June 12, 1923. 1,458,831

E. O. LANGE

SPEEDOMETER

Filed April 28, 1921 2 Sheets-Sheet 1

Fig. 1.

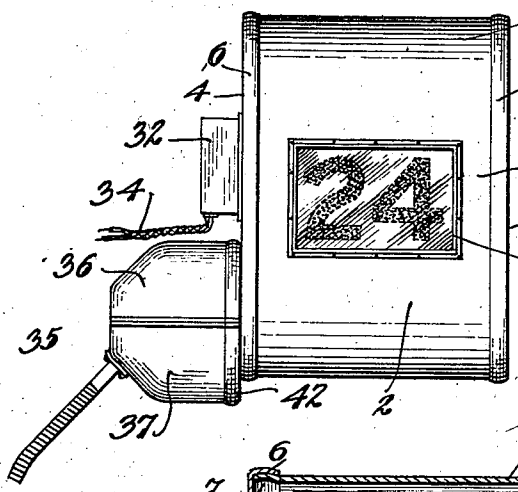
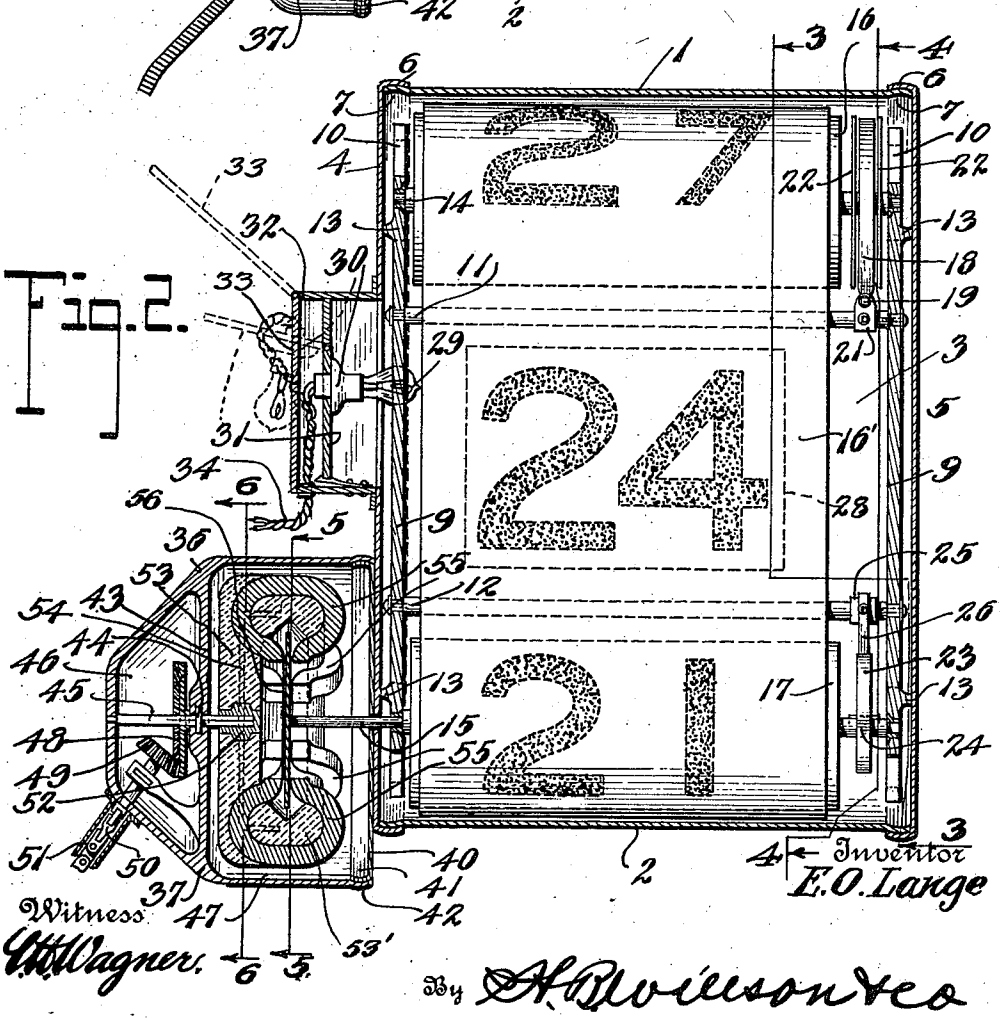


Fig. 2.



Witness
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2 Sheets-Sheet 2

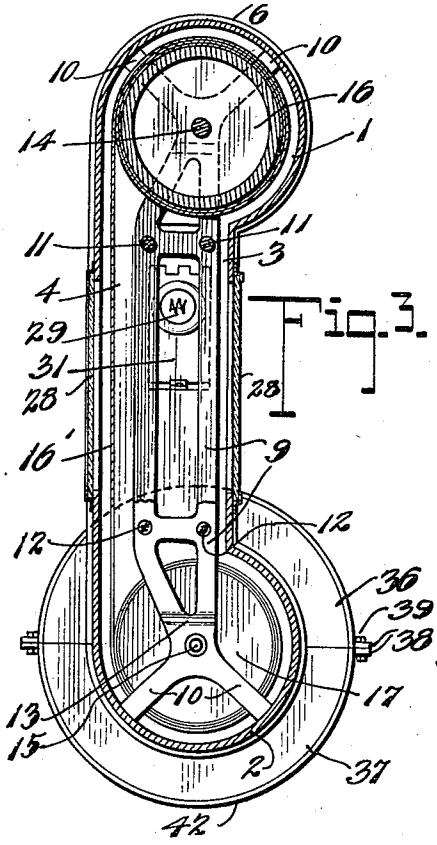


Fig. 3.

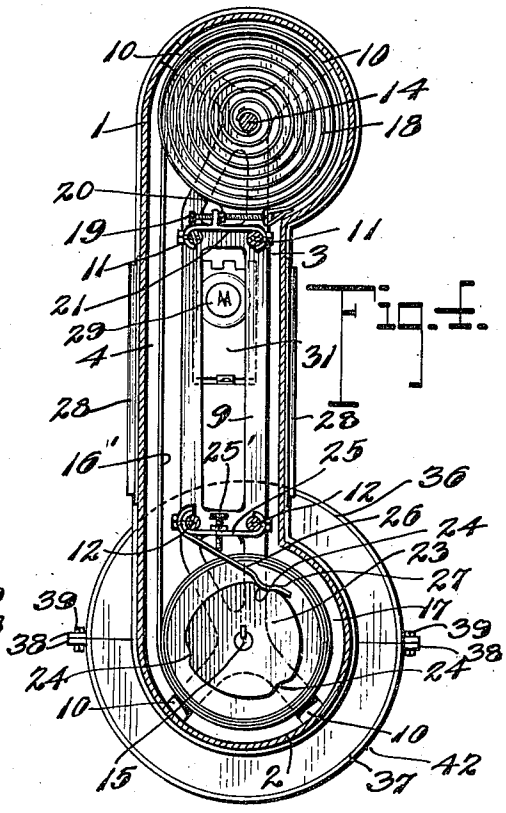


Fig. 4.

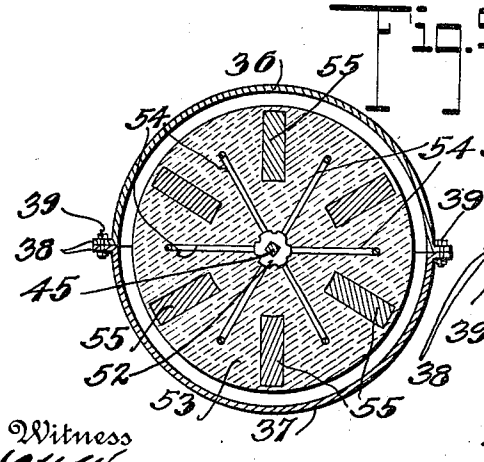


Fig. 5.

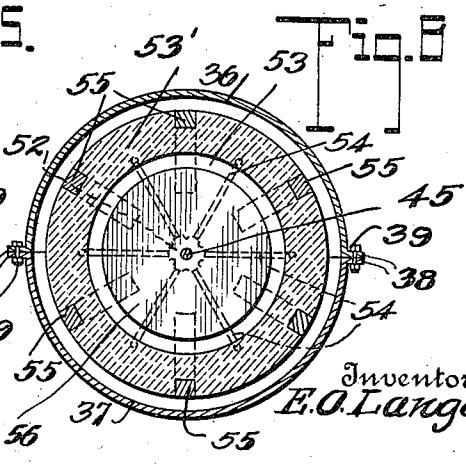


Fig. 8

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Patented June 12, 1923. 1,458,831

UNITED STATES PATENT OFFICE.

ERNEST OTTO LANGE, OF PHILADELPHIA, PENNSYLVANIA.

SPEEDOMETER.

Application filed April 28, 1921. Serial No. 465,153.

To all whom it may concern:

Be it known that I, ERNEST O. LANGE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Speedometers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved speedometer for use in connection with motor vehicles and one object of the invention is to provide a speedometer so constructed that it will be visible to persons outside the car thus permitting the speed of a car to be readily ascertained by traffic police and pedestrians as well as by the occupants of the car.

Another object of the invention is to provide a speedometer including upper and lower rollers having a curtain wound thereon and movable from one roller to another so that as the speed of the automobile increases, the curtain will be wound from one roller to the other and disclose the speed at which the automoble is moving.

Another object of the invention is to provide improved means for controlling the movement of the curtain from one roller to the other, this means including frictional drag means for releasably holding a lower roller against rotation and providing a spring in connection with the shaft of the upper roller so that the curtain can be rewound upon the upper roller.

Another object of the invention is to so construct this speedometer that adjusting means may be provided for the spring and frictional drag.

Another object of the invention is to provide an improved magnetic drive for imparting rotary movement to the shaft of the lower roller in order to wind the curtain upon the lower roller.

Another object of the invention is to so construct this magnetic drive that the magnets forming part of the same will be firmly mounted and prevented from having movement toward or away from the disk of the roller carrying shaft.

Another object of the invention is to provide an improved type of housing for the magnetic drive, the housing including a chamber for receiving the magnet carrying elements and disk of the lower roller shaft and further including a gear chamber closed so that this gear chamber may be filled with lubricating oil.

Another object of the invention is to provide an improved housing for the illuminating lamp, the housing being so constructed that the outer wall thereof may be swung to an open position and a light socket carrying plate then swung outwardly to permit of the bulb being removed or put in place.

Another object of the invention is to provide a speedometer of the character described which will be compact in its construction and neat in appearance and which will operate in a very efficient manner.

This invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a view showing the improved speedometer in front elevation.

Figure 2 is a view showing the speedometer principally in vertical section, the curtain and certain other elements of the speedometer being shown in elevation.

Figure 3 is a vertical transverse sectional view taken along the line 3—3 of Fig. 2.

Figure 4 is a vertical transverse sectional view taken along the line 4—4 of Fig. 2.

Figure 5 is a sectional view through the magnetic drive taken along the line 5—5 of Fig. 2.

Figure 6 is a sectional view through the magnetic drive taken along the line 6—6 of Fig. 2.

This improved speedometer is provided with a housing having upper and lower chambers 1 and 2 and an intermediate portion 3 constituting a neck leading from the upper chamber to the lower chamber. End walls 4 and 5 are provided for the housing and provided with inwardly extending flanges 6 which are crimped about the beads 7 formed at the sides of the housing so that the end walls or heads of this housing will be securely held in place.

Within the housing is provided a frame having side brackets 9 which are provided at their upper and lower ends with diverging arms 10 which engage the walls of the upper and lower heads as shown in Fig. 3 and thus support the brackets in the proper vertical position. These brackets are connected by upper and lower rods 11 and 12 so that they will be held in the proper

spaced relation and the brackets are further provided with outstanding lugs 13 for engaging the end walls 4 and 5 and holding the brackets in spaced relation to these walls. Shafts 14 and 15 are journaled in bearings of the brackets and these shafts carry the upper and lower rollers or drums 16 and 17 upon which the end portions of the ribbon or curtain 16′ will be wound. It will thus be seen that when one of the rollers or drums is rotated, the curtain will be unwound from one roller and wound onto the second roller.

In order to have the curtain normally wound upon the upper roller 16 and returned to this roller after being wound upon the lower roller 17, there has been provided a spring 18 which is positioned vertically about the upper shaft 14 and has its inner end secured to this shaft as shown in Fig. 4. The outer end of this spring has a swivelled connection with an adjusting screw 19 mounted in a threaded bearing 20 carried by a strip 21, the ends of which are secured to the upper bracket connecting rods 11. It will thus be seen that when necessary, proper adjustment may be given the spring 18 by turning the adjusting screw 19. Disks 22 are mounted upon this upper shaft 14 upon opposite sides of the spring, so that the spring will be held in vertical position. It is also desired to provide the friction drag in order to control rotary movement of the lower drum or roller. There has therefore been provided a disk 23 having notches 24 formed in its edge portion. A bracket 25 formed from a strip of metal is secured to the lower rod 12 and is provided with a threaded bearing opening through which extends a set-screw 25′ for engaging a spring strip 26 and moving the free end portions thereof into engagement with the edge of the disk 23. It should be noted that this spring strip is bent adjacent its free end as shown at 27 so that the spring strip may fit into the notches and thus have a firm engagement with the disk.

When this device is in use, it is intended to have the interior of the housing lighted at night so that the numbers which show through the sight openings 28 may be readily seen by pedestrians as well as by the driver of the car. These numbers may be painted upon the curtain so that they can be seen during the day and perforations will be formed in the curtain so that the light will shine through these perforations and disclose the numbers very clearly at night. The light is supplied by means of an electric lamp or bulb 29 which is carried by a socket 30 mounted upon a partition plate or board 31 hingedly mounted in the housing 32. When the rear door or head 33 of the light housing is swung upwardly to the dotted line position, the socket carrying board 31 can also be swung upwardly as shown by dotted lines and a burnt out bulb can then be removed and a new one put in place. Current is supplied by the usual wires 34.

In order to rotate the lower roller to wind the apron upon the same, there has been provided a magnetic drive shown in Figs. 2, 5 and 6. This magnetic drive is provided with a housing 35 having upper and lower sections 36 and 37 which are provided with outstanding flanges 38 through which will pass fastener bolts 39. A closure head 40 is provided with the open end of this housing and is provided with an inwardly extending flange 41 for fitting within the beads 42 of the housing. Therefore when the bolts 39 are tightened, the housing will be securely held about the flange of the head. Within the housing is provided a partition 43 having upper and lower sections carried by the upper and lower sections of the housing and provided in their contacting edge portions with registering cutouts forming a pocket in which a thrust collar 44 carried by a shaft 45 will be positioned to prevent the shaft from having longitudinal movement. This shaft 45 extends longitudinally of the housing through the compartment or chamber 46 thereof and into the compartment or chamber 47 thereof. A gear 48 which meshes with the bevel gear 49 at the inner end of a flexible shaft 50 which extends through the armoured tube or cable 51. Within the compartment 47, the shaft 45 fits into the hub 52 of a block 53 formed of bakelite or any other suitable material. This block of bakelite is reinforced by rods 54; the end portions of which are bent to provide fingers extending into the annular wall 53′ provided for this block. A plurality of magnets 55 are embedded in the wall portion of the block as clearly shown in Fig. 2 and have their arms extending inwardly for extending upon opposite sides of the metal disk 56 at the outer end of the lower roller shaft 15. It will thus be seen that when the flexible shaft 50 is rotated, the conventional means carried by the wheel or driving shaft of an automobile, the block 53 carrying the magnets 55 will also rotate and a magnetic field will be created which will act upon the metal disk 56 and rotate this disk and shaft 15 thus rotating the lower drum or roller to wind the curtain from the upper roller down onto the lower roller with the numbers passing the sight openings of the housing.

The magnetic drive supplies a torque to the indicating element when rotated which is directly proportional to the speed. Therefore as the magnets vary in speed with the moving car a torque is induced at the disk which is proportional to the speed. Maximum torque on the disk for a

fixed speed exists when the disk is stationary and this position is determined by counter torque spring. Torque is supplied the disk by virtue of the eddy currents induced in the disk, when the magnets are rotated, which react on the permanent magnetic field and produce torque, which at all times is directly proportional to the speed of the magnets, and also to the speed of the car. The disk being connected to the lower roller will cause the curtain to move. To reach a state of balance so that the indicating number will record the proper speed, a counter torque is necessary. This is supplied by the spring on the upper roller. This spring is designed so that the counter torque increases directly with the rotation of the rollers. The counter torque spring is supplied with an adjustment shown in Fig. 4 for purpose of calibration. Plates alongside of the spring keep it erect when under tension. Therefore with the parts as explained the curtain moves back and forth as the speed of the car varies. To prevent parts of two numbers from being visible in a fixed position the friction drag balance is applied as shown in Fig. 4. This cam is set so that the spring drops into one of the recesses on the cam when the whole of one number is visible. Now before the curtain can move to the next number in either direction, the torque in that direction must increase to such a value as to overcome the resistance at the cam, and when that value of the torque has been reached it has enough torque to turn rapidly and completely to the next number. The friction at the cam is adjustable for calibration purposes as shown in Fig. 4.

The device will be mounted in front of or at one side of the wind shield, preferably in front of the windshield on the side opposite the driver where it can be readily seen by the driver and also by traffic police and pedestrians. It will thus be seen that there has been provided a speedometer which will have a magnetic drive and which will operate in a very efficient manner and further will be so constructed that it may be readily seen at night as well as during the day. It will be further noted that the device is so constructed that the proper adjustment may be given to the upper spring 18 and also the friction drag strip 26 adjusted so that it will bear against the disk 23 the desired amount.

I claim:

1. A speedometer comprising a housing, indicating means including a frame in said housing, upper and lower rollers each having a shaft rotatably carried by said frame, a curtain wound upon said rollers, a coiled spring positioned about the shaft of the upper roller and anchored to the shaft, a disk rigid upon the shaft of the lower roller, bearing brackets carried by said frame, a spring strip engaging the disk, adjusting screws carried by the bearing brackets and having engagement with the coiled spring and spring strip, and a magnetic drive for imparting rotary movement to the shaft of the lower roller including a rotary carrier and magnets carried thereby in operative relation to said disk.

2. A speedometer comprising a housing having a sight opening, indicating means in the housing having a frame, upper and lower rollers having shafts rotatably carried by said frame, a rewind spring for the shaft of the upper roller, a curtain wound upon the rollers and having indicating characters thereon for showing through the sight openings of the housing as the curtain moves from one roller to the other, a frictional drag for the lower roller, and a magnetic drive operatively associated with the shaft of the lower roller.

3. A speedometer comprising a housing having a sight opening, indicating means in the housing including spaced rollers, a curtain wound upon the rollers and having indicating characters thereon for showing through the sight openings as the curtain moves from one roller to the other, a coiled rewind spring for one roller, and rotatable driving means having magnetic association with the shaft of the second roller whereby rotary movement may be transmitted to the shaft of the second roller to wind the curtain thereon against the action of the spring as the driving means increases in its speed of rotation, said spring serving to rotate the first roller and rewind the curtain upon the first roller when the speed of rotation is reduced.

In testimony whereof I have hereunto set my hand.

ERNEST OTTO LANGE.