No. 776,039. PATENTED NOV. 29, 1904.

C. H. VEEDER.

COUNTER.

APPLICATION FILED APR. 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

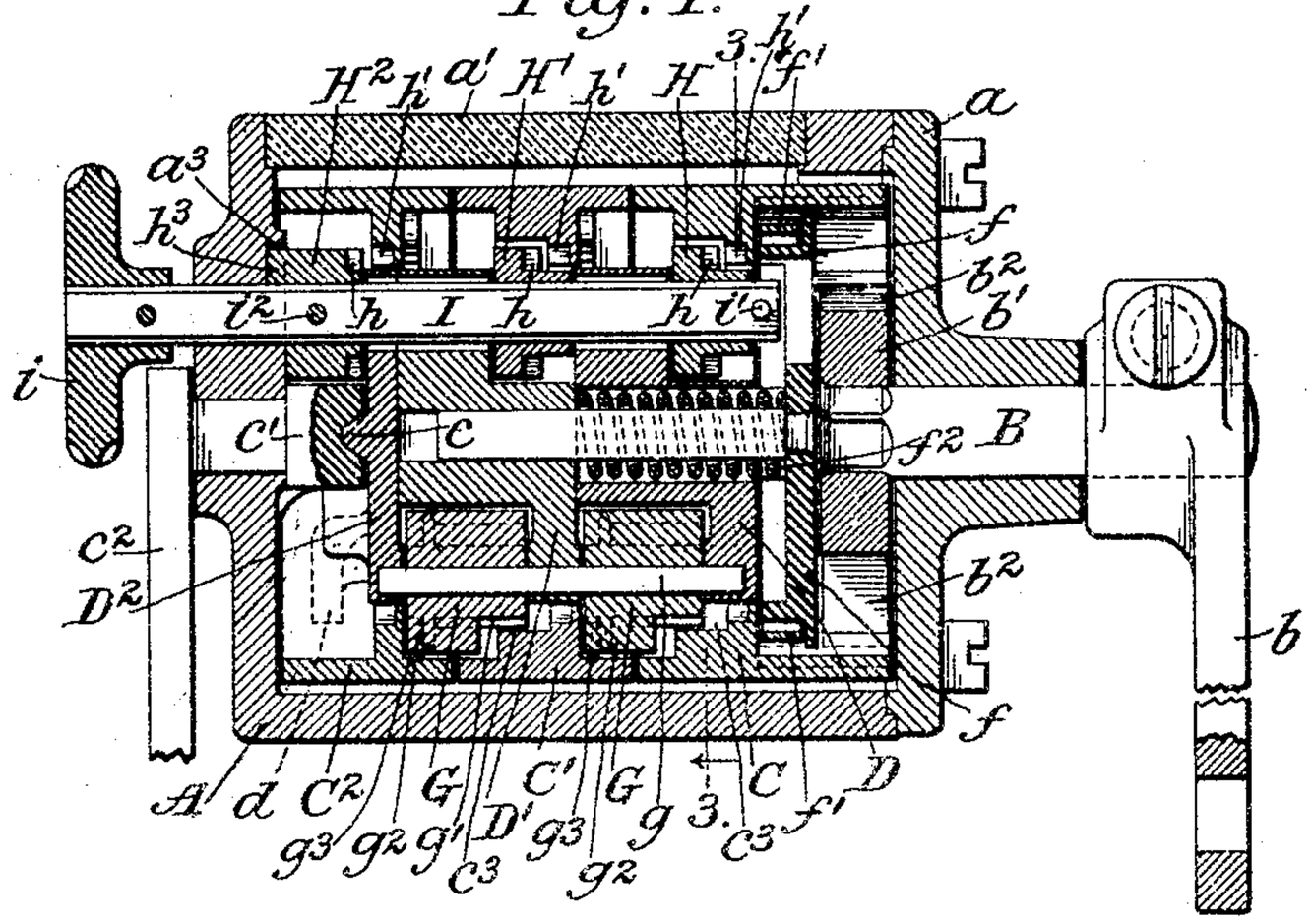
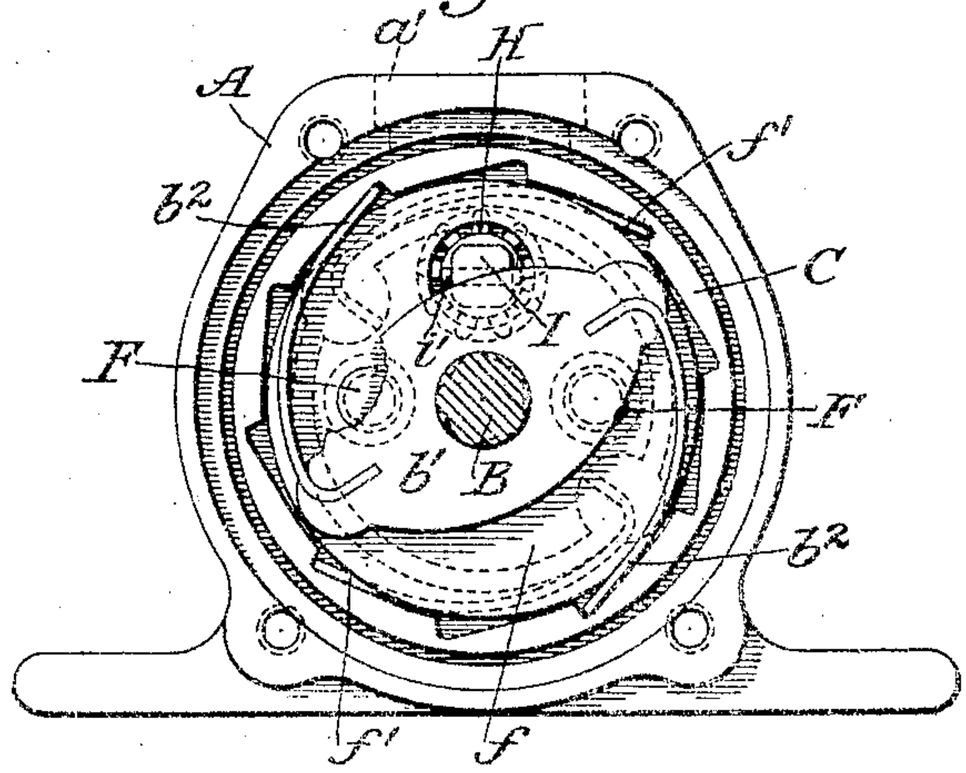


Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

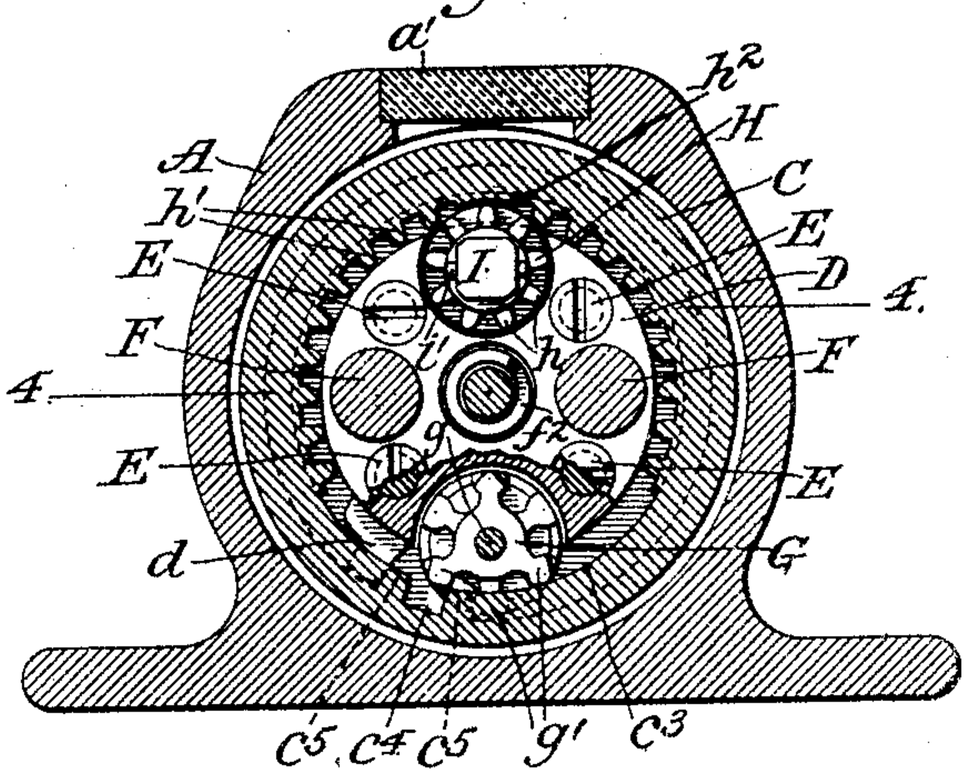


Fig. 4.

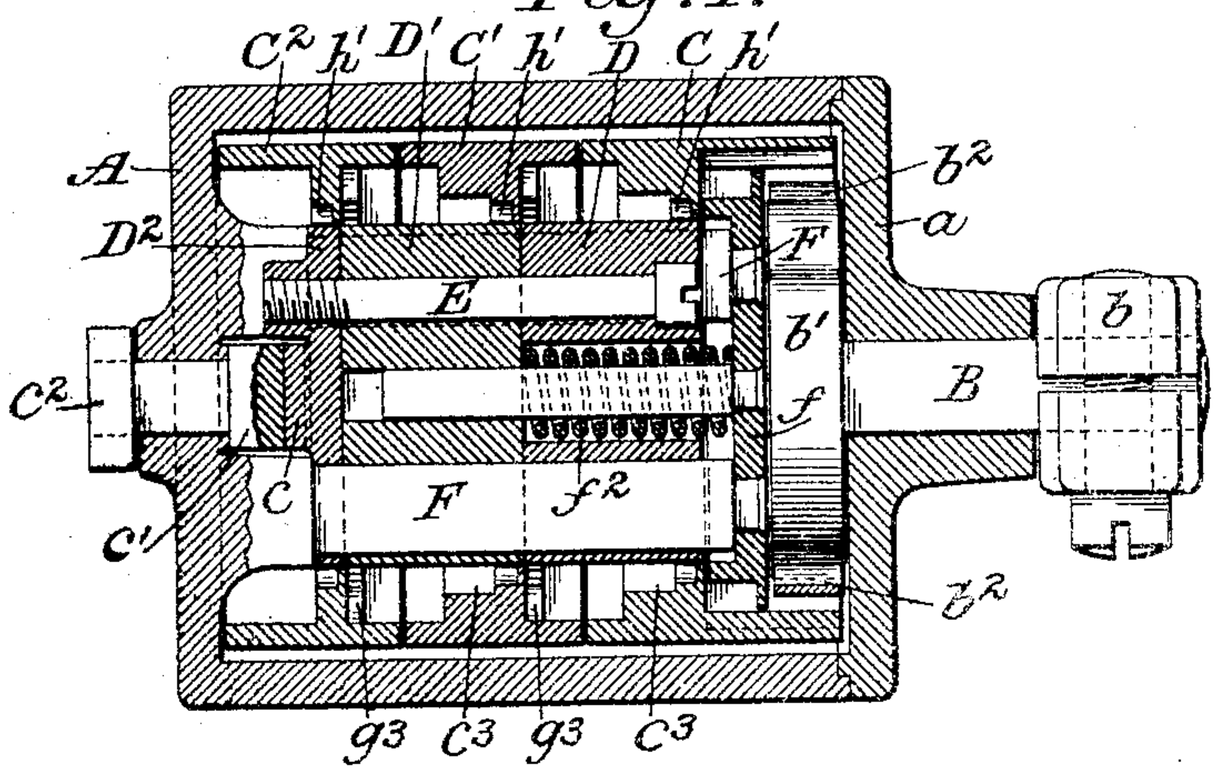


Fig. 5.

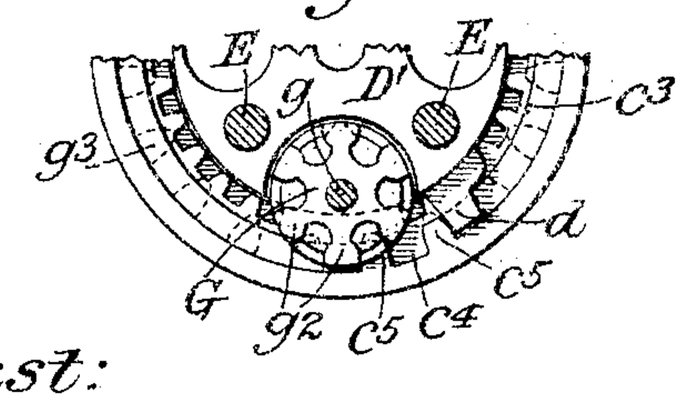
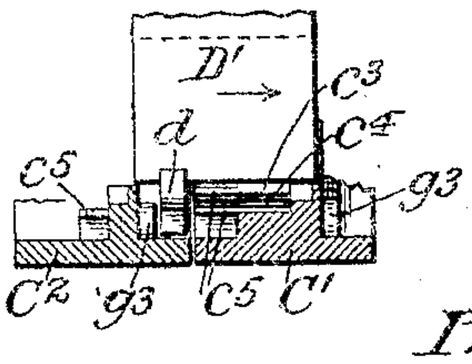


Fig. 6.



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No. 776,039. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

CURTIS HUSSEY VEEDER, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE VEEDER MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

COUNTER.

SPECIFICATION forming part of Letters Patent No. 776,039, dated November 29, 1904.

Application filed April 2, 1903. Serial No. 150,713. (No model.)

To all whom it may concern:

Be it known that I, CURTIS HUSSEY VEEDER, a citizen of the United States, residing in the city of Hartford, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Counters, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to counters or registers—such as cyclometers, revolution-counters, and other devices of like general character—in which is employed a series of number-wheels each one of which as it completes a revolution advances the next wheel in succession one space.

The invention is more particularly concerned with counters or registers of this class which require to be set back to zero from time to time, and has for its object to provide improved means for effecting such setting back of the number-wheels, such improved means providing for ready release of the number-wheels, so that it is possible to set them to zero, for the setting of the number-wheels to zero without requiring any wheel of the series to have more than one rotation, and for a positive stopping of each number-wheel at zero.

Other features of improvement and advantages will also appear hereinafter as the nature of the invention is more fully explained.

In the accompanying drawings, in which, for purposes of explanation of the invention, is illustrated a convenient and practical embodiment thereof, Figure 1 is a longitudinal central section of the improved counter. Fig. 2 is an end view of the same with the cap removed, the actuating-shaft being shown in section. Fig. 3 is a transverse section on the irregular plane indicated by the line 3 3 of Fig. 1, the lower portion of the approximate supporting-block and number-wheel being represented as broken away. Fig. 4 is a horizontal section on the irregular plane indicated by the line 4 4 of Fig. 3. Fig. 5 is a detail side view showing the lower portion of one of the supporting-blocks and a number-wheel with the transmitting-pinion locking in the direction of the arrow shown on Fig. 6. Fig. 6 is a detail view showing in side elevation the lower portion of one of the supporting-blocks and in longitudinal section the lower portion of each of two adjacent number-wheels.

In the construction which is chosen for illustration in the drawings as an embodiment of the invention a case A, having a removable cap *a* and a sight-opening, as at *a'*, supports and incloses the counting mechanism. The actuating-shaft B, which in this case is represented as an oscillating shaft adapted to be actuated from some reciprocating part through an arm *b*, has a bearing in the cap *a* and at its inner end is provided with a suitable head *b'* to carry the drive-pawls b^2, which engage the internal ratchet-teeth of the first number-wheel C. The several number-wheels, three of which are shown at C, C', and C^2, are supported for rotation upon a cylindrical hub which is movable longitudinally, as hereinafter described, and for convenience is made up in the construction shown of three blocks or sections D, D', and D^2, respectively. These blocks or sections are secured firmly together when assembled by suitable bolts E, as clearly shown in Figs. 3 and 4, and are mounted to have limited movement in a longitudinal direction upon pins F, which are formed with or rigidly secured to the inner head of the casing A and support at their free ends a guard-plate or keeper *f*, being preferably riveted thereto, as clearly shown in Fig. 4. The guard-plate or keeper *f* is preferably provided with hold-pawls *f'* (shown in Figs. 1 and 2) to engage the internal ratchet-teeth of the first number-wheel C, before mentioned. One section of the cylindrical block is recessed to form a seat for a spring f^2, which is confined between the guard-plate or keeper *f* and the opposite end of said recess and acts normally to thrust the bearing-block toward the left in Figs. 1 and 4 or away from the guard-plate or keeper *f*. The bearing-block is moved in the opposite direction when the wheels are to be set at zero, as hereinafter

described, by any suitable device adapted to be executed from the exterior of the case. As shown in Figs. 1 and 4, the rear face of the section D^2 is formed with a cam-like projection c, with which coöperates a rotatable head c', having a cam slot or groove and mounted in a bearing in the end of the casing a to be oscillated when required by a suitable arm or lever c^2, the action of the rotary head c' forcing forward the bearing-block against the tension of the spring f^2.

So far as concerns the transmitting mechanism between successive number-wheels, all of the number-wheels are constructed alike, and motion is transmitted from one number-wheel to the other by a transmitting-pinion which operates substantially in the usual manner. The transmitting-pinions (shown at G in Figs. 1, 3, and 5) are supported within recesses in the bearing-block upon a pin g, each pinion being provided with a series of teeth g' for coöperation with the locking-ring hereinafter referred to and with a series of teeth g^2 for coöperation with the gear-teeth of the next number-wheel in succession. These transmitting-pinions, as will be observed, are arranged to move longitudinally with the bearing-block, and consequently to move longitudinally with respect to the locking-ring of one number-wheel and the gear-teeth of the next number-wheel, the purpose of such movement being to release each number-wheel from the next, so that it can be revolved freely to its zero position by the devices hereinafter referred to. Each number-wheel is formed with an internal locking-ring c^3, which coöperates with the teeth g' of the transmitting-pinion to hold the same from rotation, except as the number-wheel passes through its zero position, the locking-ring being provided at one point with a notch c^4, which is adapted to receive the next advancing tooth of the transmitting-pinion and to permit of a partial rotation of such pinion as the locking-ring passes through its zero position in the number-wheel. Each number-wheel is also provided with two teeth c^6 (shown in dotted lines in Fig. 3 and in full lines in Fig. 5) to coöperate with the teeth g^2 of the transmitting-pinion, these teeth c^5 being on opposite sides of the notch c^4, above referred to, but in a different plane, so that as the number-wheel passes through its zero position it will effect a partial rotation of the transmitting-pinion. Such partial rotation of the transmitting-pinion will effect a partial rotation of the next number-wheel through the engagement of the teeth g^2 or longitudinal extensions thereof with the driving-teeth g^3 of the next number-wheel, these driving-teeth g^3 being quite narrow, as clearly shown in Figs. 1 and 6, in order that they may be cleared by the teeth of the transmitting-pinion when the latter are moved longitudinally with the bearing-block, leaving each number-wheel free to be turned independently of the next number-wheel.

To effect the rotation of the several number-wheels to zero when they have been released, as just described, resetting-pinions H, H', and H^2 are provided, being mounted in recesses in the bearing-block so as to move longitudinally therewith upon a resetting-shaft I, which is partially squared or otherwise formed so as to rotate said resetting-pinions. Each resetting-pinion is provided with teeth h to engage internal gear-teeth h' of the corresponding number-wheel, such teeth h' being omitted at one point, as at h^2, corresponding to the zero position of the number-wheel, so that as soon as each number-wheel has been moved to its zero position by the rotation of the corresponding resetting-pinion it shall then cease to be in operative engagement with said resetting-pinion, whereby the further rotation of the resetting-shaft I to move other numbering-wheels to their respective zero positions, if necessary, is permitted. It will be observed that the teeth h of the transmitting-pinion and the corresponding teeth h' of the number-wheel are quite narrow and are open at their approximate ends, so that longitudinal movement of the resetting-pinions into and out of engagement on the numbering-wheels is permitted. The resetting-shaft I is provided outside of the casing with a suitable thumb-wheel i, and at its extremity within the casing it may be provided with a guard-pin i', while the last resetting-pinion of the series may be secured to the shaft by a pin i^2. At its rear end the resetting-pinion H^2 may be provided with a projecting pin or stud h^3 to enter, when the shaft I is moved to the left with the bearing-block, one of several suitably-placed recesses a^3 in the end of the casing A, so that the shaft, and consequently the bearing-block and the parts carried by it, may not move toward the left under the influence of the spring f^2 except when the number-wheels which have just been rotated by the shaft I are in proper position to permit the engagement of the internal gear-teeth g^3 with the corresponding teeth of the transmitting-pinion G.

Upon the bearing-block, in position for coöperation with each number-wheel, is a fixed stop-tooth d, which when the bearing-block is moved to the right in Figs. 1 and 4 is moved into the path of the teeth c^5. The position of each stop d, (shown in full lines in Figs. 3, 5, and 6 and in dotted lines in Fig. 1, since it is on the side of the plane of section of said figure toward the observer,) is such as to prevent the further movement of the corresponding numbering-wheel as soon as it has been turned to zero by the resetting device. Thus, although each number-wheel is disengaged from its resetting-pinion as soon as it reaches its zero position, by reason of the blank at h^2, as shown in Fig. 3, any further movement of

the number-wheel by reason of its momentum is thus positively prevented.

The operation of the number-wheels in counting is substantially the same as any other counting device of like general character and need not be further explained herein. Whenever it is desired to reset the number of wheels to zero, the arm or lever c^2 is moved to turn the head c' and through the action of the cam-tongue c^2 to thrust the bearing-block and the parts carried by it toward the right against the tension of the spring f^2. This movement of the bearing-block moves the transmitting-pinions out of engagement with the driving teeth in successive number-wheels, while permitting such transmitting-pinions to remain in operative engagement with the respective locking-rings c^3. Each number-wheel now being free to be turned independently of the other number-wheels, the shaft I is rotated until each number-wheel has been moved to its zero position. It will be observed that in order to accomplish this result any number-wheel shall receive no more than a single rotation and as each number-wheel reaches its zero position it ceases to have operative engagement with its resetting-pinion and at the same time is stopped in exact position by the collision of one of its teeth c^5 with the corresponding stop d. It will furthermore be observed that the movement of each number-wheel in resetting is in a forward direction, so that the direct and positive engagement of the actuating devices with the first number-wheel does not require to be altered or modified.

Although a particular and specific construction has been described herein as an embodiment of the invention, it will be understood that it is not intended thereby to limit the invention to the precise construction and arrangement of parts shown and described herein.

I claim as my invention—

1. In a counter, the combination of a series of number-wheels, transmitting devices between successive wheels, resetting devices adapted for engagement with said wheels and means to produce relative longitudinal movement of said wheels and the said transmitting and resetting devices to effect disengagement of the transmitting devices and engagement of the resetting devices, substantially as shown and described.

2. In a counter, the combination of a series of number-wheels, transmitting devices between successive. wheels, resetting devices adapted for engagement with said wheels, means whereby each wheel is disengaged from the resetting devices as it reaches a predetermined position, and means to produce relative longitudinal movement of said wheels and the said transmitting and resetting devices to effect disengagement of the transmitting devices and engagement of the resetting devices, substantially as shown and described.

3. In a counter, the combination of a series of number-wheels, transmitting devices between successive wheels, resetting devices adapted for engagement with said wheels, means whereby each wheel is disengaged from the resetting devices as it reaches a predetermined position, a relatively fixed stop adapted to be made to stand in the path of a projection on the wheel, and means to produce relative longitudinal movement of said wheels and the said transmitting and resetting devices to effect disengagement of the transmitting devices and engagement of the resetting devices, substantially as shown and described.

4. In a counter, the combination of a pair of number-wheels, one having a locking-ring and the other having a relatively narrow gear, a transmitting-pinion having relatively wide teeth engaging the locking-ring and having teeth engaging said driving-gear, and means to produce relative longitudinal movement of said number-wheels and said transmitting-pinion, whereby the disengagement of the transmitting-pinion from the driving-gear is effected while the pinion is held from rotation by engagement with the locking-ring, substantially as shown and described.

5. The combination of a series of number-wheels, each having a resetting-gear with a blank, a corresponding series of resetting-pinions adapted to engage said wheels respectively, a common resetting-shaft carrying said resetting-pinions, a corresponding series of stops, and means to cause the stops to stand in the respective paths of projections on said wheels, whereby as each wheel is brought to a predetermined position it is released from said resetting-pinion and movement of the wheel through such predetermined position is prevented, substantially as shown and described.

6. The combination of a series of number-wheels held from longitudinal movement, one wheel of each pair in succession being provided with driving means and a locking-ring and the other wheel of such pair being provided with a driving-gear, corresponding transmitting-pinions each engaging with the driving means and the locking-ring of one wheel and with the driving-gear of the next wheel, and means to shift said transmitting-pinion longitudinally to disengage it from one of said engaged parts while the engagement of said pinion with the other of said engaged parts is maintained, substantially as shown and described.

7. The combination of a series of number-wheels held from longitudinal movement, one wheel of each pair in succession being provided with driving means and a locking-ring and the other wheel of such pair being provided with a driving-gear, corresponding

transmitting-pinions each engaging with the driving means and the locking-ring of one wheel and with the driving-gear of the next wheel, and means to shift said transmitting-pinion longitudinally to disengage it from said driving-gears while the engagement of said pinion with the locking-ring is maintained, substantially as shown and described.

8. The combination of a series of number-wheels held from longitudinal movement, one wheel of each pair in succession being provided with driving means and a locking-ring and the other wheel of such pair being provided with a driving-gear, corresponding transmitting-pinions each engaging with the driving means and the locking-ring of one wheel and with the driving-gear of the next wheel, said locking-ring being relatively wide and said driving-gear being relatively narrow, and means to shift said transmitting-pinion longitudinally to disengage it from said driving-gears while it is held from rotation by said locking-ring, substantially as shown and described.

9. The combination of a series of number-wheels, a longitudinally-movable block within said wheels, a transmitting-pinion for each successive pair of wheels, said pinion being mounted in a recess in said block, and means to move said block to disengage said pinion from one of said wheels, substantially as shown and described.

10. The combination of a series of number-wheels, a cylindrical, longitudinally-movable block supporting said wheels, a transmitting-pinion for each successive pair of wheels mounted in a recess in said block, and means to move said block to disengage said pinion from one of said wheels, substantially as shown and described.

11. The combination of a casing, a series of number-wheels, pins projecting interiorly from one end of said casing, a cylindrical, longitudinally-movable block mounted on said pins and supporting said wheels, a transmitting-pinion for each successive pair of wheels, said pinion being mounted in a recess in said block, and means to move said block to disengage said pinion from one of said wheels, substantially as shown and described.

12. The combination of a series of number-wheels, having each a relatively wide locking-ring and a relatively narrow driving-gear, a longitudinally-movable cylindrical block supporting said wheels, a transmitting-pinion for each successive pair of wheels adapted for engagement with said relatively wide locking-ring and said relatively narrow driving-gear, and means to move said block, substantially as shown and described.

13. The combination of a series of number-wheels, a longitudinally-movable block within said wheels, transmitting and resetting pinions mounted in recesses in said block and adapted to engage said wheels, and means to move said block to disengage said pinion from one of said wheels, substantially as shown and described.

14. The combination of a series of number-wheels, a longitudinally-movable block within said wheels, a series of stops carried by said block and adapted to engage said number-wheels to prevent movement thereof, and means to move said block to cause said stops to stand in operative relation with said wheels, substantially as shown and described.

15. The combination of a casing, a series of number-wheels, guide rods or pins supported within said casing, transmitting-pinions in operative relation with said wheels, a longitudinally-movable block supporting said transmitting-pinions, a spring normally pressing said block in one direction, and means to move said block in opposition to said spring to disengage the transmitting-pinion, substantially as shown and described.

This specification signed and witnessed this 30th day of March, A. D. 1903.

CURTIS HUSSEY VEEDER.

In presence of—

W. B. GREELEY,

M. A. BRAYLEY.