

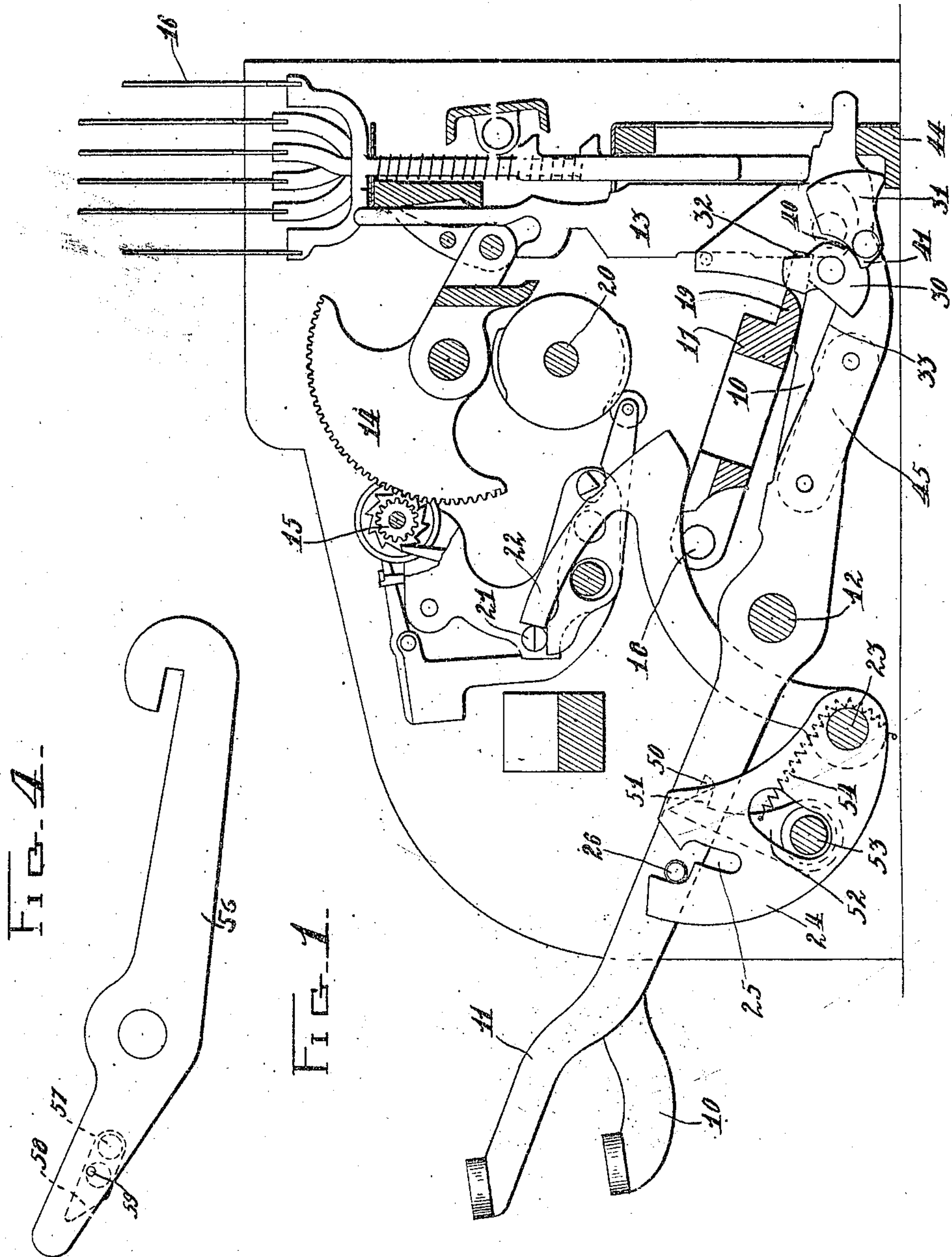
No. 875,661.

PATENTED DEC. 31, 1907.

E. J. HALL.  
CASH REGISTER.

APPLICATION FILED SEPT. 13, 1904.

2 SHEETS—SHEET 1.



Witnesses  
*Wm. Henderson*

Inventor  
*Edward J. Hall*  
*J. B. Hayward*  
Attorneys

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2 SHEETS—SHEET 2.

FIG. 3.

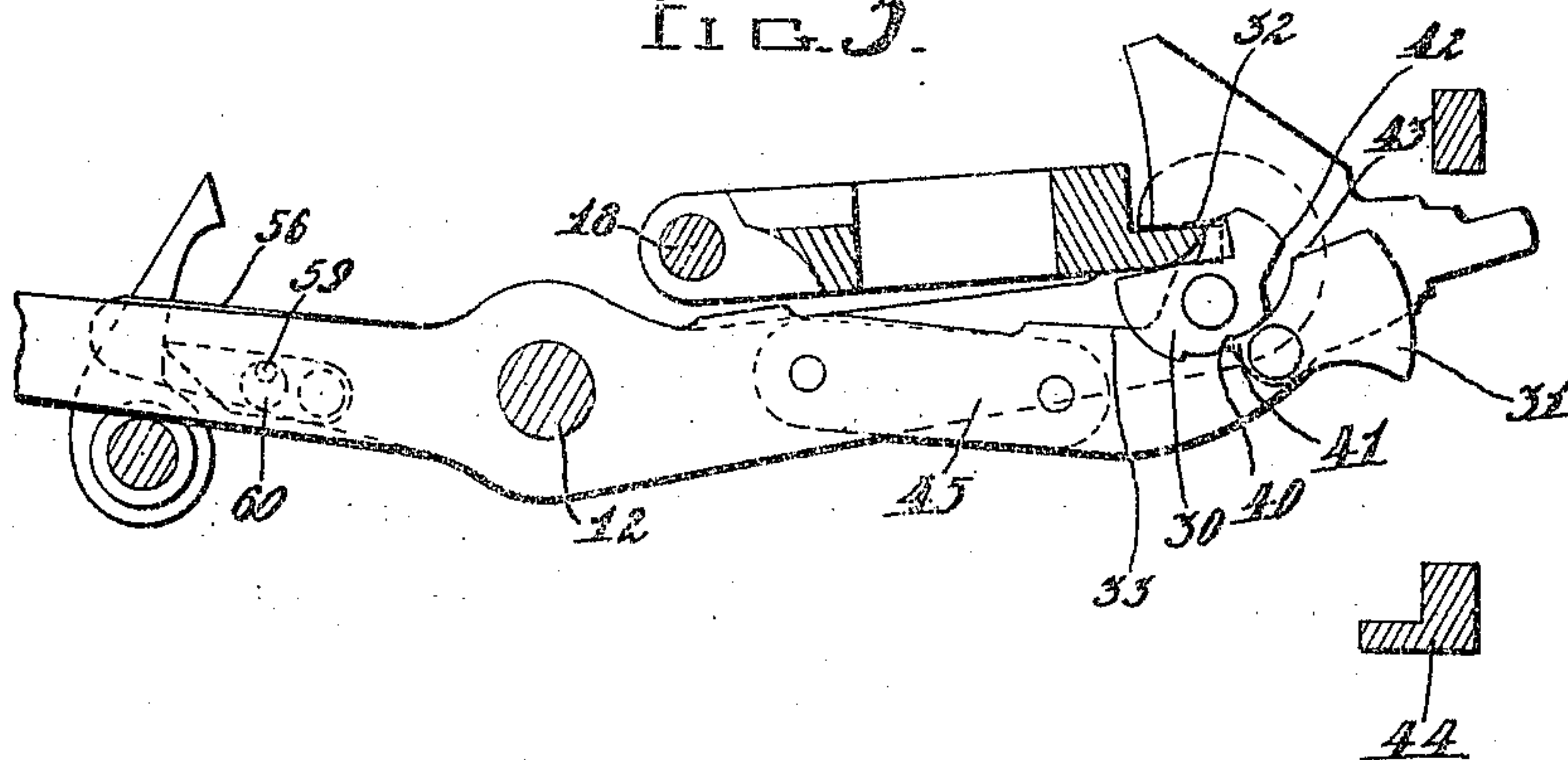
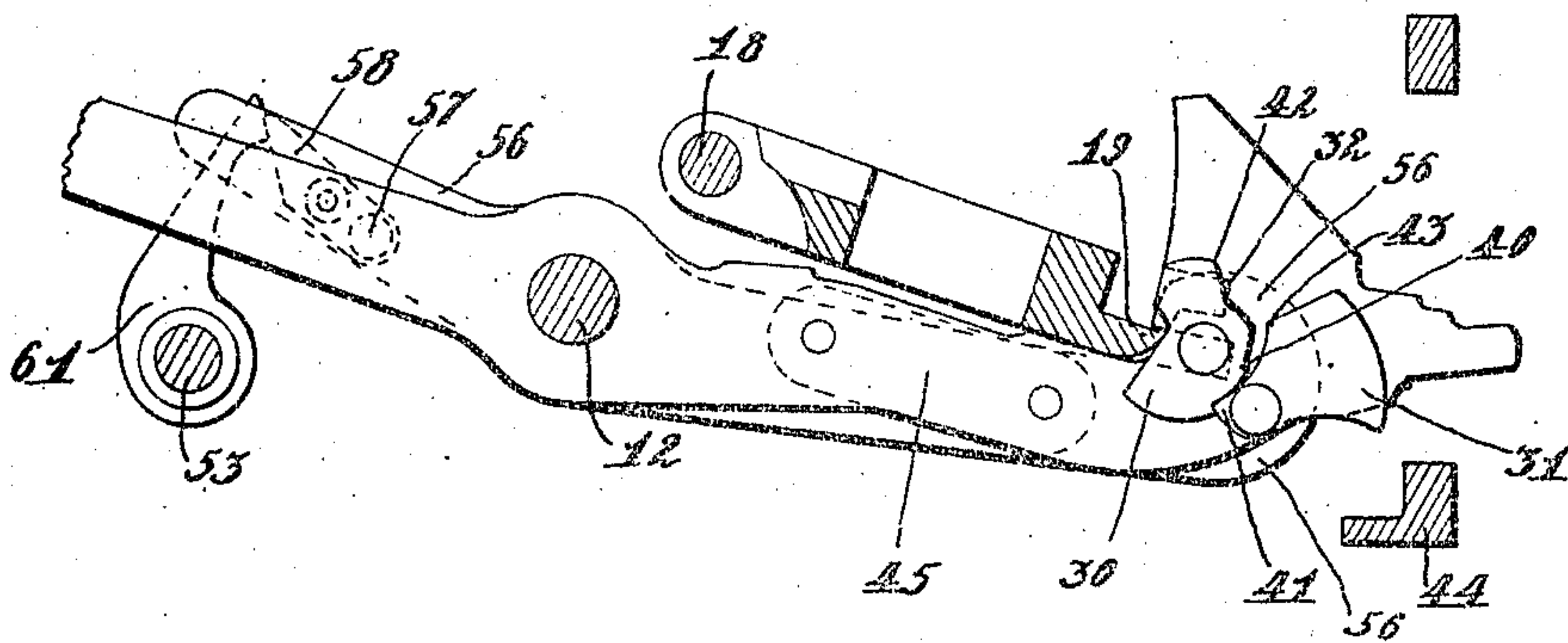


FIG. 2.



Witnesses  
*C. B. Foster*  
*Wm. O. Henderson*

Inventor  
*E. J. Hall*  
*J. B. Hayward*  
Attorneys



# UNITED STATES PATENT OFFICE.

EDWARD J. HALL, OF KANSAS CITY, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

## CASH-REGISTER.

No. 875,661.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed September 13, 1904. Serial No. 224,334.

*To all whom it may concern:*

Be it known that I, EDWARD J. HALL, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, 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 Dec. 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.

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 ma-

chine 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, showing the key in partly operated position; and Fig. 3 represents the same key given a still further extent of movement. Fig. 4 represents a part of the key unlatching device.

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 from 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 into which project pins 26 on the sides 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 throwout 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 30 and a tripping and latching pawl 31. 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, a separate latch being provided as will be explained later, for holding the key in this initially depressed position. As will also 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 near the extremity of the movement the key-coupler and special

key and amount key have assumed the position shown in Fig. 3, 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 30 is provided with a notch 40 into which the nose 41 of the tripping and latching pawl 31 is arranged to engage at a certain point in the operation of the keys. The normal position of the pawls is as shown in Figs. 1 and 2, but as soon as the special key begins to rise with the key-coupler, the engaging nose 19 of the key-coupler acts against the forward side of the pawl 30 and rotates the same upon its pivot, until the coupler has reached the position shown in Fig. 3 in which the pawl 30 has been so far rotated as to bring the notch 40 to register with and be engaged by the nose 41 of the tripping pawl, and consequently the pawl 30 is now held locked by the tripping pawl so that it cannot rotate reversely about its pivot. It will be seen that the pawl 31 is both a latching and a tripping pawl.

Ordinarily the weight of the rearward end of the pawl 31 would be sufficient to cause it to turn upon its pivot to bring this nose 41 into engagement with the notch 40, but in order to make this turning positive, the pawl 30 is so shaped that its rearward head 42 will at the extremity of the rotary movement of the pawl 30 strike the upper corner 43 of the pawl 31, and the head 42 being meanwhile carried rearward by the continued movement of the key-coupler into the slot 32 will through the head 42 positively act upon the upper side of the pawl 31 to rotate the latter pawl about its pivot and thereby positively carry the nose 41 into engagement with the notch 40. To permit this operation, of course the key must be capable of movement slightly beyond the position shown in Fig. 3, during which the head 42 would contact with the corner 43 as described, and then when the key begins to descend it would tend to cause a reverse rotation of the locking pawl 30, but the same will now be locked by the engagement of the nose 41 with the notch 40 as shown in Fig. 3, and therefore the special key is in effect positively locked to the key-coupler and will return with the key-coupler toward normal position.

As soon as the keys and key-coupler have returned almost to normal position the tripping pawl 31 strikes the stationary cross-bar 44 of the machine which thereupon rotates the pawl 31 about its pivotal point and dis-



engages the nose 41 from the notch 40 so that the two pawls now resume the position shown in Fig. 1, and upon the next operation of the machine the same key may if desired be again depressed to give the same its initial movement sufficient to bring the upper surface of the cut-away portion 33 against the key-coupler, it being apparent that this final tripping of the pawl 31 by the cross bar 44 is essential so as to permit the pawl 30 to resume its normal position and permit this initial setting movement of the key, for had the pawl remained locked in the position shown in Fig. 3 any initial setting movement of the key would have moved the key-coupler up with it owing to the fact that the key-coupler would have been resting directly upon the pawl 30 were this pawl locked in operated position. This final tripping by the cross bar 44 takes place almost at the very end of the return stroke of the key-coupler, and both the key-coupler and special keys are then practically in normal downward position, but if the special key remained even slightly depressed and did not return quite to its normal downward position, the forward nose of its operating slot 32 might then be in the path of movement of the key-coupler so as to be picked up during the movement of the key-coupler by another key, and for the purpose of obviating this each special key is provided with a weighted portion 45 which retains the rearward end of the key in normal downward position. It will thus be seen that the special key becomes positively locked to the key-coupler at the beginning of the downward stroke of the key-coupler and will remain so locked until the key has practically returned to normal position. In previous arrangements of flexible keys of this sort the initial movement of the key has been similar to that described herein, but when the key-coupler had returned to normal lower position, some spring means had to be resorted to to return the special key to its normal lower position, the extent of this return movement of the special key being of course equal to the extent of the initial setting movement of the key; and this feature has left such machines open to manipulation in that the operator could permit the amount keys to return to normal position but could by holding the special key prevent the same from returning to normal position and thereby disable some of the normal functions of the machine. A specific example of such manipulation was found in the case where the special keys were made to actuate special counters to add one unit upon the same for each time the key was operated, and by holding the special key from complete return to normal position the operator would then prevent the special counter actuating pawl from moving far enough to engage the next tooth of the counter and therefore upon a

successive operation of the special key for the next transaction the special counter would not have been actuated a second time, all of which would of course give a false indication of the true number of times that particular special key had been operated.

It will be apparent from the device herein described that the return of the key-coupler with the amount keys to normal position positively carries the special key back almost to normal position there being need only for time enough to effect the tripping of the pawl by the bar 44 at the extremity of the downward movement of the key in the manner heretofore described. It is of course understood in the description hitherto given that in general when the expression "downward" and "upward" movement of the key were referred to, reference was had to the rear portion of the key rather than to the forward portion containing the usual finger buttons.

The latch which latches the special key in its initial position against return to normal position will now be described. Each special key is formed upon its side with a lug 50 engaged by a nose 51 of a pawl 52 fast upon a transverse shaft 53, these pawls being normally drawn rearward by means of a spring 54 so that when any special key is depressed its corresponding pawl 52 will latch over the lug 50 and hold the key from return to normal position. In order to unlatch the pawl 52 at the end of the return stroke of the key, an arm 56 (see Fig. 4) is pivoted upon the shaft 12 and has a rearward hooked portion which overlaps the key-coupler engaging nose 19 so that upon each movement of the key-coupler the rearward portion of the arm 56 will be raised and the forward portion will be lowered; upon this forward portion there is pivoted at 57 a pawl 58, and the arm 56 carries a pin 59 which projects through an aperture 60 formed in said pawl. This pawl engages an upwardly extending arm 61 which is fast upon the same shaft 53 which carries the pawl 52; and upon the downward movement of the forward end of the arm 56, the extent of movement of the pin 59 within the aperture 60 is such that the pawl 58 may slip by the arm 61, but upon the return movement of the arm 56, the pawl 58 strikes the arm 61 and rocks the arm backward thereby rocking the shaft 53 to release the pawl 52 from the path of engagement with the lug 50 thereby permitting the special key to return completely to normal position.

While the form of mechanism here shown and described is admirably adapted to fulfil the objects primarily stated, it is to be understood 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 pivoted upon said key for locking the key to said member after a 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 pivoted upon said initially movable keys for locking the same to said common member.
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 said initially movable keys for locking the same to said common member; and means for latching said initially movable keys in such initial position.
4. 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 said initially movable keys for locking the same to said common member; and means cooperating with said movable devices for unlocking said initially movable keys from said common member at the end of the operation of said member.
5. 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 cooperating with said key and said coupling member to positively return said key with said coupling member to normal position beyond its initially movable position.
6. 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 cooperating with said key and said coupling member to positively return said key with said coupling member to normal position beyond its initially movable position; and means for disabling said positive returning means at the end of the return stroke of the key.
7. In a cash register, the combination with a special key having provisions formed thereon for permitting an initial movement, and a key-coupler cooperating with said key; of two co-acting pawls pivoted upon said key and arranged to be operated by said key-coupler to lock the key to the coupler.
8. In a cash register, the combination with a special key having provisions formed thereon for permitting an initial movement, and a key-coupler cooperating with said key; of two co-acting pawls pivoted upon said key and arranged to be operated by said key-coupler to lock the key to the coupler; and a stationary abutment arranged to trip one of said pawls to destroy this locking relation at the end of the movement of the key-coupler.
9. In a cash register, the combination with a special key having provisions formed thereon for permitting an initial movement; and a key-coupler cooperating with said key; of two co-acting pawls pivoted upon said key and arranged to be operated by said key-coupler to lock the key to the coupler; a stationary abutment arranged to trip one of said pawls to destroy this locking relation at the end of the movement of the key-coupler; a latch for retaining the key in initially operated position; and means operated by the key-coupler for tripping said latch.
10. In a cash register, the combination with a key having provisions formed thereon for permitting an initial operative movement, and a key-coupler to which said key becomes coupled; of a locking pawl pivoted to said key and arranged to be operated by said coupler; and a tripping pawl also pivoted upon said key and co-acting with said locking pawl, said tripping pawl being formed with a nose for engaging a locking tooth formed on said locking pawl to lock the latter in position to effect a locking of the entire key to the key-coupler.
11. In a cash register, the combination with a key having provisions formed thereon for permitting an initial operative movement, and a key-coupler to which said key becomes coupled; of a locking pawl pivoted to said key and arranged to be operated by said coupler; and a tripping pawl also pivoted upon said key and co-acting with said locking pawl, said tripping pawl being formed with a nose for engaging a locking tooth formed on said locking pawl to lock the latter in position to effect a locking of the entire key to the key-coupler; said locking pawl also being shaped to contact with said tripping pawl when operated to a certain extent by said key-coupler to positively operate said tripping pawl to force said nose thereof into engagement with said locking tooth.
12. In a cash register, the combination with a key having provisions formed thereon for permitting an initial operative movement, and a key-coupler to which said key becomes coupled; of a locking pawl pivoted to said key and arranged to be operated by said coupler; a tripping pawl also pivoted upon said key and co-acting with said locking pawl, said tripping pawl being formed with a nose for engaging a locking tooth formed on said locking pawl to lock the latter in position to effect a locking of the entire key to the key-coupler; said locking pawl also being shaped to contact with said tripping pawl when operated to a certain extent by said key-coupler to positively operate said tripping pawl to force said nose thereof into engagement with said locking tooth.



ping pawl to force said nose thereof into engagement with said locking tooth; and a stationary abutment for engaging said tripping pawl and releasing said nose thereof from engagement with said locking tooth.

13. In a cash register, the combination with a series of amount keys and a series of special keys having provisions formed thereon permitting an initial operative movement of the same, and a key-coupler common to both sets of keys; of a locking pawl pivoted upon each special key and arranged to be engaged by said key-coupler upon the operation of the same by any of said amount keys; a tripping pawl also pivoted upon each of said special keys and co-acting with said locking pawl, said pawls being formed with projections which are forced into locking position by the engagement of said coupler with said locking pawl upon the operative movement of said coupler, whereby the special key which has been initially operated is locked to said coupler during substantially the entire return movement of the same; and a stationary abutment for engaging said tripping pawl to destroy said locking relation at the end of the return movement of the key.

14. In a cash register, the combination with a series of amount keys and a series of special keys having provisions formed thereon permitting an initial operative movement of the same, and a key-coupler common to both sets of keys; of a locking pawl pivoted upon each special key and arranged to be engaged by said key-coupler upon the operation of the same by any of said amount keys; a tripping pawl also pivoted upon each of said special keys and co-acting with said locking pawl, said pawls being formed with projections which are forced into locking position by the engagement of said coupler with said locking pawl upon the operative movement of said coupler, whereby the special key which has been initially operated is locked to said coupler during substantially the entire return movement of the same; a stationary abutment for engaging said tripping pawl to destroy said locking relation at the end of the return movement of the key; a latch for latching said special keys in initial operative position; and means operated by said key-coupler for rendering said latch inoperative upon the return stroke of the key.

15. In a cash register, the combination with a series of amount keys and a series of special keys having provisions formed thereon permitting an initial operative movement of the same, and a key-coupler common to both sets of keys; of a locking pawl pivoted upon each special key and arranged to be engaged by said key-coupler upon the operation of the same by any of said amount keys; a tripping pawl also pivoted upon each of said special keys and co-acting with said locking pawl, said pawls being formed with projections which are forced into locking position by the engagement of said coupler with said locking pawl upon the operative movement of said coupler, whereby the special key which has been initially operated is locked to said coupler during substantially the entire return movement of the same; a stationary abutment for engaging said tripping pawl to destroy said locking relation at the end of the return movement of the key; a latch for latching said special keys in initial operative position; means operated by said key-coupler for rendering said latch inoperative upon the return stroke of the key; a counter and counter operating devices controlled by said amount keys; and means operated by said special keys upon the initial movement thereof for preventing the operation of the counter by the amount keys.

16. In a cash register, the combination with a key, of a latching pawl pivoted on the side of said key, and a stationary abutment positioned to engage said latching pawl and disable the latching effectiveness thereof.

17. In a cash register the combination with a key and a key coupler, of a pawl mounted on said key, and cooperating with said coupler to return the key to normal position.

18. In a cash register, the combination with a key, of a key coupler, and a pawl mounted on said key and arranged to move under said coupler and to return the key to normal position.

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

EDWARD J. HALL.

Witnesses:

G. A. LANE,  
GLEN SHERMAN.