B. HEHLE.

STOP REGISTER.

APPLICATION FILED DEC. 11, 1915.

1,211,580.

Patented Jan. 9, 1917.

4 SHEETS—SHEET 1.

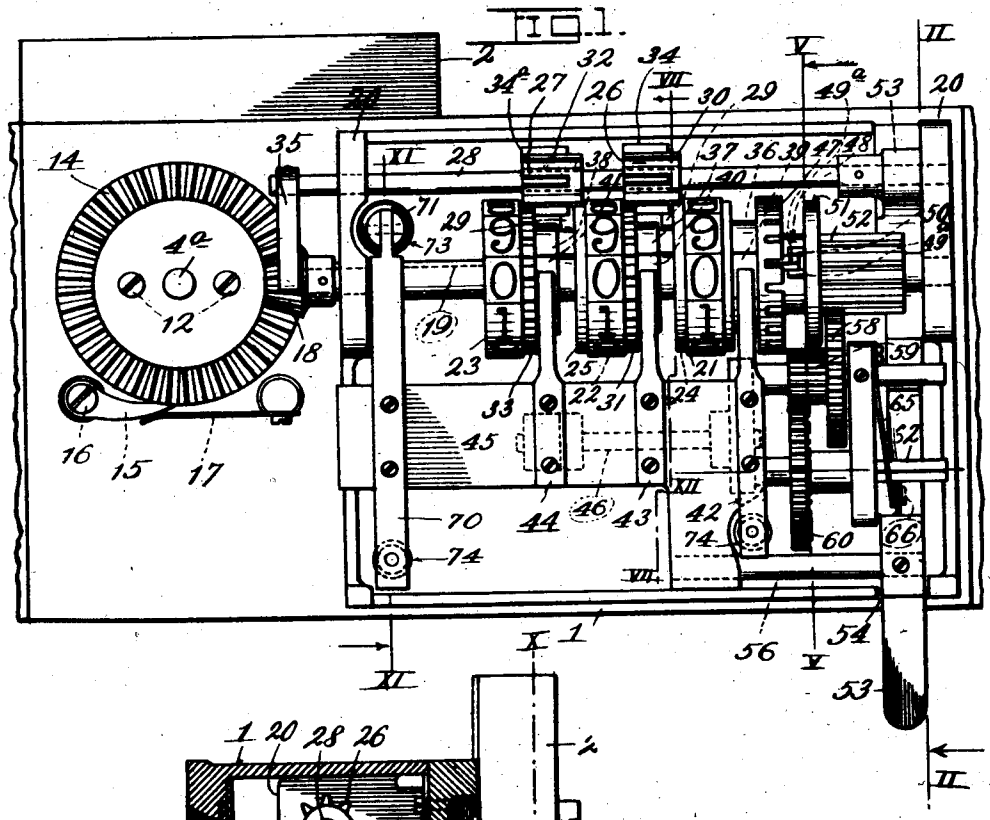

FIG. 1.

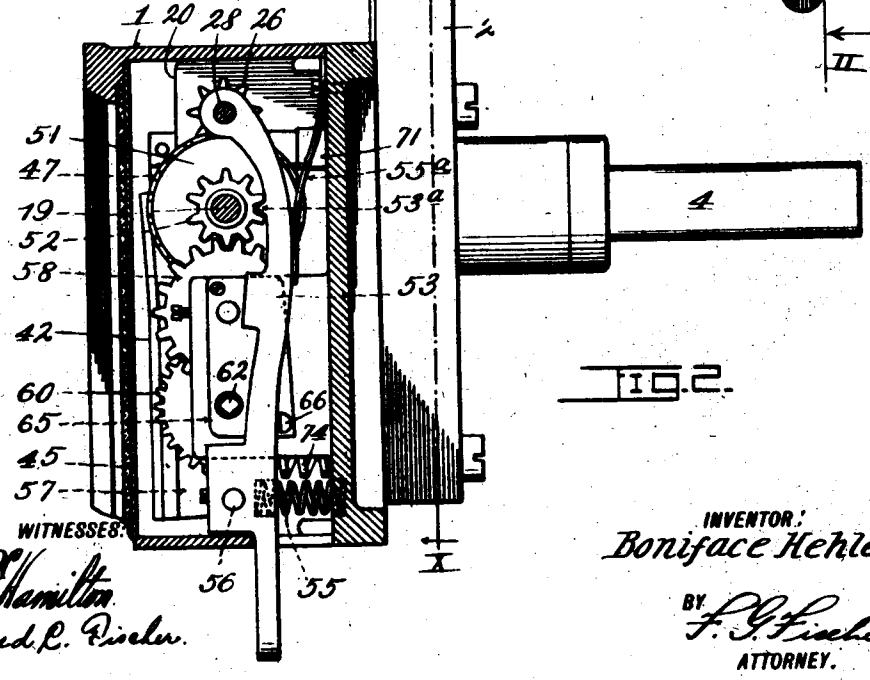

FIG. 2.

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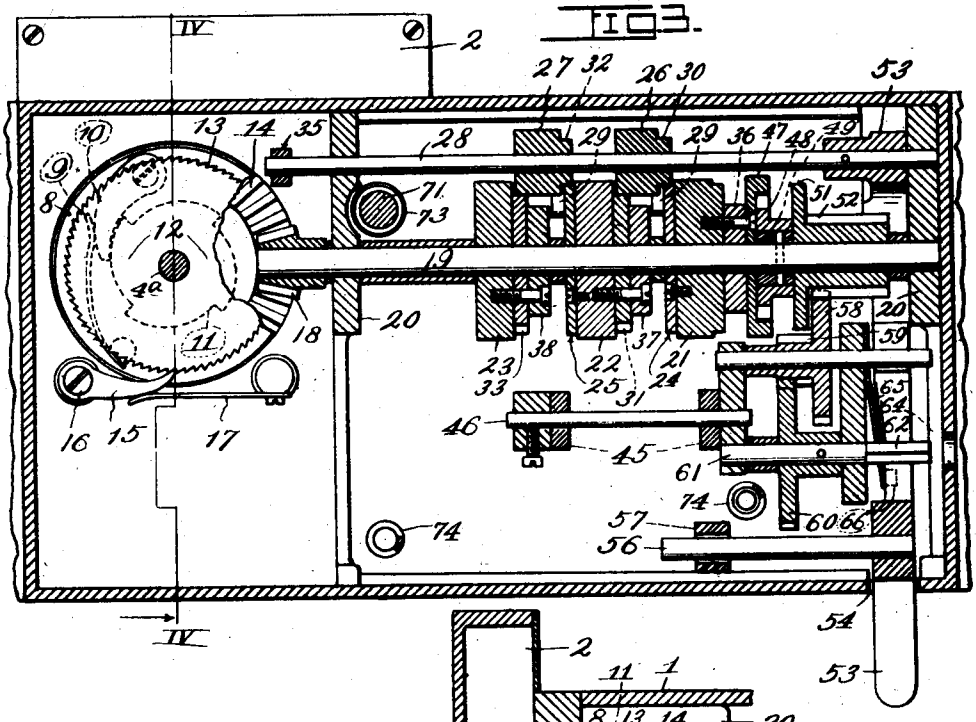
4 SHEETS—SHEET 2.

FIG. 3.



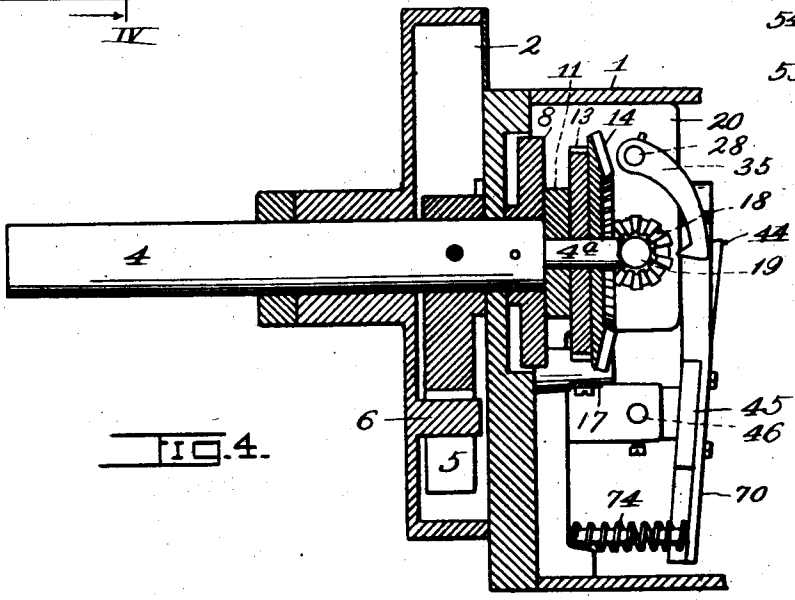


FIG. 4.

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4 SHEETS—SHEET 3.

FIG. 5.

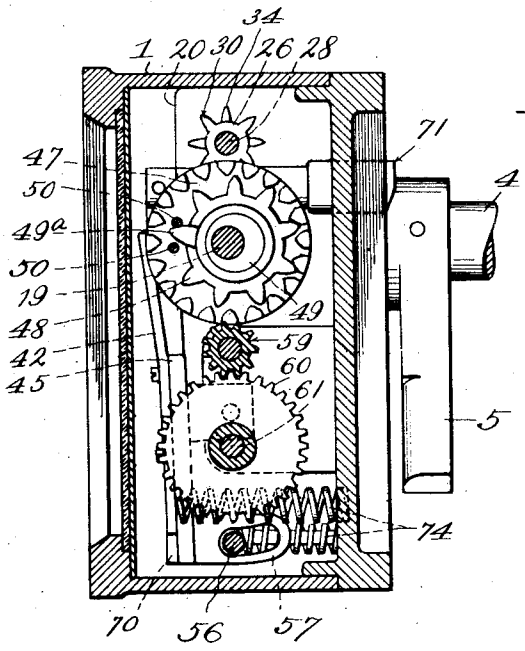


FIG. 6.

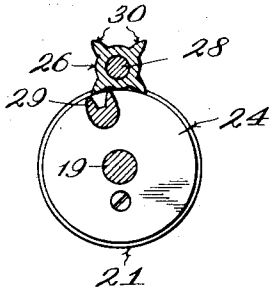


FIG. 7.

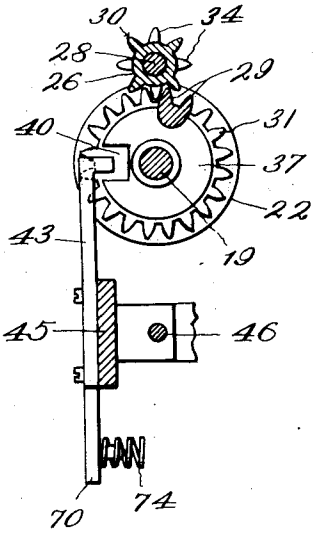
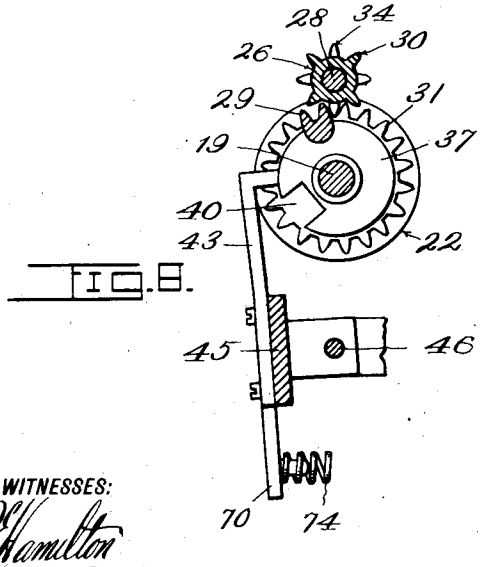


FIG. 8.



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4 SHEETS—SHEET 4.

FIG. 9.

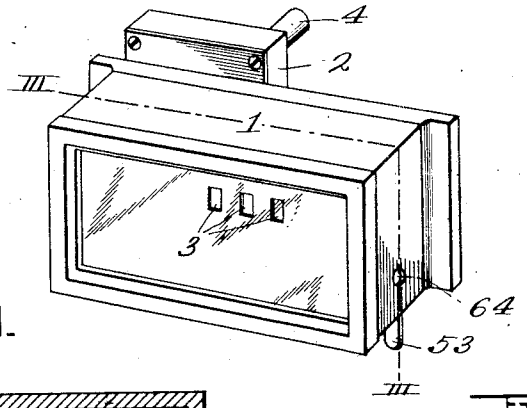


FIG. 10.

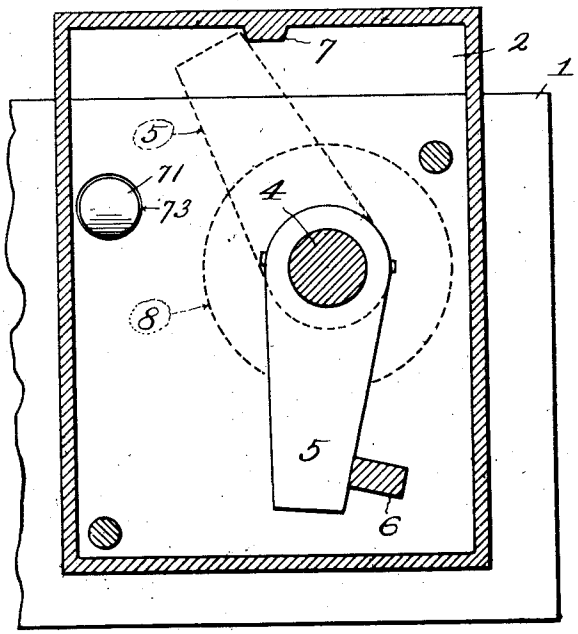
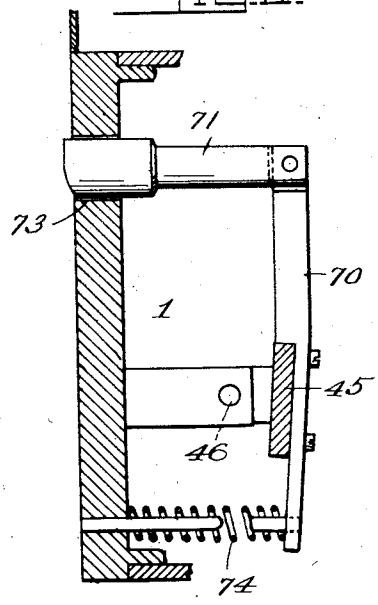


FIG. 11.



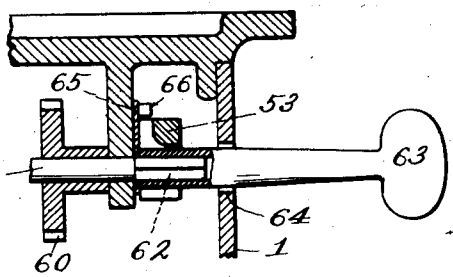


FIG. 12.

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UNITED STATES PATENT OFFICE.

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STOP-REGISTER.

1,211,580. Specification of Letters Patent. Patented Jan. 9, 1917.

Application filed December 11, 1915. Serial No. 66,281.

To all whom it may concern:

Be it known that I, BONIFACE HEHLE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Stop-Registers, of which the following is a specification.

My invention relates to a stop register, or one that will automatically lock itself and the apparatus to which it is connected, after registering any predetermined number for which it may be set.

The register may be used to advantage on scales, conveyers, cash registers, and other apparatus which it is desired to automatically lock after being actuated a predetermined number of times, and in order that the invention may be fully understood, reference will now be made to the accompanying drawings, in which:

Figure 1 is a front elevation of the register with a part of its case removed to show the interior mechanism. Fig. 2 is a cross section on line II—II of Fig. 1. Fig. 3 is a longitudinal section on line III—III of Fig. 9. Fig. 4 is a cross section on line IV—IV of Fig. 3, with some of the parts removed. Fig. 5 is a cross section on line V—V of Fig. 1. Fig. 6 is a side elevation partly in section of "Geneva" gears employed in carrying out the invention. Fig. 7 is an irregular vertical detail section on line VII—VII of Fig. 1. Fig. 8 is a section on the plane of line VII—VII, with the recessed disk disclosed thereby in a different position. Fig. 9 is a perspective of the register. Fig. 10 is a vertical section on line X—X of Fig. 2. Fig. 11 is a broken vertical section on line XI—XI of Fig. 1. Fig. 12 is a broken horizontal section on line XII of Fig. 1, with the addition of a resetting key.

In carrying out the invention, I employ a suitable case 1, provided at its rear side with a compartment 2 and at its front side with sight-openings 3, through which the numerals on the registering wheels, hereinafter described, are disclosed.

4 designates a drive shaft rockably mounted in suitable bearings in the case 1 and its compartment 2, and arranged to be actuated in any suitable manner, such for instance as the material counted, or a conveyer for conducting said material past the register. As the particular manner in which the shaft 4 is actuated constitutes no part of the present invention, I do not deem it necessary to go into the details thereof.

5 designates a stop lever fixed to the shaft 4 to limit the arc through which said shaft rocks. Said stop lever 5 is arranged within the compartment 2 and adapted to alternately contact lugs 6 and 7, Fig. 10, which limit the movement of the stop lever 4.

8 designates a disk arranged within case 1 and fixedly-mounted upon the shaft 4, Figs. 3 and 4. Said disk 8 is provided with a spring 9 and a pivotally mounted pawl 10, which latter is yieldingly held by the former in engagement with a drive ratchet 11, loosely mounted upon the reduced end 4^a of the rock-shaft 4.

The drive ratchet 11 is secured by screws 12, or other suitable means, to a stop ratchet 13 and a bevel gear wheel 14, both of which are loosely mounted upon the reduced end 4^a of the rock-shaft 4. The stop ratchet 13 is prevented from rotating backward with the shaft 4 by a pawl 15 mounted upon a pivot 16, and yieldingly held in engagement with the ratchet wheel 13 by a spring 17.

The bevel gear 14 drives a bevel pinion 18 step by step. Said bevel pinion 18 is fixedly mounted upon a counter shaft 19, extending longitudinally of the case 1 and mounted in bearings 20 within said case.

21, 22 and 23, designate registering wheels loosely mounted upon the counter shaft 19 and each bearing numbers from 0 to 9, inclusive, on its periphery. The initial registering wheel 21 and the following wheel 22 are provided with fixedly mounted "Geneva" gear wheels 24 and 25, which intermittently drive "Geneva" pinions 26 and 27, respectively, journaled upon a shaft 28 mounted upon the counter shaft 19 in the bearings 20.

Each gear wheel 24 and 25 has two peripheral cog teeth 29, Figs. 6 to 8, inclusive. On each revolution of the gear wheel 24 its teeth 29 engage a long tooth 30 on the pinion 26 and rotate said pinion one step, causing it in turn to rotate an intermeshing gear wheel 31, fixed to the wheel 22, one step. Likewise on each revolution of the gear wheel 25 its teeth 29 engage a long tooth 32 on the pinion 27 and rotate the same one step, causing it in turn to rotate an intermeshing gear wheel 33 fixed to the recording wheel 23, one step. The long teeth 30 and 32 of the pinions 26 and 27, alternate with short teeth 34 and 34^a and overlap smooth portions of the

peripheries of the gears 24 and 25, respectively, and are thereby held from accidental movement. Shaft 28 is provided with a fixedly mounted dog 35, adapted to engage the bevel pinion 18 and hold the counter shaft 19 stationary when the wheels 21, 22 and 23 are reset as will hereinafter appear.

36, 37 and 38 designate disks fixed to the wheel 21 and the gear wheels 31 and 33, respectively. The disks 36, 37 and 38 have peripheral recesses or notches 39, 40 and 41 adapted to receive the upper ends of detents 42, 43 and 44, respectively, secured to a rock-bar 45 mounted upon a stationary shaft 46.

47 designates an escape wheel fixed to the disk 36 and adapted to be rotated one step on each revolution of the counter shaft 19 by a shift gear 48, Fig. 5. The shift gear 48 is loosely mounted upon and actuated by a cam 49, fixedly mounted upon the counter shaft 19 and which intermittently throws said shift gear 48 in and out of gear with the escape wheel 47.

While the shift gear 48 gyrates and thus advances the escape wheel 46 step by step, said shift gear 48 is held from axial rotation by its wide tooth 49ª, which in turn is held from rotating by a pair of oppositely-disposed pins 50, carried by a disk 51 provided with an elongated pinion 52, loosely mounted upon the counter shaft 19 and normally secured from rotation by a toothed lever 53.

The toothed lever 53 is fixed at its upper end upon the shaft 28 and extends downwardly through a slot 54 in the bottom of the case 1. A coil spring 55 and a flat spring 55ª are interposed between the back of the case 1 and the lever 53, to normally hold its tooth 53ª, Fig. 2, in engagement with the elongated pinion 52. The lower portion of the lever 53 is provided with a laterally extending pin 56, Figs. 3 and 5, which extends into the slotted arm 57 of the rock-bar 45 to throw the detents 42, 43 and 44 out of the disk notches 39, 40 and 41, respectively, when the lever 53 is pushed backward to disengage its tooth 53ª from the pinion 52, preparatory to resetting the registering wheels.

The registering wheels are reset to the starting point by a train of gears consisting of the gears 47, 48, 51 and 52, a cog wheel 58 intermeshing with the pinion 52, a pinion 59 fixed to the cog wheel 58, and a cog wheel 60 intermeshing with the pinion 59 and mounted upon a shaft 61 having a rectangular end 62, to receive a key 63, inserted through an aperture 64 in the adjacent end of the case 1. When the key 63 is shoved inward over the rectangular end 62 of the shaft 61 it forces back a spring latch 65 carrying a lug 66, which normally engages the back of the lever 53, so that the same cannot be disengaged from the elongated pinion 52 by anyone not provided with the key 63.

70 designates an arm fixed to the rock-bar 45 and pivotally connected at its upper end to a stop pin 71 projecting into the compartment 2 through a hole 73 in the rear wall of the case 1.

74 designates coil springs interposed between the rear wall of the case 1 and the detent 42 and the arm 70 to normally hold the detents in engagement with their respective tumblers.

Briefly stated the operation is as follows: Assuming that all of the numerals "0" on the registering wheels are exposed at the openings 3 of the case, said wheels are rotated through the intermediary of the key 63 and the resetting train until all of the numerals "9" are disclosed at said opening 3. However, before the key 63 can be rotated it is necessary to swing the lever 53 back to disengage its tooth from the pinion 52 and to throw the detents 42, 43 and 44 out of the notches 39, 40 and 41, respectively, of the disks. After the registering wheels have been properly reset, the rock-shaft 4 is free to operate until all of the numerals "0" again appear at the opening 3. When this occurs the detents 42 to 44, inclusive, are forced into the respective notches of the disks by the coil springs 74, which rock the bar 45. The rocking movement of the bar 45, in turn rocks the arm 70, which throws the stop pin 71 into the path of the lever 5, so that the same cannot continue to transmit motion through the intervening gearing to the registering wheels, which latter are locked from further movement until again reset, as hereinbefore described.

While the register is arranged to subtract in the present instance, it can be made to add by reversing the arrangement of the numerals on the wheels, or it may be made to both add and subtract by providing each wheel with two properly arranged rows of numerals.

From the foregoing description, it is apparent that I have produced a stop register which is comparatively simple in construction and efficient in operation, and while I have shown and described the preferred form of my invention, I reserve the right to make such changes and modifications as properly fall within the spirit and scope of the claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. In a device of the character described, a rotary numeral wheel having a recess, an actuator for the wheel including a rotary arm, a detent arranged to enter the wheel recess, a stop operable by the detent on entering the wheel recess for projection in the path of said arm to lock the actuator, and means slidably supporting and guiding the stop to support the latter against movement

in the direction of movement of the arm when encountered by the arm.

2. In a device of the class set forth, a registering wheel having a recess, a shaft loosely supporting the wheel, a rock bar, a detent carried by the bar to engage in the recess of the wheel and lock the latter after a predetermined number has been registered, gearing for rotating the wheel, other gearing for resetting the wheel, a lever normally holding the resetting gearing fixed, and a connection between the rock bar and lever whereby on releasing the resetting gearing the detent will be disengaged from the wheel.

3. In a device of the class set forth, a registering wheel having a recess, a shaft loosely supporting the wheel, a rock bar, a detent carried by the bar to engage in the recess of the wheel and lock the latter after a predetermined number has been registered, gearing for rotating the wheel, other gearing for resetting the wheel, a lever normally holding the resetting gearing fixed, a pinion for driving said shaft, a dog engageable with the pinion when the resetting gearing is released, and a connection between the bar and lever whereby the detent will be disengaged from the wheel on releasement of the resetting gearing.

4. In a device of the class set forth, a registering wheel having a recess, a shaft loosely supporting the wheel, a rock bar, a detent carried by the bar to engage in the recess of the wheel and lock the latter after a predetermined number has been registered, gearing for rotating the wheel, other gearing for resetting the wheel, a lever normally holding the resetting gearing fixed, and a pin and slot connection between the rock bar and lever permitting of independent movement of the rock bar and its supported detent to operative position and providing a positive connection between the rock bar and lever on movement to release the resetting gearing whereby the detent will be disengaged from the wheel.

5. In a device of the character described, a registering wheel, means for locking the wheel at a predetermined time, a counter shaft upon which said wheel is loosely mounted, a pinion for driving said counter shaft, means for driving said pinion, gearing for rotating the registering wheel, a train of gears embodying a part of the last-mentioned gearing for resetting the registering wheel, a lever normally holding the resetting train stationary and connected with said means to render the same inoperative when the train is released, and a dog controlled by said lever to lock the counter shaft driving pinion during the operation of the resetting train.

6. In a stop register, a recessed registering wheel, means for rotating the same including an oscillatory arm, a slidably mounted spring pressed stop pin projectable into the path of the arm to render the same inoperative, means to guide the pin and support the latter against lateral movement when engaged by the arm, a detent engageable in the recess of the wheel when a predetermined number has been registered, and a rock arm supporting the detent and having connection with the stop pin to retain the latter inoperative when the detent is disengaged from the wheel recess.

7. In a device of the character described, a registering wheel, actuating means therefor, a train of gears embodying a key-shaft for resetting said wheel, a lever to normally lock the resetting train, means to lock said lever in engagement with the resetting train, and a key to release the lever and operate the resetting train.

8. In a device of the character described, a registering wheel, an intermittently driven shaft upon which said member is loosely mounted, an escape wheel to rotate said member, a shift gear to drive said escape wheel, and means mounted upon the intermittently driven shaft for driving the shift gear and intermittently throwing the same in and out of engagement with the escape wheel.

9. In a device of the character described, a registering wheel rotary member, an intermittently driven shaft upon which said wheel is loosely mounted, an escape wheel to rotate said wheel, a shift gear to drive said escape wheel, a cam mounted upon the intermittently driven shaft for driving the shift gear and intermittently throwing the same in and out of engagement with the escape wheel, and means to prevent axial rotation of said shift gear.

10. In a device of the character described, a plurality of registering wheels, an intermittently driven shaft upon which said wheels are loosely mounted, means on said shaft for driving the initial wheel, a gear wheel driven by said initial wheel and having a smooth periphery interrupted by a plurality of teeth, a pinion having alternate short and long teeth which latter overlap the smooth periphery and are intermittently engaged by the teeth of said gear wheel, and a cog wheel fixed to be driven by said pinion and fixed to the following registering wheel.

In testimony whereof I affix my signature, in the presence of two witnesses.

BONIFACE HEHLE.

Witnesses:
FRED C. FISCHER,
L. J. FISCHER.