

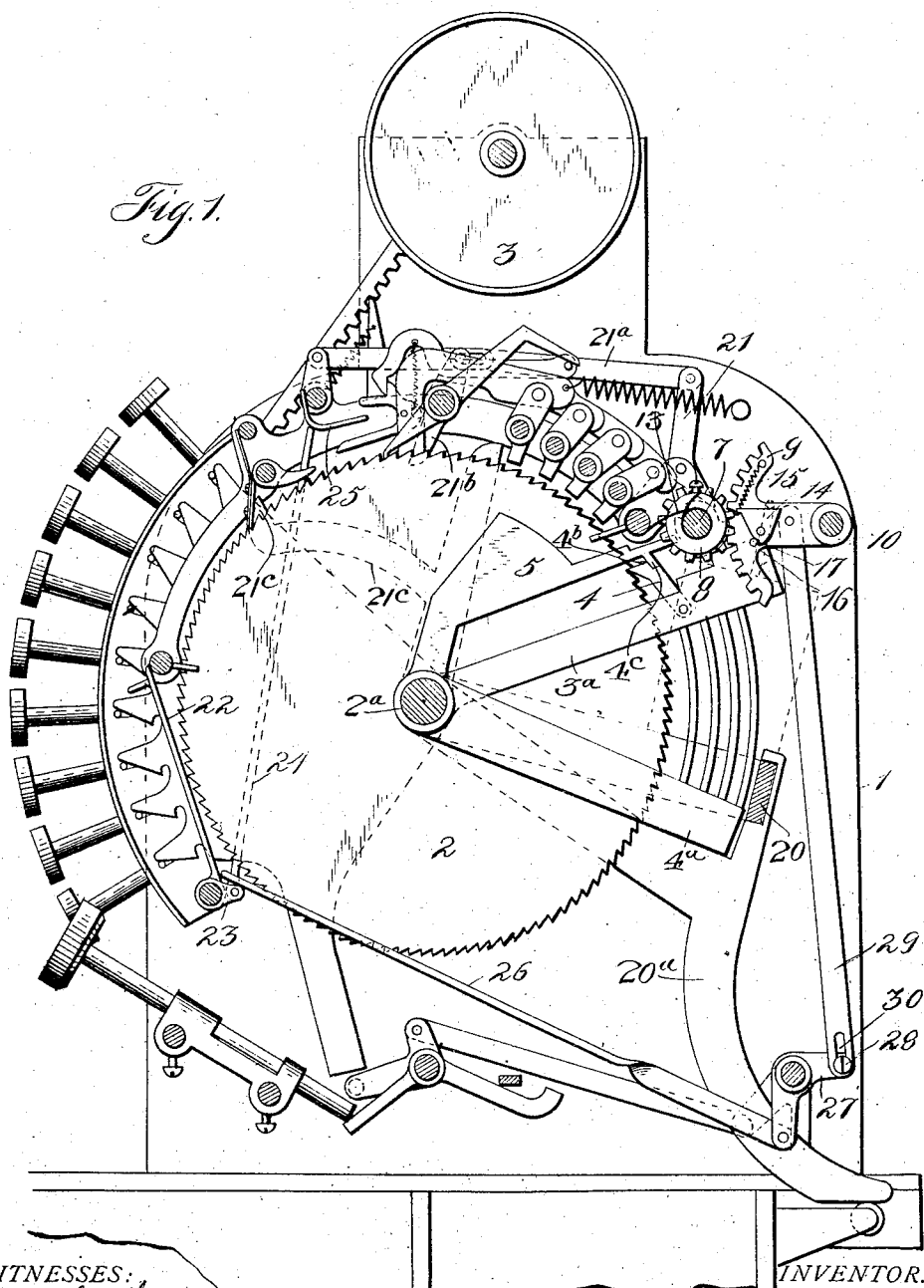
T. CARROLL.
CASH REGISTER.

APPLICATION FILED DEC. 29, 1897.

1,046,054.

Patented Dec. 3, 1912.

3 SHEETS—SHEET 1.



WITNESSES:
Wm. McCarthy
Wm. H. Muzzey

INVENTOR.
Thomas Carroll.
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ATTORNEY.

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3 SHEETS—SHEET 2.

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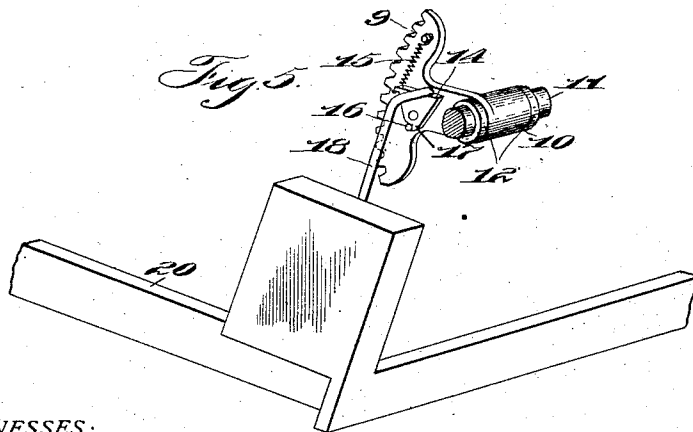
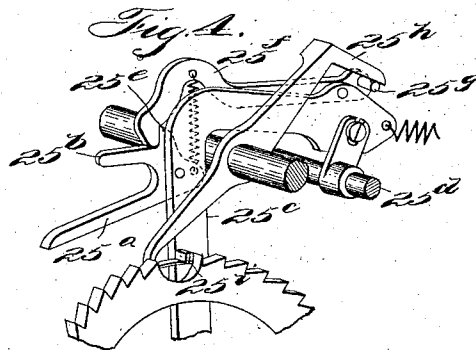
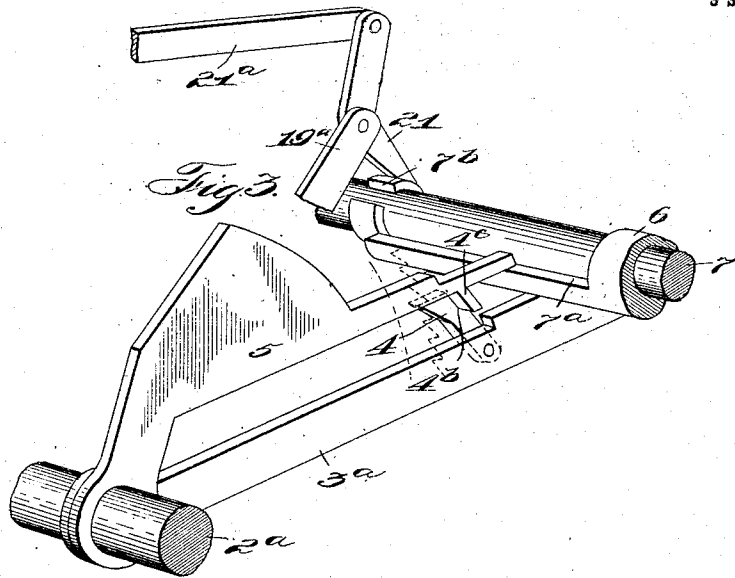
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UNITED STATES PATENT OFFICE.

THOMAS CARROLL, OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1908.)

CASH-REGISTER.

1,046,054.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed December 29, 1897. Serial No. 664,298.

To all whom it may concern:

Be it known that I, THOMAS CARROLL, 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; and I do hereby declare the following to be a full, clear, and exact description of the invention.

This invention relates to that type of cash registering and indicating machines in which the pressing in of amount keys sets up stops to limit the movements of stepped segments having compounded them with certain yokes 15 wherewith coöperate concentrically pivoted pawl-carrying arms, the latter's pawls engaging the teeth of registering wheels which are also mounted concentrically with the segments and yokes. Such a general type of machine is illustrated and described in Patent No. 570,141 issued Oct. 27, 1896, on the invention of John H. McCormick. The particular construction to which the present invention is applied, however, differs 25 somewhat from the construction shown in this McCormick patent. In the latter the registering wheels are turned by the downward swing of the pawl-carrying arms permitted by the dropping of the yokes, whereas in the later construction to which the present invention more particularly relates, this downward swing of the pawl-carrying 30 arms simply carries the pawls back over the numbers of teeth of the registering wheels corresponding with the amount keys depressed, and the said wheels are not turned to make the registration until the yokes and arms are restored to their normal positions.

In the interest of securing accurate movements of the registering wheels it was found to be desirable to lock the pawls to the wheels during the registering movement and in the construction above referred to this was accomplished by means of certain 40 weighted arms pivoted concentrically with the pawl-carrying arms and arranged to drop into engagement with the respective pawls after the latter had all been carried back over the teeth of the registering wheels the distance determined by the depressed keys. A well known defect which has to be guarded against in machines of

this character is that of overthrow of the registering wheels as a result of energetic operation of the machine. The locking of 55 the pawls to the registering wheels in the manner above indicated was expected to prevent such defective action but inasmuch as a disengagement of the weighted arms from the pawls took place as the pawl-carrying arms were restored to their normal upward positions it has been found to be still possible to overthrow the registering wheels by a violent operation.

The prime object of the present invention is to effectually overcome this difficulty and in a construction such as that above indicated, this is accomplished by providing not only for the pawls being locked in engagement with the registering wheels at the commencement of the registering movements and until such movements have 70 ceased, but furthermore to provide for maintaining this locked relation until a subsequent operation of the machine. This is found to effectually cure the defect above noted.

With this and incidental objects in view, the invention consists in certain novel features of construction and combinations of 80 parts, the essential elements of which are set forth in appended claims and a preferred form of embodiment of which is herein-after specifically described with reference to the drawings which accompany and form 85 part of this specification.

Of said drawings: Figure 1 represents a cash registering and indicating machine of the type above mentioned in vertical section from front to rear, the present invention being shown applied thereto. Fig. 2 is a top plan view of the machine. Fig. 3 represents in perspective and on an enlarged scale the pawl-locking devices employed in the construction hereinbefore mentioned as 95 having followed that shown in the McCormick patent. Fig. 4 represents in a similar manner devices also used in said known construction for effecting a transfer from one registering wheel to the next higher wheel; 100 and Fig. 5 represents in perspective some of the devices provided by the present invention to overcome the difficulty already mentioned.

Inasmuch as the keyboard and devices directly controlled thereby do not materially differ from those shown in said McCormick patent, no detailed description or illustration of the same is here attempted and for the same reason the drawer-releasing and key-detent devices are not specifically described. None of these things are essential to a complete understanding of the devices of the present invention. Inasmuch however as the later construction alluded to is not illustrated in any prior patent it will be described more in detail than would otherwise be necessary.

The numeral 1 designates the main supporting frame of the machine; 2 the registering ratchet wheels mounted to turn independently upon a fixed shaft 2^a; 3^a the pawl-carrying arms which are also independently journaled upon said shaft 2^a and carry the pivoted pawls 4 for engagement with the teeth of the wheels 2; 4^a the yokes which are also journaled upon the shaft 2^a and upon which rest depending curved abutments of the said arms 3^a; and 5 the weighted arms or locking levers also journaled upon the shaft 2^a and formed with noses 4^c which are adapted to engage in notches 4^b of the pawls 4 for the purpose of locking the latter to the registering wheels. The devices for controlling these weighted arms in the known construction heretofore mentioned comprise a substantially semi-cylindrical frame 6 journaled upon a shaft 7 fixed in the main frame-work 1, said frame 6 having a longitudinal shoulder 7^a on which the rear ends of the weighted arms 5 would normally rest; a spring 13 coiled about the shaft 7 and fastened at one end to the main frame and at the other to the journaled frame 6 so as to tend to turn the latter in a direction to carry the shoulder 7^a back from under the ends of the weighted arms 5 and permit the latter to drop; a latch lever 21 pivoted to a fixed arm 19^a of the main frame and adapted to engage a shoulder 7^b of the journaled frame 6 for the purpose of restraining the spring 13; and a link 21^a connecting said latch-lever 21 to a tappet lever 21^b. In this already-known construction the several yokes 4^a are upheld by a main lever 20^a which is compounded with a yoke 20, said lever and yoke being journaled upon the central shaft 2^a and the lever co-acting with the cash drawer so as to be elevated by the closing of the latter. The operation of the release key and the opening of the drawer are accompanied by the dropping of this main lever 20^a and its yoke by gravity, and this dropping of the main yoke and lever will be accompanied by the dropping of the auxiliary yoke 4^a belonging to stepped segments which have been released by the operation of amount keys and of course the

dropping of the yokes is accompanied by the dropping of pawl-carrying arms resting upon them and which are to operate in the return movements to make the registration. It is provided that at the conclusion of the dropping movement the weighted levers 5 shall be released so as to drop into engagement with the pawls and lock the latter to the registering-wheels as the up-stroke commences. Hence the main lever 20^a has compounded with it an arm 21^c which acts against the aforesaid tappet-lever 21^b to disengage the latch lever 21 from the shoulder of the spring-actuated frame 6 at the proper time. Now in this already-known construction, the normal latched adjustment of the spring-actuated frame 6 was such that the shoulder 7^a held the weighted arms 5 elevated and their noses 4^c disengaged from the notches 4^b of the pawls so as to leave the latter free to drop, from which it will be understood that at the conclusion of any operation of the machine these weighted levers would be disengaged from the pawls. Notwithstanding that the locked relation between the pawls and the wheels obtained during the entire registering stroke and was not destroyed until that stroke had been concluded, it was nevertheless found that an overthrow of the registering wheels might still take place in a violent operation of the machine.

By the present invention, means are provided whereby the locked relation of these parts will continue after a complete operation of the machine has been made and will not be disturbed until a subsequent operation. According to the present invention, therefore, the said spring-pressed frame 6 stands normally in a position which permits engagement between the noses 4^c of the weighted arms 5 and the notches 4^b of the pawls 4 and in fact the shoulder 7^a of said frame is entirely removed from the path of the said arms. The present invention therefore provides for turning the frame in a direction to lift the weighted arms 5, at the very outset of an operation of the machine instead of at the conclusion of an operation. Hence the latch-lever 21 does not normally engage the shoulder 7^b of the said rocking frame 6 as in the previous construction. And such engagement does not result until an operation of the machine has been started, and then at the conclusion of the preparatory or downward swing of the yokes and pawl-carrying arms the frame is released in the manner heretofore described so as to permit the falling of the weighted arm into engagement with the pawls.

The means shown in the present case for carrying out the invention comprise a gear wheel or pinion 8 fixed to one end of the rocking frame 6; a toothed segment or rack

9 in mesh with said gear wheel or pinion and formed with an elongated hub or sleeve 10 journaled upon a cross-rod 11 of the main frame between collars 12 fixed to said rod (Fig. 2); and a triangular plate 14 pivoted to the side of said segment and drawn by a spiral spring 15 against a stop-pin 16 on said segment,—the said spring being connected at one end to the forward corner of said triangular plate and at the other end to a pin on the segment and the lower corner of said triangular plate being formed with a nose 17 to engage said pin 16. When the parts are in normal relation, the upper side or edge of the said plate is substantially horizontal. The main yoke 20 heretofore mentioned has an upward projection at one side in the nature of a weight as shown in Fig. 5 and there projects from the top of this portion an angular arm 18 whose horizontally extending upper end-portion overlies the triangular plate 14, normally engaging the upper side or edge of the latter as clearly illustrated in said figure. It will now be seen that upon the lowering of the main yoke, this arm 18 will act against said plate to the rear of its pivot and so long as the plate does not yield by turning on its pivot, the segment 9 will be swung downwardly, and consequently the pinion 8 and the frame 6 will be turned against the tension of the spring 13. This is exactly what takes place at the commencement of an operation of the machine with the result that the said frame 6 lifts the weighted levers 5 out of engagement with the pawls 4 and said frame is latched in its new adjustment by engagement of the lever 21 with the shoulder 7^b. As the main yoke descends the point of contact of the angular arm 18 with the plate 14 shifts to the rear, or to the right in Fig. 1, this shifting being due, of course, to the fact that the pivot rods 2^a and 11 of the yoke and the segment gear 9, are on opposite sides of the point of contact of the angular arm 18 with the plate 14, the line joining the said pivot rods being below the said point of contact in the normal position of the parts. Therefore, the angular arm 18 will soon pass to the rear of the plate 14, thereby releasing the plate and the segment gear, and said gear will be immediately latched by the latch arm 21, thereby holding the shoulder 7^b in elevated position. As the main yoke with its lever 20^a reaches the limit of its downward swing, the tappet arm 21^c encounters the tappet lever 21^b and the latch lever 21 is thereby disengaged from the shoulder 7^b of the frame 6 and the spring 13 immediately turns said frame back and removes the shoulder 7^a from beneath the weighted levers 5 whereupon the latter drop into engagement with the pawls 4. Of course this backward turning of the frame 6 under the influence

of its spring 13 restores the gear 8 and segment 9 to normal position. This normal relation of these parts which permits the locking levers 5 to remain engaged with the pawls 4 is not disturbed by the return of the main yoke and its arm 18, for the latter simply slides along the inclined rear edge of the plate 14 displacing the same against the tension of the spring 15 until the upper end portion of said arm 18 passes by the rear upward corner of the triangular plate whereupon the latter resumes its normal position with its top edge under the horizontal end-portion of the said arm 18, and its nose 17 abutting the pin 16.

It will be seen that the construction above described as carrying out the present invention thoroughly fulfils the primary objects stated. However, it is to be understood that this object can be carried out by other means within the scope of the present invention.

As already stated, the present invention provides for leaving the pawls locked to the registering wheels at the end of an operation. Hence when it is desired to turn the said wheels to zero it will be necessary to unlock the pawls and so the present invention also provides special devices for accomplishing this purpose. Means which are employed in the known construction heretofore mentioned are utilized in this connection, such means being those which in said former construction simultaneously disclose to view the registering wheels and disable the transfer mechanism. In order that the transfer devices here referred to may be fully understood, a brief description will be given of the mechanism of the already-known construction, with reference more particularly to Fig. 4. A series of shafts 25^a are arranged to be successively rocked upon the opening of the drawer by an arm of the lever 20^a, said shafts 25^a having for this purpose a series of tappet projections on their lower sides; they also have slotted arms on their upper sides engaging respectively with pins on levers 25^c journaled upon the central shaft 2^a, and carrying pivoted to them the several transfer pawls 25^a which have overhanging fingers 25^b. Pivoted to the rear portions of the levers 25^c are latches 25^f which engage noses 25^e on the transfer pawls to hold the latter normally elevated out of operative adjustment, the rear ends of said pawls being connected by spiral springs with said latches 25^f so that such springs serve the double purpose of impelling the pawls into operative position and bringing about engagement between the latches and the noses of said pawls. The rear ends of the latches have laterally projecting pins 25^g which are engaged by the rear ends of trip levers 25^h whose forward ends rest upon peripheries of

the registering wheels. These latter are provided at intervals of ten teeth with transfer projections 25¹ which acting upon the forward ends of levers 25^a cause their rear ends to disengage the latches 25² from the noses 25³ of the transfer pawls. The operation of this transfer mechanism will be sufficiently obvious without further description. When it is desired to turn the wheels to zero, a cover-plate 22 (Fig. 1) hinged to the main frame is drawn down to expose the wheels and this action disables the transfer pawls through the medium of a rod 24 joined to an arm 23 on the pivot of the cover-plate 22, said rod 24 acting against an angular plate 25 which is fastened to a rock shaft and extends below the over-hanging fingers 25^d of the transfer pawls so that when elevated it will prevent said pawls from dropping. This plate serves primarily to reset the transfer pawls, being rocked for this purpose at each operation of the machine through a crank and link connection with the tappet lever 21^b heretofore described. It is also utilized in the manner above indicated to hold out of operative position the transfer pawls when the wheels are to be turned to zero.

The present invention provides for unlocking the pawls 4 by the opening out of this cover-plate 22, the same being effected through the following means: A rod 26 is loosely engaged with the rod 24 at the point of union of the latter with the arm 23 and this rod 26 is coupled at its rear end to one arm of a bell-crank lever 27 pivoted on a cross-rod of the main frame and having its other arm coupled by a slot and pin connection 28—30 to a vertically extending bar 29, which at its upper end is pivotally connected with the segment 9. It will be seen that the opening outwardly of the cover-plate 22 will draw forward the rod 26 and thereby depress the forwardly extending arm of the bell-crank 27 which will have the effect of drawing down the segment 9 and thereby disengaging the weighted arms 5 from the pawl 4 the same as when the main lever 20^a operates.

There are numerous devices in and about the machine which are not described because they have no direct connection with the present invention, such for example, as the indicators 3 which operate practically the same as those shown and described in the McCormick patent.

It is believed that ample illustration and description will be afforded by the specification to clearly explain the invention and one specific mode of carrying it out. It is of course to be understood that the particular construction here shown is simply a preferred way of embodying the invention and the latter is not limited to this particular

form of embodiment but may be carried out in many other ways.

Having thus described my invention, what I claim is,—

1. In a cash register, the combination with a register, of operating pawls for the same, locking levers for said pawls, a movable frame adapted to raise said levers, a pinion on said frame, a rack engaging said pinion, and means for operating the rack from the movable parts of the machine.

2. In a cash register, the combination with a register comprising a plurality of registering wheels, of operating pawls for said wheels, locking levers for said pawls, a movable frame for operating said levers, a gear connected to said frame, and a rack engaging said gear and connected to the movable parts of the machine.

3. In a cash register, the combination with a register, of operating pawls for the same, locking levers for said pawls, a rack frame for operating said levers, a rack for operating said frame, and an arm mounted on one of the moving parts of the machine and adapted to operate said rack.

4. In a cash register, the combination with a register comprising a plurality of registering wheels having ratchet teeth on their peripheries, of operating pawls for said wheels, locking levers for said pawls, a rack frame for raising said levers, a latch for said frame, a spring connecting said frame with the main frame, a pinion on said rack frame, and a pivoted rack meshing with said pinion and adapted to be operated by the moving parts of the machine.

5. In a cash register, the combination with a register, of operating pawls for the same, locking devices for said pawls, a pivoted operating rack, means connected to said rack for operating the said locking devices, and a pivoted spring-pressed plate mounted on the rack and adapted to be struck by a projection on one of the moving parts of the machine.

6. In a cash register, the combination with a register, of operating pawls for the same, locking devices for said pawls for holding them positively in engagement with said register, a movable register shield, and means connected to said shield and locking devices for moving the latter out of cooperation with the operating pawls when said shield is moved.

7. In a cash register, the combination with a register, of operating pawls for the same, locking devices for said pawls, transferring pawls for said register, and a register shield connected to both the transferring pawls and the locking devices so as to disable them simultaneously upon said shield being moved.

8. In a cash register, the combination with

a register, of operating pawls for the same,
locking levers for said pawls, a rock frame
for operating said levers, a rack for operat-
ing said frame, an arm mounted on one of
5 the moving parts of the machine for operat-
ing said rack, a register guard plate, and
means connecting said plate with the rack.

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

THOMAS CARROLL.

Witnesses:

F. B. BARNARD,
IRA BERKSTRESSER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."