

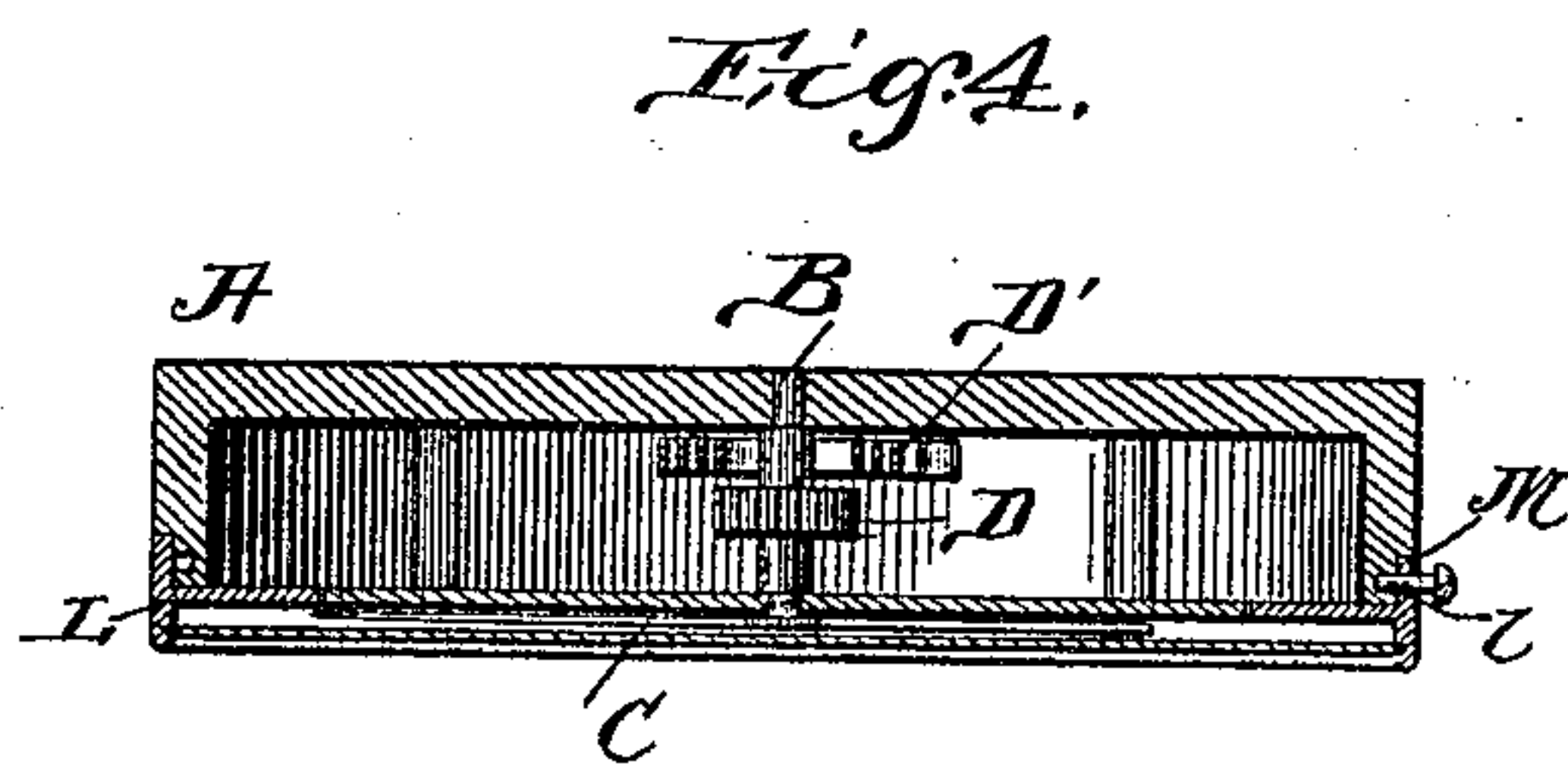
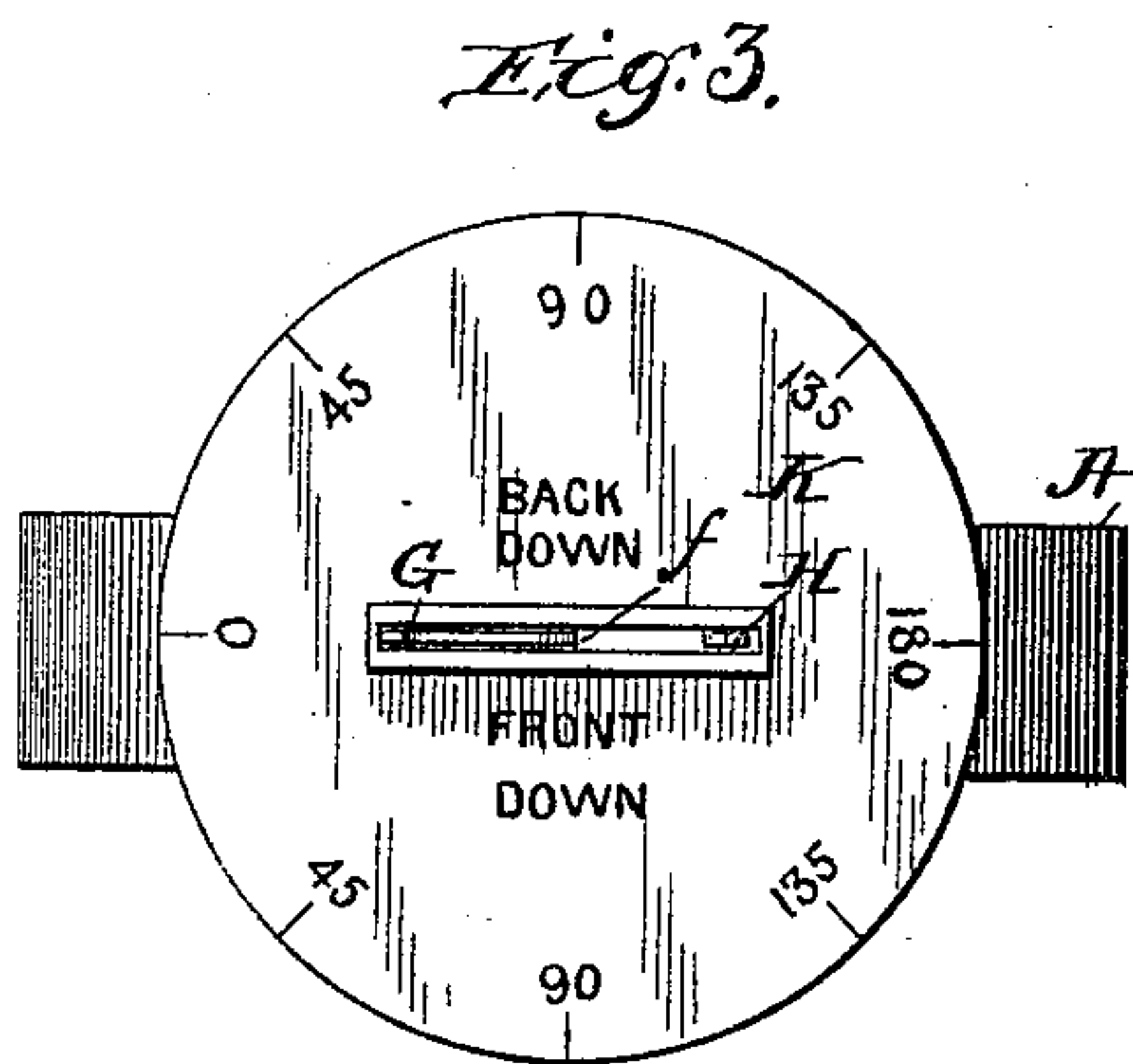
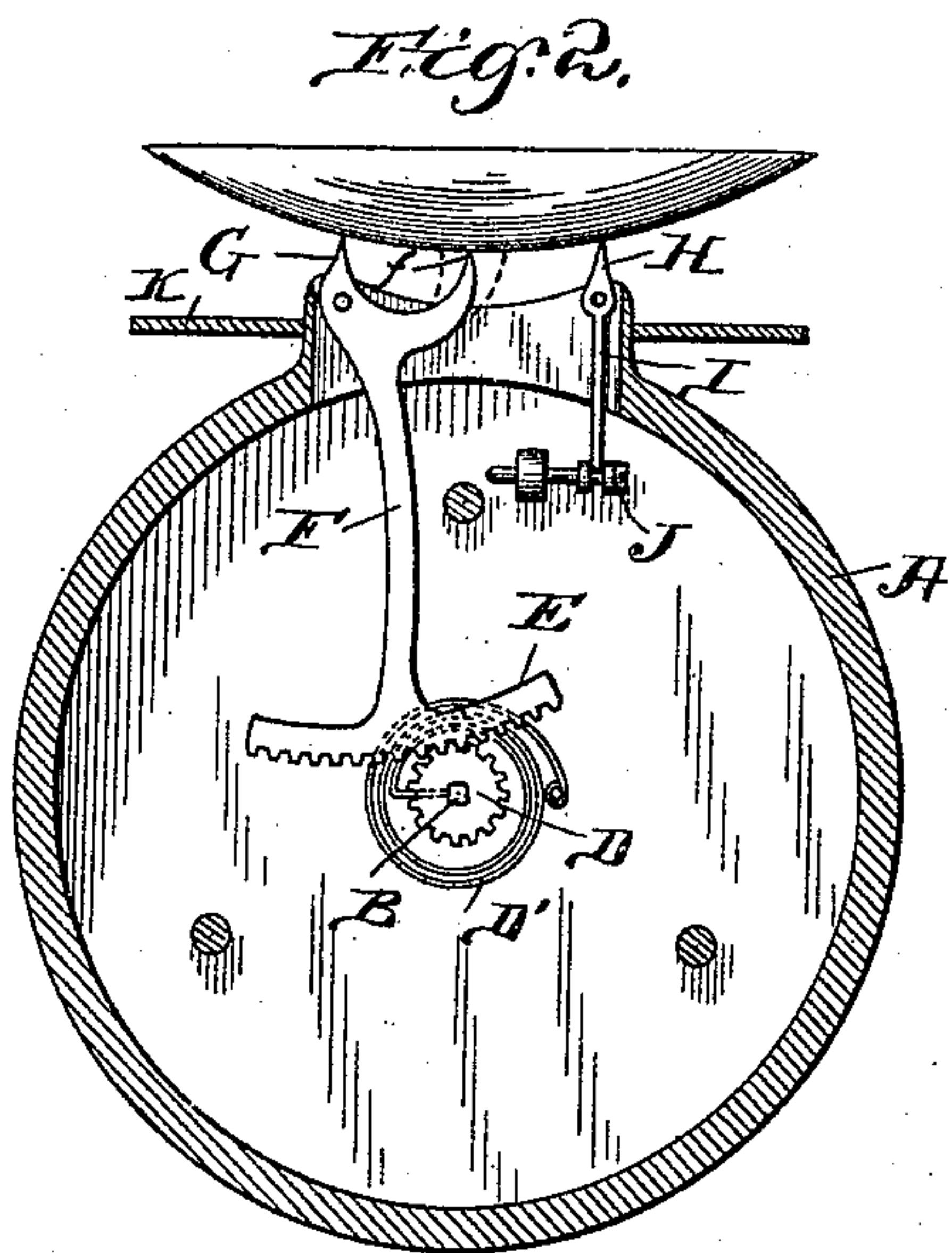
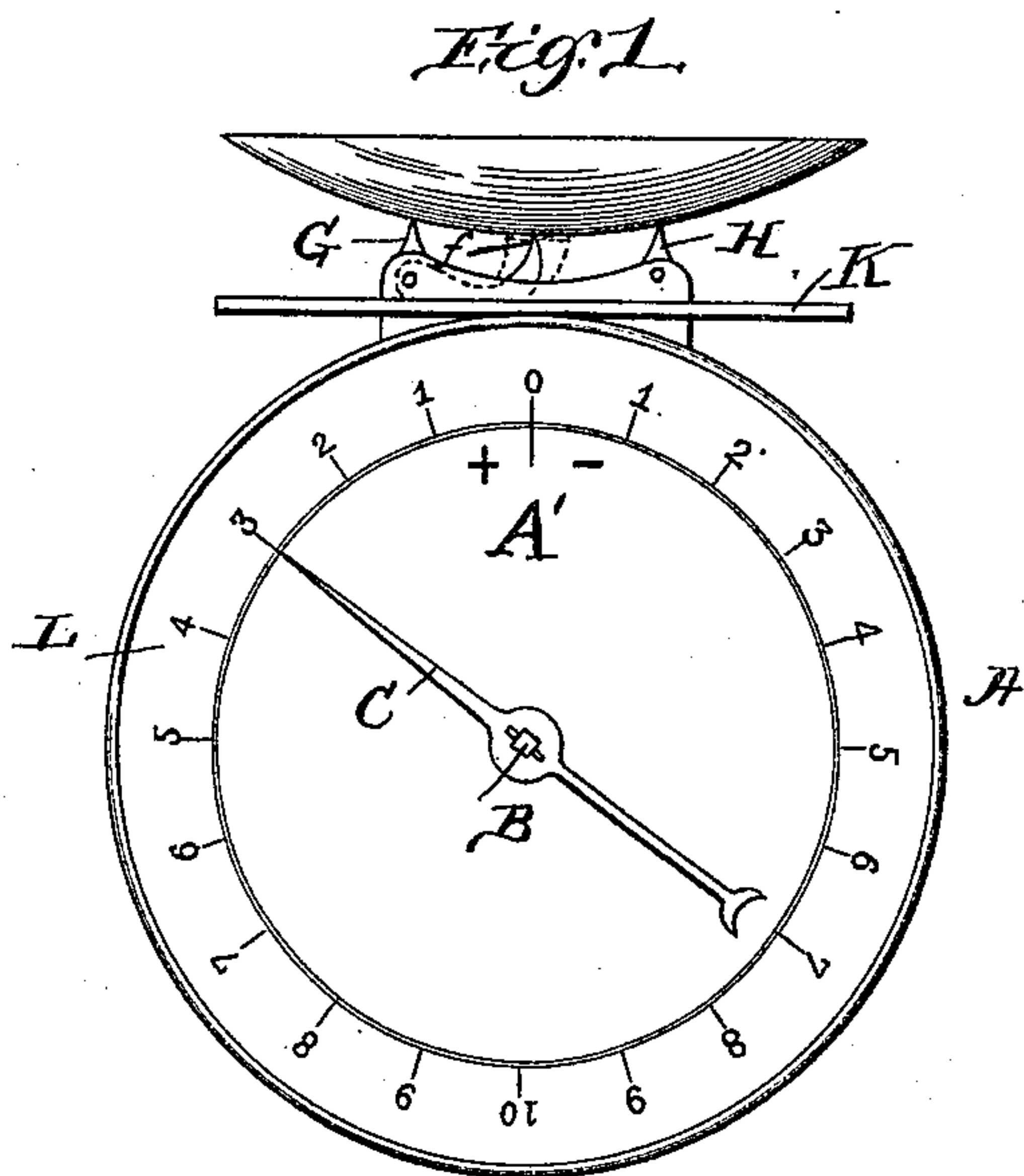
(No Model.)

J. T. BRAYTON.

GAGE FOR DETERMINING THE RADIUS OF CURVATURES.

No. 464,601.

Patented Dec. 8, 1891.



Witnesses:

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UNITED STATES PATENT OFFICE.

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GAGE FOR DETERMINING THE RADIUS OF CURVATURE.

SPECIFICATION forming part of Letters Patent No. 464,601, dated December 8, 1891.

Application filed March 25, 1891. Serial No. 386,294. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. BRAYTON, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Gages for Determining the Radius of Curvature, of which the following is a specification.

The instrument described herein belongs to the same class as that shown in my former patent, No. 447,276, and it fulfills in the main the same purposes.

One object of the improvements described herein is to simplify the construction and secure greater delicacy in the working of the parts, so as to facilitate the use of the instrument.

Additional adjustments and scales are provided, as hereinafter described.

My invention consists in parts and combinations hereinafter named.

In the drawings, Figure 1 is a side view of my improved instrument. Fig. 2 is a section thereof. Fig. 3 is a plan view, and Fig. 4 is a central cross-section.

A is the case of the instrument, in which is journaled a pivot B, carrying an index or pointer C. Said pivot carries, also, a pinion D, Figs. 2 and 4, with which a segmental gear E meshes. Said gear is formed upon or attached to one extremity of a bell-crank lever F, the other end of which forms a contact-point *f*, situated midway, or approximately so, between bearing-points G H. Said bearing-point *f* may be a sharp point, as shown in full lines, or it may be broadened, as shown in dotted lines, so as to present more than a single bearing-point or a bearing-surface. Attached at one end to the pivot B and at the other end to the case A is a helical spring D', which, acting through the pinion and gear D E and the bell-crank lever F, tends to project the contact-point *f* outward. One of the bearing-points, as H, is formed upon a finger I, which is pivoted to the casing A, and the opposite extremity of the finger I engages with an annular groove in the screw J, so that by turning the screw in or out the finger I is shifted. The bearing-point G may be rigidly attached to the case A, as seen in Fig. 1; or it may be a projection from the lever F, as indicated in Fig. 2. The latter arrangement is

preferable on some accounts, as the lever F and its attached gear E may be made of a sheet of steel which permits the convenient hardening of both the points *f* and G and minimizes the effect of wear upon the pivot of the lever F, as the relative positions of the points *f* and G are not affected thereby.

I contemplate using, ordinarily, but three points, all of which lie in the same plane as in the instrument described in my former patent above referred to; but some features of my present invention are applicable to an instrument having more than three contact-points. The use of the instrument for measuring cylindrical lenses and ascertaining the location of the axis thereof involves the use of but three contact-points, and in connection with such arrangement of the contact-points I herein provide a dial K, a face view of which is shown in Fig. 3. Said dial lies in a plane perpendicular to the plane of the contact-points, and its center is in line with the contact-point *f*, or approximately so. It is graduated in degrees, beginning with zero, in the plane of the contact-points and numbering up to one hundred and eighty degrees both ways from said zero-point. For convenience of use, one half of the dial has marked upon it the word "Back," and the other has the word "Front" and the word "Down," indicating that when the position of the axis of a cylindrical spectacle-lens with reference to the longest direction of said lens is measured by the dial the reading of one or the other side of the dial is to be taken, accordingly as the back or front of the lens may be against the contact-points.

For the purpose of ascertaining by direct reading the power of a lens having two curved surfaces I have provided in this instrument a movable annular dial L, a face view of which is seen in Fig. 1 and a section of which is seen in Fig. 4. Said annular dial is fitted to the case in any suitable manner—as, for example, by a depending lip *l*—and is kept in position by a screw M, the end of which projects into a groove in the case.

To use this dial in the measurement of a lens having a curvature on both sides, the dial is first set so that the zero-mark on the dial corresponds to that upon the fixed front

plate A' of the case and the convexity or concavity of one side of the lens is ascertained. The dial is then shifted a corresponding amount one side or the other of the zero-point, the direction depending on whether the surface just measured is convex or concave, and the other side of the lens is then measured. The reading of the dial will show the combined curvature of the two sides of the lens.

10 The purpose of the adjustment of the contact-point H is to compensate for any inaccuracy which may exist in the construction of the instrument.

It is obvious that as the bearing-points G H are brought closer together a given curvature of the lens will have less effect upon the movable contact-point f , and vice versa. As the points G and H are more widely separated the movement imparted to the contact-point f will be greater. By this means the movement imparted to the contact-point, and consequently to the index C, will be so regulated as to make the readings correspond with any desired degree of exactness to the curvature of the lenses measured, and in this way, also, the variation in the refracting power, if any, of the material of which the lenses are composed may be allowed for where the scale upon the dial L is such as to show directly the focal length of the lens. The scale upon the dial may also show the radius of curvature of the lens, if desired.

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

35 1. The combination, in a curve-measuring instrument, of a plurality of bearing-points and a relatively-movable contact-point which is formed upon one arm of a bell-crank lever, the other arm of which lever carries a seg-

mental gear meshing with a pinion actuating a pointer moving over a dial which indicates the relative positions of said contact and bearing points, substantially as described.

2. The combination, in a curve-measuring instrument, of a plurality of bearing-points and a relatively-movable contact-point connected to mechanism adapted to indicate its movements, the distance of one of said bearing-points being adjustable to or from the other point or points, substantially as described.

3. The combination, in a curve-measuring instrument, of a plurality of bearing-points and a relatively-movable contact-point connected to mechanism adapted to indicate its movements, one of said bearing-points being formed upon a pivoted finger, whereby its distance from the other points may be adjusted, substantially as described.

4. The combination, in a curve-measuring instrument, of bearing-points, a relatively-movable contact-point, and mechanism for indicating the movements of said contact-point, and an adjustable dial for taking the readings of said indicating mechanism, substantially as described.

5. The combination, in a curve-measuring instrument, of bearing-points and a movable contact-point, all lying in the same plane, mechanism for indicating the movements of said contact-point, and a dial, as K, at right angles to the plane of said contact-points, substantially as described.

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