

No. 648,548.

Patented May 1, 1900.

T. CARNEY & C. LUNDGREN.

CASH REGISTER.

(Application filed Mar. 14, 1898.)

(No Model.)

4 Sheets—Sheet 1.

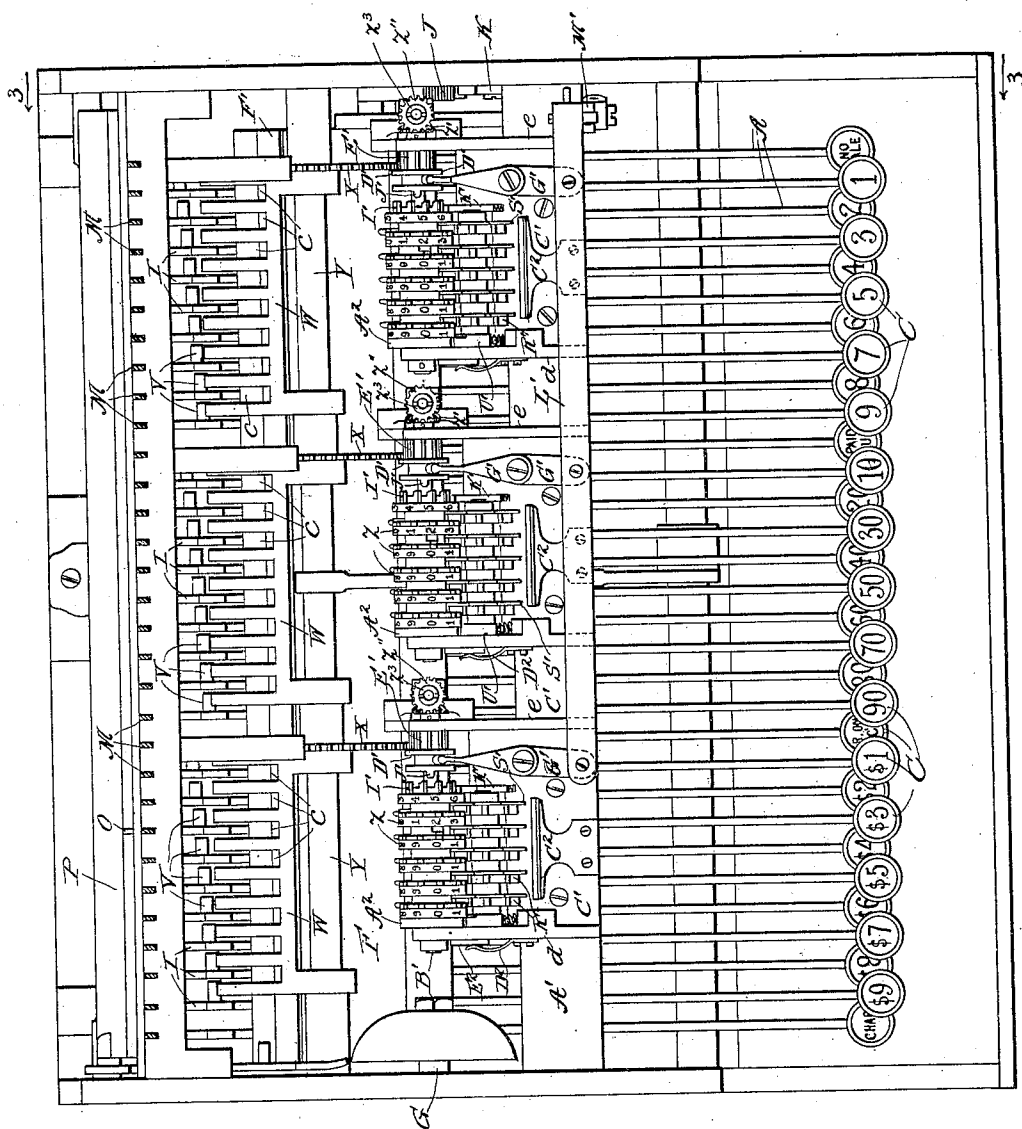


Fig. 1.

Witnesses

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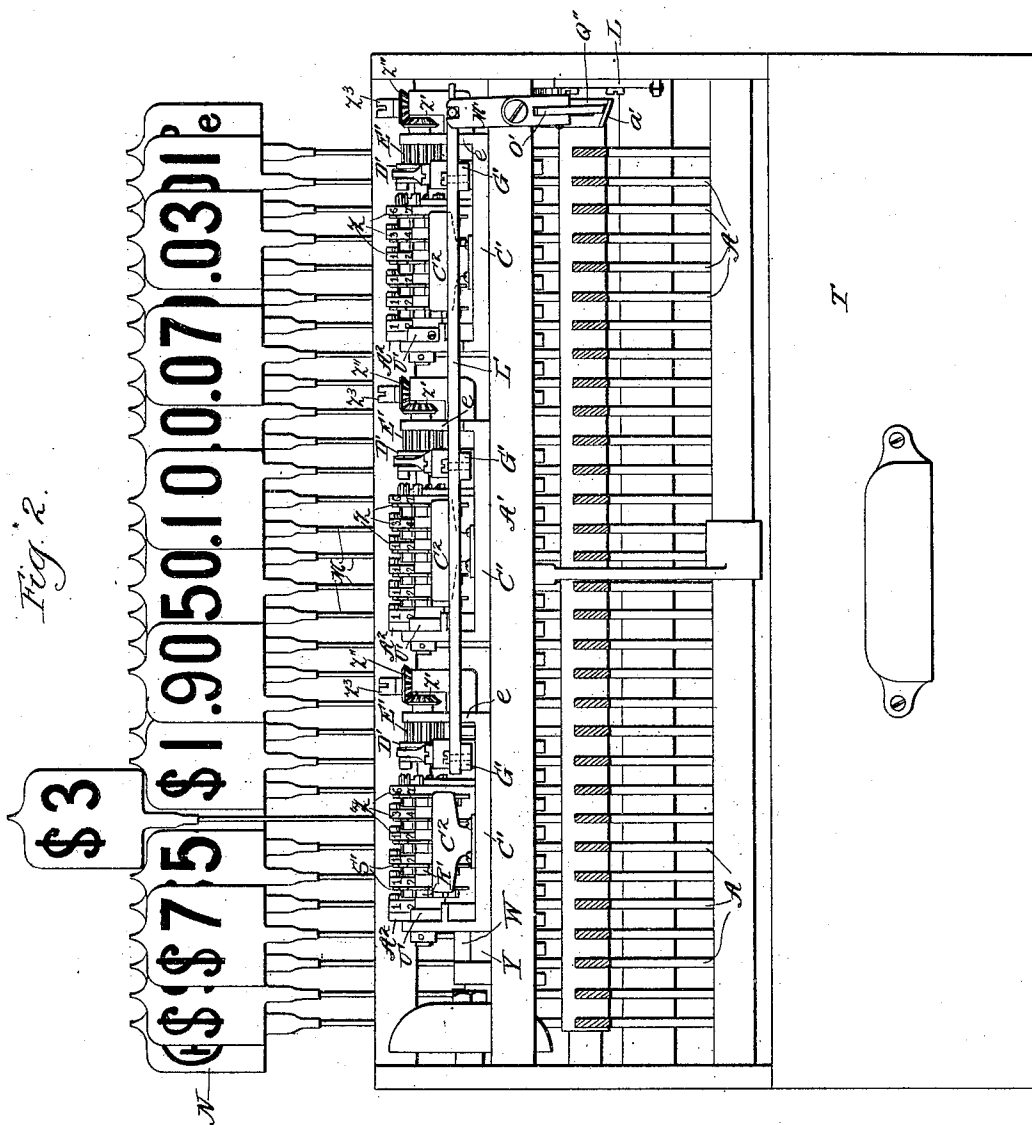
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4 Sheets—Sheet 2.



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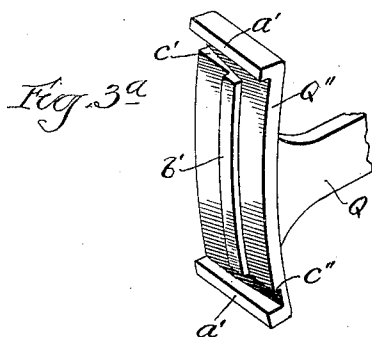
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4 Sheets—Sheet 3.



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Fig. 4.

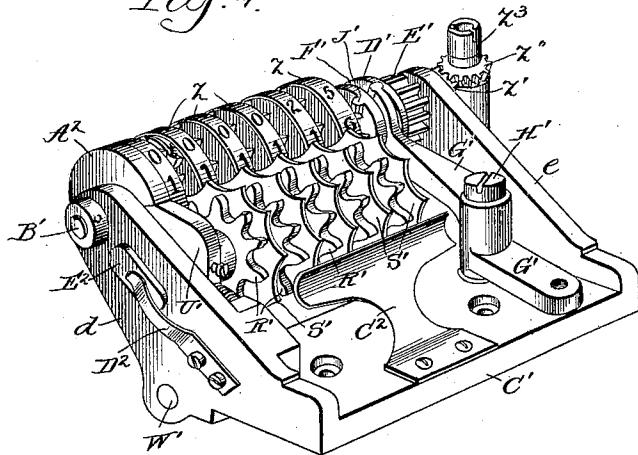


Fig. 5.

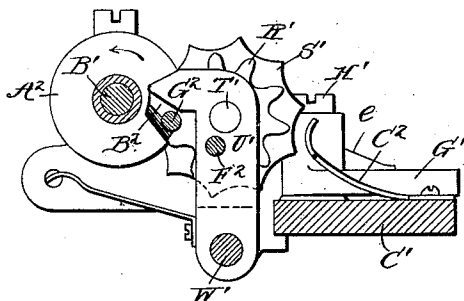


Fig. 6.

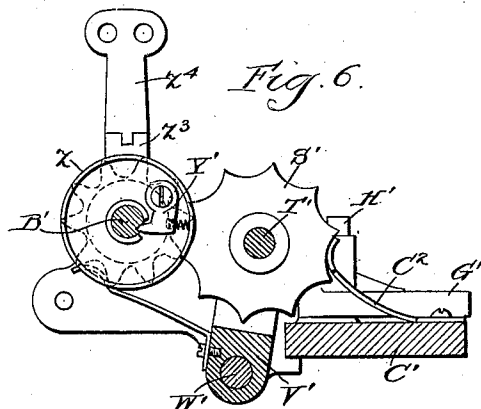


Fig. 7.

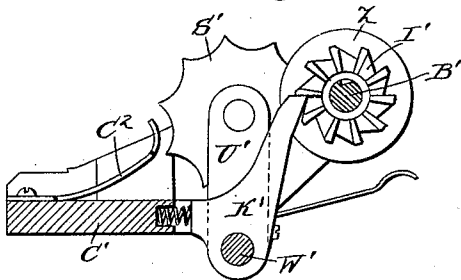
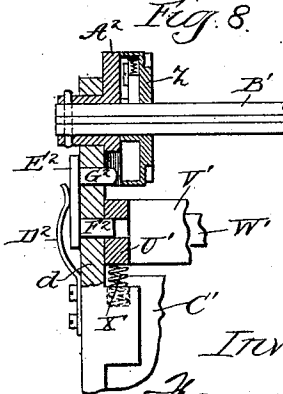


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS CARNEY AND CHARLES LUNDGREN, OF DAYTON, OHIO, ASSIGNORS,
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OF JERSEY CITY, NEW JERSEY.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 648,548, dated May 1, 1900.

Application filed March 14, 1898. Serial No. 673,727. (No model.)

To all whom it may concern:

Be it known that we, THOMAS CARNEY and CHARLES LUNDGREN, citizens of the United States, residing at Dayton, in the county of Montgomery, in the State of Ohio, have invented a certain new and useful Improvement in Cash-Registers, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to that class of cash-registers in which a plurality of keys in a single group or set cooperate with a single set of registering-wheels and operate to turn the primary wheel thereof different degrees proportionate to the values of the respective keys.

It has for its object the simplification and improvement of machines of this class, and its novelty will be hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of the machine removed from its casing or cabinet; Fig. 2, a front elevation thereof with the front ends of the key-levers cut off; Fig. 3, a vertical cross-section of the machine approximately on the line 3 3 of Figs. 1 and 2; Fig. 3^a, an enlarged perspective view of the clutch-shifting cam; Fig. 4, an enlarged perspective view of one of the sets of registering-wheels and the removable frame in which it is mounted; Fig. 5, a vertical cross-section of Fig. 4 immediately inside or to the right of the left-hand side plate of the frame in which the registering-wheels are mounted and looking toward the right; Fig. 6, a vertical cross-section of Fig. 4 between two of the registering-wheels, looking toward the right, with the transfer-pinions and their locking-disks thrown forward and disengaged from the registering-wheels; Fig. 7, a vertical cross-section of Fig. 4 immediately at the right of the right-hand registering-wheel and looking toward the left; and Fig. 8, a sectional detail of the parts at the left-hand end in Fig. 4, the section being taken on an inclined plane intersecting the shaft upon which the registering-wheels are mounted, and the locking device cooperating with the rocking frame which carries the transfer-pinions and disks.

The same letters of reference are used to indicate corresponding parts in all the views.

The machine shown in the drawings is provided with three sets or groups of cash-keys, each group containing nine keys and representing, respectively, units of cents, tens of cents, and units of dollars, as shown in Fig. 1. In addition to these cash-keys there are shown four special keys, which need not be further referred to, since they have nothing to do with the present invention. In the further description of the machine where mention is made of the keys or key-levers it will be understood that the cash-keys are referred to unless the special keys are particularly mentioned.

The keys consist of levers A, fulcrumed upon a horizontal rod B, provided upon their upper forward ends with numbered finger-buttons C and at their rear ends resting upon a cross-bar D of the framework and guided in their vertical movements by a vertically-slotted guide-plate E, as usual. Overlying the keys near their rear ends is the universal bar or frame F, which is pivotally supported at its upper forward edge at G and is lifted by the operation of any one of the key-levers A. Its lower rear edge cooperates with the slots or recesses H in the vertical extensions or fingers I of the key-levers in the well-known manner, by means of which the key-levers are coupled to the bar F during their movement away from and return to normal position. The bar F has secured to its right-hand side and projecting beyond its upper forward edge a serrated or toothed plate J, with which cooperates a double-toothed pawl K, engaged by a spring-latch L, Fig. 3, to insure a complete movement of the bar F, and consequently of the key-levers which may be coupled to it, whenever the bar is displaced from normal position, as is common in machines of this class.

The key-levers A cooperate at their rear ends with the vertical indicator-rods M, which carry the numbered indicators N at their upper ends and are provided upon their rear sides with shoulders O, cooperating with the usual pivoted supporting bar or wing P. This bar or wing P has secured to its left-hand end a forwardly-projecting arm Q, which serves

as a striker for the gong R and which is lifted and released at the downward stroke of the front end of any key-lever by a trip S, pivoted to the extreme left-hand end of the universal bar F, the coöperation of this trip S with the arm Q serving both to sound the gong and to disengage the wing P from the shoulders of the lifted indicator-rods.

The latch or holder for the money-drawer T consists of a three-armed lever U, pivoted to the frame at its forward end and having its vertical arm extended upward through a slot or opening in the bar F and provided with a shoulder *a*, which is struck by the bar F as it approaches its limit of upward movement, and thereby lifts the lever U and disengages its rear end from the drawer.

Projecting from the right-hand side of the vertical extension or finger I of each key-lever is a stud or pin V, Figs. 1 and 3, and these projections upon the nine key-levers in each group are arranged in graduated order, as indicated by the dotted lines in Fig. 3, the pin upon the right-hand lever in the group being the lowest in the series and that upon the left-hand lever being the highest and the intermediate ones being located in regular order between them. The pins upon the key-levers coöperate with rocking registering frames W, loosely hung upon a rod or shaft Y, extending entirely across the machine and mounted at its opposite ends in the side frames thereof. There are three of these rocking frames W, as seen in Fig. 1, there being one for each of the three groups of key-levers. Each frame W is provided with a longitudinal slot *b*, extending from end to end of it and opening through its rear side, as shown in Fig. 3, and also with a plurality of vertical slots *c*, as shown in Fig. 1. The vertical slots *c* are coincident with the fingers I upon the key-levers, and the fingers pass through the slots when the rear ends of the key-levers are lifted. The pins V upon the fingers I occupy the same vertical planes as the portions of the frames W intermediate the vertical slots *c*, so that when the rear end of any key-lever is lifted and its finger moved upward through the corresponding vertical slot *c* in the frame W the pin V upon such finger will enter the portion of the horizontal slot *b* in the frame immediately at the right of the slot *c*, through which the finger of the key-lever passes. This entrance of the pin V of the key-lever into the horizontal slot of the frame W will serve to couple the key-lever to the frame and cause the latter to be rocked by the further upward movement of the rear end of the lever. Inasmuch as the difference in the positions of the pins upon the key-levers in each group will cause them to engage the frame W at different points in the movement of the levers it follows that full movement of the different levers will impart different degrees of movement to the frame W, according to the positions of the pins V upon the respective levers. Assuming that the right-hand key-lever in

each series, whose pin is the lowest in the series, will move the corresponding frame W one degree or unit of distance, the second key will move it two degrees, the third three degrees, and so on up to the ninth key, which will move it nine degrees or nine units of distance.

Each rocking frame W has secured to it a sector-rack X, Figs. 1 and 3. Each of these racks coöperates with and actuates one of the three sets of registering-wheels Z, Fig. 1. The three registers are entirely independent of each other, and each is mounted in its own removable frame, as shown in Fig. 4, these removable frames being detachably secured to the cross-bar A' of the framework by screws, as seen in Fig. 1. As shown in Figs. 4 to 8, the train of registering-wheels Z in each register is mounted upon a shaft B', which is journaled at its opposite ends in the upper rear ends of the side plates *d* *e* of the removable frame C'. Loosely mounted upon the right-hand end of the shaft B', between the train of registering-wheels and the right-hand side plate *e* of the frame, is a clutch member or sleeve D', having formed upon it a pinion E' and provided with a circumferential groove F', in which fit the opposite arms of the forked rear end of a shifter-lever G', fulcrumed upon a vertical pivot H', screwed at its lower end into the frame C'. The right-hand registering-wheel Z in the series has formed upon its right side or secured to that end of its hub a combined ratchet and clutch member I', Figs. 1 and 7, with which coöperate two diametrically-opposite teeth or projections J', formed upon the left-hand end of the clutch member or sleeve D'. When the clutch member D' is thrown to the left by the shifter-lever G', the teeth J' will be engaged with two opposite notches in the clutch member I' upon the primary registering-wheel and the pinion E' be thereby locked to such wheel, and when the clutch member D' is shifted back to the right again the pinion E' will be disengaged from the registering-wheel. As shown in Fig. 1, the pinions E' of the respective registers are in mesh with the racks X', carried by the rocking frames W, so that said pinions turn backward and forward with said racks as the latter are oscillated under the operations of the key-levers. The clutch members and pinions normally occupy the position shown in Fig. 1, with the two parts of the clutch separated; but by means hereinafter described the front ends of the shifter-levers G' are thrown to the right at the first downward movement of any one of the key-levers and the clutch members thereby engaged with each other, so that the movement given any of the pinions by the racks X will be transmitted to the corresponding primary registering-wheels in the respective sets. At the end of the downward stroke of the operated key lever or levers, however, or at the very beginning of the return upward stroke thereof, the front ends

of the shifter-levers G' will be thrown back to the left again and the clutch members separated, so that the pinions may turn backward to normal position with the racks X , while the primary registering-wheels will remain in the positions to which they have been advanced. Holding-pawls K' , engaging the ratchets I' upon the primary register-wheel Z , Figs. 1 and 7, prevent any backward movement of said wheels.

The front ends of all three of the shifter-levers G' are pivoted to a bar L' , extending longitudinally of the cross-bar A' of the framework, Figs. 1 and 2. A pin upon the forward side of this bar at its right-hand end, Fig. 2, engages a recess in the upper end of a lever M' , pivoted to the forward side of the cross-bar A' of the framework, Figs. 2 and 3. Mounted in the lower end of the lever M' upon a pivot N' , transverse to the axis of the lever M' , is a spring-pressed lever O' , whose lower end is bent rearward or provided with a projection O'' , which bears against the forward face of the extended front end Q'' of an arm Q' , rigidly secured to and projecting forwardly from the universal bar F , so that at each operation of a key-lever the movement given the bar F causes the front end of the arm Q' to be thrown downward and then returned to normal position. As shown in Fig. 3^a, the extended front end of the arm Q' is provided at its upper and lower ends with inclined flanges a' and intermediate these two flanges is provided with a vertical rib b' . There is an inclined passage between the opposite ends of the rib b' and the flanges a' to permit the projecting rear end of the lever O' to be shifted laterally to opposite sides of the rib b' at the end of the stroke of the parts in each direction. The surface at the left-hand side of the rib b' , against which the lower rear end of the lever O' is pressed by its spring during the downward movement of the front end of the arm Q' , terminates at its upper end in a shoulder or offset c' , inclined parallel with the flange a' , while the space at the right of the rib b' terminates at its lower end in a like offset or shoulder c'' , parallel to the lower flange a' . In the normal position of the parts the lower rear end of the lever O' fits between the lower flange a' and the lowermost one of the two inclined shoulders above described. At the first downward movement of the front end of the arm Q' such inclined shoulder c'' forces the end of the lever O' toward the left, to the left-hand side of the rib b' , and the latter thereupon travels downward along the right side of the end of the lever O' , thus rocking the lever M' and throwing its upper end to the right and engaging all of the clutch members and holding the parts in this position during the downward stroke of the key-levers. At the end of such downward stroke the projecting rear end of the lever O' will clear the shoulder or offset c' at the upper end of the surface over which it has been riding and engage the inclined passage above such

shoulder, and upon the release of the key-lever and the beginning of the upward movement of the front end of the arm Q' such inclined shoulder will force the end of the lever O' to the right, so that in the return movement of the parts the rib b' will ride upward against the left-hand side of such lever, thereby rocking the lever M' back to normal position and disengaging the clutches and holding the parts in this position until the key-lever and parts moved by it have reached normal position. In this manner and by these means the clutch members are all engaged at the beginning of the downward stroke of any key-lever and are disengaged at the beginning of the return upward stroke thereof, so that any forward movement imparted to the racks X will be transmitted to the corresponding primary registering-wheels, while the latter will remain at rest during the return backward movement of the racks.

Referring now to Figs. 4 to 8, there is mounted in front of the train of registering-wheels Z a train of transfer-pinions R' and locking-disks S' , which cooperate with the registering-wheels and their pinions, &c., in the usual manner to effect the transfers between the several wheels. In order that the wheels Z may be reset to zero, the train of transfer-pinions and disks $R' S'$ must be thrown forward and disengaged from the pinions, &c., of the registering-wheels. To this end the pinions and disks $R' S'$ are mounted upon a shaft or rod T' , supported at its opposite ends in the upwardly-projecting side arms U' of a rocking frame V' , supported at its lower end upon a rod W' in the lower part of the frame C' . A spring X' , Fig. 8, presses the upper end of the frame V' forward and tends to hold the transfer-pinions R' and locking-disks S' in engagement with the pinions and disks upon the registering-wheels. The shaft B' , upon which the registering-wheels Z are mounted, is provided with a longitudinal groove or with a series of notches, as shown in Fig. 6, with which cooperate the spring-pressed pawls Y' , carried by the registering-wheels Z , so that when said shaft is turned in one direction it will pick up the registering-wheels and carry them to initial position, as usual. At its right-hand end the shaft B' has fast upon it a beveled pinion Z^2 , with which meshes a beveled pinion Z^3 , fast upon a vertical shaft or sleeve Z^3 , journaled in a bearing upon the right-hand side plate e of the frame C' . The upper end of the shaft or sleeve Z^3 is adapted to receive a key Z^4 , by which the shaft B' may be turned to reset the registering-wheels. Fast upon the left-hand end of the shaft B' , just inside the left-hand side plate d of the frame C' , is a disk A^2 , which has in its forward side a notch B^2 , in which fits the rearwardly-bent upper end of the left-hand side arm U' of the locking-frame V' , which carries the transfer-pinions R' and locking-disks S' . When the shaft B' and disk A^2 are turned in the direction of the arrow in Fig. 5 by turning the

key Z^1 of Fig. 6, the lower wall of the notch B^2 will contact with the beveled under side of the rear end of the arm U' , Fig. 5, and force said arm forward until its end is disengaged from the notch in the disk A^2 and rides upon the periphery of the disk. This will rock forward the frame V' , carrying the transfer-pinions and locking-disks to the position shown in Fig. 6, and disengage them from the registering-wheels and leave the latter free to be turned to initial position. When the frame V' is thus thrown forward, the locking-disks S' will contact with a curved plate C^2 , secured to the frame C' and constituting a spring stop and holding device which serves to lock the disks S' and transfer-pinions from being accidentally turned upon the shaft T' while disengaged from the registering-wheels.

For the purpose of positively locking the rocking frame V' in normal position and automatically unlocking and releasing it by the act of turning the key Z^1 to reset the registering-wheels the following locking device is provided: As shown in Figs. 4 and 8, there is held to the side plate d of the frame C by a spring D^2 a short plate E^2 , which is provided upon its inner face with two pins F^2 G^2 , which extend inward through the side plate d of the frame. The lower forward one of these pins normally engages a hole in the left-hand side arm U' of the rocking frame V' , as shown in Fig. 8, while the upper rear one G^2 normally projects into the notch B^2 in the disk A^2 , Figs. 5 and 8. The lower wall of this notch B^2 is beveled or inclined, as shown, so that when the disk A^2 is turned in the direction of the arrow in Fig. 5 by turning the key Z^1 of Fig. 6 the pin G^2 will be forced outward to the left, thereby forcing the plate E^2 in that direction and disengaging the pin F^2 from the arm U' , and thereby unlocking and releasing the rocking frame V' .

Having thus fully described our invention, we claim—

1. In a cash-register, the combination of a plurality of operating key-levers each provided with a stud or projection, a pivoted frame provided with a plurality of approximately-radial slots or recesses cooperating in the manner described with the projections on the key-levers, a rack carried by or moving with the pivoted frame, a pinion meshing with said rack, a registering-wheel, and means controlled by the key-levers for connecting the pinion with and disconnecting it from the registering-wheel to cause the rack to turn the wheel during the movement of the rack in one direction, but not in the other, substantially as described.

2. In a cash-register, the combination of a plurality of operating key-levers each provided with a stud or projection, a pivoted frame provided with a plurality of approximately-radial slots or recesses cooperating in the manner described with the projections on the key-levers, a rack carried by or mov-

ing with the pivoted frame, a pinion meshing with said rack, a registering-wheel, and a clutch connection between the pinion and registering-wheel controlled by the key-levers, for causing the rack to turn the registering-wheel during the movement of the rack in one direction but not in the other, substantially as described.

3. In a cash-register, the combination of a plurality of operating key-levers each provided with a stud or projection, a pivoted frame provided with a plurality of approximately-radial slots or recesses cooperating in the manner described with the projections on the key-levers, a rack carried by or moving with the pivoted frame, a pinion meshing with said rack, a registering-wheel, a clutch between the pinion and registering-wheel, a universal bar or frame common to the key-levers, and a shifter for the clutch operated by said frame, for the purpose described.

4. In a cash-register, the combination of the key-levers A having the fingers I provided with the studs V , the pivoted frame W having the longitudinal slot b and transverse slots c cooperating in the manner described with the studs V of the key-levers, the rack X carried by or moving with the pivoted frame W , the pinion E' meshing with the rack X , the registering-wheel Z , and a clutch connection between said wheel and the pinion E' controlled by the key-levers A , for the purpose described.

5. In a cash-register, the combination of the key-levers A having the fingers I provided with the studs V , the pivoted frame W having the longitudinal slot b and transverse slots c cooperating in the manner described with the studs V of the key-levers, the rack X carried by or moving with the pivoted frame W , the pinion E' meshing with the rack X , the registering-wheel Z , the clutch member D' turning with the pinion E' and movable toward and from the wheel Z and adapted to cooperate with clutch-teeth upon said wheel, the shifter G' for said clutch member, the lever M' connected at its upper end to the shifter G' and carrying at its lower end the spring-pressed lever O' , the universal bar F overlying the key-levers, the arm Q' carried by said bar and having the extended front end Q'' provided with the opposite flanges a' a' , rib b' , and inclined surfaces upon the opposite sides of said rib terminating at their opposite ends in the shoulders c' and c'' , said rib, surfaces and shoulders cooperating in the manner described with the projecting end O'' of the lever O' , for the purpose described.

6. The combination of the arm or lever O' movable both upon its pivot and transversely to such movement, and provided with the projection O'' , and the reciprocating plate Q'' provided with the inclined end flanges a' a' , middle longitudinal rib b' and the inclined surfaces upon the opposite sides of said arm terminating at their opposite ends in the

shoulders c' c'' , all coöperating in the manner described with the projection O'' of the lever O' .

7. The combination of the lever M' , the lever O' pivoted thereto on an axis transverse to the axis of the lever M' and provided with the projection O'' , the spring intermediate the levers M' and O' , and the reciprocating plate Q'' having the inclined end flanges $a' a'$, middle longitudinal rib b' and the inclined surfaces on the opposite sides of said rib terminating at their opposite ends in the shoulders $c' c''$, all coöperating in the manner described with the projection O'' of the lever O' .

8. In a cash-register, the combination of the series of sets or groups of key-levers A having the fingers I provided with the studs V , the plurality of pivoted frames W , one for each group of key-levers A and each provided with a longitudinal slot b and transverse slots c coöperating in the manner described with the studs V of the key-levers, the racks X carried by or moving with the pivoted frames W , the pinions E' meshing with the racks X , the several sets of registering-wheels Z , one for each group of key-levers, and clutch connections between the primary wheel of the several sets and the corresponding pinions E'' controlled by the key-levers A , for the purpose described.

9. In a cash-register, the combination of the series of sets or groups of key-levers A having the fingers I provided with the studs V , the plurality of pivoted frames W , one for each group of key-levers A and each provided with a longitudinal slot b and transverse slots c coöperating in the manner described with the studs V of the key-levers, the racks X carried by or moving with the pivoted frames W , the pinions E' meshing with the racks X , the several sets of registering-wheels Z , one for each group of key-levers, the clutch members D' intermediate the several pinions E' and the primary wheels of the corresponding sets of registering-wheels, said clutch members turning with the pinions E' but movable toward and from the primary registering-wheels and adapted to coöperate with clutch-surfaces thereon, the shifter-levers G' coöperating with the clutch members D' , the reciprocating bar L' connected to the several levers G' , the universal bar or frame F' overlying the key-levers A , and means intermediate said bar and the reciprocating bar L' for operating the levers G' to shift the clutch members D' , substantially as and for the purpose described.

10. In a cash-register, the combination of the series of sets or groups of key-levers A having the fingers I provided with the studs V , the plurality of pivoted frames W , one for each group of key-levers A , and each provided with a longitudinal slot b and transverse slots c coöperating in the manner described with the studs V of the key-levers, the racks X carried by or moving with the pivoted frames W , the pinions E' meshing

with the racks X , the several sets of registering-wheels Z , one for each group of key-levers, the clutch members D' intermediate the several pinions E' and the primary wheels of the corresponding sets of registering-wheels, said clutch members turning with the pinions E' but movable toward and from the primary registering-wheels and adapted to coöperate with clutch-surfaces thereon, the shifter-levers G' coöperating with the clutch members D' , the reciprocating bar L' connected to the several levers G' , the vertical lever M' coöperating at its upper end with the reciprocating bar L' , the spring-pressed lever O' pivoted in the lower end of the lever M' and provided with the projection O'' , the universal bar F' overlying the key-levers A , and the arm Q' projecting from said bar and provided with the extended front end Q'' having the opposite inclined flanges $a' a'$, middle longitudinal rib d' , and inclined surfaces upon the opposite sides of said rib terminating at their opposite ends in the shoulders c' and c'' , coöperating in the manner described with the projections O'' of the lever O' to rock the levers G' and shift the clutch members D' .

11. The combination with register-operating mechanism comprising the rotary shaft B' , of the registering-wheels Z loosely mounted thereon, means intermediate the shaft and wheels for causing the shaft to pick up the wheels and carry them with it when turned in one direction, the disk A^2 fast upon the shaft B' and provided with the notch B^2 , the rocking frame V' having the side arm U' provided with a rearwardly-projecting end adapted to coöperate with the notch B^2 in the disk A^2 , the transfer-pinions and locking-disks mounted upon the shaft T' in the rocking frame V' and adapted to coöperate with the registering-wheels Z and their pinions and disks, and the curved spring stop-plate C^2 adapted to coöperate in the manner described with the locking-disks S' when the frame V' is thrown forward by the act of turning the shaft B' to reset the registering-wheels.

12. The combination with register-operating mechanism comprising the rotary shaft B' mounted in the frame C' , of the disk A^2 fast upon said shaft and provided with the notch B^2 having the inclined or beveled lower wall, the rocking frame V' having the side arm U' provided with a rearwardly-projecting end adapted to coöperate with the notch B^2 in the disk A^2 , the locking-plate E^2 provided with the pins F^2 G^2 extending through the side plate d of the frame C' and coöperating respectively with the side arm U' of the frame V' and the beveled lower wall of the notch B^2 in the disk A^2 , and the spring D^2 acting upon the plate E^2 , substantially as described.

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