

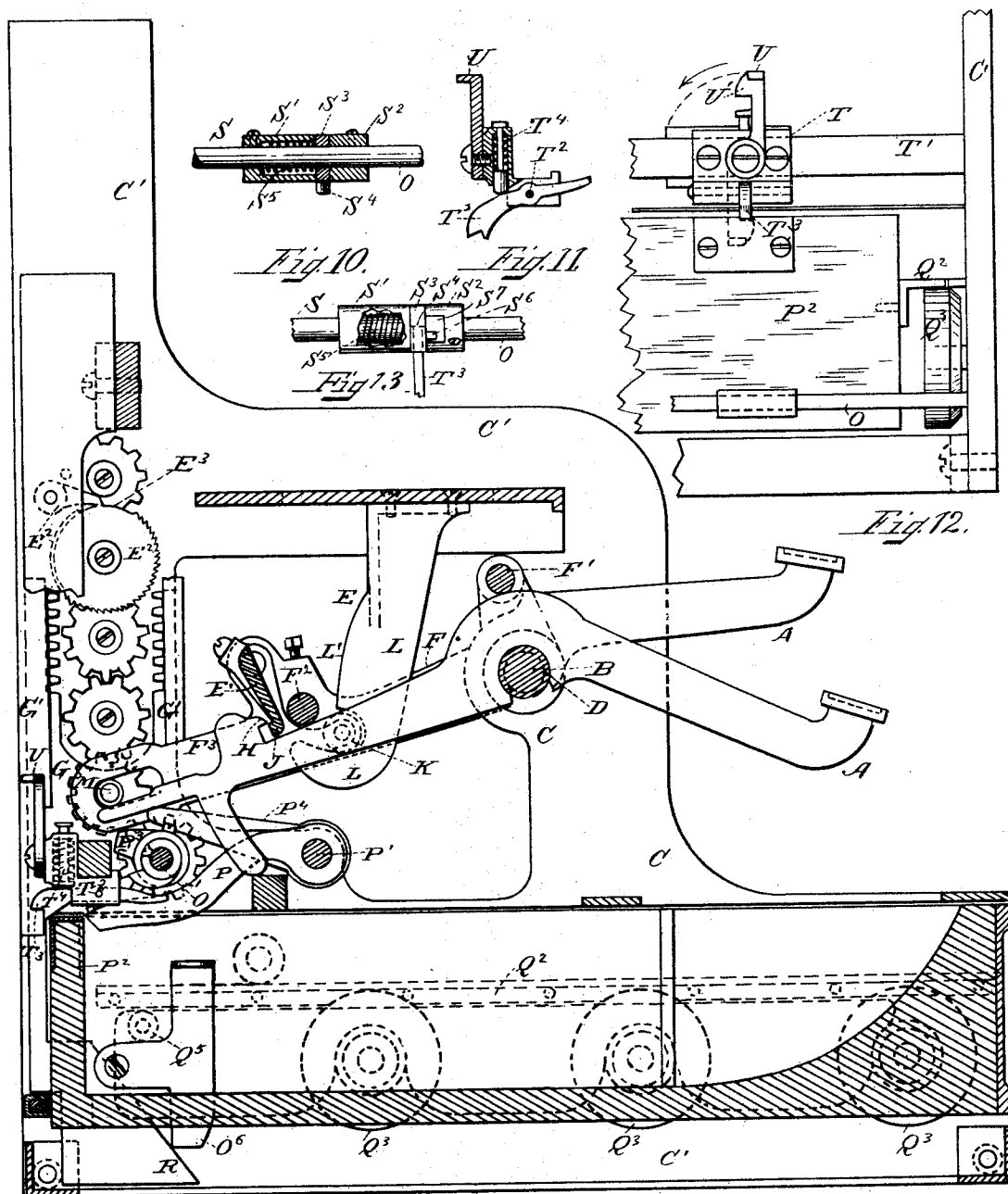
(No Model.)

3 Sheets—Sheet 1.

W. KOCH.
CASH REGISTER.

No. 506,123.

Patented Oct. 3, 1893.



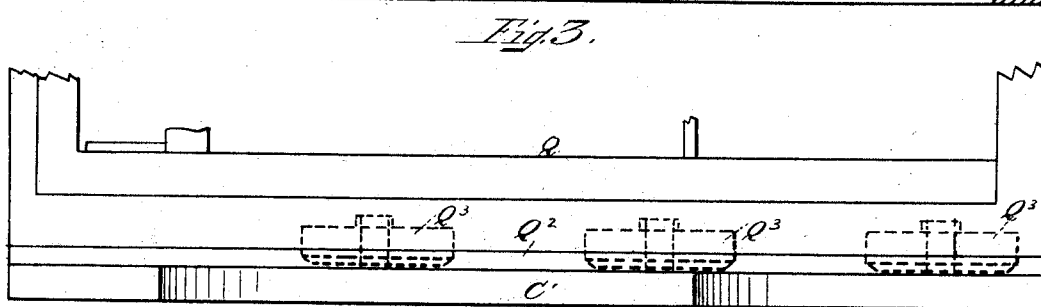
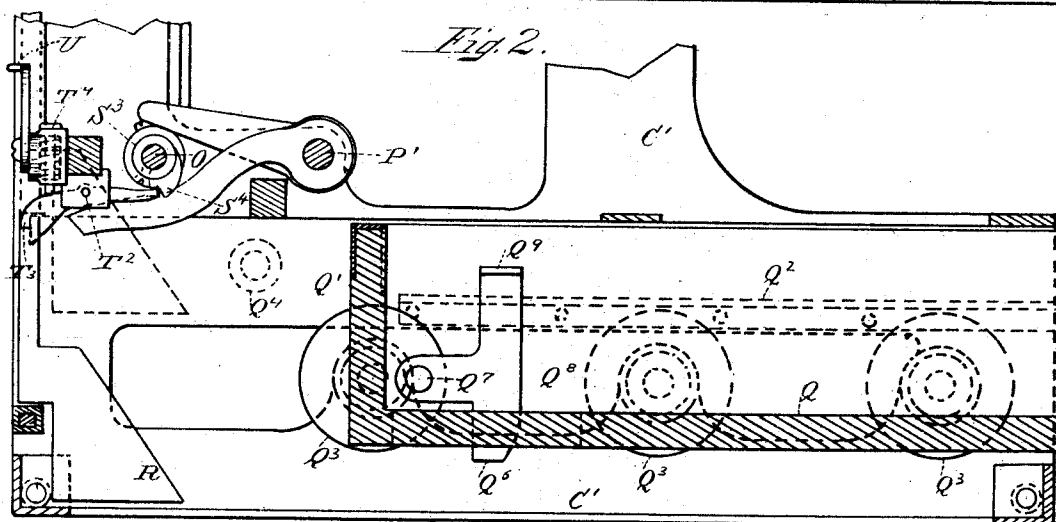
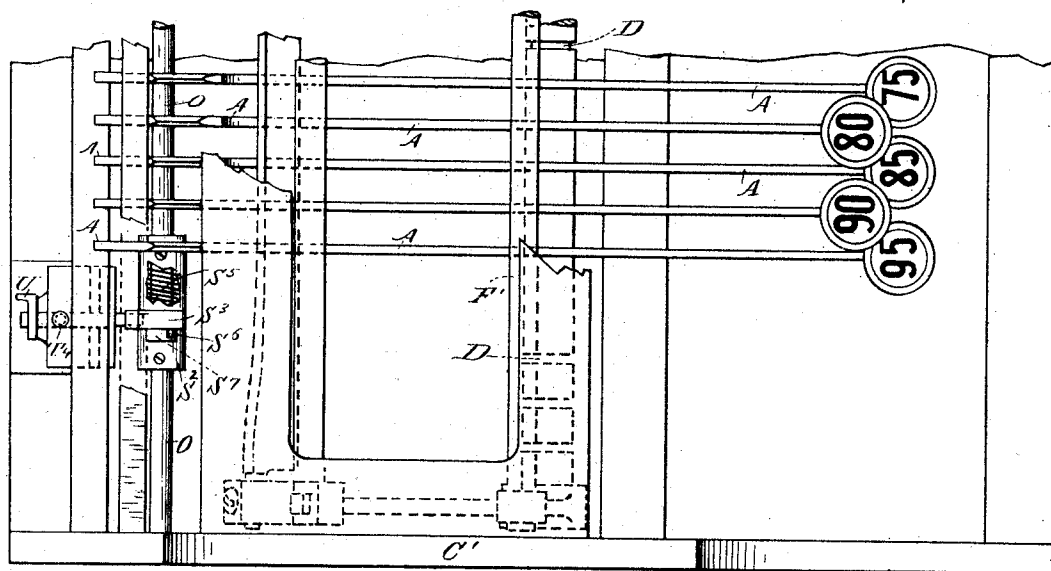
Witnesses
E. L. Carlson
John D. Howard

Proverctor.
William Koch.
By Edwin C. Gilman
J. S. Rush, Atty.

W. KOCH.
CASH REGISTER.

No. 506,123.

Patented Oct. 3, 1893.



Witnesses.
E. L. Harlow.
Helmer Durward.

Fig. 4.

Inventor.
William Koch
By Edwin C. Gilman
J. S. Clark, Atty.

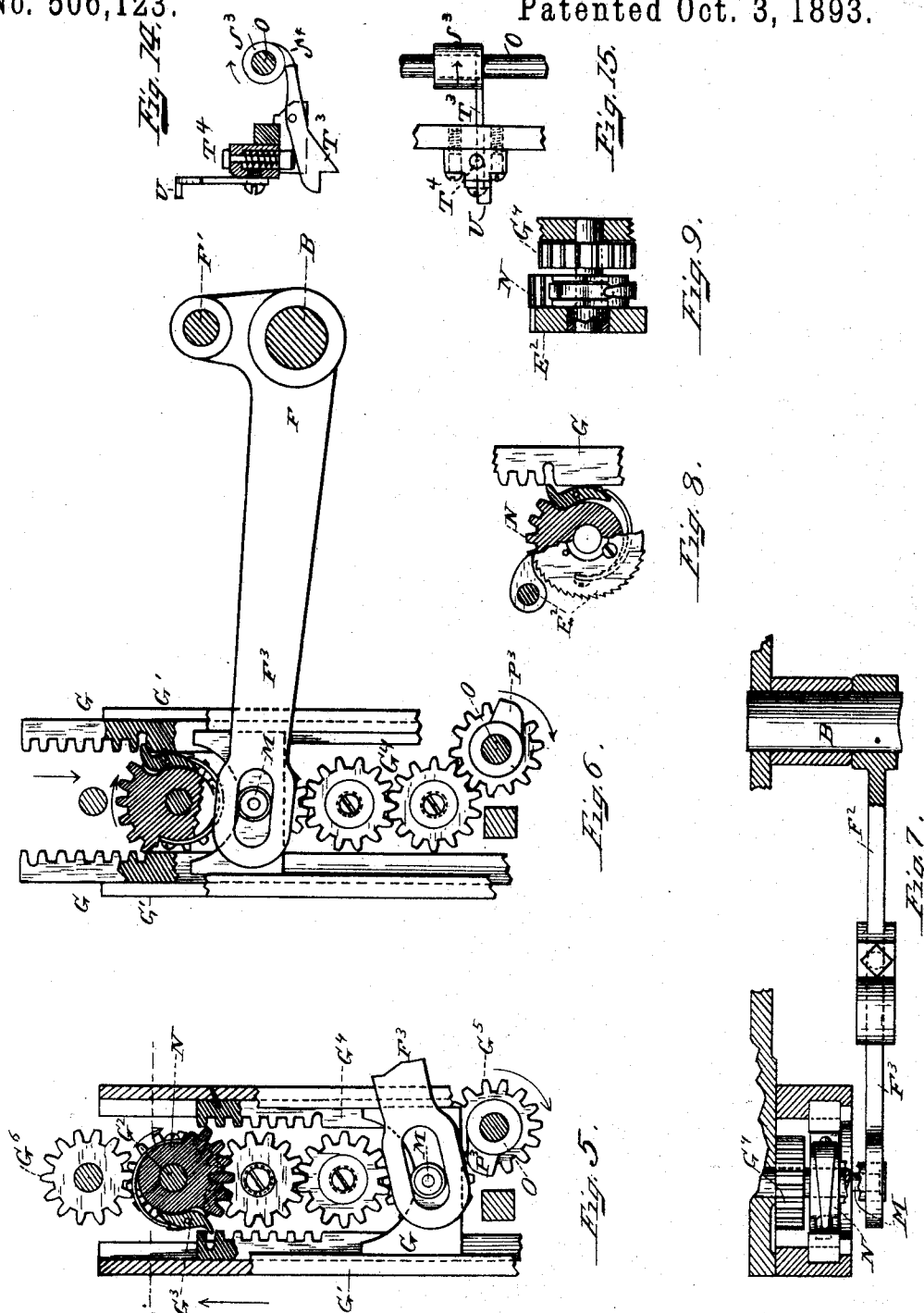
(No Model.)

3 Sheets—Sheet 3.

W. KOCH.
CASH REGISTER.

No. 506,123.

Patented Oct. 3, 1893.



Witnesses
E. L. Harlow
Chas. Duane and f.

Inventor,
William Koch
By Edwin C. Gilman,
J. S. Rush, Attys.

UNITED STATES PATENT OFFICE.

WILLIAM KOCH, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 506,123, dated October 3, 1893.

Application filed December 27, 1892. Serial No. 456,385. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KOCH, of the city, county, and State of New York, have invented a new and useful Improvement in
5 Cash-Registers, of which the following is a specification.

My invention relates to that class of cash registers and indicators shown, described and claimed in application for Letters Patent of
10 the United States, filed by me July 15, 1891, Serial No. 399,640.

The present invention relates especially to mechanism for locking the machine when the cash drawer is open so that it is impossible to
15 operate any key until the drawer is returned to its closed position.

The present invention consists of certain novel features, arrangements, and combination of parts as hereinafter described, reference being had to the drawings accompanying
20 this specification, in which—

Figure 1 is a side elevation in section showing the normal position of certain parts of the machine. Fig. 2 is a plan view of part of the
25 machine with the top casing removed. Fig. 3 is a part side elevation in section showing the cash drawer open. Fig. 4 is a horizontal elevation of the device shown in Fig. 3 showing particularly the mounting of the cash
30 drawer on one side. Figs. 5 and 6 are enlarged detail sectional elevations of the means for imparting rotary motion to the cam shaft hereinafter described. Fig. 7 is a plan partly in section of the devices shown in Figs. 5 and
35 6, in the position which they occupy in Fig. 8. Fig. 8 is a sectional detail of the driven pinion and its ratchet and of the devices shown in Figs. 5 and 6. Fig. 9 is an elevation of the devices shown in Fig. 8. Figs. 10 and 11 are respectively sectional plan and sectional side
40 views of the devices for locking the register to prevent the operation of any of the keys when the cash drawer is open. Fig. 12 is a rear elevation showing the cash drawer, the device for locking the register to prevent operation, and the latch for throwing the last mentioned device out of operative position.
45 Fig. 13 is a plan view of the key locking device, showing its position when the rotary shaft is locked against movement. Figs.

14 and 15 are modifications hereinafter described.

The improved register embraces a number of keys of different values and has suitable
55 indicating mechanism adapted to be operated on the movement of the keys to expose an indicator which agrees in value with the key which has been operated.

The keys A of the register are in the form of levers oscillating upon a rod B common to
60 them all which extends between the side frame C of the machine. The keys are made of sheet metal and have a seat in their lower side to fit in a groove D in the rod B, the sides of the groove holding each key in its
65 proper position, as shown in Figs. 1 and 2. The outer ends of the keys are bent so that their ends lie in different planes, shown in Figs. 1 and 2, as is the usual construction, and the inner or rear ends extend toward
70 the rear of the machine.

With the keys of the register there is arranged a controlling device E consisting essentially of a bar E' common to all the keys,
75 and a pawl and ratchet E².

The bar E' is supported by a pair of arms F at each side of the machine hung loosely upon the guide-rod B, said arms being also coupled so as to move bodily together by a pair of rods F' and F², the whole forming a
80 frame oscillating whenever any key is moved, one of the rods F' forming a guard above the keys to hold them to their seats on the rod B. One of the arms F is lengthened as shown at F³, to connect with the vertically reciprocating rack-frame G having connections for
85 imparting at each oscillation of the frame supporting the bar E', a single revolution of the ratchet E², and thereby whenever any key is moved compelling that key to be moved
90 through its entire stroke in each direction and its return to its normal position. In order to effect this control of the keys in their movement, there is provided means for temporarily connecting or coupling the
95 moved key with the controller, thus each key is formed with a hook H adapted to be engaged by a similar hook J extending lengthwise of the bar E' to cause the engagement of these hooks upon the movement of a key.
100

The bar E' is preferably hung in swinging bearings in the arms F, provided with an arm or extension K bearing at its end an anti-friction roll, as shown in dotted lines Fig. 1, adapted to engage or bear against a fixed cam L; the shape of this cam is such that in the normal or identical position of the parts, the end of the extension or its anti-friction roll lies within the recess in the cam, as shown in Fig. 1, but upon the movement of the key moving with it the bar E' and its extension J, the bar will be rocked so its hook is engaged with the hook of the key and is positively held in such engagement during the remaining movement of the key in both directions as the extension or its anti-friction roll moves against the concentric portion L' of the cam—concentric with the arc of the movement of the key.

The lengthened arm F³ is connected with a reciprocating rack-frame by a stud M projecting from the lower end of the rack and entering the slotted end of the arm. The reciprocation of the rack-frame imparts by the mechanical movement a rotation constantly in one direction, to a toothed wheel N to which the ratchet wheel of the pawl and ratchet E² is connected, (see Fig. 8,) so that as soon as the arm is moved by the commencement of the movement of the key, rotation is imparted to the toothed wheel N, first by one portion of the rack moving in one direction, and by the opposite portion of the rack in the return movement of the rack-frame, so that the arm is compelled to make a complete stroke upward and a complete stroke downward before the key that has moved the arm is released from the bar E', and in order to permit a slight initial movement of any key before it is under the control of the controller, the ratchet wheel of the pawl and ratchet E², has a slight blank or non-toothed portion which resting under the pawl in the normal position of the parts, has no action to prevent the return of the key when only moved for a short distance, but as soon as the first tooth of the ratchet wheel passes the pawl the bar of the controller is then locked in engagement with the key and the parts are compelled to make a complete stroke in both directions.

The vertical movement for converting the reciprocatory motion imparted to the rack-frame into rotary motion imparted to the toothed wheel N, forms the subject-matter of Letters Patent issued to me August 25, 1892, Nos. 458,302 and 458,303. It may be stated, however, that the rack-frame G, see Figs. 5 to 9, consists of a number of parallel toothed bars connected together to move as one, and sliding in a vertical guide way G' formed in the side frames, having opposed toothed surfaces between which the toothed wheel N is mounted to revolve upon a fixed stud G². This toothed wheel is a mutilated wheel, the first tooth G³ of which, is a yielding one adapted to engage with the last tooth but one of each of the racks so as to move into en-

gagement with said last tooth as indicated in Fig. 8. Thus, as shown in Fig. 5, where the parts are in their normal position, said yielding tooth is passed into engagement with the last tooth of one of the racks of the rack-frame.

In the upward reciprocation of the rack-frame the toothed wheel will be rotated by that rack until said yielding tooth has passed into engagement with the first tooth of the opposite rack, as shown in Fig. 6, when upon the return reciprocation of the frame the toothed wheel will be rotated in the same direction back to its starting position. The toothed wheel N carries a ratchet wheel E' secured to move in unison therewith, the teeth of which are engaged by a pawl, as shown in Figs. 1, 7, 8 and 9. This ratchet wheel is formed by the mutilated plain portion E³, which normally lies under the pawl when the parts are at rest, so that the key and connected parts may have a very slight movement before the pawl engages with the ratchet wheel and compels a complete movement in one direction. This rotary motion imparted to the toothed wheel N is the means for imparting rotations to a transverse shaft O through a train of gearing G⁴ in a mesh with a gear G⁵ fast to the shaft O, and through a toothed wheel 37 motion is communicated to a cam which regulates the locking of the pawl with the registering mechanism which is operated and constructed as shown in the before mentioned application, Serial No. 399,640.

The drawer Q when in its closed position by a latch P that projects from a shaft P' arranged widthwise of the machine with the end of the latch in position to fall in front of the rear wall P² of the drawer, see Fig. 1, and thus prevent it being opened. This latch is operated to release the drawer by a cam P³ on the shaft O moving in contact with an arm P⁴ projecting from, and fast to the shaft P'.

The cash drawer Q is located in the compartment Q' in the lower portion of the machine and is adapted to be positively moved outward or toward its open position for access to its contents. It is provided with a pair of side flanges Q² adapted to rest on one or more supporting rolls Q³ mounted on studs projecting into the compartment from the side frames and under a roll Q⁴, mounted above the flanges Q² near the rear of the compartment, thus forming a way for the easy movement of the drawer in and out of its compartment. When in its closed position the drawer may be moved more or less to its open position by the direct action of a cam or incline R connected in this construction to, and forming a part of the rack-frame G so as to be movable vertically therewith. This cam or incline acts against a stud or anti-friction roll Q⁵ projecting from the side of the cash drawer in position upon the vertical movement of the cam R to be struck thereby and upon the continued movement

of the cam positively to move the drawer outward from its compartment.

To prevent the drawer from being wholly removed from its compartment Q, it is provided with a stop Q^6 projecting downward through the opening in the bottom of the drawer from a lever Q^3 pivoted at Q^7 to the side of the drawer. In the normal position of the stop, it is in position to strike the front walls of the frame work and thus prevent the entire withdrawal of the drawer from its compartment. The upward end of the lever Q^3 is provided with a finger piece Q^9 which, when the drawer is open, is accessible to the attendant and may be moved to raise the stop Q^6 from engagement with the front walls of the frame work, and thus permit the entire withdrawal of the drawer.

The mechanism so far described is not claimed in this application, but shown and described so as to show clearly the parts co-operating with the key locking device hereinafter described, by which, when the cash drawer is open the machine is locked against operation so that no key can be played until the cash drawer is returned to its closed position, the return of which releases the key locking device so the machine is in condition to be operated by playing any desired key or keys.

On the shaft O which receives its rotary motion from the train of gearing G^4 , I have arranged a key locking device S, as shown in Figs. 1, 2, 3, 10, 11, 12 and 13, and it consists of three parts, S' , S^2 and S^3 , of which S' and S^2 are permanently fixed to the shaft and move with it, while S^3 is mounted loosely on the shaft between the two fixed portions and is under control of the spring S^5 in the cavity of the part S' Fig. 10 so that it can be stopped in its revolution with the two fixed parts while they continue their motion until the key is returned to its normal position.

There is a co-operating device T, secured to the brace-rod T^7 across the rear of the machine, in which is pivoted at T^2 a finger T^3 which, in the normal position of the parts as shown in Fig. 1, has its front and rear ends on about a level; as the rear end of the drawer lifts the rear end of the finger upward against the tension of the spring plunger T^4 mounted in the part T, which plunger bears against the finger T^3 and tends to hold the rear end downward and the front end upward, as shown in Fig. 11. When a key is played the motion is imparted to the shaft O through the train of gearing, and the shaft P' given a slight elevation owing to the finger P^4 being lifted by the cam P^3 , securely mounted to the shaft O, so that the latch P lifts and allows the drawer which is driven by the cam R, to move outward, which movement allows the rear end of the finger T^3 to drop downward so that its forward extension is lifted upwardly, as shown in Figs. 3 and 11, and in that position engages the nose S^4 of the cam

S^3 just before the operated key returns to its normal position while the shaft O and the parts S' and S^2 move with the shaft to their normal position, and the lug S^6 moves from the position shown in Fig. 2 to the opposite end of the space S^7 , shown in Fig. 13, so that as the part S^3 is locked by the finger T^3 engaging its cam, it locks the shaft and the secured parts S' and S^2 by its lug S^6 , and thus locks the shaft O against movement, consequently preventing the operation of any of the keys in the register as the gearing cannot be operated owing to the shaft O being thus locked. The distance the shaft O moves after the finger T^3 engages the nose S^4 of the cam S^3 is equal to the space in which the lug S^6 travels from one side to the other.

When the shaft is in the position shown in Fig. 3, the cam S^3 is under tension of its spring S^5 and the lug S^6 on its opposite side has engaged the opposite wall of the part S^2 and consequently cannot move. In other words, the limit of movement of the cam S^3 after the finger T^3 engages with its nose S^4 is determined by the distance which the lug S^6 is allowed to move in the space S^7 , which thereby puts the cam S^3 under tension of the spring S^5 so that when the cash drawer Q is closed, its rear wall strikes the rear end of the finger T^3 which throws its front end from contact with the nose S^4 of the cam S^3 , whereby the cam S^3 under tension of the spring S^5 is thrown to the position shown in Fig. 1; that is to say, it has passed the locking finger T^3 and cannot be engaged any longer by it, and the machine is then in condition to be operated by playing any of the keys, as the shaft is free to revolve. The rear wall P^2 of the drawer also in closing lifts the latch P and as the wall passes under it the latch falls in position against the inside rear wall of the drawer and holds it closed until the next operation of the machine.

In Figs. 14 and 15 I have shown a modification of the parts S' , S^2 , S^3 and S^5 so that the pieces S' , S^2 and S^3 will consist of only one piece, S^3 , which is secured permanently to the shaft O and moves with it. This cam S^3 is so timed on the rotary shaft O that when it has completed its full revolution the nose S^4 of the cam S^3 will stop just in front of the locking finger T^3 , as shown in Fig. 14, and the shaft cannot make another revolution until the finger T^3 is lifted out of its locking position by the closing of the cash lid as in the construction heretofore described. This arrangement allows the engagement of the finger T^3 and the nose S^4 of the cam S^3 whenever the cash drawer is moved slightly outward by allowing play between the latch P and the wall P^2 when the cash drawer is closed.

In the construction shown in Figs. 10, 11 and 13 the cam S^3 is permanently disengaged when lifted out of engagement with the finger T^3 , for the reason that the spring S^5 moves the cam S^3 a certain distance away from the fin-

ger T³, and the nose S¹ of the cam S³ cannot engage the finger T³ until the shaft O makes its next revolution.

U represents a latch pivoted to the part T' which has a hook U' adapted to be operated and brought into connection with the rear end of the finger T³ and lifted out of operative position when it is desired not to use the key locking device.

I do not limit myself to the exact construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus ascertained the nature and set forth the construction of my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a cash register the combination with a series of key levers, a rotary shaft, connections between the key levers and shaft for rotating the same, and an automatically locking cash drawer, of a locking device co-operating with the rotary shaft to prevent operation of the machine when the cash drawer is open, substantially as set forth.

2. In a cash register the combination with a series of key levers, a rotary shaft, connections between the key levers and rotary shaft, an automatically locking cash drawer, of a stop adapted to lock the rotary shaft against movement when the cash drawer is open, and thereby prevent the operation of the machine, substantially as set forth.

3. In a cash register the combination with a series of key levers, a rotary shaft, connections between the key levers and rotary shaft, an automatically locking cash drawer, of a stop located on the rotary shaft and adapted to lock it against movement when the cash

drawer is open, and thereby prevent the operation of the machine, substantially as set forth.

4. In a cash register the combination with a series of key levers, a rotary shaft, connections between the key levers and rotary shaft, an automatically locking cash drawer, of a key locking device for preventing the operation of the machine when the cash drawer is open, consisting of a spring-pressed stop mounted on the rotary shaft, and a spring-pressed finger adapted when the drawer is open to catch said stop and thereby lock the shaft against movement, substantially as set forth.

5. In a cash register the combination with a series of key levers, a rotary shaft, connections between the key levers and rotary shaft, an automatically locking cash drawer, of a key locking device for preventing the operation of the machine when the cash drawer is open, consisting of a spring-pressed stop mounted on the rotary shaft, and a spring-pressed finger adapted when the drawer is open to catch said stop and thereby lock the shaft against movement, and adapted to release said stop when the cash drawer is closed and thereby permit the operation of the machine, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 19th day of December, 1892.

WILLIAM KOCH.

Witnesses:

PAUL MÜLLER,
PETER SCHAUS.