S. A. ASQUITH.

SPEED INDICATOR.

APPLICATION FILED FEB. 5, 1916.

1,282,725.

Patented Oct. 29, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

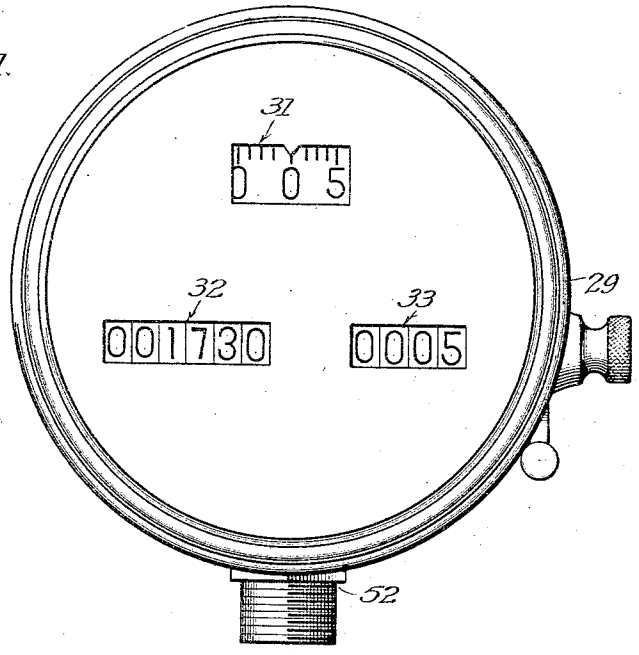
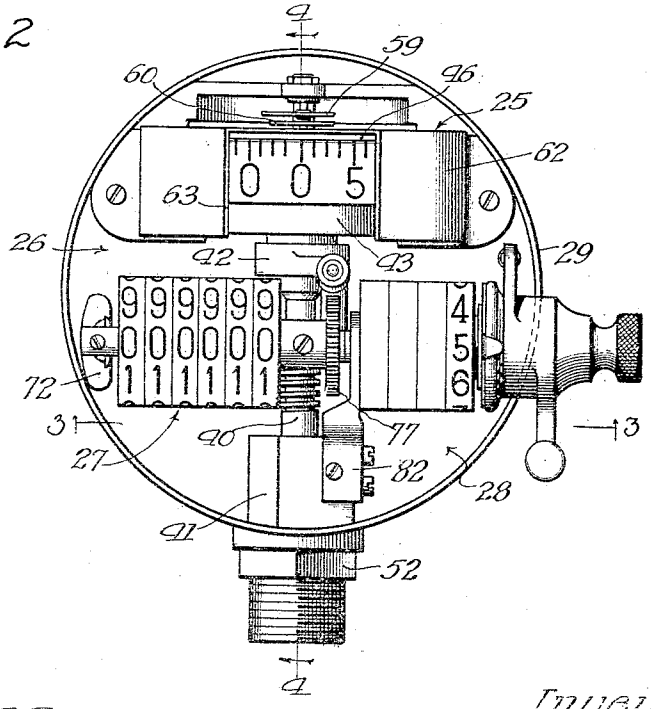


Fig. 2



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3 SHEETS—SHEET 2.

Fig. 3.

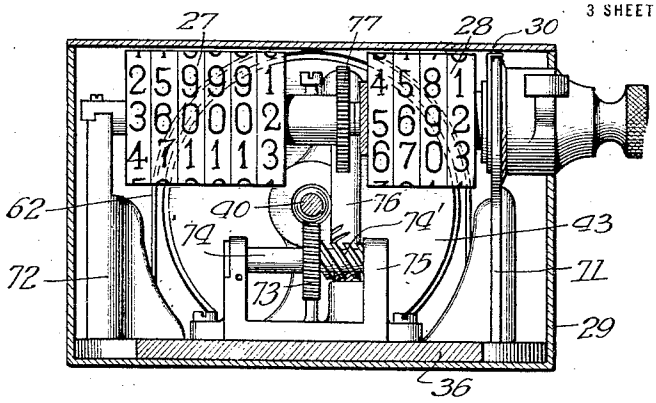


Fig. 4.

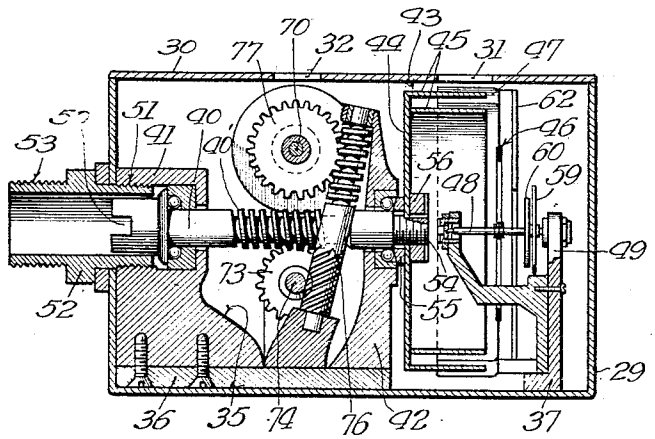
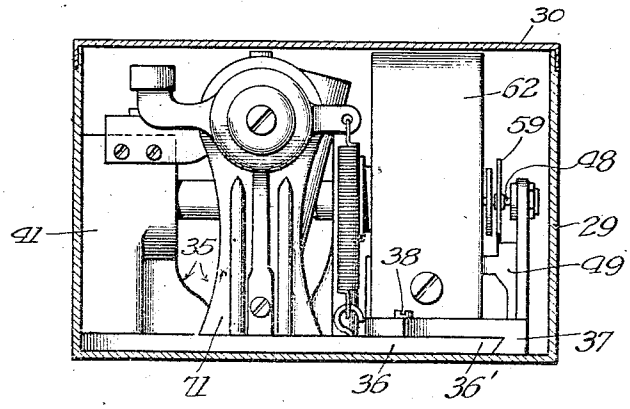


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

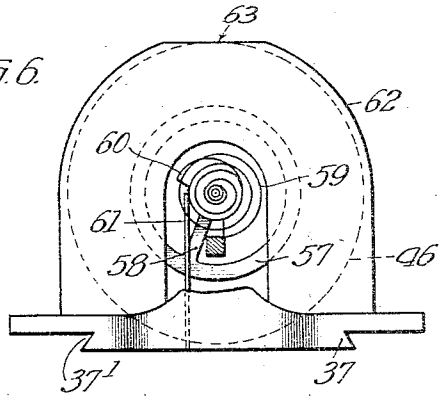


Fig. 7.

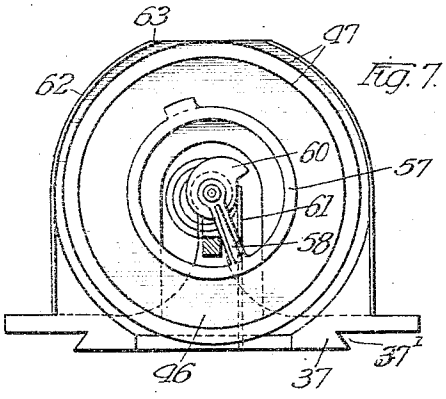


Fig. 8.

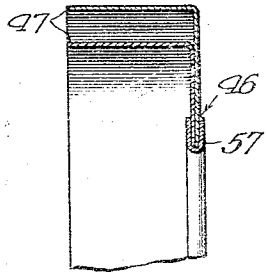
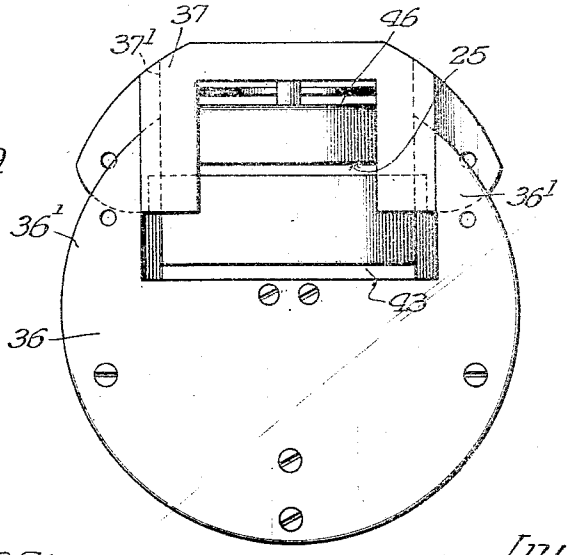


Fig. 9.



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UNITED STATES PATENT OFFICE.

STEAD A. ASQUITH, OF WATERLOO, IOWA, ASSIGNOR TO WALTHAM WATCH COMPANY, OF WALTHAM, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SPEED-INDICATOR.

1,282,725. Specification of Letters Patent. Patented Oct. 29, 1918.

Original application filed July 24, 1915, Serial No. 41,644. Divided and this application filed February 5, 1916. Serial No. 76,250.

To all whom it may concern:

Be it known that I, STEAD A. ASQUITH, a citizen of the United States, residing at Waterloo, in the county of Blackhawk and State of Iowa, have invented certain new and useful Improvements in Speed-Indicators, of which the following is a specfication.

My invention relates to improvements in speed-indicators, and in some of its features more particularly to such devices as constructed for use on automobiles.

Among the objects of my invention are to provide a novel coördination of indicating mechanisms, and a construction which is simple, inexpensive, durable, not liable to damage, either in use or from inexperienced handling, or in course of separation of its parts for substitution or repair; which affords improved, efficient and reliable means for registering speed, and which embodies advantageous re-setting mechanism.

In the drawings wherein I have illustrated a single embodiment of my invention in form well adapted for commercial manufacture.

Figure 1 is a front elevation of the instrument in complete form;

Fig. 2 is a front elevation with the casing front removed;

Fig. 3 is a section on line 3—3 of Fig. 2, with the casing in diametrical section.

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

Fig. 5 is a side elevation taken from the right of Fig. 3, but with the casing in section.

Figs. 6 and 7 are elevations, from opposite sides, of the separable speedometer member that controls the speed indication;

Fig. 8 is an enlarged detail showing a fragment of the secondary speedometer element.

Fig. 9 shows the two speedometer members in partly dis-assembled relation.

The speedometer mechanism, generally indicated at 25, and the odometer mechanism 26 (the latter having a total mileage section 27 and a trip mileage section 28), is preferably housed in a cylindrical casing 29 having in its removable circular cover plate 30 the orifices 31, 32 and 33 to expose the readings of speed, total mileage and trip mileage, the dial being of course customarily overlain by a glass plate.

The moving parts are carried on a suitable demountable frame structure 35 that, generally speaking, fits snugly against the back of the casing 29. The frame 35 is made in two slidably interfitting sections 36 and 37 (see Fig. 9) the back plate of the main section 36 being cut away to leave horns 36′, the confronting edges of which dovetail into grooves 37′ in the back plate portion 37, and the two parts when in assembled position being secured together by screws 38.

The main shaft 40 of the instrument, mounted in ball bearings in brackets 41 and 42, preferably along the line of a diameter of the casing, directly carries the driving element 43 of the speedometer. The driving element consists of a plural-annuli structure that may conveniently be made relatively heavy, as of brass, to provide a disk portion 44 carrying a suitable plurality of spaced concentric annuli 45. The secondary or influenced member of the speedometer, by the position of which an indication in terms of speed will be given, is generally indicated at 46, and consists also of a plural cup structure comprising a plurality of annuli 47 that are interleaved with, or alternated with, the annuli 45 of the driving element. These cups are preferably made extremely thin and of aluminum, the rotatable secondary element being delicately mounted, as in jeweled bearing and biased as to position by a light hair spring, so that the secondary element, presenting relatively large friction surfaces in confronting, adjacent, non-contacting relation to the rotating surfaces of the driving element, may have torque transmitted thereto from the driving element through the medium of intervening air bodies. This secondary element has its shaft 48 jewel mounted in the arms 49 of this bearing member carried by the frame member 37, and, as shown in Fig. 9, the relation of the two slidably separable elements 36 and 37 of the frame is preferably such that the horns 36′

and grooves 37′ are engaged to aline the frame parts perfectly before the opposing cup structures begin to come in to their overlapped or interleaved relation so that, notwithstanding the extreme lightness of structure of the secondary element, no material danger of damage is entailed incident to the assemblage or separation of the constitutent parts of the speedometer.

In matter of advantageous structure I prefer that the shaft 40, (Fig. 4) at its outer end suitably constructed for convenient connection with the power transmitting member such as a flexible shaft, as by provision of the head slot 50, shall have its extremity located substantially within the confines of a threaded recess 51 in the bearing member 41, and that a union 52, threaded at its outer end as at 53 for reception of a flexible shaft casing, be screwed in through the main casing 29 into the recess 51, thereby to position the frame firmly in the casing against accidental displacement, but for easy removal if desired. The remote end of shaft 40 is preferably threaded as at 54 and provided with a key way extending beyond the cone 55 of its ball bearing, so that the disk 44 of the speedometer, non-rotatably engaging such key way, and locked on the shaft by nut 56, acts to hold the ball bearing in adjusted position. Preferably, also, the secondary element is composed of a plurality of separate cups, each of say three thousandths (.003) of an inch thickness, drawn of aluminum, and having in their bottoms registering orifices that are rimmed by a folded band 57 (Fig. 8) that has connection by a single arm 58 with the shaft 48. The biasing spring 59, of course, is connected at one end to the shaft and at the other end upon some fixed support such as the bracket 49, and, supplementally, a light cam 60 working against the fixed damper spring 61 may be provided on the shaft, in order that its resistance to displacement may increase as its displacement progressively varies. A housing 62, cut away as at 63, at the proper reading point, and fixed to the frame element 37 may be provided for further protection of the fragile secondary elements.

The reading indications suitably displayed on the periphery of the outermost cup of the biased member, of course are spaced and designated according to the particularly intended use of the appliance, generally reading in miles per hour and of course as the secondary element is rotated the figures are successively presented to be viewed through the reading orifice 31 of the dial.

It will be understood that upon rotation of the main shaft with the concomitant rotation of the driving element 43 of the speedometer, torque is transmitted through the air films or bodies intervening between the primary and secondary element to drag the secondary element rotatively against the bias of its spring, there being no distributing mechanical connection whatever, other than through the intervening air, between the driving and driven elements, owing to the mounting of the secondary element on separate bearings on its own support.

The odometer structure 26, having its number wheels divided into two groups 27 and 28 for total mileage indication and trip mileage indication, has such number wheels centered about a shaft 70 that is transverse to the main shaft 40, and ultimately supported in bearing post 71 and 72. Drive for the odometer is obtained as follows: Shaft 70 is geared to shaft 40, about mid-length, preferably through worm 40′ on the main shaft meshing with gear 73 on a short cross shaft 74, mounted in a bracket 75, (Fig. 3) said shaft 74 having a worm portion 74′ engaging the worm shaft 76 that extends from front to back of the casing between suitable bearings on plate 36 and arm 42, said shaft 76 worm-engaging a gear 77 that is fast on shaft 70.

The particular construction of the odometer mechanism which I prefer to associate with my speedometer is illustrated and described more in detail in my copending application Serial No. 41,644, filed by me July 24, 1915, entitled Speed and distance indicators, of which application this is a division.

While I have herein described and shown in some detail a particular embodiment of my invention for purposes of full disclosure it will be understood by those skilled in the art that I do not desire to be limited to the details of construction thereof further than as set forth in the claims, as many changes in construction and arrangement and adaptation for special use may be made without departure from the spirit of my invention and within the scope of the appended claims.

Having described my invention, what I claim is:—

1. In a speedometer, an inclosing casing, a separable frame detachably connected to the casing and comprising two parts slidingly engaged and separable in the direction of slide length, a driving element carried by one of said parts and a driven element axially separable from the driving element carried by the other said part, the axis of said driving and driven part paralleling the length of the slide.

2. In a speedometer, driving and driven elements comprising opposed, confronting, spaced, axially-concentric annuli arranged for torque transmission through the intervening air bodies, a drive shaft for one element, an alining shaft for the other element

an inclosing casing, and a supporting frame positioned at the rear of the casing and comprising parts separable on a line parallel with the shaft axes, said parts having coacting guiding surfaces spaced apart and parallel with the line of separation each part of said frame carrying the shaft for one of said elements.

3. In a speedometer, driving and driven elements comprising opposed, confronting, spaced, axially-concentric annuli arranged for torque transmission through the intervening air bodies, a drive shaft for one element, an alining shaft for the other element and a supporting frame comprising parts slidingly separable on a line parallel with the shaft axes and having spaced apart guiding surfaces positioned at the rear of the annuli, each part of said frame carrying the shaft for one of said elements.

4. In a speedometer, driving and driven elements comprising opposed, confronting, spaced, axially-concentric annuli arranged for torque transmission through the intervening air bodies, a drive shaft for one element, an alining shaft for the other element and a supporting frame comprising parts slidingly engaged for a length greater than the overlapped depth of the driving and driven elements and separable in a direction paralleling the shaft axes, each part of said frame carrying the shaft for one of said elements whereby said driving and driven parts are radially immovable when in radial register with each other

5. In a device of the character described, the combination of a frame having bearing brackets, a main shaft having a threaded end, ball-bearings for said shaft including, adjacent the threaded end of said shaft, an adjusting-cone, a primary speedometer element on said shaft-end arranged to bear against said adjusting-cone, a nut on said threaded shaft-end clamping said element against the cone to hold the latter adjusted, and a secondary biased speedometer element operatively associated with the primary element.

6. In a device of the character described, the combination of a frame having bearing brackets, a main shaft having a threaded end, ball-bearings for said shaft including, adjacent the threaded end of said shaft, an adjusting-cone, a primary speedometer element non-rotatably mounted on said shaft-end arranged to bear against said adjusting-cone, a nut on said threaded shaft-end clamping said element against the cone to hold the latter adjusted, and a secondary biased speedometer element operatively associated with the primary element.

7. In a device of the character described, the combination of a frame having bearing brackets, a main shaft having a threaded end, ball-bearings for said shaft including, adjacent the threaded end of said shaft, an adjusting-cone, a primary speedometer, element on said shaft-end arranged to bear against said adjusting-cone, a nut on said threaded shaft-end clamping said element against the cone to hold the latter adjusted, a secondary, biased speedometer element operatively associated with the primary element and a shaft for said secondary element alining with, and supported independently of the main shaft.

8. In a device of the character described, a biased element comprising a plurality of cups of thin material having their side-walls concentric and their bottom walls provided with registering openings; clamping means comprising an annular flanged ring engaging the edges of said openings, a primary rotatable element having concentric walls interleaved with and spaced from the side-walls of the biased element and connected therewith for torque transmission only through intervening air; and means for supporting said elements.

9. In a device of the character described, the combination of a biased element comprising a shaft, a plurality of cups of thin material having their side walls concentric and their bottom walls provided with registering openings, a clamp ring securing together the edges of the openings and mounted on said shaft; a primary element comprising a shaft, a part driven thereby having concentric walls interleaved with and spaced from the side walls of the biased element and connected therewith for torque transmission only through intervening air, and means for supporting said shafts.

10. A speedometer element comprising a plurality of nested, thin cups of different diameters, having registering bottom openings, a clamping ring having outturned flanges engaging the edges of said openings and means to support said ring.

11. A speedometer element comprising a plurality of nested, thin cups of different diameters, having registering bottom openings, a clamping ring having out-turned flanges engaging the edges of said openings, a shaft therefor, and means extending from the clamping ring to the center of the opening and secured to the shaft.

12. A speedometer element comprising a plurality of nested, thin cups of different diameters, having registering bottom openings, a clamping ring having out-turned flanges engaging the edges of said openings, a shaft therefor, and an arm formed integral with the ring and extending radially inwardly to the center of the opening for attachment to the shaft.

13. In a speedometer, driving and driven elements comprising opposed, confronting,

spaced, axially concentric annuli arranged for torque transmission through the intervening air bodies, a drive shaft for one element, an aligning shaft for the other element, a supporting frame, arms projecting therefrom and carrying the drive shaft, horns formed on the frame and having parallel spaced apart guide surfaces, and a support on which the driven element and its shaft are mounted and having guide surfaces for sliding engagement with the guide surfaces of the supporting frame.

14. In a speedometer, the driving and driven elements comprising opposed, confronting, spaced, axially concentric annuli arranged for torque transmission through the intervening air bodies, a drive shaft for one element, an alining shaft for the other element, a supporting frame, arms projecting therefrom and carrying the drive shaft, horns formed on the frame and having parallel beveled edges, and a support on which the driving element and its shaft are mounted and having beveled guide surfaces for sliding engagement with the beveled edges of the supporting frame.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses.

STEAD A. ASQUITH.

In the presence of—
A. M. SUNDLY,
A. J. ROTH.