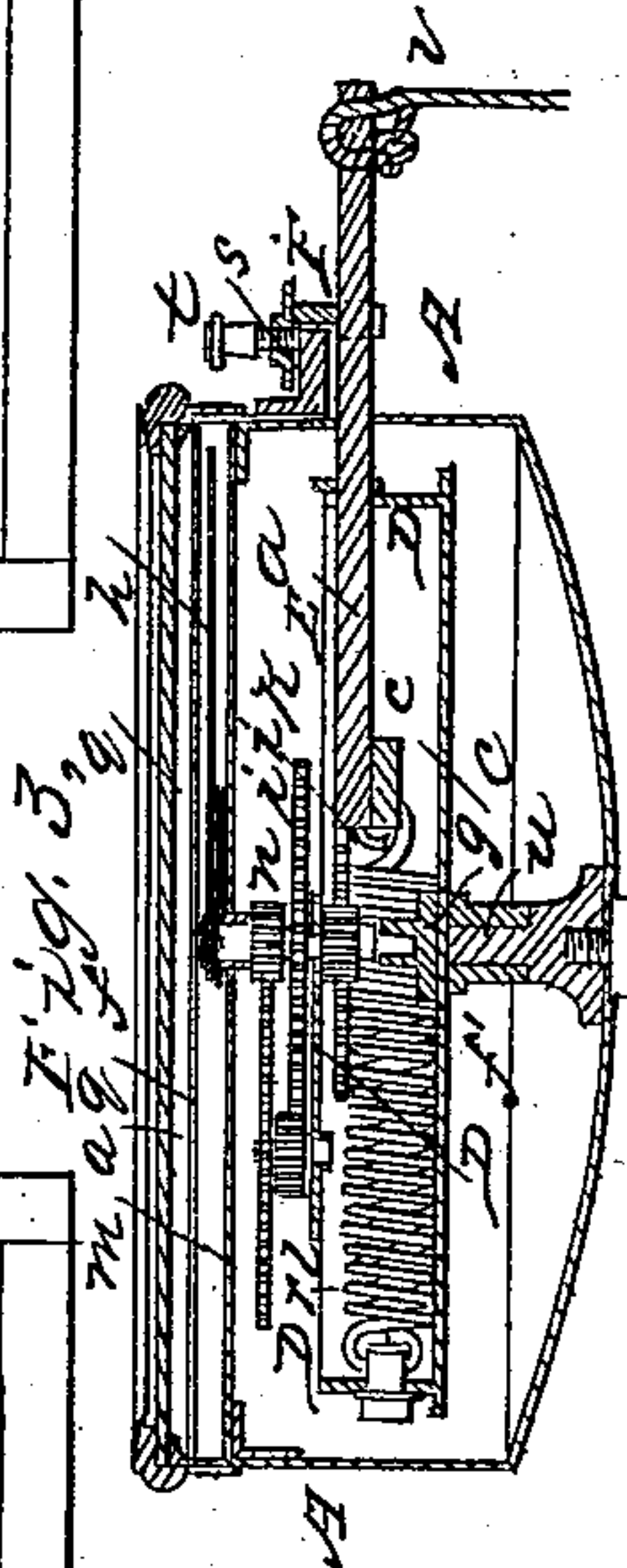
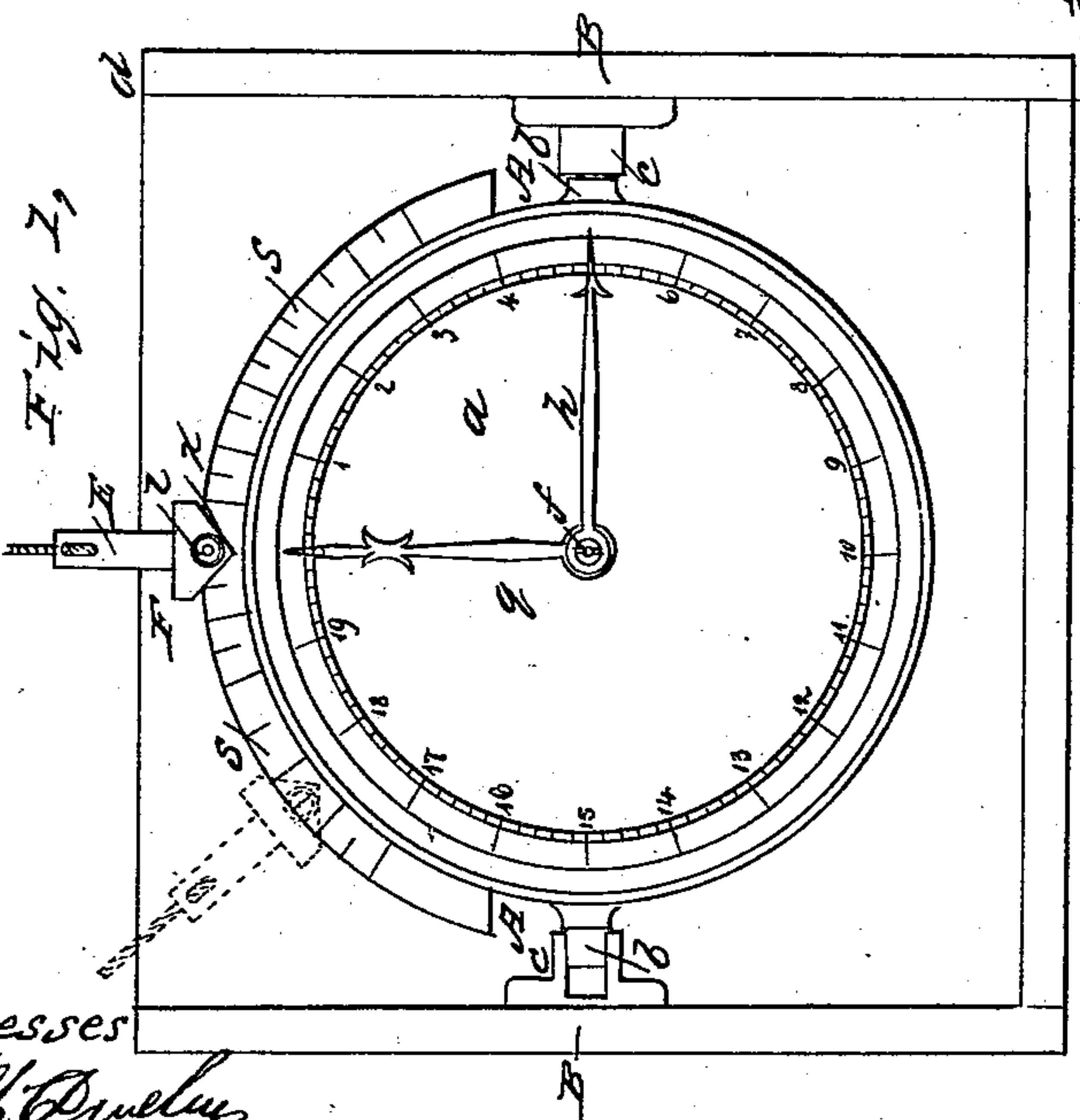
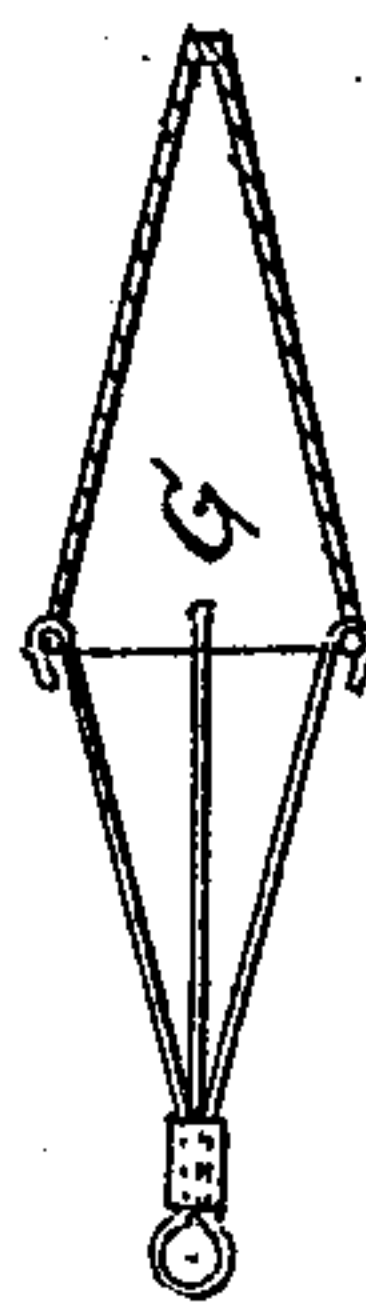
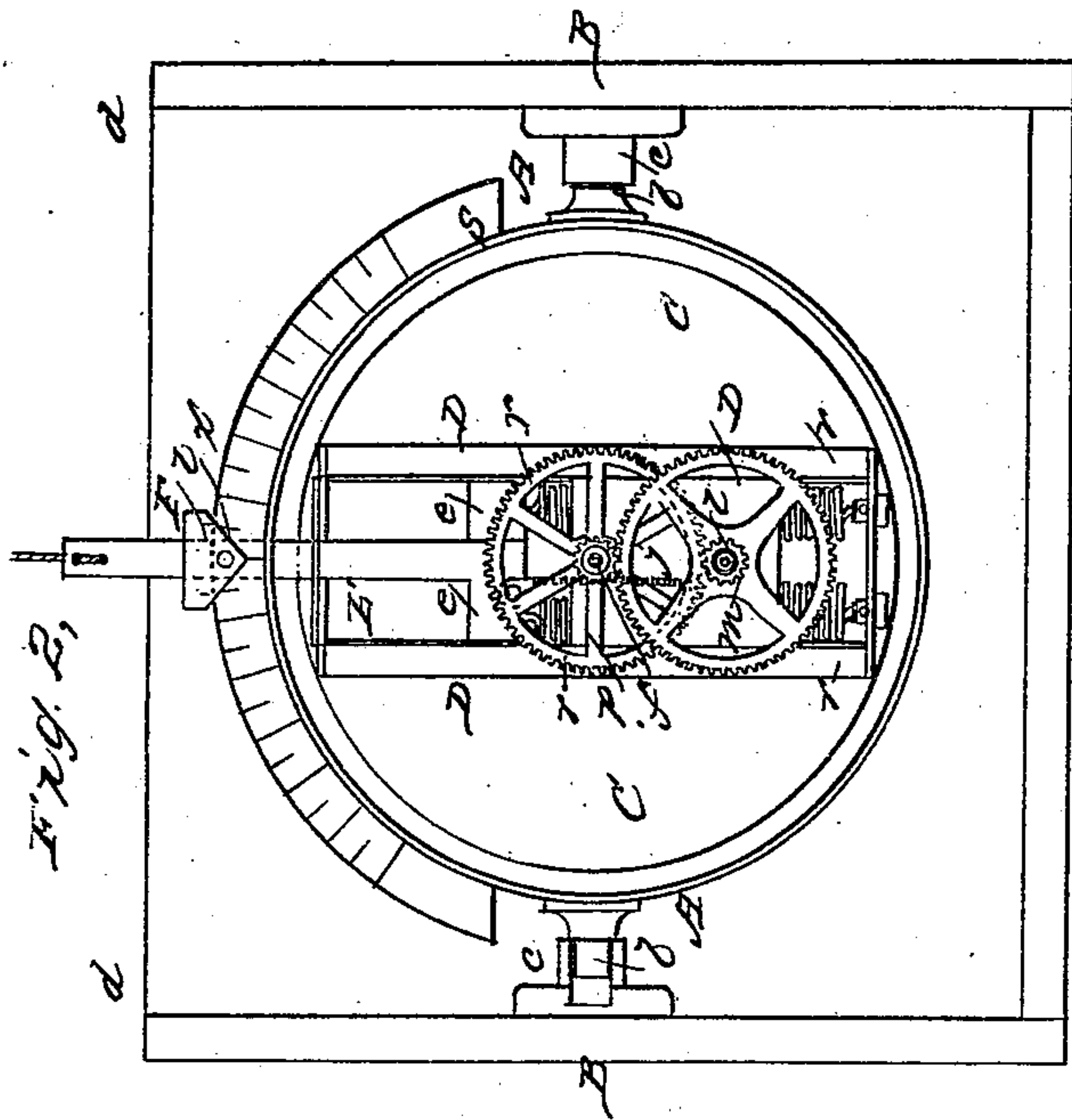


A. E. LOZIER.

Marine Log and Leeway Indicator.

No. 41,932.

Patented March 15, 1864.



Witnesses  
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# UNITED STATES PATENT OFFICE.

A. E. LOZIER, OF NEW YORK, N. Y.

## IMPROVEMENT IN MARINE LOGS AND LEEWAY INDICATORS.

Specification forming part of Letters Patent No. 41,932, dated March 15, 1864.

*To all whom it may concern :*

Be it known that I, A. E. LOZIER, of the city, county, and State of New York, have invented a new and Improved Marine Log and Leeway Indicator; 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, forming part of this specification, in which—

Figure 1 is a plan of the instrument complete. Fig. 2 is a plan of the interior, as exposed to view by the removal of the dial. Fig. 3 is a vertical section of the same without its box.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a certain novel arrangement of a dial, indices, gearing, and springs, in combination with a slide which has attached to it by a line of suitable length a chip bucket or float, which by dragging in the water astern of a vessel while the instrument is arranged upon the taffrail is made to produce a greater or less draft upon the slide and tension upon the springs according to the speed at which the vessel passes through the water, thereby causing the slide so to act through the gearing upon the indices as to indicate upon the dial the speed of the vessel in miles and fractional portions thereof. In order that the draft of the line may be always direct upon the slide, the case of the instrument, containing the springs, gearing, dial, and slide, is balanced on journals or between centers. The invention further consists in so arranging the several working parts of the instrument as to permit the whole to turn within the case, that when the vessel is making leeway the slide may be drawn by the line and chip or float to a position oblique to an imaginary line passing longitudinally through the vessel and so indicate the leeway upon a graduated scale provided on the case of the instrument.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the case which contains the working parts of the log, made of circular form and furnished with a dial, *a*. This box is furnished with two journals, *b b*, on which it is balanced in such a manner that it will hang with its axis in a vertical position and with the dial

upward and in a horizontal position. These journals are received in bearings *c c* in a box, B, which may either be permanently secured on the center of the taffrail of a vessel or furnished with hooks or other means of attaching it to the center of the taffrail when it is desired to ascertain the speed of the vessel. The back of this box is either open, as shown at *d d*, or made with a door which may be opened when it is desired to ascertain the speed. C is a circular plate arranged to turn on a pivot, *u*, secured in the center of the bottom of the case A. To the top of this plate there is secured a parallel-sided frame, D, the sides of which serve as guides to the T-shaped head *e* of the slide E, the stem of which passes out through a horizontal slot in the back of the case A and through a guide, F, which is adjustable upon a projecting flange, *s*, formed on the back part of the exterior of the case E and extending about or nearly half-way round the same. This guide is provided with a set-screw, *t*, by which it can be secured upon the flange *s*.

*f* is the index-spindle, fitted to turn in one bearing, *g*, secured on the center of the plate C, and to another bearing in the top of the frame D and passing through the center of the dial, outside of which the index *h* is secured to the said spindle. *i* is a toothed pinion secured on the said spindle *f*, and gearing with a toothed rack, *j*, which is secured to the slide E parallel with the stem thereof for the purpose of producing a rotary movement of the index by the longitudinal movement of the slide. The spindle *f* has also secured to it a spur-wheel, *k*, which gears with a pinion, *l*, which turns freely on a fixed stud, *m*, secured to the top of the frame D, and this pinion has secured to it a spur-gear, *m*, which gears with a pinion, *n*, on a sleeve, *p*, which is fitted to turn freely upon the spindle *f*, and which carries a second index, *q*. The said pinions and spur-gears have relatively such numbers of teeth that the index *q* will make one complete revolution for every twentieth part of a revolution made by the index *h*. The T-shaped head of the slide E is connected with the frame D by means of the two spiral springs *r r*, arranged parallel with each other, one on each side of the spindle *f*, and these springs, when in their normal condition, hold the slide E and its attached rack *j* in such position that the



gearing keeps the two indices at the zero-point of the dial.

The dial is represented as graduated all around in twenty equal parts representing miles, and numbered from 0 to 19, and these twentieth parts are subdivided in fifths. The index *h* is to indicate miles and the index *q* twentieth and hundredth parts of miles.

The slide *E* has attached to its outer end by the line *v* the small bucket *G*, or any other device which, like the "chip" of an ordinary log, will meet with some resistance in being drawn through the water. The line *v* may be about one hundred and fifty feet long, but the best length will depend somewhat upon the height of the taffrail of the vessel, a higher vessel requiring a longer line.

To ascertain the speed of the vessel, the box *B* having been attached to the center of the taffrail, the guide *F* is secured by the set-screw *t* directly behind the index-spindle, as shown in Fig. 2, and in black outline in Fig. 1, and the bucket or chip *G* thrown overboard. The resistance which the water offers to the bucket or chip being drawn through it, which is greater or less according to the speed of the vessel, causes the slide *E* to be drawn out a greater or less distance, in opposition to the action of the springs *r r*, till the increasing tension of the springs balances the resistance of the water and thereby causes the indices to be moved upon the dial; and the springs having been properly adjusted, the indices indicate upon the dial the speed at which the vessel is moving through the water, the index *h* indicating miles and the index *q* twentieths and hundredth parts of miles. In this operation the case *A*, being balanced on the pivots *b b*, assumes the same inclination as the line *v*, so that the draft of the said line is directly

in line with the slide *E* and unnecessary friction upon the said slide is prevented.

To provide for ascertaining the leeway which a vessel is making, the upper surface of the flange *s* is graduated in divisions corresponding with the points of the compass. When the leeway is to be found, the set-screw *t* is unscrewed to release the guide *F* and allow the slide *E*, the plate *D*, and all the mechanism within the case *A* to turn about the pivot *u*. The draft produced on the line *v* by the bucket or chip *G* then draws the bar *E* in one direction or the other, as shown in red outline in Fig. 1, according to the direction of the leeway, till the bar *E* has the same direction as the line and becomes stationary. The point *x* of the movable guide *F* then indicates on the graduated upper surface of the flange *s* the number of points of leeway.

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

1. The combination of the case *A*, slide *E*, springs *r r*, line *v*, chip or bucket *G*, rack and gearing *j i k l m n*, indices *h q*, and dial *a*, the whole applied, arranged, and operating substantially as herein set forth.

2. The balancing of the case *A* on pivots or journals *b b*, substantially as and for the purpose herein specified.

3. The attachment of the slide *E*, gearing, and springs of the log to a plate, *C*, or its equivalent, which is capable of turning within the case *A* in such manner that by the use of a suitable scale outside of the box the slide may serve to indicate the leeway.

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Witnesses:

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