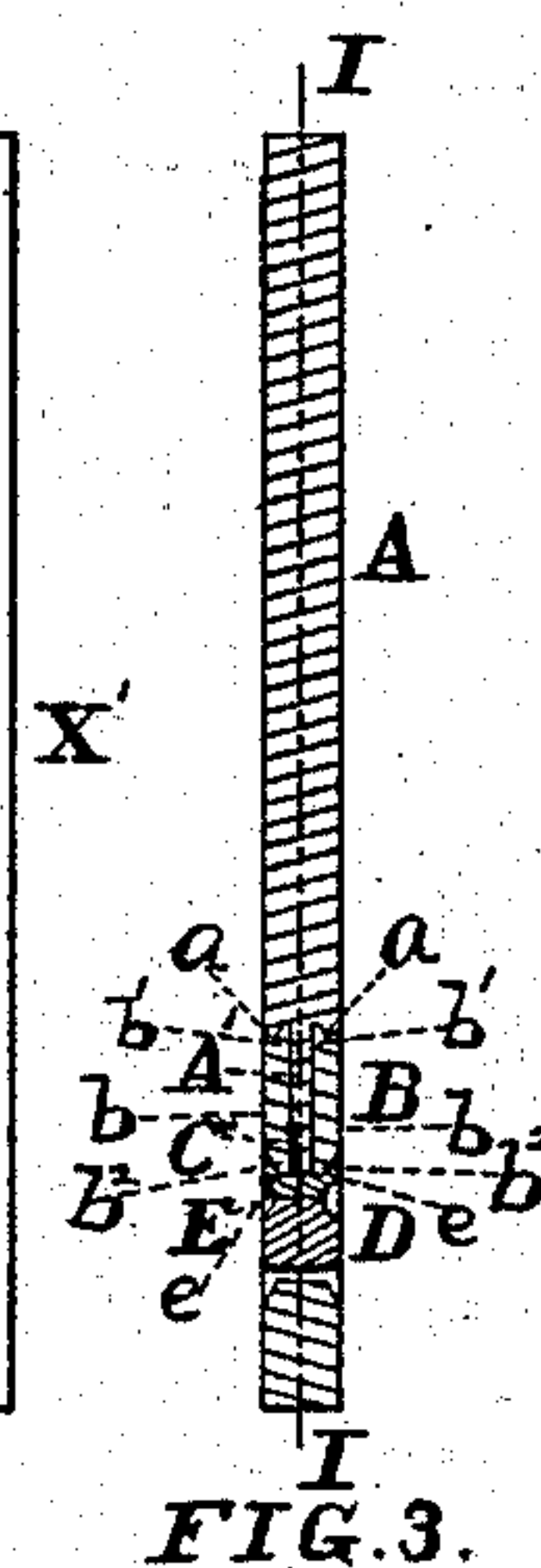
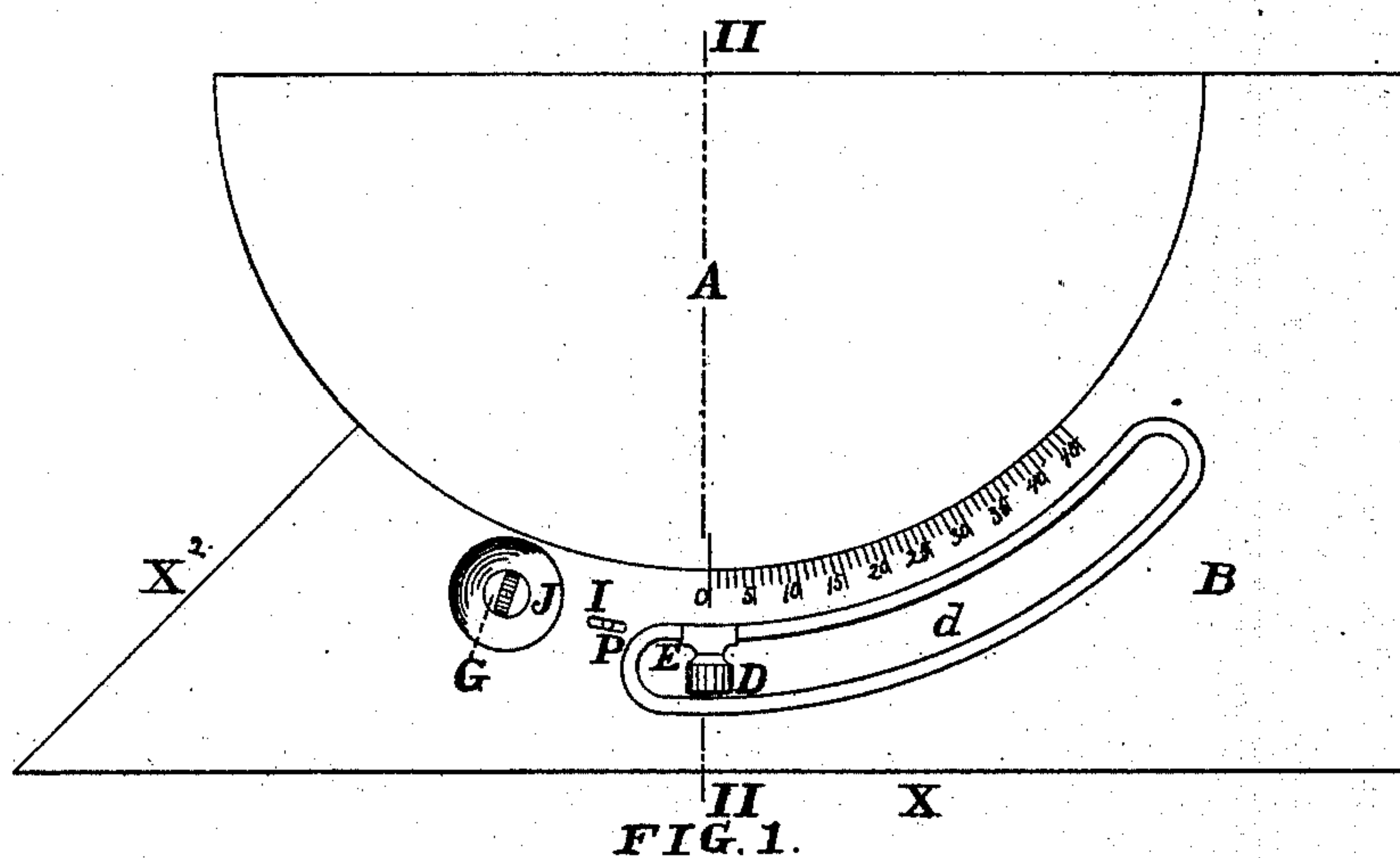
(No Model.)

C. E. DE PUY.

PROTRACTOR.

No. 413,497.

Patented Oct. 22, 1889.



WITNESSES

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PROTRACTOR.

SPECIFICATION forming part of Letters Patent No. 413,497, dated October 22, 1889.

Application filed August 22, 1888. Serial No. 283,497. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. DE PUY, of Jackson, Michigan, have invented a new and useful Protractor, of which the following is a specification.

My invention relates to that class of protractors in which a movable semicircular ruler turns in a frame having at least one straight edge, the angle being read from a graduated scale on side of circular parts; and its object is to provide for draftsmen a protractor which can be easily adjusted to any angle and clamped, so that it will remain fixed as long as desired, but with the adjusting and clamping screws so placed that the instrument can be used either side up without changing the adjustment or position of any of the parts. At the same time the instrument is light and convenient to handle. To accomplish this I prefer to make it of hard rubber, though it can be made of brass or other suitable material.

In the accompanying drawings, Figure 1 represents an outside view of the complete instrument; Fig. 2, a longitudinal section on line I I; Fig. 3, a cross-section on line II II; Fig. 4, a view of the segment for making fine adjustments.

Similar letters of reference represent corresponding parts.

In the drawings, letter A represents a semicircular movable ruler; B, a quadrilateral-shaped frame holding said ruler, having a side X and an end X' at right angles, the opposite end X² at an angle of forty-five degrees, and the opposite side formed with a semicircular depression corresponding to the semicircular side of A, and of sufficient depth to allow the straight side of A and the upper side of B not cut away to form one straight line when said straight side of A and long side X of B are parallel. From the center of the circular side of A projects a tongue A', its thickness being one-third that of main part of A, into a slot B' of sufficient length to allow ruler A to turn through an angle of forty-five degrees.

The screw F, nut D, and washer E are for the purpose of clamping the ruler A in any desired position, and being placed in slot d, with F screwed into A', they move with said ruler as it is turned to make the various angles.

On the circular edge of ruler A are grooves a a, of V or other suitable shape, which fit over corresponding elevations b' b' on B. The edges b² b² of the slot d are also beveled like b' b', and fit into corresponding angles e e in washer E in such a manner that the combination of the four beveled edges b' b' b² b² with the corresponding grooves a a e e the screw F and nut D so act when the nut D is tightened as to bring the parts A, A', B, and E into close contact. The tightening of nut D forces washer E against upper edge of slot d and also brings the circular edges of parts A and B together, but all the surfaces of contact being beveled, as hereinbefore described, the bringing of these surfaces together produces a lateral pressure on parts b b, which forces them against the sides of A, thus preventing the springing of these otherwise thin parts and making a firm joint. The groove a a and projection b' b' also serve to hold parts A and B in line sidewise when the nut D is loosened. The segment C, of some thin material, preferably steel, with the tangent screw H and nut G placed in annular openings H' and G', give a means of accurately adjusting ruler A to any desired angle. The circular edges of A and B are either or both (making a vernier) graduated in any suitable manner, so that the desired angle can be easily read from such graduated scale. The lower side of the projection A' has a small portion C', corresponding to the width and thickness of segment C, cut away, thus allowing said segment to be placed in slot B'. The outside of segment C has the same radius as upper side of slot d, thus allowing them to coincide. The notch C' is made slightly less in width than segment C, so that when nut D is tightened the washer E is first brought into contact with segment C, and that being in contact with the shoulder of C' the segment C and semicircle A are firmly fastened, so that a longitudinal movement of C gives a corresponding circular motion to A. The central part of shoulder of notch C' is cut slightly wider than at the outside, thus giving the space L, which allows segment C to spring slightly when nut D is further tightened after final adjustment by nut G has been made, thus allowing washer E to form firm contact with the parts, as hereinbefore described. The pin P passes through

the hole P' in segment C and moves in slot I, which prevents excessive movement of segment C in either direction. The annular depression J is formed to afford a convenient means of grasping nut G with the fingers.

The nuts D and G are made slightly less in diameter than the thickness of B, and being placed in the center of B they therefore do not project beyond the sides of said frame B, so that in using on the drawing-board the operator can use it either side up. This feature, in combination with the right angle of the frame, allows all possible angles to be obtained when the protractor is used with an ordinary T-square, straight-edge, or on a line, although the movable ruler turns but forty-five degrees.

The method of operation is this: When long side X rests on T-square, all angles from zero to forty-five degrees can be drawn, and when short side X' rests on T-square all angles from forty-five degrees to ninety degrees can be drawn. So by using the instrument on either side of T-square all possible angles can be drawn.

I am aware that prior to my invention protractors have been made with a semicircular ruler moving in a quadrilateral frame, having both ends at right angles and the adjusting and clamping screws on one side; others having a blade with a circle at one end, which turns in a corresponding circular opening made in a holding-frame, but with no adjusting or clamping screws.

I therefore do not claim such constructions; but

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

1. A protractor consisting of a frame with a part of a semicircular depression on one edge, a corresponding semicircular ruler turning in said depression, a projecting tongue

from one piece entering a corresponding slot in the other, and V-shaped grooves on edge of one of semicircular parts, one on each side of said tongue, fitting over corresponding V-shaped elevations on edge of other semicircular part, for purposes substantially as set forth.

2. A protractor consisting of a frame with a part of a semicircular depression on one edge, a corresponding semicircular ruler turning in said depression, projecting tongue and V-shaped grooves on semicircular edge of one piece fitting corresponding slot and V-shaped elevations on semicircular edge of the other, and a thumb nut and washer with V-shaped channel placed in a slot cut through side of protractor, so that said nut and washer are entirely contained between the two surfaces of sides of protractor, and being for the purpose of clamping the semicircular ruler, substantially as set forth.

3. A protractor consisting of a frame with a part of a semicircular depression on one edge, a corresponding semicircular ruler turning in said depression, a projecting tongue and V-shaped grooves on edge of one piece fitting corresponding slot and V-shaped elevations on the other and arranged to be clamped with a thumb-nut and V-shaped washer, and a segment of a circle of some thin metal placed in same slot that receives the before-described projecting tongue, and which is also clamped to said tongue by the before-described thumb-nut and V-shaped washer, said segment having on one end a tangent screw and thumb-nut, by means of which accurate adjustments of semicircular ruler can be made in the manner hereinbefore described.

CLARENCE E. DE PUY.

Witnesses:

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E. R. LEWIS.