(No Model.)

J. NAYLOR, Jr.

SPEED INDICATOR.

No. 514,865. Patented Feb. 13, 1894.

Fig 1

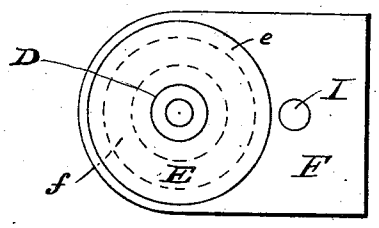


Fig 3

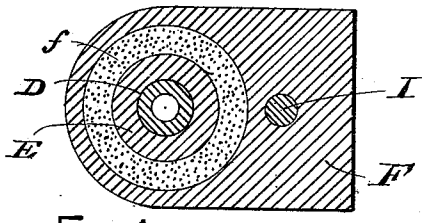


Fig 4

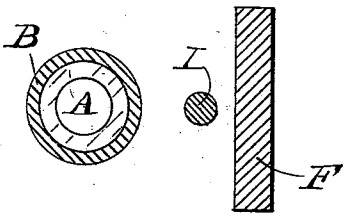


Fig 5

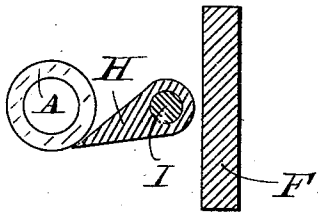


Fig 6

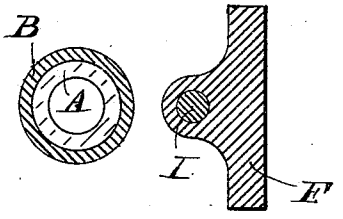


Fig 7

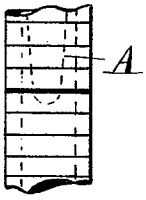
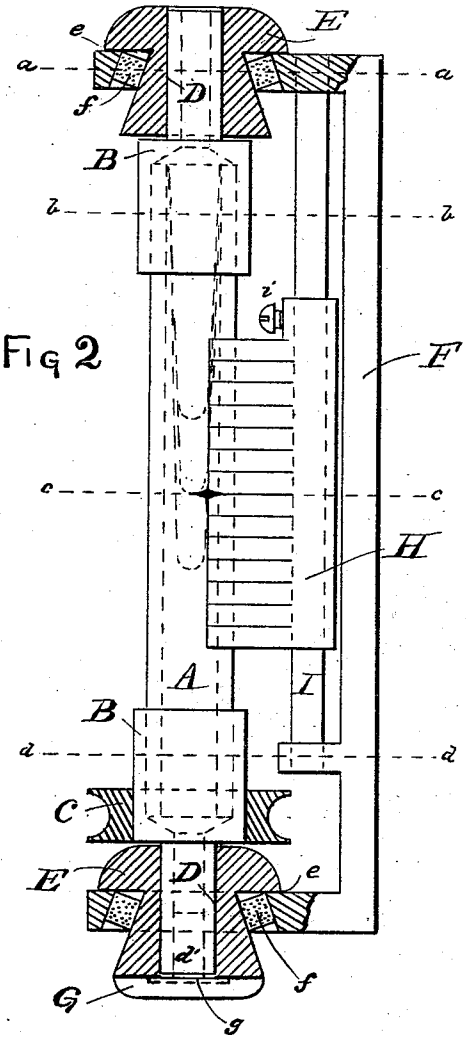


Fig 2



WITNESSES:

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SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 514,865, dated February 13, 1894.

Application filed March 30, 1893. Serial No. 468,406. (No model.)

To all whom it may concern:

Be it known that I, JAMES NAYLOR, Jr., a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Speed-Indicators, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to produce an article in salable shape that will indicate any speed and variations of speed at sight, and it consists of a novel arrangement of parts as will be hereinafter described, and of its operation in such a manner as will also be hereinafter set forth.

Figure 1 is a top plan view; Fig. 2 a part sectional side elevation; Fig. 3 a horizontal section on lines *a a;* Fig. 4 a like section on lines *b b*, and Fig. 5 the same on line *c c*, and Fig. 6 on line *d d*, Fig. 7 being a portion of the glass tube showing a modification of the index.

The drawings represent the indicator full size.

A is a glass tube hermetically sealed and almost filled with refined glycerine, so as to leave an empty space within it. Any liquid will answer, but glycerine is preferred for ordinary uses; alcohol may be used when extreme sensitiveness is required. This glass tube has metal gudgeons B B fitted on to each end, the lower one having a pulley C thereon, to which a belt or friction band may be applied to revolve it.

D D are the journals and are solid with, and a part of the gudgeons B B; holes are drilled through as shown by the dotted lines which serve at the upper end for an oil chamber and at the lower end for the insertion of a hardened steel plug *d'*.

The whole revolving parts previously described, are mounted in the bearing boxes E E, these being made preferably of close grained wood; said boxes being held in a novel manner to the frame F.

The bearing boxes E E have projecting shoulders *e e*, to overlap the openings in the frame F, and below the shoulders *e e*, the external diameter of the boxes, and the internal diameter of the openings through the frame, increase as they extend downward and between these diameters is inserted a rubber or yielding ring *f*. By this simple arrangement the boxes are held to the frame; the shoulders *e e* prevent them from going down and the rubber ring holds them from going up. The rubber rings are also held in place by the conical shape of the lower part of the box. This construction allows a free oscillatory or gyratory movement to the bearing boxes E E and thus renders the revolving parts self-balancing. To the bottom of the lower box is secured the piece G into which is inserted a hardened steel step *g* on which the plug *d'* rests to support the weight of the whole revolving parts. An index plate H is secured to the rod I by set screw *i*, and is vertically and horizontally adjustable. There is a pointer at, or about its vertical center and shown on the dotted line *c c*, and above and below this pointer, the plate may be marked into divisions, representing variations from the normal speed. The plate is made adjustable, to provide for a quick and accurate adjustment in first setting, or of any change in speed either fast or slow; or to make the indicator either right or left to suit any direction of light. The plate may be omitted and instead of it, the normal point may be marked around the glass tube by a heavy line, and the division lines marked by lighter lines above and below it, as shown in Fig. 7; and on any change of speed these marks must be correspondingly changed to meet the changed location of the normal point.

In operation, it is fastened up at any convenient location, and a speed of three thousand revolutions per minute (more or less) given to the revolving parts from the motor or machines it has to indicate the speed of. When the normal speed has been determined then the pointer of the index plate H is set to the indication in the glass as shown by the dotted line. Any variation in speed will show the indication in the glass above or below this normal point, viz. slower above and faster below as represented by the dotted lines.

The principle on which this invention acts

is centrifugal force, and gravity; the liquid being heavy seeks the periphery, while at the axis gravity exerts its influence where the centrifugal force has none, and thus the indication appears.

The curvature and size of the indication in the glass is the same at, above or below the normal point, the dotted lines shown in the drawings being a correct representation thereof.

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

1. A sight speed indicator consisting of a vertically revolving transparent tube, a contained fluid, gudgeons B B having the solid extending journals D D and the grooved pulley thereon in combination with the open frame F, bearing boxes E E, and rubber rings *f f* as shown and described.

2. The combination with a vertical revolving transparent tube, a contained fluid, gudgeons having extending journals and a grooved pulley, of the yielding bearing boxes and open frame as shown and described.

3. In a sight speed indicator the revolving parts consisting of the glass tube, the contained fluid, gudgeons having the extending journals and grooved pulley, all secured and moving together integrally and suitably mounted in the bearing boxes and frame so as to be well exposed, in combination with the rod I and the vertically and horizontally adjustable index-plate, as shown and described.

4. The bearing boxes E E having the shoulders *e e* and conical shaped extension, the frame F having the opening also conical, in combination with an intervening rubber or yielding ring as described, and for the purpose set forth.

5. In a speed indicator the combination with a supported and revolving glass tube containing an indicating fluid; of an adjustable index-plate supported on the rod I, said plate having a central projection or equivalent to serve as a normal mark, and graduation marks above and below it as herein shown and described.

6. In a speed indicator the combination with an index-plate mounted upon a vertical rod, said plate tapering to an edge so that the face of same may be set at a tangent to the glass tube, and means to secure the same at proper elevation; of the supported and integral revolving parts as herein set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 5th day of December, A. D. 1891.

JAMES NAYLOR, JR.

Witnesses:
N. C. MCNAUGHTON,
JOHN A. JOHNSON.