

April 3, 1951

H. H. HARADA  
RESETTING DEVICE

2,547,751

Filed May 25, 1948

2 Sheets-Sheet 1

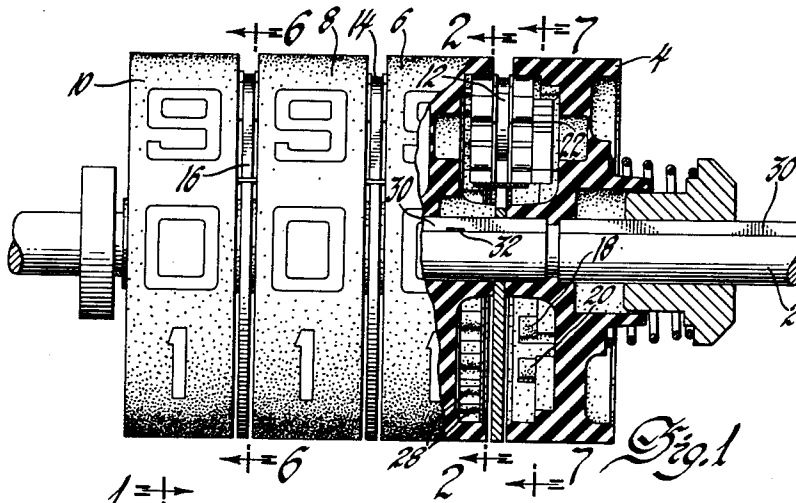
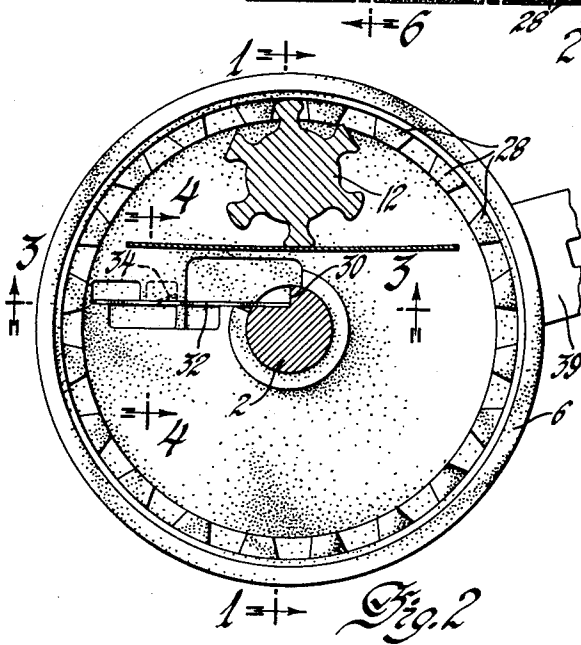
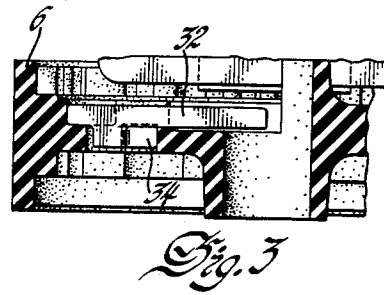
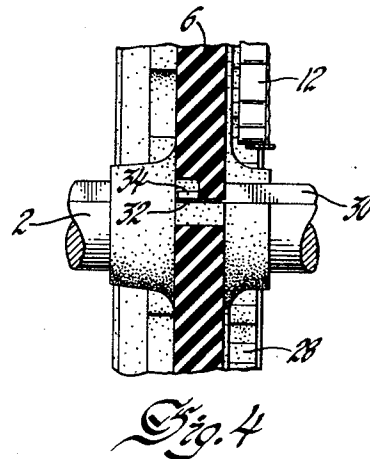
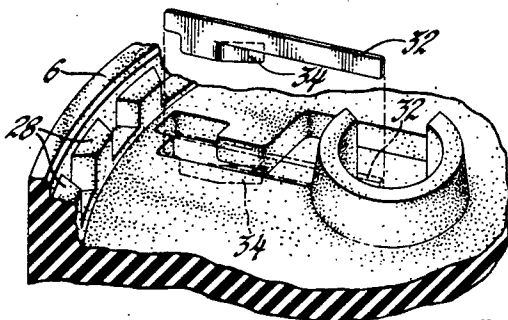


Fig. 5  
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2 Sheets-Sheet 2

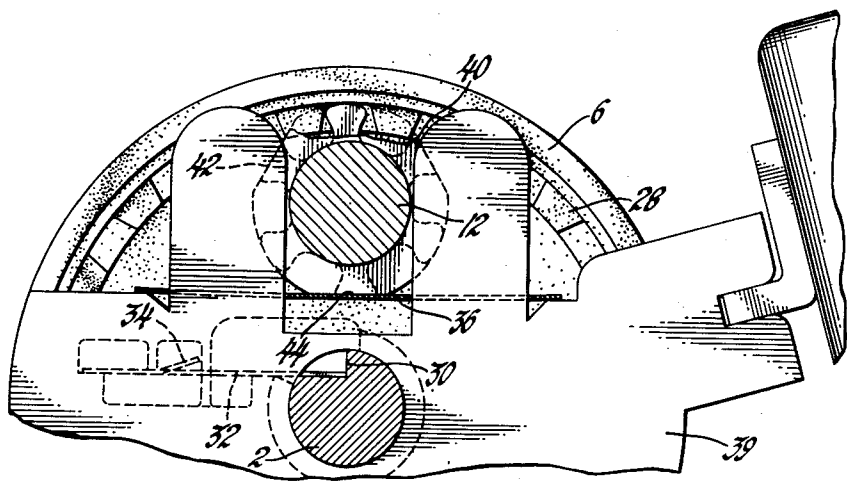


Fig. 6

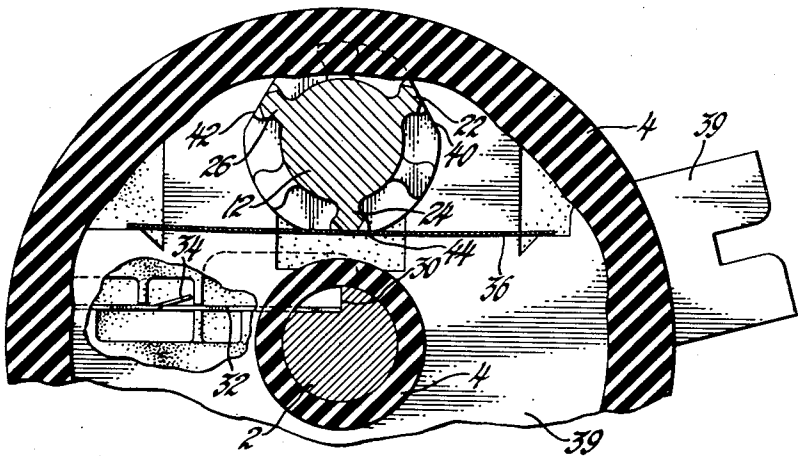


Fig. 7

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## UNITED STATES PATENT OFFICE

2,547,751

## RESETTING DEVICE

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4 Claims. (Cl. 235—144)

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The present invention relates to odometers, and more particularly it relates to odometers including cylinders having intermittent motion and means for controlling this motion so as to facilitate the correct alignment of the numbers on the odometers. It also relates to a quick reset mechanism for returning the cylinders to a predetermined initial position.

Prior to the present invention great difficulty has been experienced in maintaining the figures on odometer cylinders in correct alignment and preventing their creep. Difficulty has also been experienced in quickly resetting the odometer to its starting position. The difficulty in maintaining correct alignment of the odometer cylinders results from frictional forces in the motion transfer mechanism between the cylinders, dragging the driven cylinder along with the driving cylinder when such motion is not desired. In many of the previously used odometers it is possible only to impart reset motion to the units cylinder and this cylinder therefore must be rotated a very large number of turns to return the hundreds and thousands cylinders to their initial starting, or zero set point.

In the present invention the transfer gear between the odometer cylinders makes one-third of a revolution for each figure position the index cylinder is moved. This transfer gear has flat portions thereon with spring biasing holders so as to maintain the driven cylinder in a fixed position until it is driven to the next index position by the positive action of the gear train including the driving cylinder, the transfer gears and the driven cylinder. In order to eliminate, insofar as possible, any frictional coupling between the driving and driven cylinder, the transfer gear teeth, which mesh with the driving cylinder, are so formed as to minimize frictional forces between the driving cylinder, and the transfer gear.

The present invention also provides a spring ratchet means in each of the odometer cylinders so as to engage the shaft carrying these cylinders when it is rotated in a direction reverse to that in which the cylinders rotate during normal operation of the odometer.

It is therefore an object of the present invention to produce an odometer which is simple in construction and economical to manufacture.

It is another object of the present invention to produce an odometer which may be reset to its zero position with a minimum of effort.

Other objects of the present invention will become apparent on reading the specification, and

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inspection of the figures in the drawings, and will be particularly pointed out and claimed in the appended claims.

Referring to the figures in the drawings:

Figure 1 is a general view of the odometer which is subject to the present invention.

Figure 2 is a sectional view taken along the lines 2—2 of Figure 1.

Figure 3 is a partial sectional view taken along the lines 3—3 of Figure 2.

Figure 4 is a partial sectional view taken along the lines 4—4 of Figure 2.

Figure 5 shows the method of assembling the leaf spring ratchet in an odometer cylinder.

Figure 6 is a partial sectional view taken along the lines 6—6 of Figure 1.

Figure 7 is a partial sectional view taken along the lines 7—7 of Figure 1.

The partial sectional view of the assembly shown in Figure 1 is taken along the center line of the odometer cylinders as shown on the line 1—1 of Figure 2.

Referring more particularly to Figure 1, 2 is a shaft extending through the axis of the odometer cylinders 4, 6, 8 and 10. Each of the cylinders 4, 6, 8 and 10 have inscribed upon their periphery numbers from zero through 9. Transfer gears 12, 14 and 16 are included between these cylinders. These gears are so arranged and mated with internal teeth on the cylinders, as will be later described, to permit 10 revolutions of the cylinder 4, for one revolution of cylinder 6, and 10 revolutions of cylinder 6 for one revolution of cylinder 8, and 10 revolutions of cylinder 8 for one revolution of cylinder 10. This ratio forms no part of the present invention as the applicant considers his invention to apply to any desired ratio between the cylinders. This ratio 1 to 10 is used for illustrative purposes only to facilitate proper description of the invention. Intermittent motion between the cylinders of this odometer is produced by a mutilated gear here illustrated as containing gear teeth 18 and 20 engaging the teeth 22, 24 or 26 (more particularly shown in Figure 7) causing rotation of the gear 12, and this rotative motion imparts motion to the adjoining cylinder here illustrated as cylinder 6 through the internal teeth 28.

The shaft 2 has a groove 30 cut therein extending through all of the odometer cylinders. As will be noted by inspection of Figure 2, this slot has one side thereof along a radial axis and the other side inclined to this axis.

Referring more particularly to Figures 2, 3, 4 and 5, a leaf spring 32 with a small turned up

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locking portion 34 is adapted to engage the slot 30 so as to form a ratchet. This ratchet permits clockwise rotation of the shaft without moving the cylinder 4 but locks the cylinder and shaft when the shaft is rotated in a counter-clockwise direction. Previously used leaf springs, such as shown in Patent 2,117,024 to Helgeby and the applicant, have been secured to the cylinder by molding therein, or attaching thereto by swedging. Such a method of attaching the spring leads to added expense and manufacturing difficulties. In the present case, the spring 34 may be snapped into position thus eliminating the necessity of integral molding or attaching by swedging. The use of this type of spring also permits easy replacement of damaged springs.

Referring more particularly to Figures 6 and 7, another feature of the applicant's odometer assembly is shown. It will be here noted that the idle pinion or transfer gear 12 is biased into engagement with the teeth 28 of the cylinder 6 by means of leaf spring 36. This leaf spring and its method of attachment to the carrying frame 39 is very similar to that described in the above mentioned patent. It was found, however, through the use of the odometer shown in this above patent, that certain creep might be expected under severe conditions of operation. To eliminate this creep, I have provided flat portions 40, 42 and 44 on the gear 12 to engage the leaf spring 36. This transfer gear moves one-third of a revolution for each revolution of the driving cylinder and each indexed position of the driven cylinder. Thus a flat spot on this transfer gear engages the leaf spring 36 at each position on the driven gear where the figures on said cylinder are properly aligned. The engagement between the spring 36 and the transfer gear flat spot maintains this figure wheel in a fixed position against all frictional forces but permits its rotation upon the application of a positive driving force.

It is to be understood also that although the invention has been described with specific reference to a particular embodiment thereof, it is not to be so limited, since changes and alterations therein may be made which are within the full intended scope of this invention as defined by the appended claims.

I claim:

1. In an odometer, a shaft having a groove therein, a figure wheel rotatably mounted on said shaft, a leaf spring mounted on said figure wheel, means for retaining said spring in position, said last mentioned means comprising spaced supporting means on said wheel for said spring, a lug on said wheel disposed intermediate said supporting means, and a tongue on said spring lockingly engaging said lug to retain said spring

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on said figure wheel, and said spring being adapted to extend into said groove in such a manner as to permit overrunning of the shaft during rotation thereof in one direction and to drive said figure wheel during rotation of said shaft in the reverse direction.

2. In an odometer, a shaft having a longitudinally extending groove therein, a figure wheel rotatably mounted on said shaft, a resilient pawl mounted on said figure wheel, one end of said pawl extending into said groove in such a manner as to permit overrunning of the shaft during rotation thereof in one direction and to drive said figure wheel during rotation of said shaft in the reverse direction, spaced supporting means on said wheel for said pawl, a locking lug on said figure wheel intermediate said supporting means, and a spring tongue on said pawl adapted to interlock with said lug to retain said pawl on said wheel.

3. In an odometer, a shaft having a groove therein, a figure wheel mounted on said shaft, a leaf spring pawl mounted on said figure wheel, one end of said spring pawl extending into said groove in such a manner as to permit overrunning of the shaft during rotation thereof in one direction and to drive said figure wheel during rotation of said shaft in the reverse direction, supporting means on said wheel engaging one side of said pawl, a lug on said wheel adapted to engage the other side of said pawl and self-locking interengaging means on said pawl and lug to lock said pawl on said wheel.

4. In an odometer, a shaft having a groove therein, a figure wheel mounted on said shaft, a leaf spring pawl mounted on said figure wheel, one end of said spring extending into said groove in such a manner as to permit overrunning of the shaft during rotation thereof in one direction and to drive said figure wheel during rotation of said shaft in the reverse direction, supporting means on said wheel engaging one side of said pawl, a lug on said wheel adapted to engage the other side of said pawl, abutment means on said lug, and a tongue on said pawl lockingly engaging said abutment means to retain said pawl on said wheel.

HENRY H. HARADA.

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