(No Model.)

C. S. LABOFISH.

CYCLOMETER.

No. 583,491. Patented June 1, 1897.

Fig. 1.

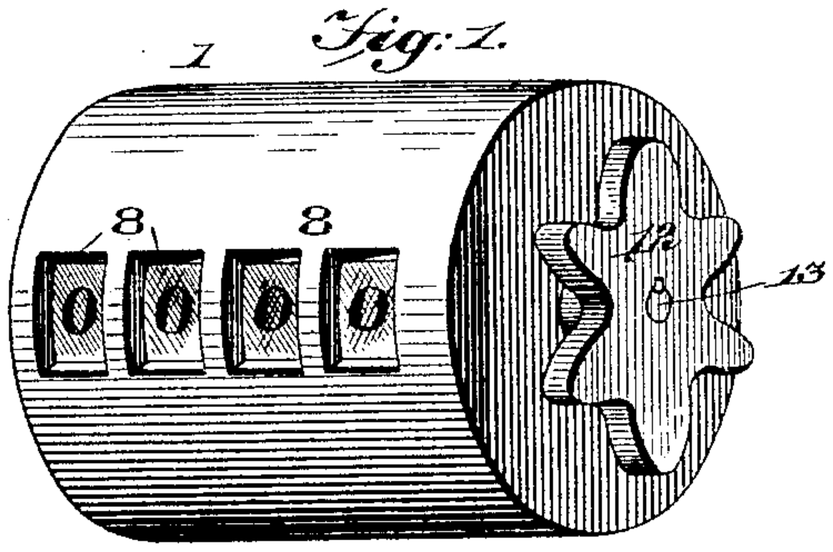


Fig. 2.

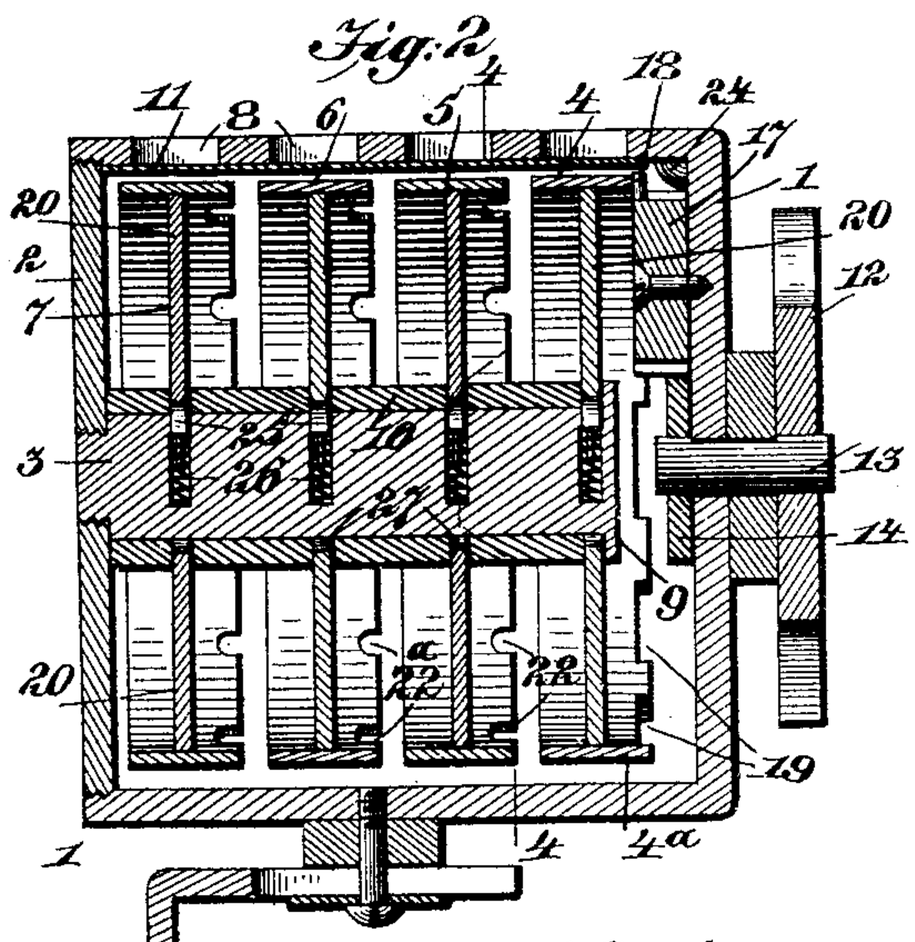


Fig. 3.

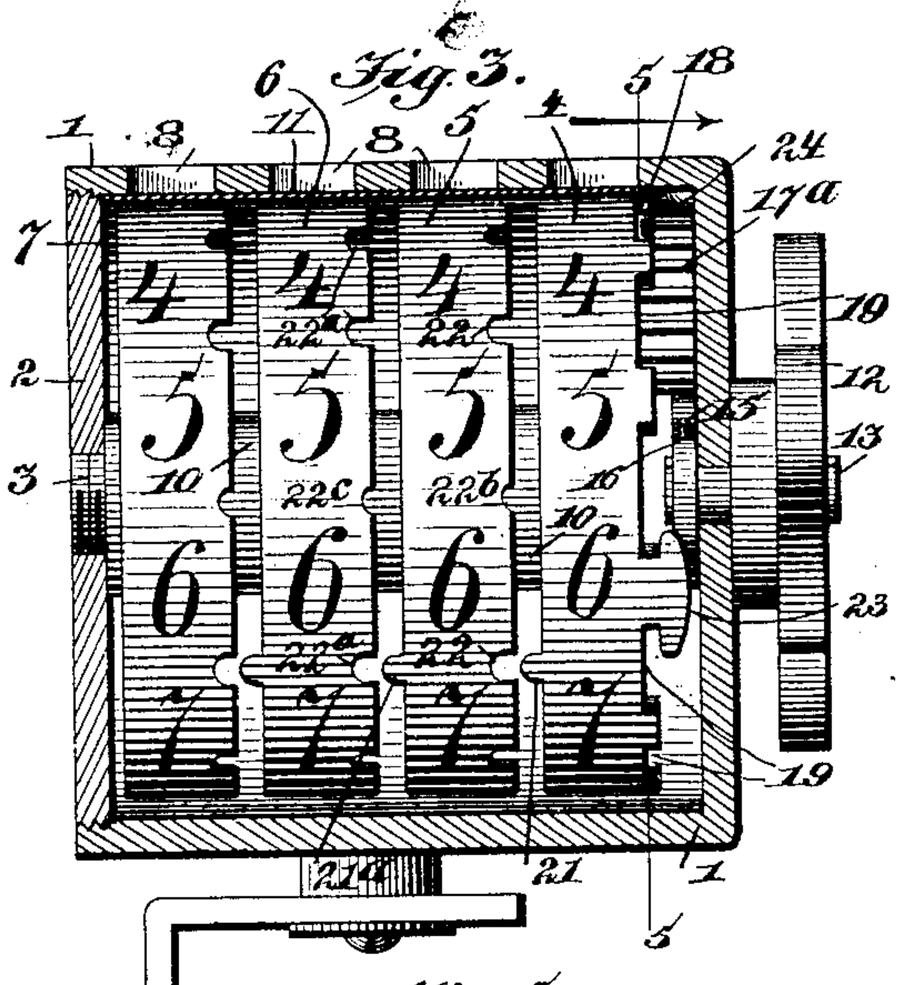


Fig. 4.

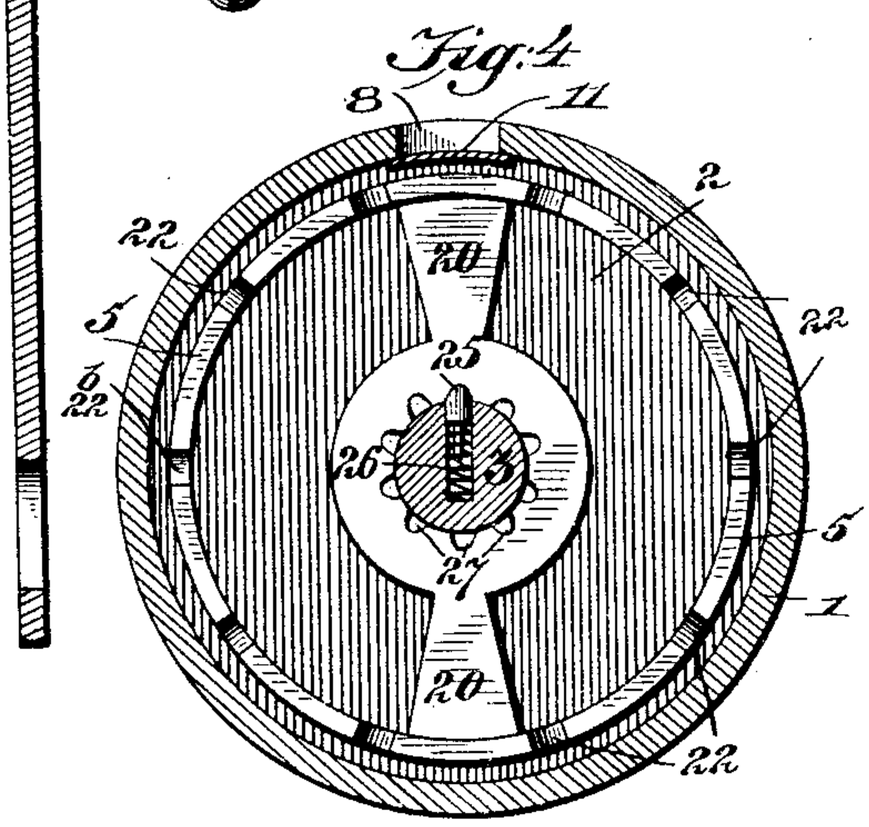
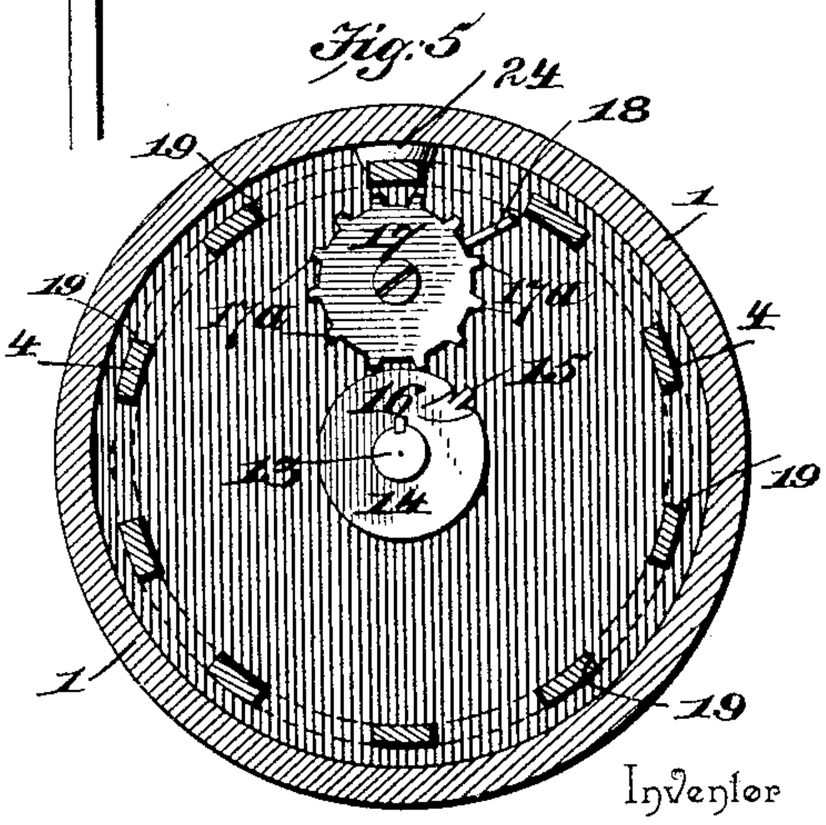


Fig. 5.



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UNITED STATES PATENT OFFICE.

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CYCLOMETER.

SPECIFICATION forming part of Letters Patent No. 583,491, dated June 1, 1897.

Application filed October 24, 1896. Serial No. 609,979. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. LABOFISH, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Cyclometer, of which the following is a specification.

My invention relates to cyclometers, and has for its object to provide a device of this class which is simple in construction and is adapted to accomplish the registration of distance when applied to a vehicle, such as a bicycle, with the minimum number of operating parts and without the use of gearing for communicating motion from one registering wheel or member to the next of higher denomination.

Further objects and advantges of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view. Fig. 2 is a longitudinal central section of the same. Fig. 3 is a similar view showing the registering-wheels in elevation. Fig. 4 is a transverse section on the line 4 4 of Fig. 2. Fig. 5 is a transverse section on the line 5 5 of Fig. 3.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a cylindrical casing having one end open and fitted with a removable head or cap 2, which in the construction illustrated is threaded in the end of the casing. This removable head or cap carries an arbor 3, which is located axially in the casing, and upon it are mounted rotary registering members or wheels respectively designated by the numerals 4, 5, 6, and 7, bearing numerals for exposure through inspection-openings 8 in the shell or casing and occupying such relative positions as to arrange the exposed numerals, respectively, in the units, tens, hundreds, &c., places. The units-registering member or wheel 4 is held from displacement by a terminal enlargement or head 9 on the inner end of the arbor 3, and the wheels are spaced at the desired intervals by means of interposed collars 10. A suitable transparent shield 11 covers the openings 8 to prevent the access of dust and moisture to the interior of the casing.

Located exteriorly of the shell or casing is a star-wheel 12, adapted to receive motion from the wheel of the vehicle, and to the spindle 13 of the star-wheel is fixed a driving-gear 14, having a smooth circular periphery, except at one end, where it is provided with a radial spur or tooth 15, the contiguous portions of the periphery upon opposite sides of said spur or tooth being cut away to form depressions 16. Arranged in operative relation with the driving-gear is a toothed pinion 17, adapted to receive motion from the gear 14, and hence having its teeth 17^a located in the plane of the detent 15 for successive engagement thereby. Hence each complete revolution of the gear 14 will advance the pinion 17 a distance equal to the interval between two contiguous teeth 17^a, and in order to hold said pinion from accidental movement, as by the jarring of the device, the circular periphery of the gear projects into the paths of the contiguous teeth 17^a or extends slightly between said teeth. This forms a lock to prevent the movement of the pinion, and the latter is only released when the notch or depression 16, located contiguous to the spur 15, comes into alinement with the tooth which is about to be engaged by said spur. As soon as the spur has advanced the pinion one step the circular periphery of the gear again locks the pinion against further movement until the gear has completed the next revolution. The pinion 17 also carries the spur 18, which is designed for successive engagement with seats or notches 19 in the units-registering member or wheel 4, said seats or notches being formed in the cross-sectionally flat circular rim 4^a, which combines with a web 20 to constitute the registering member or wheel. It will be seen that as the pinion 17 completes a revolution the spur 18 will engage one of the seats or notches 19 and advance the units-registering member or wheel one step, or the distance between contiguous seats or notches.

In order to accomplish the communication of motion from one registering member or wheel to the next of higher denomination, I preferably construct the same with yielding

webs 20, whereby the rims are laterally resilient. This quality of the registering members or wheels enables them to be moved to secure the engagement or interlocking of the rims, the rim of each wheel of lower denomination being provided with a lateral stud or projection 21 to engage one of a series of seats or notches 22, formed in the rim of the adjacent wheel of higher denomination. Hence by imparting lateral movement to the units-wheel it may be brought into interlocking engagement (by means of the stud 21 and one of the seats or notches 22) with the tens-wheel to cause an advance movement of the latter, and the means illustrated in the drawings for accomplishing this lateral movement of the units-wheel include coöperating movable and fixed cams 23 and 24, carried, respectively, by the units-wheel and the shell or casing, and shown, respectively, in Figs. 2 and 3. When the units-wheel has completed one revolution, the projecting cam 23 comes in contact with the cam 24 and forces the rim of the units-wheel toward the tens-wheel sufficiently to cause the engagement of the stud or projection 21 with one of the notches 22, and hence while the movable cam is traversing the surface of the fixed cam the tens-wheel is moved forward one step, or a distance equal to the interval between contiguous notches 22.

In order to communicate motion from the tens-wheel to the hundreds-wheel, it is necessary to lock the hundreds-wheel to the tens-wheel long enough to secure the advance movement of the former through a distance equal to the interval between contiguous numerals. The tens-wheel is provided with a stud or projection 21^a for engagement with seats or notches 22^a in the rim of the hundreds-wheel, but the coacting cams 23 and 24 are capable of moving the units-wheel laterally a sufficient distance only to secure the engagement of the stud 21 of the units-wheel with the seats or notches 22 of the tens-wheel, whereas it is necessary that motion should be communicated from the units-wheel to the tens-wheel in order that the stud 21^a may be brought into engagement with one of the notches 22^a. In order to accomplish this, I reduce the depth of one of the seats or notches in the tens-wheel, as shown at 22^b, the bottom of this shallow notch being arranged out of the plane of the notches 22 and closer to the rim of the wheel 4, whereby when the tens-wheel is about to complete one revolution and the units-wheel is deflected laterally to interlock its rim with that of the tens-wheel the stud 21 engages the notch 22^b, and as this notch is shallow the tens-wheel will also receive lateral movement sufficient to cause its rim to interlock with that of the hundreds-wheel by the engagement of its stud 21^a with one of the notches 22^a. In the same way when the hundreds-wheel is about to complete a revolution the forward motion of the hundreds-wheel is communicated thereto by reason of the engagement of the stud 21^a with a shallow or reduced notch 22^c in the hundreds-wheel.

From the above description it will be seen that motion is communicated from one wheel to the next of higher denomination by reason of the laterally resilient or yielding construction of the wheels, which are provided with rims having interlocking projections and depressions, said projections and depressions being brought into operative relation by the deflection of the wheels from their normal positions, and the subsequent disengagement of said rims to avoid communicating excessive motion being secured by the resilience of the webs 20.

In order to prevent accidental displacement of the registering members or wheels, I preferably employ a locking device consisting of a yielding spring-actuated locking-pin 25, mounted in a cavity 26 in the arbor in the plane of each wheel, to engage one of a series of notches 27 formed in the hub of the wheel.

It will be understood that in practice various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a cyclometer, the combination with a plurality of coaxial registering members or wheels having transversely-resilient rims provided with interlocking projections and depressions, and means for deflecting the rim of each member or wheel of lower denomination to bring it into operative relation with the rim of the contiguous wheel of higher denomination, substantially as specified.

2. In a cyclometer, the combination of a plurality of coaxial transversely-resilient registering members or wheels having projections and depressions normally held out of engagement and adapted to be interlocked by the lateral deflection of a wheel of lower denomination toward the contiguous wheel of higher denomination, the wheel of lowest denomination being provided with a cam-face to coact with a stationary projection, substantially as specified.

3. In a cyclometer, the combination of a plurality of coaxially-mounted registering-wheels having rims provided with complemental interlocking faces, said rims being supported by transversely-yielding webs, and means for imparting transverse movement to the rims to bring those of lower denomination in interlocking relation respectively with those of higher denomination, substantially as specified.

4. In a clyclometer, the combination of a plurality of coaxial registering-wheels having transversely-resilient rims, the adjacent faces of contiguous rims being provided, respectively, with projections and depressions adapted to be interlocked by the lateral deflection of one of the rims, one notch in each

series carried by a wheel being of less depth than the remaining notches and adapted to be engaged by the projection on the adjacent wheel with a minimum lateral movement of the rim thereof, and means for laterally deflecting the rim of the wheel of lowest denomination, substantially as specified.

5. A cyclometer having a casing provided with lateral openings, an inclosed series of coaxial registering-wheels provided with means for communicating motion from one wheel to the next of higher denomination and having their peripheries visible through said openings in the casing, the registering-wheel of lowest denomination having a projecting rim provided with a plurality of spaced elongated notches 19, a driving-gear having a smooth periphery and a radially-projecting spur, a pinion having a plurality of teeth for intermittent engagement by said spur, the pinion being held from accidental movement by the projection of the smooth periphery of the gear into the interval between contiguous teeth of the pinion, and a spur carried by the pinion for successive engagement with said notches in the registering-wheel of lowest denomination, said driving-gear and pinion being arranged within the cylindrical space bounded by the peripheries of the registering-wheels, substantially as specified.

6. In a cyclometer, the combination of a shell or casing provided with a plurality of inspection-openings, a head or cap removably fitted in one end of the shell or casing, an arbor carried by the head or cap, a plurality of registering-wheels mounted for rotation upon the arbor respectively in the planes of the inspection-openings, spring-actuated locking-pins mounted in cavities in the arbor for engagement with notches in the hubs of the registering-wheels to prevent accidental displacement thereof, means for communicating motion from one wheel to the next of higher denomination, and a driving-gear operatively connected with the registering-wheel of lowest denomination, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES S. LABOFISH.

Witnesses:
HARRY C. SHOOK,
GEO. B. LEITER.