(No Model.) 2 Sheets—Sheet 1.

M. H. COFFIN.

COUNTING REGISTER.

No. 423,374. Patented Mar. 11, 1890.

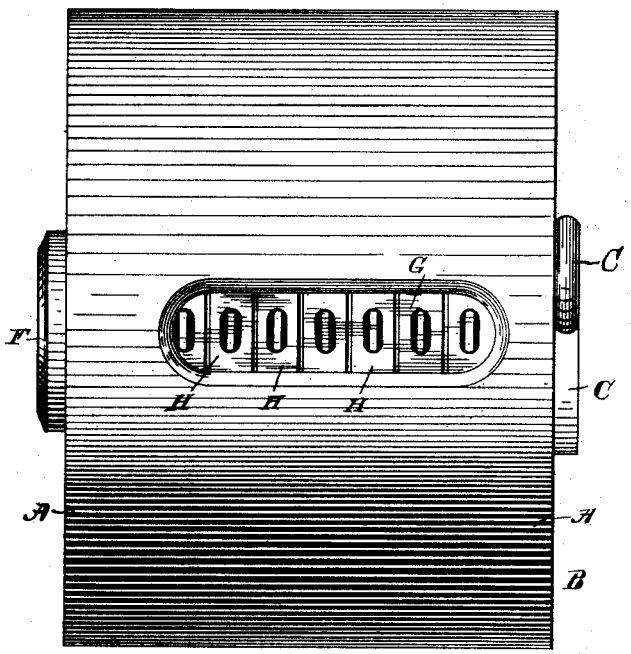

Fig. 1.

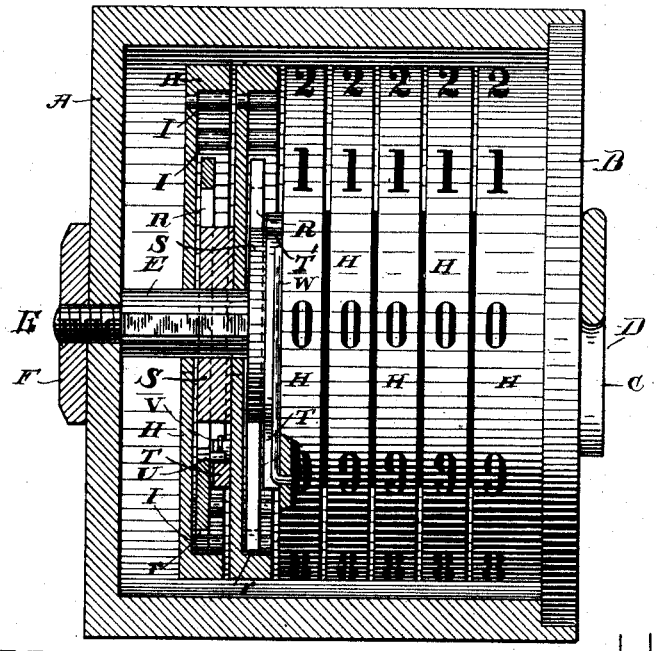

Fig. 2.

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R C. Murch

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atty

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(No Model.) 2 Sheets—Sheet 2.

M. H. COFFIN.

COUNTING REGISTER.

No. 423,374 Patented Mar. 11, 1890.

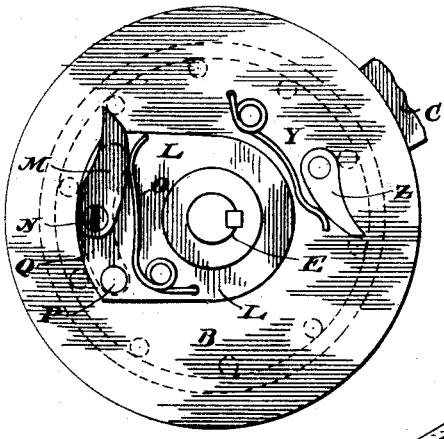

Fig. 4.

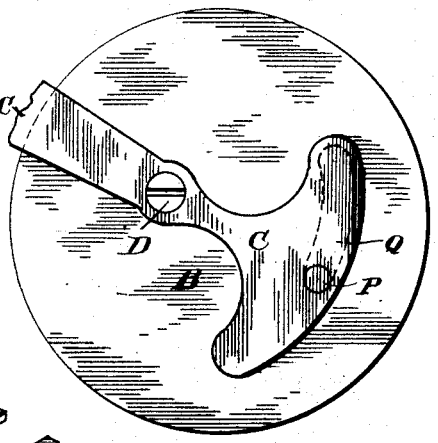

Fig. 3.

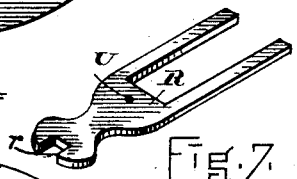

Fig. 7.

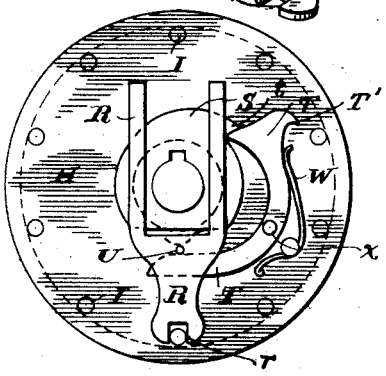

Fig. 5.

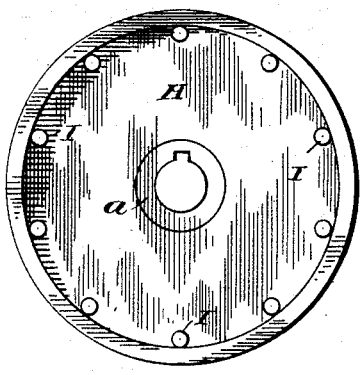

Fig. 6.

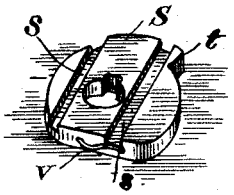

Fig. 8.

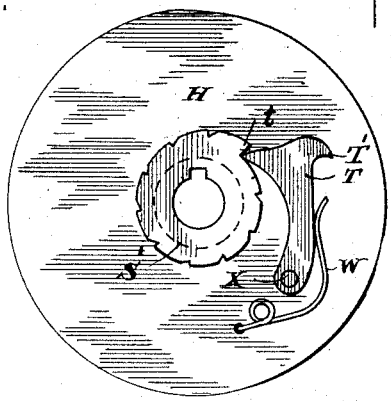

Fig. 10.

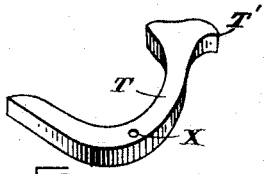

Fig. 9.

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UNITED STATES PATENT OFFICE.

MELVIN H. COFFIN, OF CHELSEA, ASSIGNOR OF ONE-HALF TO CHARLES W. COFFIN, OF LAWRENCE, MASSACHUSETTS.

COUNTING-REGISTER.

SPECIFICATION forming part of Letters Patent No. 423,374, dated March 11, 1890.

Application filed December 21, 1888. Serial No. 294,319. (No model.)

To all whom it may concern:

Be it known that I, MELVIN H. COFFIN, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Counting-Registers, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of this invention is to provide an improved mechanism for accurately counting rotations or reciprocations in machinery, and to construct the same in such compact and simple form as to be durable, convenient, and cheap.

My invention is embodied in a register consisting of an inclosing-case having in its periphery a glazed portion for inspection of the registered numbers, and at its axis a central shaft with an external vibrating arm, in combination with a series of rotatable disks mounted on said shaft, each peripherally numbered with the cipher and nine digits in succession, and each provided with means for moving the disk next beyond it to the extent of the tenth part of an entire revolution with every complete revolution of its own.

My invention consists in the combinations of devices herein described and shown, and especially referred to in the appended claims.

In the drawings, Figure 1 is a side elevation of the register complete, showing the peripherally-numbered disks set at zero ready to begin a count. Fig. 2 is an axial section of the case and of two of the disks, with their connected parts, the other disks being uncovered and in elevation. Fig. 3 is an external view of the end cap or plate on a smaller scale, the end of the actuating-lever being broken away and its other end broadened to cover the slot in the end plate. Fig. 4 shows the inner face of the end cap and the adjacent pawl-carrying plate with its pawl. Figs. 5 and 6 are front and back views of one of the numbered disks with parts adjacent thereto. Figs. 7, 8, and 9 are details of the pawl and locking device. Fig. 10 is a modification.

A represents the inclosing-case, cylindrical in form, B the end plate, and C the actuating-lever pivoted upon the end plate at D.

E is a central shaft or axis fixed to the end cap B and extending through to the opposite end of the case, where it is shown as secured by a nut F.

G is a glazed opening in the side of the case, through which the registered number is to be seen.

Upon the shaft E is a series of disks H, each having equidistant upon its broad periphery the successive numbers 0 1 2 3 4 5 6 7 8 9. Each disk is recessed upon its face which is toward the lever C, and is furnished near the outer margin of such recess with ten teeth, perforations, or pins I, to be engaged by the operating-pawl at the proper time. The actuation of the disk nearest to the operating-lever will be first described, and afterward the means of moving the others in their turn will be set forth.

Adjoining the inner face of the end plate B is a pawl-carrying plate L, which has a short oscillating movement upon the central shaft E. The pawl M is pivoted at N upon the free end of the plate L, and is pressed outwardly into engagement with the pins I of the first disk H by a spring O. The pawl-carrying plate has fixed in its outer face a stud P, which extends through an arc-shaped slot Q in the end plate B and enters a perforation in the end of the actuating-lever C, as in Figs. 3 and 4. Now when the lever C is vibrated the plate L is oscillated and a stroke imparted to the pawl M, by which the disk next to it (being the right-hand one, or the first of the series) is given one-tenth of a revolution, the toe of the pawl engaging with the pins of the next disk. (Shown in dotted lines.) Nine more vibrations of the lever complete one revolution of the first disk H, since its ten teeth or pins I are successively engaged by the toe of the pawl M, and the tenth stroke, which brings again into view the cipher on the periphery of disk one, moves the second disk one-tenth of a revolution and shows on its periphery the figure 1, making, with the cipher on the first disk, the registration 10. A stop-pawl Z, pivoted on the inner face of the end plate B, is pressed outwardly by a spring Y, to engage the pins I of the first disk and prevent its retrograde movement, as indicated in Fig. 4. This movement of the next disk to the left one-tenth of a revolu-

tion, when the preceding disk has made a complete revolution, is effected positively by means forming part of my invention, and illustrated in Figs. 5 to 10. Each of the disks H has, as stated, the ten teeth or pins I in the outer margin of its recess. Each has also on its back or opposite face and moving with it a pawl T, pivoted at X and pressed by a spring W into contact with a toothed cam S, which is held stationary on the shaft E between each disk and those adjacent to it. Such pawl, spring, and cam on the back of each disk enter and work in the recess of the adjoining disk. When the shaft E is splined to receive a projecting key, as shown, washers *a*, of corresponding form internally, may furnish a cylindrical surface as a bearing for the pawl-plate and disks.

A feature peculiar to my invention is the stationary toothed cam, by means of which the pawl carried on each disk is caused to engage with one of the pins of the adjacent disk, and to move such disk one-tenth of a revolution and then release it. A simple form of this apparatus is shown in Fig. 10. The cam S is held fast upon the shaft E; but the disk H travels around such shaft when intermittingly moved by the engagement of its pins I with the pawl of the preceding disk. The pawl T of the disk so driven is held by its spring W close against the cam S, and its hooked extremity T′ is thus kept from catching the pins I of the next disk until said pawl is thrown outwardly by the protruding tooth *t* of the cam S. This tooth is so prominent as to carry the pawl so far away from the shaft E that its hooked end T′ at that point engages a pin I of the next disk H and moves such disk with it one-tenth of a revolution, after which the spring W presses the pawl inwardly and releases its hook from the pin I.

For all ordinary cases this construction will suffice. In order, however, to furnish an absolute lock, so that no one disk can be moved either forward or back, accidentally or fraudulently, I have devised the apparatus shown assembled in Fig. 5 and in detached views in Figs. 7, 8, and 9.

The cam S is held fast as before, and is grooved, as at *s*, Fig. 8. In these grooves the prongs of a bolt R, Fig. 7, fit and have a sliding movement, while the point of the bolt has a notch *r*, which engages one of the pins I of the succeeding disk, so that such disk cannot be moved until the bolt is retracted. The bolt has a projecting stud U, which bears against a spring V, Fig. 8, in the edge of the cam S, and this keeps the bolt pressed forward.

The pawl T T′, Figs. 8 and 9, when intermittingly carried around the cam by the disk on which it is pivoted, bears against the edge of said cam without affecting the succeeding disk until the pawl reaches the protruding tooth *t*, which carries its hooked end outwardly to engage one of the pins I, while at the same time the curved tip or forward end of the pawl presses back the bolt R, releasing from its notch *r* the pin held thereby and leaving the disk free to be advanced one-tenth of a revolution, after which the bolt again springs forward and holds the next pin I while the former disk makes another revolution.

I claim as my invention—

1. The case A, the slotted end cap B, and the series of peripherally-numbered disks H in said case, in combination with the vibrating lever C, pawl-plate L, with its stud P, engaged by said lever through the end-cap slot and with the spring-actuated pawl M thereon, substantially as and for the purpose set forth.

2. The inclosing-case A, actuating-lever C, stationary shaft E, stop-pawl Z, and swinging pawl-plate L, with its spring-pressed pawl M, in combination with a series of peripherally-numbered disks H, each recessed on one face and having ten marginal teeth or pins I in such recess, with a spring-actuated pawl on its opposite face, and with a toothed cam fixed on the shaft E, substantially as and for the purpose set forth.

3. The recessed and peripherally-numbered disks H, the vibrating lever C, and the pawl-carrying plate L, with its pivoted pawl adapted to intermittingly rotate the first disk of the series, in combination with a stationary toothed cam and a sliding spring-lock for each disk, and with a spring-pressed pawl carried on each disk, substantially as and for the purpose set forth.

4. The described locking device for counting-registers, consisting of the grooved cam S *s*, held stationary upon the shaft and formed with a single prominent tooth *t*, in combination with the spring-bolt R, working in the grooves S and adapted to engage and release one of the disk-pins I and disks H, and with the pivoted pawl T, having hooked extremity T′, and the spring W, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 15th day of December, A. D. 1888.

MELVIN H. COFFIN.

Witnesses:
A. H. SPENCER,
C. W. COFFIN.