W. F. KENDALL.

DRIVING MECHANISM FOR SPEED OR DISTANCE INDICATORS.

APPLICATION FILED NOV. 30, 1909.

1,042,687.

Patented Oct. 29, 1912.

3 SHEETS—SHEET 1.

FIG. 1.

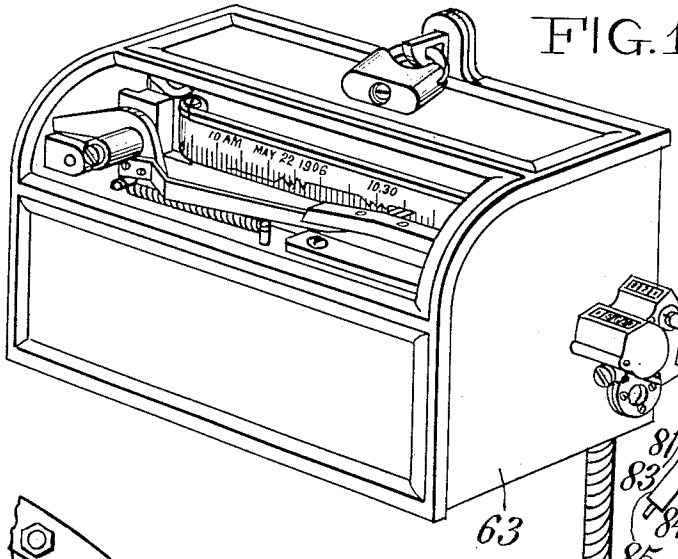


FIG. 2.

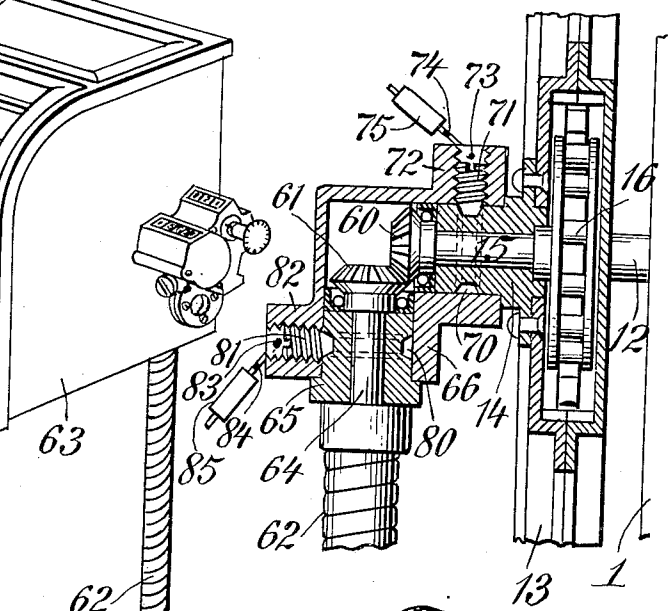
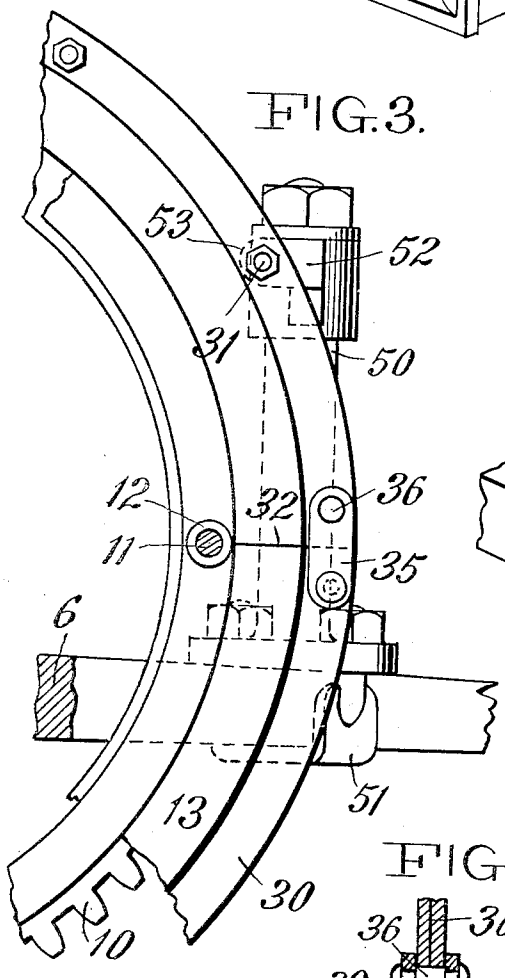


FIG. 3.



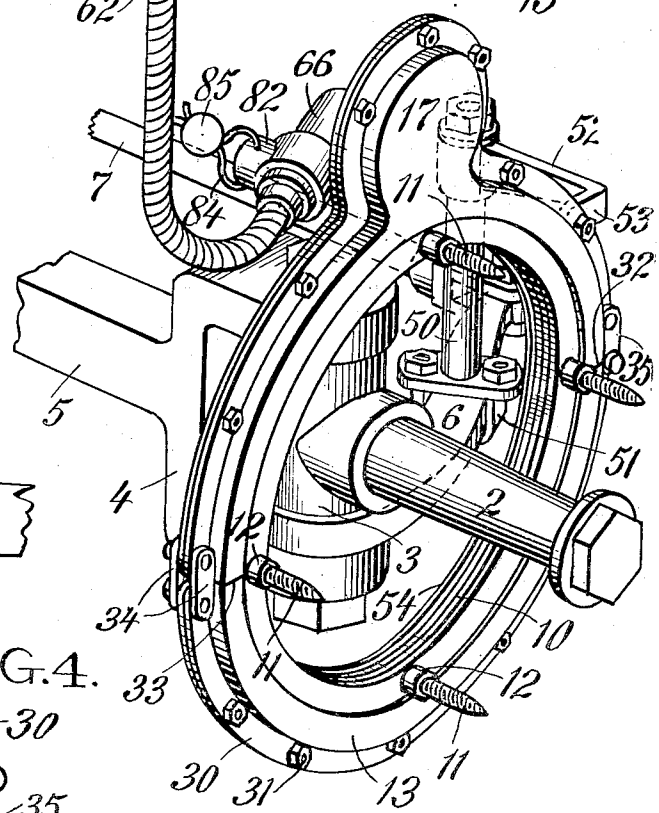
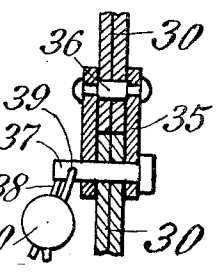


FIG. 4.



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3 SHEETS—SHEET 2.

FIG. 5.

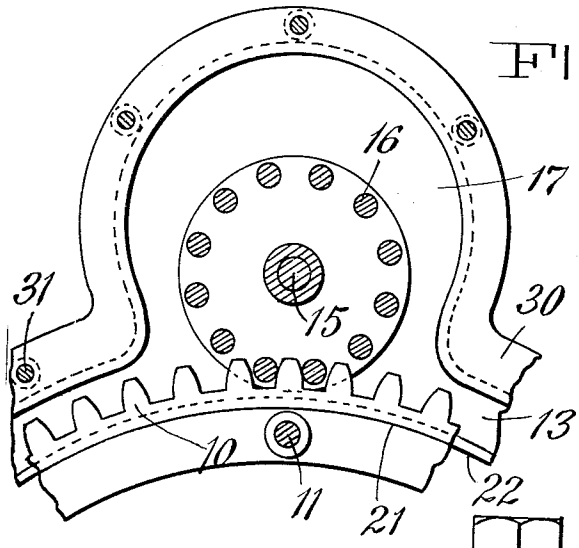


FIG. 6.

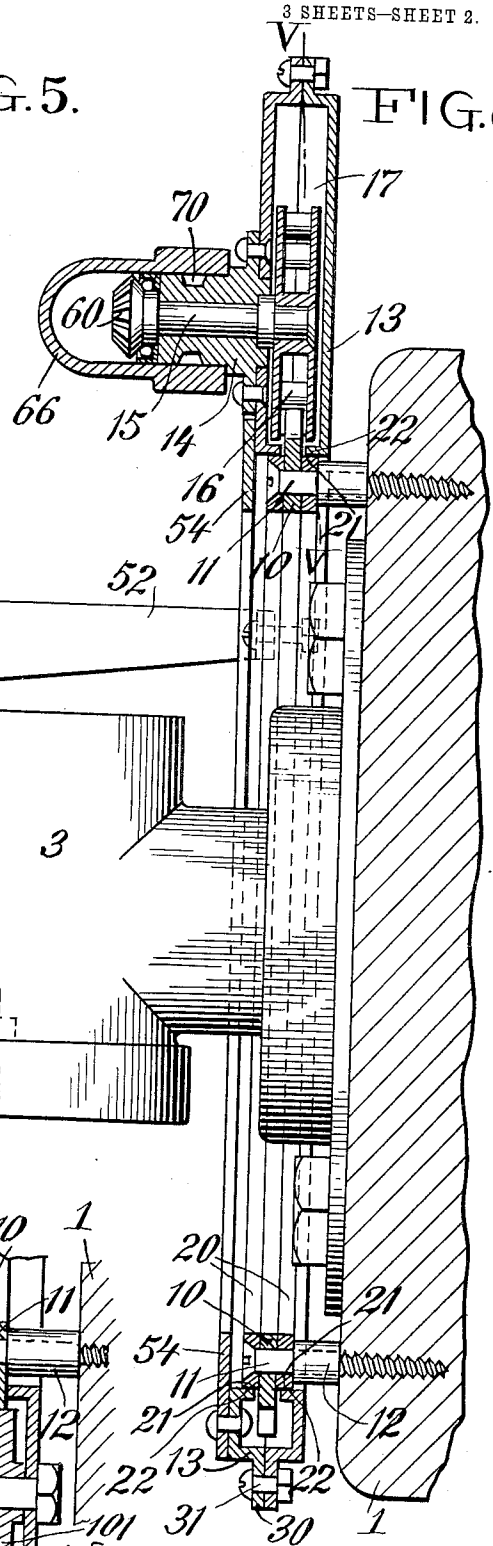


FIG. 7.

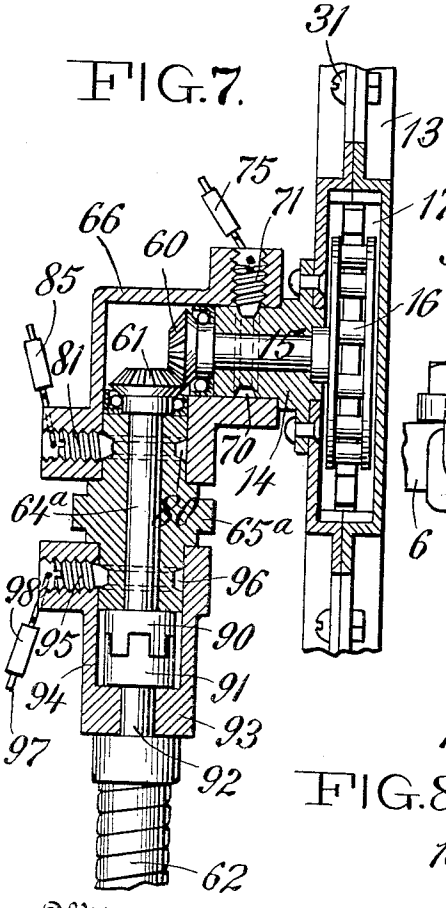
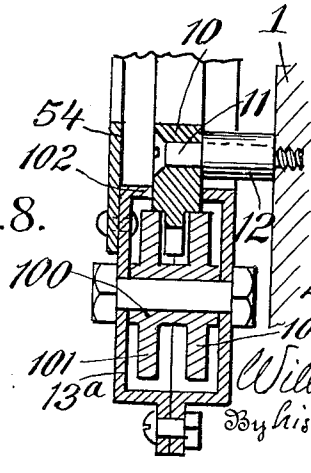


FIG. 8.



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3 SHEETS—SHEET 3.

FIG. 9.

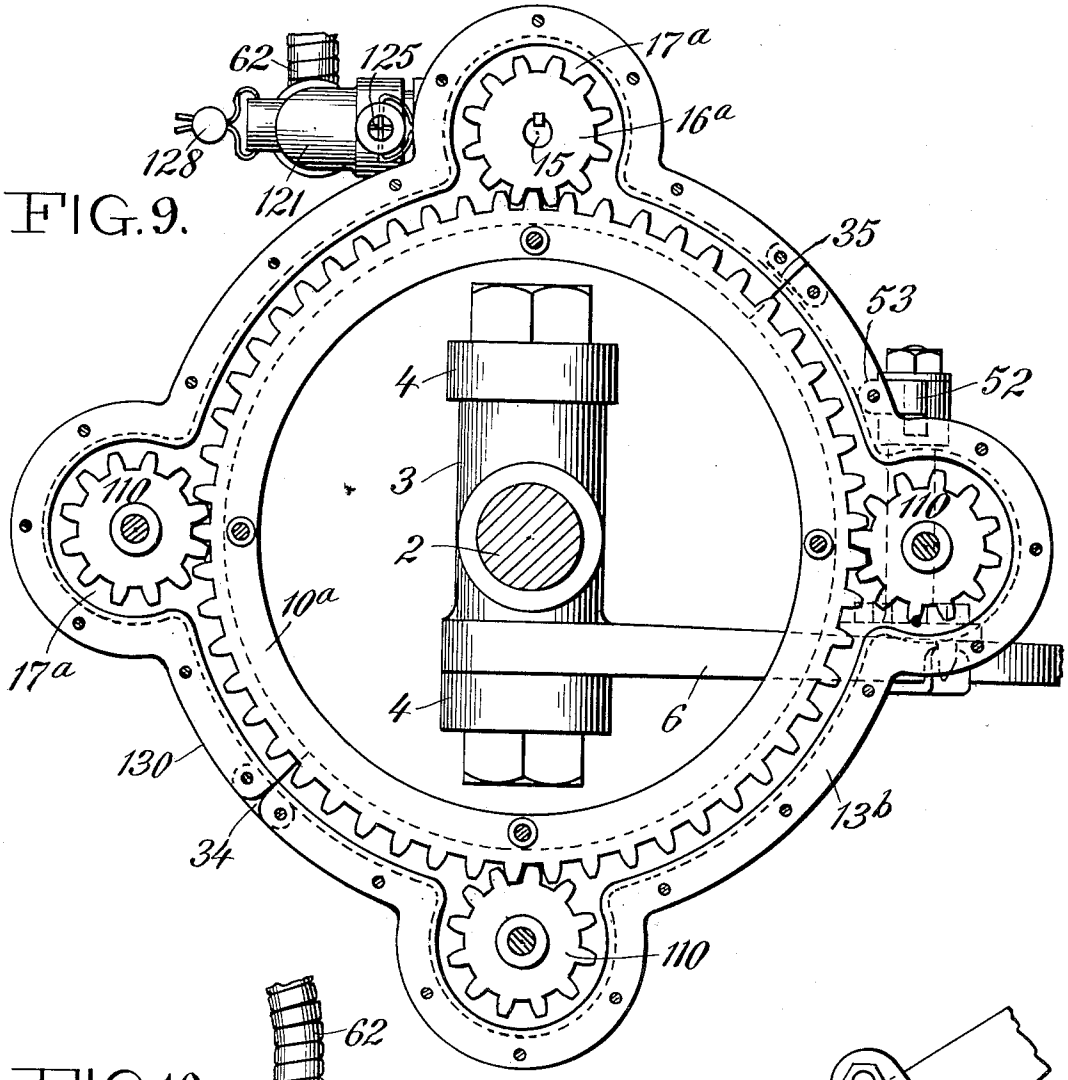
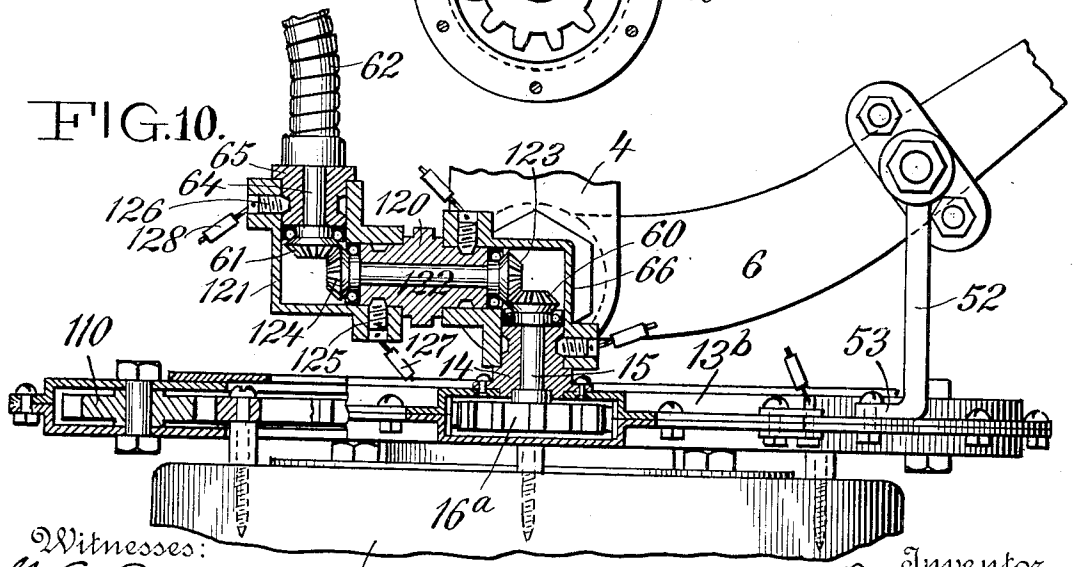


FIG. 10.



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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM FOR SPEED OR DISTANCE INDICATORS.

1,042,687. Specification of Letters Patent. Patented Oct. 29, 1912.

Application filed November 30, 1909. Serial No. 530,561.

To all whom it may concern:

Be it known that I, WILLIAM F. KENDALL, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Driving Mechanism for Speed or Distance Indicators, of which the following is a specification.

My invention relates to driving mechanism by which motion may be taken from a vehicle wheel or like part, and is primarily designed for the driving of vehicle speed indicators, distance registers or taximeters.

Various difficulties have been experienced in driving devices of this nature owing to the inconvenient location of the driving gear, which is usually secured to the hub of one of the wheels, and also to the fact that with self-propelled vehicles it is necessary to take the motion from one of the front or non-driving wheels, which is also a steering wheel and must, accordingly, be free to change its angle.

My invention also contemplates the provision of means for sealing the connection between a recording instrument and the driving gear, whereby unauthorized disconnection of the recording instrument is made impossible. A record may thus be made which cannot be tampered with, and from which the owner of the vehicle or other person interested may ascertain to just what extent the vehicle has been used.

In the accompanying drawings, which form a part of this specification, I have chosen certain modifications for illustration, but I do not wish to be limited thereto, as it is obvious that my invention may be embodied in various other forms.

In these drawings Figure 1 is a perspective view showing one form of my driving mechanism in the position it will occupy upon a vehicle, the end of the vehicle axle and the steering knuckle being shown, but the wheel itself being omitted to disclose more fully the driving gear. Fig. 2 is a horizontal sectional view through the driving pinion, pinion casing and bevel gear case or elbow; Fig. 3 is a side elevation showing a portion of the gear case and main driving gear, and the supporting device for preventing rotation of the gear case; Fig. 4 is a detail sectional view showing the means for sealing the joint in the gear case; Fig. 5 is a section on line V—V of Fig. 6; Fig. 6 is a vertical sectional view of the driving gear, pinion and gear case showing the wheel hub and steering knuckle; Fig. 7 is a view similar to Fig. 2, showing a modified form of connection between the driving pinion and the driving shaft; Fig. 8 is a sectional view through one side of the main driving gear and gear case, showing a modification of my device; Fig. 9 is a side elevation of a modified form of my invention, one side of the gear case being removed, and Fig. 10 is a plan view, partly in section, of the modification shown in Fig. 9.

Referring to the drawings in detail, 1 is the hub of a vehicle wheel from which it is desired to transmit motion. This may be any vehicle wheel, but I have shown it as the steering wheel of an automobile, mounted upon a journal 2, projecting from the steering knuckle 3, which is pivoted in the forked end 4 of the front axle 5 of the vehicle. The steering knuckle has projecting from it the steering arm 6, to which is connected an end of the steering rod 7.

Secured to the hub 1, or to the spokes of the wheel, is the main driving gear 10. Screws 11 passing through spacing sleeves 12 may advantageously be used for this purpose. Surrounding the main driving gear is a gear case 13, which supports a bearing 14, carrying the shaft 15, of the driving pinion 16. The gear case 13 is preferably enlarged, as at 17, to form the casing for this pinion, this enlargement being of sufficient size to inclose the largest pinion which it may be desired to use with the driving gear. For supporting the gear case 13 and the driving pinion 16 carried thereby, I provide upon opposite sides of the driving gear annular rings 20, the outer faces of which, 21, form bearing surfaces for the bearing faces 22 on the gear case. By this means the gear case and driving shaft will always be maintained in the same relation with the driving gear, dirt will be excluded from the driving gearing and the case may be filled with a suitable lubricant to insure quiet running.

The gear case 13 is preferably formed of two portions provided with flanges 30, held together by bolts or rivets 31. It is also preferably split transversely at diametrically opposite points as indicated at 32 and 33, the two sections being held together at

one side by hinge links 34 riveted to the case sections, and at the other side by a pair of links 35 riveted permanently to one case section by means of a shouldered rivet 36, and detachably held to the other case section by means of a removable pin 37. For preventing the unauthorized removal of this pin, and, consequently, of the gear case, some means may be used, such as a wire 38 passed through a hole 39, in the end of pin 37, the ends of the wire being secured together by seal 40. The driving gear 10 turns inside of the casing 13, with very little friction, but in order to positively prevent movement of the latter, I connect the same to some non-rotatable part of the vehicle. As shown, I mount upon the steering arm 6 a standard 50, which is secured thereto in any suitable manner, as by the clip 51. From the upper end of the standard projects an arm 52, bearing a forked or perforated projection 53, which engages with one of the bolts or rivets 31. The gear case is provided on one side with an inwardly projecting flange or lip 54 adapted to overlie the side of the main gear and cover the heads of screws 11. The removal of the screws and detachment of the main driving gear from the wheel hub is thus prevented.

Power from the pinion 16 is transmitted through its shaft 15 and from suitable bevel gears 60 and 61 to a flexible shaft 62 in the casing, which drives the mechanism of the indicator or recording device 63. I have not illustrated the mechanism of the latter in detail, as it forms no part of the present invention, my driving mechanism being applicable to the operation of any of the types of mechanism now in use. In the drawings, I have illustrated by way of example a time and distance recorder of the form shown in United States Patent No. 850,109 to Clement C. Clawson.

For supporting the bevel gear 61 in mesh with the gear 60, the former is mounted upon the end of the shaft 64, which forms an extension of the flexible shaft in casing 62. The shaft 64 turns in a box 65, which is mounted in the gear case or elbow 66, supported by the box 14. The box 14 is grooved, as at 70, a set screw 71 being provided in the elbow for engagement with this groove, to prevent the removal of the elbow. The set screw may be screwed tightly against the box 14, thus preventing turning of the elbow, or may be only partially screwed in the groove, thus permitting the elbow to swivel about the box. In order to prevent the removal of the elbow and consequent breaking of the driving connection to the indicator or recorder, the boss 72 through which the set crew 71 passes is perforated upon opposite sides, as at 73 to receive a wire 74, the ends of which are connected by a seal 75. To prevent the removal of the box 65, it is provided with a groove 80, into which fits a set screw 81 passing through a boss 82, perforated at 83, a wire 84 and seal 85 being provided to prevent the removal of the set screw.

In Fig. 7 I have shown a modified connection for a flexible shaft, in which a separable coupling is used to permit the detachment of the shaft without disengaging the gears 60 and 61. In this construction the gear 61 is mounted upon a shaft 64^a journaled in a box 65^a and provided at its outer end with a coupling member 90 adapted to be engaged by the coupling member 91 secured to the extension 92 of the flexible shaft. This extension 92 is journaled in a box 93, provided with a sleeve 94 adapted to engage the box 65^a and be secured thereto by a set screw 95 engaging a groove 96 in said box. A wire 97 and seal 98 may be provided for preventing the removal of the set screw. As will be apparent in this form of my device, the flexible shaft may be freed from the driving mechanism by breaking the seal wire 97, withdrawing the set screw 95 and removing the box 93, when the coupling parts 90 and 91 will separate.

In Fig. 8 I have shown a modified form of gear casing in which a roller bearing for the driving gear is provided, the casing 13^a having journaled therein a plurality of rollers 100 having flanges 101, between which pass the teeth on gear 10, the edges of the flanges traveling upon the annular shoulders projecting from the gear. The case 13^a is provided with flanges 102 projecting inwardly into engagement with the sides of the gear 10, to exclude dust from the gear case and retain a lubricant therein.

In Figs. 9 and 10, I have shown another modification of my invention in which the gear case 13^b is provided with a plurality of enlargements 17^a in one of which is mounted a driving pinion 16^a while the others contain idle pinions 110, which serve to support the gear case in position about the gear. In these figures I have also shown a modified form of connection for the flexible shaft. In this modification the box 65 carrying the shaft extension 64 on the end of which is mounted the gear 61, is removed from the elbow 66, a connector being inserted in its place. This connector comprises a box 120, adapted to fit in the elbow 66 at one end and having secured to its other end an elbow 121. In this box turns a shaft 122, to one end of which is secured a bevel gear 123, adapted to mesh with bevel gear 60, and to the other end of which is secured a bevel gear 124, adapted to mesh with the bevel gear 61 when the box 65 is inserted in the elbow 121. Suitable means for securing the boxes 120 and 65 to the elbow 121 are provided, such as the set screws 125 and 126 engaging grooves in the boxes in the manner

already described, seals 127 and 128 being provided for preventing the removal of these set screws. By means of the connection above described great flexibility is obtained, and the flexible shaft may be led away from the driving mechanism at any angle. As will be obvious, the separable connection shown in Fig. 7 may be applied to the form of connection shown in Figs. 9 and 10.

The operation of my invention will be apparent from the foregoing description. The mounting of the driving pinion in a gear case, which is supported directly by the driving gear, absolutely insures a true engagement between the pinion and gear at all times, thus preventing accidents and greatly prolonging the life of the parts. Greater accuracy is also obtained. My connections insure the constant operation of the recording or indicating mechanism and prevent tampering with the same, or the throwing of the same out of operation, thereby preventing the surreptitious use of the vehicle without the making of a record.

Having thus described my invention, I claim:

1. In mechanism for transmitting motion from a vehicle wheel, a gear adapted to be secured to a wheel, an annular shoulder projecting laterally from said gear, an annular casing surrounding said gear and forming a running bearing with said shoulder about the entire periphery thereof, and a pinion supported by said casing in mesh with said gear.

2. In mechanism for transmitting motion from a vehicle wheel, a gear adapted to be secured to a wheel, a casing inclosing said gear, said casing comprising two segments divided along a diameter, means for fastening said segments together, and means for preventing the unauthorized separation of said segments.

3. In mechanism for transmitting motion from a vehicle wheel, a gear adapted to be secured to a wheel, a pinion meshing with said gear, a shaft secured to said pinion, a box in which said shaft rotates, said shaft having a gear on its free end, an elbow having one end swiveled on said box, a box having one end mounted in the other end of said elbow, a shaft journaled in said second-named box, a gear on said shaft engaging with the gear on the free end of the first-named shaft, a gear on the other end of said second-named shaft, an elbow mounted on the free end of said second-named box, a third box mounted in said elbow, a shaft journaled in said box, and a gear on the end of said shaft, engaging with the second-named gear on said second-named shaft.

4. In mechanism for transmitting motion from a vehicle wheel, a gear adapted to be secured to said wheel, and a two-part annular casing split along a diameter inclosing said gear, said casing being formed to prevent the detachment of said gear from said wheel without separating the parts thereof.

5. In mechanism for transmitting motion from a vehicle wheel, a gear adapted to be secured to a wheel, and a casing inclosing said gear, said casing comprising two separable parts, and means for securing said parts together, said means including a link secured to one of said parts, a pin for connecting said link to the other of said parts, and a seal for preventing the removal of said pin.

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