(No Model.) 2 Sheets—Sheet 1.

# P. YOE.

## CASH REGISTER AND INDICATOR.

No. 490,466. Patented Jan. 24, 1893.

Fig. 3.

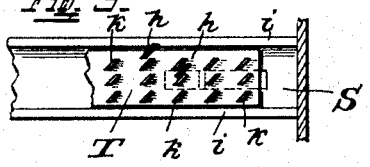



Fig. 5.

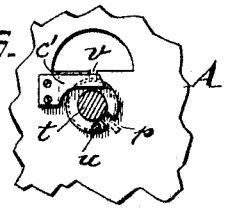



Fig. 4.

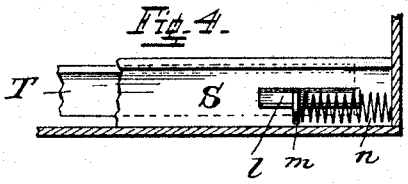
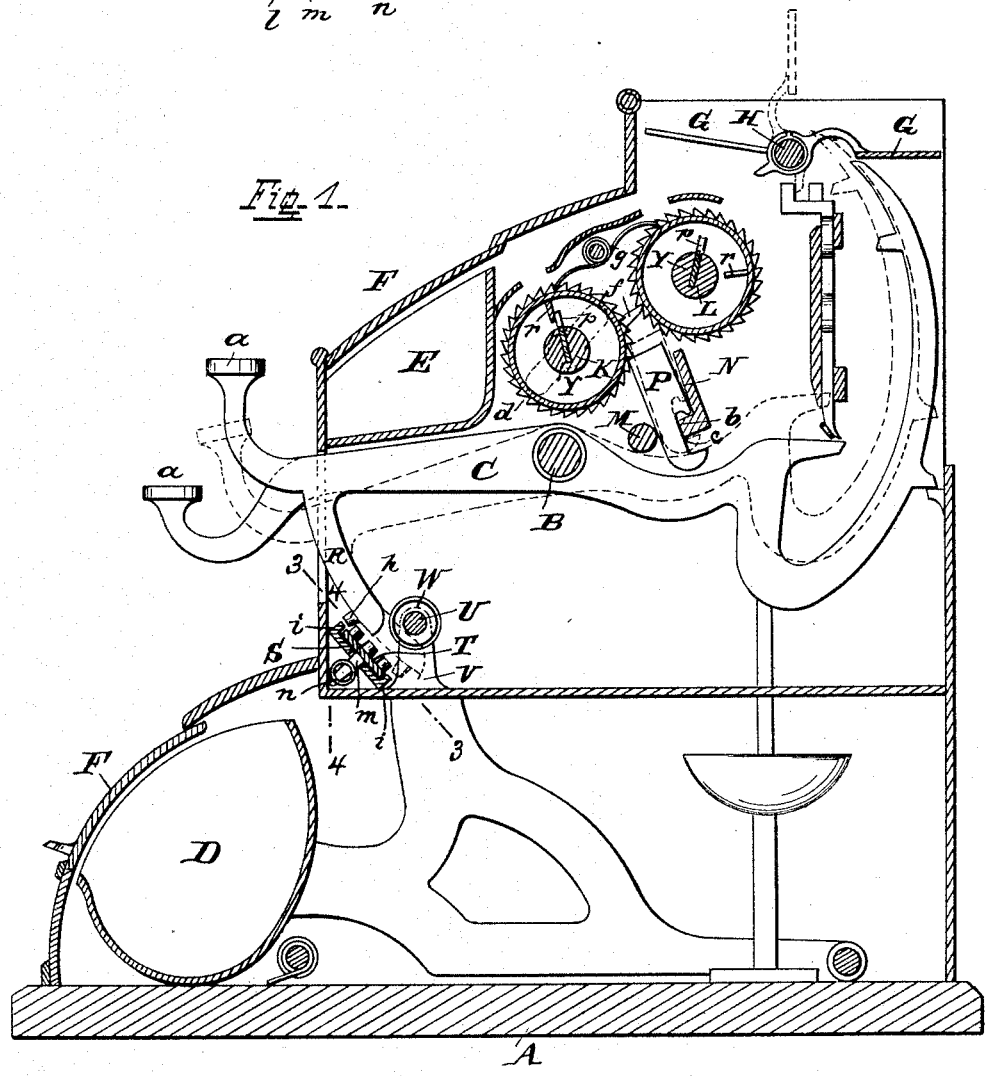



Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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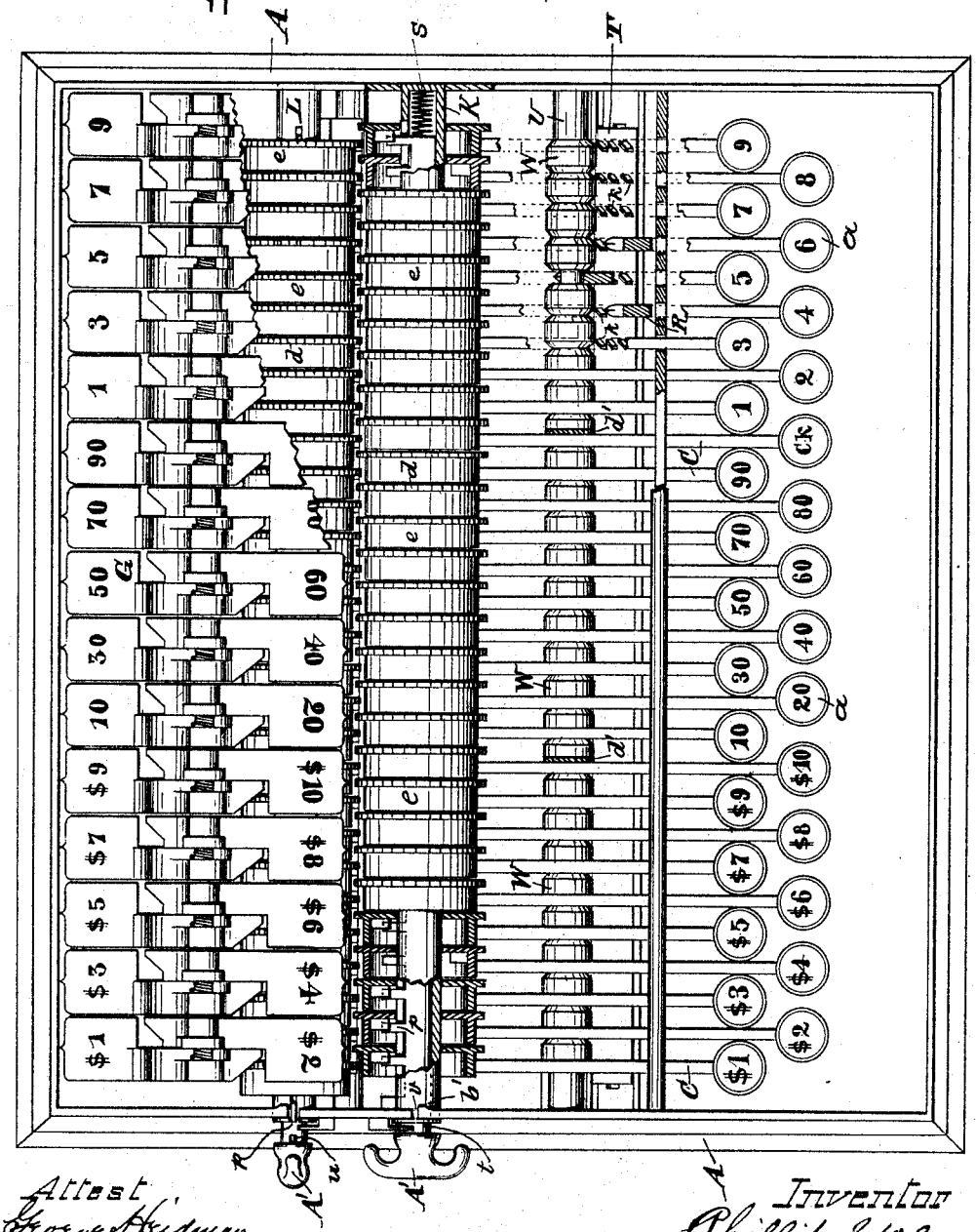
## CASH REGISTER AND INDICATOR.

No. 490,466. Patented Jan. 24, 1893.

Fig. 2.

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# UNITED STATES PATENT OFFICE.

PHILIP YOE, OF DAYTON, OHIO.

## CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 490,466, dated January 24, 1893.

Application filed March 31, 1892. Serial No. 427,153. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP YOE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash-Registers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The invention has for its object, various improvements in the construction of cash register machines, the novelty of which will be hereinafter more particularly pointed out and claimed.

My machine belongs primarily to that class of cash registers in which a series of operating keys are employed in connection with a series of registry wheels one for each key, with suitable registry mechanism operated by the keys, whereby the value of each key of said series is registered on its separate registry wheel, and the total amounts deposited in the register is obtained by adding together the amounts indicated by the separate registry disks; a class of machines well known in the art as "detail adding" machines, as distinguished from those in which the registry mechanism itself adds into one total sum the receipts of the register, a class of machines known as "total adders." It will however be understood, that very many of the improvements hereinafter specified, may be employed with equal success on machines of the "total adding" class, as will be hereinafter clearly set forth.

It is the aim of my improvements as a whole to simplify the various mechanical features and to dispense with any multiplication of parts beyond what is absolutely essential to the operativeness of the machine, and thereby to greatly cheapen the construction and increase the reliability of the device. At the same time, and more particularly with reference to the registry mechanism, my aim has been to render the operation absolutely certain in its results and to deprive any dishonest user, of the power of affecting in any way the proper registration of the keys operated. The ordinary method of registering the value of the keys, has been by means of a dog or pawl carried by the key engaging with the ratchet teeth of a numbered registry wheel, so that each operation of a key will advance its registry wheel one tooth. If the operator should either purposely, or accidentally strike the key a sharp sudden blow, the momentum given the registry wheel is very apt to advance it more than one tooth and consequently cause a false registration. Brakes of various kinds are therefore employed, to prevent any extra momentum from carrying the registry disk beyond the proper point, but if these brakes are applied with the requisite force necessary to negative any sharp sudden operation of the keys, for ordinary use the action of the keys is apt to be stiff and hard. Pawls have also been used arranged to be thrown into engagement with the wheel to stop the movement at the moment the wheel has been moved the proper distance, to register the value of the key, but constructions of this description, require a large number of parts and nice adjustment and hence are undesirable.

The first part of my invention relates to my novel method of locking the registry wheels from further movement upon the completion of the registration, so that no matter what momentum may be given these wheels, any further movement is absolutely stopped, and this part of the invention consists of such an arrangement of stop bars that when the driving pawl in contact with the ratchet teeth of the registry wheel has been operated, the necessary distance to effect the registration, the registry wheel will be locked against further movement by the wedging of the pawl between the ratchet teeth of the registry wheel and the stop bars so that it will be absolutely impossible to advance the registry wheel farther until the pawls return to its normal position. Each registry wheel being provided in my register with an addition wheel or wheels to receive the transfer from each complete revolution of the primary wheel, as a further precaution, I also arrange the registry mechanism so that the driving pawls will be wedged between the primary and secondary wheels upon each operation of the keys and thus act as an additional stop to the primary wheel.

The second part of my invention, relates to a novel form of key arrester to prevent pumping and compel the complete operation of the keys operated in both directions, and consists

of a single bar common to the entire series of keys and which is provided with lugs or teeth, one set for each key, to be engaged by the keys and prevent any return movement, the common arrester bar moving transversely or across the path way of the keys instead of in the same plane with the keys as is usually the case.

The third part of my invention, relates to a simple cheap and effective key locking device to prevent the simultaneous operation of more than one key of a series, and it consists in a series of hubs strung on a common shape arranged so as to allow one of the keys of a series to pass between them, but to interfere with and prevent the operation of any of the other keys of the same series at the same time. The series of hubs are very cheaply formed, and can be strung on the shaft at a moment's notice and without any nice adjustment of parts, and hence this form of key lock is much cheaper than very many of the key locks in use, in which care in construction and nice adjustment of parts are essential and which consequently materially increase the cost. And in addition to this, the friction between the keys and locking hubs, is reduced to a minimum, in as much as the hubs will rotate on the shaft at the same time that they are shifted longitudinally, a matter of some importance in cash registers where the operating keys usually have a large amount of work to perform and easy movement is an essential requisite.

The fourth part of my invention relates to a resetting device for returning the various registry wheels to zero. It has been usual heretofore, to mount the registry wheels on a common shaft, provided at intervals with recesses into which are inserted spring pawls and the like one for each wheel, which pawls are arranged to engage the registry wheels when it is desired to return them to zero.

My invention relates to this class of resetting devices, but instead of providing a pawl or dog for each wheel, and consequently multiplying the parts, I arrange a single resetting bar common to all the wheels and provided with lugs to engage projections on the registry wheels when it is desired to reset them to zero, the bar having a transverse or lateral movement to the plane of the wheels and being normally out of engagement therewith; a construction which is much cheaper and simpler than the constructions now in use.

It will be understood that the three last mentioned parts of my invention can be applied to all kinds of cash registers where such devices are required, and their use is not intended to be limited to machines of the "detail adding" class herein referred to.

In the drawings:—Figure 1, is a central sectional side elevation of my machine. Fig. 2, is a top plan view of same, the upper part of the case being removed, and with certain portions of the machine broken away and with other parts in section. Fig. 3, is a sectional view of a part of the register taken on lines 3, 3, of Fig. 1, showing a part of the key arresting bar. Fig. 4, is a similar view taken on lines 4, 4, of Fig. 1. Fig. 5, is a detail view of the operating end of the device for resetting the registry wheels to zero.

Like letters of reference indicate identical parts in all the figures.

The machine is inclosed in the usual case A, within which is secured the shaft B, upon which are mounted or strung the operating keys C, C, their front ends extending through slots in the case and provided with the usual numbered buttons *a*.

D and E are the money compartments closed by the sliding lids F, F.

In the upper part of the case is located the indicating mechanism, consisting of a series of tablets G, numbered to correspond to the various values of the keys, the tablets being mounted on shaft H and operated by the rear ends of the key levers.

All the above parts are of the construction shown and described in my patent No. 460,623 of October 6, 1891, and forming no part of the invention here need not be further described.

Extending across the case from side to side, are the shafts K, L, upon which are mounted the two banks of registry wheels, *e*, *e*, in the usual way, one set of wheels for each key. The registry wheels mounted on the lower shaft K being the primary wheels, and the wheels mounted on shaft L being advanced one tooth upon each complete revolution of their corresponding primary wheel. Extending across the case from side to side and directly over the key levers C, C, are the bars M and N parallel to each other, and to the registry shafts K L. One of these bars M, is preferably circular in cross section while the other N, is rectangular and provided with a shoulder or lip *b*. Between these two bars and directly over the various key-levers a series of dogs P, are placed one for each key. These dogs may be either loose or pivoted to the key levers, although I prefer not to pivot them as considerable labor of construction is thereby saved. These dogs are guided in their movement by flanges or partitions which separate the dogs from each other.

The dogs are cut away at *c*, so as to fit within the lip *b*, of the bar N, and be stopped in their upward and downward play by the shoulders on the dog, coming in contact with this lip *b*, the upper shoulder on the dog resting on the lip *b*, holds the dog in its normal position. The upper ends of these dogs are in engagement with the ratchet teeth *d*, of the primary registry wheels *e*, so that upon the depression of any of the key levers, the corresponding dog will be raised onto the position shown in dotted lines, Fig. 1, and advance its corresponding registry wheel one tooth, to register the value of the key operated. While the dog P is in its raised posi-

tion, after effecting the registration, it will be impossible to move the registry wheel farther until the dog drops back to its normal position. For its will be noticed that as the dog P rests against the ratchet wheel *d* below its center, the dog in rising to advance the registry wheel, will be turned toward the perpendicular as shown by dotted lines Fig. 1, until the back face of the dog comes in contact with the front face of the bar N, when in this position the dog cannot farther approach a perpendicular position as the rod M prevents. The registry wheel *e*, not being able to push aside the dog P, must necessarily be stopped in any further movement until the return of the dog to its normal position, and consequently no matter how sharp a blow may be given the key lever, the registry wheel can only advance one point. In addition to this, the registry wheels of both banks are arranged in line and the dogs P are just of sufficient breadth to turn the primary registry wheel one tooth and then become wedged between the ratchet wheels of each bank as shown by the dotted lines in Fig. 1.

The dogs in my preferred construction, are loose and return to their normal position by gravity, but if desired they may be pivoted to the key levers in the usual way and when this is the case, the lip *b* on the bar N may be dispensed with and also the notches *c* in the dogs.

*f*, is a pin on each primary registry wheel by means of which the transfer is made to its corresponding secondary wheel, and *g*, a double ended spring pawl to prevent either of the registry wheels from being turned in the wrong direction.

For my key arrester to compel the movement of the key lever in both directions, I provide as follows. Each key lever C, is provided with an arm R upon which there is a lug *h*, set at an angle to the plane of the arm. Extending across the case from side to side and underneath these arms R on the key levers, is a guide plate S, provided with flanges *i*, *i*, upon which plate and between the flanges as guides, slides the key arrester bar T. This bar T, is provided with a series of lugs *k* set at the same angle as the lugs *h*, on the key arms, three or more of these lugs *k* for each key lever are arranged in line, so close together that the lug *h* of the key lever arm will not pass between them. Near each end of the guide plate S, a slot *l*, (Fig. 4) is cut and through each slot extends an arm *m*, on the key arrester bar, while spiral springs *n*, bear against the outside of each of these arms *m*, the parts being so adjusted that the two springs will hold the key arrester bar T in equilibrium with the lugs *k* thereon directly under the lugs *h* on the key lever arms. It will therefore be seen from an examination of Figs. 3 and 4, that as any key lever C is depressed, the lugs *k* will serve as ratchet teeth for the lug *h*, the bar T will be moved laterally against the pressure of the spring *n* (the spring *n* on the left hand side as one faces the machine) so as to allow the lug *h* to pass, but that the key lever cannot return to its normal position until the key has been depressed to its full limit as the lug *h* will catch between the lugs *k* on the arrester bar. On the return movement of the key the key must be forced to its normal position before it can be again depressed as on the return movement, the arrester bar will be moved to the right to allow the key to pass, but if it is sought to depress the key during the return movement the lugs *h*, will again catch between the lugs R. Thus with a single arrester bar and one set of lugs, I am enabled to control the movement of the key in both directions, and the bar T moves in a plane across or at right angles to the plane of movement of the various keys. Of course it will be understood that this form of key arrester can be employed in any of the various classes of cash registers and is not to be limited in its use to the class of machine described herewith.

For the purpose of preventing the operation of more than one key, of a series, at a time, I provide, the following key locking mechanism. U, is a shaft extending horizontally across the machine from side to side and supported at the sides of the case by standards V. This shaft is located just in the rear of the path of motion of the arms R on the key levers, and on this shaft are strung the hubs W, one for each key lever and arranged in groups to correspond to the groups of keys, while between each group of hubs is a plate or stop *d'* to separate the groups of hubs from each other. These hubs have their inner edges beveled as shown in Fig. 2, and there is sufficient space for each group of hubs to allow them to separate and permit the passage of one key lever arm, but if another key of the same group is sought to be operated simultaneously therewith, there is not sufficient space to allow for its passage and thus all the other keys of the same group, will be locked until the completion of the stroke of the key first operated.

In the grouping of the key arrester and key lock herein shown, it will be noticed that the arms R on the key levers serve to engage both the key arresting bar and the key locking hubs which makes a very convenient and simple arrangement and dispenses with a large number of parts which are usually necessary when the key locking and key arresting devices are separated. In addition to this, the locking hubs are very simple in construction, and being strung on a shaft as they are, no nice adjustment is required, as is usually the case where balls or other forms of interfering devices are employed.

In order to reset the registry wheels to zero whenever it is desired, I provide the following devices. The same device is applied to each bank of registry wheels, so I will confine my description more particularly to the resetting devices for the primary registry wheels. A

longitudinal slot is cut in each of the shafts K and L, upon which shafts the registry wheels are loosely mounted so that the shaft will turn without moving the wheels, and within this slot a resetting bar Y is placed flush with the surface of the shaft. This bar Y is provided with a series of lugs $p$, one for each registry wheel, extending above the surface of the shaft and each registry wheel is provided with a lug $r$, to be engaged by its corresponding lug $p$ when the resetting device is in operation. A coiled spring $s$, keeps this bar Y pressed to the left and normally with the two sets of lugs $p$ and $r$, out of engagement with each other. The outer or operating end of the bar Y extends through the side of the case and is at the end made circular in cross section as shown at $t$, in Fig. 5, so as to turn easily in the circular opening in the side of the case, and this end provided with the key or crank arms A′: In order to reset the registry wheels to zero, the bar Y is pushed in against the spring $s$, so that the lugs $p$ on the bar will be ready to engage the lugs $r$ on the registry wheels and the key A′, is then turned so that the bar will pick up each of the registry wheels and return same to zero. In order that the user may be sure to stop the registry wheels at the zero mark, the key A′ is provided with an inwardly extending pin $u$ (best shown on the key to shaft L Fig. 2 and in Fig. 5). The outermost lug $p$, when the shaft is in its normal position, stands within the slot $v$, which is cut in the casing, so that the bar Y cannot be turned without pressing it in to bring the lugs $p$ and $r$ into engagement. One edge of the casing is raised or has an inwardly projecting shoulder $b'$ (Fig. 2) and outside the casing an arm $c'$ is secured which is cut away at its lower edge as shown in Fig. 5. Now when the user presses the bar Y in until the outer most lug $p$ will just clear the shoulder $b'$, the bar Y can then be turned a little more than three quarters of a revolution when the pin $u$ will come in contact with the lower edge of the arm $c'$ and the bar Y cannot be turned farther until the user allows the bar to be moved outwardly by the spring $s$ until the outermost lug $p$ touches the inside of the case, the pin $u$ being of the same length as the projecting shoulder $b'$ and as the thickness of arm $c'$, the user can then continue the revolution of the bar Y (the pin $u$ clearing the arm $c'$) until the lug $p$ comes in contact with the shoulder $b'$ on the casing, when the bar Y will be stopped. The lugs $r$ on the registry wheels are fixed in such relation to the zero marks thereon that when the bar Y is thus turned a complete revolution, the registry wheels will all be returned to zero. It will be understood that each bank of registry wheels is provided with a similar resetting device.

The advantages of my construction over older devices are its simplicity, cheapness, durability. Only a single bar is employed for all the wheels of a bank and only one spring is needed, no separate pawls and springs for each wheel are required. There is nothing that can get out of order.

In the first part of my invention, I have shown gravity dogs to effect the registration and two stop bars acting in conjunction with the registry wheel to limit the vibration of the dog, and thus to act as a positive stop on the registry wheel after the registration is accomplished while the dog is in engagement with the wheel, and I have already pointed out that instead of gravity dogs the pawls may be pivoted to their respective keys, when this is done, it will not be necessary to provide the bar M, as the pivoting of the dogs to the keys will then accomplish in itself the functions of this bar, as will be readily understood.

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

1. In a cash register the combination with each operating key, registry wheel to register the value thereof and loose gravity dog to effect said registration, of stops at the front and rear of said dog to limit its vibration and acting in conjunction with said registry wheel to positively arrest the movement of the wheel after each registration, substantially as shown and described.

2. In a cash register the combination with a series of operating keys, registry wheels to register the values thereof and loose gravity dogs to effect said registration, of stop bars common to all of said dogs at the front and rear thereof to limit their vibration and acting in conjunction with said registry wheels to positively arrest the movement of any of said wheels after each registration, substantially as shown and described.

3. In a cash register the combination with each operating key primary registry wheel to register the value thereof, and secondary registry wheel to receive transfers from said primary wheel, of a broad registry pawl having a width just sufficient to fit between the ratchet teeth of said primary and secondary wheels upon the completion of a registration whereby said primary wheel will be positively stopped from further movement, substantially as shown and described.

4. In a cash register the combination with a series of operating keys registry wheels to register the values thereof and loose gravity pawls to effect said registration of a stop bar common to all of said pawls, rectangular in cross section, to limit the vibration of the pawls and provided with a shoulder with recesses in said pawls to be engaged by said shoulder, and to thus limit the stroke thereof, substantially as and for the purpose described.

5. In a cash register the combination of a series of operating keys, each provided with an arm carrying a tooth or lug and a ratchet bar extending across said keys, provided with a series of sets of ratchet teeth or lugs, one set for each key arm, said ratchet bar sliding

in guides across the plane of movement of the keys, to allow same to operate, with spring or equivalent to return same to its normal position, substantially as shown and described.

6. In a cash register the combination of a series of operating keys each provided with an arm carrying a tooth or lug, and a ratchet bar extending across said keys, provided with a series of sets of double acting ratchet teeth or lugs, one set for each key arm, said ratchet bar sliding in guides across the plane of movement of the keys to allow same to operate with spring or their equivalent, to return said bar to its normal position when shifted in either direction, by the positive or reverse stroke of the key operated, substantially as shown and described.

7. In a cash register the combination with a series of operating keys, each provided with an arm, of a shaft extending across said keys and a series of hubs loosely mounted on said shaft rotatable and movable longitudinally thereon, and having their edges beveled, said hubs arranged so as to permit the operation of one key at a time and to prevent the operation of two or more keys of the series simultaneously, substantially as shown and described.

8. In a cash register, the combination, with a series of groups of operating keys, each provided with an arm, of a shaft extending across all of said groups and a series of sets of hubs loosely mounted on said shaft and both rotatable and movable longitudinally thereon and having their edges beveled, with stops on said shaft between each group of hubs, said hubs arranged so as to permit the operation of one key of each group simultaneously but so as to interfere with and prevent the simultaneous operation of two or more keys of each group, substantially as shown and described.

9. In a cash register the combination with a series of operating keys each provided with an arm carrying a lug, and a transverse shiftable ratchet bar having a series of sets of ratchet teeth, one set for each key, of a shaft extending across said keys, parallel with said ratchet bar, with a series of hubs loosely mounted on said shaft and movable laterally thereon, said hubs arranged to permit the operation of one key at a time and to prevent the operation of two or more keys of the series simultaneously whereby the operated keys may be properly arrested and the unoperated keys locked through the medium of a single arm on each key lever, substantially as shown and described.

10. In a cash register the combination with a series of numbered registry wheels, loosely mounted on a common shaft, each wheel carrying a lug on its inner periphery, and said shaft being slotted longitudinally, of a resetting bar fitting within said slot and shiftable lengthwise therein with spring to return said bar to its normal position, said bar having lugs to engage with the lugs on the registry wheels and normally held out of engagement therewith but shiftable into engagement when it is desired to reset the wheels to zero, substantially as shown and described.

11. In a cash register the combination with a resetting device for the registry wheels consisting of a bar provided with lugs laterally shiftable into line with corresponding lugs on the registry wheels, of a slot in the case to receive the outermost lug with shoulder on inner edge of the slot and spring acting on said resetting bar to return the bar to the inner edge of the case after it has passed the shoulder on the slot and thus to stop the resetting bar after each complete revolution, substantially as shown and described.

12. In a cash register the combination with a resetting device for the registry wheel consisting of a bar provided with lugs laterally shiftable into line with corresponding lugs on the registry wheels, of a slot in the case to receive the outermost lug with shoulder on the inner edge of the slot, spring acting on said resetting bar to return it to its normal position, pin on said bar without the case and curved arm without the case to engage with said pin and prevent the complete revolution of the bar until the spring has acted on said bar to bring the outermost lug thereof into the pathway of the shoulder on the slot and thus stop the resetting bar with each complete revolution substantially as shown and described.

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Witnesses:
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H. S. MILLER.