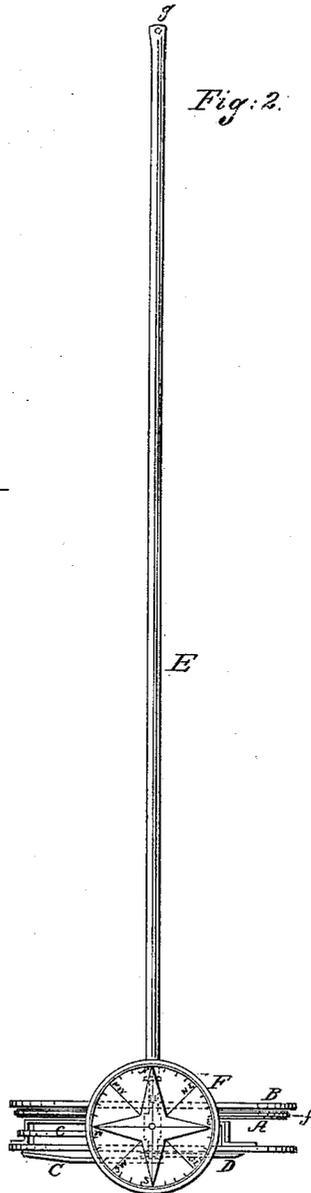
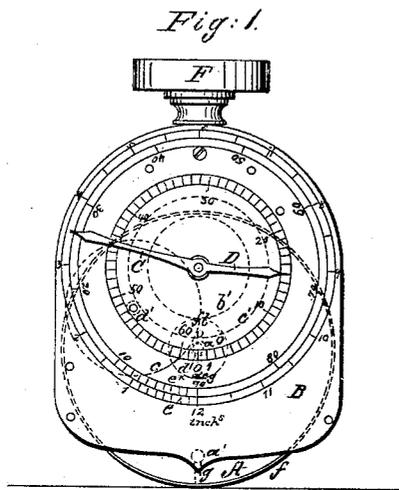


E. V. LAWRENCE.
Rotary Measure.

No. 37,002.

Patented Nov. 25, 1862



Witnesses:
Timothy Shive
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UNITED STATES PATENT OFFICE.

EDGAR V. LAWRENCE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ROTARY-DISK MEASURES.

Specification forming part of Letters Patent No. 37,002, dated November 25, 1862.

To all whom it may concern:

Be it known that I, E. V. LAWRENCE, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Rotary-Disk Measure; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a face view of my invention. Fig. 2 is a plan or top view of the same.

Similar letters of reference in both views indicate corresponding parts.

The object of this invention is an improvement in that class of measures in which the perimeter of a rotary disk is used for the purpose of determining the linear dimensions of plane or curved surfaces.

The invention consists in the combination, with the rotary disk, and with the cog-wheels which transmit the motion of said disk to the index-hands, of a case of known width, which incloses the whole measure, with the exception of a small portion of the disk, and which is provided with a pointer in such a manner that the disk can be started accurately from any desired point, and at the same time the instrument is inclosed in a small compass and can conveniently be carried in the pocket.

It consists, further, in the application to the periphery of the rotary disk of a strip of india-rubber or leather, for the purpose of preventing the disk from slipping while being carried over the surface to be measured.

It consists, further, in the application to the case which incloses the measuring-disk and wheels of a pointed radius-bar, in combination with a suitable scale marked on the dial-plate of the case in such a manner that by inserting the point of the radius-bar in the point of the angle and carrying the disk over the arc measuring said angle the number of degrees contained in the arc, and also its length, may be determined with ease and facility.

It consists, finally, in the arrangement of a compass, inserted into the handle, which serves to carry the disk over the surface to be measured in such a manner that the direction in which the disk moves can be observed at every point.

To enable those skilled in the art to make

and use my invention, I will proceed to describe it with reference to the drawings.

A represents a disk, made of sheet metal or any other suitable material, and secured to an arbor, *a*, which has its bearings in the front and back plates of the case B. The perimeter of this disk is equal to six or any other known number of inches, and said disk, which rotates freely on its arbor, protrudes below the lower edge of the case, so that on bringing the latter down upon the surface to be measured in an upright position the edge of the disk comes in contact with said surface, and if the case is then moved over the surface the disk rotates. The case is provided with a pointer, *a'*, so that the disk can be started accurately from any desired point. The width of the case is exactly two (or any other known number of) inches, and the distance of the pointer is equal to one-half the width of the case from either edge, so that in measuring a line which terminates in a corner, by adding one inch, or half the width of the case, to the number indicated by the instrument, the correct measurement is obtained. The rotary motion of the disk is transmitted to the index-hands C D by means of wheels *b b'* *c c'* and pinions *d d'*. The wheels *b b'*, which impart motion to the index C, are so proportioned in relation to the perimeter of the disk that one complete revolution of said index indicates exactly one foot or twelve inches traversed by the disk, and the pinions *d d'* and wheels *c c'*, which impart motion to the index D, are of such a size relatively, when compared with the perimeter of the disk, that one revolution of the first index produces one-sixtieth part of a revolution of the second index. Scales *e e'* are engraved on or otherwise attached to the front plate of the case, one for the index C, to indicate the number of inches, and one for the index D, to indicate the number of feet traversed by the disk A.

In applying the disk A to a smooth surface, if the metallic edge of the same would be allowed to come in immediate contact with said surface it would be liable to slip and an inaccurate result would be the consequence. To obviate this difficulty, I have applied to the edge of the disk a thin strip, *f*, of india-rubber, leather, or other suitable material, by inserting the same in a groove turned in said

edge in such a manner that it projects very slightly beyond it, and that the diameter of the disk is not materially changed, and at the same time a slipping of the same is prevented.

E is a radius-bar provided with a point, *g*, at one end, and arranged at the other end with a screw-thread screwing into a socket in the back plate of the case. This radius-bar is intended to measure angles; and this object is effected in the following manner: The point *g* is inserted in the point of the angle, and the disk A is now carried over the arc, which measures said angle. If the length of the radius-bar is known the actual length of arcs of smaller or larger diameters can easily be found by calculation. The number of degrees of the arcs to be measured are determined by a scale, *e**, on the dial-plate. This scale shows the number of degrees from 0 to 90; but it will be easily understood that by a suitable change in the wheels and pinions the scale *e** might be made to indicate minutes and parts of minutes, and in the same manner the scale *e*' might be made to indicate fractional parts of inches, if it should be desirable; or the wheels might be so arranged that by means of the disk-measure a line of certain known length could be divided in any desired number of parts. The handle F of the case is turned out in the shape of a small cup or cylindrical box to receive a paper card marked with the points of direction and fixed to a magnetic needle, thus constituting a regular compass, whereby the direction can be determined in which the disk moves. This compass attachment is of particular value in laying out maps or in surveying or in determining the course of a vessel on sea.

In its simplest construction, without the compass and radius-bar, my instrument will be of particular value for mechanics or draftsmen for the purpose of determining the dimensions of plain or curved surfaces. With the radius-bar and compass it will be used with advantage by surveyors and other persons in laying out maps or making trigonometrical calculations, and it may be attached to theodolites or other instruments for measuring with a graduated scale, for the purpose of observing with perfect accuracy measurements of straight or curved lines.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the cylindrical case B with its pointer *a*', in combination with the rotary disk A, wheels *b b' c c' d d'*, and index-hands C D, all constructed and operating in the manner and for the purpose shown and described.

2. The application of a strip, *f*, of india-rubber or other suitable material, to the edge of the rotary disk A, when said disk is used as and for the purpose set forth.

3. The arrangement of the radius-bar E with point *g*, in combination with the case B, carrying the measuring-disk wheels and indices, all constructed and operating substantially as and for the purpose described.

4. The use of a compass, in combination with the handle F of the case B, as and for the purpose specified.

EDGAR V. LAWRENCE.

Witnesses:

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