June 26, 1923. 1,460,119

G. W. TONEY

RESETTING MEANS FOR COUNTERS

Filed Aug. 16, 1917

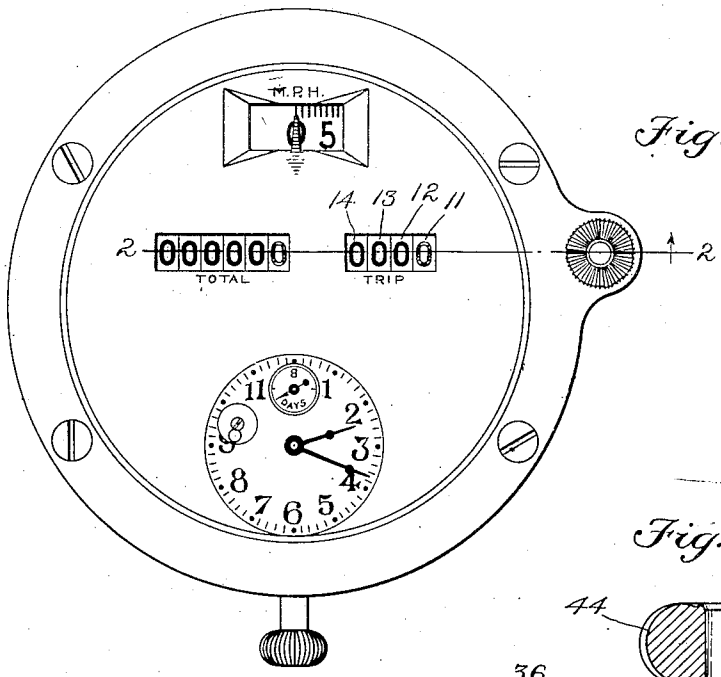

Fig. 1.

Fig. 2.

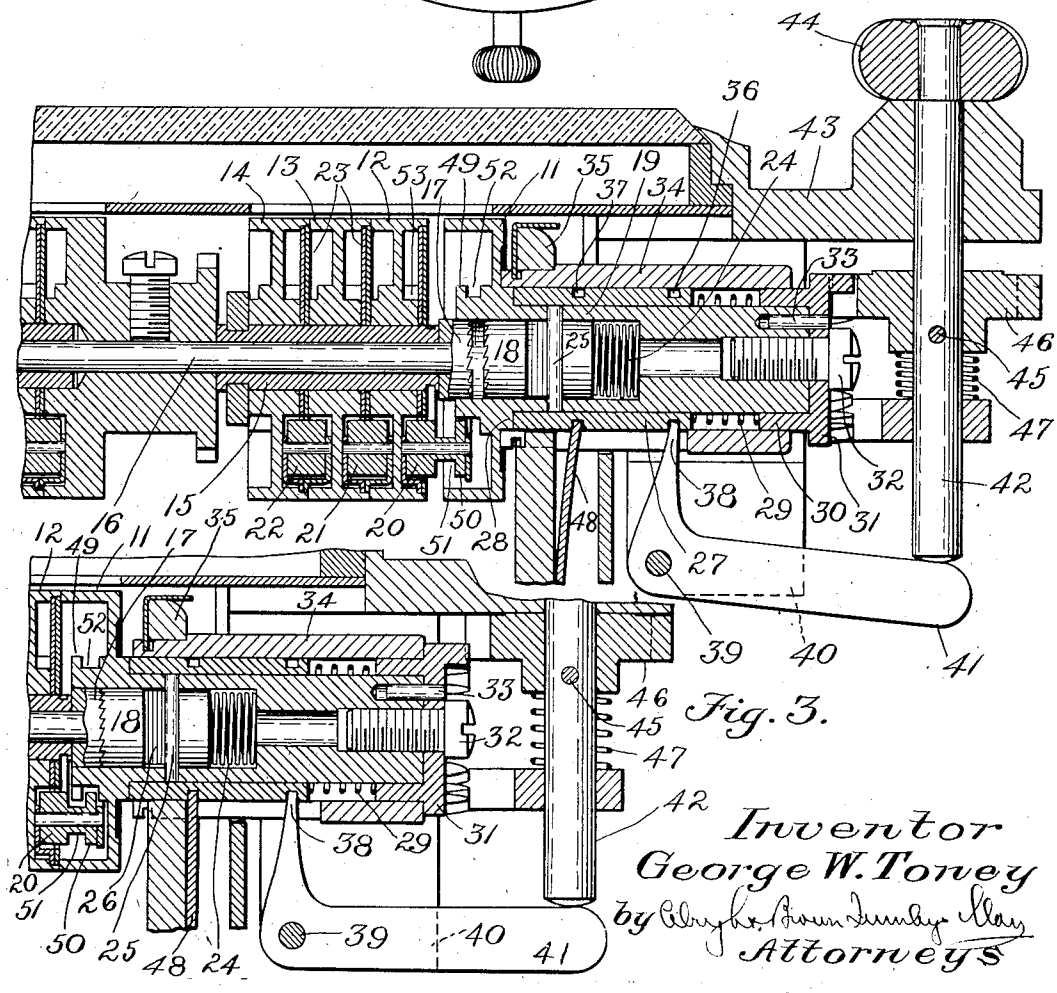

Fig. 3.

Inventor
George W. Toney
by Albright, Brown, Tunley & Clay
Attorneys

Patented June 26, 1923. 1,460,119

UNITED STATES PATENT OFFICE.

GEORGE W. TONEY, OF WALTHAM, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO OLD COLONY TRUST COMPANY, A CORPORATION OF MASSACHUSETTS, TRUSTEE.

RESETTING MEANS FOR COUNTERS.

Application filed August 16, 1917. Serial No. 186,490.

To all whom it may concern:

Be it known that I, GEORGE W. TONEY, a citizen of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Resetting Means for Counters, of which the following is a specification.

This invention relates to a means for setting back to zero position the number-bearing wheels or disks which are used in many instances for the purpose of making an automatic tally. I have applied the invention to an odometer provided for motor car use for the purpose of re-setting into the zero position those counter disks which are commonly provided in such instruments to show the distance traveled in a single trip, and are adapted to be set back to zero at any time independently of the usual totalizing counters; and I have illustrated and described the invention in this combination in the present specification. I desire it understood, however, that I do not intend such illustration and description to be construed as a limitation of the invention, because it is my purpose to protect the novel features of this invention in any combination with counting disks or wheels, whatever the nature of the combination may otherwise be and whatever may be the use to which it is put. Thus, for example, I may apply the invention to fare registers, such as are generally used in public conveyances, and to all other instruments of similar nature in which counting wheels are used and it is desired to shift such wheels by manual operation.

The objects of the invention are, first, to provide as the re-setting element for such an odometer or counter, a stem or shaft extending transversely to the axis of the counting disks and also to the face of the odometer instrument and being accessible for manipulation at one side of such face; second, to combine with a re-setting element arranged substantially as thus indicated, a means by which the same element may put the counters in condition to be re-set, when moved or shifted in a certain way otherwise than that in which it is moved for setting them; and in general, to furnish improved means and principles for effecting in a better manner than heretofore disconnection of the counters from the driving mechanism and their connection with the setting element, and vice versa.

In the drawings,

Figure 1 is a face view of an odometer in which my invention is embodied in combination with a speedometer and time-piece.

Figure 2 is a sectional detail view enlarged on line 2—2 of Figure 1, illustrating parts in which my invention is embodied.

Figure 3 is a similar sectional view showing those parts wherein my invention is embodied placed in a different position from that in which they are illustrated in Figure 2.

The same reference characters indicate the same parts in all the figures.

In the drawings the trip indicating counting disks or wheels, of which four are shown, are designated by the reference characters 11, 12, 13, and 14. For the purposes of this description such wheels or counters may be called the indicator of the instrument. In the ordinary odometer the number wheels 12, 13 and 14 represent, respectively, units, tens, and hundreds of miles, and the figures on the disk 11 represent tenths of a mile, but a counting mechanism used for other purposes would read in other units, and therefore the disk 11 may be more generically considered as the units-indicating wheel, for it is essentially that even when applied to register tenths of miles, and it will be so called in this description. The other disks represent, respectively, tens, hundreds, and thousands of the unit designated by the disk 11.

All of these disks except disk 11 are mounted rotatably upon a sleeve 15 which is held fast by any suitable means, and through which passes a rotatable drive shaft 16, the latter carrying on its end at the right hand of the disk 12, one member 17 of a clutch, the complemental member being shown at 18 and being contained in a sleeve 19 to which the unit-indicating disk 11 is secured. Said sleeve 19 is adapted to be moved endwise so as to connect the clutch member 18 with the clutch member 17 and disconnect it therefrom respectively. When these clutch members are connected, the disk 11 is rotated by the driving shaft, and it imparts step by step motion at every re-

tation to the disk 12 through a carrying wheel 20 in the same manner commonly used in counting mechanism having numbering wheels. Similar motion is transmitted to the disk 13 and from the latter to the disk 14 by carrying wheels 21 and 22, respectively. These carrying wheels are mounted in holders 23 which are fixed upon the sleeve 15. My invention is not concerned either with the carrying mechanism or with the means for mounting the carrying wheels, all of which are old, wherefore they are not shown in complete detail herein.

The normal position of the unit-indicating disk 11 and of the clutch member 18 is that shown in Figure 3. The particular clutches are here shown of the radial ratchet tooth type, and the member 18 is mounted so that it may yield when the driving shaft is rotated reversely or when the units disk is turned ahead of the shaft, being fitted to slide in the sleeve 19 and pressed toward the clutch member 17 by a spring 24, while it is connected to the sleeve by a pin 25 passing through a slot 26 in the clutch member and anchored at its ends in the sleeve, such slot permitting endwise movement of the clutch member in the sleeve, and its sides co-operating with the pin to prevent rotation relatively to the sleeve.

On the exterior of the sleeve 19 is a second sleeve 27 which is pressed against a shoulder 28 by a spring 29 confined between sleeve 27 and the hub portion 30 of a crown gear 31 which is secured to the sleeve 19 by a screw 32 and is prevented from rotating thereon by a pin 33. Sleeve 27 and the part of the sleeve 19 next to the shoulder 28 are fitted to rotate in a bearing sleeve 34, which is held by one end in a post 35 fixed to the base of the frame of the instrument.

The sleeve 27 has two peripheral grooves 36 and 37, into the former of which enters the narrow end 38 of one arm of a bell crank lever pivoted on a fulcrum pin 39 which is mounted between lugs 40 on the side of the case. The other arm 41 of said lever extends across the end of a stem 42 which is mounted in a bracket 43 on the cover to extend beside the face of the odometer instrument at right angles to the plane of such face and carries a crown 44 in accessible position to be turned between the thumb and finger of the operator. On this stem is secured by a pin 45 a spur gear 46 which meshes with the crown gear 31. The stem 42 is movable endwise as well as rotatably in its bearing in the bracket 43, and it is pressed outwardly by a spring 47.

The groove 37 previously mentioned receives one end of a leaf spring 48 which is fixed upon the side of the post 35 and constantly exerts pressure tending to hold the parts in the position shown in Figure 3 and to return them to such position from that shown in Figure 2.

On the inner end of the hub part of disk 11 is a gear element 49, and connected with the carrying wheel 20 is a pinion 50 which is adapted to mesh with the gear element 49 when the latter is in the position shown in Figure 2. Between the pinion 50 and the carrying wheel 20 is a groove 51, and in the hub of the disk 11 at the right of the gear 49 is a groove 52. When disk 11 is in the normal position, shown in Figure 3, the rim of gear 49 is in the groove 51 and the rim of pinion 50 is in the groove 52, whereby these gear elements are brought out of mesh and permitted to rotate independently of one another without interference.

The parts being in the position last indicated, the units disk is driven by the shaft 16 and motion is intermittently carried therefrom in the usual manner to the disks 12, 13, and 14. But when it is desired to re-set the indicator, the crown 44 is pushed inward, that is toward the bracket 43. This causes the stem 42 to press on the lever arm 41 and rock the arm 38 so as to withdraw the sleeve 19 carrying the disk 11 from the next disk, bringing the gear 49 into mesh with the pinion 50. The force applied for that purpose is transmitted to the sleeve 19 through the outer sleeve 27 and spring 29 in order not to injure the teeth of these gear elements in case they should not be in position to mesh at the time this shifting takes place. At the same time the gears 46 and 31 are brought fully into mesh, the teeth of these gears being sufficiently deep and pointed to cause them to engage without interference when each is thus moved toward the axis of the other. At the same time the clutch member 18 is withdrawn from engagement with the clutch member 17. There is enough space between the gears 49 and 50 in the normal position to permit complete disconnection of the clutch members before these gears come into mesh, in order that there may be no such locking as would prevent resetting.

If now the crown 44 is rotated, the disk 11 is correspondingly rotated. The first motion of the disk brings the gear 49 into mesh with 50, in case it did not so mesh at first, and thereupon the movement of the disk 11 is communicated to the disk 12 in the same direction and with the same speed, so that these disks rotate in unison, because the pinion 50 is part of the carrying wheel 20 which latter is in mesh with a line of teeth 53 on the disk 12. Disks 13 and 14 are driven by the carrying wheels in the same 1 to 10 and 1 to 100 ratio to the disk 12 as before. The direct connection between the disks 11 and 12, however, enables the

indicator to be re-set with only one-tenth as many motions and in one-tenth of the time that would be required otherwise. When the setting crown is released spring 48 restores the parts to normal position.

The part of the herein described mechanism in which my present invention resides is the setting stem arranged transversely to the face of the instrument with a crown or knob beside such face, and the means which put the counter disks in condition to be reset whenever the re-setting device, which is the crown 44, is pushed inward. One advantage in this construction and arrangement is that thereby the re-setting mechanism may be made operative and the resetting may be accomplished with the use of a single hand and by what is essentially a single movement, that is, an inward push of the operator's fingers and at the same time a twirling of the crown. Another advantage is this, that I am able to secure this result by means of a setting device which is mounted beside the face of the instrument. This is important in connection with odometers used with automobiles, such odometers being usually mounted upon the dashboard of the vehicle with their faces nearly flush with the exposed face of such dashboard. A further advantage is the simplicity and ruggedness of the mechanism, which can be produced at low cost and is little liable to get out of order.

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

1. The combination in a counter with alined number disks and a driving shaft coaxial with said disks and disconnectibly connected to one of them, of a re-setting device comprising a stem at an angle to the axis of the disks which is movable both axially and rotatably, mechanism operated by axial movement of said stem for disconnecting said disconnectible disk from the said shaft, and mechanism operated by rotation of said stem for turning said disk.

2. The combination with a rotatable number-carrying disk, a drive shaft therefor and a clutch member associated with said disk and connectible with said shaft, of a setting stem mounted for movement both longitudinally and rotatably, intermeshing gears connected to said stem and said disk respectively, and a lever having one arm in position to be displaced by movement of said stem axially, and having a second arm engaged with said disk in such manner as to withdraw the same and the associated clutch element from connection with the shaft when so moved.

3. In a counting mechanism a rotatable and axially movable counting disk, a driving shaft having a clutch element, a complemental clutch element connected with the disk and movable axially therewith into and out of connection with the shaft-carried clutch element, a lever having one arm in connection with said disk for moving the same axially, a gear connected to said disk for moving the same rotatably, a setting element engaged with said lever and movable so as to displace the latter, and a gear connected to said stem and in mesh with the aforesaid gear for rotating the disk.

4. The combination with a series of number-displaying disks, a driving shaft for the unit-indicating disk, complemental clutch members, one connected to said shaft and the other connected to said unit-indicating disk, said disk being movable axially to disconnect and connect, respectively, said clutch members, said disk having an elongated hub in which one of said clutch members is contained, a gear on the end of said hub, a rotatable and endwise movable setting stem, a gear fixed to said stem adapted to mesh with the aforesaid gear, a sleeve mounted on the hub of said disk and arranged to apply force for displacing the same when moved axially, and a lever having one arm connected to said sleeve and having the other arm crossing the path in which said stem moves axially, whereby the latter is enabled to disengage said unit disk from the driving shaft.

5. In an indicator having number-exhibiting disks the combination with a drive shaft, a clutch disconnectibly engageable with said shaft and connected with one of said disks, being displaceable into and out of connection with the shaft, a setting member arranged substantially at right angles to and geared to said disk and operable to rotate the latter, and a clutch shifter having connection with said clutch and operable by said setting device for disengaging the clutch from the drive shaft.

6. In an indicator having a series of number-exhibiting disks mounted coaxially with means for carrying movement periodically from each right hand disk to the neighboring disk at the left, a driving shaft, complemental clutch members connected to said driving shaft and the right hand disk, respectively, arranged for engagement and disengagement by axial shifting of said disk, a rotatably and axially movable setting member geared to said right hand disk for resetting the same, and a shifter mechanism operable by said setting member when moved axially to shift the right hand disk axially, and thereby disengage the clutch member carried by the disk from the complemental clutch member.

7. In an indicator having a plurality of number-exhibiting disks with carrying mechanism between adjacent disks and a drive shaft, complemental clutch members on said drive shaft and right hand disk, respectively, operable to be connected and

disconnected by movement axially of said disk, connected pinions for conveying continuous motion from said right hand disk to the next disk, being normally out of engagement with the right hand disk but adapted to become engaged therewith when the latter is so displaced as to disconnect its clutch member from the clutch member on said shaft, a single setting member, and means operated by said setting member for both shifting the right hand disk in the manner above indicated and for rotating the same.

8. In an indicator a plurality of indicating disks and intermediate carrying mechanisms, a driving shaft, complemental intermeshing toothed clutch elements connected to said driving shaft and the right hand disk respectively, and said right hand disk being movable axially for disconnecting said clutch elements to permit setting of the disks, and for reconnecting said clutch elements respectively.

9. In an indicator a plurality of number indicating disks and intermediate carrying mechanisms, a drive shaft, complemental clutch elements on said drive shaft and the right hand indicating disk, said disk being displaceable axially whereby to disconnect and connect such clutch elements, a setting stem projecting at an angle to the axis of said disks and being movable endwise and also rotatably, means for displacing the disk when said stem is moved endwise, and complemental gears on said disk and stem arranged to intermesh for rotating the disk by rotation of the stem.

10. In an indicator a driving shaft, a series of interconnected counting disks mounted to rotate about said shaft, the right hand endmost disk being movable axially, a clutch element on the shaft, a complemental clutch element connected to said right hand disk adapted to be brought into and out of engagement with the other clutch member when said disk is so moved in one direction or the other, a gear element connected to said right hand disk, a setting stem arranged at an angle to the axis of said disk and being movable endwise and also rotatably, a gear element carried thereby complemental to the gear element of the disk adapted to mesh therewith whereby to turn the disk for resetting when the stem is moved endwise in one direction, and a lever having an arm arranged to be displaced by said stem when the latter is displaced in the aforesaid direction, and having a second arm arranged to apply force to the right hand disk at such times tending to move it in the direction which causes disconnection of said clutch elements.

11. An odometer instrument including a series of number indicating disks, a driving element, coaxial with said disks, disconnectible clutching means between said driving element and the units disk of said series, and a setting stem geared to the units disk and projecting transversely thereto at one side of the instrument.

12. An indicator instrument having a series of axially alined number disks arranged to exhibit at the face of the instrument the numbers from which readings are taken, a resetting stem mounted substantially at right angles both to the axis of said disks and to the face of the instrument, a driver for the units disk of said series, alined axially therewith, disengageable coupling means between said driver and units disk, and gearing arranged to transmit rotation from said setting stem to the units disk.

13. A counting instrument embodying an axially alined series of number disks, a driving shaft coaxial therewith, complemental clutch members associated respectively with said shaft and the units indicating disk of said series, a re-setting stem mounted transversely to the axis of the disks with provision for endwise movement and rotation, gearing between said re-setting stem and the units indicating disk, and means operable by endwise movement of the stem for causing disconnection of said clutch members, the gearing being arranged to mesh when the clutch members are separated.

14. In a counting instrument a series of axially alined number disks, a driving shaft, complemental clutch members one of which is secured to said driving shaft and the other is engaged non-rotatably with the units disk of the series, one of said clutch members being movable into and out of engagement with the other, a re-setting stem extending transversely to the axis of said disks and being movable both endwise and rotatably, mechanism operable by said stem in its endwise movement in one direction for disconnecting said clutch members, a spring acting on said stem tending to move it endwise into, and retain it in, the position in which it permits coupling of the clutch members, and gearing arranged to transmit rotation from the stem to the said units disk when the stem is in the clutch uncoupling position.

In testimony whereof I have affixed my signature.

GEORGE W. TONEY.