No. 863,997. PATENTED AUG. 20, 1907.

F. G. JAHN.

COUNTING OR REGISTERING MECHANISM.

APPLICATION FILED FEB. 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

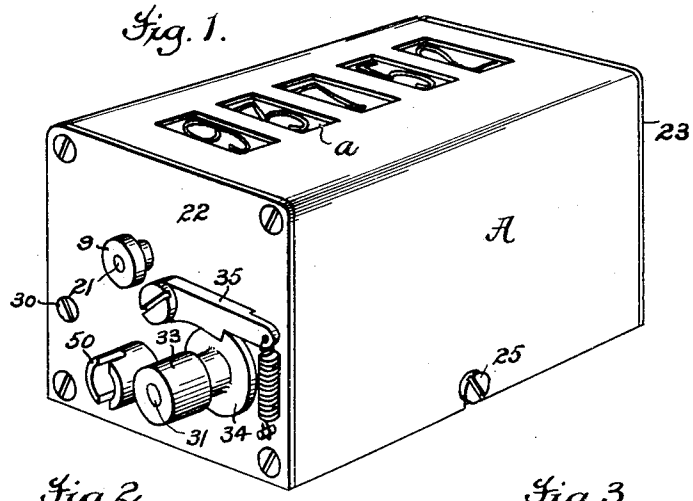


Fig. 2.

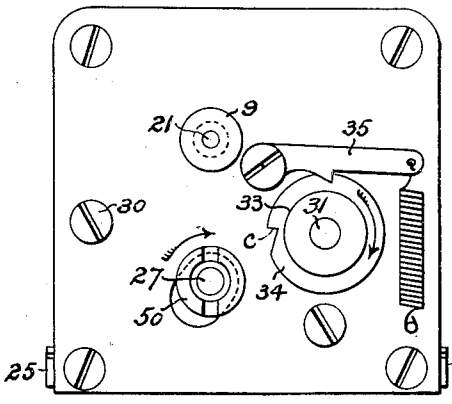


Fig. 3.

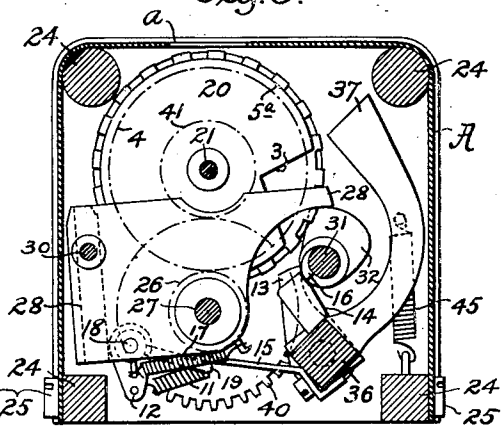


Fig. 4.

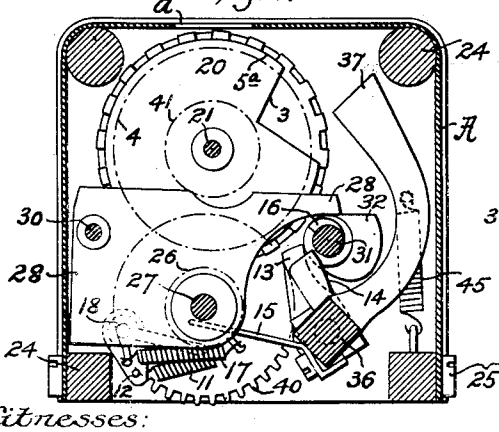
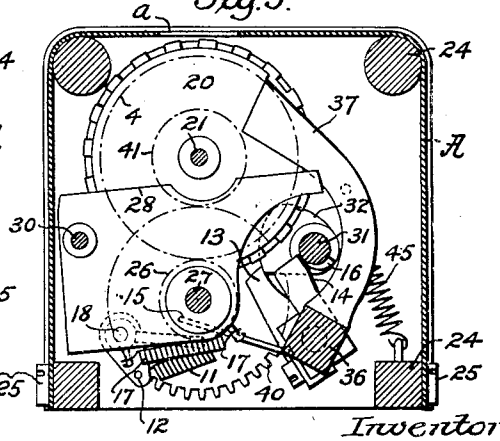


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

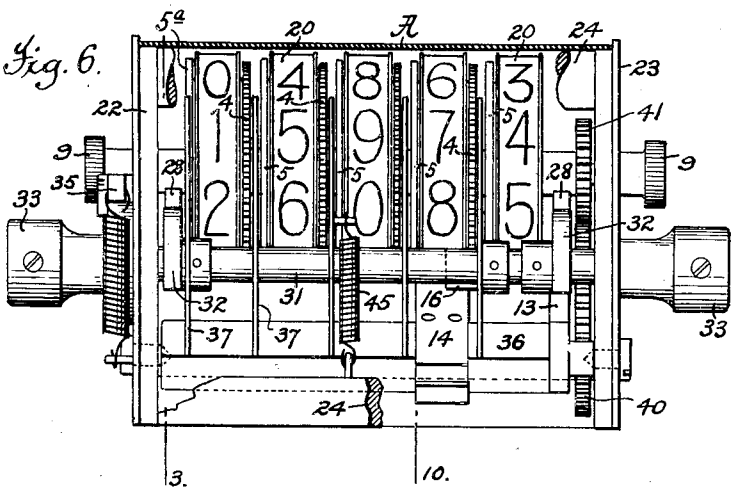


Fig. 8.

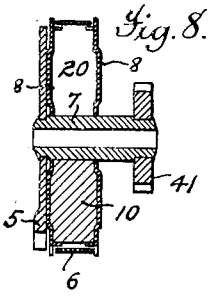


Fig. 7.

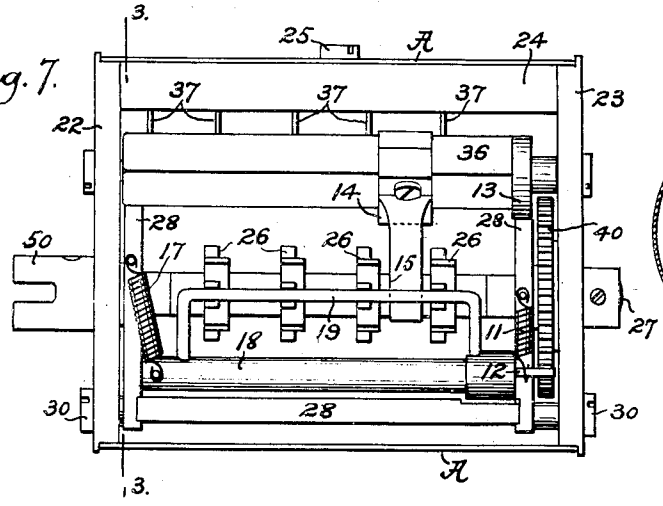


Fig. 9.

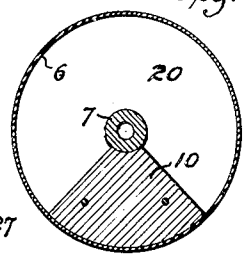


Fig. 10.

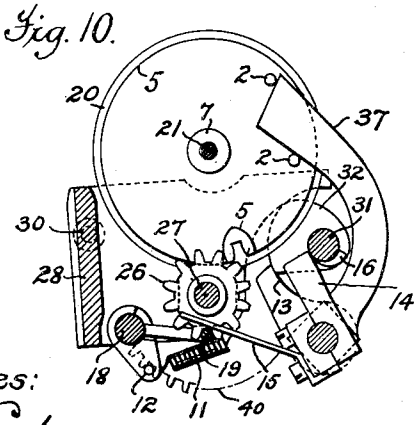
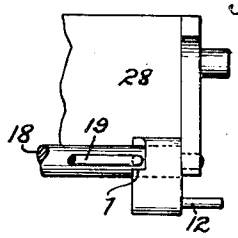


Fig. 11.



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UNITED STATES PATENT OFFICE.

FREDERICK G. JAHN, OF NEW YORK, N. Y., ASSIGNOR TO THE INTERNATIONAL POSTAL SUPPLY COMPANY OF NEW YORK, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

COUNTING OR REGISTERING MECHANISM.

No. 863,997. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed February 28, 1906. Serial No. 303,336.

To all whom it may concern:

Be it known that I, FREDERICK G. JAHN, a citizen of the United States, residing at the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Counting or Registering Mechanisms, of which the following is a specification.

The present invention relates generally to counting or registering devices adapted to tally or register repeated operations of an actuator or other instrumentality and more particularly to that class of such registering devices wherein it is desired at more or less frequent intervals to reset the counters to zero position so that one tally may be made and kept independent of a preceding one.

The object of the present improvements is to provide an efficient and entirely practicable counter wherein the indices or number-bearing wheels may be returned correctly and quickly to zero whenever desired ready for subsequent operation, and wherein the resetting movements of the counter are controlled by a single operating handle; and to these ends the improvements consist in the novel combinations and arrangements of parts hereinafter set forth.

In the accompanying drawings: Figure 1, is a perspective view of the exterior of the counter. Fig. 2, is an end elevation. Figs. 3, 4 and 5, are similar cross sections on the line 3, 3, of Figs. 6 and 7, showing the parts in changed positions in the operation of resetting the counter to zero. Fig. 6, is a side elevation, the inclosing case and the tie-bars being broken away to expose underlying parts. Fig. 7, is a bottom view. Fig. 8, is a vertical section of the units-wheel and Fig. 9, is a like view taken at right angles thereto. Fig. 10, is a sectional diagram taken on the line 10 of Fig. 6, with the parts in the position shown in Fig. 5. Fig. 11 is a detail elevation of a portion of the gearing locking device.

The invention is preferably embodied in that class of counters in which the indices are represented by a plurality of wheels 20 that are arranged in axial line with their peripheries carrying or bearing the indicating numerals 0, 1 to 9, inclusive, to be exposed and read through an opening *a* in an inclosing case A, as shown in Fig. 1. In the present instance, these wheels 20, are five in number, representing units, tens, and so forth, up to and including tens of thousands. This number of wheels may obviously be increased or diminished as the requirements for use may warrant. These counter-wheels 20, are mounted, rotatively loose, on a spindle 21 that is supported by a pair of end plates 22 and 23, of a suitable frame work which consists of said end plates and properly arranged tie bars 24, with the inclosing case A of U shape, fitting between ribs on three sides of each of the end plates, and fastened in place to the lower tie bars by screws 25.

With the counter-wheels are associated a proper number of carrying-pinions 26, mounted, rotatively loose, on a spindle 27, whereby each complete rotation of one counter-wheel is communicated to a limited extent to the next higher wheel. The spindle 27 may act as the means for transmitting the movements of the instrumentality to be counted to the counter-wheels, and for this purpose carries a toothed wheel 40 in mesh with a similar wheel 41 fast to the units counter-wheel.

In order to adapt the counter for resetting the intermeshing gearing of the counter is arranged for disengagement to temporarily render the counter-wheels wholly free of restraint and of the actuating instrumentality so that any one or more will move or may be instantly moved to the zero position, that is, to expose "0" through the opening in the case. In the preferred embodiment of the invention the carrying-pinion spindle 27 is journaled in a frame 28 capable of limited movement with respect to the counter-wheels to effect the disengagement of the pinions from the wheels, and for this purpose the frame is pivoted to the end plates by pivot-screws 30 which engage trunnions on the frame.

To effect a disengagement of the carrying-pinions and wheels, the movable frame 28 is controlled by a resetting device consisting of a spindle 31, carrying a suitable cam or cams 32, which engage the free ends of the frame and in this instance normally hold the frame with its carrying-pinions in engaging position, the movement of the spindle and cams releasing the frame and allowing it to drop by gravity a sufficient distance to carry the gearing out of engagement with the counter-wheels. The resetting spindle 31 is mounted to rotate in bearings in the end plates, one or both projecting ends of the spindle having grasping pieces 33 for convenient rotation, one such piece being formed with a notched flange 34, that is engaged by a spring pressed pawl 35 to act as a means for defining the extent of rotation and initial position of the resetting spindle, as well as to prevent backward rotation thereof.

In order to prevent any rotative movement of the carrying-pinions, no matter how slight, while they are being moved from and into engagement with the counter-wheels, there is provided a pinion lock, preferably timed to engage with and hold the pinions immediately previous to their disengaging movement and only release them when reëngaged with the counter wheels. This lock conveniently takes the form of a single bail 19, sufficiently long to engage those teeth of all of the pinions that are in propinquity

thereto. The bail projects from a rockable spindle 18 mounted in the carrying-pinion frame 28 and is under the influence of a spring 17 tending to move the bail into locking position. The timely movement of this lock-forming bail 19, is controlled by suitable connections with the resetting spindle 31, which for this purpose carries a properly shaped cam 16, that engages one arm of a lever 14, the other arm 15 meeting a portion of the bail; the position of the parts when in operative condition being such that the cam normally holds the bail in its inactive position against the pull of the spring 17. The actuating spindle 27, or its toothed wheel 40, which is also disengaged from its companion wheel 41, during the resetting operation, is preferably held against movement or positioned with respect to its wheel 41 by an independent lock in the form of a pawl 12 that is hung on the rock spindle 18 to yieldingly engage the teeth of the wheel 40 under the pull of a spring 11. The hub of the pawl is formed with a shoulder 1, see Fig. 11, held against one of the arms of the locking bail 19 by said spring 11, compelling its release of the toothed wheel simultaneously with the release of the carrying-pinions. The yielding of the pawl 12 permits the spindle 27 and gear 40 to be turned forward tooth by tooth without interfering with the positioning action of the pawl.

Other means are provided for temporarily engaging, holding or positioning each of the counter-wheels immediately before and while the carrying-pinions and actuating gear are returning to their normal engaging position so that the intermeshing teeth of the gearing will be properly located and held stationary while the pinions are being reëngaged, thereby greatly facilitating the resetting operation in obviating the liability of the intermeshing teeth striking end on. These engaging means are provided by a plurality of fingers 37, one for each counter-wheel, all carried by a rock spindle 36, pivoted to the end plates and which spindle also serves as a convenient support for the two armed lever 14 of the carrying-pinion lock. The outer ends of the fingers 37, suitably engage predetermined parts of the counter-wheels which may be defined by properly positioned pins or projections 2, Fig. 10, or by a properly shaped recess 3, Figs. 3, 4 and 5, both methods being utilized for convenience sake in the construction shown. The fingers are held in the normal inactive position by a spring 45 and the rock spindle 36 has an arm 13, situated in the path of a suitable cam for moving the fingers into engaging position against the pull of said spring, such cam in the present instance being provided by the cam 32, controlling the carrying-pinion frame 28.

To cause the automatic return of the counter-wheels to the zero position as soon as they are freed from restraint by the separation of the intermeshing or operating gearing, each wheel is loaded with a weight 10, Figs. 8 and 9, positioned in or on the wheel so that gravity will act to rotate the wheel until its weight reaches the lowermost position with the zero mark on its periphery exposed through the opening in the inclosing case. The counter-wheels may in lieu of the weighted portion be returned to zero position, or be aided in returning to zero by a hand-rotation of their supporting spindle 21, through a thumb-wheel 9, secured to one or both of its projecting ends; the friction between the hubs of the wheels and the spindle being sufficient to cause them to move to zero position by simple rotations or oscillations of the supporting spindle. Resort also may be had to a turning of the spindle 21 should either of the counter-wheels for any reason refuse to turn or remain out of zero position as by the perfect balancing of the weighted portion of the wheel when directly over its axis.

The counter-wheels are preferably of skeleton form for convenience of manufacture and to reduce their weight to the minimum so that the needed weight added to automatically return them to zero position may be correspondingly lessened in the necessarily restricted space occupied by the weight. All the counter-wheels, as constructed, are in the main the same, only minor differences being needed in the units and highest wheels.

Each wheel as in Fig. 8, is formed of a pair of thin side disks 8, securely mounted on a central hub 7, inwardly projected ledges or shoulders being stamped out of the body of the disks at their peripheries to form a depressed seat for a peripheral strip or ring 6, bearing on its exterior face the indicating numerals 0, 1 to 9 inclusive. The hub of the units wheel has fast to it the toothed wheel 41 which receives motion from the actuating instrumentality through its intermeshing driving wheel 40. Each of the wheels, with the exception of the highest, carries a single tooth-notched disk 5 for periodical intermeshing with the mutilated gear portion of the carrying-pinion, the unnotched portion of the disk being in surface engagement with the non-toothed portion of the pinion to hold it against rotation except when its notched portion is passing and is rotating the carrying-pinion. The opposite side of each of the counter-wheels, with the exception of the units wheel, is provided with a toothed-wheel 4, intermeshing with the non-mutilated toothed portion of the carrying-pinion. No further detailed description of the carrying operation from one wheel to the next highest is needed, as such is well known to those familiar with the construction of totalizing counters or registers. The disk 5^a on the highest counter-wheel, taking the place of the single tooth-notched disk provided on the other counter-wheels, is utilized for the recess 3 before referred to; and the pins 2 provided for a similar purpose on the other counter-wheels extend laterally from the disks 5 into the space between contiguous wheels.

Assuming that the counter has been operated and is indicating the number 93752, through the opening in the inclosing case and it is desired to return or reset the counter at zero or initial starting position, the thumb piece 33, on the end of the resetting spindle 31 is simply moved through a single complete rotation, in doing which the pawl 35 has been forcibly raised from its notch in the flange 34, the flange moved a complete turn under the pawl until the notch is brought around for the reëntry of the pawl. In this single rotation of the re-setting spindle 31, the following sequence of movements have taken place: The cam 16 moves from the two armed lever 14, allowing the spring 17 to move the locking bail 19 into engagement with the carrying-pinions and the holding pawl 12 into contact with a toothed-wheel 40. Immediately following this fixing or positioning of the movable parts of the counter, the

cam or cams 32 (two being preferred), move away from the free ends of the frame 28, allowing said frame with the driving spindle 27, its toothed wheel 40 and carrying-pinions 26 to move away (by gravity in this instance), a distance sufficient to disengage the intermeshing gearing and thus entirely free the counter-wheels of all restraint as in Fig. 4, so that the weighted portions thereof will quickly act to move each wheel the required distance to bring all their peripheral zero indications into line and exposed through the opening in the inclosing case. Continuing to turn, the cam 32, then bears against the arm 13 of the rock spindle 36, moving the fingers inwardly into engagement with the position-defining pins and recess of the counter-wheels, stopping their oscillation, and bringing them into a stationary condition so that the cam 32, still turning and while yet causing the fingers to hold the counter-wheels against movement, now acts against the frame 28, as in Figs. 5 and 10, and returns it to its normal position with all the intermeshing gears reëntered in mesh and thereupon finally releasing the fingers from the counter-wheel so that the fingers may return to their inactive position under the pull of the spring 45; about simultaneously therewith the cam 16 acting against the lever 14 moves the lock from the carrying-pinions and tooth-wheel 40.

It will be observed that the first function of the resetting spindle as herein embodied is to lock the operating gearing against rotation and the last function thereof to release said lock. The counter has thus been reset to zero and brought back into condition ready for further counting operation.

In order to break the continuity of the single rotation of the resetting spindle, the grasping piece flange 34 is provided with a second notch c, Fig. 2, a short distance removed from the initial notch, for the engagement of the pawl 35 therewith at the moment the counter-wheels have become free of the intermeshing gearing, so that an interval of time is necessarily gained in having to again forcibly move past the pawl during which the counter-wheels have been given full opportunity to return to zero position in advance of the engagement of the positioning fingers therewith.

When the spindle 27 carrying the actuating gear 40 and supporting the carrying-pinions is also the actuating spindle, one of its ends may have provision for connection with the actuating instrumentality such as a coupling head 50 of a universal connection, permitting the lateral movement of the spindle in the disengaging operation without disconnecting its driving connection.

While the improvements are shown in connection with progressively rotative wheels that bear the indicating numerals on their peripheral faces, it is obvious that other forms of movable indices may be utilized without departing from the scope of the invention.

What is claimed is:

1. The combination of a plurality of counter-wheels, intermeshing gearing for progressively moving them, means for disengaging and reëngaging said gearing, means movable into engagement with the disengaged members of the gearing for holding them against rotation and means for resetting the counter-wheels at zero.

2. The combination in a totalizing counter, of transmitting gearing consisting of separable members, means for separating said members, means movable into engagement with a portion of the separated members for holding the same against rotation while separated, said other members having loaded portions causing them to automatically return to initial position as soon as separated.

3. The combination of a plurality of counter-wheels, intermeshing gearing for progressively moving them, an operating handle and connections for temporarily separating certain members of said gearing from the others and for moving a holding device to hold said separated members against rotations while separated, and said counter-wheels having loaded portions causing them to automatically return to zero indication as soon as said separation occurs.

4. The combination of a plurality of counter-wheels each of which is loaded to cause them to automatically return to zero position when disengaged, intermeshing gearing for progressively moving them, and an operating handle and connections for disengaging said gearing, for moving a holding device to hold the disengaged gears against rotation and for positioning the counter-wheels.

5. The combination of a plurality of counter-wheels, actuating gearing and carrying-pinions, means for separating said gearing and pinions from the counter-wheels, means for locking the gearing and carrying-pinions against rotation before being separated and means for resetting the counter-wheels to the zero position.

6. The combination of a plurality of counter-wheels each having a loaded portion adapting their return to zero when freed, operating gearing therefor, a gravitating frame carrying said gearing, and a cam for supporting said frame and its gearing in operative position.

7. The combination of a plurality of counter-wheels each having a loaded portion adapting their return to zero when freed, an actuating gear and carrying-pinion therefor, a gravitating frame supporting said gear and pinions, and a spindle and connections for supporting the frame in normal operative position.

8. The combination of the plurality of counter-wheels, gearing for operating said wheels, means for disconnecting said gearing from the wheels and a lock movable into engagement with the disengaged gearing for holding the same against rotation while disconnected.

9. The combination of a plurality of counter-wheels, gearing for operating said wheels, an operating spindle and connections with said gearing whereby the gears are locked against rotation and then disconnected from the wheels.

10. The combination of a plurality of counter-wheels, gearing for operating said wheels, an operating spindle and connections with said gearing whereby the gears are locked against rotation, then disconnected from the wheels and the wheels positioned while the gearing is disconnected therewith.

11. The combination of a plurality of counter-wheels, a movable frame and gearing supported thereby for operating the wheels, a lock for the gearing carried by said frame, and a single operating handle and connections for operating the lock and moving the frame.

12. The combination of a plurality of counter-wheels, a movable frame and gearing supported thereby for operating the wheels, a lock for the gearing, a cam for operating the lock, another cam controlling the movement of the frame and a single operating handle for said cams.

13. The combination of a plurality of counter-wheels, the actuating gearing therefor, means for rendering the counter-wheels rotatively free of said gearing, and means for positioning the wheels in advance for being reëngaged by the gearing.

14. The combination of a plurality of counter-wheels, a movable frame and an actuating gear and carrying-pinion supported thereby for operating the wheels, a yielding lock for the gear and another lock for the pinion and means for controlling the operation of the locks and the frame.

15. In combination of a plurality of counter-wheels, a movable frame and an actuating gear and carrying-pinion supported thereby for operating the wheels, independent locks for the gear and pinion, a single cam and connections for operating both locks and means for moving the frame.

16. The combination of a plurality of counter-wheels, means for rendering them rotatively free for resetting and

a plurality of fingers to position the wheels at their initial position.

17. The combination of a plurality of counter-wheels, means for rendering them rotatively free for resetting, a rock-spindle having a plurality of fingers to position the wheels at their initial position and an operating handle and connections for controlling said means and rocking the spindle.

18. A combination of a plurality of counter-wheels, a gravitating frame and gearing carried thereby for operating the wheels, rock fingers for positioning the counter-wheels at zero, a cam for supporting the frame with the gearing in operative condition and operating said fingers, a lock for the gears, a cam for operating the lock and an operating spindle carrying both cams.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 26th day of February 1906.

FREDERICK G. JAHN.

Witnesses:
GEO. H. GRAHAM,
S. EDGAR DYE.