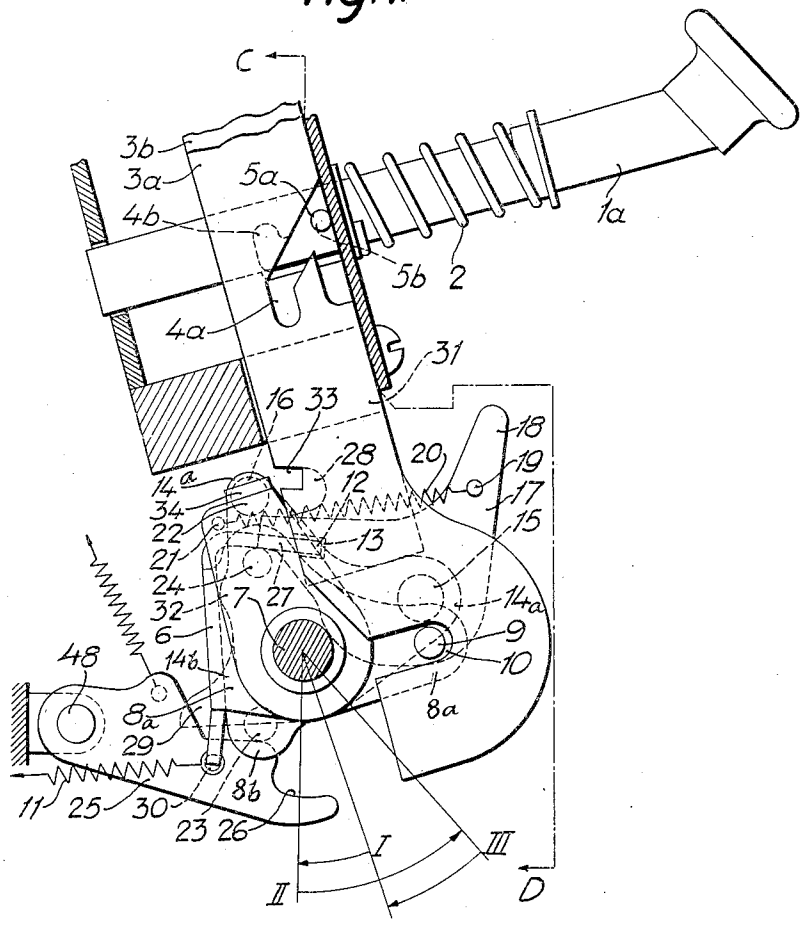
Jan. 13, 1942. K. F. BRATT 2,269,644

KEYLOCK FOR CASH REGISTERS

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Fig. 1.



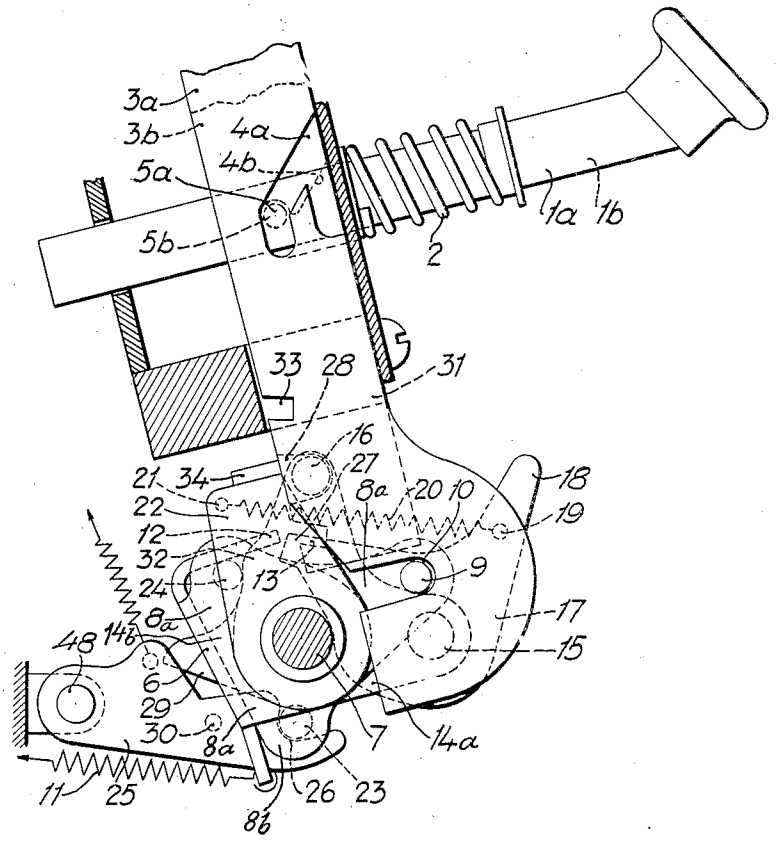
Knut Folke Bratt
INVENTOR
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KEYLOCK FOR CASH REGISTERS

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Fig. 2.



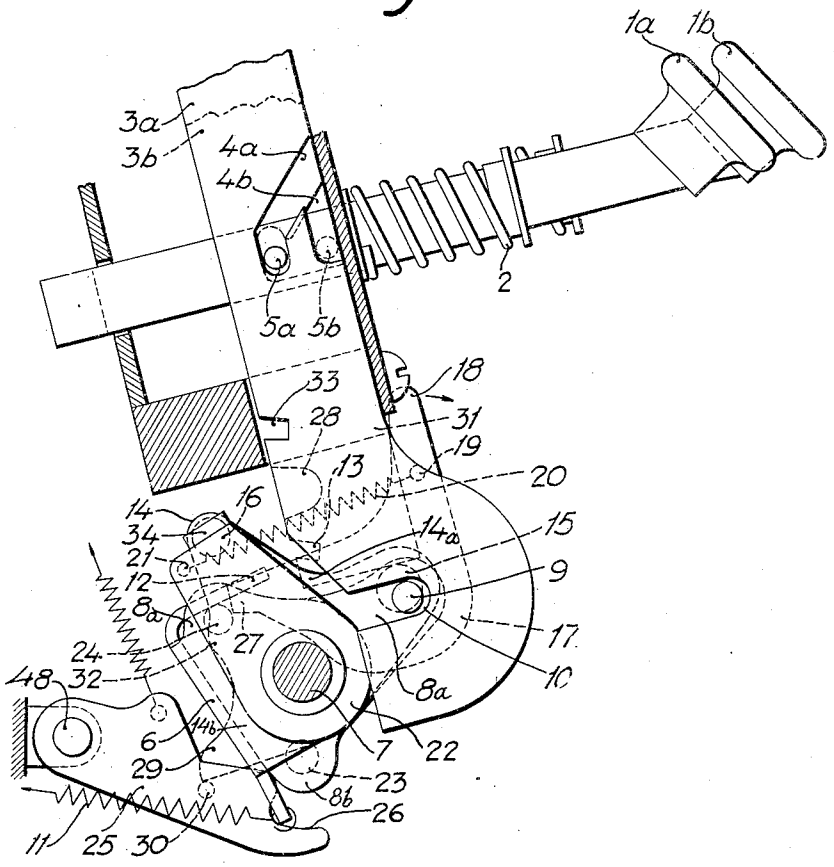
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KEYLOCK FOR CASH REGISTERS

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Fig. 3.



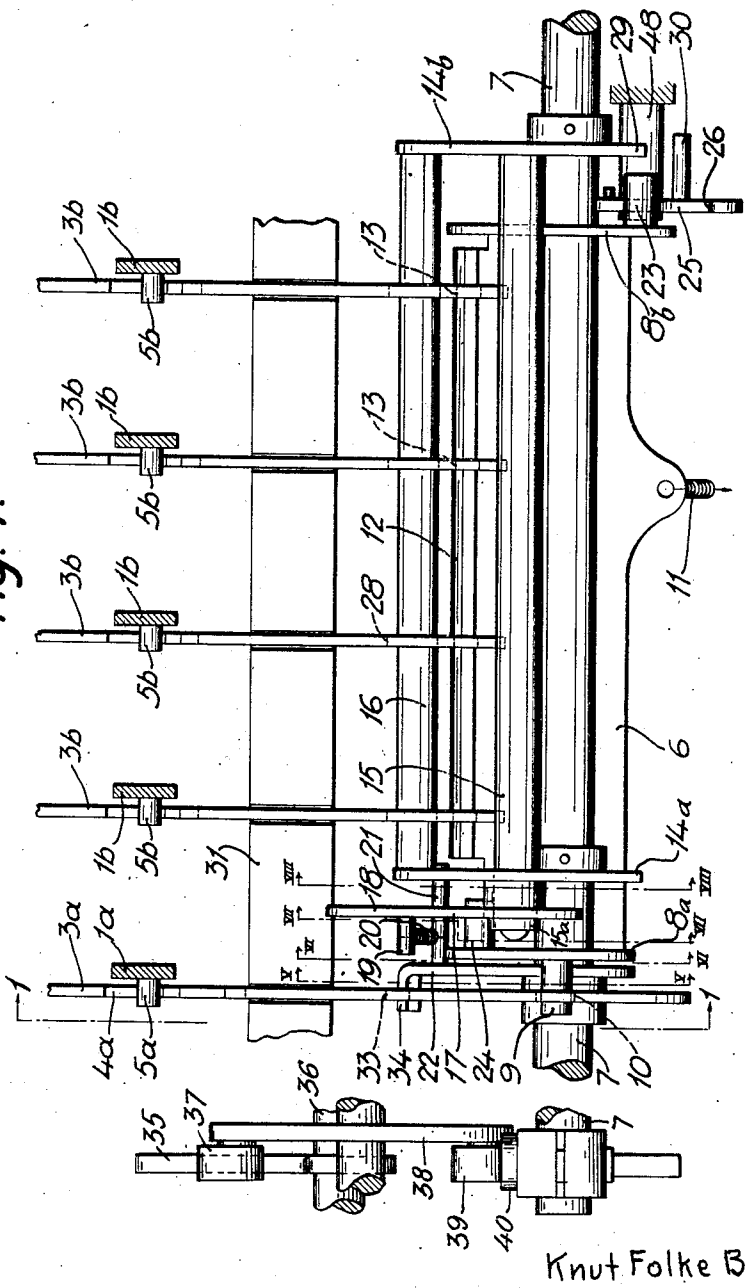
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KEYLOCK FOR CASH REGISTERS

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Fig. 4.



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KEYLOCK FOR CASH REGISTERS

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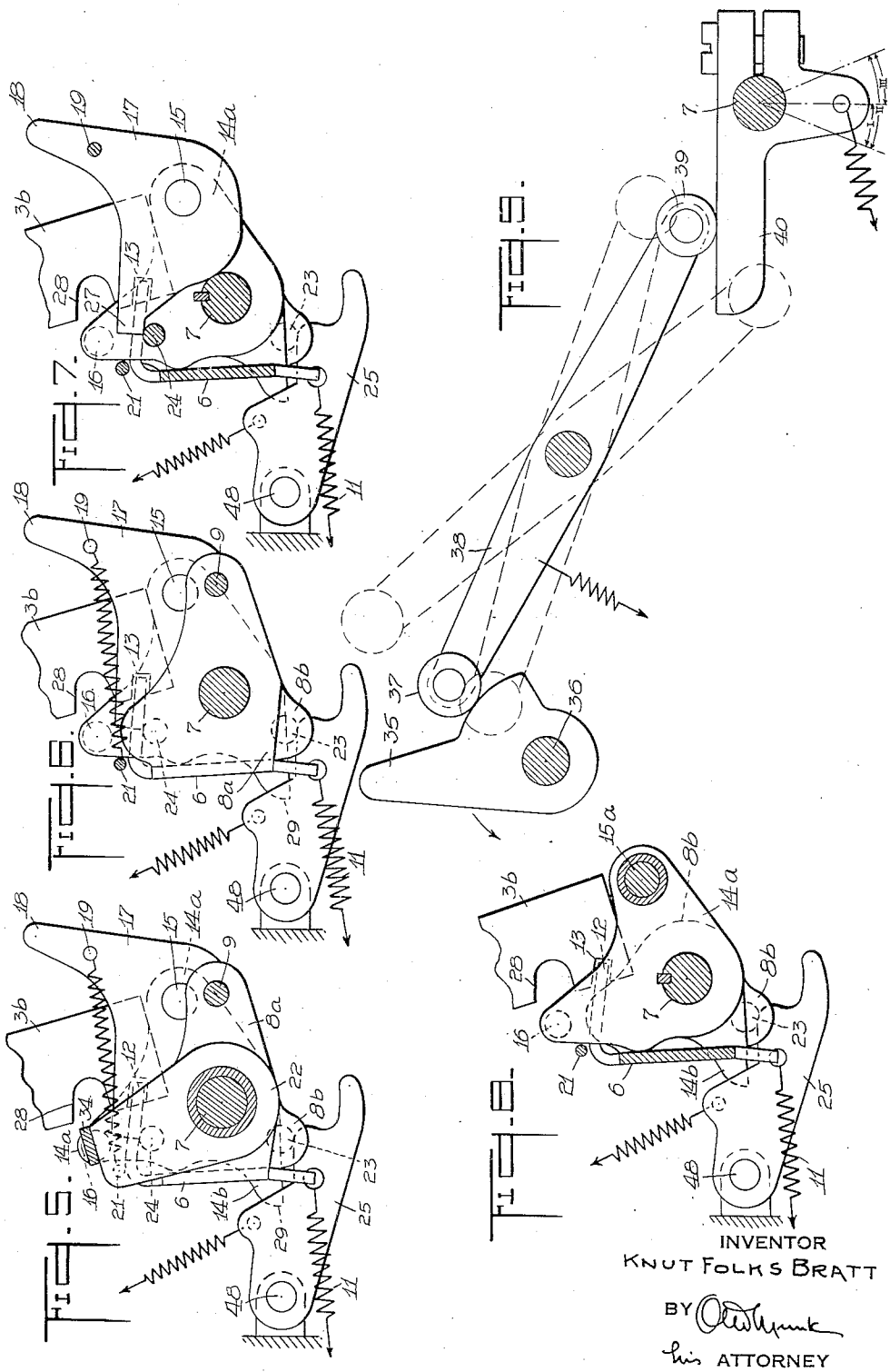


FIG. 7.

FIG. 6.

FIG. 5.

FIG. 8.

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Patented Jan. 13, 1942

2,269,644

UNITED STATES PATENT OFFICE

2,269,644

KEYLOCK FOR CASH REGISTERS

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Application August 24, 1938, Serial No. 226,433
In Sweden August 31, 1937

2 Claims. (Cl. 235—27)

This invention relates to key locks for cash registers and more particularly to key locks for cash registers comprising in addition to the usual amount or figure keys, special keys, as for instance assistance keys denoting the kind of transaction to be carried out or indicating the special account on which the transaction is to be recorded.

One object of the invention is to provide a simplified structure which requires depression of a special key before any amount key can be depressed.

Another object of the invention is to provide a device in which all keys are locked against movement, either depression or release during each working stroke of the machine.

A further object is to provide a structure in which a single element serves to lock the amount keys during the working stroke and to initiate at the end of each working stroke return to its normal position of the part locking the amount keys during the rest period of the machine.

A still further object is to provide a device in which the locking and unlocking of the different keys at the proper moments is accomplished by simple, positively acting machine elements including a single detent for each key or key bank.

The above specified and other objects are accomplished, according to the invention, by the arrangement and combination of parts set forth in the following detailed description, defined in the appended claims and illustratively exemplified in the accompanying drawings, in which

Figs. 1, 2 and 3 illustrate a device according to the invention in side elevation and partly in section on line I—I of Fig. 4, the movable machine parts being shown in three different positions, respectively.

Fig. 4 shows the device in elevation and partly in section on line IV—IV of Fig. 1.

Figs. 5 to 8 are four sections of the lower portion of the device, with the movable machine parts in the position shown in Fig. 1, the four sections being taken on lines V—V, VI—VI, VII—VII and VIII—VIII, respectively, and

Fig. 9 is a side view of the cam mechanism actuating the key lock device.

Referring to the drawings, the reference numeral *1a* denotes a special key, and the reference characters *1b* designate keys belonging to four different amount key banks. All the keys *1a* and *1b*, under the action of pressure springs **2**, tend to assume the positions shown in Fig. 1. Each key *1a*, *1b* can be locked in its depressed position by means of a slidable detent *3a*, *3b*, respectively. Each detent *3a*, *3b* is provided with a recess *4a*, *4b*, which is adapted to cooperate with a pin *5a*, *5b* secured to the corresponding key. Before, as well as after, the depression of a key *1b*, the detents *3b*, which are controlled by springs (not shown), assume the position illustrated in the drawing. On the other hand, upon depression of the key *1a*, the associated detent *3a* is shifted from its end position shown in Fig. 1 to its locking position shown in Fig. 2. An elongated bail **6** serves to lock all the detents *3b*, as long as the detent *3a* remains in its position shown in Fig. 1. The bail **6** is provided with angularly bent end walls *8a* and *8b* by means of which it is rockably mounted on a shaft **7**. A coupling pin **9** projecting from the outer side of the end wall *8a* engages a recess **10** provided in the lower end of the detent *3a*, whereby the bail **6** performs a rocking movement when the detent *3a* is shifted longitudinally. A spring **11** extending between an eyelet at the lower edge of the bail **6** and a stationary part of the machine tends to turn the bail **6** in clockwise direction. The bail **6** has a bent-over edge **12** which engages recesses **13** in the detents *3b* when movable parts of the machine assume the position shown in Fig. 1. Thus, as long as the detent *3a* remains in this position, none of the amount keys *1b* can be depressed, because the edge **12** of bail **6** prevents the detents *3b* from performing any sliding movements. However, if the special key *1a* is depressed, the detent *3a* is shifted upwardly and takes along the coupling pin **9**. This movement causes the bail **6** to carry out a counterclockwise rocking movement and to release the detents *3b*, whereupon the amount keys may be depressed.

On the main shaft **36** of the machine, which starts to turn as soon as the special key and all the desired amount keys have been depressed, there is mounted a cam **35**, which acts upon a roller **37** provided on one arm of a spring controlled lever **38**. The other arm of lever **38** carries a second roller **39** for cooperation with a spring controlled member **40** clamped to the shaft **7**. The cam **35** is shaped to apply a predetermined oscillatory movement to the shaft **7**.

Two discs *14a* and *14b* are rigidly secured to the shaft **7** and carry two rods **15**, **16** extending between said discs parallel to one another and to the shaft **7**. An angle lever **17** is rockably mounted on a projection *15a* of the rod **15** between the disc *14a* and the end wall *8a*. One arm **18** of the angle lever **17** carries a pin **19**

which has attached thereto one end of a spring 20, the other end of which is secured to a pin 21. The pin 21 projects from a disc 22 rockably mounted on the shaft 7 and has such a length, that it may be brought into contact with the edge of the disc 14a. A pin 23 projects outwardly from the end wall 8b for cooperation with a recess 26 in a detent member 25 which is spring-actuated and rockable about a stationary axle 28. A further pin 24 projects inwardly from the other end wall 8a for cooperation with the arm 27 of angle lever 17.

The device described operates as follows:

Upon depression of the special key 1a the detent 3a, associated with this key, is shifted from the position shown in Fig. 1 to that shown in Fig. 2, while the bail 6 is rocked in counterclockwise direction to release the detents 3a. The bail 6 is locked in its release position by the detent member 25 cooperating with the pin 23 on end wall 8b. The desired amount keys 1b may now be depressed. If, inadvertently, instead of an intended amount key, 1b a different amount key in the same key bank has been depressed and the error is discovered before the beginning of the working stroke of the machine, the mistake can be easily corrected by depression of the correct key which causes an automatic release of the previously depressed incorrect key. When all the amount keys 1b have been set correctly, the working stroke of the machine is started. First, shaft 7 turns clockwise from the position shown in Fig. 1 and indicated by I in this figure to the position shown in Fig. 2 and indicated by II in Fig. 1. During this movement, the locking and unlocking element consisting of discs 14a, 14b and rods 15 and 16 is taken along and the rod 16 enters recesses 28 in the detents 3b, thereby locking all amount keys 1b positively against depression or release, as the case may be. Simultaneously, the angle lever 17 is moved downwardly and, if, accidentally, no special key 1a has been depressed prior to the beginning of the working stroke and the bail 6 is still in the position shown in Fig. 1, the arm 27 slips off the pin 24 and assumes a position in which its end face abuts against the periphery of said pin. Next, the calculating operation is performed. When this operation has been completed the shaft 7 is turned in counter-clockwise direction to the position indicated by III in Fig. 1. During the first part of this counter-clockwise movement the locking and unlocking element 14a, 14b, 15, 16 is swung about to withdraw the rod 16 from the recesses 28, whereupon the detents 3b are free to shift. In the further course of the counter-clockwise movement of shaft 7, the rod 15 strikes against the lower ends of the detents 3b and raises the latter positively to a position in which the amount keys 1b are released. During the counter-clockwise movement of shaft 7, the angle lever 27 is swung towards the left and, if no special key 1a has been depressed and the bail 6 is still in the position shown in Fig. 1, the arm 27 of angle lever 17, which, in this case, abuts with its end face against pin 24, shifts the bail 6, thus releasing the detents 3b immediately before they are acted upon by the rod 15. If the bail 6 has already been shifted to release position by a preceding depression of a key 1a, the arm 27 of lever 17 reaches pin 24 on wall 8a while the rod 15 raises the detents 3b, and, as the counterclockwise movement continues, arm 27 pushes against pin 24 thereby applying to bail 6 an additional counterclockwise movement swinging pin 23 on wall 8b to a position in which it is out of contact with the surface of detent member 25 and lifting detent 3a by means of coupling pin 9 a little further. Immediately before this movement has been completed, the movable parts of the machine assume the positions shown in Fig. 3. As can be seen from this figure a projection 29 formed on the disc 14b acts now upon a pin 30 secured to the detent member 25 to move the latter out of the path which pin 23 on end wall 8b has to traverse when the bail 6 returns to its initial position. The displacement of detent member 25 takes place without any friction, because the contact between member 25 and pin 23 has previously been broken through the action of angle lever 27, as described above. However, at this moment, the arm 27 of angle lever 17 is still in contact with the pin 24 on end wall 8b and prevents the bail 6 from performing a clockwise rocking movement towards the detents 3b (see Fig. 3). Upon continued counter-clockwise rotation of the shaft 7, the arm 27 of lever 17 will eventually release the pin 24, when the arm 18 of lever 17 abuts against the stationary machine part 31 thus causing the lever 17 to perform a rocking movement in the direction indicated by the arrow in Fig. 3. When this release of the bail 6 has taken place, the spring 11 starts to move the bail 6 in clockwise direction towards the detents 3b. However, since the detents 3b are likely to be damaged, if the edge 12 of bail 6 would hit them with the full force of the spring 11, the bail 6 is caught by a projection 32 formed on the disc 14a after it has carried out a small rocking movement just sufficient to prevent the pin 23 on wall 8b from reentering the recess 26 of the detent member 25 when the latter returns to its initial position.

When the shaft 7 has reached its end position indicated by III in Fig. 1 all movable parts with exception of pins 5a, which has been locked during the previous operations, have been released again. The shaft 7 is now turned once more in clockwise direction until it has reached its initial position I. During this return movement of the shaft 7 back to position I, all previously released parts are restored gently and surely to the positions shown in Fig. 1. The bail 6 is turned in clockwise direction by the spring 11 as the disc 14a recedes; the detent 3a is shifted downwardly by the coupling pin 9; the pin 5a is released, and the depressed special key 1a is allowed to return to its initial position.

If the special key 1a has not been depressed before the beginning of a working stroke, it is locked against depression for the duration of the stroke by an arrangement adapted to lock the detent 3a in its lower-most position. For this purpose the detent 3a is provided with an additional recess 33. A portion 34, bent angularly from the disc 22 enters the recess 33 when the shaft 7 performs its oscillatory movement from position I to position II, provided the detent 3a has not previously been shifted upwardly by a depression of the key 1a. Thus, depression of the key 1a during the working stroke is prevented. If, on the other hand, the detent 3a has been shifted, prior to the beginning of the working stroke to the position shown in Fig. 2, the angularly bent portion 34 of the spring-controlled disc 22 contacts the edge of the detent 3a without producing any locking action.

It should also be noted, that in a device, in which several special keys 1a are provided, all

those special keys 1*a*, which have not been depressed, are locked against depression when any one of them is depressed, because the upward movement of the detent 3*a* caused by the depression of one key 1*a*, is transferred by means of pin 9 and bail 6 to all other detents 3*a*, whereby the projections provided in the recess 4*a* slide past the pins 5*a* on the keys 1*a* which have not been depressed and lock said keys against depression.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A key lock for a calculating machine having amount key banks, each including a number of spring pressed keys, and at least one special key, said key lock comprising in combination, a single detent slide for each amount key bank, respectively, each of said detent slides assuming normally a predetermined position, cooperating means on each amount key and associated detent slide, respectively, whereby, upon depression of any key in one of said amount key banks, the corresponding detent slide is first temporarily displaced from and then permitted to return to said predetermined position thus locking the depressed key, a locking element normally arresting all said detent slides in their predetermined positions thereby preventing depression of any amount key, coupling means between each special key and said locking element whereby the latter is shifted to a release position when a special key is depressed, a spring controlled member to arrest said locking element in its release position, cam-controlled means to lock all said detent slides in their predetermined positions at the beginning of each working stroke and for the duration of the calculating phase thereof, cam - controlled means to temporarily displace the detent slides, which lock depressed amount keys, from their predetermined positions after completion of the calculating phase of each working stroke to release said depressed keys, and cam-controlled means to disengage said spring controlled member from said locking element at the end of each working stroke to permit return of said locking element to its normal position.

2. A key lock for a calculating machine having amount key banks, each including a number of spring-pressed keys, and at least one special key, said key lock comprising in combination, a single detent slide for each amount key bank, respectively, each of said detent slides assuming normally a predetermined position, cooperating means on each amount key and associated detent slide, respectively, whereby, upon depression of any key in one of said amount key banks, the corresponding detent slide is first temporarily displaced from and then permitted to return to said predetermined position thus locking the depressed key, a locking element normally arresting all said detent slides in their predetermined positions thereby preventing depression of any amount key, coupling means between each special key and said locking element whereby the latter is shifted to a release position when a special key is depressed, a spring controlled member to arrest said locking element in its release position, cam-controlled means to lock all said detent slides in their predetermined positions at the beginning of each working stroke and for the duration of the calculating phase thereof cam-controlled means to temporarily displace all said detent slides from said predetermined positions after completion of the calculating phase of each working stroke to release any amount key that may have been depressed, cam-controlled means operative immediately prior to said temporary displacement of said detent slides to shift said locking element to release position during each working stroke which has not been preceded by the depression of a special key, and cam-controlled means to disengage said spring controlled member from said locking element at the end of each working stroke to permit return of said locking element to its normal position.

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