

L. A. GREENLEAF.
SPEEDOMETER.
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1,265,077.

Patented May 7, 1918.
2 SHEETS—SHEET 1.

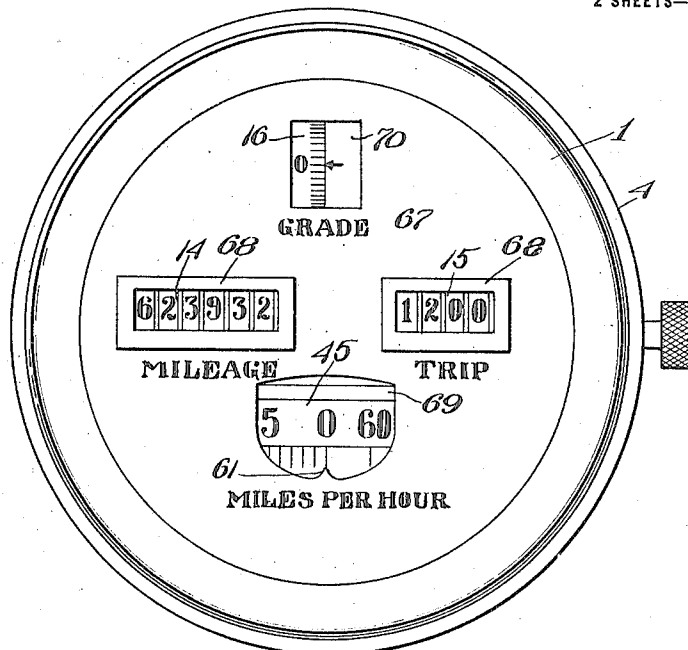


Fig. 1.

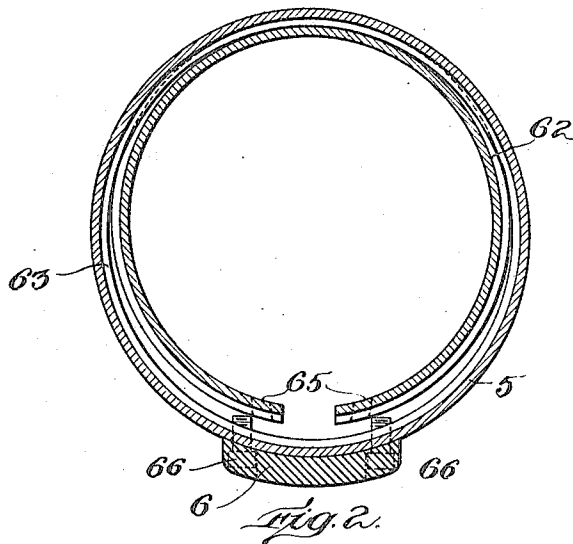


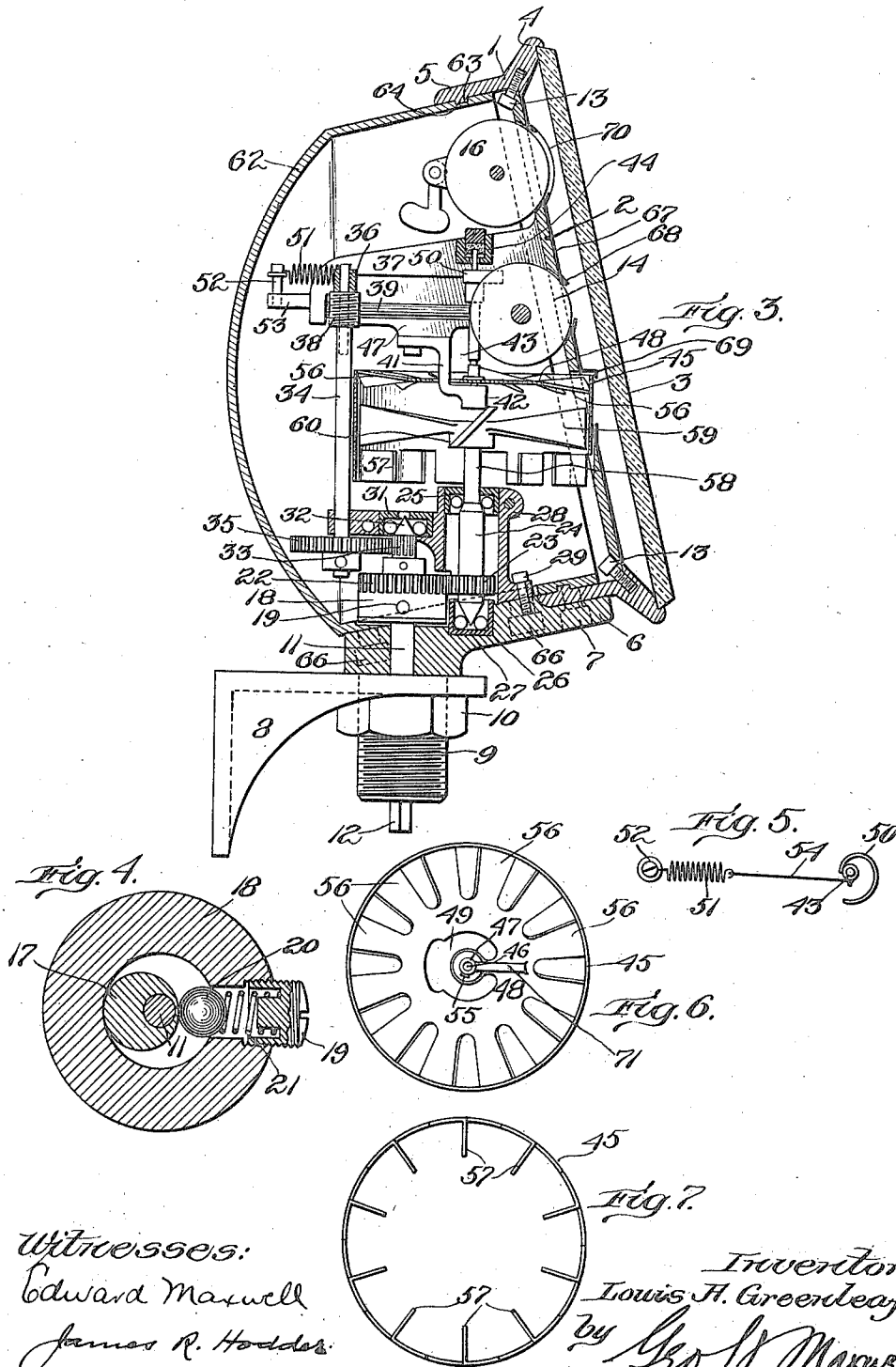
Fig. 2.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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SPEEDOMETER.

1,265,077.

Specification of Letters Patent.

Patented May 7, 1918.

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To all whom it may concern:

Be it known that I, LOUIS A. GREENLEAF, a citizen of the United States, and resident of Beverly, county of Essex, State of Massachusetts, have invented an Improvement in Speedometers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

5 This invention relates to speedometers intended for use primarily on automobiles.

My present invention is an improvement upon the speedometer of my prior Patent No. 1,011,051, wherein a current of air is employed to actuate the speed indicator, and it is an object of the present invention to improve and perfect speedometers of the type shown in said patent. It is also an object of the invention to provide means which will be more accurate and efficient in response to the air current produced; to provide an improved shock absorber between the driving shaft and the mechanism contained within the speedometer; and to

15 so arrange the entire speedometer actuating and indicating means that the same may be easily, readily, and accurately adjusted, and then to permit the covering and inclosing device to be affixed and sealed. It is an important feature of my invention to provide a speedometer which may be entirely supported by the front plate which also carries the dial and is secured to the bezel. The speed indicator is preferably in the form of

20 a drum, which will also act as a directing plate or means to confine the air current which actuates it, and said drum is also positioned to project through the supporting plate or dial, and carrying the speed indicator figures on the outer surface may thus be readily read during the operation of the speedometer.

Other novel features of the invention, combinations of parts, and details of construction will be hereinafter more distinctly pointed out and claimed.

Referring to the drawings, wherein a preferred embodiment of my invention is illustrated,

50 Figure 1 is a front view of the speedometer, showing the dial and indicators;

Fig. 2 is a view illustrating the manner of affixing the inclosing cover;

Fig. 3 is a side view, principally in section, substantially through the center of

the speedometer, and showing the same as mounted on a permanent support;

Fig. 4 is an enlarged detail view, also in section, of the shock absorbing device;

Fig. 5 is a view of the spring and cam controlling the speed indicating drum; and

60 Figs. 6 and 7 are detail views of the said drum.

In order to construct the speedometer so that the entire actuating and indicating mechanism may be securely supported in its permanent position on the vehicle or automobile, with the inclosing cover entirely removed to facilitate access to the various parts of the interior mechanism, I preferably arrange the entire mechanism to be supported by the front or bezel of the instrument which is carried by a base to be secured to a bracket. As herein shown therefore, the bezel of the speedometer comprises the rim 1, carrying a dial 2 and the usual glass cover thereover 3, fitted to the projecting flange 4 of the rim 1. A rearwardly extending flange 5 is secured at the lowermost portion to a base 6, by means of

70 a set-screw 7, said base being adapted to rest on a suitable bracket 8, and having a depending stem 9 passing through a hole provided therefor in the bracket and upon which a threaded nut 10 is fitted to clamp

85 the base 6 firmly on to the bracket 8. The stem 9 is bored to receive a shaft 11, having a squared lower end 12 to be fitted to and actuated by the usual flexible driving shaft of the mechanism leading from the speedometer to an axle or wheel of the vehicle in well known manner. The plate 2 is of suitable size to fit the bezel 1, and as this plate is to carry the actuating mechanism, it is made of metal and is firmly secured to the bezel by

95 a plurality of screws 13, which are threaded into correspondingly tapped sockets in the flange 4, as clearly shown in Fig. 3. The plate 2 may be provided with suitable brackets to carry journal bearings for the pinions of the mileage and trip indicators 14 and 15, and for the grade indicator 16, each of these indicators being in position to show through suitable apertures through the plate in the usual manner. The shaft 11 is arranged to actuate the driving gear and speed indicating mechanism through a shock absorbing device, comprising an eccentric 17, mounted on the shaft, and with an annular drum 18 having its central diameter sub-

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stantially larger than the diameter of the eccentric 17. Threaded through a suitable aperture in the side of the drum 18 is a screw 19, adapted to hold a ball 20 yieldingly by bearing upon one end of a coiled spring 21 at the other end of the spring seated upon the rounded surface of the ball 20, and holding the same into yielding contact with the surface of the eccentric 17 on the shaft 11. As the shaft 11 is rotated the drum 18 will be correspondingly rotated, but sudden shocks, jars, and variations in speed of the shaft 11 will be communicated to the drum 18 through the yielding transmission afforded by the construction just described, and which is illustrated in Fig. 4. The upper part of the drum 18 carries gear teeth 22 in mesh with a pinion 23 on the shaft 24, said shaft being suitably mounted in ball bearings carried within upper and lower raceways 25 and 26, the lower raceway being supported in a socket 27 made therefor in the base 6, and the upper raceway being carried in a bracket 28, which is also secured to the base 6 by a headed screw 29. The bracket 28 has a rearwardly extending plate 30 carrying a raceway 31 containing a ball bearing for the shaft 32 carrying a pinion 33, which shaft is secured to the drum 18, so that the pinion 33 is rotated in unison therewith. A shaft 34 passing through a bearing on the plate 30 and carrying a gear wheel 35 in mesh with the pinion 33 has its upper end supported in a bearing 36 carried by a bracket 37, which bracket is secured to the dial 2. The shaft 34 also carries a worm 38 adapted to mesh with a gear on the shaft 39 to drive the mileage and trip indicators 14 and 15 in any suitable and well known manner.

Depending from the bracket 37 is a flange 40 to which I secure an arm 41 provided with a hub 42 to receive the lower end of a vertical spindle 43 having its upper end supported in an adjustable bearing 44 on the bracket 37. The spindle 43 is intended to carry the speed indicating disk or drum 45, the spindle 43 passing through a central aperture 46, through the hub 47 in the top 48 of said drum. This top is provided with a slot 49 of suitable width, form and length to permit the drum 45 to be positioned over the arm 41 and its hub 42, and to be given a rotative movement determined only by the length of the slot 49 before the end walls thereof contact with the depending arm 41. To the upper portion of the spindle 43 I affix a cam 50, preferably comprising a bendable arm which may be bent to secure the desired adjustment with the figures carried on the drum 45, which cam coöperates with a coiled spring 51, said spring having its outer end attached to a post 52 on a stud 53 carried by the bracket 37 and the other end of said spring being connected to the

cam 50 by any suitable means 54, herein shown as a silk cord. As the spindle 43 and drum 45 are rotated, the cam 50 is so arranged as to contact with the silk cord 54 and tends to wind up the same around the increasing diameter of the cam 50, thus exerting increased tension on the spring 51. I provide the side face of the drum 45 with numerals x to indicate speed in miles per hour, which numerals are shown during the rotative movement imparted to the drum 45, and controlled by the spring 51 and cam 50, as just described. I preferably secure the drum 45 to the spindle 43 by means of a set-screw 55, the spindle 43 having a reduced shank for the purpose of passing through the hub 47, and this arrangement provides a range for adjustment of the drum 45 thereon, so that it will not rest upon the hub 42 of the supporting arm 41. The top 48 of the speed indicating drum 45 is formed with a plurality of fanlike members, 56, and the lower rim of the drum 45 may also be provided with a plurality of fanlike members 57. The lower fan members are only short extensions, and may be bent out of the side wall of the drum 45, and may be either perpendicular with said side wall or beveled slightly, corresponding with the bevel of the fans 56. Mounted on the upper end of the shaft 24 is a fan 58, having a plurality of blades 59, and with a hub 60, adjustably secured on the shaft 24 by a setscrew, or in any other suitable manner. The blades 59 are preferably of a diameter almost exactly filling the inner diameter of the drum 45, so that the clearance between the ends of the fan blades and the inner wall of the drum 45 will be comparatively slight. Preferably also the number of lower fans 57 on the drum 45 are limited in size, and so spaced apart as to facilitate the assembling of the instrument and to allow the blades 59 to be passed therethrough.

Rotation of the shaft 12 will actuate the indicators 14 and 15 in the usual manner, and will simultaneously rotate the shaft 24 and the fan 58, the blades 59 on the latter drawing or forcing the air contained within the speedometer through the fan blades 56 formed in the top 48 of the drum 45 and tending to rotate said drum. Rotation of this drum, however, is resisted by the action of the spring 51 and the cam 50, secured to the top of the spindle 43 supporting the drum 45. Increased rotation of the fan 58, and therefore increased draft, will impart a partial rotation of the drum 45 against the resistance of the spring 51, and permit the figures indicating speed carried by the face of the drum and projecting through the opening provided therefor in the plate 2, to show. Said plate 2 may be provided with an indicating point 61. Preferably the blades 59 are beveled and rotated in a di-

rection to draw the air contained within the speedometer downwardly through the fan blades 56 and force said air outwardly against the fan blades 57. The drum 56 thus acts as a guideway or partition aiding in determining the direction of the air current generated by the fan 58. Also it acts as a baffle wall to deflect the air from the blades 59 to the lower fan blades 57 carried by the drum 45. I am thus enabled to secure a greatly increased efficiency and steadiness in the air current transmitted by the actuating fan upon the fan blades carried by the drum 45, and to insure a steady and uniform actuation thereby at all times, and under all speeds and varying conditions of use. The use of air transmission on cars eliminates the entire train of gears from the outer transmitting member to the speed indicator, as is customary in some constructions, and also effectually eliminates the unevennesses due to variations and jolts in the prime mover.

It will be noted that the entire mechanism, including the actuating gear, shafts, and the adjustments therefor, together with the connections between the said shafts and the speed indicating, and the speed, grade, and distance indicating devices, are all supported by the base 6 and bezel 1, and may be secured to a bracket 8, attached to the dasher or other part of the vehicle, and adjusted during the running of the vehicle, as may be necessary or desirable. When adjusted, I then cover the entire mechanism by an inclosing back 62, as will now be described. The flange 5 of the bezel 1 is provided with an inwardly extending rib 63, and the back 62 is provided with a corresponding recess 64. The back 62 is also cut out at the bottom portion to fit over and around the central portion of the base 6 carrying the ball bearings 26 and the drum 18. The cover 62 is therefore "sprung" together somewhat, at the base, and fitted into the inner rim of the flange 5 and around the speedometer mechanism until the recess 64 registers with the rib 63 on said flange, when the back may be permitted to expand and snap into place. Preferably the lower portion of said back is provided with threaded recesses 65, in which a plurality of screws 66 may engage, said screws being fitted through sockets provided therefor in the base 6, as clearly shown in Fig. 2. When the back 62 has thus been positioned, the screws 66 are fitted and lock the back firmly in position. Preferably these screws 66 are so positioned in the sockets therefor in the base 6 as to be countersunk, and the heads may be covered with sealing material, such as wax, paint, or the like, and the entire instrument then coated with enamel or other finishing material, so that the mechanism can not be tampered with or disturbed.

This construction also enables a dust proof cover to be secured. It will be understood that the space between the ends of the back or cover 62, as shown in Fig. 2, will be sufficiently far apart so as to provide clearance for said cover to be contracted as it is fitted to place over the spindle 11 and drum 18.

The supporting plate 2 may be either a single sheet of metal, or may be, and preferably is formed in two sections, the supporting plate to which the brackets carrying the indicators are secured, and a thin dial covering 67 of aluminum or the like applied to the outer surface to give proper finish, and to receive the lettering, as shown in Fig. 1. Preferably such dial will be slightly embossed at the various openings provided in the plate 2, so that the indications may be read as shown at 68, 69, and 70.

In order to provide suitable strength to the top 48 of the drum 45, I may equip the same with a reinforcing member 71 secured thereto by a plurality of screws, said member being best shown in Fig. 6. This enables the slot 49 to be of a length sufficient to permit the drum 45 to be almost completely rotated, leaving but the small portion of the outer surface of said drum between the speed indicating figures zero and 6, as illustrated in Fig. 1, as blank to allow for the width of the reinforcing member 71.

It will thus be seen that I have provided a speedometer wherein the speed indicating drum or dial itself carries the means to cause its rotation, viz., the fan blades 56, and if desired, the lower blades 57, and acts as a deflector for the air currents generated by the speed indicator driving fan 59. The action of the speed indicating drum 45 is steadied by means of the construction herein shown, and the provision of a silk cord 54 enables the low speeds to be accurately indicated with great ease, much better than where a wire is used in place of a silk cord, moreover such silk cord does not rust, and is easily fitted to its spring and spindle, and winds easily and readily upon the cam 50. Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A speedometer having a supporting base and a bezel rigidly secured thereto, actuating and indicating mechanism carried by the base and bezel, and an inclosing cover adapted to cooperate with the base and bezel to inclose said actuating and indicating mechanism in a substantially air tight manner in combination with means within said inclosure to generate a current of air and actuate the speed indicator thereby.

2. A speedometer, comprising a substantially air tight case inclosing the speedometer mechanism, a speed indicator within said case, means to actuate said speed indicator by generating a current of air within

the case, said indictor being in the form of a hollow drum with a plurality of fan blades constituting the top portion thereof, means to support said drum permitting a rotative movement thereof, the current generating mechanism being contained within the drum, and means to control the rotative movement of the indicating drum responsive to the speed of the air current generated within the speedometer, comprising a cam member, a spring to operate upon said cam, and a silk cord connecting the spring and cam, whereby said cam winds upon said silk cord during the rotative movement of the indicating drum.

3. A speedometer, comprising a support-

ing base and a bezel carried thereby, actuating and indicating mechanism supported by the base and bezel, an inclosing cover adapted to cooperate with said base and bezel to inclose said mechanism in a substantially air tight manner, means to permanently secure said cover in its assembled position, said securing means being countersunk within said base and concealed by the base and bezel.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

LOUIS A. GREENLEAF.

Witnesses:

EDWARD MAXWELL,
GEO. H. MAXWELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."