

(No Model.)

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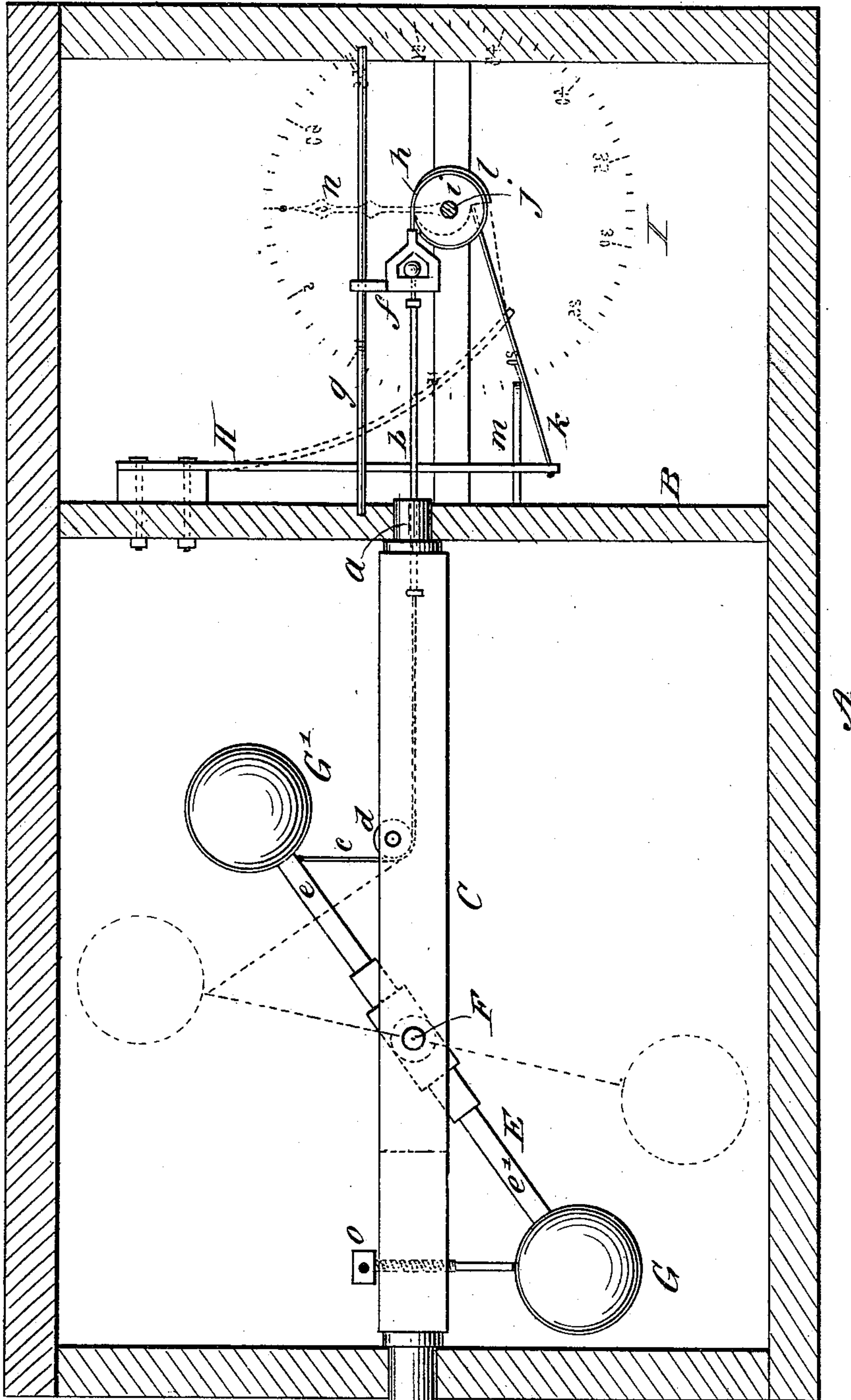
H. HERDEN.

CENTRIFUGAL SPEED INDICATOR.

No. 338,841.

Patented Mar. 30, 1886.

*Fig. 1.*



WITNESSES:

*Donn Twitchell*  
*C. Sedgwick*

INVENTOR:

*H. Herden*

BY

*Munn & Co.*

ATTORNEYS.

(No Model.)

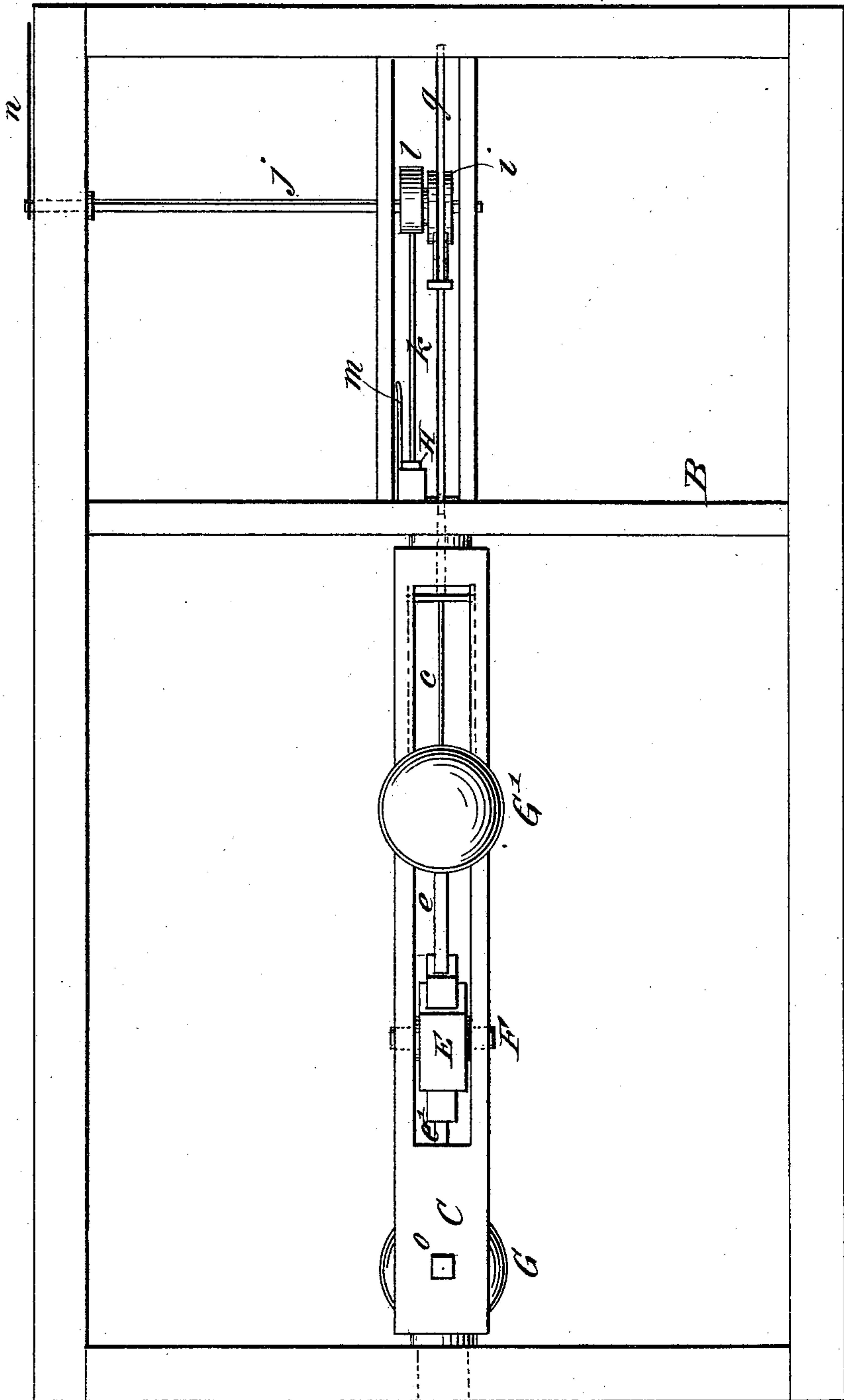
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*Fig. 2.*



WITNESSES:

*Donn Twitchell.*  
*C. Sedgwick*

INVENTOR:

*H. Herden*

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ATTORNEYS.



# UNITED STATES PATENT OFFICE.

HENRY HERDEN, OF CORNING, NEW YORK.

## CENTRIFUGAL SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 338,841, dated March 30, 1886.

Application filed November 14, 1885. Serial No. 182,837. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY HERDEN, of Corning, in the county of Steuben and State of New York, have invented a new and useful  
5 Improvement in Centrifugal Speed-Indicators, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a front elevation showing the inclosing-case in section, and the dial and index in dotted lines. Fig. 2 is a side elevation with the side of the casing removed.

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

15 My invention relates to the class of speed-indicators in which the indicating mechanism is actuated by the centrifugal action of weights receiving motion from the machinery whose speed is to be indicated.

20 My invention consists in a slotted shaft and a two-armed lever pivoted therein, and provided with weights on the ends thereof, and, in combination therewith, of an index and a spring for opposing the centrifugal action of  
25 the weights of the lever.

It also consists in means for preventing the vibration of the weighted lever when the indicator is running at a low speed.

The casing A, in which all of the parts of  
30 the speed-indicator are contained, is provided with a transverse partition, B, and in the partition B and end of the casing A is journaled a shaft, C, which projects through the end of the casing, and is provided with a pulley, D.  
35 The portion of the shaft C between the partition B and the end of the casing A is preferably made rectangular in cross-section, and is slotted to receive the lever E, which is pivoted on the pin F, passing transversely through  
40 the shaft C. The arms *e e'* of the weighted lever E, upon opposite sides of the shaft C, are of equal length, and are provided with weights G G'. The journal *a* of the shaft C, which is received in the partition B, is made  
45 hollow, and a rod, *b*, extending through the journal *a*, is connected with a cord, *c*, which passes under a pulley, *d*, hung in the slot of the shaft C, and which extends into the slot of the shaft, the end of the cord being at-  
50 tached to the arm *e* of the lever E. The opposite end of the rod *b* is attached by a swivel-joint to a slide, *f*, which moves along a guide-

rod, *g*, secured in the casing A, parallel with the axis of the shaft C. The slide *f* is attached to one end of a cord, *h*, which is wound  
55 once around and secured to the drum *i* on the spindle *j* of the indicator. A flat spring, H, secured at one end to the partition B, is connected at the opposite end with a cord, *k*, attached to the smaller part of a snail, *l*, secured  
60 to the spindle *j*, so that as the cord *k* is wound upon the snail it is received on a continually-increasing diameter. A spring, *m*, projecting from the partition B at right angles to the  
65 spring H, bears against the side of the spring H with sufficient friction to modify the movements of the spring and the weighted lever carried by the shaft C when the indicator is used for indicating low speeds; but the length  
70 of the spring *m* is less than the distance through which the spring H moves, so that the spring H, during the latter part of its outward excursion, leaves the spring *m*. The  
75 free extremity of the spring *m* is bent backward away from the spring H, so that when the spring H retracts it may readily pass the end of the spring *m*.

Upon the outside of the casing A is formed a dial, I, as indicated in dotted lines in Fig. 1.

The spindle *j* extends through the side of  
80 the casing, and is provided with an index, *n*, which turns in front of the dial I.

The shaft C is provided with a transverse screw, *o*, for limiting the movement of the  
85 lever E.

The speed-indicator receives its motion through a belt, *p*, from the machinery whose speed is to be indicated. As the shaft C revolves, the centrifugal action of the weights G G' tends to bring the lever E into position  
90 at right angles with the shaft C. The centrifugal action of the weights G G' is opposed by the spring H, through its connection with the spindle *j*, and the connection of the drum *i* with the arm *e* of the lever E, in the manner  
95 already described. An increase in the speed of the shaft C by increasing the centrifugal action of the weights G G' tends to put the spring H under greater tension, and by unwinding the cord *h* on the drum *i* and winding  
100 the cord *k* upon the snail *l* the spring secures a greater advantage over the action of the weights G G'.

When the indicator is employed to indicate



low speeds, the tendency of the weighted lever to vibrate under a light pull of the spring H is opposed by the bearing of the spring *m* against the side of the spring H.

5 By employing a single lever, E, with equal arms *ee'* and the weights G G', arranged in the manner described, the weighted lever is affected only by centrifugal action. Any lateral or longitudinal movement of the indicator  
10 will produce opposite effects upon the weights G G', which would neutralize each other. For this reason my improved speed-indicator is especially adapted for use on railway-trains and steam-vessels where it is liable to be sub-  
15 jected to shocks from various directions.

The indicator is adapted to the machine in connection with which it is to be used by applying a pulley, D, of the required diameter, or by adapting the graduations of the dial I  
20 to the speed to be indicated.

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

1. In an indicator, the combination, with a  
25 shaft carrying a weighted lever, of the spring opposing the movements of said lever and connected to a spindle, said spindle also being connected to said lever and carrying an index, substantially as set forth.

30 2. In a speed-indicator, the combination of the slotted shaft C, the two-armed lever E and

weights G G', attached thereto, the spindle *j*, means for connecting the spindle with the weighted lever, a spring, H, connected with the spindle, and an index, *n*, carried by the  
35 end of the spindle, substantially as herein specified.

3. In a speed-indicator, the combination of the shaft C, the two-armed weighted lever E, the cord *c*, rod *b*, slide *f*, cord *h*, drum *i*, spin-  
40 dle *j*, snail *l*, cord *k*, and spring H, substantially as herein specified.

4. In a speed-indicator, the combination, with a weighted lever, E, and spring H, opposing the centrifugal action of the weighted  
45 lever, of a spring, *m*, arranged to bear against the side of the spring H, substantially as herein specified.

5. In a speed-indicator, the combination, with the shaft C and the weighted lever E, of  
50 the screw *o*, for limiting the motion of the lever E, as herein specified.

6. In a speed-indicator, the combination of the shaft C, weighted lever E, cord *c*, guiding-  
55 pulley *d*, rod *b*, slide *f*, guiding-rod *g*, cord *h*, drum *i*, spindle *j*, snail *l*, cord *k*, spring H, and spring *m*, substantially as herein described.

HENRY HERDEN.

Witnesses:

WM. H. PAINTER,  
THOS. KENNEDY.