April 20, 1937. H. N. BLISS 2,077,666

ODOMETER

Filed June 11, 1934

Fig. 1

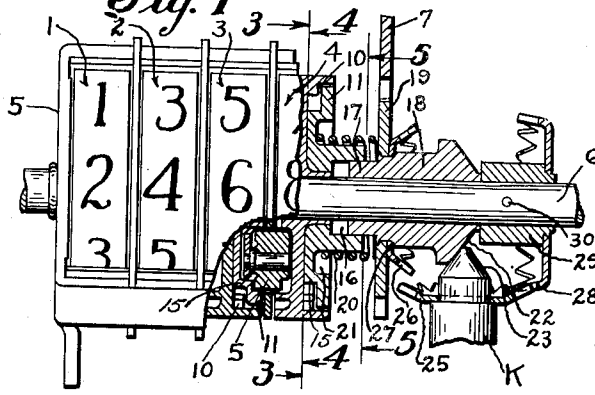


Fig. 2.

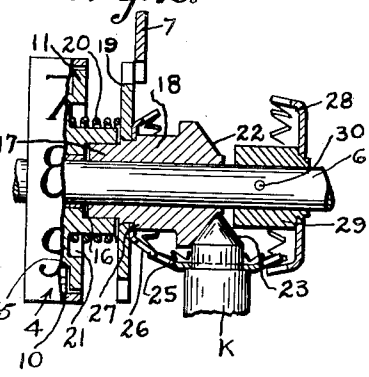


Fig. 3.

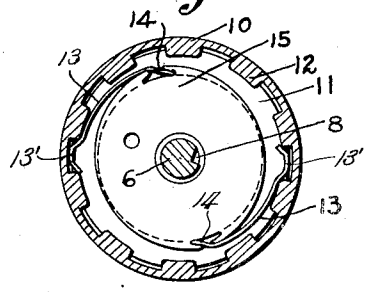


Fig. 4.

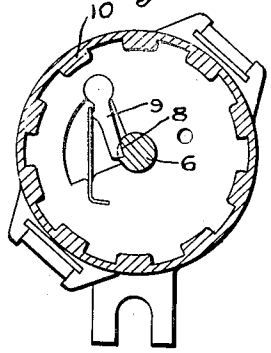
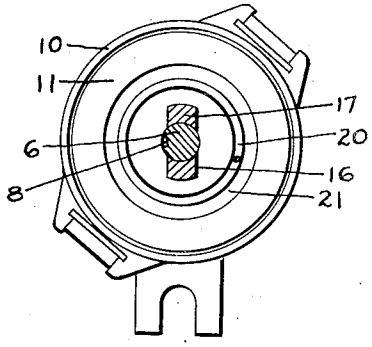


Fig. 5.



Inventor
Harvey N. Bliss.

By

Attorney

Patented Apr. 20, 1937 2,077,666

UNITED STATES PATENT OFFICE

2,077,666

ODOMETER

Harvey N. Bliss, East Hartford, Conn., assignor to Veeder-Root Incorporated, a corporation of Connecticut

Application June 11, 1934, Serial No. 730,051

17 Claims. (Cl. 235—144)

My invention relates to odometers.

It has for its object to provide an improved reset trip odometer of the type adapted to be used on automobiles or the like. A further object is to provide such a device which is both markedly more flexible and more convenient in use than existing structures of which I am advised. Other objects are to provide such a device having improved resetting means whereby it is made possible to avoid confusion resulting from backing the car, and such means wherein the drive is positive, wherein the counter may be reset quickly to zero without the necessity for reciprocating an operating part, and wherein the counter wheels can also be turned forward or backward through their transfer mechanism to any desired figure. A still further object is to provide an improved and simplified construction having the parts thereof arranged and cooperating in an improved manner to enable these improved results to be obtained, while at the same time producing a simple and inexpensive construction. These and other objects and advantages of my 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 side elevation partly in section of a trip section equipped with my improvements, the parts being shown in normal driving position;

Figure 2 is a detail sectional view of the mechanism shown in Figure 1 with the parts in position for certain resetting operations;

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

Figure 4 is a sectional view on line 4—4 of Fig. 1, and

Figure 5 is a transverse sectional view on line 5—5 of Fig. 1.

In this illustrative construction, I have shown a reset trip section of a well known internal transfer pinion 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.

In my improved construction, the number units, 1, 2, 3, 4, are connected by usual internal transfer mechanisms one of which is generally indicated at 5, while the several units are arranged coaxially of a resetting shaft 6, and driven from a rotating part connected to the vehicle wheels, as by a spur gear 7. Herein, however, the number units 1, 2, 3, and 4, the gear 7, the shaft 6, and the usual rotatable and reciprocable reset knob K are operatively associated through improved means in such manner as to enable the shaft 6 to be used as a quick resetting shaft while the counter remains connected to the gear 7, and while also enabling the number wheels to be operated to add or subtract when the counter is disconnected from said driving gear 7; all through suitable manipulation of the rotatable and reciprocable reset knob or member K and while the first or lowest number unit, herein 4, is rotatable independently of the shaft 6 and also adapted to reset with the other number units 1, 2, and 3.

More particularly, it will be noted that the shaft 6 is provided with a usual resetting groove 8 adapted to cooperate with pawls 9 carried on the several number wheel units. Herein these pawls and this groove 8 are reversely disposed so that when the shaft 6 is turned in one direction through the rotation of the knob K, as hereinafter described, the several pawls 9 will be picked up in the groove 8 and the several number units 1, 2, 3, 4, will be returned to zero position in a quick reset operation requiring only one complete revolution of the shaft 6. Further, as will hereinafter appear, this shaft 6 herein is not rotated at any other times than during this quick resetting operation and during the subtracting operation, and also is always disposed in a single longitudinal position, no reciprocation of this shaft being necessary.

It will also be noted that each of the number units is provided with an improved and reversed spring connection between two clutch parts 10 and 11 cooperating to form the number units, herein illustrated only in connection with unit 4, the others being identic in construction. As shown, this clutch connection comprises a series of ratchet teeth 12 disposed around inside the rim of the member 10 and a plurality of springs 13, each of the latter herein having one end seated in a slot 14 in a laterally projecting portion 15 on the clutch member 11, and the springs 13 herein also extending to the left from the slots 14 as illustrated in Fig. 3, and having their opposite ends seated in oppositely located notches between the teeth 12. Here attention is also directed to the fact that these springs 13 are so formed at their outer ends 13', which engage in the notches between the teeth 12, that each portion 13' will engage the edges of adjacent teeth 12 and thus act to carry its member 10 in

either direction, and only ratchet idly over the teeth 12 whenever the load, as for example, that due to binding of the wheels, exceeds the spring tension.

As shown herein, the member 11 is freely rotatable relative to the shaft 6 and provided with an axial recess 16 receiving a corresponding driving extension 17 (Figs. 1 and 5) on the end of a member 18 reciprocable longitudinally of the shaft and herein adapted to rotate the member 11 and rotatable with a spur gear 19 adapted to mesh with the driving gear 7 in one longitudinal position on the shaft 6 (see Fig. 1) and to be disconnected from the gear 7 when shifted longitudinally of the shaft 6 to the left (see Fig. 2). Herein, it will also be noted that a coiled spring 20 acts between the bottom of an annular recess 21 in the member 11 and the adjacent face of the spur gear 19 in such manner as normally to locate the parts in the position shown in Fig. 1.

Also, it will be noted that the member 18 is provided with a beveled cam face 22 engageable by a like beveled cam end 23 on a transversely reciprocable and reversely rotatable resetting member or knob K which in turn carries a bevel gear 25 adjacent its end 23. Herein this gear 25, when in its normal or out position, shown in Fig. 1, meshes with a bevel gear 26 fixed to and rotatable with a collar 29 which is, in turn, suitably fixed, as by a pin 30, to the shaft 6 beyond the end of the member 18. Further, this gear 25, when the knob K is pushed in, as shown in Fig. 2, is adapted to mesh with a cooperating bevel gear 26 disposed around the member 18 as an axis and between the spur gear 19 and a suitable shoulder 27 on the member 18 and rotatable with the latter and the gear 19.

In the use of this construction, it will be evident that when the parts are in their normal or driving position shown in Fig. 1, the resetting shaft 6 may be operated when desired by merely rotating the resetting knob K to the left; the bevel gear 25 then meshing with its fellow 26 and rotating the shaft 6 clockwise, as viewed in Figure 4, through the collar 29 to cause the groove 8 of the shaft to pick up the various number wheels including the wheel 4 and return them to zero position in the counting direction, or to any of the usual intermediate positions 111.1, 222.2, 333.3, etc., for a quick resetting. For example, if it is desired to turn the number wheels to indicate 111.1, they obviously may be turned to this position within approximately one revolution of the shaft 6. Further, if it is desired to turn them to 125, it will be evident that they may be turned by use of the shaft 6 to indicate 111.1, and that then in my improved construction, by merely pushing in the knob K to force the member 18 to the left as shown in Fig. 2, and then rotating the knob K to the right in such manner as, without rotating the shaft 6, rotate the gear 26 in an advancing direction, the number wheels will be caused to add through their transfer mechanism just as if the machine was traveling over the road, the pawls 9 then traveling over the groove 8 in the shaft 6 without engagement therein. Further, it will be evident that, with the reading at 111.1, if the figure sought is 108, it is similarly possible by merely pushing in the knob K and then rotating it reversely, i. e. to the left, to make the number wheels subtract through the transfer mechanism to the desired figure, the pawls 9 then engaging in the groove 8 and rotating the shaft 6, which is free to rotate due to the disengagement of gears 25 and 26.

As a result of my improvements, it will be noted that in addition to the slow settings ahead or backward of the wheels through their transfer mechanism when the reset knob is pushed in and reversely rotated, it is made possible to effect a quick reset to zero without the necessity of pushing in the knob at all. Attention is further directed to the fact that in my improved construction, as above described, backing of the car with the reset knob in its normal "out" position, has no tendency to cause the figures to be split in a window, or upon longer backing, to effect a quick reset of the counter through the rotation of the resetting shaft thereof in a resetting direction since, in the normal position of the parts shown in Figure 1, the shaft 6 can never drive the number wheels, the mileage backed being merely subtracted from the reading in my improved construction through the transfer mechanism. Splitting of the figures in a window and the inadvertent quick reset, above mentioned, occurred in certain former constructions because the reset shaft was also used as a driving shaft with the result that the reset pawls of the counter wheels where engaged during backing of the vehicle by the reset slot upon reverse rotation of the driving and resetting shaft and moved in a resetting direction. It should be particularly noted that in the present construction the lowest order number wheel 4 is neither fixed to the reset shaft 6 nor driven by a member fixed to the latter and that as a result, even during prolonged backing, the counter wheels cannot be driven in a resetting direction by the shaft 6 through reset pawls 9 either to effect a quick reset or to split the figures in a window, the shaft 6 never driving the counter wheels except when the knob K is manually rotated in its "out" position. Further, it will be observed that the drive is positive, as distinguished from a friction drive, and that all wheels are reset, as distinguished from requiring a non-reset first wheel as in the prior art. Attention is further directed to the fact that it is made possible to obtain these results while continuing to use a non-reciprocable reset shaft and eliminating any necessity for either rotating this shaft during driving, or shifting the reset shaft longitudinally between driving and resetting positions. These and other advantages of my improved construction will, however, be clearly apparent to those skilled in the art.

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

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

1. 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 mechanism normally driving said counter units in a counting direction through their operative connections and reversible to drive them in the opposite direction through said connections and having means including a driving member freely rotatable relative to said resetting shaft for inhibiting automatic quick resetting of said counter units upon driving the latter in a reverse direcion.

2. 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 mechanism normally driving said counter units through their operative connections in one direction and reversible to drive them in the opposite direction through said connections and having a driving member on said shaft and means enabling said driving member to rotate freely relative to said shaft during driving in one direction while inhibiting automatic quick resetting of said counter units during driving of the latter in a reverse direction.

3. A counter having operatively connected counter units, driving mechanism therefor, and resetting mechanism for said units including a rotatable resetting shaft stationary during counting movement of said units in a forward direction, means operative upon rotation of said shaft in a resetting direction for automatically connecting said shaft to each of said units to effect quick resetting of said units, and means operative to disconnect said driving mechanism and rotate said units to add or subtract.

4. A counter having operatively connected counter units, driving mechanism therefor, and resetting mechanism for said units including a rotatable resetting shaft stationary during adding movement of said units, means operative upon rotation of said shaft in a resetting direction and while said driving mechanism remains connected for automatically connecting said shaft to each of said units to effect quick resetting of said units, and means operative to disconnect said driving mechanism and rotate said units to add or subtract.

5. The combination with a vehicle trip section odometer comprising a plurality of number units having transfer mechanism therebetween and unit driving mechanism having a driving member adapted to be driven from the vehicle, of resetting mechanism including a reset shaft, means for operating said units to effect a quick reset thereof upon a resetting operation of said shaft, and means for at will operating said shaft, and means for at will shifting said driving member and thereupon driving said units through said transfer mechanism while said shaft operating means is inoperative.

6. The combination with a trip section odometer comprising a plurality of number units having transfer mechanism therebetween and unit driving mechanism including a driving member, of resetting mechanism including a rotatable reset shaft, means for rotating said units to effect a quick reset thereof upon rotation of said shaft in a resetting direction, and means for at will rotating said shaft, and means for at will shifting said driving member and thereupon rotating said units in opposite directions through said driving and transfer mechanism with said shaft inoperative in one direction of rotation of said units and rotating in the other.

7. The combination with a trip section odometer comprising a plurality of number units having transfer mechanism therebetween and unit driving mechanism connectible to an outside drive, of resetting mechanism including a reset shaft, means for rotating said units to effect a quick reset thereof upon a resetting operation of said shaft, and means for at will operating said shaft to effect said quick reset while said driving mechanism remains connected to an outside drive, and means for at will actuating said driving mechanism to disconnect it from an outside drive and thereupon rotating said units through said transfer mechanism while said shaft operating means is inoperative.

8. The combination with a trip section odometer comprising a plurality of number units having transfer mechanism therebetween and unit driving mechanism including a driving member connectible to an outside drive, of resetting mechanism including a rotatable reset shaft, means on said units for effecting a quick reset of said units upon rotation of said shaft in a resetting direction, and means for at will rotating said shaft while said driving member remains connected to an outside drive including a reset knob and means operated by said knob for shifting said driving member to disconnect the outside drive and thereupon rotating said units through said transfer mechanism while said shaft is stationary.

9. The combination with a trip section odometer comprising a plurality of number units having transfer mechanism therebetween and unit driving mechanism including a driving member connected to the first unit, of resetting mechanism for said units including a reset shaft rotatable relative to said first unit, a rotatable and reciprocable reset knob, means rotatable by said knob in one longitudinal position of the latter for operating said shaft to effect a quick reset of said units, and mechanism operable by said knob as the latter is reciprocated into another longitudinal position thereof for shifting said driving member and thereupon driving said units through said transfer mechanism with said shaft stationary in one direction of rotation of said units or rotating upon a reverse direction of the latter.

10. The combination with a trip section odometer comprising a plurality of number units having transfer mechanism therebetween and unit driving mechanism including a driving member connectible to an outside drive, of resetting mechanism for said units including a rotatable reset shaft, a rotatable and reciprocable reset knob, means rotatable by said knob in one longitudinal position of the latter for operating said shaft while said driving member remains connected to an outside drive, and mechanism operable by said knob for shifting said driving member to disconnect said outside drive as said knob is reciprocated and thereafter rotating said units through said transfer mechanism.

11. A reset trip section odometer comprising a plurality of number units having transfer mechanism therebetween, a shaft projecting from said units, unit driving means on said shaft including a rotatable and reciprocable element and a cam, quick reset means between said units and said shaft operable upon rotation of the latter in a resetting direction, a reciprocable and rotatable reset knob carrying a cam cooperating with said first mentioned cam to reciprocate said element, and selectively operative rotating connections between said knob and shaft on the one hand and said knob and rotating element on the other.

12. A reset trip section odometer comprising a plurality of number units having transfer mechanism therebetween, a shaft projecting from said units, unit driving means on said shaft comprising a rotatable and reciprocable element and a cam quick reset means between said units and said shaft operable upon rotation of the latter in a resetting direction, a reciprocable and ro-

tatable reset knob carrying a cam cooperating with said first mentioned cam to reciprocate said element, and selectively operative rotating connections between said knob and shaft on the one hand and said knob and rotating element on the other comprising rotating means on said knob cooperating with said rotating element in one longitudinal position of the knob, and rotating means on said shaft cooperating with said rotating means on said knob in another longitudinal position of the latter.

13. A reset trip section odometer comprising a plurality of number units having transfer mechanism therebetween, a shaft projecting from said units, unit driving means on said shaft including a rotatable and reciprocable element and a cam, quick reset means between said units and said shaft operable upon rotation of the latter in a resetting direction, a reciprocable and rotatable reset knob carrying a cam cooperating with said first mentioned cam to reciprocate said element, and selectively operative driving connections between said knob and shaft on the one hand and said knob and rotating element on the other comprising a plurality of rotating means one engaged and operable only when said reciprocable cam is in one position and the other only when said cam is in another position.

14. In a counter, the combination with a plurality of counter units having transfer mechanism therebetween, driving mechanism for said units, and quick reset mechanism for the latter having a reset shaft, of a single manually operable actuating member for setting said units, and means selectively operable by said actuating member for operating said shaft to reset said units in one position of said member and in another position thereof for selectively rotating said units in opposite directions.

15. In a counter, a plurality of counter units having transfer mechanism therebetween and quick reset mechanism including a reset shaft, driving means for said units including a driving element on said shaft, a single actuating member, and mechanism selectively operable by said actuating member for operating said shaft in a direction to reset said units in one position of said member and in another position thereof for rotating said units in opposite directions including means for automatically shifting said driving element along said shaft before reversely rotating said units as aforesaid.

16. In a counter, a plurality of counter units having transfer mechanism therebetween and quick reset mechanism including a reset shaft, driving means for said units including a driving element on said shaft, a single rotatable and reciprocable actuating member, and mechanism selectively operable by said actuating member for operating said shaft in one position of reciprocation of said member to reset said units upon rotation of said actuating member in a resetting direction and in another position thereof for rotating said units in opposite directions upon rotation of said actuating member in opposite directions including means for automatically shifting said driving element along said shaft upon reciprocation of said actuating member.

17. In a counter, a plurality of counter units having transfer mechanism therebetween and quick reset mechanism having pawls carried by said units and a reset shaft having a groove cooperating with said pawls in one direction of rotation of said shaft, a single rotatable and reciprocable actuating member, means cooperating in one position of said member for rotating said shaft to effect a quick reset, and means cooperating in another position of said member for rotating said units in opposite directions through said transfer mechanism with said pawls moving over said groove in one direction and engageable therein in the other direction to rotate said shaft.

HARVEY N. BLISS.

CERTIFICATE OF CORRECTION.

Patent No. 2,077,666. April 20, 1937.

HARVEY N. BLISS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 52, after the word "mechanisms" insert a comma; and second column, line 15, after "to" insert be; page 2, second column, line 73, claim 1, for "direcion" read direction; page 3, first column, line 34, claim 4, strike out the comma before "and"; line 61, claim 6, for "mechanism" read mechanisms; and second column, line 73, claim 12, after "cam" insert a comma; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of July, A. D. 1937.

Henry Van Arsdale

(Seal) Acting Commissioner of Patents.