W. P. DUN LANY.

SPEEDOMETER.

APPLICATION FILED AUG. 27, 1906.

976,054.

Patented Nov. 15, 1910.

3 SHEETS—SHEET 1.

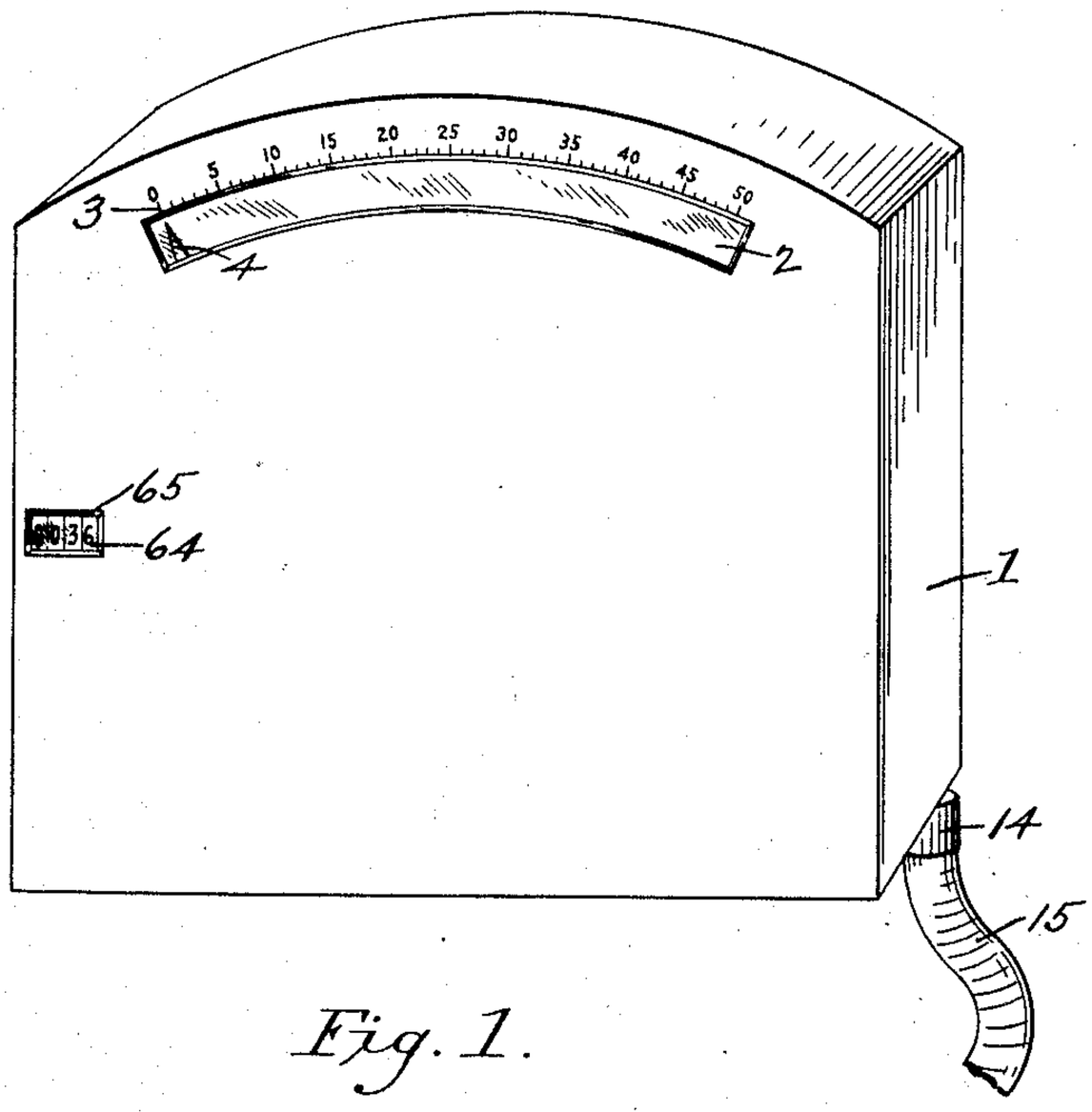


Fig. 1.

Fig. 6.

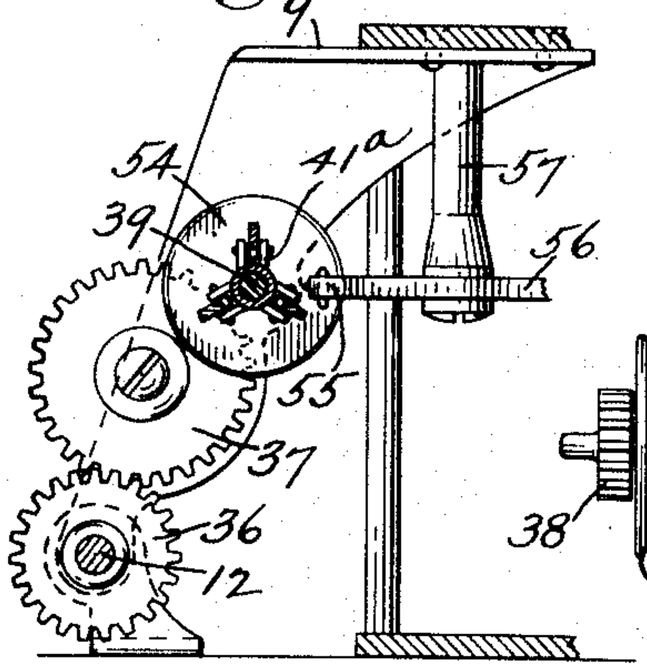
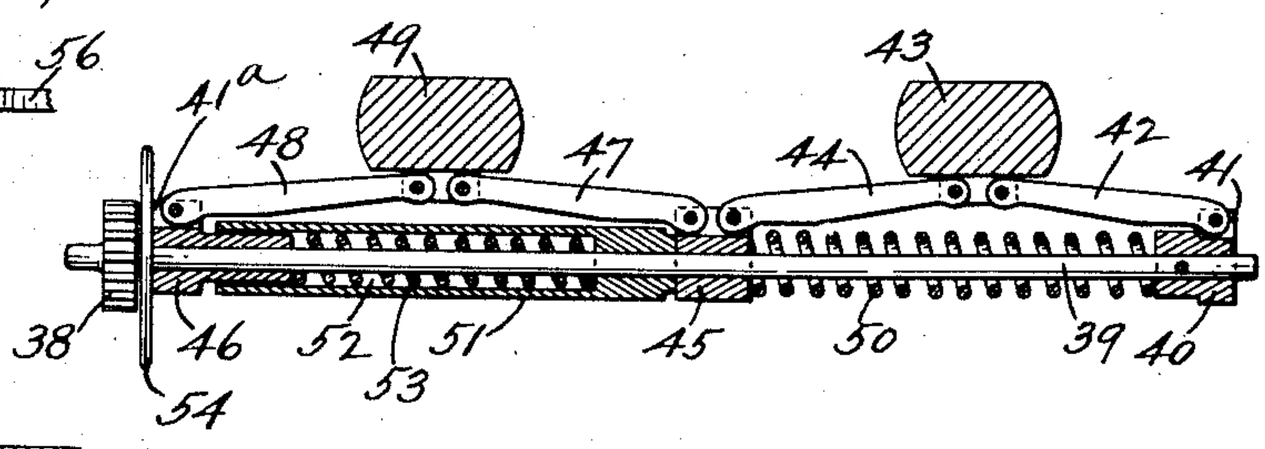


Fig. 7.



Witnesses:-

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3 SHEETS—SHEET 2.

Fig. 2.

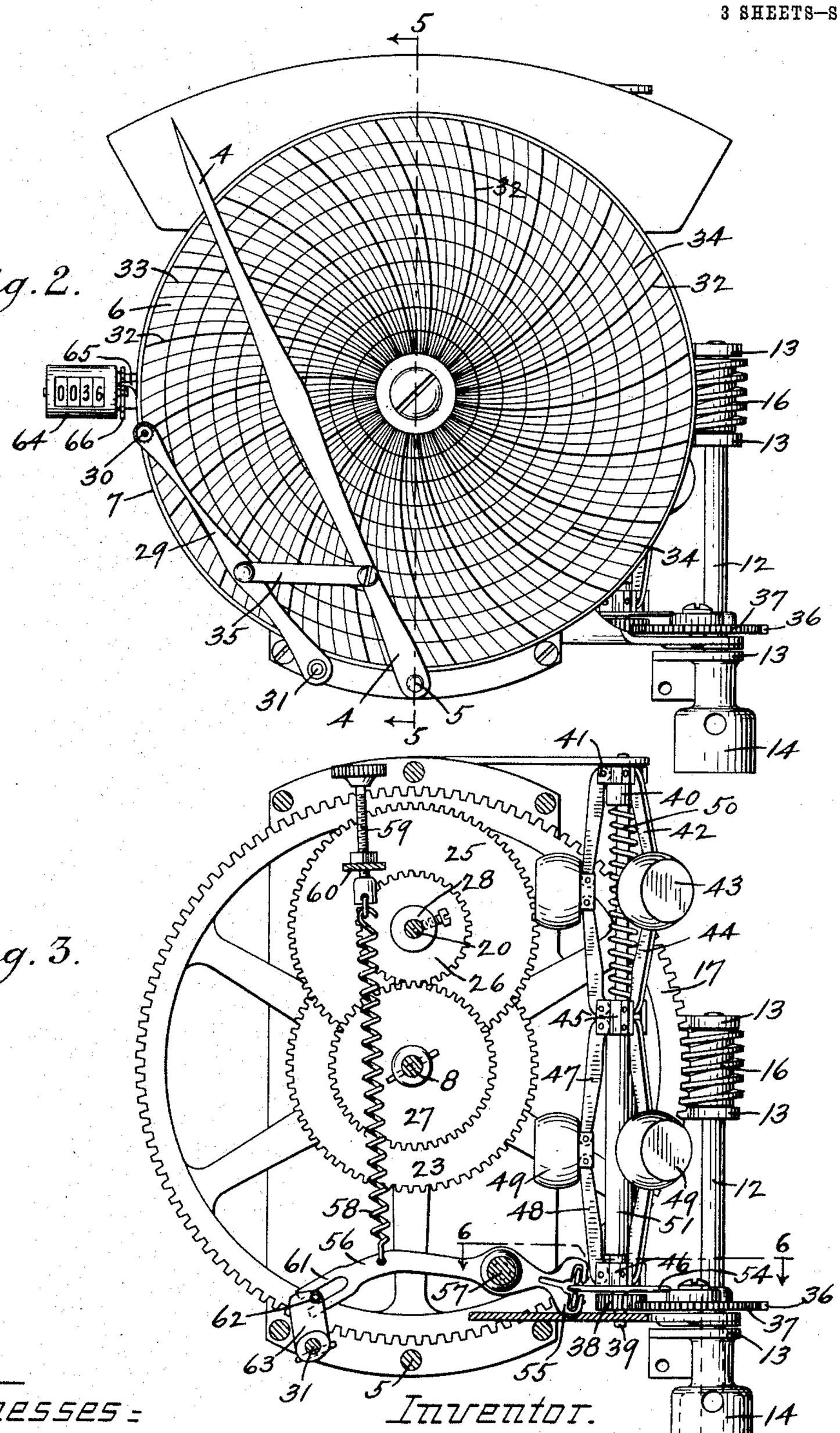

Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 5.

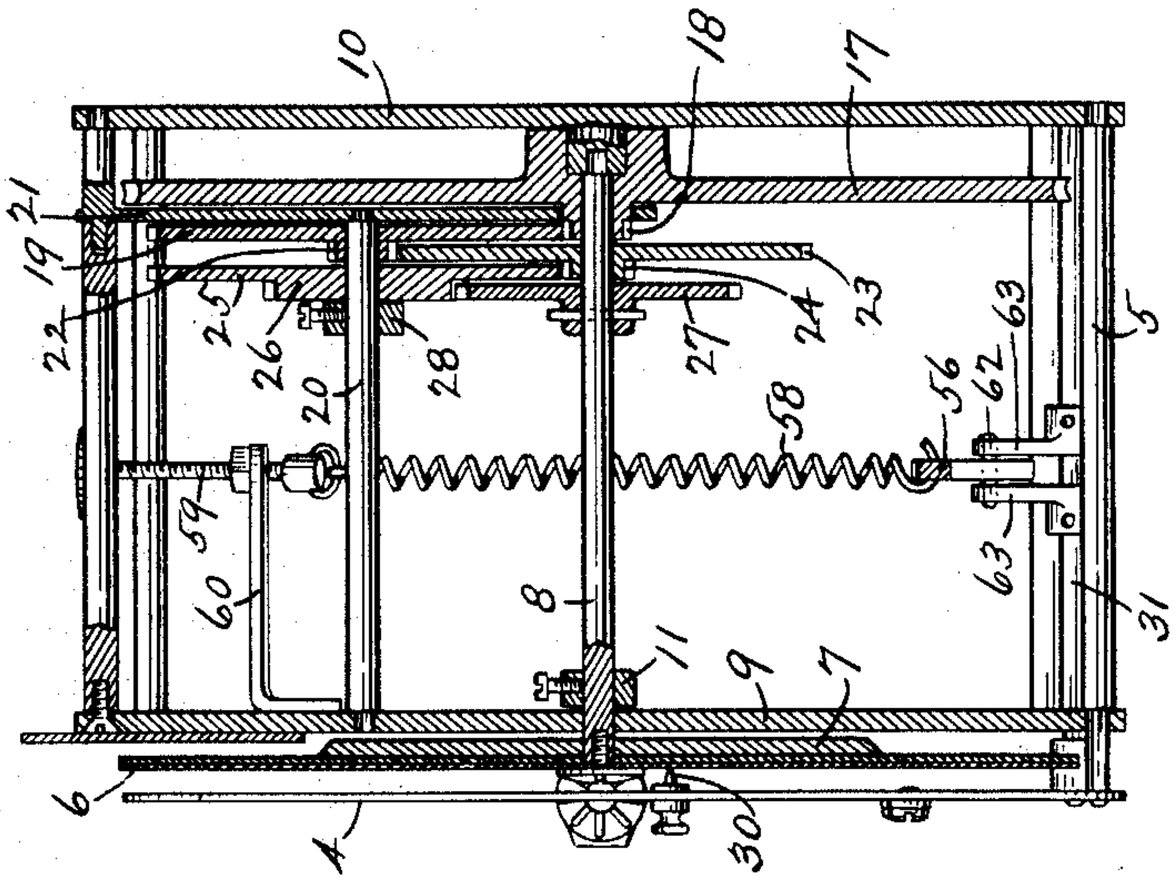

Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM P. DUN LANY, OF CLEVELAND, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE CONTINENTAL MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

SPEEDOMETER.

976,054. Specification of Letters Patent. **Patented Nov. 15, 1910.**

Application filed August 27, 1906. Serial No. 332,147.

To all whom it may concern:

Be it known that I, WILLIAM P. DUN LANY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Speedometers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to speedometers, and it has for its object the simplification of these devices, whereby they are rendered more economical in manufacture, and the increase in the sensitiveness of the same, whereby they will respond to slight variations in speed irrespective of the rate of travel. Heretofore in devices of this character, if the speedometer is so adjusted that it will correctly record slight variations in speed when the vehicle to which it is attached is traveling slowly, it will not give correct indications when the vehicle is moving at a high rate of speed, and vice versa.

By my invention the speedometer is rendered accurate throughout the entire range of speed which it is designed to record. These desirable results are effected by a simple arrangement of governors and their cooperating mechanisms, all of which will hereinafter be described and set forth in the claims hereof.

In the drawings, forming a part of this application, Figure 1 is a perspective view of the outer casing of my speedometer, showing the index and pointer, the flexible shaft for driving the device, and the cyclometer for measuring the distance of travel; Fig. 2 is a front elevation of parts of the interior mechanism, the recording dial being shown in full; Fig. 3 is a sectional view through the device taken substantially on line 3—3 of Fig. 4; Fig. 4 is an edge elevation looking to the left in Fig. 2; Fig. 5 is a sectional view taken through Fig. 2, in line 5—5, also looking to the left; Fig. 6 is a detail sectional view taken on line 6—6 of Fig. 3, and Fig. 7 is a longitudinal sectional view through the center of the governor.

For a fuller description of the invention, reference will be made to the drawings, in which the same parts are designated by the same reference characters throughout the several views, and in which—

1 represents the casing of my speedometer, which casing may be of any suitable contour and design. This casing is provided on its front side with a slot 2, on one edge of which is an index scale 3, forming one part of a speed indicator, the other part consisting of an index pointer 4, said pointer being secured to the end of a rock shaft or rod 5, near the edge of the casing opposite the said slot. The slot is preferably curved about the rock shaft 5 as a center.

The recording dial, which is shown at 6, lies in a plane that is parallel with that of the pointer 4, and just back of the same. It is mounted upon a rotatable disk 7, that is secured to the end of a shaft 8, said shaft being journaled in the interior frame pieces 9 and 10, and being held in proper position by a collar 11, removably secured to the shaft just within the frame piece 9. The power or drive shaft is shown at 12, said shaft being suitably journaled in lugs or brackets 13, projecting from the frame piece 10. At the outer end of the drive shaft is a member 14, to which is attached an end of a flexible shaft 15, indicated in Fig. 1, said flexible shaft being connected with some suitable part of the vehicle, the speed of which it is desired to measure.

The dial shaft 8 derives its rotation from the power shaft 12 through the following train of gearing: The inner end of the shaft 12 is provided with a worm 16 that meshes with and turns a large worm gear 17 that is journaled just inside the frame piece 10. This worm gear, which is mounted loosely upon the dial shaft 8, is provided upon its inner face with a hub, in which is formed a spur pinion 18, said pinion meshing with a gear 19 that is journaled upon an arbor 20, said arbor being mounted within the plate 9 and a bracket plate 21 secured to the interior frame. The gear 19 also has a small pinion 22 secured thereto, and said pinion meshes with a gear 23 that is journaled upon the dial shaft 8. This gear also has a pinion 24 secured to it, said pinion meshing with a gear 25 that is loosely mounted upon the arbor 20, said gear 25 also having a pinion 26. This pinion meshes with a gear 27 that is secured to the dial shaft. The gears and pinions on the arbor 20 are held in proper position by means of a collar 28, that is secured to the arbor.

From this description it will be under-

stood that the dial shaft turns at a very slow speed as compared with that of the power shaft, the reduction gears being so proportioned that the dial will turn but once for each one hundred miles of travel. Any other suitable arrangement, or any other convenient proportion of reduction gearing may be employed. However, the proportion stated is a particularly convenient one, since I am enabled to so design the dial as to make it very easy to ascertain, from an inspection thereof, the exact fractional part of the hundred miles that has been traveled.

Taking up the recording mechanism, 29 is an arm that is provided at its free end with a pencil, or other suitable recording means, 30. This arm is secured at its other end to a rock shaft or rod 31; and, as said shaft is rocked, the pencil 30 will travel over and make a line upon the dial 6. This dial is divided by heavy lines 32 into twenty different parts or spaces, said lines extending outwardly from the center and being curved on an arc having a radius equal to the length of the arm 29. In view of the stated proportions of the reduction gearing, the space between any two adjacent lines 32 represents five miles of travel. In order that the distance may be more accurately read from the dial, each of the said spaces is subdivided by light lines 33 into five equal parts. Each of these subdivisions will, therefore, represent one mile of distance.

The movement of the pencil 30 is dependent upon the speed of travel. As shown, in Fig. 2, the parts are at rest, since the pencil rests upon the outer edge of the dial. As the speed increases, the pencil moves toward the center of the dial. For indicating the speed, the dial is divided by concentric lines 34 into any desired number of spaces. As shown, there are ten of these spaces, and the speedometer is so adjusted that each space represents a speed of five miles.

The index pointer 4 is connected with the arm 29 by a link 35, so that, as the shaft 31 is rocked, the pointer will sweep over the index 3, and thus indicate the speed of travel.

The shaft 31 is rocked by mechanism now to be described, reference being had especially to Figs. 3, 6 and 7.

Secured upon the drive shaft 12 is a gear 36, said gear meshing with an idle gear 37 which meshes with a pinion 38 on the governor shaft 39. Near its end opposite the gear 38, the shaft 39 carries a collar 40, said collar being pinned, or otherwise secured, to the shaft. This collar is provided with a series of pairs of projecting arms or lugs 41, between each pair of which there is pivoted a link 42, the opposite end of said link being jointedly connected to a governor weight 43. A corresponding link 44 is also connected to the weight 43, and its opposite end is joined to a slidable collar 45 that is carried by the shaft 39 near its middle. A similar set of links and a similar weight connect this collar 45 with a sliding sleeve 46 on the end of the shaft 39, near the gear 38, said links and weight being shown at 47, 48, and 49. Fig. 6 shows an end view of the collar 46, from which it will be seen that I use three pairs of arms or brackets 41ª, between which are pivoted the links 48. There are, therefore, three governor weights 49, and a corresponding number of weights 43. It will be understood, however, that a different number of weights may be employed if desired.

Surrounding the shaft 39 between the collars 40 and 45 is a helical spring 50, said spring being under normal tension and tending to hold the collar 45 to the left, as seen in Fig. 7. Surrounding the shaft 39 and bearing against the collar 45 is a sleeve 51, said sleeve having one of its ends formed with an enlarged bore 52 so that it can telescope over the end of the sleeve 46. Within the bore, and between the sleeves 46 and 51 is a helical spring 53, said spring tending to push the sleeve 46 toward the gear 38, which forms a stop therefor. The spring 53 is weaker than the spring 50, for a purpose hereinafter set forth.

The sleeve 46 is provided, next the gear 38, with a disk flange 54, with the opposite faces of which engage the forked extremities 55 of a lever 56, said lever being pivoted upon a stud 57 projecting from the plate 9. The lever is held with one part of its forked end against the disk flange 54 by a spring 58, said spring being connected at one of its ends to the lever and at its other end to an adjustable tensioning device, consisting of a screw 59 that is threaded through a stationary bracket 60 projecting from the frame 9. The adjustment of the tension of the spring 58 helps to regulate the action of the governor.

The lever 56 is bifurcated at its end opposite the disk 54, as shown at 61, the bifurcations extending on opposite sides of a pin 62 that extends between crank arms 63, secured to the rock shaft 31. By this means, the lateral movements of the disk 54 are transmitted to the rock shaft, and, by it, to the arm 29 and pointer 4.

As will be seen from Fig. 6, the governor shaft 39 will be driven at a higher rate of speed than the drive shaft 12. As the speed increases, the governor weights 43 and 49 will tend to move away from the shaft 39 by centrifugal action, and as they so move, the sleeve 46 will be moved to the right, carrying the disk 54 with it, and thereby moving the pointer and recording pencil. In order to render the governor more sensitive, the spring 53 is made weaker than spring 50, so that the weights 49 are first to act. When

they have moved the sleeve 46 into contact with the end of the sleeve 51 they can fly outwardly from the shaft no farther. By this time, however, the tension of the spring 53 is substantially equal to that of the spring 50, so that any further increase of speed will cause the weights 43 to act and draw the collar 45 to the right, in Fig. 7, this movement of the collar being followed by a corresponding movement of the sleeves 51 and 46. By the construction thus described, I am able to secure the advantages of a weak spring in my governor, which acts sensitively at a comparatively slow speed, and to combine with it the advantages of a stiffer spring, which does not come into use until the speed has reached a point at which the weaker spring would be too sensitive to be reliable.

In order to measure distances greater than one hundred miles, I cause the disk 7, that carries the dial, to operate a cyclometer 64 at each of its rotations. Any suitable connections may be employed to secure this result, that shown consisting of a lug 65, that projects from the disk and engages arms or teeth on a wheel 66 on the cyclometer. In Fig. 1 the cyclometer appears, showing through an opening 65 in the casing 1.

Various details in the construction of my invention may be made without departing from the spirit thereof, but

What I claim as new and desire to secure by Letters Patent is:

1. In a recording device, a rotatable shaft, means for rotating said shaft, a collar secured to said shaft so as to rotate therewith, a collar mounted to slide upon said shaft near the center thereof, a pair of arms connected to the respective collars, a governor weight connected to said arms, a sleeve carried by said shaft near the end opposite the fixed collar, a pair of arms connected to said sleeve and to the slidable collar, a governor weight connected to the said arms, a spring surrounding the said shaft and resisting the movement of the first governor weight, a slidable sleeve mounted upon the shaft and a relatively weaker spring within said slidable sleeve resisting the movement of the second governor weight, said sliding sleeve forming a stop for the sleeve connected with the second governor weight, whereby the centrifugal motion of said second weight is limited, and, after said limit is reached, the first governor weight becomes operative.

2. In a recording device, a rotatable shaft, means for rotating said shaft, a collar secured to said shaft so as to rotate therewith, a collar mounted to slide upon said shaft near the center thereof, a plurality of pairs of arms connected to the respective collars, a governor weight connected to each pair of said arms, a sleeve having a disk flange carried by said shaft near the end opposite the fixed collar, a plurality of pairs of arms connected to said sleeve and to the movable collar, a governor weight connected to each pair of the said arms, a spring surrounding the said shaft and resisting the movement of the first governor weights, a slidable sleeve mounted upon the shaft, a relatively weaker spring within said slidable sleeve resisting the movement of the second governor weights, said sliding sleeve forming a stop for the sleeve connected with the second governor weights, whereby the centrifugal motion of said second weight is limited, and, after said limit is reached, the first governor weight becomes operative to move the sleeve having the disk flange, and means connected with the said flange for producing a record.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM P. DUN LANY.

Witnesses:
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J. B. Hull.