S. A. ASQUITH.

SPEEDOMETER.

APPLICATION FILED DEC. 5, 1913.

1,093,166. Patented Apr. 14, 1914

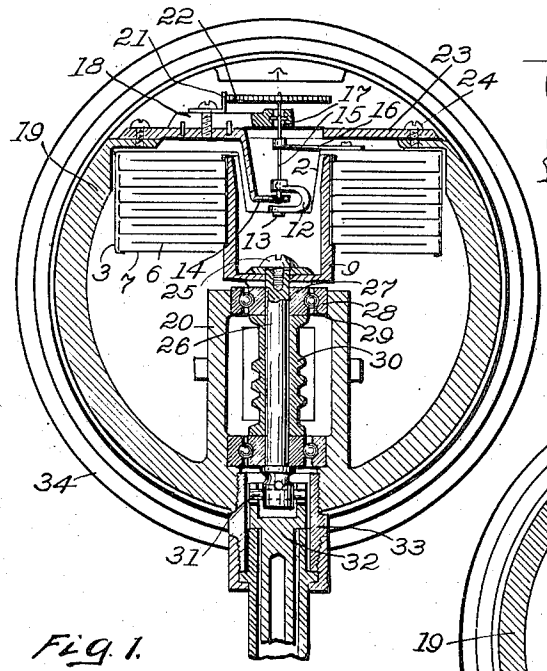


Fig. 1.

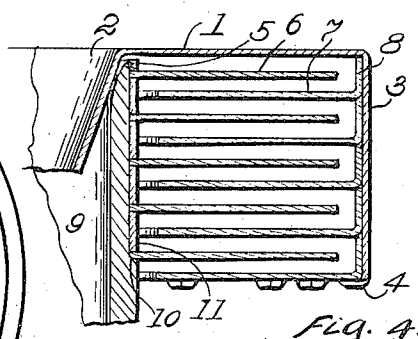


Fig. 4.

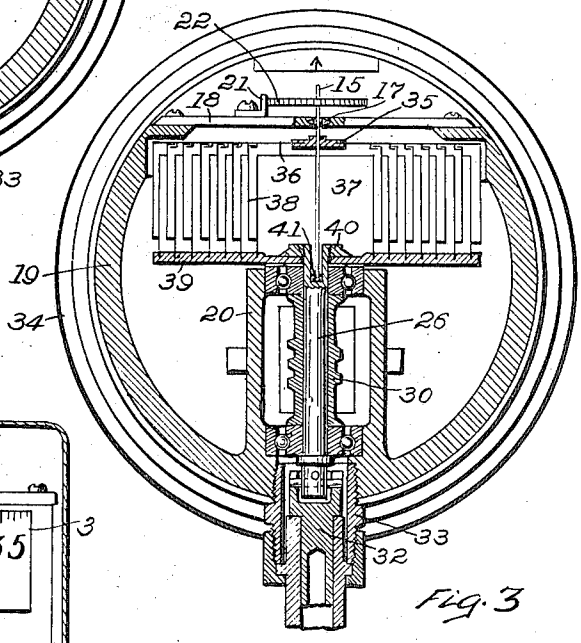


Fig. 3

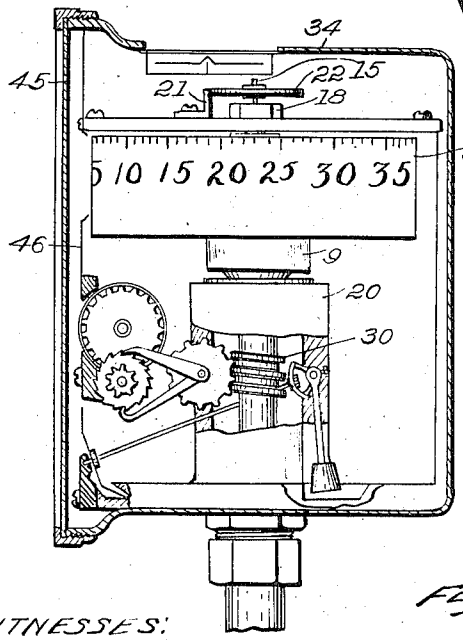


Fig. 2.

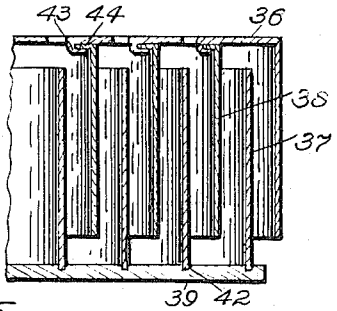


Fig. 5

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SPEEDOMETER.

1,093,166. Specification of Letters Patent. Patented Apr. 14, 1914.

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To all whom it may concern:

Be it known that I, STEAD A. ASQUITH, a citizen of the United States of America, and a resident of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Speedometers, of which the following is a specification.

My invention relates to improvements in speedometers, and the object of my improvement is to furnish a speed-indicating mechanism for such a device which shall be at once positive in action, free from tremor, and have its accuracy unaffected by wear, temperature, magnetism or age. This object I have attained by the mechanism which is hereinafter described and claimed, and which is illustrated in the accompanying drawings, in which:

Figure 1 is a vertical central section of my improved speedometer. Fig. 2 is a transverse vertical section of the casing of said speedometer, with parts of the interior mechanism broken and sectioned away. Fig. 3 is a vertical central section of a modified form of my speedometer. Fig. 4 is a magnified detail view in vertical section of parts of the air traction apparatus of the speedometer, while Fig. 5 is a like magnified detail view of a modified form of the air traction means.

Similar numerals of reference denote corresponding parts throughout the several views.

The mechanism of my improved speedometer is inclosed within a cylindrical casing 34 provided with a transparent face 45 at one end, and being orificed to receive the bearings of the rotatable body 32 which is driven by the usual operative connections to the wheels of the moving body whose speed is to be indicated. Within said casing is a fixed frame 19 comprising arc-shaped arms fitting the interior of the casing, and integral with an inwardly-projecting hollow cylindrical part 20, whose hollow contains the anti-friction bearing raceway parts 27 and 28 in pairs containing anti-friction balls 29, and fitting a shaft 26, on which is secured the worm 30 between said bearings. The lower end of the shaft 26 is connected to the body 32, within the inclosing hollow casting 33, by means of a universal joint 31. To the inner end of the shaft 26, a cup-shaped body 9 is coaxially secured by means of a screw 25. The outer side of the cup 9 has an annular shoulder 10 formed thereabout.

On the upper ends of the curved parts of the body 19 is secured a disk 23 by means of the screws 24, which is centrally orificed by reason of the cutting of a tongue-shaped piece 14 therefrom, said piece 14 being then bent downwardly at an angle to the disk with its end then offset, as shown in said Fig. 1, to be parallel to the disk, and located about midway between the center of the disk and the inner end of the shaft 26. The end of said tongue 14 is vertically orificed to movably receive the vertical rotatable spindle 15, whose upper end is secured to the inner extremity of the coiled spring 22. The numeral 18 denotes an arm secured upon said disk to have one end project over the opening therein, and having an orifice in which is placed a hollow jeweled bearing 17 adapted to seat the rotatable spindle 15. A short standard 21 is secured to the top of the arm 18, and to it is secured the outer end of the said coiled spring 22. The numeral 12 denotes a U-shaped body, the upper end of which is orificed with the lower end of the spindle 15 seated fixedly in it to project below and have its lower end rotatably seated in a cap-jewel in the bracket 14.

The numeral 3 denotes a hollow cylindrical body, preferably made quite thin and of some light material such as aluminium, and which has its upper edge continued inwardly angularly to form an annular horizontal plate 1, whose inner portion 2 is bent obliquely downwardly and inwardly, and integral wth a central depressed disk-shaped part, coaxial with the spindle 15 and the shaft 26, and secured to the lower end of the U-shaped body 12, by means of a rivet 13.

The numeral 16 denotes a fixed arm projecting from the spindle 15 and secured to the flat part 1 of the body 3 fixedly.

The numerals 6 and 7 denote flat horizontally spaced rings which are alternated with each other in a desired plurality, and which are respectively mounted upon the bodies 9 and 3, in the following manner: The rings 7 have their inner edges spaced from said body 9, while their outer edges are bent upwardly vertically to form circular upwardly-directed flanges 8. To assemble the rings 6 and 7 in proper relation to each

other, as shown in said Fig. 4, it is necessary to first place the lowermost ring 7 down over the outside of the cup-shaped body 9, to a position a little lower than the shoulder 10 thereon. Then, one of the other rings 6 is carried down over the body 9 to rest closely and fittingly upon said shoulder or shelf 10. The diameter of the ring 6 being less than that of the ring 7, its outer edge will be spaced apart from the flange 8 of the latter. Another of the rings 7 is then brought down over the body 9 to rest upon the upper edges of the raised flange 8 on the lowermost like ring 7, which spaces it away from the ring 6 located thereunder. In this manner, the space between the top of the body 9 and the lowermost ring 7 is filled up with the spaced alternated rings 6 and 7, except that the uppermost ring 6 is a little below the upper edge of the body 9.

In order to space the alternated rings 6 apart to keep them equally spaced between the alternated rings 7, the cylindrical rings 11 are used as spacers between the rings 6, and seated removably in contact with the outer wall of the body 9. The pile of rings 6 and the spacers 11, thus formed, are held fixedly upon the body 9 by means of an interiorly threaded ring 5, placed removably upon the upper threaded end of said body 9 to bear upon the uppermost ring 6. The cylindrical hollow body 3 is, after the said disks have been assembled as above described, seated over said disks with its inner wall in contact with the outer walls of the flanges 8 on the disk 7. There are a plurality of points 4 provided on the lowermost circular edge of the cylinder 3, and these are bent over inwardly so as to uphold the lowermost disk 7, as shown in Fig. 4. The disks 7 are thus held securely to the body 3 to rotate therewith between the alternated disks 6, which are secured to the hollow body 9.

When the coupled shaft-parts 32 and 26 are rotated by means of the driving connections to the wheels of the vehicle, the same rotation is imparted to the cup-shaped body 9 and to the connected disks 6. The disks 6, when placed into relatively rapid rotation, pull with them, by adhesion, the air molecules in contact therewith, which thus creates a strain or pull upon the other air molecules situated between them and the adjacent surfaces of the other disks 7, and this strain or pull, or suction, exerts a tractive effect upon the disks 7, tending to pull them around in the same direction in which the other plates are rotating. The rotatory movement thus imparted to the disks 7, is transmitted to the spindle 15 through the contacting hollow body 3, and thus the turning spindle 15 moves more or less, and places under tension the coiled spring 22.

Referring to Fig. 2, it will be seen that the outer cylindrical surface of the cylindrical body 3 has a graduated scale marked around it at its upper edge, with numerals indicating certain regular graduations of said scale. A screen 46 in said casing 34 covers from view the cylindrical body 3, except for a small open space opposite the window 45 in said casing. The number on said scale, which shows through the middle of said opening, indicates the speed in miles per hour in which the vehicle is progressing, since the part 3 is moved around more or less according to the greater or less tractive effort exerted thereupon through the intermediate air from the rotating disks 6. When the rotation becomes less or the vehicle stops, the coiled spring being under tension, reacts to rotate the cylindrical body 3 in an opposite direction to the zero point indicated thereon, or to some intermediate point on the scale. It is evident that the action of this transmission device must be always positive, and that there can be no change in the manner of indicating the speed of a vehicle.

In Fig. 3 is shown a modified form of my device in this, that instead of using horizontal disks 6 and 7, the alternated vertical hollow cylinders 37 and 38 are employed. In this form of my device, a jeweled bearing is provided in a hollow in the upper part of the shaft 26, in which is rotatably seated the inner or lower end of the spindle 15, said spindle then being passed upwardly through an orificed jeweled bearing 17 and a cross-bar 18 secured on the frame 19, and has its upper end secured to the inner end of the coiled spring 22. A disk-shaped plate 39 is secured upon the upper end of the shaft 26 by means of a nut 40. Said plate 39 is provided with a number of spaced concentric circular grooves 42, as shown in Fig. 5, in which are fixed the lower edges of the cylindrical parts 37. The numeral 35 denotes a circular casting or plate secured upon the spindle 15, and upon which is concentrically mounted a horizontal disk 36, whose outer parts are bent over downwardly and vertically to form a hollow cylinder of the same height as the other cylinder 38, and spaced apart therefrom. The plate 36 is provided with a number of punched-out tongues 43, which are bent downwardly, and which are then bent over outwardly to engage the inwardly flanged top edges 44 of the cylinders 38 between them. In this way, the cylinders are suspended in spaced relation between the cylinders 37. When the disk 39 is rotated by means of the rotation of the shaft 26, the cylinders 37 are likewise rotated, exercising through the intermediate air a like tractive effect upon the interposed cylinders 38 to that already described in causing rotation of the spindle 15 and the winding up of the spring 22. The outermost cylinder 38 is provided with a graduation scale, and numbers in the same way as that

shown in said Fig. 2, and the indicating of the speed of the vehicle is in every way the same. The worm 30 on the sleeve mounted on the shaft 26 is adapted to rotate a worm-wheel by means of a suitable pawl and ratchet mechanism which operate numbering disks, which indicate the total mileage obtained by the vehicle. This feature, however, is not claimed herein, and will not be specifically described.

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

1. In combination, fixed supporting means, disconnected alined driving and driven shafts rotatably mounted in said supporting means, relatively thin spaced rigid pieces of material rigidly connected to and arranged coaxially about said driven shaft with broad surfaces opposite each other, and other relatively thin spaced rigid pieces of material rigidly connected to and arranged coaxially with the driving shaft, and being alternated with the first-mentioned pieces, between them and having their broad surfaces adjacent to and spaced from the broad surfaces of said other pieces.

2. In combination, disconnected alined driving and driven shafts, a fixed support, said shafts being mounted in said support, a coiled spring having one end secured to said fixed support and the other end secured to said driven shaft, relatively thin spaced rigid pieces of material rigidly connected to and arranged coaxially about said driven shaft with their broad surfaces opposite each other, and other relatively thin spaced rigid pieces of material rigidly connected to and arranged coaxially with the driving shaft, and being alternated between said first-mentioned pieces and spaced therefrom.

3. In combination, disconnected alined driving and driven shafts, a frame having bearings for said shafts, a coiled spring whose inner end is secured to said driven shaft and having its outer end secured to said frame, spaced rigid pieces of material rigidly connected to and arranged about said driven snaft, other spaced rigid pieces of material rigidly connected to and arranged about said driving shaft, the former pieces being alternated between the latter pieces in spaced relation with their broad surfaces in close juxtaposition, and with the inter-spaces between said spaced pieces forming a convoluted channel therebetween.

4. In combination, disconnected alined driving and driven shafts, a fixed support, bearings therefor in said support, a coiled spring having one end secured to the driven shaft and its other end secured to said fixed support, a cup-shaped body secured to one end of said driving shaft coaxially, spaced rigid relatively thin plates secured to said body in parallel relation to each other, another cup-shaped body secured coaxially to said driven shaft and inclosing said plates at their outer edges in spaced relation thereto, and other spaced rigid relatively thin plates secured to the second-mentioned body and extending between the first-mentioned plates in spaced relation thereto.

Signed at Waterloo, Iowa, this 20th day of Nov. 1913.

STEAD A. ASQUITH.

Witnesses:
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