

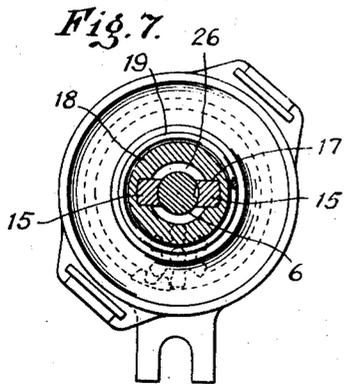
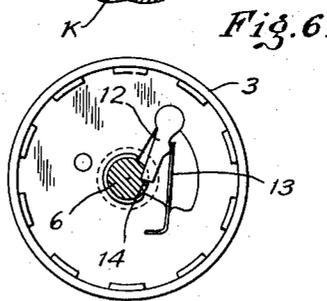
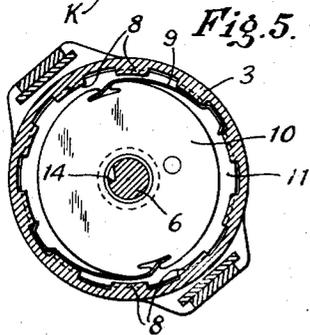
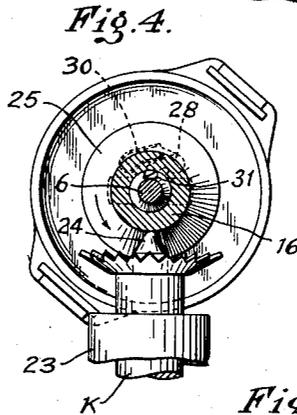
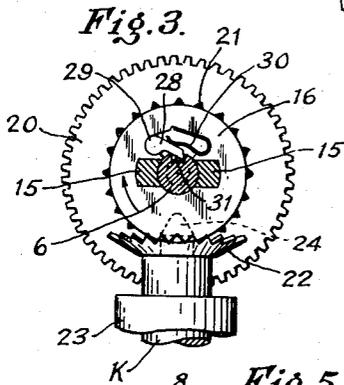
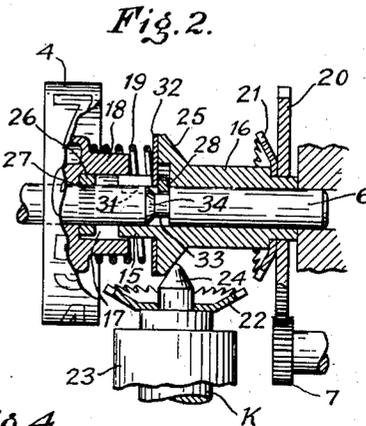
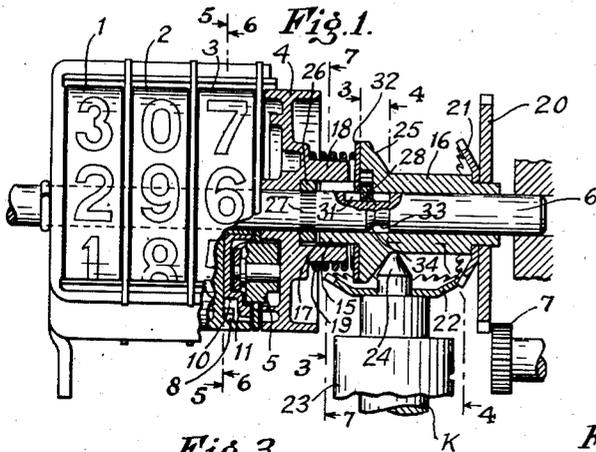
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H. L. SPAUNBURG

2,077,667

ODOMETER

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2,077,667

ODOMETER

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12 Claims. (Cl. 235-144)

My invention relates to odometers.

It has among its objects to provide an improved odometer of the trip section type adapted to use on automobiles or the like. A further object of my invention is to provide such an improved construction having an improved drive and, more particularly, an improved drive whereby, while retaining the advantages of a quick reset, it is made possible to eliminate objectionable automatic resetting during backing of the vehicle. A still further object of my invention is to provide an improved trip section of the quick reset type adapted to accomplish the above advantageous results and utilizing a shaft which is stationary during forward movement of the vehicle, while requiring no longitudinal movement at any time during the operation of the device. Another object of my invention is to provide an improved clutch mechanism for operatively connecting this shaft during the quick resetting operation and having improved cooperating controlling mechanism. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawing I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In the drawing,—

Figure 1 is a view partially in side elevation and partially in longitudinal section showing my improved drive applied to a standard type of counter, certain parts being broken away to facilitate illustration and the parts being illustrated in resetting position;

Fig. 2 is a detail view of a portion of the mechanism shown in Fig. 1, the parts being shown in normal driving position;

Fig. 3 is a sectional view on line 3-3 of Fig. 1;

Fig. 4 is a sectional view on line 4-4 of Fig. 1;

Fig. 5 is a sectional view on line 5-5 of Fig. 1;

Fig. 6 is a sectional view on line 5-5 of Fig. 1, but looking in the opposite direction to show one of the resetting pawls, and

Fig. 7 is a sectional view on line 7-7 of Fig. 1.

In this illustrative construction I have shown my improved drive applied to a trip section of a well known internal transfer type described and claimed in a co-pending application of Edward A. Slye, now issued as Patent No. 2,004,881, and having a reset knob K, this trip section being herein improved as will hereinafter appear.

As usual in this type of counter, it will be noted that the units or number wheels 1, 2, 3 and 4 are connected by usual internal transfer mechanisms, one of which is generally indicated at 5, while the several wheels are arranged coaxially of a main shaft 6 and driven through improved connections hereinafter described from a rotating part 7, herein a spur gear suitably

connected to the vehicle wheels. Moreover, as usual in this type of counter, it will be understood that each number wheel 1, 2 and 3 includes a clutch comprising spaced internal projections 8 on the number wheel providing notches therebetween and connectible by spring pawls 9 to a projecting portion 10 on a cooperating clutch element 11. Also, each wheel 1, 2 and 3 carries within the same a reset pawl 12 acted upon by a spring 13 and adapted to seat in a reset groove or slot 14 in the shaft 6 to effect resetting when the shaft is rotated in one direction by the reset knob K, while the number wheel rotates freely around the shaft at other times. Further, it will be understood that the number wheel 4 is rotated by a slidable driving connection including driving projections 15 on a cam sleeve 16 and receivable in a cooperating driving recess 17 in a hub 18 on the number wheel 4, while a coiled spring 19 is disposed outside this hub and acts between the hub and the end of the cam sleeve 16 in such manner as normally to dispose the parts in the position shown in Fig. 2, i. e. with a spur gear 20, fixed to and rotatable with the sleeve 16, in mesh with the driving pinion 7. In this position, it will also be noted that a bevel pinion 21, adjacent the spur gear 20 and rotatable therewith, is out of mesh with a bevel pinion 22 longitudinally reciprocable with the knob K and rotatable in opposite directions with the knob as the latter is rotated in a suitable support 23, while a cam 24, likewise reciprocable with the knob K, is movable into and out of engagement with a cooperating cam 25 on the cam sleeve 16 to effect reciprocation of the latter to the left to the position shown in Fig. 1.

In my improved construction, it will particularly be noted that the first number wheel 4 is freely rotatable on the shaft 6, as distinguished from being fixed or pinned to that shaft. Herein, it is suitably positioned longitudinally of the shaft while being free for rotation on the shaft, by a collar 26 secured to the shaft, the collar being, as herein shown, frictionally secured to the shaft by being forced onto a longitudinally knurled portion 27 on the shaft between the ends of the projections 15 and an adjacent portion of the hub of the wheel. Thus it will be evident that when the cam sleeve 16 is rotated, i. e. during rotation of the spur gear 20 from the driving pinion 7, or upon rotation of the bevel gear 21 by the bevel gear 22 rotatable with the knob K, since both the gears 20 and 21 are fixed to the sleeve 16 and the latter is operatively connected to drive the number wheel 4 through the slidable driving connection 15, 17, the wheel 4 will be rotated relative to the shaft 6. In other words, this wheel 4 will be rotated and drive the other wheels 3, 2, 1 through their connected transfer mechanisms 5, during vehicle movement, when

the gear 20 is in mesh with the pinion 7, or during rotation of the reset knob K when the latter is pushed in to bring its bevel gear 22 into engagement with the gear 21 as shown in Fig. 1 and disconnect pinion 7.

In my improved construction I also provide an improved clutch between the cam sleeve 16 and the shaft 6 which is adapted to function automatically through the member 16 to effect quick resetting, upon suitable operation of the knob K, while normally maintaining the shaft 6 disconnected and stationary during driving of the vehicle wheels and gear 7 in either direction except for an incidental rotation of shaft 6 which may occur during backing of the vehicle, as hereinafter explained. Herein, this clutch includes a pawl 28 suitably pivoted as at 29 in the cam portion 25 of the sleeve 16 and having a spring 30 normally pressing the pawl toward a position to engage a longitudinal slot or groove 31 in the shaft 6. In this construction, an end disc or washer 32 is also provided on the face of the cam portion 25 adjacent the spring 19, and acts as an abutment for the latter and an enclosing member for the pawl 28 and spring 30. Herein also, it will be noted that when the parts are in the position shown in Fig. 2, i. e. with the spring 19 extended, the pawl 28 extends down into an annular groove 33 provided in the shaft 6 and having one inclined or cam wall 34 on the side of the groove adjacent the first number wheel 4. Moreover, it will be noted that the slot 31 in the shaft extends through this cam wall 34 into the groove 33.

As a result of my improved construction it will be noted that, with the parts in the counting position shown in Fig. 2, the various number wheels 1, 2, 3 and 4 will be rotated in a usual manner to count. However, the shaft 6 will remain stationary and the sleeve 16 will be rotated by the gears 7 and 20 relative to the shaft 6 with the pawl 28 moving freely in groove 33, and the sleeve in turn rotating the wheel 4 through the slidable driving connection 15, 17, while the rotation of this wheel 4 will be imparted to the wheels 3, 2 and 1 in a usual manner through the associated transfer mechanisms 5. It will also be evident that by pushing in the knob K to the position shown in Fig. 1 and then rotating the knob K to the right, the shaft 6 will be rotated in such manner as to effect a quick reset. Thus, pushing in the knob K will cause the cam 24 to engage the cam surface 25 on the cam sleeve 16 and force the latter to the left to compress the spring 19, and, at the same time, cause the pawl 28 to move up the inclined cam face 34 and onto the outer periphery of the shaft to compress the pawl spring 30. When the knob K is pushed in, it will also be evident that its bevel gear 22 will mesh with the bevel gear 21, as shown in Fig. 1. Thus, rotation of the knob K to the right will cause the cam sleeve 16 to be rotated in a counter-clockwise direction, as seen in Fig. 4. As a result of this rotation, the pawl 28 will also be projected downward into the slot 31 by the spring 30 as soon as the sleeve has rotated sufficiently to bring the pawl 28 over the slot 31, and the shaft 6 will thereafter be rotated with the sleeve 16 to effect a quick reset of the number wheels 3, 2, 1, the pawls 12 of these number wheels being picked up in the reset groove 14 in the shaft 5 in a usual manner. Also, it is possible with the knob K pushed in, to turn the number wheels 1, 2, 3, 4 to bring them quickly to a reading approximat-

ing any desired setting. Thus, if it is desired to set the trip section to read 105.5, it will be evident that after moving the number wheels to a reading 111.1, it will be possible by a short rotation of the knob K to the left to cause the number wheels to subtract to 105.5. Of course, as soon as the knob K is pulled out, completing the resetting operation, the spring 19 will automatically return the parts to the position shown in Fig. 2.

As a result of my improved construction, it will be noted that, with the parts in their operative or counting position shown in Fig. 2, i. e., with the resetting knob K pulled out, there will be no automatic resetting effected if the vehicle is backed. Instead, the pawl 28 will then merely rotate freely in the annular groove 33 in the shaft 6 and the number wheels 1, 2, 3, 4 will merely slowly subtract through the transfer mechanism as the vehicle moves backward, irrespective of the distance. Here it should be noted that while the shaft 6 normally remains stationary, except when used for resetting purposes, upon sufficiently prolonged backing of the vehicle to cause rotation of any of the higher order wheels 1, 2 and 3, the reset pawls 12 of the latter may engage the reset slot 14 of shaft 6 and rotate the shaft in a clockwise direction as viewed in Figure 6. This incidental rotation of the shaft by a higher order wheel during backing has no effect on the operation of the odometer, a quick reset being impossible since shaft 6 is rotated in the opposite direction from resetting, and the pawl 28 is in the annular groove 33. Thus, the confusion resulting from a return of the trip section to zero as a result of only a short backing operation of, for example, a few hundred yards, is entirely obviated in this improved construction. These and other advantages of my improved construction will, however, be apparent to those skilled in the art.

While I have in this application specifically described one embodiment of my invention, it will be understood that this form of the same is shown for illustrative purposes and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

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

1. A counter having operatively connected counter units including number wheels adapted to add when rotated in the direction of ascending numbers, and resetting mechanism for said units including a resetting shaft stationary during such additive counting, a cam reciprocable on said shaft and rotatable with one of said units, and a clutch between said cam and shaft and automatically connecting said shaft and cam for rotation upon a resetting operation of said resetting mechanism.

2. A counter having operatively connected counter units including number wheels adapted to add when rotated in the direction of ascending numbers, and resetting mechanism for said units including a resetting shaft stationary during such additive counting, a cam reciprocable on said shaft and rotatable with one of said units, and a clutch between said cam and shaft and automatically connecting said shaft and cam for rotation upon a resetting operation of said resetting mechanism including a clutch member on said cam and cooperating clutch means on said shaft engaged by said clutch member for actuating said shaft in a resetting direction.

3. A counter having operatively connected counter units including number wheels adapted to add when rotated in the direction of ascending numbers, and resetting mechanism for said units including a resetting shaft stationary during such additive counting, a cam reciprocable on said shaft and rotatable with one of said units, and a clutch between said cam and shaft and automatically connecting said shaft and cam for rotation upon a resetting operation of said resetting mechanism including an actuating clutch member on said cam and cooperating inter-engaging means on said shaft.

4. A counter having operatively connected counter units including number wheels adapted to add when rotated in the direction of ascending numbers, and resetting mechanism for said units including a resetting shaft stationary during such additive counting, a cam reciprocable on said shaft and rotatable with one of said units, and a clutch carried by said cam and automatically connecting said shaft and cam for rotation upon a resetting operation of said resetting mechanism comprising a slotted cam section on said shaft and a cooperating member engageable with the cam and slot thereof in different positions of said reciprocable cam and carried by the latter.

5. In a counter having operatively connected counter units adapted to add when driven in one direction, driving mechanism including a rotatable and reciprocable cam rotatable during driving and having a sliding driving connection with the first of said units, and resetting mechanism for said counter units including a resetting shaft extending through said cam and stationary during driving of the counter units in an adding direction, means for reciprocating and thereupon rotating said cam, and clutch mechanism between said cam and shaft automatically connecting the same upon rotation of said last mentioned means in a resetting direction.

6. In a counter having operatively connected counter units adapted to add when driven in one direction, driving mechanism including a rotatable and reciprocable cam rotatable during driving and having a sliding driving connection with the first of said units, and resetting mechanism for the latter including a resetting shaft extending through said cam and stationary during driving of the counter units in an adding direction, means for reciprocating and thereupon rotating said cam, said shaft having an annular transverse groove having an adjacent sloping cam face and a longitudinal slot, and a spring pressed member rotatable with said first mentioned cam normally disposed in said groove during driving and adapted to ride up said cam face upon reciprocation of said cam and engage in said slot upon rotation of said cam in a resetting direction.

7. An odometer having a reset shaft stationary during driving of said odometer in a direction to advance the count thereon, operatively connected counter units having resetting means cooperating with said shaft during resetting and also having driving means for rotating said units in opposite directions including a rotary cam, and reset operating mechanism having means for automatically disconnecting said driving means and automatically connecting said shaft to said cam when the latter is rotated in a resetting direction to effect resetting of said units.

8. An odometer having resetting mechanism

including a reset operating member and a reset shaft stationary during driving of said odometer in a direction to advance the count thereon, operatively connected counter units on said shaft, driving means rotatable relative to said shaft, and mechanism including clutch elements carried by said shaft and driving means for operatively connecting an element of said driving means to said shaft upon rotation of said driving means by said reset operating member in a direction to effect resetting and automatically disconnecting the same upon completion of the resetting operation of said reset operating member.

9. An odometer having operatively connected counter units, resetting mechanism for said units including a rotary reset shaft and means for effecting a quick reset of said units upon rotating said shaft in one direction, and means including a transversely grooved and longitudinally slotted cam section on said shaft and a spring pressed member disposed in the transverse groove thereof during driving and during resetting reciprocable on said cam section and thereupon rotatable in a resetting direction into the longitudinal slot therein to clutch said shaft to the counter unit of lowest order.

10. A counter having operatively connected counter units including number wheels adapted to count when rotated in the direction of ascending numbers, driving mechanism therefor including a rotatable and reciprocable driving member having a constant driving connection to the first unit during driving and resetting, and resetting mechanism for the other units including a reset shaft coaxial with said units and stationary within said member during counting, means for reciprocating said member to disconnect the latter from the drive and subsequently rotating said member during resetting, and clutch mechanism between said reciprocable member and shaft inoperative during driving and automatically connectible by said last mentioned means during resetting.

11. An odometer having operatively connected counter units, resetting mechanism for said units including a rotary reset shaft and means for effecting a quick reset of said units upon rotating said shaft in one direction, and driving mechanism for said counter units including a driving member on said shaft and clutch means between said member and shaft enabling said driving member to rotate freely relative to said shaft during driving of said units in one direction while inhibiting automatic resetting of said counter units during driving the latter by said member in a reverse direction.

12. An odometer having operatively connected counter units, resetting mechanism for said units including a rotary reset shaft and means for effecting a quick reset of said units upon rotating said shaft in one direction, driving mechanism for said counter units including a driving member on said shaft and clutch means between said member and shaft enabling said driving member to rotate freely relative to said shaft during driving of said units in one direction while inhibiting automatic resetting of said counter units during driving of the latter by said member in a reverse direction, and means including a reset operating member for rotating said shaft through said clutch means to reset said counter units.

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