Jan. 7, 1964 R. H. WOLFENDEN ET AL 3,116,875

CYCLOMETER REGISTERS

Filed Oct. 18, 1961

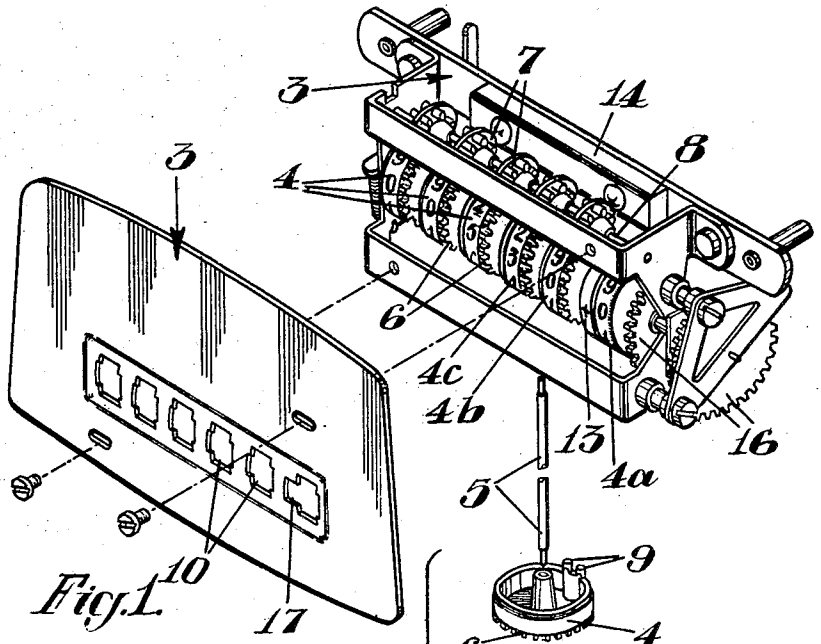


Fig. 1.

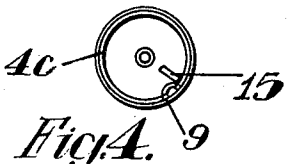


Fig. 4.

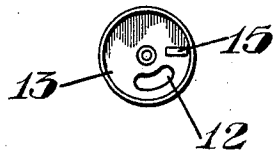


Fig. 3.

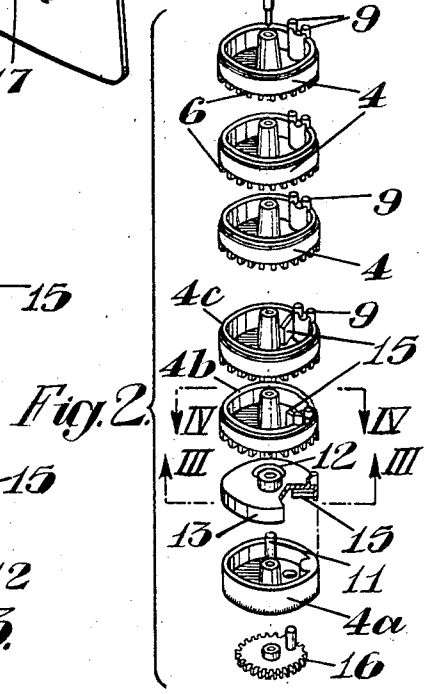


Fig. 2.

United States Patent Office

3,116,875

Patented Jan. 7, 1964

3,116,875

CYCLOMETER REGISTERS

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Filed Oct. 18, 1961, Ser. No. 145,918
Claims priority, application Great Britain Nov. 1, 1960
3 Claims. (Cl. 235—139)

The invention relates to cyclometer registers of the impulse or jumping figure type in which the first or lowest reading number wheel changes instantaneously from 9 to 0 and initiates a quick change of all higher denomination figures.

Such registers suffer from the disadvantage that after the changeover has taken place the register reads one unit of the lowest denomination roller in advance for at least the expiry of one unit and may be longer and limits the range over which the register may be accurately read.

According to the present invention, there is provided a cyclometer register having a series of charactered divisioned rollers rotatably mounted in a frame, comprising means for continuously driving the lowest denomination roller, a driving wheel which meshes with a changeover pinion when the lowest denomination roller first indicates 0 and lost motion mechanism being provided between the lowest denomination roller and the driving wheel, sign means on the driving wheel, means for controlling the sign means to render it visible until the roller of second lowest denomination has been advanced by one division through the intermediary of the changeover pinion.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawing in which:

FIGURE 1 is a perspective view of a cyclometer register according to the invention,

FIGURE 2 is an exploded view of the rollers of the register,

FIGURE 3 is a plan view of a driving wheel for the rollers looking in the direction of the arrows III—III of FIGURE 2, and

FIGURE 4 is a plan view of one of the rollers of the register looking in the direction of the arrows IV—IV of FIGURE 2.

Referring to the drawings, a cyclometer register comprises a frame 3 within which is mounted a series of number wheels or rollers 4 on a central shaft 5 each roller having numbers from 0 to 9 on their peripheral faces. Each roller, apart from the roller *4a*, which is of lowest denomination, is provided with teeth 6 on its face nearer its neighbouring lower denomination roller and the teeth 6 of each roller 4 are in mesh with one of a series of changeover pinions 7, freely mounted on a separate shaft 8. Each roller 4 also has projections 9 on its face nearer the adjacent roller 4 of higher denomination and these projections 9 are located so that they contact once during each revolution the teeth of the adjacent changeover pinion 7 which is permanently in mesh with the teeth 6 of the adjacent roller 4 of higher denomination. For each roller 4 this contact of a pinion 7 by the projections 9 takes place as the lower denomination roller 4 as seen through windows 10 in the frame 3 moves from 9 to 0 during each revolution and as it does so the adjacent roller 4 of higher denomination is advanced by one

division through the gearing. The roller *4a* of lowest denomination has an eccentric, laterally extending driving pin 11 which projects through an elongated slot 12 extending over an arc of at least 36° in a driving wheel or intermediate roller 13 freely mounted on the central shaft 5 of the register. The driving wheel 13 is marked with a positive sign for a purpose as will hereinafter be explained.

A permanent magnetic strip 14 is located on the register frame 3. The strip 14 which is fitted adjacent the periphery of the rollers 4, runs the length of their axes and is magnetised with a flux normal to the radius of the rollers. Small permanent magnets 15 are fitted radially within each roller *4b* and *4c* and in the driving wheel 13.

In operation of the register, the driving wheel 13 is driven through gearing 16 and roller *4a* by means of the driving pin 11 abutting against the leading edge of the slot 12 in the driving wheel 13 when the lowest denomination roller *4a* is rotated. When the numeral 0 on the roller *4a* shows in the window 10 and positive sign on driving wheel 13 shows in auxiliary window 17, the frame magnet 14 attracts the small magnet 15 on the driving wheel 13 and advances it instantaneously.

At the instant prior to changeover when the lowest denomination roller *4a* is reading 0 and the next higher denomination roller *4b* has not changed, the register will be reading one unit of this higher denomination roller in error negative. The positive sign marked on the driving wheel 13 indicates this condition and instructs that the next higher digit on the higher denomination roller *4b* should be read.

When the driving wheel 13 changes, either by the magnetic method as described above or by a falling weight method, the driving wheel 13 turns forward at least one tenth of a revolution carrying its changeover pinion 7 and in turn the next higher denomination roller *4b* with it and the positive sign disappears, the reading of the rollers now being correct. At this stage the driving wheel is now at least 36° in advance of the lowest denomination roller *4a* and the drive pin 11 in contact with the trailing edge of the elongated slot 12. The pin 11 picks up the leading edge of the slot either in the next one tenth of a revolution or quarter of a revolution depending on whether the quick-change method is obtained by magnetic means or mechanical means.

The auxiliary window 17 is cut in the dial plate to allow observation of the positive sign for a sufficient period.

It will be apparent that any suitable sign may be employed on the driving wheel and not necessarily the positive sign as described.

What we claim is:

1. A cyclometer register having a series of charactered divisioned rollers rotatably mounted in a frame, comprising means for continuously driving the lowest denomination roller, a driving wheel which meshes with a changeover pinion when the lowest denomination roller first indicates 0, and lost motion mechanism being provided between the lowest denomination roller and the driving wheel, sign means on the driving wheel, means for controlling the sign means to render it visible until the roller of second lowest denomination has been advanced by one division through the intermediary of the changeover pinion.

2. A cyclometer register having a series of charactered divisioned rollers rotatably mounted in a frame, compris-

ing a lowest denomination roller which is continuously driven, a driving wheel which meshes with a changeover pinion when the lowest denomination roller first indicates 0, lost motion mechanism provided between the lowest denomination roller and the driving wheel, said mechanism comprising an eccentric pin carried by the lowest denomination roller, which pin engages in an elongated slot in the driving wheel, sign means on the driving wheel, means for controlling the sign means to render it visible until the roller of second lowest denomination has been advanced by one division through the intermediary of gearing.

3. A cyclometer register as claimed in claim 1, in which

means are provided on the frame and means on at least the roller of second lowest denomination, which means provide a magnetic force therebetween to advance at least said roller instantaneously through the last division of each complete revolution, the adjacent roller of higher denomination being advanced simultaneously by one division through gearing.

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