C. S. BURTON.

CENTRIFUGAL SPEEDOMETER.

APPLICATION FILED MAR. 20, 1913.

1,089,746.

Patented Mar. 10, 1914.

2 SHEETS—SHEET 1.

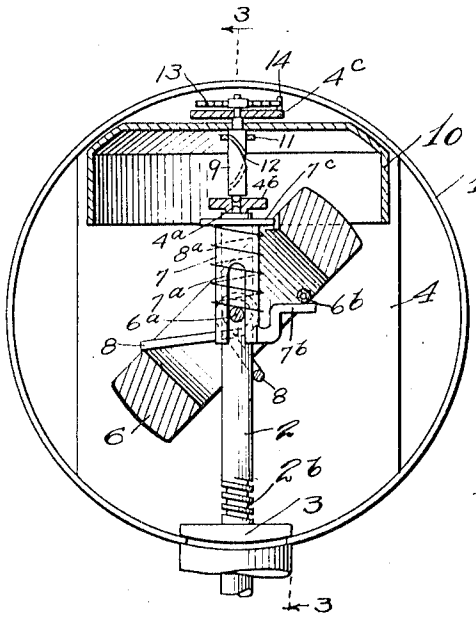
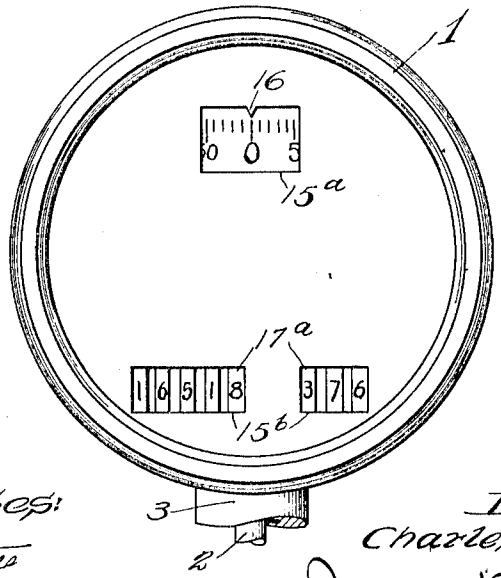


Fig. 2.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

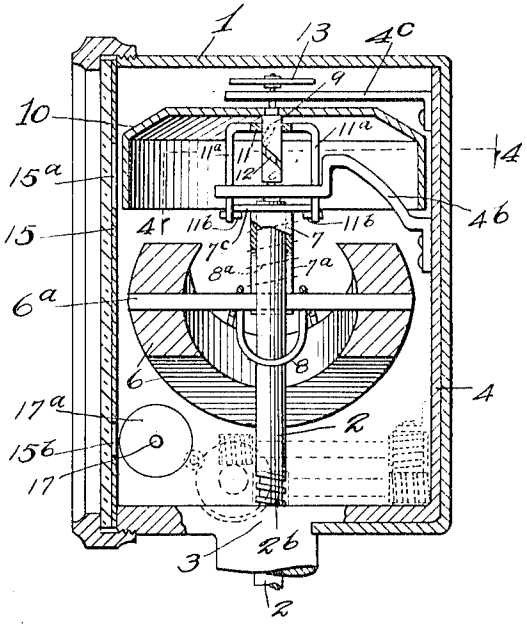
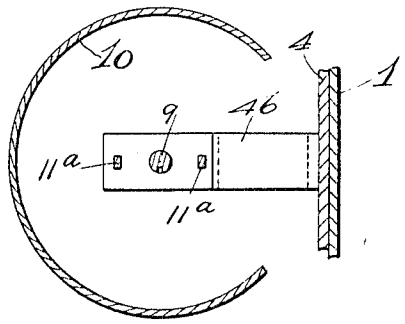


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL SPEEDOMETER.

1,089,746. Specification of Letters Patent. Patented Mar. 10, 1914.

Application filed March 20, 1913. Serial No. 755,596.

To all whom it may concern:

Be it known that I, CHARLES S. BURTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Centrifugal Speedometers, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved construction of a speedometer of the type in which the speed indication results from centrifugal action, and having a scale graduated for speed indication on the rotating or oscillating member.

It consists in the elements and features of construction shown and described as indicated in the claims.

Figure 1 is a face view of an instrument embodying this invention. Fig. 2 is an elevation of the same having the face plate and the odometer train removed. Fig. 3 is a section at the line 3—3 on Fig. 2. Fig. 4 is a section at the line 4—4 on Fig. 3.

The instrument shown in the drawings comprises the casing, 1, in which there is journaled a revoluble shaft, 2, from which the speed indication is to be derived. One bearing of the shaft is obtained at 3, where the shaft protrudes from the casing, and the other bearing is obtained at 4^a, in a bracket lug, 4^b, of a bearing frame, 4, which also has the bearing, 3, and which is mounted rigidly in the casing, 1. On the shaft, 2, there is pivoted a weighted lever in the form of a ring, 6, the pivot being at the axis of the ring and intersecting the axis of the shaft. A sleeve, 7, is mounted for sliding on the shaft, 2, being guided for such sliding and controlled for rotation with the shaft by being provided with longitudinal slots, 7^a, which engage the pivot shaft, 6^a, of the ring, 6. A spring, 8, coiled about said pivot shaft and stopped at one end on the inner circumference of the ring and at the other end on the side of the shaft operates to hold the ring normally in a position oblique to the shaft, and to yieldingly resist its movement from that position to a position perpendicular to the shaft, to which latter position it tends to move under centrifugal action when the shaft is rotated. From one end of the sleeve, 7, a finger, 7^b, extends off transversely with respect to the shaft and engages an abutment, 6^b, in the form of a stud-and-roll mounted on the ring, 6, above said finger, 7^b, and in such relation thereto that the rocking of the ring on the shaft from its normal position toward a position perpendicular to the shaft causes said abutment to move the sleeve downward on the shaft. For the purpose of positioning the sleeve normally with the finger, 7^b, up against the abutment, a light spring, 8^a, is coiled about the sleeve and stopped at one end on the pivot shaft, 6^a, and at the other end on a disk, 7^c, with which the upper end of the sleeve is provided.

Above the bracket lug, 4^b, of the frame, 4, there is stepped in it a spindle, 9, which has another bearing in a bracket, 4^c, mounted on the bearing frame, 4; and on this spindle there is mounted rigidly a member comprising a flange, 10, coaxial with the spindle. For compactness of construction, the bracket lug is formed with an upwardly offset portion extending up within said flange 10, as seen clearly in Fig. 4. In said offset portion of the lug, there is mounted for sliding by means of its opposite parallel arms, 11^a, 11^a, a yoke, 11, whose said arms, 11^a, extend down past the periphery of the disk, 7^c, and have projecting inward from their ends pins, 11^b, 11^b, which engage under the margin of said disk. The spindle, 9, inside or below the top of the flange, 10, has a worm thread, and the cross bar of the yoke is constructed for engagement with said worm thread so that the reciprocation of the yoke lengthwise of the spindle rotates the spindle. The worm thread is constructed so as to produce one complete revolution of the spindle, and thereby of the flange, 10, by the movement of the yoke to the extent which will be caused by the movement of the sleeve, 7, in the swinging of the ring, 6, from its normal oblique position to a position nearly at right angles to the shaft, 2, the stiffness of the spring, 8, and the weight of the ring, 6, being so related that the ring will be caused to swing to that extent about its pivot shaft, 6^a, by the rotation of the shaft at the highest speed which the instrument is adapted to indicate. A hair spring, 13, connected at one end to a collet on the spindle, 9, and at the other end to a fixed stud, 14, on the frame, 4, is adapted to resist the rotation of the spindle and flange, 10, away from a certain normal position of

rest, and to return it to that position with sufficient force to cause the worm, 12, to return the yoke, 11, to normal position, causing its pins, 11^b, to follow up the return of the disk, 7^c, to the normal position of the latter when the ring, 6, is swung back toward its normal position upon cessation of the rotation of the shaft, 2. The action of the two springs, 13 and 8^a, tends to prevent any lost motion in the connection by which the movement of the sleeve, 7, is transmitted to the flanged disk or cup, 10.

The mechanism described is inclosed in the casing by a face plate, 15, which has a window or aperture, 15^a, directly in front of the flange, 10; and the outer surface of said flange is furnished with a graduated scale for indicating the speed, a pointer, 16, being mounted on the face plate at the middle point of said window for reading the graduated scale.

The drawings show in outline the position of an odometer train, 17, driven by a worm, 2^b, on the shaft, 2, and having the numbered counting wheels or disks, 17^a, exposed through suitable apertures or windows, 15^a, in the face plate, 15. The construction of this odometer train is not a part of this invention and need not be further described. It is illustrated to the extent stated merely for the purpose of indicating that the arrangement of the speed-indicating devices in the case is such as to permit the association with them of a customary form of odometer train adapted to be read at the same face plate.

I claim:—

1. In a speedometer, in combination with a revoluble shaft, a centrifugally operable element pivoted on the shaft; a slidable element on the shaft mounted for positively rotating therewith; connections by which the pivoted element actuates the slidable element; a graduated member having a spindle journaled in the case; connections whereby the slidable element rotates the spindle; a face plate having an aperture, the graduated element being positioned for exposing its graduations through said aperture as said graduated element is rotated by its spindle.

2. In a speedometer, in combination with a revoluble shaft, a centrifugally operable element pivoted on the shaft, a slidable element on the shaft rotatable therewith; connections by which the pivoted element actuates the slidable element; a spindle journaled in the casing substantially in line with said shaft; a flange carried by and co-axial with the spindle exteriorly graduated for speed indication; a yoke mounted non-rotatably for sliding parallel to the spindle; means by which the yoke is engaged by the slidable element, the spindle having a worm, and the yoke having means for engaging the worm for movement along the spindle; and a face plate having an aperture positioned in front of said graduated flange.

3. In a speedometer, in combination with a revoluble shaft, a centrifugally operable element pivoted to the shaft and a spring for resisting its centrifugal operation; a slidable element on the shaft rotating therewith; connections by which the pivoted element operates the slidable element; a spindle journaled in the casing substantially in line with the shaft; a graduated member carried by the spindle; a disk on the sliding element having a concentric portion of its area positioned in a plane perpendicular to the axis of the shaft; a yoke mounted non-rotatably for sliding parallel to the spindle and having abutments by which it is engaged with said portion of the disk; means by which the yoke engages the spindle for rotation by the sliding of the yoke along the spindle, and a face plate having an aperture positioned in front of the graduated member.

4. In a speedometer, in combination with a revoluble shaft, a centrifugally operable element pivoted on the shaft; a spring which yieldingly resists the action of said pivoted element; a sleeve mounted for sliding on the shaft and connected therewith for rotation; a spindle journaled in the casing substantially in line with the shaft; an exteriorly graduated flange carried by the spindle; a disk on the sleeve having a concentric portion of its area perpendicular to its axis; a yoke mounted non-rotatably parallel to the spindle and having abutments engaging the disk, the spindle having a worm and the yoke having means for engaging the worm for movement along the spindle, and a face plate having an aperture positioned in front of the graduated flange.

5. In a speedometer, in combination with a revoluble shaft, a centrifugally operable element pivoted on the shaft; a slidable element on the shaft mounted for positively rotating therewith; connections by which the pivoted element actuates the slidable element; a spring which resists the centrifugal operation of the pivoted element; a second spring which resists the sliding action of the slidable element, the shaft having one bearing proximate to the case wall and extending out through said bearing and having a second bearing within the case and in which it is stopped against inthrust into the case; a spindle stepped in said last mentioned bearing at the opposite side thereof from that at which the shaft is stopped; a flange co-axial with the spindle and rigid therewith, said last mentioned bearing being extended from the wall of the case transversely to the shaft, and spindle, and offset along the shaft within the coaxial flange for positioning the stopped end of the

shaft and the stepped end of the spindle within said flange, the spindle having a worm within the flange; a yoke mounted for sliding in said last mentioned bearing parallel with the spindle, said yoke having engagement with the worm and with the slidable element on the shaft, said flange being exteriorly graduated for speed indication, and a face plate having an aperture through which said graduation is readable.

6. In a speedometer, in combination with a casing, comprising a face plate having a speed-reading aperture; a revoluble shaft mounted in the casing for revolving transversely with respect to said face plate; an element carried by the shaft in its rotation connected therewith for centrifugal movement from the shaft; means yieldingly resisting such movement and operating to cause centripetal movement of said member toward the shaft; a graduated member mounted in the casing for oscillation about an axis; means for positively so oscillating said member, and connections from said centrifugally operable element to said means by which said member in its centrifugal movements actuates said oscillating member in one direction, and in its centripetal movement operates it in the opposite direction about its axis, said member being positioned in the casing for exposing its graduations through said face plate aperture, as said member oscillates.

7. In a speedometer, in combination with a casing, comprising a face plate; a revoluble shaft mounted in the casing; an element pivotally mounted for rotation with the shaft and for oscillation about its pivot in planes parallel to the shaft, and adapted by its said pivotal mounting to be centrifugally moved about its pivot away from the shaft by the rotation of the latter; means for yieldingly resisting such centrifugal movement and for reversing the same to cause said pivoted member to move about its pivot centripetally toward the shaft; a graduated member mounted for oscillation about an axis; means for so oscillating it and connections to said means from the said pivotally-mounted centrifugally and centripetally operable element, by which the movement of said element away from the shaft axis moves the graduated member in one direction about its axis, and the opposite movement of said element moves said member in the opposite direction; the face plate having an aperture and the graduated member being positioned for exposing its graduations through said aperture as said member oscillates.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 10th day of March, 1913.

CHARLES S. BURTON.

Witnesses:
EDNA M. MACINTOSH,
LUCY I. STONE.