March 9, 1937. R. O. HELGEBY 2,073,152

SPEEDOMETER

Filed Feb. 27, 1935

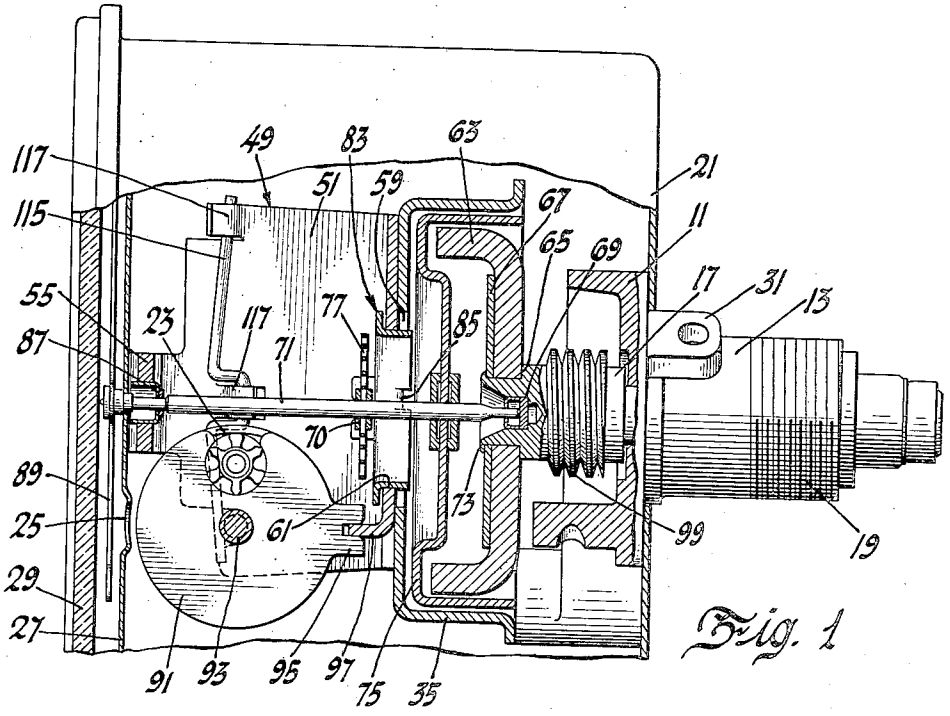

Fig. 1

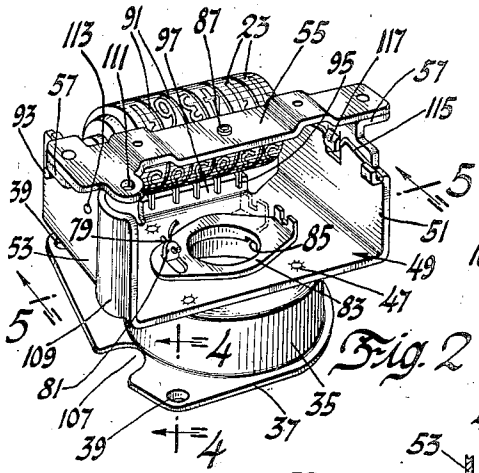

Fig. 2

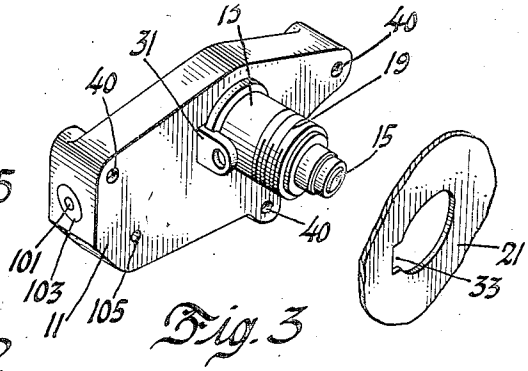

Fig. 3

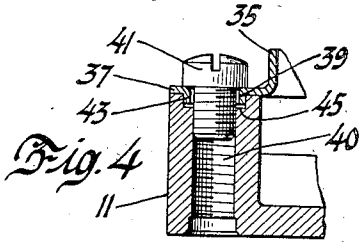

Fig. 4

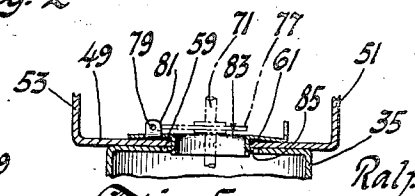

Fig. 5

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Patented Mar. 9, 1937 2,073,152

UNITED STATES PATENT OFFICE

2,073,152

SPEEDOMETER

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Application February 27, 1935, Serial No. 8,422

1 Claim. (Cl. 264—13)

This invention relates to measuring instruments. It has been designed as an improvement in a so-called speedometer as used on vehicles.

An object of the invention is to obtain an improved instrument which may be manufactured at a reduced cost.

A further object consists in a simplification of the assembly of the parts.

A further object is a lessening of the cost of the die cast supporting element.

A still further object is an improvement in the adjustment of the tension of the hair spring which is used to bias the pointer to zero reading.

The novel structure for the attainment of the above and other objects will be understood from the following description.

In the drawing:

Fig. 1 is a longitudinal sectional view.

Fig. 2 is a perspective of an assembly adapted to be secured to the die cast support.

Fig. 3 is a perspective of the die casting and a part of the housing in disassembled relation.

Fig. 4 is a section on line 4—4 of Fig. 2.

Fig. 5 is a section on line 5—5 of Fig. 2.

In the above figures numeral 11 designates a base, preferably made by die casting. It has a stem 13 apertured as at 15 for receiving a driving cable, not shown. The cable end is connected in any conventional way with a rotor shaft 17. The stem 13 is threaded as at 19 for engaging a conventional drive cable housing, also not shown.

The casing to house the instrument is marked 21. The die casting carries certain indicating members such as figure wheels 23. The dial plate 27 which is rigid with the casing is provided with an opening 25, which opening must be so positioned as to render wheels 23 visible through the glass cover 29. It is therefore necessary that both the wheels and the casing be accurately positioned relatively to the die casting. For assembling the die casting and casing in this predetermined relative position the stem 13 is cast with a lug 31 designed to enter a notch 33 in the adjacent wall of the casing as shown in Fig. 3. It will be apparent that this solves the problem of assembly of these two parts. The parts are readily engaged to accurately position the casing so that the dial opening 25 is definitely located relatively to the die casting. If provision be made, as it is and as will be explained, for similarly accurately positioning the assembly of wheels 23 relative to the die casting, a quick and accurate complete assembling process is insured.

Fig. 2 shows a field cup 35 having a flange 37. The flange has a plurality of openings 39 through which extend fastening means 41 threaded into threaded openings 40 in the die casting 11. The openings 40 may also receive the screws by which the casing 21 is secured to the base or casting 11. The flange 37 around the opening 39 is depressed into the form of a sleeve as at 43 to fit in a recess 45 of the die casting. These sleeve portions 43 and the recesses 45 accurately locate the field cup 35 relative to the die casting so that it is only necessary to assemble the parts with the sleeve portions in the recesses to insure a predetermined relative position of these parts. The cup 35 is preferably a stamping as indicated by the drawing.

Welded as indicated at 47 to the bottom of the cup is a U-shaped stamping 49 having upstanding arms 51 and 53. A bridge piece 55 extends across the arms 51 and 53 and is welded to angular extensions 57 thereof. The bottom of the inverted cup 35 is apertured at 59 and the stamping 49 has a somewhat smaller registering opening 61.

Within the field cup 35 the rotor shaft 17 carries a magnet 63 secured thereto in any preferred manner. The shaft 17 is shown as having a shoulder 65 upon which the magnet rests. Above the magnet is a temperature compensating plate 67. The extreme end of the rotor shaft is recessed to support suitable shaft bearings, indicated by numeral 69, for a spindle 71. The metal around the recess is spun over to hold the parts in assembled relation. This is illustrated at 73. Secured to the spindle 71 within the cup 35 is a cup-shaped rotor element 75. These parts operate in the manner well known in the magnetic speedometer art and need no further explanation.

For adjusting the conventional return spring the following expedient is employed. The spindle has secured thereto at 70 one end of a zero biasing spring 77. The outer end of the spring is secured at 79 to a tongue 81 turned up from a plate 83. The plate 83 rests upon the bottom of the clamping 49 and is bowed slightly as shown by Fig. 5. It has a central opening, the metal surrounding the latter being deflected to form a short sleeve extending through the opening 61 in the bottom 49 of the U-shaped stamping and is then bent over as at 85 to form a bearing engagement and holding the bowed surface with sufficient resiliency to resist but not prevent rotation. In this way the tension of the hair spring may be adjusted by rotating the plate 83 but the

resilience is such that the plate will be retained in positions of adjustment.

The bridge piece 55 is apertured to receive a side bearing 87 for the spindle 71. Outside the dial plate the spindle carries a conventional pointer 89.

Between the several figure wheels are conventional transfer pinion carriers marked 91, each of which has a radial notch 95 to engage an arm 97 turned up from the base of the U-shaped stamping. The assembly of figure wheels 23 is carried on a shaft 93 supported in the walls 51 and 53. The position of the shaft 93 and its wheels relative to the die casting is definitely determined by the expedient shown in Fig. 4 and represented by numerals 41, 43, and 45. Since the cup 35 and the stamping 49 are secured together, and since the shaft 93 is carried in the stamping 49, it will therefore be clear that no skill is required in accurately assembling the parts. The expedient of Fig. 4 definitely fixes the position of the wheels 23 relative to the die casting and the expedient of Fig. 3 similarly locates the casing relative to the die casting.

No novelty is involved in the mechanism for driving the figure wheels. There are shown gear teeth 99 on the rotor shaft. These teeth drive a worm shown only by its extreme end 101 in a bearing 103. At 105 is a bearing opening for a second worm, also not shown, and driven by the first worm. The second worm extends axially. For its accommodation a notch is cut in the flange 37 at 107 and also a bowed part 109 is formed in wall 53. The end of the second worm enters a bearing hole 111 in the bridge 55. This second worm is geared to an idler pinion, not shown, but rotatable on a pin 113 projecting inwardly from wall 53. This idler drives a pinion (also not illustrated) on the shaft 93 for rotating the several wheels 23 in sequence in the usual way through the instrumentality of pinions between the several wheels carried by plates 91 anchored as explained above. A wire 115 held in notches 117 of wall 51 engages a groove (see dotted lines in Fig. 1) on shaft 93 to prevent axial movement of the shaft.

The die casting as compared with the similar casting in previous instruments is reduced in size, partly by the omission of integral side walls to support the shaft for the equivalent of wheels 23. The die casting is therefore reduced in cost. The stampings 49 and 55 are, of course, very inexpensive and the assembly expedients require no skill in putting together the several parts and housing them in the casing. The resilient mounting of the hair spring arm 83 is a convenient means of maintaining the adjustment of the hair spring 77.

I claim:

In a measuring instrument, a base, an inverted cup, means to secure said cup to said base, a U-shaped stamping secured to said cup, said stamping having an opening between the arms thereof, a bridge terminally united to said arms, magnetic measuring mechanism within said cup including a spindle journaled therein, projecting therefrom and journaled in said bridge, a plate having a resilient bowed surface, said plate having a sleeve extending from said surface and journaled in said opening of said U-shaped stamping, and a calibrating spring secured to said spindle and to said plate.

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