

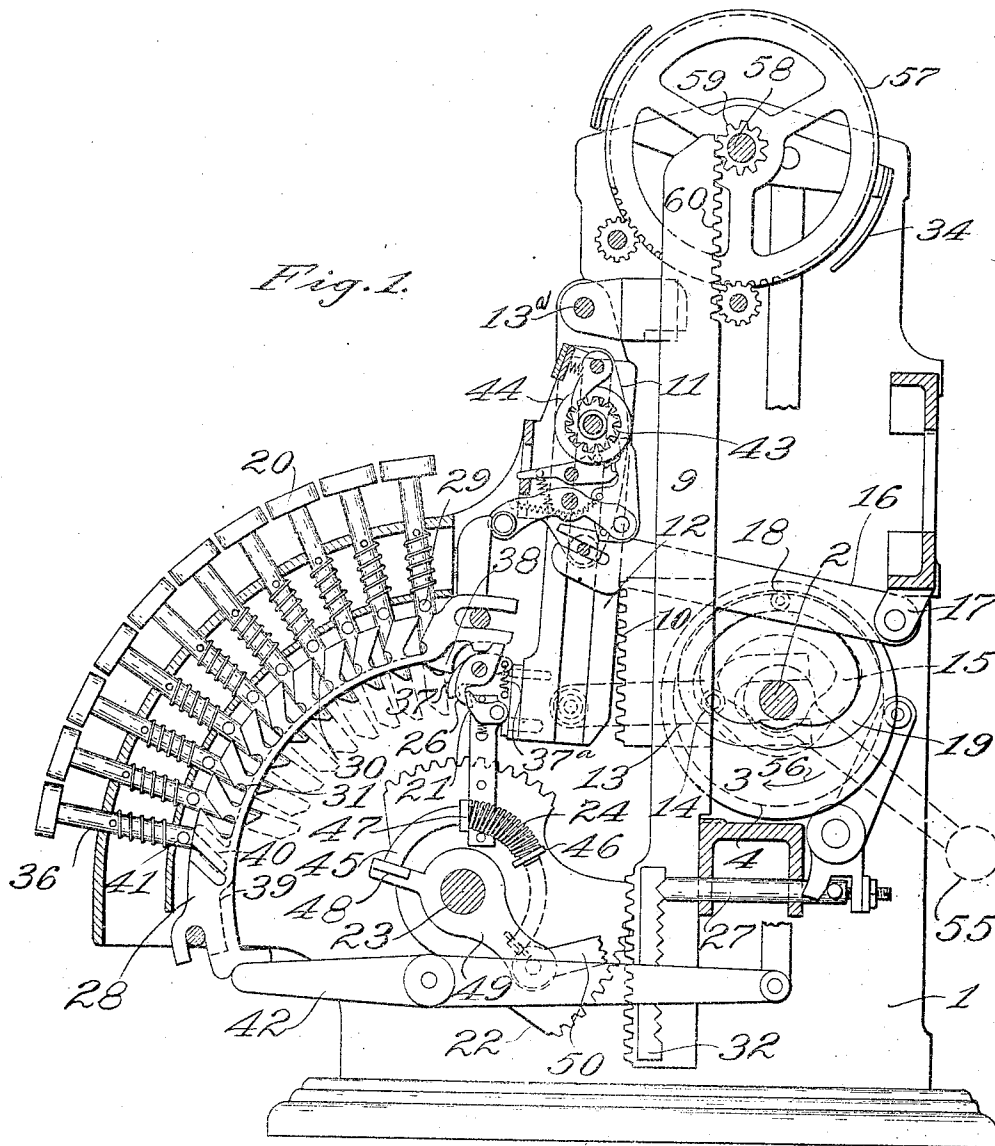
E. S. CHURCH.
CASH REGISTER.

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1,005,601.

Patented Oct. 10, 1911

2 SHEETS-SHEET 1.



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2 SHEETS—SHEET 2.

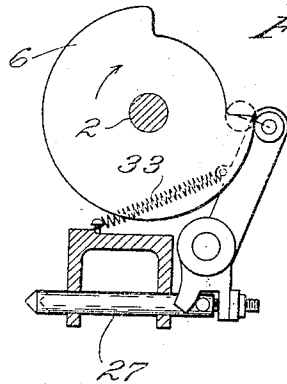


Fig. 5.

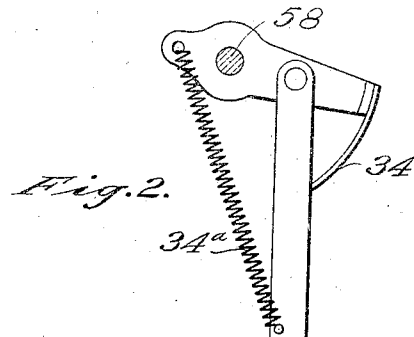


Fig. 2.

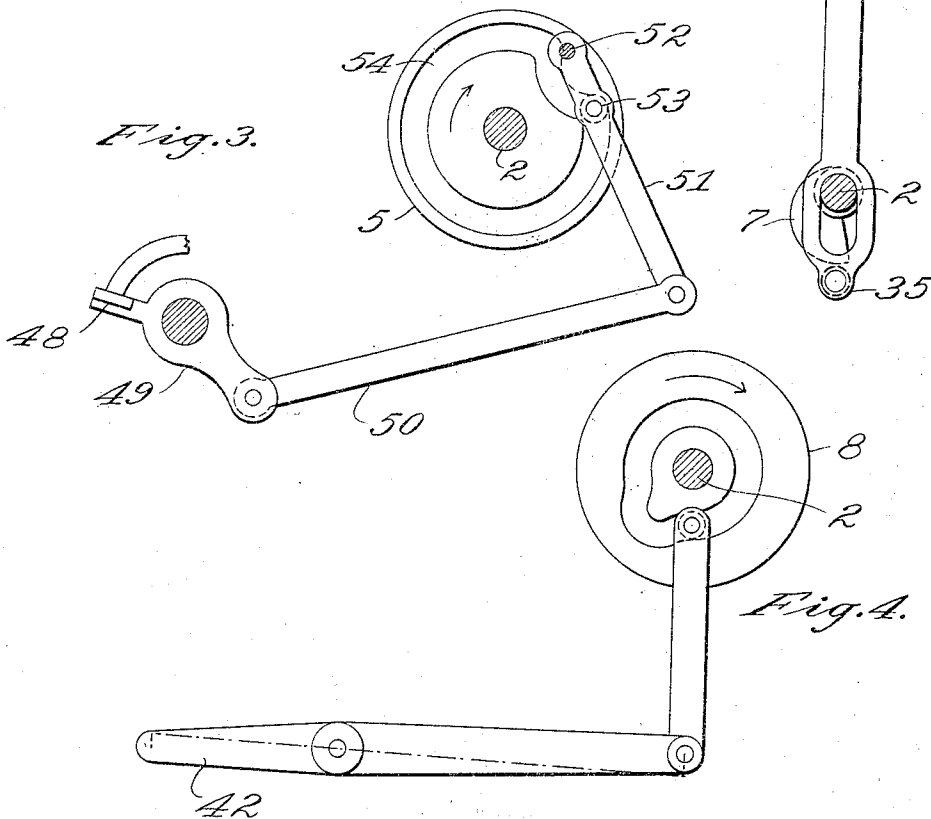


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

EDMUND S. CHURCH, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

CASH-REGISTER.

1,005,601.

Specification of Letters Patent.

Patented Oct. 10, 1911.

Application filed September 12, 1907. Serial No. 392,564.

To all whom it may concern:

Be it known that I, EDMUND S. CHURCH, 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 I declare the following to be a full, clear, and exact description.

This invention is an improvement of that type of cash register described in Letters Patent of the United States, No. 751,611 issued to Thomas Carroll, Feb. 9, 1904.

The main objects of this invention are; to provide an improved mechanism for adjusting the registering racks to particular operative positions; to provide an improved means for locking the racks in any of such positions; to provide improved means for controlling spring actuated indicating mechanism.

With these and incidental objects in view, the invention consists in certain novel features of construction and combination of parts, the essential elements of which are set forth in appended claims and a preferred form of embodiment of which is hereinafter described with reference to the drawings which accompany and form part of this specification.

Of said drawings: Figure 1 is a vertical transverse section, the casing and cash drawer being omitted. Fig. 2 is a detail of the flash. Fig. 3 is a detail of the cam which operates mechanism, first, for returning the segments and their corresponding racks to their initial positions and second, for compressing the springs which operate the segments. Fig. 4 is a detail of the cam which by its connection to the key detent strip releases depressed keys at the end of each complete revolution of the operating handle. Fig. 5 is a detail of the cam and detent which lock the racks in any position to which they are set.

The cams illustrated in Figs. 2, 3, 4 and 5 are shown in the relative positions which they assume at the beginning and ending of each complete operation of the machine.

The device comprises a movable counter, the pinions of which engage differentially set racks, as shown in the Carroll patent above referred to. The counter is also operated by cams as shown in said patent. Banks of keys have, however, been substituted for the operating levers of the Carroll

device and a novel construction used for setting the racks. This consists of spring pressed segment gears in mesh with the racks and cams which set and release the segments and also compress the springs by which the segments are actuated, regardless of any movement of the segment. But one bank of keys and the mechanism operated thereby is shown in the drawings. In the actual machine this bank of keys and the mechanism is duplicated several times.

In the device shown in the drawings the frame 1 has journaled therein the shaft 2 extending longitudinally through the machine. The operating crank 55 shown by dotted lines in Fig. 1 is rigidly secured to the shaft 2. Rigid upon this shaft are the cams 3, 4, 5, 6, 7 and 8. The cams 3 and 4 shown in Fig. 1 operate the registering mechanism. The registering mechanism is adapted to be moved first, toward the rack bar 9, so that the counter pinions 43 will come into the plane of the rack teeth 10, second, downwardly over said racks, third, outwardly for throwing the pinions out of mesh with the rack teeth, and finally returned to its initial position as shown in Fig. 1, the amount which the counter is turned being dependent upon the position of the racks.

The register wheels 44 are mounted in the frame 11, while the frame 11 is slidably mounted in a swinging frame 12. The frame 12, which is pivoted at 13, is moved toward and away from the racks 9 by the link 13, which is provided with an anti-friction roller 14 which projects into the cam groove 15. The cam groove 15 is so formed with respect to the center of the shaft 2 as to swing the frame 12 toward the racks and hold it in that position until the counter has passed down over the racks, then to return the frame to its outer position and thereby disengage the counter pinions from the racks.

The vertical movement of the counter is effected by the lever 16 which is pivoted at its rear end to a fixed bracket 17 and is provided with a roller 18 which projects into the cam groove 19. The movement of this lever is so timed as to draw the counter down over the racks while the counter pinions are in position to engage the rack teeth and to return the same after the counter pinions have been disengaged from the racks.

The keys 20 are slidable in the frame of the machine and when depressed will project into the path of a dog 21, which is mounted on a rocking segment gear 22, loosely mounted on the shaft 23. A spring 24 urges the segment toward the left of Fig. 1 but is normally prevented from doing so by the detent 26 and the plunger 27. The spring 24 is coiled around a curved rod 45 and is compressed between the head 46 of said rod and a lug 47, fixed to the segment gear 22. The rod 45 is slidable in said lug and is secured at 48 to a lever 49. The opposite end of the lever 49 is connected by a link 50 to a lever 51 (see Fig. 3) pivoted at 52 and provided with a roller 53 which projects into a cam groove 54. It will be seen from the form of the cam groove 54, that upon starting to rotate the operating crank 55 in the direction of the arrow 56, the lever 49 coming in contact with the lug 47 will move the segment 22 to its zero position provided the segment has been released in the last preceding operation of the machine. It will then be held in its zero position if no key has been depressed by the detent 26. In case a key has been depressed, the detent 26 would be swung out of its engaging position and the segment would immediately swing back under the pressure of the spring 24 until stopped by the depressed key.

The bank of keys is provided with a detent plate 28 which is moved upwardly to swing the detent 26 out of engagement with the dog 21, by the depression of any key of the bank. The upward movement of the plate 28 is effected by one of the pins 29 extending from the shank of each key coming in contact with one of the inclined surfaces 30 on said detent plate. The pins 29 also cooperate with notches 31 in the detent plate, for the purpose of retaining depressed keys in such position until the shaft 2 has been caused to make one complete revolution. A release key 36 is provided for each bank for the purpose of releasing any key that has been depressed by mistake to which end a pin 41 on the release key is adapted to enter an inclined slot in plate 28 to lift the plate out of engagement with a depressed value key. As the upward movement of the plate 28 upon the depression of any key causes the detent 26 to be swung out of engagement with the dog 21, and as it is desirable upon the depression of the release key to retain said dog in its upper position, a detent 37 is provided for so doing. The detent 37 is forced into engagement with the dog 21 by the shoulder 38 on a plate 39, provided with a cam slot 40 which co-acts with the pin 41 on the release key 36. The detent 37 is normally held out of engagement with the dog 21 by a spring 37^a. The construction and arrangement is such that detent 26 is normally in engagement with dog 21 while

detent 37 is normally out of engagement with the dog. Detent 26 is rocked out of engagement by the depression of a value key and permitted to return into engagement on the release of a value key, whether accomplished by the release key 36 or releasing lever 42, while detent 37 is rocked into engagement by the depression of release key 36 but only remains in engagement while the release key is held depressed.

The keys are released at the end of each operation of the machine by the cam action illustrated in Fig. 4, the lever 42 lifting the detent strip 28.

Each rack 9 is provided with a notched alining plate 32, co-acting with the plunger 27 which is engaged with and disengaged from the alining plate by the device shown in Fig. 5, the spring 33 tending to withdraw the plunger from engagement but being prevented from so doing by the cam 6, except during the time in which the racks are being restored and set.

The flash 34 is immediately drawn over the exposed indicators at the starting of the operating crank by the spring 34^a. The release of the spring 34^a is effected by the roller 35 being drawn into the cut away portion of the cam 7, as will be understood from Fig. 2 of the drawings. The cam 7 returns the flash 34 to normal position at the end of each operation.

The indicator drum 57 is journaled on the shaft 58. Revolvable with and secured to the indicator drum is a pinion 59 which meshes with the teeth 60 of the rack 9.

The operation of the machine is as follows: By depressing one of the keys 20 the detent 26 will be thrown out of engagement with the dog 21 as has already been described. The shaft 2 is then caused to make one revolution. The cams act so as to first release the flash 34 and withdraw the plunger 27 from engagement with the alining plate 32 and return the segment 22 to its zero position by means of the lever 49 which is immediately returned to its initial position and followed by the segment 22 which is thrown forward under the action of the spring 24 until stopped by the depressed key. By this movement of the segment 22, in mesh with the rack 9, the rack 9 will simultaneously set the indicator to the proper numeral and bring a certain number of teeth 10 into position to be engaged by the counter pinions. Immediately after the rack 9 has been set, the plunger 27 is again forced into engagement with the alining plate 32 and locks the rack. The register is now brought down its constant distance causing the pinions 43 to be engaged by the rack teeth 10 and turned an amount which corresponds to the number of rack teeth which have been moved into the path of the register, and then moved out of engagement

with the rack and returned to the starting position. Finally, before the machine comes to rest, the lever 42 is rocked, throwing the detent plate 28 out of engagement with the depressed key.

In case the operating crank is turned when no key has been depressed, the segment 22 would merely be returned to its upper position and retained by the detent 26 in such position so that no registration would be effected.

The plungers 27 are so positioned relatively to the notches on alining bar 32, that the alining movement of the plungers slightly depresses rack bar 9, or in other words, the keys 20 will stop the bar 9 so that the bottom of the notch in bar 32 opposite plunger 27 is slightly above the center of the plungers. The objects of this construction is to slightly raise the dog 21 away from the key so that there is less friction on said key and a light returning spring will be sufficient.

While the form of mechanism here shown and described, is admirably adapted to fulfil the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein shown, for it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In an accounting device, the combination of a movable register; a movable rack; a spring for moving the rack; manipulative devices for controlling the movement of the rack; means for moving the register over the rack; and means for storing power in the spring when said rack is at rest.

2. In an accounting device, the combination of a movable register; a movable rack; a spring pressed segment gear adapted to engage the rack; manipulative devices adapted to project into the path of the segment gear; means for returning the segment gear to its zero position, and means for compressing the spring by which the segment gear is actuated after the segment has been returned to its zero position.

3. In an accounting device, the combination of a register; a movable rack; a spring for moving the rack; manipulative devices for setting the rack; means for storing power in the spring when said rack is at rest, and means for moving said register over said rack.

4. In an accounting device, the combination of a register, a movable rack, a spring pressed segment gear adapted to engage the rack, a detent to retain said segment in its zero position, keys adapted to simultaneously release said detent and project into the path of said segment, a locking device for holding said rack in adjusted position until a subsequent operation of the machine, and

means for returning the segment to its zero position and then compressing its actuating spring as a preliminary to such subsequent operation.

5. In an accounting device, the combination of a register; mechanism for operating the register; means adapted to normally lock said mechanism against operation; depressible keys for unlocking said mechanism; and a release key adapted to release a depressed key and lock said mechanism against operation.

6. In an accounting device, the combination with a registering device, of operating devices for same, springs for adjusting said operating devices; keys for positioning said operating devices differentially, and means for causing said registering device to traverse said operating devices.

7. In an accounting device, the combination with a registering mechanism, of an operating device therefor with means for causing a differential positioning of said operating device, manipulative devices controlling the differential adjustment of said operating device and the operativity of the positioning means, and means for causing the registering mechanism to traverse said operating device after the same has been positioned.

8. In an accounting device, the combination with an indicating mechanism, of rack segments for operating same, springs for actuating said segments, keys for limiting differentially the movement of said segments, an operating mechanism for resetting said segments to normal position and then compressing said springs at the beginning of each operation, thereby allowing said springs to again adjust said rack segments as determined by said keys.

9. In an accounting device, the combination with an operating mechanism for same, devices having potential energy for adjusting said mechanism, keys for limiting differentially the adjustment of said operating mechanism, and means for latching said operating mechanism in its differentially adjusted position between operations of the machine.

10. In an accounting device, the combination with spring set operating devices, and keys for limiting differentially the movement of said devices and plungers for alining the operating devices said plungers being so positioned as to slightly withdraw the operating devices from the keys for the purpose specified.

11. In an accounting device, the combination with a member having a constant excursion at each operation of the accounting device, of a differentially movable element, and a spring interposed between said member and element by which the differential movement of said element is imparted there-

to, the said member being constructed to positively return the element to normal position at the beginning of each operation of the accounting device.

- 5 12. In an accounting device, the combination with depressible value keys, of differential mechanism controlled thereby, a detent for the differential mechanism normally preventing its operation, a movable element controlled by the value keys for operating the
10 detent, a release key for the value keys, a detent for the differential mechanism normally permitting its operation, a movable

element controlled by the release key for operating said second detent, and said detents so constructed and arranged that upon the release of their respective controlling keys the latches will return to normal position.

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

EDMUND S. CHURCH.

Witnesses:

J. B. HAYWARD,
ROY C. GLASS.