(No Model.)

C. W. FOWLER.

REGISTERING MACHINE.

No. 409,950. Patented Aug. 27, 1889.

Fig. 1.

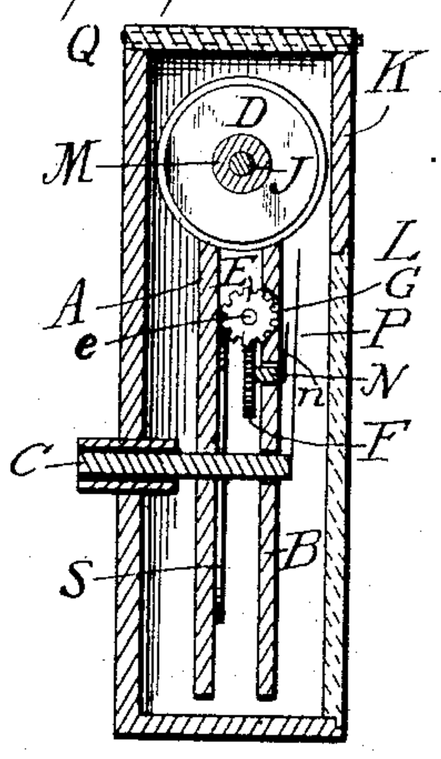


Fig. 2.

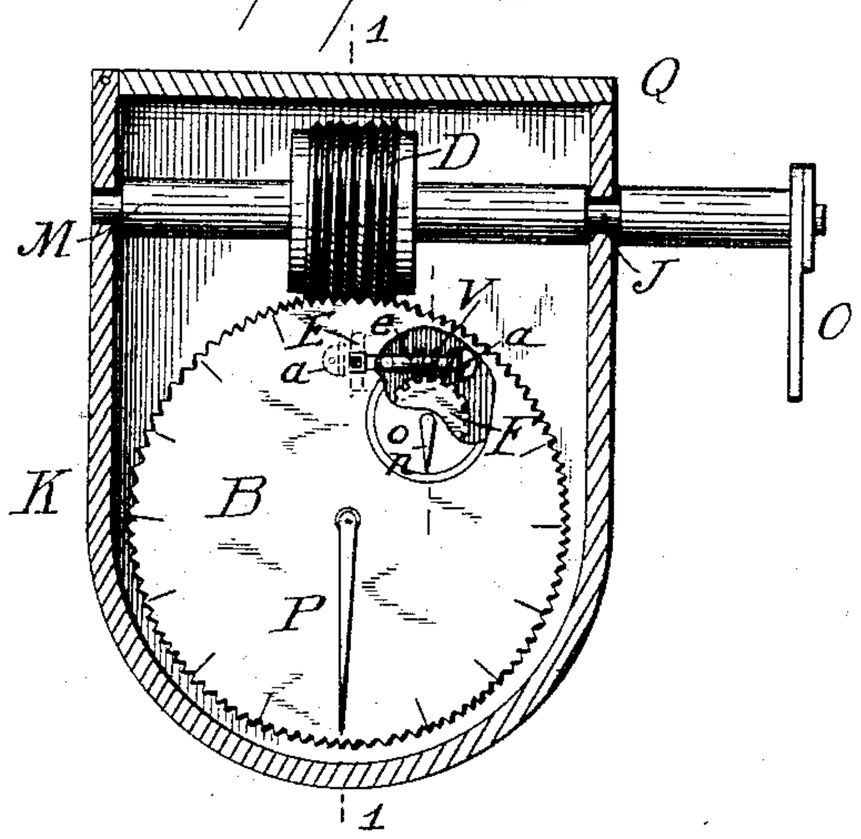


Fig. 3.

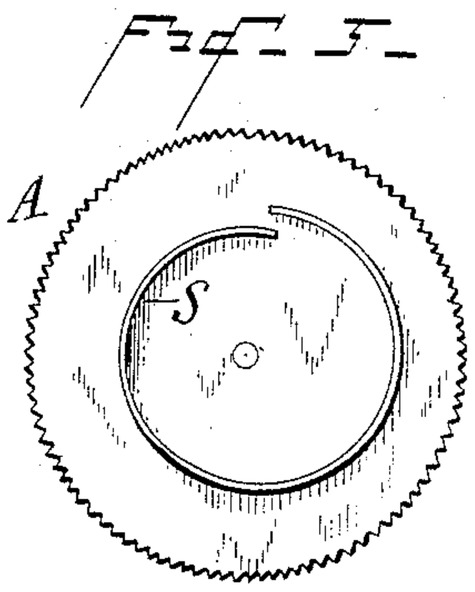


Fig. 4.

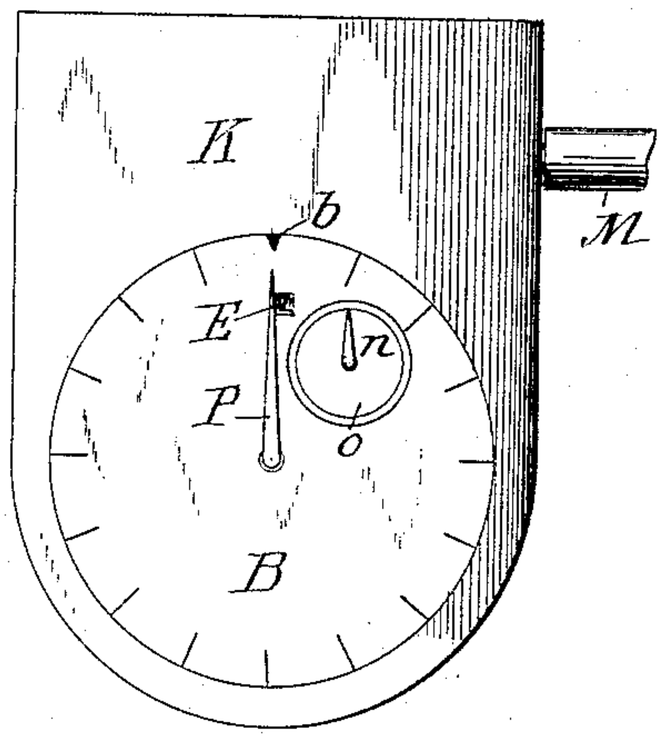
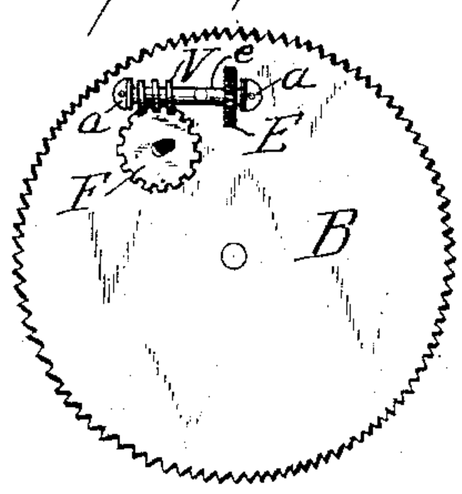


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES WESLEY FOWLER, OF CLOVERPORT, KENTUCKY.

REGISTERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,950, dated August 27, 1889.

Application filed February 9, 1889. Serial No. 299,338. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WESLEY FOWLER, a citizen of the United States, residing at Cloverport, in the county of Breckinridge and State of Kentucky, have invented certain new and useful Improvements in Registering-Machines, of which the following is a full, clear, and exact description.

My invention relates to machines for counting and registering rotations of wheels, shafting, &c., which are adapted to be used either as speed or distance registers; and the object of the invention is to greatly increase the capacity of the machine for counting and registering without unduly adding to the number of parts or making them more complicated, and consequently without materially increasing the cost of manufacture. I have attained these objects by mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section on the line 1 1. Fig. 2 is a front elevation of the registering apparatus, the front of the case being removed and some parts being broken away to show special features. Fig. 3 is an elevation of one of the differential gear-wheels. Fig. 4 is an elevation of the apparatus in its case, showing the arrangement of the dial. Fig. 5 is an elevation of one of the differential gear-wheels.

My improvements are based upon an old and well-known form of speed and distance register in which the essential features are a worm-shaft gearing into two differential spur-wheels, one loose and one fixed upon a counter-shaft. The fixed wheel contains, say, one hundred teeth, the loose wheel ninety-nine. If the worm-shaft be revolved one hundred times, the fixed wheel will have made just one rotation, but the loose wheel will have made one whole rotation and one tooth-space more. Thus, if the shaft be rotated ten thousand times, the loose wheel will have gained one hundred complete rotations upon the fixed wheel and both wheels will have come to their original relative positions. This simple mechanism is effective and accurate for counting and indicating a limited number of rotations; but, as my object is to multiply this capacity many times, I have added certain special improvements to accomplish that purpose.

In the drawings, K represents a casing formed, preferably, as shown at L, to carry a glass front. The upper part Q of the casing is separable from or hinged to the lower, and in both upper and lower parts are formed half-bearings for the journals J of the shaft M, which communicates to the machine the movements to be counted and registered. Any well-known form of lock may be used to hold the parts of the casing together, a suspension of a divided box from a shaft in the manner shown being old and common. D is an ordinary worm-gear on the shaft. C is a counter-shaft supported in bearings in the back of the case, Fig. 1, and projecting forward nearly to the front thereof. It carries the fixed gear-wheel A, with its one hundred teeth, and the loose gear-wheel B, with its ninety-nine teeth, both wheels engaging with the worm D. The face of the wheel B is of course a dial properly spaced, and the shaft C carries an indicating-hand P, which, as before stated, will count and register up to ten thousand rotations of the shaft M on the dial.

On the inner face of the wheel A, I place or form a raised spiral thread S, which meshes with the teeth of a small pinion E, carried on the wheel B and having a plane of rotation at right angles to that of the latter. The pinion E is mounted upon a small shaft *e*, running loosely in bearings *a a* upon the inner face of wheel B. Compactness is secured by forming a recess, Fig. 1, in the wheel B, into which the pinion E enters. At the bottom of the recess an aperture G is formed, opposite to which the teeth of pinion E, numbered from 1 to 10, appear successively, Fig. 4. Now, as one rotation of the wheel A relatively to the wheel B (produced by ten thousand rotations of the shaft M) will only move the pinion E one tooth-space, it is clear that a complete rotation of pinion E can only be produced by one hundred thousand rotations of the shaft M, and that the figures on the teeth of said pinion as they appear at the opening will indicate tens of thousands. The capacity of the machine is, however, increased tenfold by the additional mechanism illustrated in Figs. 1 and 2.

On the shaft *e* of the pinion E is cut a worm V, which engages with a pinion F, the arbor

N of which is mounted in and projects through the wheel B and carries a hand *n*, registering on a dial *o*, stamped upon the face of wheel B. The wheel B is in Fig. 2 partly broken away to show the arrangement and connection of parts. Ten rotations of pinion E are required to produce one of pinion F, the result being that the hand *n* registers up to one million rotations of the shaft M.

The rotations up to one hundred are indicated on wheel B by a fixed index *b* on the stationary casing, after which the hand P, rigid with the wheel A, continues registering up to ten thousand, when all the indexes will be at zero.

If at any time it be desirable to return all the indexes to zero before the machine has registered its full capacity, the upper part of the casing may be removed and the shaft M lifted, so that the worm D will be out of engagement with the wheels A B, which may then be reset.

The machine thus constructed is applicable to all the purposes for which speed and distance registers are or may be used, and thus, while I prefer the decimal system in numbering the dials, I do not limit myself to that or any particular system of marking. When used as an odometer for vehicles, and particularly for bicycles, it would be so constructed as to count and indicate miles instead of rotations. In such cases it may be fixed so as to receive its motion directly from the rotating axle of the wheel gearing into the wheels A B, or may be suspended by a suitable clamp from a spoke, as indicated at *o*, Fig. 2, where it would hang freely and practically stationary while its shaft M rotated.

There are, of course, numerous practical applications of the instrument which might be specified; but it is thought that sufficient has been said to demonstrate its utility under many different circumstances.

Having described my invention, I claim—

1. In a registering-machine, the combination, with a fixed and a loose differential gear-wheel mounted upon a common shaft, of a spiral thread upon the face of one of said wheels and a pinion mounted upon the other of said wheels engaging said thread and moving in a plane at right angles to that of the wheel upon which it is mounted, substantially as set forth.

2. In a registering-machine, the combination, with the shaft M, having gearing, substantially as described, of the fixed and loose differential gear-wheels A B, both engaging with said gearing, a spiral thread S upon the wheel A, a pinion E, mounted in bearings upon the wheel B and gearing into said thread, indicating marks or characters upon the face of the teeth of said pinion E, and an aperture in said wheel B for successively displaying said characters as the pinion revolves, substantially as described.

3. The combination, with the shaft M, having gearing, substantially as described, of differential gear-wheels operated by said gearing, a worm-shaft, as V, mounted upon the face of one of said wheels and carrying a pinion engaging with and operated by the other wheel, an independent pinion F, engaging with said worm-shaft V, and indicating-dials for registering the movement of all of said wheels, substantially as set forth.

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