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J. ZUBATY ET AL

1,713,860

INDICATING INSTRUMENT

Filed Sept. 19, 1924

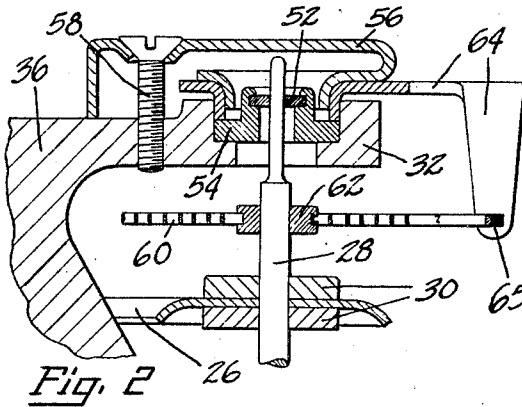


Fig. 2

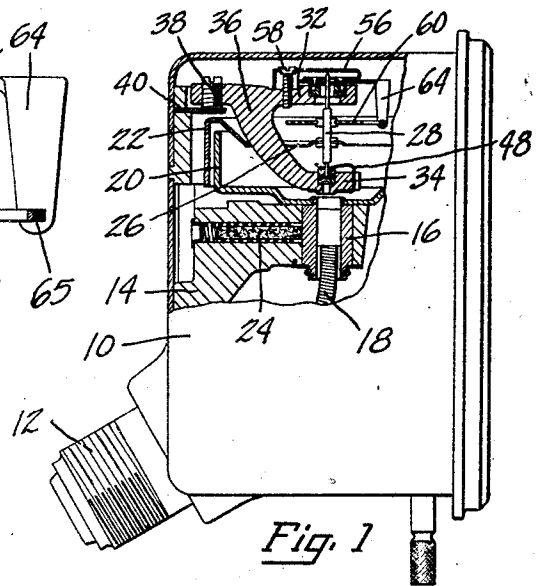


Fig. 1

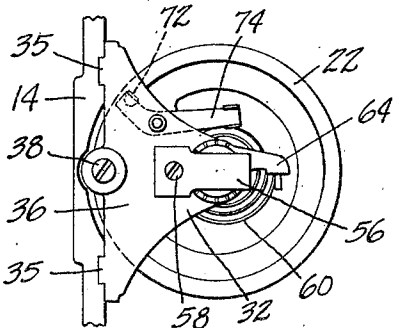


Fig. 3

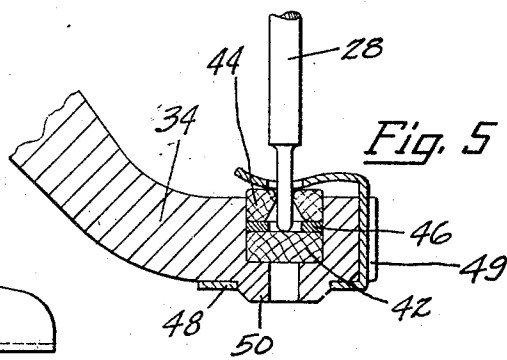


Fig. 5

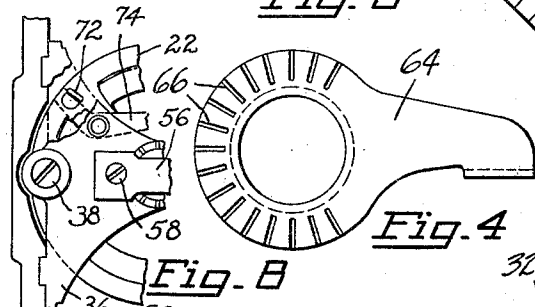


Fig. 4

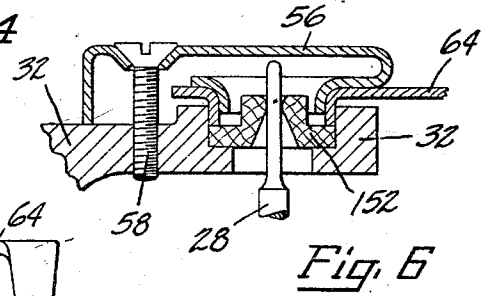


Fig. 6

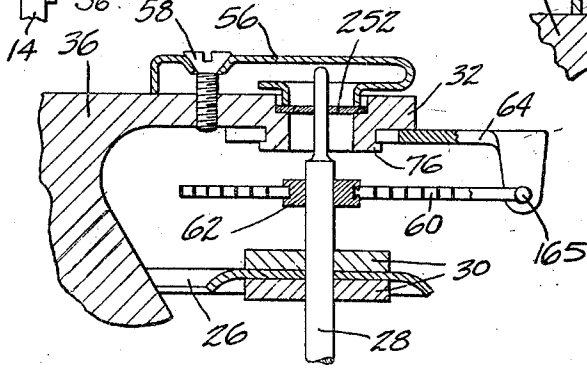


Fig. 7

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INDICATING INSTRUMENT.

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This invention relates to speedometers and similar indicating instruments, and is illustrated as embodied in a speedometer of the type having an angularly-movable indicating element turned more or less against the resistance of a spring by speed-controlled magnetic means. An object of the invention is to provide a novel sensitive and compact mounting for an indicating element of this general character.

One feature of the invention relates to adjusting a resilient part, shown as a leaf spring, above the end of the spindle carrying the indicating element, and which serves as a stop against axial movement of the spindle, by flexing it more or less to adjust the clearance above the spindle (e. g. by means of a setscrew). This part may also be used to hold in its seat the upper bearing of the spindle, or to hold in adjusted position an anchor for one end of the spring which resists movement of the indicating element. We prefer to use the spring or equivalent part for both these purposes, by superposing a part of the anchor on the bearing, under the end of the resilient part.

Another feature of the invention relates to holding the lower end and side bearings for the spindle in their seat by a clip embracing the lower arm of the bracket carrying the indicating element.

The above and other features of the invention, including a new zero adjustment and various other novel and desirable constructions, will be apparent from the following description of the illustrative embodiments shown in the accompanying drawings, in which:

Figure 1 is a side elevation of a speedometer, broken away to show the upper part in vertical section;

Figure 2 is a vertical section on a larger scale, showing the mounting of the upper end of the spindle;

Figure 3 is a top plan view of the indicator assembly;

Figure 4 is a top plan view of the anchor member for the torsion spring;

Figure 5 is a vertical section, on the scale of Figure 2, showing the mounting of the lower end of the spindle;

Figures 6 and 7 are vertical sections showing two alternative mountings for the upper end of the spindle; and

Figure 8 is a top plan view corresponding

to Figure 3, plate 36 being broken away to show the adjustable abutment.

The speedometer illustrated includes a casing 10 having a part 12 to be connected to the drive connection from the vehicle wheel or transmission, and inclosing a frame 14 forming a support for a hub 16 driven by a flexible shaft 18 and carrying an iron rotor 20 which varies the lines of force in a magnetic field to turn more or less an angularly-movable indicating element or dial 22. Except as further described below, these parts or their equivalents may be of any desired construction, those illustrated being parts of a standard A—C speedometer. The odometer mechanism, being in the lower part of the casing, does not appear in Figure 1. Hub 16 is shown lubricated by a wick oiler 24.

The indicating element 22 has a radial arm 26, pressed or keyed on a spindle 28 and held by retaining washers or the like 30. The element is arranged between an upper arm 32 and a lower arm 34 of a supporting bracket 36 having key ribs 35 sliding in grooves in frame 14, and raised and lowered to calibrate the instrument by a setscrew 38 engaging a stamping 40 inserted in a slot formed in frame 14.

The lower arm 34 of the bracket is formed with a seat for an end jewel or bearing 42, and a perforated side jewel or bearing 44, separated by a stamping or washer 46, and retained in the seat by a spring clip 48.

These bearings may be synthetic or genuine jewels, or of metal, as for example phosphor bronze. The bearings or jewels are held by the upper resilient arm of the clip, which is convex on the bottom to take care of possible variations in the thickness of the assembly. This arm of the clip has an opening for spindle 28. The clip is seated in a notch 49 in the end of bracket arm 34, which keeps it from turning, and its lower arm has an opening embracing a boss 50 on the bottom of the arm 34, to prevent displacement of the clip.

In the arrangement of Figures 1 and 2, the upper end of the spindle is journaled in a jewel or bearing, here shown as including a metallic stamping or washer 52 and a carrier 54 having a flange spun over the edge of the stamping 52. A synthetic or genuine jewel may be substituted for the stamping, and held in the same way. The carrier 54 of the bearing rests in a seat in arm 32 of bracket 36. The bearing is held in the seat by a resilient

part shown as a leaf spring 56, which is doubled back across the top of the spindle 28 to serve as a stop or top bearing preventing axial movement of the spindle. The spring 56 is
 5 flexed more or less by means such as a set-screw 58 threaded into bracket 36, to adjust the clearance above the top of the spindle. The set screw is held in adjusted position by the pressure between its tapered head and the
 10 conical socket formed in the spring for it.

The purpose of the stop constituted by the spring 56 is to limit axial movement of the spindle 28 without introducing friction and applying pressure to the shaft as would be
 15 the case were an end thrust bearing provided. The torque available to rotate the indicating element and its spindle is very slight and should not be reduced by needless friction. At the same time it is undesirable
 20 that the spindle be permitted appreciable longitudinal movement. By adjusting set screw 58 so as to reduce the clearance between the spring 56 and the end of the spindle to a minimum no friction or pressure is applied
 25 to the spindle and at the same time endwise movement of the spindle is practically done away with.

Angular movement of the indicating element 22, as is usual in instruments of this
 30 character, is resisted by a torsion hair spring 60, connected at one end to a part 62 on the spindle and at its other end to an anchor 64. The spring may be secured to the anchor by a tapering pin or wedge 65, preferably rectangular in cross section. We prefer to provide the anchor with a flanged part engaging the carrier 54 of the top bearing, under the
 35 end of spring 56. Thus spring 56 not only holds the bearing in its seat, and serves as a stop or top bearing for the spindle, but also serves to hold the anchor 64 in any angular position, to permit adjustment of the tension of spring 60. If desired, anchor 64 may be
 40 pressed out to form serrations or rounded teeth 66, any one of which may be engaged by one or more teeth on the spring 56.

The zero position of the indicating element 22 is adjustably determined by engagement of a projection or stop 72, bent up from
 50 its top surface, with the end of a lever 74 pivoted on the under surface of arm 32. Ordinarily the friction of the pivotal riveted mounting of lever 74 will be ample to hold the lever in adjusted angular position.

The arrangement of Figure 6 differs from that described above, in that a single jewel or bearing 152 is used instead of the two-part bearing 52, 54. In Figure 7, a simple stamping 252 is used as a jewel or bearing,
 60 and anchor 64 is not held by spring 56, but is mounted on a boss 76 of arm 32. In this modification, spring 60 is attached to anchor 64 by a wedge pin 165 round in cross section.

While several embodiments have been described in detail, it is not our intention to

limit the scope of the invention to those particular embodiments, or otherwise than by the terms of the appended claims.

We claim:

1. In a speedometer or the like comprising, 70 in combination, an angularly-movable indicating element, a spindle carrying said element, a bearing for the lower end of the spindle, and a side bearing for the upper end of the spindle, a resilient part spaced 75 above the end of the spindle for directly engaging the spindle to serve as a stop to limit axial movement of the spindle, and means to adjust the clearance between said part and the end of the spindle by flexing the part. 80

2. In a speedometer or the like comprising, in combination, an angularly-movable indicating element, a spindle carrying said element, a bearing for the lower end of the spindle, and a side bearing for the upper end 85 of the spindle, a resilient part above the end of the spindle and spaced therefrom for directly engaging the spindle to serve as a stop to limit axial movement of the spindle, a support for the bearings and said part, and a 90 setscrew threaded into the support and having a head engaging the resilient part to flex it more or less to adjust the clearance above the end of the spindle.

3. In a speedometer or the like comprising, 95 in combination, an angularly-movable indicating element, a spindle carrying said element, a bearing for the lower end of the spindle, and a side bearing for the upper end of the spindle, a leaf spring having one end 100 holding the side bearing and bent back on itself and spaced from the end of said spindle for directly engaging the spindle to serve as a stop to limit axial movement of the spindle, and means to flex the spring more or less to 105 adjust the clearance between the spring and the spindle.

4. In a speedometer or the like comprising, in combination, a supporting bracket having upper and lower arms, said upper arm being 110 provided with a seat, an angularly-movable indicating element between said arms, a spindle carrying the indicating element, a bearing for the lower end of the spindle carried by the lower arm of the bracket, and a perforated 115 side bearing surrounding the upper end of the spindle and mounted in said seat formed in the upper arm of the bracket, a resilient part engaging the side bearing and passing across but spaced from the upper end of the spindle 120 for directly engaging the spindle to serve as a stop to limit axial movement of the spindle, and means engaging the resilient part and the bracket to flex said part more or less to tension it to hold the bearing in its seat and to 125 adjust the clearance above the end of the spindle.

5. A speedometer or the like comprising, in combination, an angularly-movable indicating element, a spindle carrying said element, 130

bearings for the ends of the spindle and seats for the bearings, a torsion spring resisting angular movement of the indicating element, a stationary anchor for one end of the spring which is angularly adjustable about the axis of the spindle, and common means for holding the anchor in adjusted position and for holding one of the bearings in its seat.

6. A speedometer or the like comprising, in combination, an angularly-movable indicating element, a spindle carrying said element, bearings for the ends of the spindle and seats for the bearings, a torsion spring resisting angular movement of the indicating element, a stationary anchor for one end of the spring which is angularly adjustable about the axis of the spindle, and a part holding the anchor in adjusted position and passing above the end of the spindle to serve as a stop against axial movement of the spindle.

7. A speedometer or the like comprising, in combination, an angularly-movable indicating element, a spindle carrying said element, bearings for the ends of the spindle and seats for the bearings, a torsion spring resisting angular movement of the indicating element, a stationary anchor for one end of the spring which is angularly adjustable about the axis of the spindle, a part holding the anchor in adjusted position and passing above the end of the spindle to serve as a stop against axial movement of the spindle, and means for flexing said part more or less to vary the clearance above the end of the spindle.

8. A speedometer or the like as defined by claim 6, in which said part also holds one of the bearings in its seat.

9. A speedometer or the like comprising, in combination, a supporting bracket having upper and lower arms with seats for bearings, an angularly-movable indicating element between the arms, a spindle carrying said element, a bearing for the lower end of the spindle in the lower arm of the bracket, a side bearing for the upper end of the spindle in the seat in the upper arm of the bracket, a torsion spring resisting angular movement of the indicating element, an anchor arm for

one end of the torsion spring having a part superposed on the side bearing in its seat and angularly movable to adjust the tension of the torsion spring, a leaf spring engaging the anchor arm to hold the anchor arm and the bearing in the seat and to hold the anchor arm in adjusted position and which extends over the top of the spindle to serve as a stop against axial movement of the spindle, and means for flexing the leaf spring more or less to adjust the clearance above the top end of the spindle.

10. A speedometer or the like comprising, in combination, a supporting bracket having upper and lower arms with seats for bearings, an angularly movable indicating element between the arms, a spindle carrying the indicating element, a bearing in the seat of the upper bracket arm for the upper end of the spindle, an end bearing and a side bearing for the lower end of the spindle mounted in the seat in the lower arm of the bracket, a clip embracing the lower arm of the bracket and extending around said arm to a position above the bearing and holding the bearing in the seat.

11. In a speedometer or the like comprising, in combination, an angularly movable indicating element adapted to be turned more or less according to the speed, a spring resisting angular movement of the indicating elements, a bracket having arms above and below the indicating element, and a spindle journaled in said arms and carrying the indicating element, a plate secured to and above said upper bracket arm and spaced above the end of said spindle serving as a stop to limit the axial movement of said spindle, a stop projecting upwardly from the indicating element and a lever pivoted to the lower side of the upper arm of the bracket and engaged by the stop to adjustably determine the zero position of the indicating element.

In testimony whereof we affix our signatures.

JOSEPH ZUBATY.
A. CHAMPION.