

Sept. 27, 1938.

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2,131,622

ODOMETER RESET MECHANISM

Filed Aug. 29, 1935

3 Sheets-Sheet 1

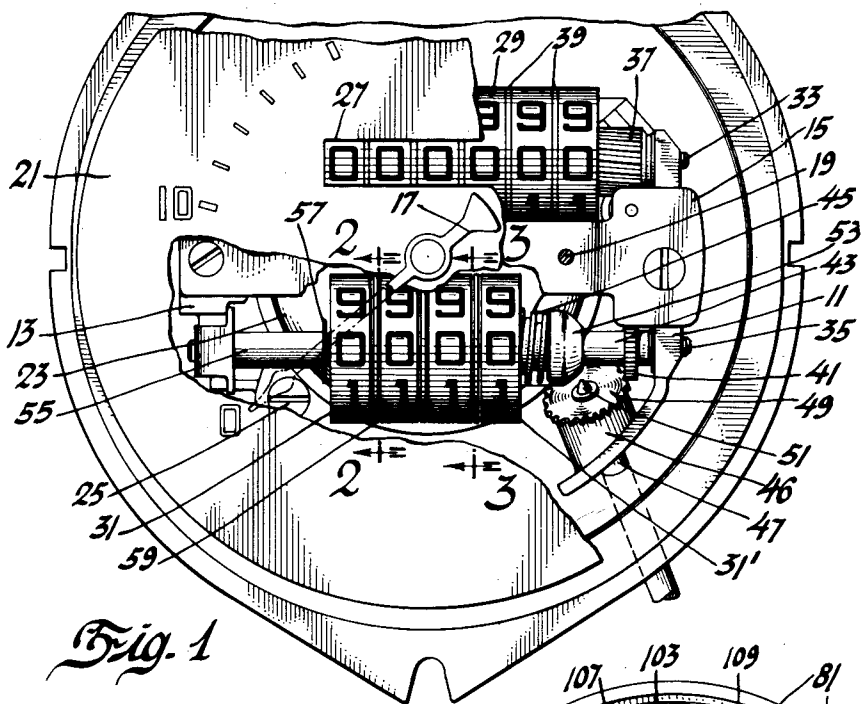


Fig. 1

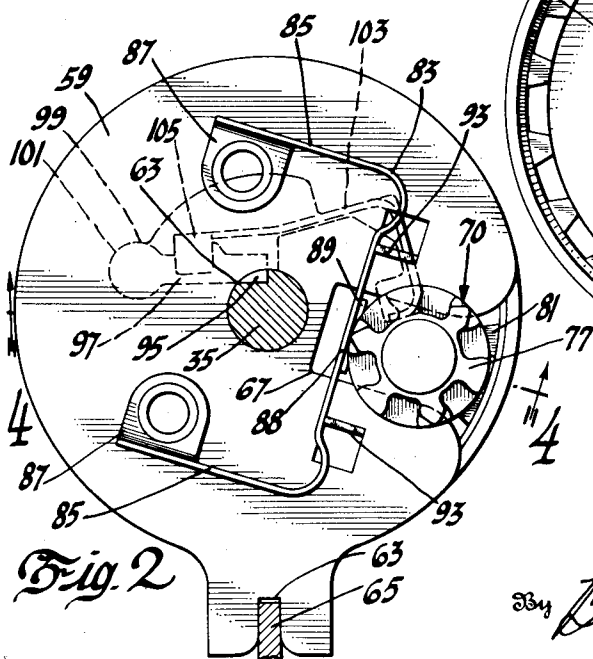


Fig. 2

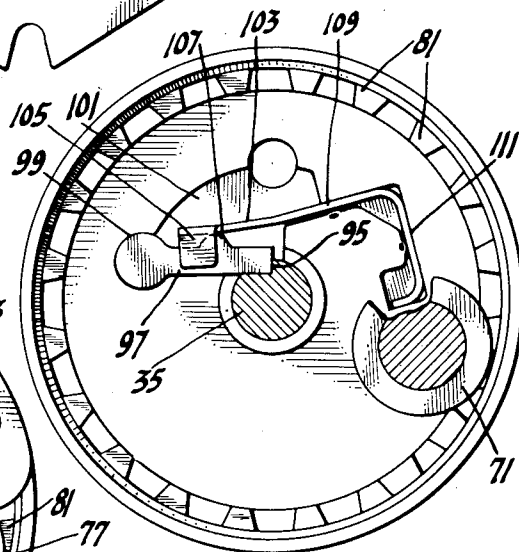


Fig. 3

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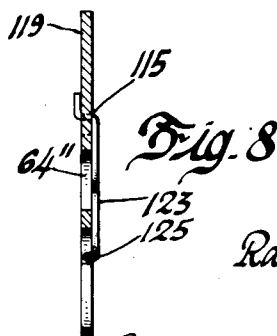
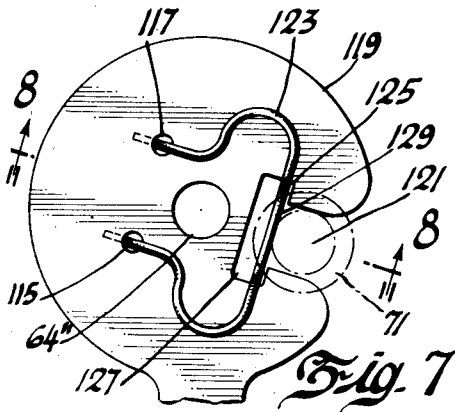
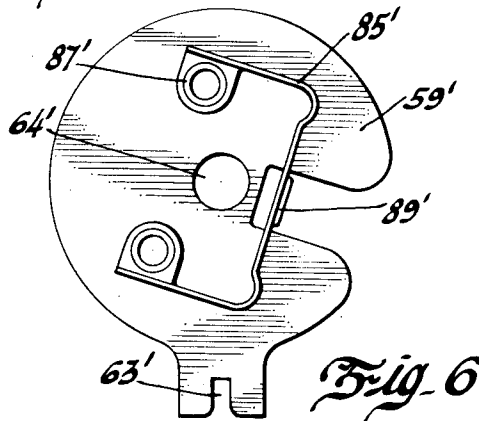
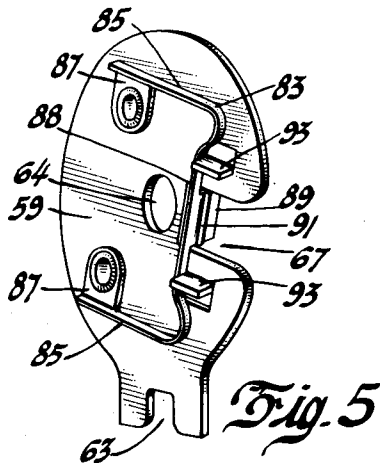
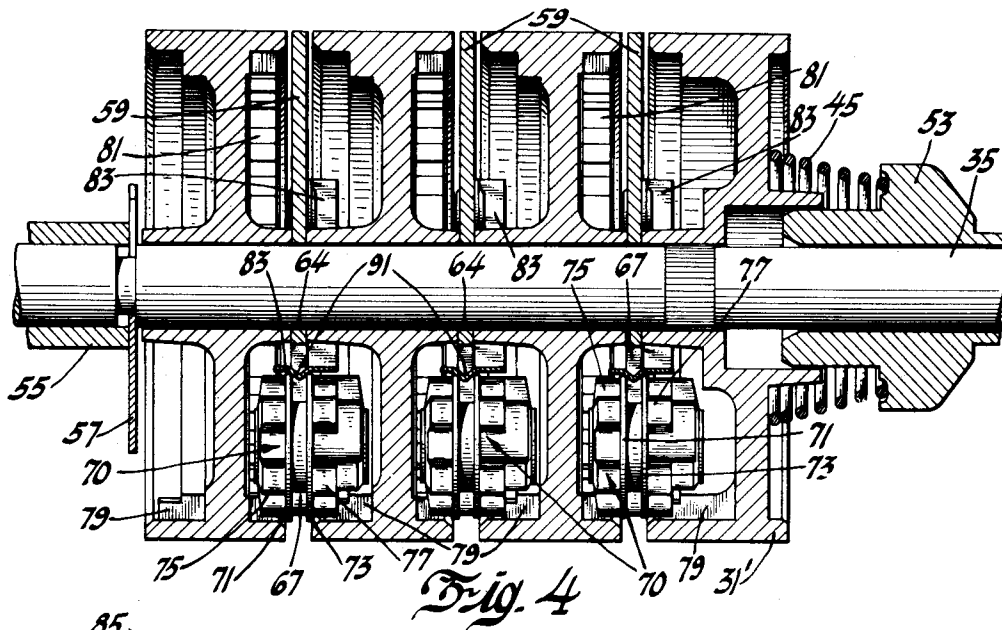
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ODOMETER RESET MECHANISM

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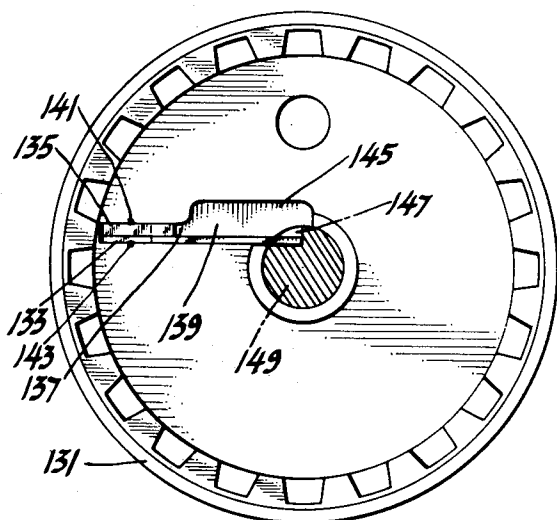


Fig. 9

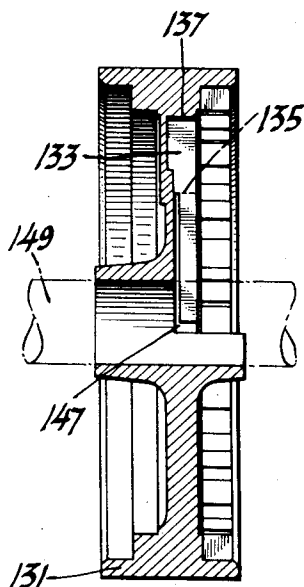


Fig. 10

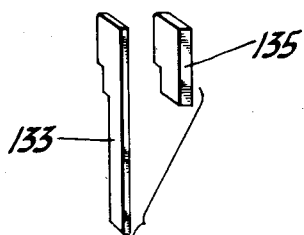


Fig. 11

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UNITED STATES PATENT OFFICE

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ODOMETER RESET MECHANISM

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6 Claims. (Cl. 235—144)

This invention relates to counting mechanism and has been designed as an improvement in the odometer such as is usually associated with the speedometer of a motor vehicle.

5 More specifically the invention is concerned with an improvement in the resetting mechanism of odometers whereby a quick reset to zero reading may be made.

The principal object is therefore an improvement in the resetting mechanism.

A further object is to improve the structure used to effect the bodily movement of the transfer pinion, the bodily movement made necessary by the provision for quick resetting.

15 Another and more specific object is to provide resilient means to bias the transfer pinion to operative position and to yield to permit its movement to inoperative position when making the quick reset.

20 Still another object is to prevent undue pressure between the transfer pinion and the wheel teeth with which it cooperates.

Other objects and advantages will be understood from the following description.

25 In the accompanying drawings:

Fig. 1 is a front elevation of the combined instruments, partly broken away to disclose internal parts.

Fig. 2 is a view as seen from line 2—2 of Fig. 1.

30 Fig. 3 is a view as seen from line 3—3 of Fig. 1.

Fig. 4 is a transverse section through the trip set of the odometer, substantially on line 4—4 of Figure 2.

Fig. 5 is a perspective of a transfer pinion carrier plate and spring.

Fig. 6 is a side elevation of a modified form of the same.

Fig. 7 is a side elevation of another embodiment of the pinion carrier and spring assembly.

40 Fig. 8 is a section on line 8—8 of Fig. 7.

Fig. 9 is a view in elevation of one of the odometer wheels with a modified form of pawl and spring.

Fig. 10 is a transverse section through the 45 odometer wheel of Figure 9.

Fig. 11 is a perspective of certain associated details.

Referring by reference characters to the drawings, numerals 11 and 13 are side walls of a speedometer body or frame. The said walls support a bridge 15 which affords a convenient means to locate one bearing for the spindle of the conventional speedometer needle 17. Fastening means shown only in section at 19 secure 55 to the bridge a cover and dial plate 21 having

suitable figures to indicate speed. The magnetic operating mechanism is not shown, being concealed for the most part within an inverted cup 23, the cup being fastened to the body by suitable means 25. No further reference need be made to the speedometer which is not of itself a part of the invention.

The dial plate 21 has openings, one of which is marked 27 to render visible the figures on the odometer wheels. The wheels of the season set are marked 29 and those of the trip set are marked 31. The wheels of the two sets are mounted on shafts 33 and 35 carried by the walls 11 and 13. Suitable odometer wheel driving gearing, for the most part concealed, drives the wheels. Shaft 33 is shown as having a driven worm gear 37 for driving the wheels of the season set. Adjacent wheels are separated by transfer pinion carrier plates 39, the pinions being of the usual kind and requiring no description.

Simultaneously with the driving of the wheels of the season set wheels of the trip set are driven. To that end gear element 41 on clutch 43 is rotated by gearing, not shown. Clutch 43 is slidably but non-rotatably associated with the decimal wheel 31' of the trip set. This wheel 31' is tightly press-fitted on shaft 35. A spring 45 normally presses the clutch 43 so that its gear element 41 is in mesh with the unillustrated driving element. The frame has a boss 46 through which slides a reset stem 47 carrying a gear element 49. When the reset stem is reciprocated inwardly of the boss, cooperating conical parts 51 and 53 on the stem and clutch respectively reciprocate the clutch, disengage gear 41 from its driving element, and effect the engagement of gear 41 with the stem gear 49 so that rotation of the stem may rotate the clutch and the decimal wheel 31'. Fig. 1 and Fig. 4 show a spacer 55 and a retainer 57 for the trip set of wheels.

The wheels of the trip set with the exception of wheel 31' are mounted loosely on shaft 35. Between each two adjacent wheels is a pinion carrier 59. These carriers (see Fig. 5) have a central opening 64 surrounding the shaft and are held from rotation by notches 63 which engage a lug 65, which latter may conveniently project from cup 23 or be otherwise supported. Each carrier has an enlarged opening 67 within which is received the hub portion of a transfer pinion 70. The pinion has radial flanges 71 and 73 to engage the outer faces of the opening 67, and axially beyond the flanges are teeth 75 and 77. The pinion functions in the usual way. Teeth 77 are engaged at times by a pair of driving teeth 55

79 located on the side of the figure wheel adjacent the wheel of next higher denomination and teeth 75 engage continuous teeth 81 on that side of the figure wheel adjacent the wheel of next lower denomination. It is unnecessary to describe the character of teeth 77 and their association with the lower denomination wheel whereby the pinions are held from rotation except when the teeth 79 engage them. This is an old and well-known expedient.

The pinions 70 are not mounted on fixed pivots in their supporting carriers as is usual in conventional odometers, but they are mounted to move radially in the openings 67. Their flanges resist movement of the pinions axially of the carriers. When in their radially outermost position the pinion teeth engage the wheel teeth and the conventional counting process is operative. When the pinions move radially inwardly disengagement is effected. The pinions are normally projected outwardly into driving engagement by resilient means. To that end each carrier is provided with a U-shaped spring 83. Its side walls 85 have interned tabs 87 suitably riveted to the carrier plate. The part 88 connecting the sides is formed with a transverse web 89 located within and having limited motion in the opening 67. Formed on the web is a ridge 91 to engage the pinion hub between the flanges 71 and 73 as shown in Fig. 4. The spring 83 therefore yieldingly pushes the pinion toward engagement with the wheel teeth, but contacts only along the line or ridge 91. It should be observed, too, that the freedom of the web 89 in the opening 67 provides for a sidewise reciprocation of the spring in addition to its radial reciprocation. This sidewise reciprocation occurs during the quick resetting operation. When the teeth of the pinion are disengaging from the teeth of the wheel, the pinion is given a slight rotation. The yielding pressure of the spring part 89 on the pinion creates friction between the pinion and the spring web with the result that the spring is moved sidewise or laterally by the pinion rotation. A certain amount of potential energy is thus stored in the spring. This energy reappears when the pinion teeth again engage the wheel teeth, serving to reversely rotate the pinion and facilitate tooth reengagement. The construction thus avoids any binding tendency and avoids any difficulty of reengagement after the quick resetting operation.

To avoid excessive spring pressures on the part of the spring and consequent binding between the teeth, and to avoid the necessity of keeping the spring tension within very close limits, tongues 93 are turned up from the material of the plate to form stops to engage the springs and thus limit the outward movement of the pinions.

As best shown in Fig. 3, the face of each figure wheel adjacent the wheel of next lower denomination is modified to provide a locking engagement between the wheel and the shaft. The shaft has a continuous longitudinal angular notch 95 to be engaged by a pawl 97 pivoted in a rounded end 99 of a recess 101 in the face of the wheel. The recess is dimensioned to permit the pawl to swing out of engagement with the notch of the shaft. The recess is shaped to hold a spring 103 which has an end 105 to straddle the pawl and contact a bulged part 107 thereof. The spring extends through narrow channeled parts 109 and 111 which serve to hold it in position.

From Fig. 1 it will be seen that in the normal operation of counting the shaft 35 together with

the decimal wheel rotates clockwise, as seen from the right, the other wheels being successively turned by the transfer pinion as usual. This direction of shaft rotation is such that the shaft does not cause the pawl to rotate the figure wheels. The shaft may be reversely rotated by the reset stem for quick reset purposes. As the shaft is rotated counterclockwise it picks up one after another the several wheels from whatever position they occupy in the course of a single complete rotation of the shaft. The several pawls are so located relative to the figures on the wheels that when all are engaged similar figures on the several wheels are in alignment. Since the pinions can rotate only when they engage both the sets of teeth 81 and the driving teeth 79, it will be obvious that, for the operation of quick resetting dependent upon a like rotation of the several wheels by the rotation of the shaft, the pinion must be moved from engagement with the teeth of the wheels. Provision is made for this movement by locating the pinion in the radially elongated slot. When the pinion would otherwise lock the wheel from rotation the pressure upon its teeth by the wheel teeth pushes it further into the slot so that joint rotation of wheels may occur. After resetting, the spring 83 effects reengagement of the teeth, too much pressure being prevented by the stops 93.

In Fig. 6 is shown a simpler but less desirable form where the stops are omitted. In this form the degree of resiliency must be accurately predetermined.

A further modification is shown by Figs. 7 and 8 where a carrier plate 119 has holes 117, and a central opening 84". Extended through holes 117 are the doubly bent ends 115 of a spring, the spring being made of wire, circular in section. As a result of the double bend the extreme ends lie on one side of the carrier and the major part lies flat against the other side. This major part includes loops 123 bent at 125 to form a part 129 lying within an inner extension 127 of the opening 121. The part 129 lies in the plane of the carrier plate and engages the channel of the pinion between the flanges 71 and 73. The spring element thus aids in holding the pinion in position and resiliently presses it out into engagement with the wheel teeth. The pinion itself held by its flanges 71 and 73 serves to cooperate with the attachment 115 to hold the spring in position. This form of the invention operates in the same way as before described.

In Figures 9, 10 and 11 is shown a modification of the pawl and spring assembly 97-103 wherein these two parts are made in the form of a single member.

The figure wheel 131 is supported on the notched shaft as before. Instead of the pawl and spring heretofore described, there is used a combined pawl and spring 133 as best shown in Figure 11. Associated with this pawl is a spacer 135. The spacer and the end of the pawl fit snugly into the reduced dimensioned end 137 of an opening 139 cut into the face of the wheel 131 as shown by Figure 9. These parts may then be staked into position as indicated at 141 and 143. The resilient pawl extends in a radial direction into the larger dimensioned part 145 of the opening 139, normally resting against the wall of the opening and entering the notch 147 of the shaft 149. For forward counting the shaft 149 turns in a clockwise direction. Until the next lower dimensioned wheel turns the wheel 131 through the instrumentality of the usual

transfer mechanism, the pawl is sprung out of the notch. When the shaft is rotated in a counterclockwise direction the wall of this notch engages the pawl at some time during the course of a single rotation and thus turns the wheel 131 in a counterclockwise direction to effect a quick resetting operation as will be understood from what has been before described.

I claim:

1. A quick reset device for counting mechanism including a first wheel and a series of other wheels, said wheels having internal teeth, a pinion having external teeth located between adjacent wheels, means to mount said pinion for radial movement to and from engagement with the wheel teeth, yielding means to bias said teeth into cooperative relation, and quick reset means whereby all the other wheels shall be picked up and rotated jointly with the first wheel during one rotation thereof, said pinion mounting being a non-rotatable plate located between adjacent wheels and having an opening therein, said pinion being slidable in said opening, and said yielding means being secured to said plate and said engaging and yieldingly pressing said pinion outwardly.

2. A quick reset device for counting mechanism including a first wheel and a series of other wheels, said wheels having internal teeth, a pinion having external teeth located between adjacent wheels, means to mount said pinion for radial movement to and from engagement with the wheel teeth, yielding means to bias said teeth into cooperative relation, and quick reset means whereby all the other wheels shall be picked up and rotated jointly with the first wheel during one rotation thereof, said pinion mounting means comprising a non-rotatable plate having a substantially radial opening, said pinion mounted in said opening for radial but non-axial movement, said yielding means being of U-shape having its ends anchored to said plate, its side walls in parallel relation to the plate and the connecting portion lying within the opening and engaging the pinion.

3. A quick reset device for counting mechanism including a first wheel and a series of other wheels, said wheels having internal teeth, a pinion having external teeth located between adjacent wheels, means to mount said pinion for radial movement to and from engagement with the wheel teeth, yielding means to bias said teeth into cooperative relation, and quick reset means whereby all the other wheels shall be picked up and rotated jointly with the first wheel during one rotation thereof, said pinion mount-

ing means comprising a non-rotatable plate having a radial opening, said pinion radially slidable in said opening, said yielding means being of U-shape, the ends of its arms anchored to said plate and its mid portion engaging said pinion whereby the yielding means serves to position the pinion and the pinion serves to aid in positioning the yielding means.

4. In a quick reset device for odometers, a series of internally toothed wheels, an externally toothed transfer pinion between adjacent wheels, means to rotate said wheels in unison for quick resetting and yielding means to normally press said pinion radially into operative relation to said wheels for normal operation, but to yield to allow the pinion to move radially inward when making a quick reset, said yielding means also mounted for resiliently resisted lateral reciprocation for the purpose set forth.

5. In a quick reset device for odometers, a series of internally toothed wheels, an externally toothed transfer pinion between adjacent wheels, means to rotate said wheels in unison for quick resetting and yielding means to normally press said pinion radially into operative relation to said wheels for normal operation, but to yield to allow the pinion to move radially inward when making a quick reset together with a pinion carrier plate having an opening to permit the pinion to slide into and out of contact with said wheel teeth, said yielding means being carried by said plate and having a part within said opening and engaging said pinion, said last named part dimensioned to permit a slight lateral resiliently resisted reciprocation whereby disengagement between the wheel teeth and pinion teeth causes pinion rotation and tensioning of the yielding means to thereafter facilitate reengagement of the teeth.

6. In a quick reset device for odometers, a series of internally toothed wheels, an externally toothed transfer pinion between adjacent wheels, means to rotate said wheels in unison for quick resetting and yielding means to normally press said pinion radially into operative relation to said wheels for normal operation, but to yield to allow the pinion to move radially inward when making a quick reset, together with a carrier plate having an opening to permit the pinion to slide into and out of contact with said wheel teeth, said pinion having axially spaced toothed portions, and said yielding means engaging said pinion between said toothed portions whereby the pinion and the yielding means aid in positioning each other.

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