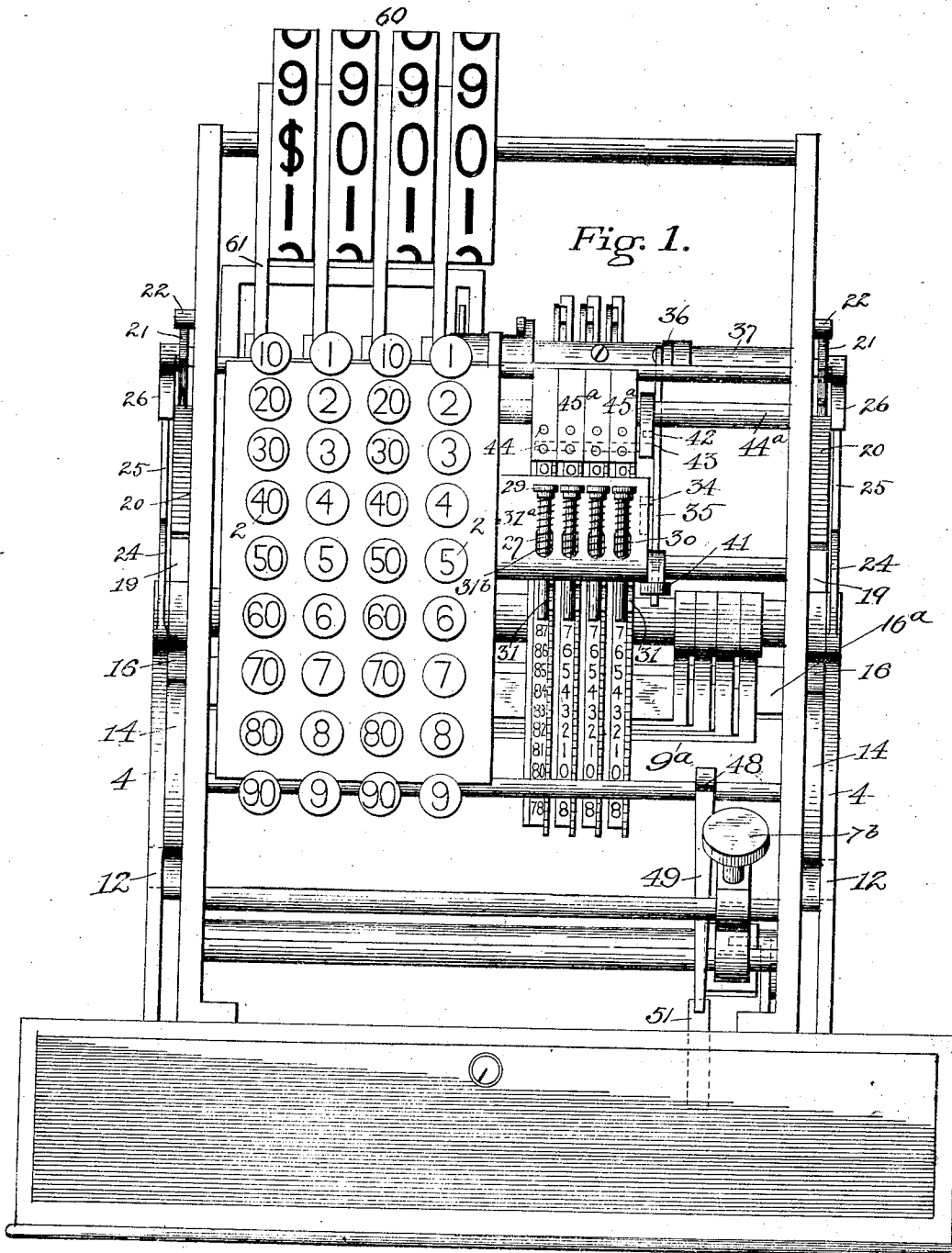


J. H. McCORMICK.
CASH REGISTER.
APPLICATION FILED DEC. 6, 1897.

1,012,682.

Patented Dec. 26, 1911.

4 SHEETS—SHEET 1.



WITNESSES:

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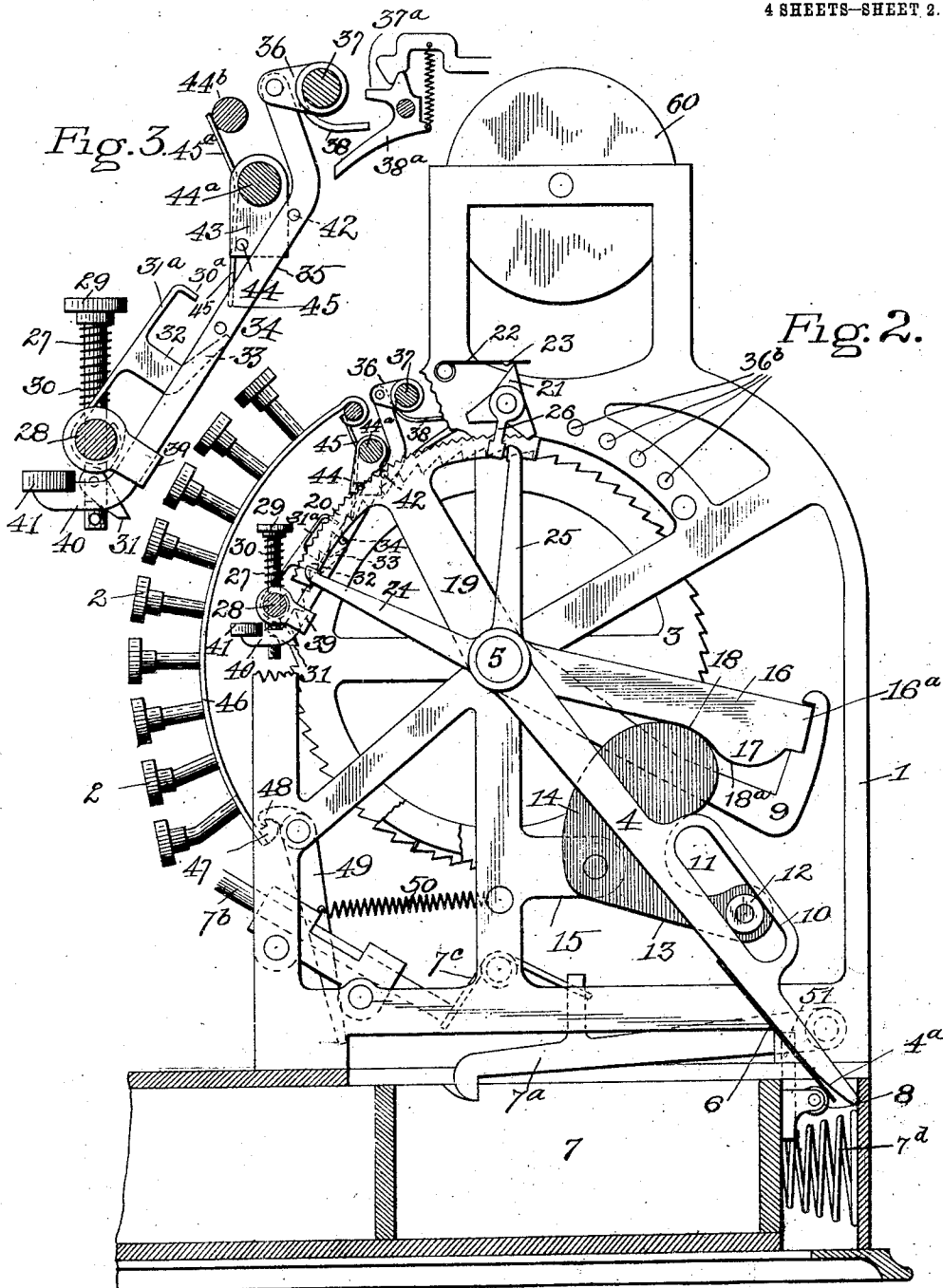
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4 SHEETS—SHEET 2.



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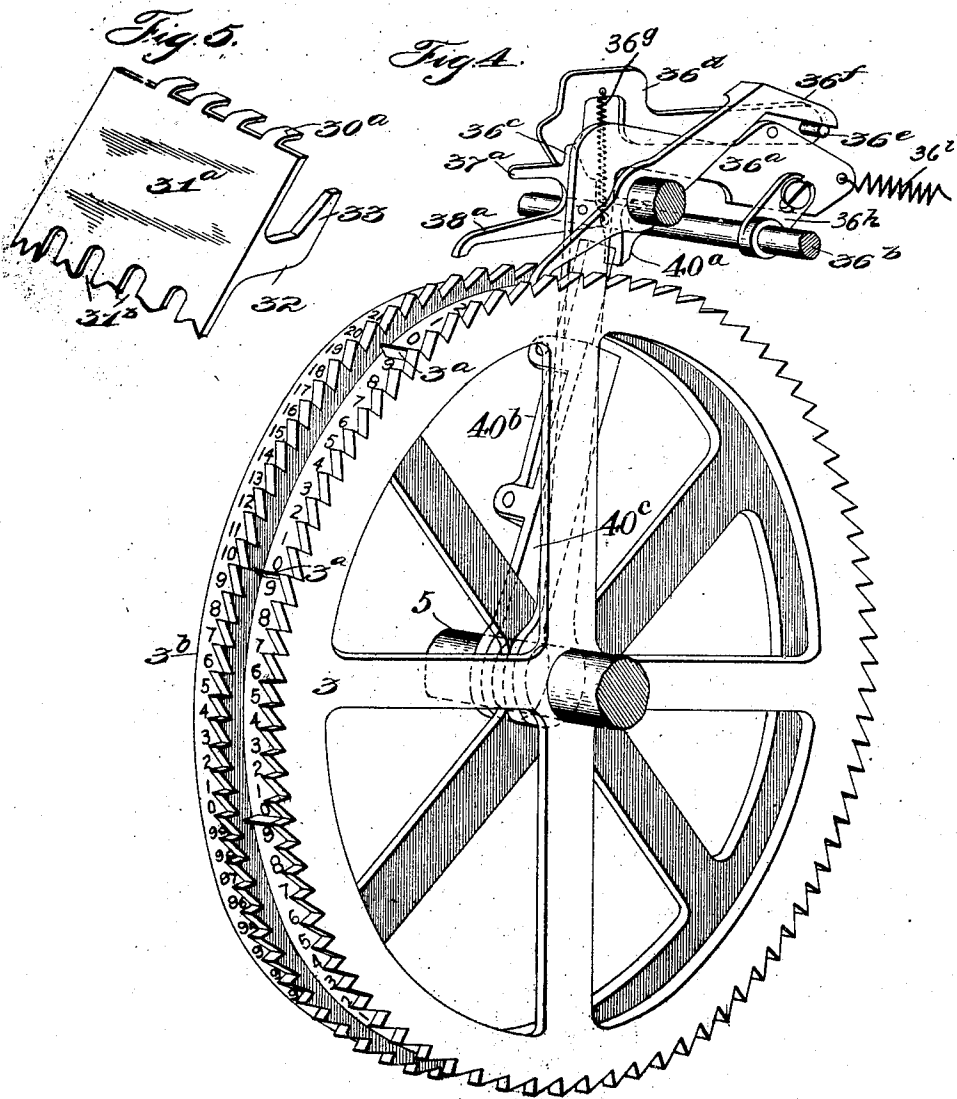
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4 SHEETS—SHEET 3.



WITNESSES:

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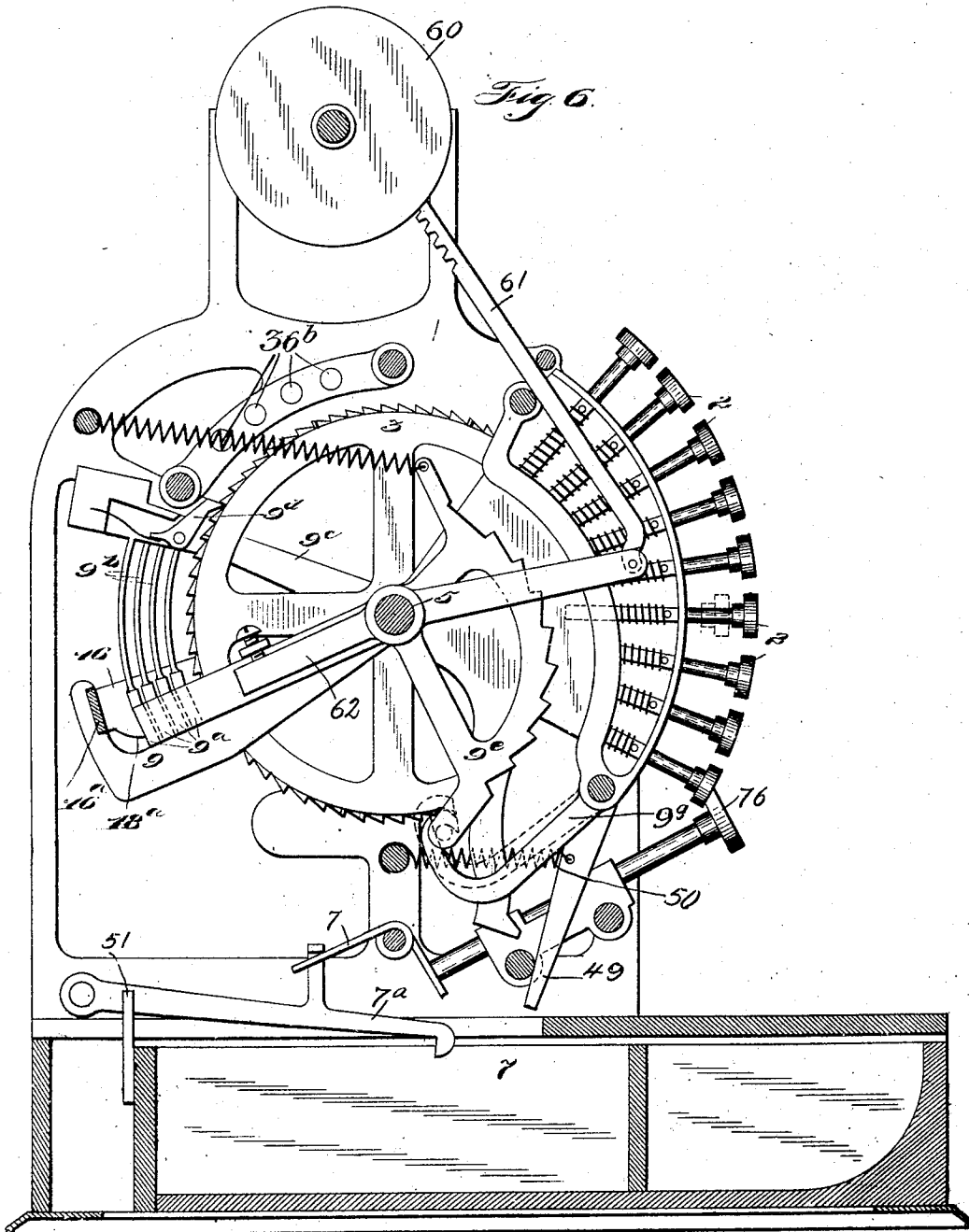
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4 SHEETS—SHEET 4.



Witnesses

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Attorney

UNITED STATES PATENT OFFICE.

JOHN H. McCORMICK, OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

CASH-REGISTER.

1,012,682.

Specification of Letters Patent.

Patented Dec. 26, 1911.

Application filed December 6, 1897. Serial No. 680,918.

To all whom it may concern:

Be it known that I, JOHN H. McCORMICK, 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 more particularly to that type of cash registering and indicating machines in which the pressing in of keys sets up stops to limit the movements of swinging stepped segments having compounded with them yokes wherewith co-operate 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 form of mechanism to which the improvement of the present invention is here shown as applied differs somewhat in general construction from that disclosed by this McCormick patent. In the latter the registering wheels are turned by the downward swinging of the pawl-carrying arms permitted by the dropping of the yokes whereas in a later construction this downward swinging of the pawl-carrying arms simply carries the pawls back over the numbers of teeth of the registering wheels corresponding with the numerals of the keys pressed in, and the said wheels are not turned to make the registration until the yokes and arms are restored to their normal positions. This restoration of parts to normal is effected in said later construction as well as in the said patented construction by the pushing in of a sliding cash drawer. The latter normally supports the yokes in elevated adjustment and the release of this drawer to be started outward by a spring, permits the falling of the yokes distances determined by the pressed in keys. It will be understood that in machines of this character the mathematical results of a series of operations as for example those pertaining to a day's transactions are periodically taken from the machine to go into book accounts, and it is essential that the register wheels

be capable of rotation to zero for the beginning of a new set of transactions. It is further to be understood that in order to properly totalize transactions it is essential that the wheels of lower denomination transfer to wheels of higher denomination, and in the particular type of machine above-mentioned the transfer actuation must take place during a different part of a cycle of operation from that in which direct or straight registering actuation occurs. Now in order to get the correct reading from the register wheels of a total of all transactions it is of course necessary that all transfers shall have been completed.

The principal object of the present invention is to provide means whereby the reading of a proper total is insured and no turning of the register wheels to zero can take place until all transfers have been effected.

The invention also aims to provide improved facilities for turning the register wheels to zero.

While a certain type of machine has been chosen for purposes of illustration of the utility of the present invention it is nevertheless to be understood that the invention is not limited to employment in connection with this particular type of machine as the essential elements for accomplishing the objects above stated may be combined with other forms of registering mechanism.

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

Of said drawings: Figure 1 represents in front elevation with casing or cabinet removed, a machine of the type above indicated the same having the improvements of the present invention applied thereto. Fig. 2 represents the machine partly in side elevation and partly in section, part of the framework being broken away to show some devices behind it. Fig. 3 represents these devices on a larger scale than they appear in Fig. 2. Fig. 4 represents in perspective register wheels and transfer mechanism. Fig. 5 is a detached fragmentary perspective of a

certain stop plate, and Fig. 6 is a section-
alized side elevation of the machine viewed
from the opposite side to that seen in Fig. 2.

While as before stated the general type of
5 machine here illustrated is disclosed in said
prior patent yet the departures from the
construction shown therein are such as to
make it necessary to give a more detailed de-
scription of the machine which the present
10 invention seeks to improve, than would
otherwise be required.

Reference numeral 1 designates a metal
supporting framework composed of side
pieces and cross rods and erected upon a
15 suitable base within which slides a cash
drawer 7 the same being under the stress of
the spiral spring 7^a inserted between it and
the rear of said base.

The numeral 5 designates a central cross-
20 rod of the supporting frame which rod con-
stitutes a bearing for various parts of the
mechanism. A series of register wheels 3
are mounted side by side to rotate inde-
pendently upon this shaft, these wheels hav-
ing 25 ratcheted peripheries and continuous
side flanges numbered sectionally from "0"
to "9" as clearly shown in Fig. 4. Upon
this central shaft 5 are also journaled a
series of nested yokes 9^a one for each register
30 wheel said yokes extending across from one
side of the frame to the other in rear of the
register wheels and being compounded re-
spectively with stepped segments 9^b (Fig. 6)
projecting on the forward side of the
35 shaft 5.

Reference numeral 2 designates the
amount keys which are arranged in ver-
tical series or banks with their stems pass-
ing radially through suitable guide plates
40 supported by the frame of the machine at
the front thereof, these keys having suitable
heads or buttons with numerals inscribed
thereon. The banks of keys co-act respec-
tively with the said stepped segments to
45 determine the extent of movement thereof.

A series of arms 9^c journaled upon the
shaft 5 have depending legs 9^a which rest
upon the yokes 9^a respectively and said arms
9^c carry spring-pressed pawls 9^d which en-
50 gage the ratcheted peripheries of the reg-
ister wheels respectively. An arm 9 also
journaled upon the central shaft 5 extends
under all the yokes 9^a and is joined to the
cross bar 16^a of an outside or main yoke 16.
55 In machines of this type it is customary for
the main yoke to be normally supported by
the closed cash drawer and for the inner
or auxiliary yokes to be separately upheld
by certain key-controlled detents one of
60 which is shown at 9^e in Fig. 6. The pushing
in of amount keys operates to displace the
detents pertaining to the banks in which
keys are so manipulated (see dotted lines
Fig. 6) and the inner ends of the stems of
65 such keys projected into the paths of cer-

tain steps of the hereinbefore mentioned seg-
ments 9^b. The drawer is held closed by a
latch 7^a and a release key 7^b is provided to
displace the latch through the medium of a
bell-crank 7^c. Upon the operation of this re- 70
lease key the drawer springs open followed
by the main yoke, and those of the auxiliary
yokes drop which have been released from
their detents the extent of movement of the
yokes being limited by the engagement of 75
the pressed in keys with the steps of the
segments. The pawl-carrying arms 9^c fol-
low the yokes 9^a, the pawls 9^d clicking over
the ratcheted peripheries of the register
wheels. Upon the closing of the drawer the 80
main yoke is of course swung back and up
and will pick up the auxiliary yokes and
carry them home, the register wheels being
turned by the pawls to the extent already
determined by the pressed in amount keys. 85

Indicator drums 60 are mounted in the
upper part of the frame of the machine and
geared to rack bars 61 which are coupled to
levers 62 journaled upon the central shaft 5
and having a one-way engagement with 90
the auxiliary yokes respectively so that in
the downward swinging of the latter the in-
dicators will be set. As the present inven-
tion has no relation to the indicator mecha-
nism, it will not be necessary to show or de- 95
scribe the means for holding the drums at
indicating position and releasing and re-
storing the same to zero at the commence-
ment of a subsequent operation.

A brief description will next be given of 100
a novel form of means employed to transmit
movement from the cash drawer to the main
yoke; also of a form of means for compel-
ling full strokes of the main yoke actuating
mechanism. These devices are not claimed 105
herein but merely described for the pur-
pose of making clear the construction and
operation of everything shown in the ac-
companying drawings.

Lever designated by the reference nu- 110
meral 4 are journaled one upon each end of
the supporting shaft 5 and these levers ex-
tend down behind the cash drawer where
they rest upon rollers 8 supported in brackets
fastened to the back of said drawer. The 115
front edges of the lower end portions of
these levers are preferably beveled as shown
at 4^a in Fig. 2 and flat springs 3 are fas-
tened to the levers to project over these bevels
to cushion the inward thrust of the drawer. 120
Each of the levers 4 has a rearward enlarge-
ment 10 with a longitudinal slot 11 and there
is pivotally mounted upon a lug 15 of the
framework at each side of the machine a bell
crank cam piece the lower arm 13 of which 125
carries a roller 12 occupying a slot 11. The
cam portion 14 of the bell crank is semi-
heart-shaped and upon its curved upper edge
bears the under edge of side bar 16 of the
main yoke, the bar being formed with a 130

bulging portion 17. The principal purpose of interposing the cams between the drawer operating levers and the main yoke is to prevent injury to the machine by the rapid manipulation of the drawer. With each lever 4 there are made integral a diverging pair of arms 24, 25 constituting tappets for a full stroke pawl 21. This pawl is three-armed and the two lower arms are arranged to alternately engage a segmental saw-tooth rack 20 on an arm 19 which is compounded with the main yoke. A short arm 26 is compounded with said pawl and arranged to be struck alternately by the arms 24 and 25 for the purpose of reversing the full stroke pawl. To prevent accidental displacement of the pawl a flat spring 22 is fastened to the framework and bears upon the pointed third arm of the pawl said spring having a teat 23 which stands on one side or the other of this pointed arm according to the adjustment of the pawl.

Reverting to the register wheels it will be understood that when one wheel has been turned the extent of one of the subdivisions of its numbered flange, a transfer should be made to the wheel of the next higher denomination. Referring to Fig. 4 the reference numeral 3^a designates transfer projections located between the sub-divisions of the flange. The nose of a lever 36^c journaled upon a cross-rod of the main frame normally rests against the register wheel flange, the tail of this lever overlying a pin 36^e projecting from a latch lever 36^d which is pivoted to the horizontal portion of an arm 36^a which is journaled upon the central shaft 5. This latch lever engages a shoulder 36^c of a transfer pawl 38^a to hold the latter normally out of engagement with the ratchet of the register wheel of next higher denomination. This transfer pawl is also pivoted to the arm 36^a and the same spring 36^e which draws the latch lever 36^d downwardly for its engagement with the transfer pawl also tends to throw the latter into engagement with its ratchet. It will be seen that under this construction whenever one of the projections 3^a displaces the nose of the lever 36^c the latter tilts the latch lever 36^d and the transfer pawl 38^a is then thrown into engagement with the ratchet of the register wheel of next higher denomination. This sets the transfer and the transfer is then effected by a vibration of the arm 36^a. This is produced during the opening of the cash drawer and consequent downward swinging of the main yoke, through the medium of an arm 40^c compounded with the latter and carrying on one side another arm 40^b pivotally mounted and suitably spring-pressed away from its supporting arm 40^c and against an appropriate stop thereon. A series of rock-shafts 36^b are journaled in the supporting framework of the machine and

each has secured to it a radial slotted arm 36^b embracing a pin on one of the transfer arms 36^a. The shafts 36^b also have projecting noses 40^a to be acted upon by the arm 40^b during the outward movement of the cash drawer. The purpose of mounting the arm 40^b pivotally upon the arm 40^c is to provide for its displacement through suitable bevels (see prior Patent #570,141) during the closing movement of the drawer when it is not to actuate the rock shafts 36^b. The transfer arms 36^a are drawn rearwardly by suitable springs 36^f. It will be seen then that in each downward swing of the main yoke consequent upon outward movement of the drawer the arm 40^b traverses the line of noses 40^a and one after another rocks the shafts 36^b in a direction to cause the advance of the arms 36^a. Consequently if at this time any of the transfer pawls 38^a have been tripped and are engaging their ratchets these particular register wheels will be advanced each one step. The transfer pawls 38^a are provided with lifting fingers 37^a by which they can be held up while the register wheels are being turned to zero; it being obvious that the transfer tripping mechanism should be disabled at this time for otherwise at the end of this operation of turning to zero the transfer pawls would remain tripped and in the first subsequent opening of the cash drawer the higher denomination wheels would be turned before any transactions were registered. In Fig. 4 where this transfer mechanism is illustrated the register wheel of highest denomination is shown and adjacent thereto a wheel 3^b with a flange numbered from "0" to "99", there being a continuous series of numbers extending entirely around the periphery of the flange. This wheel is such as commonly employed to increase registering capacity and is actuated only by the transfer mechanism. (See said Patent #570,141.)

Coming now to the particular improvement which is the subject of the present invention, the reference numeral 46 designates a curved cover plate in front of the register wheels, said cover plate constituting a guard or shield to prevent access to said wheels or a view of the latter. This plate is pivotally mounted at its upper end on one of the cross-roads of the framework and at its lower end has on the inner side a latch-lug 47. A lever 49 is pivoted to the framework of the machine and on its upper end is formed as a hook 48 to take over said latch-lug and thus lock the cover plate 46 in closed position. The lower arm of this lever 49 is drawn rearwardly by a spring 50 for the purpose of automatically effecting the latching and this arm of the lever extends downwardly into the path of an upstanding projection 51 at the rear of the cash drawer. As has been before explained the transfer actuation of

the register wheels is done during the outward movement of the drawer. It is therefore desirable that no access be had to the register wheels, either for the purpose of turning them to zero or for taking a reading therefrom, until the transfers have gone in, or in other words, until the drawer has moved far enough outward to provide for completion of transfer actuation. It will be seen that this is accomplished by the above-described construction for the cover plate 46 is latched until the drawer has moved outwardly far enough to cause its projection 51 to act against the lever 49 and disengage the latter from the latch-lug 47.

To facilitate the operation of turning the register wheels to zero, which means advancing them until zeros show at the reading line, there is provided a plunger 27 for each register wheel. These plungers stand vertically and are arranged to reciprocate through suitable guide-ways in one of the cross-rods 28 of the main frame and each plunger is upheld by a coiled spring 30 surrounding its stem between said cross-rod and the head or button 29, of the plunger. Each plunger also has a spring-pressed pawl 31 engaging the ratchet of the registering wheel to which the plunger pertains. It will be obvious that by finger pressure applied to the plungers the register wheels can be turned the desired extent through the engagement of the pawls 31 with the ratchets of said wheels.

In order to provide a positive stop to limit the movement of the registering wheels to that necessary to bring zeros to the reading line a resilient plate 31^a is employed, the said plate being fastened to the cross-rod 28 and having fingers 30^a one for each register wheel and adapted when the plate is pressed inwardly to stand in the path of the transfer projections 3^a. The said resilient plate is slotted as shown at 31^b to accommodate the plungers 27 and their surrounding springs 30. Backward movement of the register wheels is prevented by the engagement of a series of pawls 45 with the ratchets respectively, said pawls being loosely mounted on a cross rod 44^a of the main frame and being pressed into engagement with the ratchets by flat springs 45^a bearing against another cross rod 44^b of the main frame. Neither the said resilient stop plate nor the pawl construction for preventing retrograde movement are claimed as novel features of the present invention but there is combined with these devices a novel structure whereby control of said devices is facilitated so that by the manipulation of a single finger piece the stop plate is brought into action, the restraining pawls are displaced and the transfer pawls are withheld from engagement with ratchets of the registering wheels. The construction for accom-

plishing these several functions comprises a bar 35 which extends through a guiding stirrup 39 loosely mounted on the cross-rod 28 and has a finger piece 41 mounted upon its lower end which projects outwardly into convenient position for manipulation. This bar carries a pin 34 which operates upon the inclined edge of a finger 33 projecting from an ear 32 of the resilient plate 31^a. The bar 35 is further provided with a similar pin 42 arranged to act against the rear edge of a plate 43 mounted loosely upon the cross-rod 44^a to one side of the series of restraining pawls 45 and carrying a pin 44 which extends behind all of said pawls. The upper end of the bar 35 is pivotally connected with a short crank arm 36 of a rock shaft 37 which carries a blade 38 projecting beneath all of the fingers 37^a of the transfer pawls. A suitable spring will be employed to normally retract the blade 38 so as to leave the transfer pawls free to drop when released by the latch levers 36^a. This spring-retracted transfer-disabling blade is not claimed as a novel feature and the spring which would ordinarily be employed to retract it will be found sufficient to hold the bar 35 normally elevated. It will be seen that by downward pressure on the finger piece 41 the said bar will be slid downward through the stirrup 39, the latter rocking to allow for the slight swinging of the bar by reason of its pivotal connections with the crank arm 36. This downward movement of the bar results in its pin 34 drawing the resilient plate 31^a into operative position and at the same time the pin 42 displacing the restraining pawls 45. Simultaneously the blade 38 is thrown up to position for preventing the dropping of the transfer pawls 38^a. Thus by a single manipulation the stops are set for insuring the presentation of the zeros on the register wheels at the reading line, the register wheels are freed from the restraining pawls and the transfer mechanism is disabled. Of course this cannot be done while any transfers are yet to go in because access to the finger-piece 41 cannot be had until the cash drawer is moved outward far enough to insure complete transfer actuation. Having depressed the finger-piece 41 under these conditions the register wheels can all be turned to zero with great facility by manipulation of the plungers 27.

It will now be seen that the construction herein described is admirably suited to thoroughly accomplish the objects primarily stated. It is however to be understood that the invention is not limited to the particular form of means described and hence in the claims which follow essential elements are recited without limitation to details.

The subject matter claimed is as follows:—

1. In a cash register, the combination with

- a register operating mechanism; of a register; movable means for normally concealing and guarding the register; and devices controlled by the register operating mechanism for preventing the movement of the concealing and guarding means during the regular registering movement of the machine and until after such regular movement has been completed.
2. In a cash register, the combination with an operating mechanism; of a register; a movable guard for the latter; a latch for said guard; and means for controlling the latch by the movements of the register operating mechanism whereby said guard cannot be opened until a predetermined period in the operation of the register has been reached and a full registration effected.
3. In a cash register, the combination with an operating mechanism, of a register; a pivoted guard for concealing and guarding the latter; and devices actuated by the operating mechanism for locking the guard against movement to expose the register when the parts are in a normal position and during the registering movement.
4. In a machine of the character described, the combination with a totalizing counter turnable to zero, means for actuating the same to degrees according with amount-controlling manipulation, carrying or transferring devices between elements of the counter, and means for effecting transfer-actuation of the counter in a different part of the cycle of operation of the machine from that in which straight actuation of the counter takes place; of means for preventing turning-to-zero of the counter after straight actuation thereof until transfer actuation has been completed.
5. In a cash register, the combination with an operating mechanism; of a register; devices for turning the register to zero; transfer devices operated upon the initial movement of the operating mechanism; and means preventing the operation of the turn-to-zero devices until after this initial movement of the operating mechanism to effect the transfer.
6. In a cash register, the combination with a series of registering wheels; of a cash drawer for operating said wheels; turn-to-zero devices for said registering wheels; a normally locked movable cover inclosing said turn-to-zero devices; and an arm or projection upon said cash drawer arranged to unlock the movable cover as the cash drawer opens to operate the registering wheels.
7. In a cash register, the combination with a register; of an automatically opening cash drawer; transfer devices dependent for operation upon the opening of the drawer; a shield for the register; and means compelling the opening of a cash drawer before

the shield can be opened to expose the register.

8. In a cash register, the combination with a plurality of keys; of a registering mechanism controlled by the same and comprising registering wheels; supporting means carrying pivoted pawls which engage the registering wheels; transfer devices between the registering wheels constructed to be operated by the drawer; and mechanism for preventing the pawl-carrying means being operated to reset the registering wheels to zero until after the cash drawer is operated to effect the transfer.

9. In a cash register, the combination with a series of registering wheels; of a cash drawer; pawl-supporting means carrying pawls which engage the registering wheels to turn them to zero; a normally locked movable cover inclosing said turn-to-zero devices; transfer devices between the registering wheels operated by the cash drawer; and means whereby as the cash drawer opens it will unlock the movable cover.

10. In a cash register, the combination with a series of keys; of a cash drawer; a register comprising a plurality of registering wheels having teeth formed upon their peripheries; pawls arranged to engage said teeth to lock the wheels against movement; means for freeing said pawls and mechanism for preventing the operation of said means until the cash drawer is fully opened.

11. In a cash register, the combination with a plurality of keys of registering mechanism governed thereby and comprising a register wheel, a reciprocating turn to zero plunger, a pawl carried by said plunger and engaging said registering wheel, a spring for retracting said plunger after its operation, and movable means for limiting the movement of the registering wheel by the plunger, and devices for moving said limiting means into and out of effective position.

12. In a cash register, the combination with a plurality of keys, of a registering wheel governed thereby and having peripheral teeth, a plunger for moving said wheel, a pawl mounted on said plunger and engaging said wheel teeth, whereby said wheel may be reset to its normal zero position, a stop plate for engaging parts of said wheel and thereby positively stopping it in zero position, and means for moving said stop plate into and out of effective stopping position.

13. In a cash register, the combination with a plurality of keys; of a registering mechanism governed thereby and comprising a register wheel having transfer projections; a stop plate cooperating with said projections but normally spring retained out of the path thereof; a plunger carrying a pivoted pawl which is arranged to

engage and turn the register wheel when the plunger is reciprocated; a spring for holding the plunger in normal operative position; and means for moving the stop plate into operative position.

14. In a cash register, the combination with a registering mechanism, of a cash drawer, an operating yoke, a pivoted cam lever arranged to be operated from the

drawer and having a cam periphery which is arranged to engage and operate said yoke.

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

JOHN H. McCORMICK.

Witnesses:

IRA BERKSTRESSER,
ALVAN MACAULEY.

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