

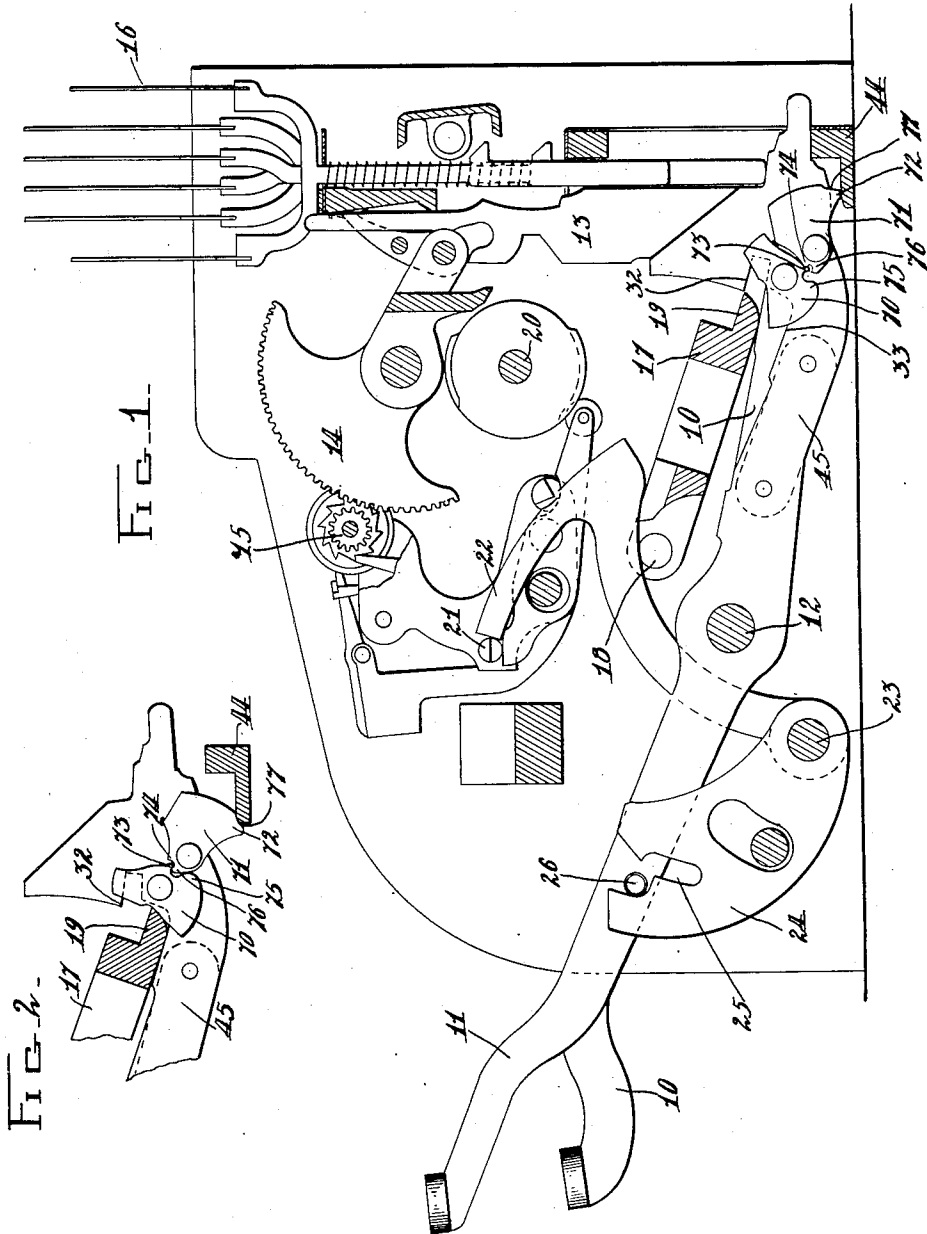
No. 823,516.

PATENTED JUNE 19, 1906.

W. G. DOTY.
CASH REGISTER.

APPLICATION FILED NOV. 15, 1904.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

FIG. 3.

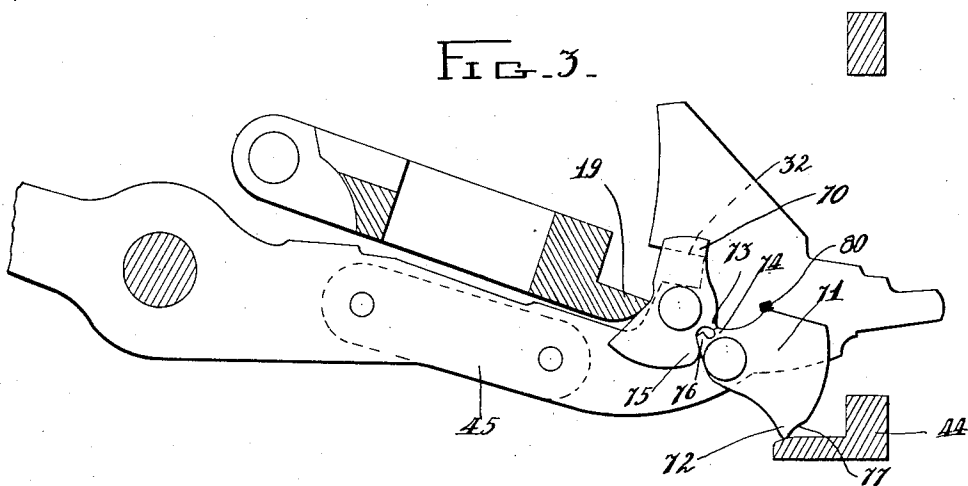


FIG. 4.

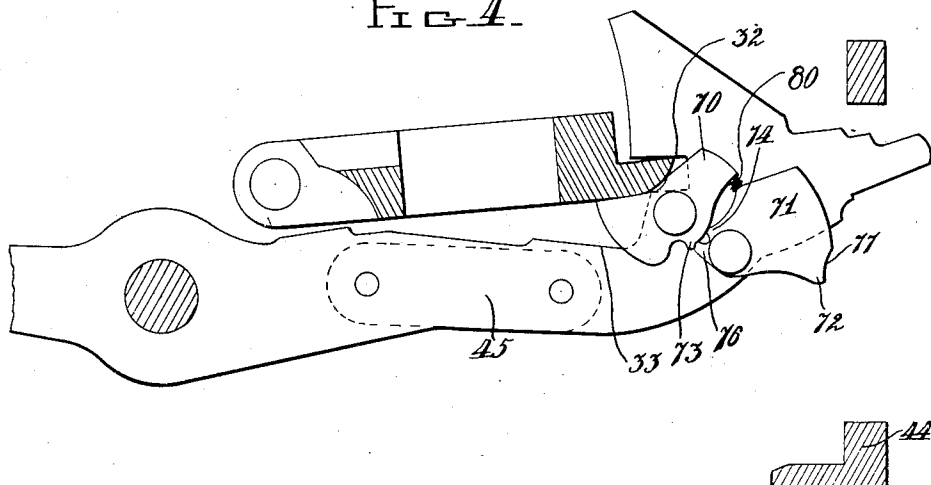
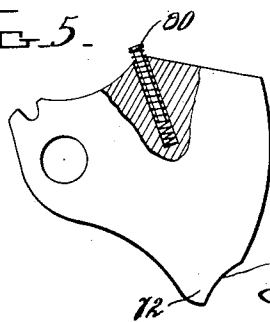


FIG. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

WALTER G. DOTY, 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.

No. 823,516.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed November 15, 1904. Serial No. 232,832.

To all whom it may concern:

Be it known that I, WALTER G. DOTY, 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, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in the key construction of cash-registers of the key-operated type, and has among its objects to provide improved devices in registers of this kind for locking the keys to a common operating member during a certain period of the operation of the machine, and also to provide an improved form of a so-called "flexible-key" construction. This flexible-key construction as understood in the present state of the art refers to a key which is given an initial setting movement, while the final movement of the key or a part thereof is effected by means of the operation of other keys, so that by this means several keys which it is desired to operate at one time may be started initially and then all of the mechanism ordinarily actuated thereby will be actuated by the mere depression of a single key, thus obviating the necessity of spanning several keys with one hand in order to secure the simultaneous operation of these several keys.

The general type of key-operated registers to which these improvements are shown as applied is set forth and described in Letters Patent to Thomas Carney, No. 497,860, dated May 23, 1893, and the machine is provided with a mechanism for throwing out the counter on the operation of the special transaction-keys, this mechanism being similar to that shown in patent to Joseph P. Cleal, No. 748,261, dated December 29, 1903; but it will readily be seen that the present improvements may well be applied to any of the various forms of key-operated registers. The key construction herein set forth is more particularly intended as an improvement upon a similar form of key construction shown in a copending application of Edward J. Hall, filed September 13, 1904, Serial No. 224,334.

With these and incidental objects in view the invention consists in 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 a side elevation, partly sectionalized, of a machine to which the present improvements have been applied. Fig. 2 represents a detail view of the particular key construction forming the basis of these improvements and showing the key in a partially-operated position. Figs. 3 and 4 represent the key in different stages of its operative movement, and Fig. 5 represents a detail view, partly sectionalized, of one of the pawls carried by the key.

The machine itself comprises a series of amount-keys 10 and special-transaction keys 11, pivoted upon a transverse shaft 12. (See Fig. 1.) To the amount-keys 10 are attached graduated lifting-bars 13, which operate registering-segments 14 to operate the counter 15. The operation of each key also raises a suitable tablet-indicator 16. The key-coupler 17 is common to all of the keys and is suitably pivoted at 18 in the main frame of the machine and is provided with an engaging nose 19, which is arranged to engage slots formed in the keys in a well-known manner to couple the operated keys together upon the operation of the machine. By suitable mechanism (not shown) the operation of the key-coupler revolves the main revolution-shaft 20 and at each operation of the machine throws the counter 15 into engagement with the segments 14. The disengagement of the counter with the segments is controlled by means of plungers 21, mounted in the counter-carrying frame, these plungers being beveled upon their ends and being forced inward against spring tension by means of arms 22, which are fast to a shaft 23, to which shaft are attached plates 24, having slots 25, and into which project pins 26 on the side of the special keys 11, so that the operation of any special key will rock its plate 24, and thereby by rocking the arm 22 force inward the beveled plunger 21 and prevent the counter being thrown into engagement with the segments upon the operation of the machine. The general construction of the machine is described in the

aforesaid patent to Thomas Carney, No. 497,860, and the control of the throw-out mechanism for the counter is substantially similar to that shown in the aforesaid patent to Joseph P. Cleal, No. 748,261. Consequently no further description of the same will be given, reference being had to said patents for a more detailed explanation.

Coming now to the subject-matter of the present invention, the special keys are the so-called "flexible" keys, and as each one is constructed in the same manner only one of the keys will be shown and described. As shown in Fig. 1, each of these special keys has pivoted upon its rearward end a locking-pawl 70 and a tripping-pawl 71. The upper half of this rearward end of the key is formed with the usual notch 32 for engagement by the engaging nose 19 of the key-coupler; but the upper side of the key below the key-coupler is cut away at 33, so that the key may have an initial movement before this upper side comes in contact with the key-coupler. In Fig. 1 this special key is shown in its normal position, and it will be observed that the key-coupler in its normal position rests upon the upper sides of the amount-keys 10, whereas the upper side of the special key 11 is some distance below the key-coupler, so that when the forward end of the special key is depressed the key may have an initial movement before it comes in contact with the key-coupler, and the coming in contact with the key-coupler in this manner denotes to the operator that he has pressed the key to a sufficient extent, the key being retained in this initially-depressed position by the cooperation of devices to be later described. As will be observed in Fig. 1, the notch 32 of the special key normally stands opposite the engaging nose 19 of the coupler and in the same horizontal plane with the corresponding notches of the amount-keys. This initial movement of the special key, as just explained, carries the key into the position shown in Fig. 2, in which the cut-away portion 33 of the special key is now in engagement with the key-coupler; but the notch 32 is now raised to a higher position above the engaging nose 19 of the key-coupler, while the corresponding notches of the amount-keys remain in the same horizontal alinement with the engaging nose 19 of the key-coupler, as shown in the normal position of the keys in Fig. 1. This movement of the special key, however, so rocks the key about its pivotal shaft 12 that the forward and upper side of the notch 32 now lies in the path of movement of the key-coupler when the key-coupler is carried upward in the manner to be described, the key-coupler and key moving obviously about different centers.

The special key now having been moved to its initial position and latched in such position from backward movement, the amount-

key is now operated, whereupon the key-coupler is given an upward movement, its nose 19 thereupon engaging the slot of the particular amount-key operated and the key-coupler also strikes the forward and upper side of the notch 32, so as to engage the special key and carry that likewise up with the key-coupler along with the amount-key, so that at the extremity of the movement the key-coupler and special key and amount-key have assumed the position shown in Fig. 4; but it will be observed that since the coupler had to move a certain distance before it came in contact with and picked up the special key the same space is now left between the key-coupler and the special key as existed in the normal position of the key and key-coupler, as shown in Fig. 1—that is, the space due to the cut-away portion 33 of the special key. During this movement of the keys the locking and the tripping pawls hitherto referred to have become operative in the manner now to be explained. The locking-pawl 70 and the tripping-pawl 71 are, as before stated, pivoted upon the rear end of the special key and are so shaped as to cooperate with each other in the manner to be described. The normal position of the pawls is as shown in Fig. 1, in which the tail 72 of the pawl 71 rests upon the cross-bar 44. When the operator gives the key its initial movement to bring the cut-away portion 33 against the under side of the key-coupler, the lower and forward side of the pawl 70 strikes the key-coupler and said pawl is turned upon its pivot into the position shown in Fig. 2. During this movement of the pawl 70 the pawl 71 is also rotated, first by the engagement of the small tooth 73 of the pawl 70 with the small tooth 74 of the pawl 71 and then by the large tooth 75 of the pawl 70 striking the large tooth 76 of the pawl 71, the movement of these teeth being somewhat analogous to a gear movement. As will be seen in Fig. 2, the limit of this initial movement of the key is such as to permit the pawl 71 to rotate sufficiently to allow its cut-away portion 77 to ride over the curved forward end of the cross-bar 44, and as the key settles back slightly the pressure of the pawl 71 against the cross-bar 44 is such as to hold the key in this partially-operated position. Thus the pawl 71 itself serves as a latch to prevent the key from return to normal position after this initial movement has been given to it. If the operator should attempt to return the key to normal position and by some possibility so manipulate the key that the cut-away portion 77 of the pawl 71 would be freed from contact with the cross-bar 44 and the pawl 71 would begin to rotate in the reverse direction to permit return of the key, the complete return of the key to normal position would be absolutely prevented, because the pawls would assume the position shown in Fig. 3, in

which the pawl 71 is shown as partially returned toward its normal position and with the tail 72 resting upon the cross-bar 44; but it will be observed that the relative positions of the pawls is such that the large teeth 75 and 76 and the small teeth 73 and 74 are binding against each other, so that the reverse rotation of the pawl 71 is no longer possible and the key remains positively locked from complete return to normal position, and even in such position the key is still in position to be caught by the key-coupler-engaging nose 19 when the coupler rises, which of course also happens when the key-coupler rises while the key is in the position shown in Fig. 2.

The special key now having been given its initial movement and thereupon being automatically locked from return movement by the pawls themselves, an amount-key is now operated, whereupon the key-coupler rises, as heretofore explained, and after having been moved through a certain distance by the amount-key picks up the special key and lifts the same in turn, this movement of the coupler prior to the time it engages the special key being sufficient again to open up the gap between the coupler and the cut-away portion 33 of the special key. During this upward movement of the key-coupler the engaging nose 19 now strikes the forward upper side of the pawl 70 and rotates the pawl upon its pivot in a direction the reverse of its previous direction of movement, and near the extremity of the upward movement of the coupler the pawl 70 has been forced into the position shown in Fig. 4, the rearward upper portion of the pawl striking against a spring-pressed pin 80, which is socketed in the upper part of the pawl 71, as shown in Fig. 5, and by the pressure of the pawl 70 against this pin 80 the pawl 71 is rotated upon its pivot in such manner as to bring the large tooth 76 of said pawl in behind the small tooth 73 of the pawl 70, so that the pawl 70 now becomes locked from rotating in the opposite direction, and therefore since the key-coupler is resting upon the forward end of the pawl 70 the key is now, in effect, positively locked to the key-coupler, so that upon the downward movement of the coupler the special key will be carried back with the coupler to normal position. This locking condition of the pawl 70 obtains until the tail 72 of the pawl 71 again strikes the cross-bar 44, in which case the pawl 71 is rotated sufficiently to withdraw the large tooth 76 from locking position behind the small tooth 73 and to permit the tooth 73 to enter the recess between the tooth 76 and the tooth 74, so that the pawls then assume their normal position, this unlocking taking place of course at the extremity of the downward movement of the rear end of the key. It will thus be observed that with this arrangement of the pawls the

pawls themselves serve first to latch the key in initially-depressed position, so as to prevent return to normal position and also serve to lock the key to the key-coupler during the return of the key from its completely-depressed position. It will be observed that the key-coupler in returning to normal position practically carries the special key itself positively home to normal position, since the key is locked to the coupler until the coupler has almost reached its normal downward position. This tripping of the pawl 71 by the cross-bar 44 at the extremity of this downward movement is of course essential to permit a succeeding initial movement of the same key without an attendant movement of the key-coupler, for if the pawl 71 will not trip and the pawl 70 remained in locked position, with the key-coupler resting thereon, any initial movement of the special key on the succeeding operation will of course lift the key-coupler instead of permitting the ordinary initial movement of the key which carries the cut-away portion 33 up against the key-coupler. Although this final tripping of the pawl 71 takes place almost at the very end of the return stroke of the key, yet if the key remained even slightly removed from its final downward position the forward nose of its operating-slot 32 might still be in the path of movement of the coupler, so as to be caught by the key-coupler in the next upward movement of the same. Therefore to obviate such an accidental operation each special key is provided with a weighted portion 45, which returns the rearward end of the key completely to normal position after the above-mentioned tripping has taken place.

The feature of locking the key to the key-coupler and retaining this locking position until both have returned almost to normal position is a feature the advantage of which is already set forth in the aforesaid Hall application, for in previous arrangements of flexible keys of this sort some spring means had to be resorted to to return the special key completely to normal position, this spring means being operative over an extent of movement equal to that of the original initial movement of the key, and this has left the machine open to manipulation due to the holding back upon the special key to prevent the same from returning to normal position. The construction herein adopted for securing the return of the key practically to normal position is similar to that before described and claimed in said Hall application, the present improvements being more particularly directed to the use of these very devices to effect the latching of the key in its partially-operated position.

While the form of mechanism here shown and described is admirably adapted to fulfil the objects primarily stated, it is to be under-

stood that it is not desired to confine the invention to the one form of embodiment here disclosed, for it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

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

1. In a cash-register, the combination with a key, and a member movable with said key; of a movable device mounted on said key for preventing the return of the key to normal position after an initial movement of the same and for also locking the key to said member after a certain partial movement of the key.

2. In a cash-register, the combination with a series of keys certain of which have provisions permitting an initial movement of the same, and a member common to said keys; of movable devices carried by the initially-movable keys for locking the same to said common member and for also latching such keys in initially-operated position.

3. In a cash-register, the combination with a series of keys certain of which have provisions permitting an initial movement of the same, and a member common to said keys; of movable devices carried by the initially-movable keys for latching the same to said common member and for also latching such keys in initially-operated position; and means coöperating with said movable devices for unlocking said initially-operative keys from said common member at the end of the operation of said member.

4. In a cash-register, the combination with a key formed with provisions permitting an initial movement, and a coupling member to which said key becomes coupled; of means coöperating with said key and said coupling member to positively return said key with said coupling member to normal position beyond its initially-operated position, said means also serving to latch the key in such initially-operated position.

5. In a cash-register, the combination with a special key having provisions formed thereon for permitting an initial movement, and a key-coupler coöperating with said key; of two coacting pawls pivoted upon said key and arranged to be operated by said key-coupler to lock the key to the coupler, said pawls also being constructed to latch said key in initially-operated position.

6. In a cash-register, the combination with a special key having provisions formed thereon for permitting an initial movement, and a key-coupler coöperating with said key; of two coacting pawls pivoted upon said key and arranged to be operated by said key-coupler to lock the key to the coupler; of a

stationary abutment positioned to engage one of said pawls to cause said key to be latched in initially-operated position, and also to engage said pawl at the completion of the stroke of the key to trip the pawl and destroy the locking relation with the key-coupler.

7. In a cash-register, the combination with a key having provisions formed thereon for permitting an initial movement, and a key-coupler to which said key becomes coupled, of a tripping-pawl pivoted upon said key and formed with operating projections; and a locking-pawl positioned to be operated by the movement of said coupler and formed with operating projections for engaging the operating projections of the tripping-pawl when the locking-pawl is moved by said key-coupler and thereby positively force said tripping-pawl into position to effect the latching of the key in initially-operated position.

8. In a cash-register, the combination with a key having provisions formed thereon for permitting an initial movement, and a key-coupler to which said key becomes coupled; of a stationary abutment; a tripping-pawl pivoted upon said key and formed with operating projections; and a locking-pawl positioned to be operated by the movement of said coupler and formed with operating projections for engaging the operating projections of the tripping-pawl when the locking-pawl is moved by said key-coupler and thereby positively force said tripping-pawl into position to engage said stationary abutment to effect the latching of the key in initially-operated position.

9. In a cash-register, the combination with a key having provisions formed thereon for permitting an initial movement, and a key-coupler to which said key becomes coupled; of a tripping-pawl pivoted upon said key and formed with operating projections; and a locking-pawl positioned to be operated by the movement of said coupler and formed with operating projections for engaging the operating projections of the tripping-pawl when the locking-pawl is moved by said key-coupler and thereby positively force said tripping-pawl into position to effect the latching of the key in initially-operated position, said two sets of operating projections also serving to lock the locking-pawl by the tripping-pawl and thereby lock the key to the key-coupler.

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

WALTER G. DOTY.

Witnesses:

WM. O. HENDERSON,
CARL N. BEUST.