Dec. 9, 1941. B. BERIA 2,265,125

CASH REGISTER

Filed Oct. 25, 1937 3 Sheets-Sheet 1

Fig. 3

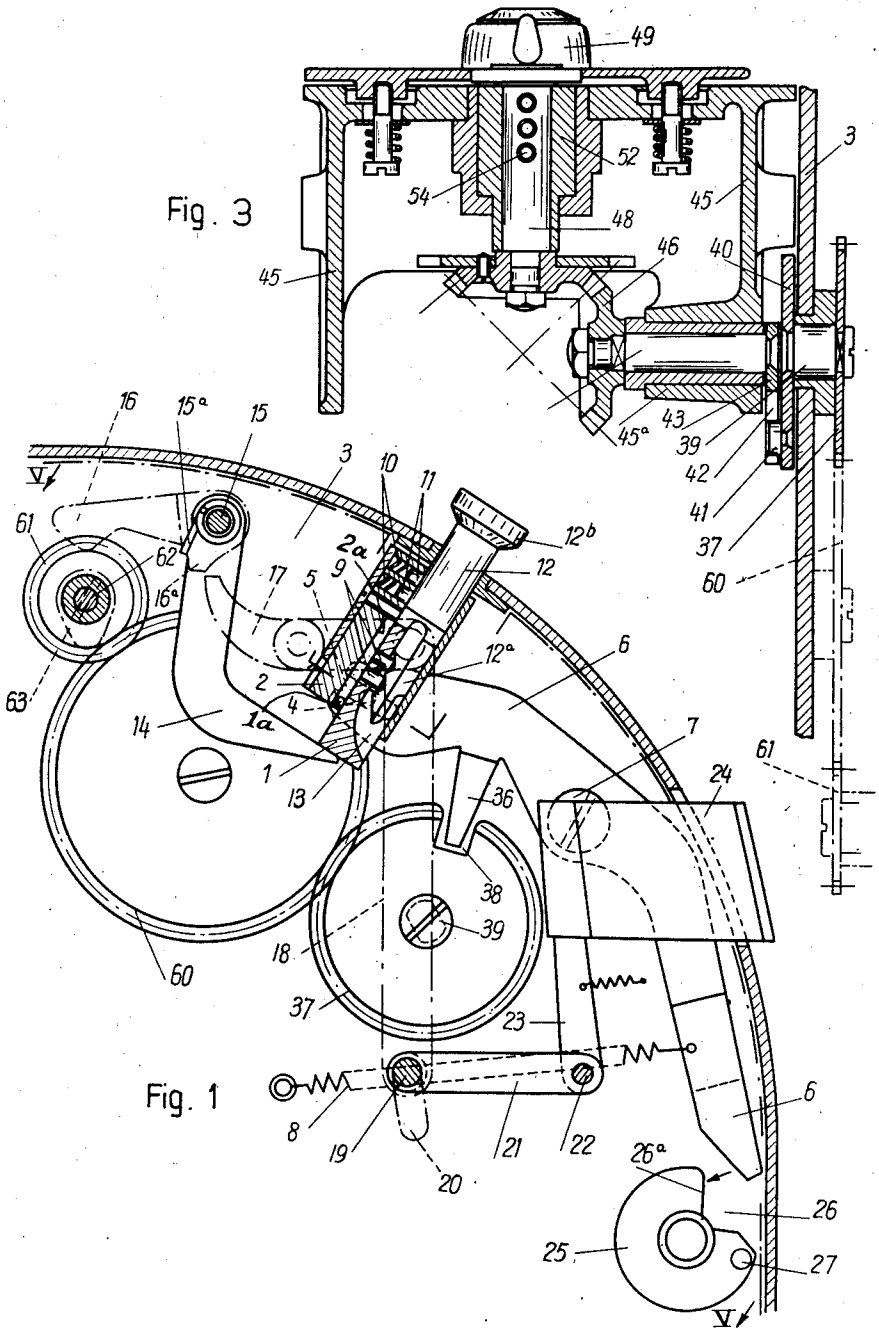


Fig. 1

B. Beria
INVENTOR

By: Glascock Downing & Seebold
Attys.

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Fig. 2a

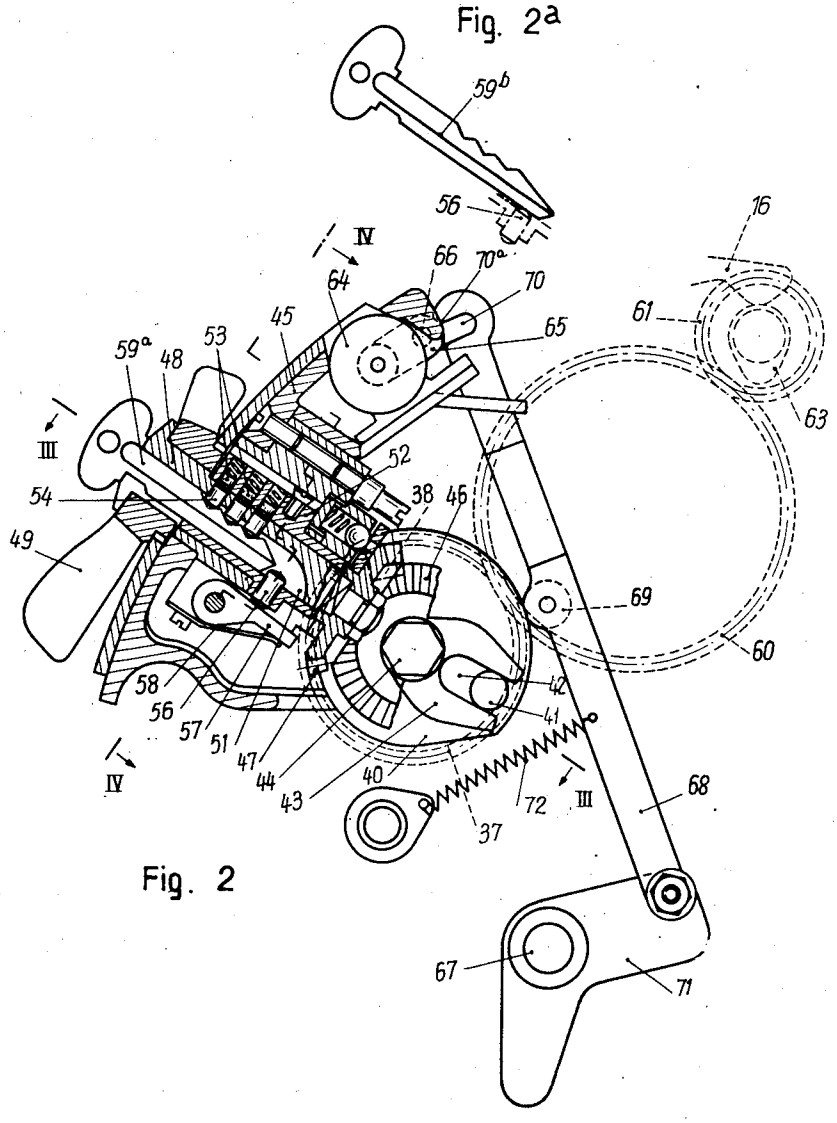


Fig. 2

B. Beria
INVENTOR

By: Glascock Downing & Seibold
Attys.

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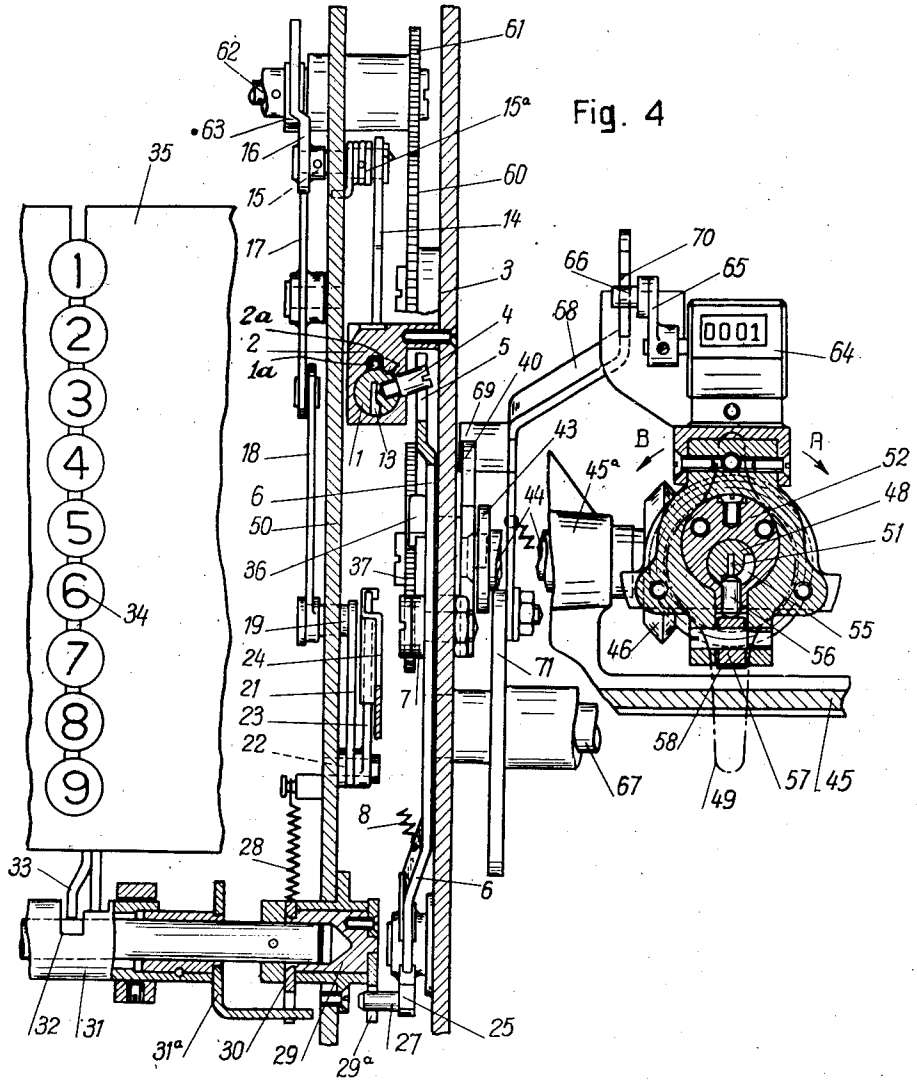


Fig. 4

B. Beria
inventor

by Glascock Downing & Seebold
Attys.

Patented Dec. 9, 1941

2,265,125

UNITED STATES PATENT OFFICE

2,265,125

CASH REGISTER

Biagio Beria, Turin, Italy, assignor to Societa Anonima Officine Di Villar Perosa, Turin, Italy

Application October 25, 1937, Serial No. 170,929
In Italy October 31, 1936

3 Claims. (Cl. 235—130)

This invention relates to a mechanism for preventing unauthorised use of cash registers or similar machines, comprising a key bank for the amounts and a control member for preparing the machine for the various operations (registering items, reading sub-totals and grand totals).

According to this invention the machine is provided with two locks, namely a lock for the amount key bank and a lock for the above mentioned control member. The key bank lock merely releases the keys, but does not permit of bringing the control member to its reading position; on the other hand, the lock for the control member merely releases this member in order to bring it to its reading position, but does not release the key bank. When both locks are closed, the machine is blocked.

For example, the key for the key bank lock is kept by the salesman and the key for the control member lock is entrusted to a higher member of the staff. With the key in his possession the salesman is able to block the machine against registration of items even by the person having the key for the control member lock. On the other hand, the salesman is unable to read either sub-totals or grand totals. It is more particularly important to deprive the salesman of the possibility of reading grand totals, for this operation would cancel from the totalisers every trace of the amounts, which would remain only on the checking tape of the printing mechanism. However, checking of this tape is very tedious, for it necessitates removal and unwinding of the tape and reading of a large number of figures. In order to better afford a greater safety against the taking of grand totals by unauthorised persons, and possibly also by the person authorised to take sub-totals, according to a preferred form of this invention the lock for the control member may be supplied with two different keys, one of which merely permits displacement of the control member to the position for taking sub-totals, while only the other key, which is entrusted to a dependable person permits of moving the control member to the position for taking sub-totals and grand totals.

A further object of this invention is to provide means for giving an indication of all the grand total taking operations performed, besides the indication given by the checking tape. For this purpose, a counter is provided which advances automatically by one unit on the reading effected after movement of the control member to the position for taking grand totals, so that this reading, effected by a non-authorised person, can be immediately ascertained.

The two locks may be coupled with the motor bar, that is the push button for starting the motor driving the cash register, so that when both locks are closed, the motor bar cannot be actuated and the machine is fully blocked. The motor-bar can be released by operating either lock. The motor-bar is conveniently locked by the key bank lock, but locking is annulled when the control member takes a position for reading, such displacement of the control member implying, however, use of the key for the control member lock.

According to a further feature of this invention, the provision of a separate lock for the key bank may be utilised for the alternate locking between the amount keys and control member. In this form of the invention, the key bank lock cannot be opened even with its key when the control member is in reading position, and the control member cannot be brought to its reading position even with its own key when the key bank lock is open.

It has been found convenient to construct the key bank lock in such manner that it can be opened and closed, respectively, by depressing and lifting, respectively, a push button, which can be depressed only after the key has been fitted into the lock.

The accompanying drawings show by way of example a construction according to this invention, more particularly suitable for use in connection with a cash register as described in my co-pending application Ser. No. 71,522.

Figure 1 is a vertical section on the center line of the amount bank lock.

Figure 2 is a vertical section on the center line of the reading lock in which the key for reading sub-totals only is fitted and Figure 2a shows the special key for taking grand totals also.

Figure 3 is a section on line III—III of Fig. 2.

Figure 4 shows in its right portion a section on line IV—IV of Figure 2 and in its left portion a section on line V—V of Figure 1, seen in the direction of the longitudinal axis of the key bank lock.

As shown by Figures 1 and 4, the key bank lock comprises a slide 1 longitudinally movable in the stud 2 secured to the cross wall 3 of the cash register. The slide 1 is provided with a cylindrical tooth 4 guided in the slot 5 in the upper end of the lever 6 journaled by means of the pivot 7 on the cross wall 3. The lower end of the lever 6 is acted upon by the spring 8. Lowering of the slide 1 is subject to the introduction of the key 12, of which the flattened portion 12a is received by the recess 13 in the slide 1.

On introducing the key 12, the pins 9 in the slide 1 are lifted and cause the tumblers 11 to recede into the holes 10 in the stud 2. When the slide 1 is lifted and the key is removed under the action of their respective springs the tumblers 11 enter the holes receiving the pins 9, whereby the slide 1 is locked against lowering. The slide 1, which is lowered by means of the button 12b on the key, is moved angularly by means of said button and held in its lowered position by means of a bayonet joint comprising the pin 1a on the slide 1 and the inner hook-shaped slot 2a in the stud 2. On lowering the slide 1 strikes the lever 14 keyed on the shaft 15, journaled in a second cross wall 50, to which there is also fixed the arm 16. Lowering of the slide 1 releases the nose 16a of the arm 16 from the lever 17, having articulated thereto the link 18 connected by means of the pin 19 guided in the slot 20 in the wall 50 with the bell crank lever 21, 23 journaled by means of the pivot 22 on the cross wall 50. The arm 23 of this lever carries the push member or motor bar 24 projecting from the front wall of the casing of the cash register and the lowering whereof sets into action the motor operating the cash register. It will be seen from the above that in the raised position of the slide 1, the motor-bar 24 cannot be depressed, for the nose 16a pressed by the spring 15a is in front of the lever 17, unless other means as shall be described hereinafter come into action for rocking the arm 16.

The lower end of the lever 6 is situated in front of the disc 25 rotatably mounted on the wall 3 and formed with a notch 26 and an eccentric pin 27. This pin enters the slot 29a in a flange on the cylinder 29 journaled in the wall 50 and fast with a further flange 30 acted upon by the spring 28. The tension of this spring is smaller than that of the spring 8. When the above mentioned bayonet joint for the slide 1 is disconnected and the button 12b on the key 12 is released, the slide 1 is lifted under the action of the spring 8 and the lever 6 rocks in the direction indicated by the arrow in Figure 1, its lower end striking the edge 26a of the notch 26, and the ensuing rotation of the disc 25 being transmitted to the tubular shaft 31 through the flange 30 and the hook 31a on said shaft which reaches into a notch in the flange 30. The tube 31 is formed with cuts 32 of which the edges by effect of the above said rotation of the disc 25 lift the members 33 which, in their raised position, prevent any lowering of the amount keys 34 projecting from the plate 35 of the key bank. The details of this blocking mechanism are disclosed by my co-pending application Ser. No. 71,522 and it would be superfluous to describe them further.

When the slide 1 is released and lowered by means of the key 12, the lever 6 takes the position shown in Figure 1, in which the members 31, 30, 29, 27 and 25, free from the lever 6, can be rocked under the action of the spring 28 so as to release also the keys 34. The above said lowering of the slide 1 represents so to say the opening of the amount bank lock.

The lever 6 is provided with a tooth 36 which in the lowered position of the slide 1, enters the notch 38 in the toothed wheel 37 keyed on the shaft 39 rotatable in the wall 3. This toothed wheel 37 is a member of the mechanism for preparing the cash register for the various operations. As will be seen from Figures 2, 3 and 4, the shaft 39 carries beyond the wall 3 the cam 40 of which the function shall be described hereinafter. The cam 40 is provided with an eccentric pin 41 entering the slot 42 in the arm 43 fixed on the shaft 44 guided in the bush 45a forming part of the bracket 45 supporting the control mechanism for preparing the cash register. The end of the shaft 44 carries the bevel gear 46 meshing with the bevel gear 47 on the shaft 48 of the control lever 49, mounted in the fixed stud 52.

As explained in detail in my co-pending application Ser. No. 71,522 the control lever 49 serves for preparing the cash register for registering items (middle position of the lever 49) or reading sub-totals (lever 49 displaced in the direction of the arrow A in Figure 4) or reading grand totals (lever 49 displaced in the direction of the arrow B) the control lever 49 may have two sub-total reading positions, one for reading the grand totalizer and the other for reading the transaction totalizers, and may have also in similar manner two grand totalizer reading positions.

The shaft 48 on which the lever 49 is keyed is formed with a longitudinal slot 51 and the control lever may be moved away from its middle position only when the key for the lock is fitted in said slot 51. When the key is not fitted therein, the tumblers 53 arranged in the stud 52 are pushed by springs into cross bores in the shaft 48 and keep the latter against rotation with respect to the stud 52. When the key is fitted in, the pins 54 arranged in the shaft 48 lift the tumblers 53 releasing them from the shaft.

A circumferential notch 55 is cut in the shaft 48 (Fig. 4) and extends from the middle line thereof substantially in one direction only. A further pin 56 reaches into said notch 55 which opens into the slot 51, the pin 56 being guided in a cross bore in the stud 52 and pressed by the spring 58 through the lever 57.

Two keys 59a (Figure 2) and 59b (Figure 2a) are provided for this lock, which distinguish from each other only in that the distance between the notches and the tip of the key 59b is longer than the key 59a. When the key 59a is fitted in, it does not reach as far as the pin 56, as is visible in Figure 2. On account of the position of the notch 55, in this case the control lever 49 can be displaced only in the direction of the arrow A, that is it may be brought to the position for reading sub-totals. When the longer key 59b is fitted in, the pin 56 is pushed outwardy and fully frees the shaft 48, so that the lever 49 may be brought to any of its positions including those for taking grand totals.

The angular displacements of the lever 49 are transmitted through shaft 48, bevel gears 47, 46, shaft 44, arm 43, pin 41, cam 40 and shaft 39 to the toothed wheel 37 so that when the lever 49 is in either of its reading positions, the cut 38 in the toothed wheel 37 is no longer in front of the tooth 36 and lowering of the slide 1 of the key bank lock becomes impossible.

The toothed wheel 37 meshes with the toothed wheel 60 and the latter meshes in turn with the toothed wheel 61 keyed on the shaft 62, which also has keyed thereon the cam 63 cooperating with said arm 16 having the nose 16a. The transmission ratio between the lever 49 and shaft 62 is such that when the lever takes either of its reading positions, the cam 63 lifts the arm 16, lowered by effect of the spring 15a, thereby releasing the lever 17 from the nose 16a so that

the motor-bar 24 may be depressed notwithstanding the raised position of the slide 1.

The mechanism described above operates as follows:

When the slide 1 is lowered, it is merely possible to register items by depressing the keys 34 and motor bar 24. The tooth 36 being in engagement with the toothed wheel 37, preparation of the cash register for any reading operation is impossible. When the slide 1 is lifted, any registration of items is impossible because the keys 34 are locked, and depression of the motor bar is not possible either by reason of the blocking position of the nose 16a. Consequently, items cannot be registered by persons who are not in possession of the key 12, 12a. On the other hand the person who is in possession of this key only cannot read totals, for the shape of the key 12, 12a does not match the lock for the control member 49. For the same reason, the person possessing only the keys for this lock cannot register items. By reason of the locking action of the pin 56 the person possessing only the key 59a can merely bring the lever 49 to the position for reading a sub-total, while the person having the key 59b can read sub-totals and grand totals, but cannot register items unless he is in possession of the key 12, 12a. The possibility for the person having the key 59a or 59b of reading as above is given by the fact that the motor bar 24, which is locked in the raised position of the slide 1, is freed by means of the cam 63, independently of the actuation of the key bank lock.

When the lever 49 is in a position for reading a total, the person having only the key 12, 12a cannot register items, because the notch 38 in the toothed wheel 37 is not in front of the tooth 36 on the lever 6 and lowering of the lever 6 as required in order to release the keys 34 is prevented.

In order to afford a further safety against unauthorised grand total reading, the frame 45 of the mechanism for preparing the machine carries the step by step-counter 64, which is advanced by one unit by effect of an alternating rocking motion of the lever 65 having a pin 66. The main shaft 67 of the machine which, as disclosed by my co-pending patent application Ser. No. 71,522 performs an alternating rotation on each operation of the cash register, has keyed thereon a lever 71 to which is articulated the bar 68 provided with a roller 69 and hook 70, the latter being situated near the pin 66. The roller 69 is actuated by the above mentioned cam 40 which forms a part of the mechanism for preparing the machine. When the lever 49 is in the position for registering items or in that for reading sub-totals, the cam 40 holds the hook 70 out of engagement with the pin 56. Consequently the alternating movements of the bar 68 do not advance the counter 64. The counter is actuated on the first operation performed by the machine after the lever 49 has taken the position for grand total reading; during this preparation the depressed portion of the cam 40 comes under the roller 69 and the spring 72 pulls the hook 70 of the bar 68 into engagement with the tooth 66.

During this angular displacement of the bar 68 the inclined portion 70a of the upper edge of the hook 70 abuts the pin 66 of the lever 65 imparting to the latter a certain angular displacement, which is not, however, sufficient to advance the counter 64. Consequently, if the control lever 49 is removed from the grand total reading position without effecting the operation, the counter again takes its prior position, and, after return of the bar 68 to the position illustrated, a spring (not shown) returns the lever 65. On rotation of the shaft 67, the bar 68 performs an alternating movement, of which the first part completes the stroke already effected by the lever 65 to advance the counter 64 by one unit. The figures on the counter are visible from the outside, so that any restoring of the totaliser of the machine will promptly be ascertained. When operation of the cash register is repeated without moving the lever 49 away from its position for grand total reading, the counter 64 is not advanced, as the angular displacement of lever 65 produced by the oscillation of the bar 68 is not sufficient by itself to effect advancement of the counter.

I wish to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What I claim is:

1. In a cash register having a plurality of amount keys, a motor bar for operating said cash register, a blocking mechanism for the amount keys, a stop means for said motor bar and a control member for preparing the machine for the various kinds of operations, a lock mechanism for releasing at will the amount keys from the blocking mechanism and for releasing the stop means from the motor bar, a second lock mechanism adapted to be brought into three positions, whereby three different operations of the cash register may be performed, a stop member controlled by the first lock mechanism to lock the second lock mechanism when the latter is in one of the three positions and when the first lock mechanism is in key releasing position, and means controlled by the second lock mechanism when in another of its positions to release said stop means independently of the first lock mechanism.

2. In a cash register having a plurality of amount keys, a motor bar for operating said cash register, a blocking mechanism for the amount keys, a stop means for said motor bar and a control member for preparing the machine for the various kinds of operations, a lever to hold said blocking mechanism normally in the blocked position, a lock mechanism coacting with the lever to release the blocking mechanism from the keys and to release the stop means from the motor bar, a second lock mechanism by means of which said control member may be brought, at will, into three positions to effect three different operations of the cash register, a stop member carried by said lever, means connected with the second lock mechanism and coacting with the stop member to lock the second lock mechanism when the latter is in one of said three positions and the first lock mechanism is in key releasing position, and means controlled by the second lock mechanism when in another of its positions to release said stop means independently of the first lock mechanism.

3. In a cash register having a plurality of amount keys, a motor bar for operating said cash register, a blocking mechanism for the amount keys, a stop means for said motor bar and a control member for preparing the machine for three different operations, a lever to hold said blocking mechanism normally in the blocked position, a one key lock mechanism to operate, at will, said lever and stop means to release the amount keys and motor bar, a second two key lock mechanism permitting, when it is not op-

erated, the operation of the first lock mechanism; said two key lock being operable by one of its keys to effect the displacement of the control member in one direction to effect one operation, and adapted when operated by the other key, to effect the displacement of the control member in either direction to effect two operations, a cam operated by said control member to actuate said stop means when the first lock mechanism is in the locked position, a wheel provided with a notch and operatively connected to said control member, and a tooth formed on said blocking lever adapted to engage said notch to lock said control member during the operation of the amount keys.

BIAGIO BERIA.