Nov. 10, 1953 H. H. HARADA 2,658,685

QUICK RESET ODOMETER

Original Filed May 25, 1948 2 Sheets-Sheet 1

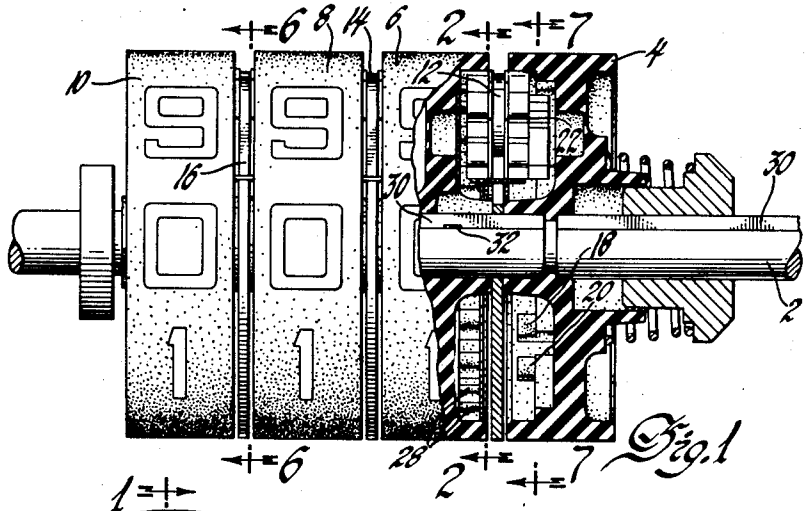


Fig. 1

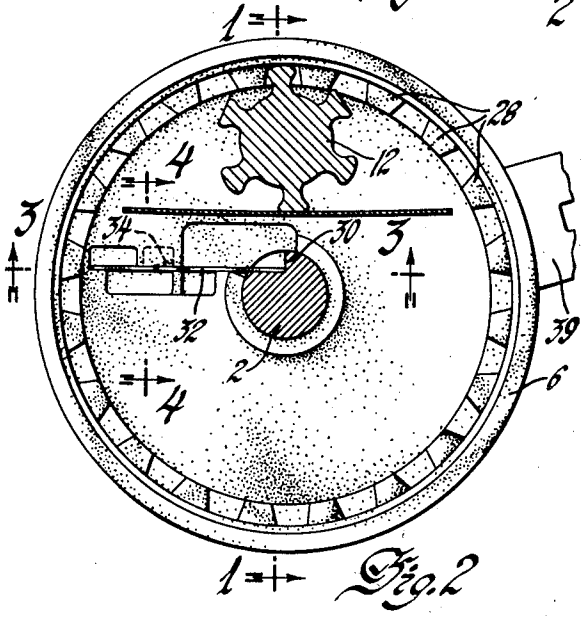


Fig. 2

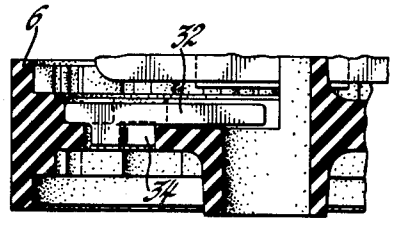


Fig. 3

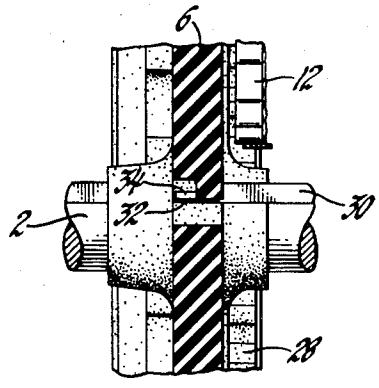


Fig. 4

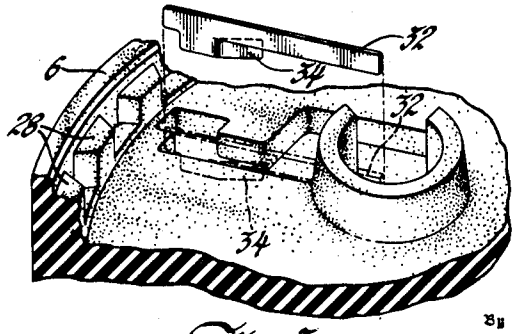


Fig. 5

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QUICK RESET ODOMETER

Original Filed May 25, 1948 2 Sheets-Sheet 2

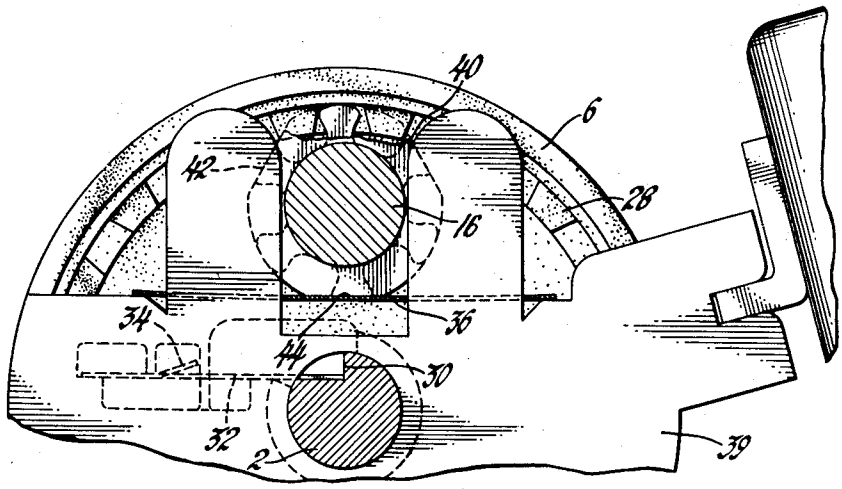


Fig. 6

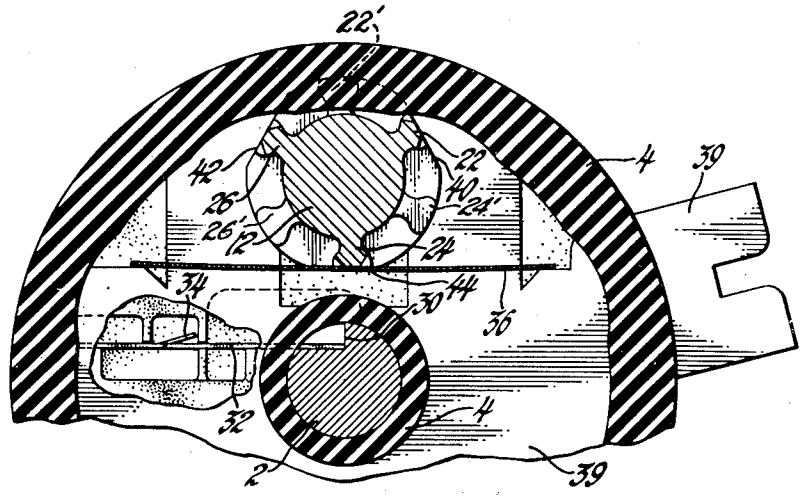


Fig. 7

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UNITED STATES PATENT OFFICE

2,658,685

QUICK RESET ODOMETER

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Original application May 25, 1948, Serial No. 29,049. Divided and this application August 3, 1950, Serial No. 181,591

2 Claims. (Cl. 235—139)

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This application is a division of my copending application Serial No. 29,049, filed May 25, 1948, and 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 odometer. 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 a second object of the present invention to produce an odometer with means for maintaining the cylinders of the odometer in a fixed position against frictional and inertia forces.

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It is a third 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 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 multilated 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, in substantially the same manner as disclosed in the patent to Helgeby et al. 2,117,024, 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 thereing 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 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 alined. 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 first figure wheel, a second figure wheel, a floating transfer pinion between said wheels and having axially spaced sets of teeth and equiangularly located flat spots on its periphery, means restricting said transfer pinion to movement in its own plane, said movement being radial with respect to the center of rotation of said figure wheels, a plurality of teeth on one part of said first figure wheel to engage one set of teeth on said transfer pinion, teeth on the entire periphery of said second figure wheel to engage the second set of teeth on said transfer pinion, and a flat spring for maintaining the transfer pinion in frictional and tooth-meshing engagement with said figure wheels, a portion of said spring engaging one of said flat spots on said transfer pinion only when the figures on said figure wheels are in predetermined alined positions.

2. An odometer, as claimed in claim 1 in which the flat spots on said pinion are three in number.

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