

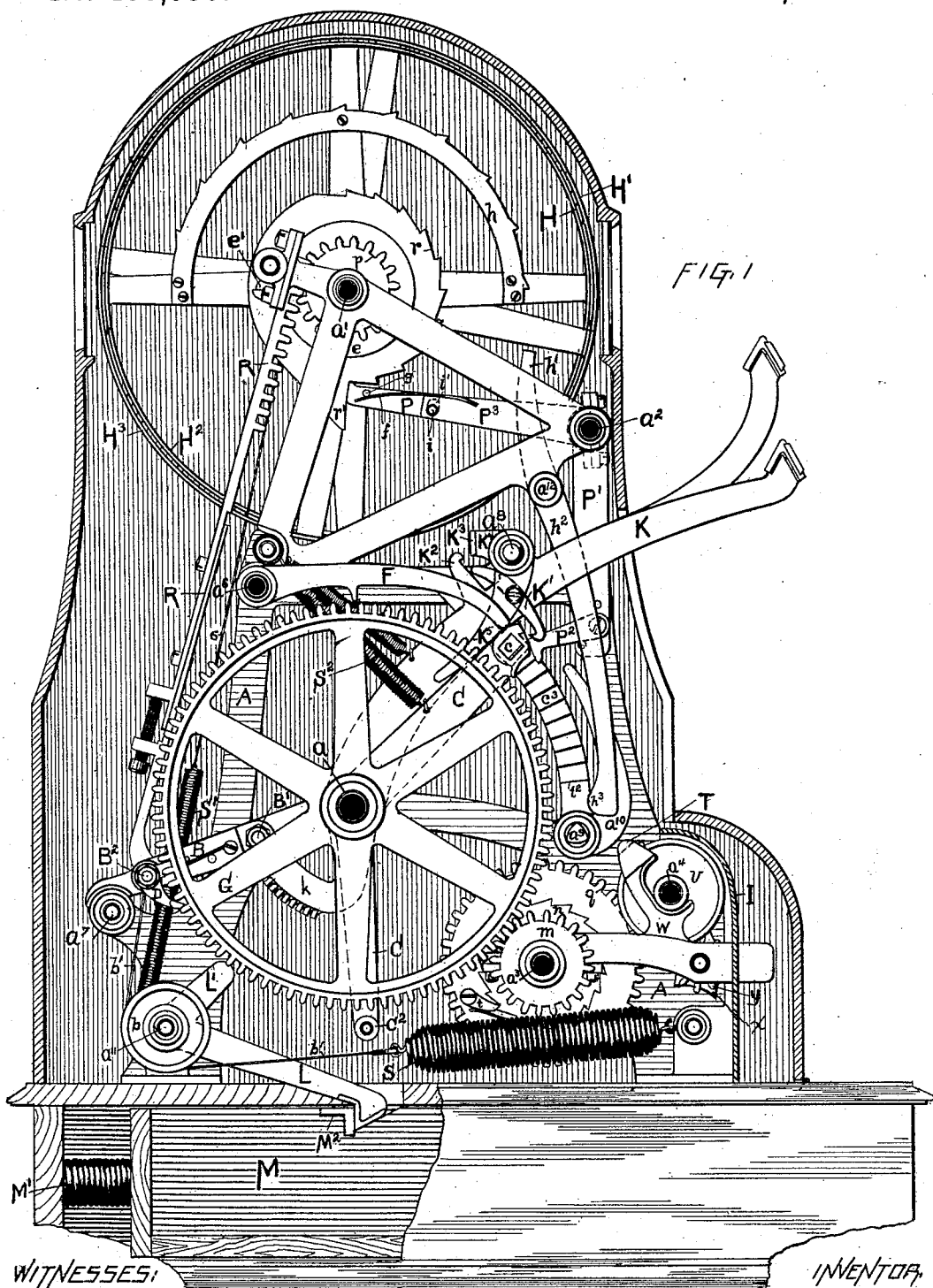
(No Model.)

4 Sheets—Sheet 1.

C. CARR.
CASH REGISTER AND INDICATOR.

No. 468,330.

Patented Feb. 9, 1892.



WITNESSES:

Howard L. Gohorn.
Hals A. Martin

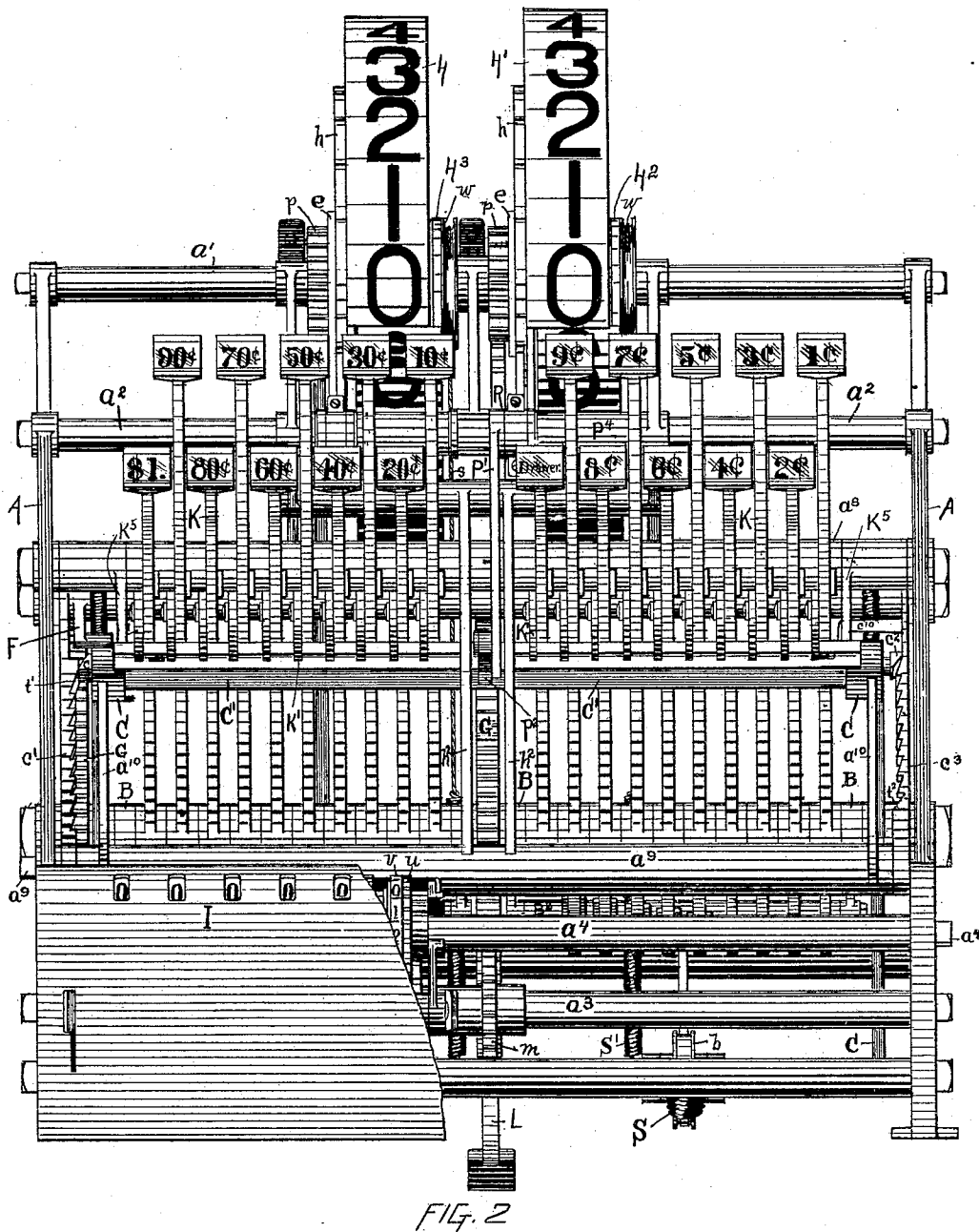
INVENTOR,

Charles Carr

4 Sheets—Sheet 2.

No. 468,330.

Patented Feb. 9, 1892.



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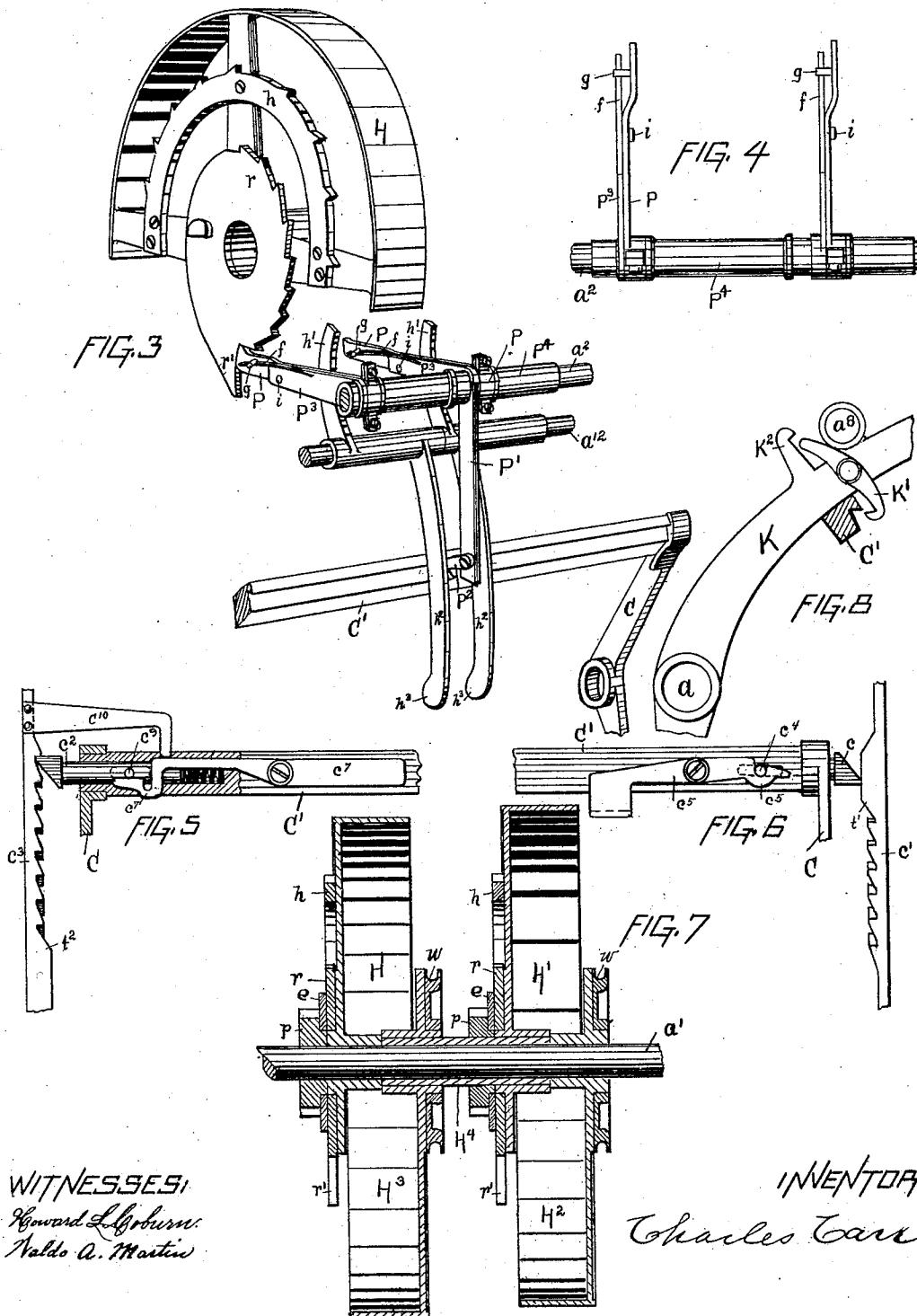
(No Model.)

4 Sheets—Sheet 3.

C. CARR.
CASH REGISTER AND INDICATOR.

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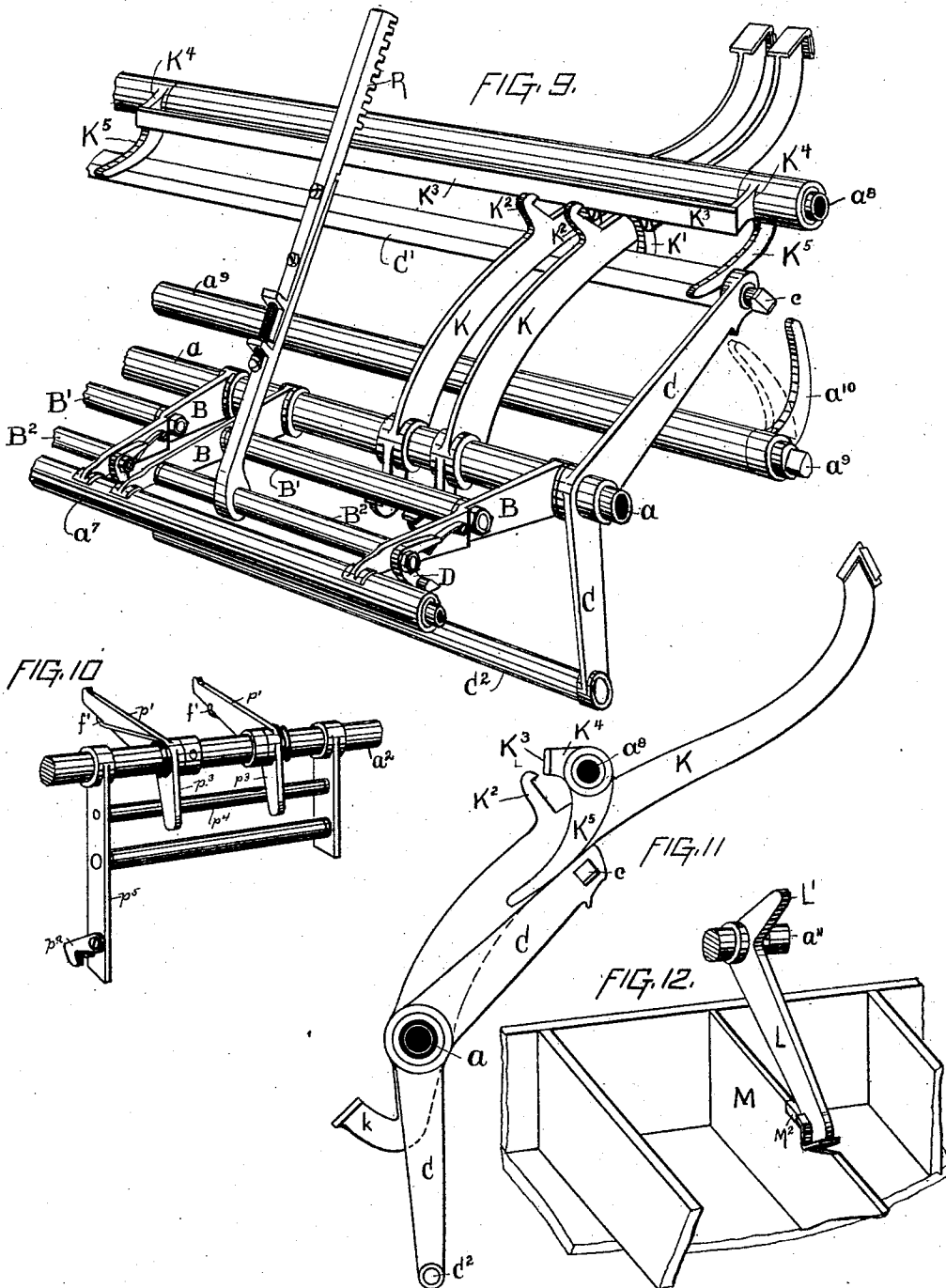
(No Model.)

4 Sheets—Sheet 4.

C. CARR.
CASH REGISTER AND INDICATOR.

No. 468,330.

Patented Feb. 9, 1892.



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UNITED STATES PATENT OFFICE.

CHARLES CARR, OF BOSTON, MASSACHUSETTS.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 468,330, dated February 9, 1892.

Application filed August 22, 1891. Serial No. 403,462. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARR, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a specification.

The following, together with the accompanying drawings, having reference-letters herein referred to, is a full and exact description of said invention.

The nature of my invention relates to the key-controlling devices, retaining and releasing mechanism for indicating-wheels, and a drawer-locking device, their connecting and controlling parts, and their combinations, substantially as hereinafter more fully set forth.

With reference to the drawings, Figure 1 is a sectional end elevation of a machine in which my improvements are embodied, the section being taken just within and parallel to the left-hand end frame A in Fig. 2. Fig. 2 is a front elevation of the machine with case removed and a portion of the plate I broken away in order to show the parts more clearly. Fig. 3 is a perspective view of one of the indicating-wheels and the stopping, retaining, and tripping mechanism. Fig. 4 is a plan of the said retaining and tripping mechanism. Fig. 5 is a sectional detailed view of a portion of the key-controlling mechanism. Fig. 6 is also a detailed view of said key-controlling mechanism. Fig. 7 is a sectional elevation showing arrangement of indicating-wheels. Fig. 8 is a detailed view of a portion of a key, showing the device by which it is locked to a rocking frame common to all the keys. Fig. 9 is a perspective view of keys, locking devices for same, and parts for operating the registering and indicating mechanism. Fig. 10 is a perspective view showing a modification of the retaining and tripping mechanism. Fig. 11 is a side elevation of a key, the rocking frame, and key-locking device. Fig. 12 is a perspective view of a portion of a cash-drawer and the locking-hook therefor.

The machine in general consists of indicating and registering mechanism, with operating-keys and connecting and controlling devices, all mounted upon longitudinal shafts, rods, &c., connecting two end frames or cast-

ings A, and all may be mounted upon any suitable base or bed. A case of either wood or metal and of useful or ornamental design may inclose the operative mechanism, with "sight" slots or openings properly located to expose to view the required numbers on the indicating-wheels.

The registering and indicating devices are in general like those shown and described in the application of Charles Carr, Serial No. 372,737, now pending before the United States Patent Office, and are briefly as follows:

The registering mechanism consists of a decimal-adding device, which is composed of the numeral-wheels *v*, with gears *u* attached thereto, transmitting-pinions *x*, and "Geneva" stops *y*. (Any suitable decimal-adding mechanism may be substituted for this.) Intermediate gears *q* and *m* are provided, said gear *m* meshing with and driven by the gear *G* and in turn driving gear *q* through the medium of ratchet-wheel *n*, rigidly mounted on the extended bearing of gear *m*, and the pawl *t*, pivoted to gear *q*, said gear *q* meshing with and driving a gear *u* of the adding device. Keys *K*, being, with the tappets *k* constructed thereon, levers of the first order, are pivoted at *a*, and oscillating bails or yokes *B*, with cross-bars *B'* and *B''* and pawls *D*, together with the previously-mentioned gears, form the necessary operative and connecting mechanism for registering. (See Figs. 1 and 9.) The tappets *k* are made of varying lengths to correspond to the numerical values of the keys. (See Figs. 1 and 2.) Said keys in the machine illustrated are arranged in two groups, those in the first or right-hand group (see Fig. 2) representing the units place in notation and are numbered from 1 to 9, inclusive. (An extra key, marked "Drawer," is shown, and its use will be explained later on.) The second group represents the tens place and are correspondingly numbered. The key marked "\$1" would be the first of a third or hundreds group if such were used, and it might be, as may still higher groups. When a key is depressed or pulled forward, its tappet *k* strikes the bar *B'* of the bail *B*, raising it and the pawl *D*, which slips over a number of teeth in gear *G*, corresponding to the length of the tappet and the value of the key. When the key is released, the bail *B* and

pawl D are returned to their normal position by any suitable force, such as a spring S and cord b' , acting over a pulley b , Fig. 1. The pawl D during its return pushes with it the gear G, turning it and through it and the intermediate gearing already described a wheel of the adding device. The first or right-hand bail (as viewed from the front) acts immediately on the release of the key and during the return stroke thereof, while the second is prevented from operating by a retaining-pawl F, Fig. 1, which at the beginning of the forward stroke drops into gear G, and is only raised when the rocking frame C reaches its normal position. Thus the first gear G is driven during the return of the keys and the second immediately thereafter. Devices such as intermediate gears might be employed to cause one bail to work on the forward and the other on the backward stroke. These devices and parts are all fully shown and explained in the aforesaid application.

The indications are made by the use of the wheels H, H' , H^2 , and H^3 , Figs. 1, 2, and 7, having the digits upon their peripheries. In the case shown these wheels are half-wheels, but may be whole wheels. Of these the wheels H and H^2 are mounted upon and fast to a common revoluble shaft a' and read in radial opposition to one another, wheel H reading from the "left" front and wheel H^2 from the "left" rear. The wheels H' and H^3 are similarly mounted upon a sleeve H^4 , (see Fig. 7,) which is free to turn with shaft a' as an axis, wheel H' reading from the "right" front and H^3 from the "right" rear. Wheels H and H^2 represent the tens place and H' and H^3 the units place in notation. Thus the tens indicated on wheel H and the units on wheel H' read in front to produce a common total, which reads correctly with the units place to the right. Wheels H^2 and H^3 read correspondingly from the rear. The rack-bars R, Fig. 1, (being shown as adjustable as to length,) are pivotally mounted upon cross-bars B^2 of bails B and mesh into pinions p , mounted on shaft a' as an axis. Besides the indicating-wheels, drivers e , each having a tooth or lug, are fast to the side or pinions p . On the side of wheels H and H' are fast ratchet-wheels r , and pins e' project therefrom into the path of the lug on drivers e . (See Figs. 1 and 3.) These ratchets r have as many teeth as there are numbers on the indicating-wheels. The first tooth r' is made extra long, for the reason which will appear presently. Pawls P are mounted on shaft a^2 as an axis and act with ratchet-wheels r to retain the indicating-wheels in the required position, the long tooth r' acting with pawls P to stop the wheels when they return to their normal positions. The pawls P were rigidly connected in my previous application. When the bails B and rods B^2 move upward, propelled by keys K, the racks R turn the pinions p , and through them and the drivers e and pins e' the indicating-wheels, the ratchet-

wheels r slipping over the pawls P and holding the indicating-wheels against returning, while the pinion p , rack R, bail B, and key K return to their normal position, ready to repeat the operation. It is obvious that the wheels must be turned back to their normal position before another transaction can be indicated; but as the method of doing this is new it will be described later. It is also obvious that as the tappets k vary in length and the angle through which bail B turns varies with the numerical value of the key the number indicated by a wheel will always correspond to the key which last operated it. As previously stated, these devices are not original with this application and will not be claimed, except in combination with other new devices, as will more fully be set forth hereinafter. The pawls P (see Figs. 1, 3, and 4) are pivotally mounted upon the hub P^4 , which in turn is loosely mounted upon shaft a^2 . Besides each of the pawls P, an arm P^3 extends out from hub P^4 , and a screw or pin i in each of said arms extends through and acts against the bottom of a slotted hole i' in pawls P. (See Fig. 1.) This pin might act against the upper side of the pawl itself instead of the slot i' . Springs f , attached to arms P^3 and acting under pins g in pawls P, tend to keep said pawls in such a position that the pin i is in working contact therewith. When a ratchet-wheel r is turned with its indicating-wheel, the slotted hole i' allows the pawl P to slip over the teeth of the ratchet-wheel without depressing the arm P^3 or disturbing the remaining pawls P. A rocking frame C, provided with cross-bars C' and C^2 , is pivoted at a and extends entirely across the keys K, the cross-bar C' resting against the under side of said keys. From the hub P^4 an arm P' extends downwardly, having pivoted on its lower end a latch or trigger P^2 , which projects into the path of cross-bar C' of frame C. When any of the keys are pulled forward, the frame C is turned with it and the cross-bar C' strikes the trigger P^2 , forcing it and arm P' outward, turning hub P^4 , arms P^3 , and by means of pins i the pawls P, releasing the ratchet-wheels r from the control of said pawls and allowing the said ratchet-wheels and their indicating-wheels to return to their normal position under the influence of any suitable force, such as cords and springs or weights. The cross-bar C' passes trigger P^2 and allows it and arm P' , hub P^4 , arms P^3 , and pawls P to return to their normal position in time for pawls P to act on the ratchet-wheels r when they are again turned, this tripping of the pawls necessarily being accomplished at the beginning of the stroke of the key and before the wheels have reached the next indicating position. A modification of this tripping device is shown in Fig. 10, in which the pawls p' are pivoted directly upon shaft a^2 and have arms p^3 projecting downward. A swinging frame p^5 , pivoted on a^2 , takes the place of arm P' and hub P^4 , and the trigger P^2 is on the bottom

of arm p^6 . Springs f' act to hold the pawls p' in such a position that the arms p^3 rest against bar p^4 . When the trigger is forced outward, the frame swings on shaft a^2 , and the bar p^4 , acting against arms p^3 , turns pawls p' on their pivot and away from the teeth of ratchet-wheels r . This is simply a mechanical deviation from the other device, the principle in both being a series of pawls independent of each other, with a tripping mechanism common to all. Other mechanical designs may be employed without departing from the spirit of the invention.

In machines of this class, where the keys are arranged in groups, those of one group acting during the return stroke and those of the next immediately thereafter, or the first during the forward stroke and the second during the return stroke, it has been found necessary to provide means for so locking together two or more keys which are started at the same time as to compel them to move in unison, and also means whereby after one or more keys are started all the remaining keys will be locked against any movement whatever until the acting keys have returned to their normal position. I accomplish the first result by the use of the hooks K' , Figs. 1, 8, and 9, pivoted to keys K , and the cross-bar C' of frame C and the shaft a^8 . When any of the keys move forward, the hooks K' , which have been held away from the frame C by reason of the action of shaft a^8 against them, are allowed to drop, so that they catch under the projection on cross-bar C' or the bar itself, thus securing all the acting keys to the frame C . It is obvious that all such acting keys must move in unison with each other and the frame until they reach their normal position, when the shaft a^8 , striking the hooks K' , unlatches them from the frame.

To lock the non-acting keys during a registration, each key is constructed with an upwardly-extending hook K^2 , and on shaft a^8 as a pivot the locking-frame $K^3 K^4 K^5$ is provided, Figs. 1, 9, and 11, which consists of arms K^5 , acting against cross-bar C' of frame C , rocking arms K^4 , having tubular bearings common to K^5 , and a stop bar or plate K^3 , extending entirely across the keys. When the frame C and its cross-bar C' move forward under the action of a key, the hook K^2 on the acting key passes the bar K^3 , which, as cross-bar C' moves away from arm K^5 , drops by force of gravity into the path of the hooks K^2 on all the non-acting keys, preventing any movement of these keys until the frame C returns, the cross-bar C' raising the stop K^3 out of the path of the hooks by striking the arms K^5 . It is obvious that the hooks K^2 might be on the opposite side of the shaft a^8 and the stop-bar K^3 correspondingly reversed. Other slight mechanical variations might be introduced in this device without departing from the spirit of the invention.

In order to insure against the accidental or designed return of a key or keys prema-

turely or before the completion of the forward stroke, I have provided at the right-hand end of the machine a stationary curved rack-plate c^3 , with downwardly-inclined teeth in the path of a spring-bolt c^2 in the end of cross-bar C' of frame C . The construction of this bolt and the catch c^7 for controlling the spring-bolt will be readily seen by referring to Fig. 5. It is also obvious that this bolt might work in guides on the side of bar C' . A pin c^9 passes through the bolt and cross-bar, the hole in the cross-bar being a slotted hole, in which the pin may slide. The last or bottom tooth t^2 of rack-plate c^3 is higher than its mates, and when the frame C , to which the acting keys are secured, nears the end of the forward movement the bolt c^2 , striking the high tooth t^2 on rack-plate c^3 , is pressed in sufficiently to allow the hook c^7 to catch the pin c^9 , holding the bolt away from the rack-plate during the return movement of frame C or until the stop c^{10} or its equivalent strikes the hook c^7 , pressing it down and releasing the bolt, which will then be ready to act during another registration. A similar but reversely-acting device, Fig. 6, is provided, which compels the completion of the return movement before a forward movement can be begun. The curved rack-plate c' on the left-hand end of the machine has upwardly-inclined teeth, and a spring-bolt c in cross-bar C' acts against it during the return movement. The upper or last tooth t' on plate c' is raised higher than its mates, and as the frame C and spring-bolt c near the end of the return stroke the bolt is forced in until the hook c^5 catches the pin c^4 , holding the bolt away from the teeth of rack-plate c' until at the end of the forward stroke a suitable fixed stop—such as shaft a^9 —forces the hook c^5 off pin c^4 , allowing the bolt to act during the return.

On shaft a^{11} at the bottom and rear of the machine, Fig. 1, a bell-crank $L L'$ is pivoted, on the long arm L of which is formed a hook, against which a stop M^2 (or equivalent) in a cash-drawer may act, preventing the opening of the drawer. A spring M' , compressed by the drawer in closing, tends to force it open. As the frame C , propelled by a key, nears the end of its forward stroke the cross-bar C^2 of said frame strikes the short arm L' of the bell-crank, raising the hook and releasing the drawer.

If no special means were provided, it is obvious that the drawer could not be opened except by the indication and registration of some amount. In order that the drawer may be opened without registration, but yet indicate the fact, I have provided an extra key, marked "Drawer," in Fig. 2, which has no tappet k . Thus it may act as do the others on frame C and hook $L L'$ without moving the registering or operative indicating mechanisms. That such a transaction has taken place will be shown by the indicating-wheels, which will have returned to zero or normal position by

reason of the action of frame C on the tripping mechanism. It will be readily seen that after the machine has once performed a registration no key can be operated without leaving the indicating-wheels at a number corresponding to the value of the key. Thus the drawer-key will leave all wheels set at zero.

As the momentum acquired by the indicating-wheels might sometimes turn them too far, I have provided an automatic stop, which positively prevents an indicating-wheel from passing the position to which it is designed to turn it. The device, Figs. 1, 2, and 3, consists of a ratchet-wheel h , attached to one of each pair of indicating-wheels and having as many teeth as there are numbers on the wheel, and stop-arms h' , having cylindrical bearings on shaft a^{12} and pendent arms h^2 , the lower end of which have cam-shaped projections h^3 , said projections h^3 being in the path of cross-bar C' of frame C. As frame C nears the end of its forward stroke, the cross-bar strikes the cam-shaped projections h^3 and causes the arms h^2 to swing on a^{12} and brings the stop-arms h' in the proper position to catch the tooth of the ratchet-wheel h , which corresponds to the number to be indicated. The shaft a^9 is provided with an upwardly-projecting arm a^{10} at each end, Figs. 1 and 9, situated in the plane of the ends of frame C. The left-hand end of the shaft a^9 is provided with a triangular key-post formed thereon. When it is desired to lock the machine against any and all action, the shaft a^9 is turned by means of a key, bringing the arms a^{10} under the frame C, preventing its motion, and consequently that of the keys K.

The advantages of these devices over others now in use are durability, simplicity, and that they are more positive in action. The parts may all be made of the materials ordinarily used in machines of this class.

Having described my invention, what I claim is—

1. In an indicating-machine, the combination of keys K, indicating-wheels H, H', H², and H³ and connecting operative mechanism, a ratchet-wheel r , attached to each set of indicating-wheels, a retaining-pawl P for each of said ratchet-wheels, with a tripping mechanism for said pawls, consisting of a tilting frame pivoted upon the same shaft as the pawls, a trigger attached to said tilting frame, and a key-operated rocking frame acting in connection with said trigger and its tilting frame to simultaneously free all of the retaining-pawls from their ratchet-wheels during the beginning of the forward stroke of a key and to allow said pawls to act during the remainder of the stroke each pawl independent of the others and with its individual ratchet-wheel, substantially as set forth.

2. In an indicating-machine having key-operated indicating-wheels retained in indicating position by ratchet-wheels fixed thereon acting against independent retaining-pawls, one for each ratchet-wheel, the com-

bination of said indicating-wheels, the keys and connecting operative mechanism, ratchet-wheels and retaining-pawls P, and with a tripping mechanism common to all of said pawls, consisting of a rocking frame C, trigger P², arm P', drum P⁴, arms P³, and pins i , acting against pawls P, substantially as and for the purpose specified.

3. In an indicating-machine having indicating-wheels operated by keys and suitable connecting operative mechanism, the combination of said keys, indicating-wheels, operative mechanism, ratchet-wheels attached to said indicating-wheels, a rocking frame common to all and operated by any of said keys, with swinging stops having pendent arms in the path of said rocking frame and which, when acted upon by said rocking frame, serve conjointly with the aforesaid ratchet-wheels to positively stop said indicating-wheels at the required positions, substantially as described.

4. In an indicating and registering machine, the combination of the keys and a rocking frame common to all of said keys and pivoted upon the same shaft and automatically controlled as regards the reversal of its movements with a series of pendent hooks, one of which is pivoted upon each key, which serve during the manipulation of any of the keys to lock all of such acting keys to the rocking frame, and which upon the completion of the return stroke of said keys and rocking frame are automatically unhooked from said rocking frame, substantially as described.

5. In an indicating-machine, the combination of the keys, the hooks pivoted thereon, and the rocking frame with a stationary stop-bar so arranged that when any number of said keys and the rocking frame are in motion the hooks on the acting keys shall lock said keys to the frame, but at the completion of the return stroke said stop-bar shall serve to unlatch said hooks from said frame, thereby freeing all the keys from the frame, substantially as set forth.

6. In a machine of the class described, having operating-keys, a rocking frame common to all of and acting with said keys and to which all acting keys are locked, the combination of said keys, rocking frame, and a spring-bolt attached to said frame, with a rack-plate having downwardly-inclined teeth, said rack-plate and bolt acting in conjunction to prevent any upward movement of said acting keys and frame before the completion of their downward movement, substantially as described.

7. In a machine of the class described, having operating-keys, a rocking frame common to all of said keys and to which all acting keys are locked, the combination of said keys, rocking frame, and a spring-bolt attached to said frame, with a rack-plate having upwardly-inclined teeth, said rack-plate and bolt acting conjointly to prevent any downward movement of said acting keys and frame before

the completion of their upward movement, substantially as described.

8. In an indicating and registering machine having operating-keys, a rocking frame common to all of said keys and to which all acting keys are locked, the combination of said keys, rocking frame, with two systems of spring-bolts and rack-plates, one of said systems preventing any reversal of the movement of keys and frame during the forward stroke, the other system preventing any reversal of the movement during the return stroke, substantially as described.

9. In an indicating and registering machine having keys and a rocking frame common to all of said keys and spring-bolts attached to said frame and acting alternately with fixed rack-plates to compel a full motion of the frame in either direction, the combination of said spring-bolts with catch-hooks, one for each bolt, for the purpose of holding said spring-bolts alternately out of action, substantially as described.

10. In an indicating and registering machine, the combination of the rocking-frame C, spring-bolts c and c^2 , catch-hooks c^5 and c^7 , and rack-plates c' and c^3 , having each a high tooth or cam t' and t^2 , whereby the bolts c and c^2 are forced into locking position with hooks c^5 and c^7 , in which position the said bolts are free to pass the rack-plates without interference, substantially as described.

11. The combination of the keys constructed with hooks springing upwardly therefrom, said hooks, a rocking frame common to all and acting with any or all of said keys, with a swinging stop-bar extending across all

the keys and having arms resting against said frame when it is in its normal position and so arranged that when any of said keys and the rocking frame are pulled forward the arms are allowed to swing clear of the frame, bringing the stop-bar into the path of the hooks on the non-acting keys, preventing the movement of any of said non-acting keys until the return of the frame to normal position, when the stop-bar and its arms are again raised, freeing all the keys, substantially as described.

12. In a registering and indicating machine, the combination of keys K, rocking frame C, limiting stop-bars a^8 and a^9 , and the arms a^{10} , formed on bar a^9 , substantially as and for the purpose set forth.

13. In an indicating and registering machine, the combination of cash-drawer M, stop M^3 , bell-crank lock-hook L, having an arm L' in the path of rocking frame C, said arm, the rocking frame, and keys, substantially as described.

14. In a cash register and indicator, the combination of cash-drawer M, stop M^3 , locking-hook L, rocking frame C, tripping mechanism P' , P^2 , P^3 , and P^4 , retaining-pawls P, and indicating-wheels, with a non-registering key whereby the cash-drawer may be unlocked and the transaction indicated by the return of the indicating-wheels to zero without performing a registration, substantially as described.

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Witnesses:

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