

J. A. TREAT.
CASH REGISTER, INDICATOR, AND RECORDER.

No. 561,837.

Patented June 9, 1896.

Fig. 15.

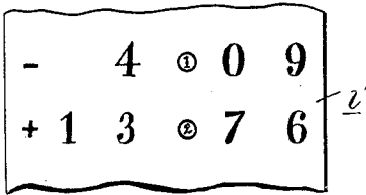


Fig. 14.

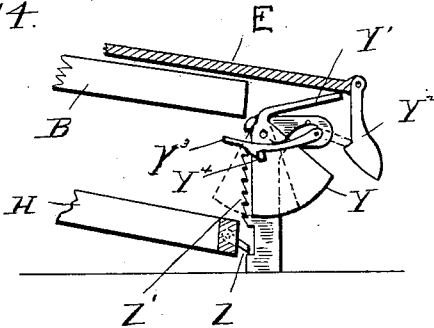
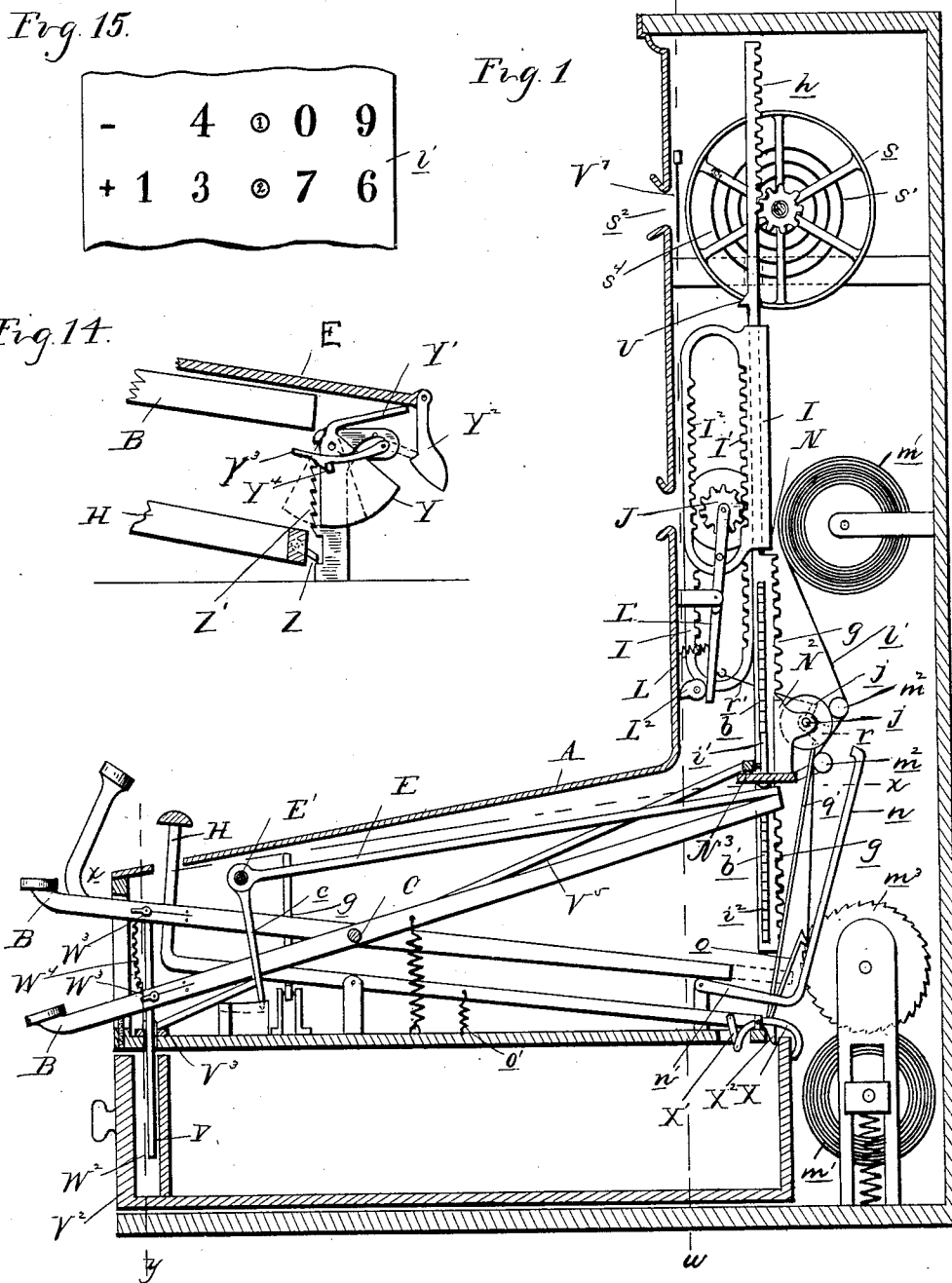


Fig. 1



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Attys

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(No Model.)

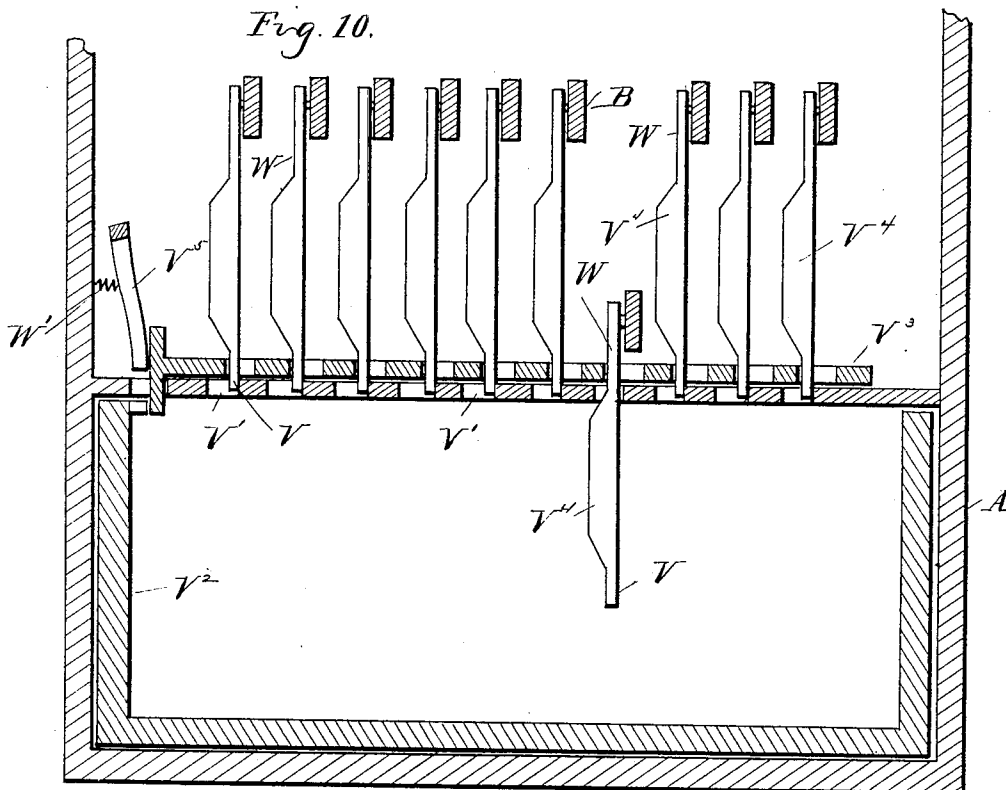
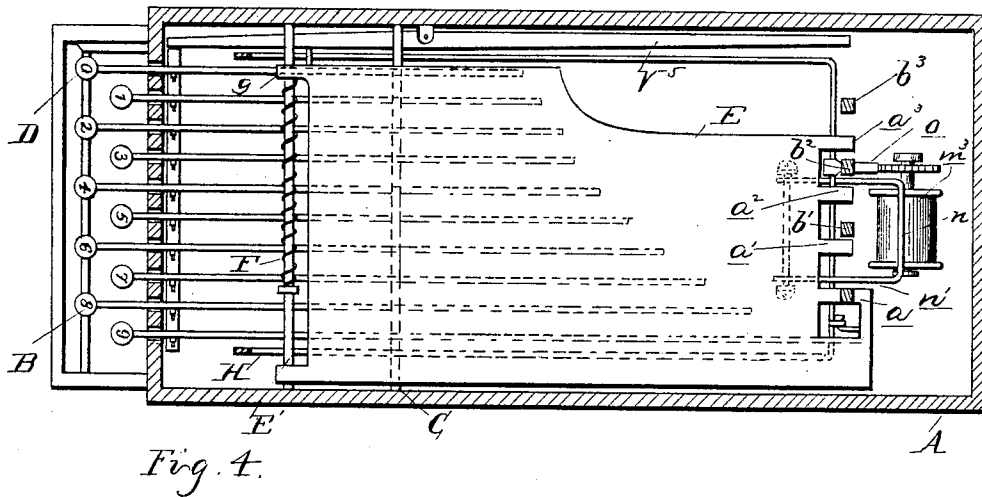
6 Sheets—Sheet 3.

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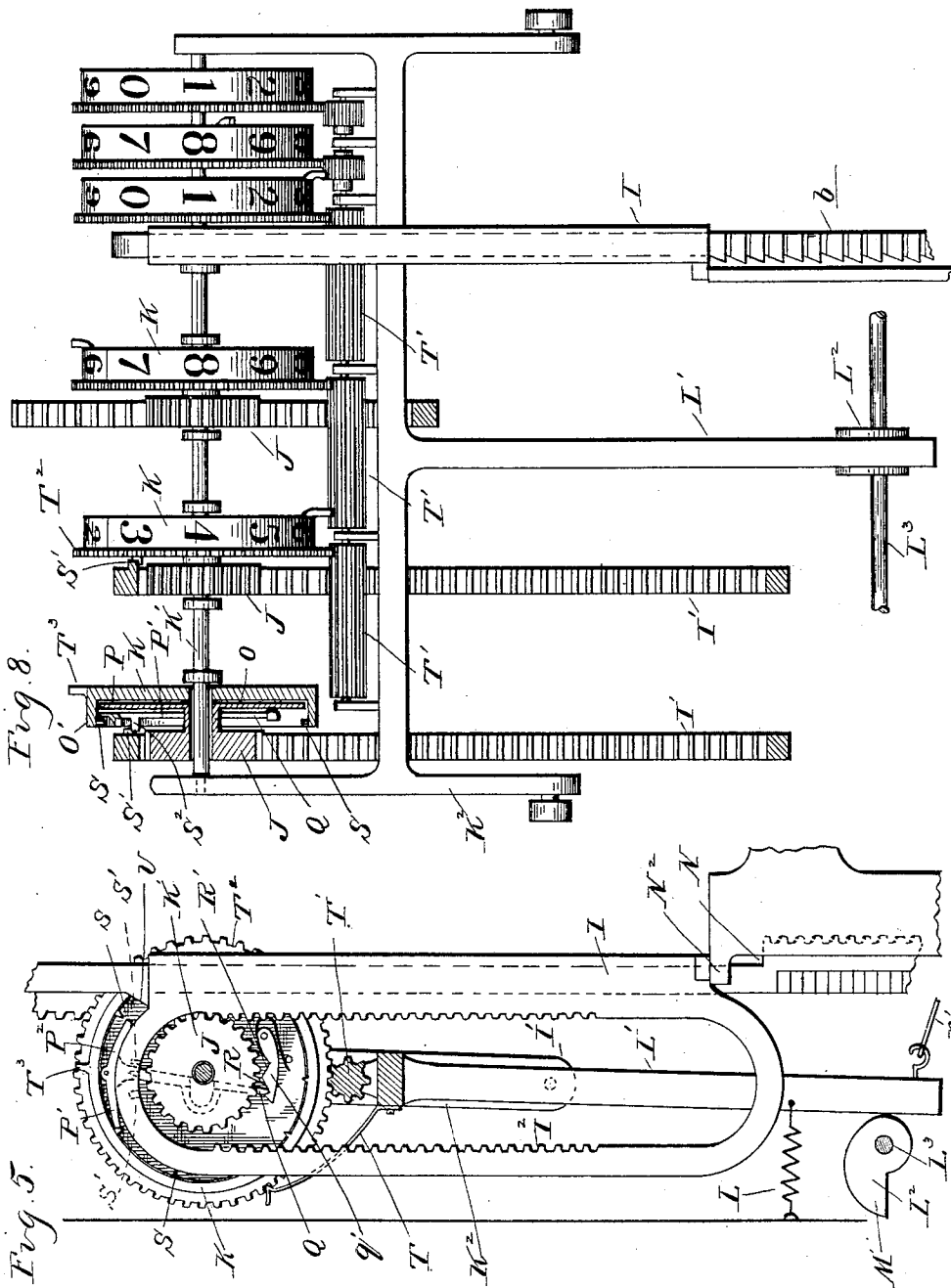
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Fig. 7.

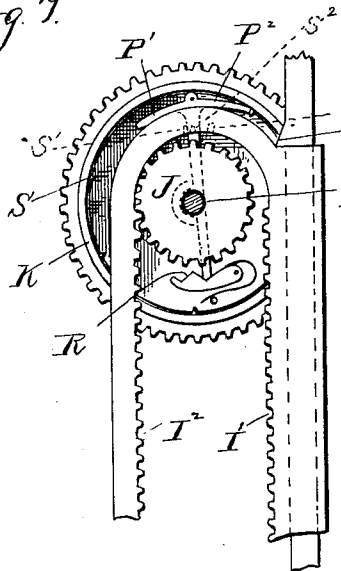


Fig. 6.

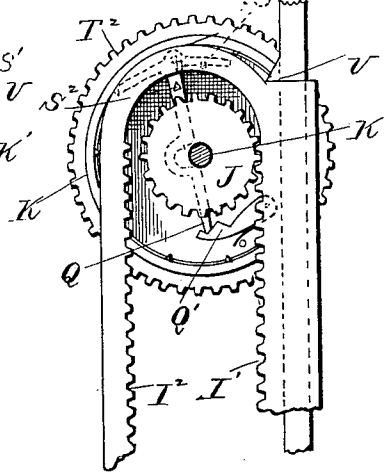
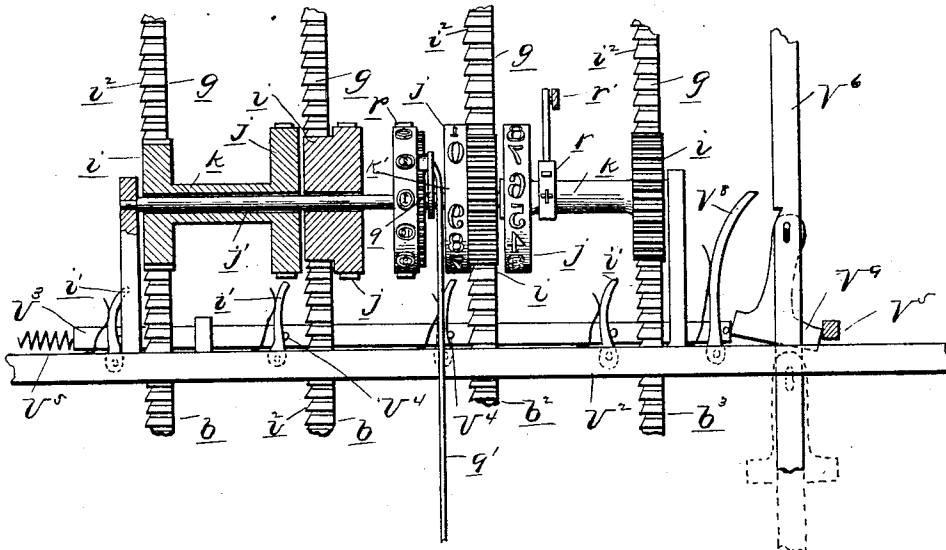


Fig. 9.



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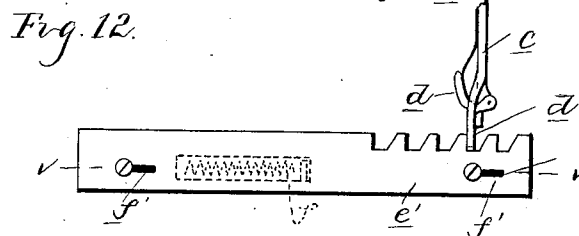
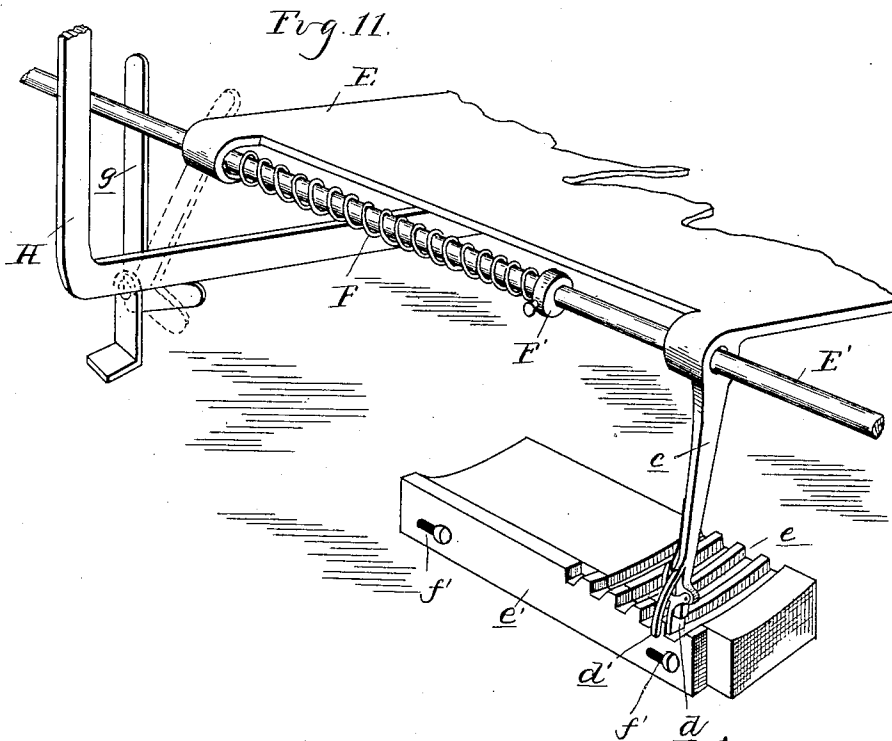
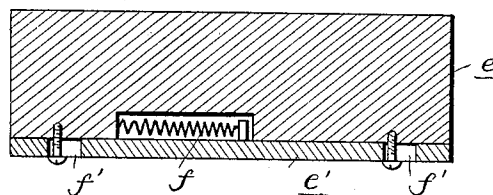


Fig. 13.



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UNITED STATES PATENT OFFICE.

JOSEPH A. TREAT, OF STUART, IOWA.

CASH REGISTER, INDICATOR, AND RECORDER.

SPECIFICATION forming part of Letters Patent No. 561,837, dated June 9, 1896.

Application filed July 13, 1891. Serial No. 399,385. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. TREAT, a citizen of the United States, residing at Stuart, in the county of Guthrie and State of Iowa, have invented certain new and useful Improvements in a Combined Calculator and Register, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in a cash register, indicator, and recorder; and the invention consists in the peculiar construction of the following mechanism: first, in the construction of the registering mechanism whereby with a single series of registering-wheels and a single group of keys a totalizing-register is obtained; further, in the peculiar construction of the registering mechanism whereby a sum may be added or subtracted; second, in the construction of the recording or printing mechanism whereby each individual amount or sum is printed separately, and, further, whereby the additive or subtractive character of each sum is likewise printed upon the record; third, in the peculiar construction of the indicating mechanism whereby a blank is normally exposed to view in all spaces of higher denomination than the amount previously indicated; further, in the construction of a hood adapted to obscure the indication during the operation of the keys and a lever designed to be moved after the operation of the keys necessary for the exhibition of any desired sum, to lift said rod, and to perform other functions; fourth, in the peculiar construction of the actuating mechanism for the various parts; fifth, in the peculiar construction of the actuating mechanism and locking device for the cash-drawer; sixth, in the peculiar construction, combination, and arrangement of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a side elevation of my improved cash-register with the casing removed, showing the parts in the position with a key operated. Fig. 2 is a vertical cross-section thereof on line *ww* in Fig. 1, looking from the front. Fig. 3 is a rear elevation with the casing removed and the paper and paper-actuating rolls removed. Fig. 4 is a horizontal section on line *xx* in

Fig. 1. Fig. 5 is an enlarged end elevation of the registering mechanism, showing the parts in their initial position when a sum is being added. Fig. 6 is a similar elevation showing the register-wheel partially operated. Fig. 7 is a similar elevation showing the position of the parts when a sum is to be subtracted. Fig. 8 is a rear elevation, partly in section, of the registering mechanism. Fig. 9 is a rear elevation, partly in section, of the recording mechanism. Fig. 10 is a vertical cross-section on line *yy* in Fig. 1. Fig. 11 is a detached perspective view of the lifting plate and the mechanism for shifting it. Fig. 12 is a front elevation thereof. Fig. 13 is a horizontal section on line *vv* in Fig. 12. Fig. 14 is a detached elevation of a lock for the resetting-lever. Fig. 15 is a plan view of a portion of the printing-strip.

A is the casing of the machine, of suitable shape to receive the operating parts.

B is a series of key-levers journaled upon the transverse shaft C and provided at their forward ends with suitable finger-pieces. The finger-piece of each lever is marked with its value, and I use ten keys, one for each digit and a cipher-key D. These levers are so arranged as to impart a movement proportionate to its value to the actuating mechanism for the register and indicator and recorder. This I preferably accomplish by journaling them upon a common fulcrum and making the lever-arms of different lengths; but this may be accomplished by other means, such as arranging the fulcrums diagonally across the machine or by giving them a different length of movement before striking the operating mechanism, or any other suitable means.

E is a plate journaled upon the shaft E' near the front of the machine. This plate is adapted to have a sliding movement upon its fulcrum. The plate is of sufficient width to extend across all of the keys and is lifted by every key whenever it is operated. At its rear end this plate is provided with the fingers *a*, *a'*, *a''*, and *a'''*, Fig. 4, one for each monetary denomination which it is designed to indicate, register, or record.

b, *b'*, *b''*, and *b'''* are a series of vertically-actuating rods placed in the rear of the machine. These rods are of successive higher denomination and are designed to be succes-

sively operated by the fingers on the plate E. To accomplish this, I arrange a device for laterally shifting the plate E after the depression of each key until the desired sum has been registered, when a resetting-lever returns the plate to its normal position.

The construction which I preferably employ for laterally shifting this plate consists of the downwardly-extending arm *c*, formed at the rear end of the plate E. This arm is provided at its lower end with a spring-pawl *d*. The arm *c* is also provided with a finger *d'* at the front side thereof, extending down to substantially the same distance as the pawl *d*, Figs. 11, 12, and 13.

e is a stationary rack arranged transversely the machine, and *e'* is a shifting rack arranged beside the stationary rack and actuated by a spring *f*. This shifting rack has a limited sliding movement corresponding to the length of the slot *f'*. These parts are plainly shown in Figs. 11, 12, and 13.

Upon the shaft E' is a shifting-spring F, which bears at one end against the stationary lug F' and at the other end against the lifting-plate. This spring is under tension in the normal position of the parts and acts to move the lifting plate toward the left of the machine. Its tension is sufficient to overcome the tension of the spring *f*. In the normal position of the parts, the lifting plate being in its lowest position, the pawl *d* is in engagement with the shifting rack *e'*. The tension of the spring *f* moves that rack to its farthest position to the left, in which position the pawl *d* is in line with the interdental space in the rack *e*. The depression of a key raises the lifting plate and rocks the arm *e* forward, moving the pawl and the finger *d'* into the stationary rack. As soon as the rack *e'* is released it moves to the limit of its movement to the right by the expansion of the spring *f*. Upon the return of the arm *c* it engages with the second space in the rack *e'*. The spring F, overcoming the tension of the spring *f*, moves into line with the second space in the stationary rack, carrying the lifting plate a corresponding distance to the left. This operation may be repeated a sufficient number of times to carry the lifting plate to the end of its lateral movement. To return it to its initial position, I employ a bell-crank lever *g*, having one arm in engagement with the lifting plate and the other beneath a lever H, which I call a "resetting-lever," as its function is to reset the plate and put other parts in position to be operated by the next operation of a key. The depression of this lever moves the lifting plate to the right, compressing the spring F, the pawl *d* allowing the arm *c* to move to the right over the teeth in the rack *e'*. The function of the finger *d'* is to form a rigid connection between the shifting plate and the stationary rack, so that during the operation of a key it will be engaged with the racks and prevent the operation of the resetting-lever to shift the lift-

ing plate. In the normal position of the parts this finger extends beyond the racks, as plainly shown in Fig. 11.

When the lifting plate is in its initial position, the depression of a key will lift the actuating-rod *b*, the depression of a second key will lift the actuating-rod *b'*, and the succeeding operations will lift the rods *b*² *b*³ successively.

It will be observed that the lifting plate is provided with fingers corresponding to the number of actuating-rods.

In the initial position the units-finger *a* on the plate engages beneath the units-rod *b*, and the operation of any key operates that rod. As soon as the key is released the plate is shifted, the units-finger *a* is disengaged, and the tens-finger *a'* engages beneath the tens-rod *b'*. The depression of a key now actuates the tens-rod. As the shifting follows each successive depression of a key, the units, tens, dollars, and tens-of-dollars fingers on the plate will successively operate the actuating-rod of corresponding denomination. The plate is returned to its normal position by the resetting-lever H.

Each actuating-rod is alike and is correspondingly moved by the operation of any key when the plate is engaged therewith. Each rod actuates the registering mechanism and sets the recording mechanism and indicating devices. The resetting-lever actuates the printing mechanism and elevates the hood to expose the indication and sets the tripping mechanism in position, so that the succeeding operation of a key will hide the indication and return the parts to their initial position.

Each actuating-bar is provided on its rear face with the racks *g* *h*, Figs. 1 and 3, the former actuating the type-wheels and the latter the indicating-wheels.

i are the drive-pinions for the type-wheels *j*, journaled upon the shaft *j'*, Fig. 9, and arranged in close proximity to each other. This I accomplish by means of sleeve *k*, connecting the drive-pinion and type-wheel of the highest and lowest denomination.

Each type-wheel is turned by the raising of its actuating-rod. A number corresponding to the value of the key struck is brought in the path of the printing-hammer, and is held in its adjusted position by a spring-pawl *i'* engaging with the rack *i*² on the actuating-rod, Fig. 9. Each type-wheel has upon its face figures corresponding with the keys—that is, a cipher and ten digits—and between the "0" and "9" is a blank space *l'*, a fractional part of the circumference, Fig. 9.

l is an inking-ribbon, Fig. 2, extending across the face of the type-wheels, carried by suitable spools. These spools may be turned by the operating mechanism or by hand, as desired.

l' is a paper strip, Fig. 1, wound around the spools *m* *m'* and passing over idler-rolls *m*², which bring it in proper relation to the type-wheels.

n is a hammer extending across the face of all the type-wheels. This hammer is actuated by the resetting-lever H , which strikes the arm n' thereof, Fig. 1, in its upward movement. The resetting-lever also carries the pawl o , which engages a ratchet-wheel on the spool m^3 . As the actuating-arm of the lever is raised the pawl moves over the teeth of the wheel. As it is returned by the spring o' the spool is revolved and the paper moved in proper position for the next record, Fig. 1.

p is a numbering-wheel, Fig. 9, having figures thereon from "1" to "10," these figures being printed beside each sale, thus arranging them in groups of ten—an assistance in counting the number of sales. This wheel I preferably arrange between the tens and dollars wheels and arrange the type in a small circle, which forms the period or decimal point, and which takes up no extra room on the paper. This wheel is turned a tenth of a revolution after the actuation of the keys to record any desired amount by means of the pawl q engaging with the wheel and actuated by the setting-lever H by means of the connecting-rod q' . The imprint from this wheel is shown in Fig. 15.

As I use this recording mechanism in connection with a registering mechanism with which I may add or subtract to indicate whether a sum is added or subtracted, I use a printing-plate r , Figs. 1 and 9, having a plus and minus sign thereon. This plate is connected by means of a rod r' with the shifting mechanism of the register, so arranged that when the register is in position for adding the plus sign is printed, and when it is in position for subtracting the minus sign is printed opposite each sum recorded.

If desired, the plus sign may be omitted and the minus sign alone may be brought into position to indicate subtraction, the absence of a sign indicating addition.

To record a sum such as \$4.09, the operator first strikes the "9" key, which moves the units-wheel to "9;" next the "0" key, which moves the tens-wheel to "0;" next the "4" key, which moves the dollars-wheel to "4." The operation of the resetting key-lever prints this sum upon the paper, with the plus sign if it is added and the minus sign if it is subtracted, and the numbering-wheel prints the proper number, as shown in Fig. 15. As each actuating-rod rises it turns the indicating-wheels s (see Fig. 1) by its engagement with the pinions s' thereon and brings the proper number opposite the aperture s^2 in the casing. The indicating-wheels have marked thereon figures from "1" to "9," a cipher, and a blank space s^3 . The cipher is exposed by the operation of the cipher-key. Thus I obtain an exact indication without exposing ciphers on indicating-wheels which may not be required in such sums as \$4.09. If the cipher instead of the blank were normally exposed, the indication would be for \$04.09, which I deem undesirable.

The registering mechanism is actuated by the bars b b' b^2 b^3 through the medium of the key-levers and lifting plate, and it is of the following construction. (Shown in Figs. 1, 2, 3, 5, 6, 7, and 8.)

I are frames apertured to slidably engage with the actuating-bars b b' , &c. This frame is provided with a link-shaped yoke on its front side, having racks I I^2 upon the inner faces of the vertical portions thereof. These racks are separated sufficiently to enable the register-actuating pinions J to lie freely between and engage with either rack. These pinions J and the register-wheels K , which they are adapted to actuate, are all journaled upon a common shaft K' , which is secured at the top of the swinging frame K^2 , journaled at the lower end in suitable bearings in the casing.

L is a spring acting on the lever L' to hold the frame in position to engage the pinions with the rack I . L^2 is a cam-wheel against which this lever bears, and L^3 is a shaft on which this cam is secured. By turning the crank M at the end of the shaft, Figs. 2 and 3, the bearing M' on the cam rocks the lever, throwing the pinion into engagement with the rack I^2 .

N is a shoulder on each rod b b' , &c., normally in position a short distance below the lower edge of the frame and adapted to strike it and raise the frame, with the rod, to actuate the register-pinions. The lost motion between the rod and frame is sufficient to allow the rod to be actuated by the cipher-key without actuating the frame. The frame rests upon a stop N^2 in its initial position. Upon the actuation of a digit-key the rod is carried up a distance proportionate to the value of the key, and the rods are successively operated by the lifting plate, as previously described.

To transmit the motion from the pinions to the register-wheels and from one wheel to another, I employ the following mechanism:

Each pinion J has a short sleeve O extending from its inner face, while the register-wheel is recessed by forming a flange O' on its periphery. P is a disk secured to the end of the sleeve O and arranged within the recess of the register-wheel. Between the pinion and the disk is a reversible spring-pawl P' , pivoted to the disk at the edge, having the arms P^2 P^3 on opposite sides of its stem Q . This stem is suitably shaped to pass the shaft K' and extends to near the bottom of the disk, where it engages with a spring-pawl Q' , having inclined bearings R R' .

S are lugs on the inner face of the flange O' corresponding to the numbers on the periphery. S' are stationary lugs on the inner face of the yoke on opposite sides of the stem Q and in the path of the lug S^2 on the stem. The lugs S' act as a fulcrum to shift the arm P' or P^2 into engagement with the lugs S when the frame K^2 is moved by the cam L^2 .

The raising of the frame when the pinion

is in engagement with the rack I', Fig. 5, will cause the pinion to turn toward the front of the machine. The arm P², being in engagement, will cause the register-wheel to move with it and add the sum to the number already expressed. In returning the spring-pawl T will hold the register-wheel in its adjusted position, the stem Q sliding up the incline R as the arm P² passes the lug S.

When the pinion is in engagement with the rack I², it will rotate in the opposite direction as the frame is raised, and the arm P², being in engagement with the lugs S, will carry the register-wheels in the opposite direction, subtracting the sum from that already expressed.

T' is a pinion, with which a gear T² on the periphery of the tens register-wheel engages.

T³ is a tooth or segmental gear on the units-wheel, adapted to mesh with this pinion once in each revolution and move the tens-wheel a fractional division to "carry one." Corresponding pinions T' carry from the tens to dollars and from dollars to tens of dollars, &c., and I thus obtain a totalization.

U, Fig. 5, is a lug on the actuating-bar, to positively bring the frame down with the rod, a spring s⁴ in the indicating-wheels acting with its tension to return the rods when released by the pawls i'. These pawls i' are journaled upon a stationary bar U², Fig. 9, and pass beside a movable or tripping bar U³, which has cross-bars or pins U⁴ in front of each pawl. Each pawl has a spring acting to hold it in engagement with the ratchet on the side of the actuating-bars b b', &c., while the bar U³ has a spring U⁵, Fig. 9, acting to force the cross-bar back, carrying the pins U⁴ normally out of engagement with the pawls. The mechanism for operating this tripping-bar and throwing down the previously-operated rods, returning the parts to a position for another registration, is as follows:

V, Fig. 10, are legs pivoted to the sides of the key-levers near the front and extending some distance below, engaging in guide-bearings V' in the bottom casing of the machine above the cash-drawer V². They also pass through apertures in a horizontal reciprocating bar V³, and are adapted to move that bar in their downward movement by means of the lugs V⁴, formed on the side of these legs. This bar at its end bears against the lever V⁵, Figs. 4 and 10, which extends rearwardly and upwardly to a point opposite the end of the tripping-bar U³. (See Fig. 9.)

V⁶ is a hood-bar carrying a blind or hood V⁷, which is adapted to cover the indication in its lower position. This rod is held in its elevated position, Fig. 2, by means of a spring-pawl V⁸ (similar to the pawls i') engaging a detent or shoulder on the rod. Pivoted to this rod is the swinging tripper V⁹, lying between the lever V⁵ and the tripping-bar U³. The pivot of this tripper engages in a slot in the rod, as shown in Fig. 9. When the pawl V⁸ holds the rod up, the tripper is suspended by its pivot in the lower end of the slot.

The operation of a key moves the lever V⁵ laterally, carrying the tripper into engagement with the tripping-bar, which it moves into the position shown in Fig. 9, disengaging the pawls i' from the actuating-bars and the pawl V⁸ from the rod V⁶, which drops the length of the slot, carrying the shoulder below a point where it is impossible for the pawl V⁸ to reengage until the rod is again lifted. The parts are held in this position during the time the lug V⁴ is in engagement with the bar V³, Fig. 10. As the key approaches its limit of movement the reduced portion W on the leg V enters the bar and allows the spring W' of the lever V⁵ to return the lever, disengaging the tripper and allowing the rod and tripper to fall below the bar V³. It remains in this position until the resetting-lever is operated, which raises the hood-bar, displays the indicating-wheels, and is held elevated by the pawl V⁸ until another key is operated. Thus the hood obscures the indication until it is completed, and then when the resetting-lever is operated the hood is raised and the indication is exposed until another key is struck, which throws down all previously-operated rods and the hood.

W² is a partition near the front of the cash-drawer, into which the legs V enter in their downward movement, as shown in Fig. 1, preventing the movement of the cash-drawer during the depression of a key.

As the cash-drawer is actuated by the resetting-lever, it is evident if the cash-drawer is locked that the resetting-lever cannot be actuated, and therefore this engagement of the leg V into the drawer also locks the resetting-lever during the depression of the key.

In order to insure the complete depression of the key after it has started, I arrange a spring-pawl W³ upon each key, which engages with a segmental rack W⁴ on the front of the casing.

The mechanism which I employ for throwing out the drawer is shown in Fig. 1. It consists of a curved lever X, pivoted in the rear of the casing and actuated by the upward movement of the resetting-lever H, to which it is connected by means of the connecting-link X'. The upward movement of the end of the resetting-lever moves the lever X laterally and pushes out the drawer.

The resetting-lever is also provided with a lug X², which engages in front of the rear edge of the drawer and holds it locked until the lever is elevated. I also provide means for locking the resetting-lever after each operation thereof, which mechanism I have shown in Fig. 14 and which consists of the locking-plate Y, pivoted above the normal position of the resetting-lever and weighted to swing over said lever, as shown in dotted lines in Fig. 14. This plate is provided with an arm Y', with which a hook Y², secured to the lifting plate, is adapted to engage at each upward movement of said plate. As this hook is elevated and engages with the arm Y' it

rocks the plate Y out of engagement with the resetting-lever, in which position it is held by means of the spring-catch Y³ engaging with the pin Y⁴ upon the plate Y. When the resetting-lever is again actuated, it lifts the latch Y³ and disengages it from the plate, allowing the plate to assume its normal position. As the lever descends it moves the plate back sufficiently to allow it to reach its initial position, when the plate swings over it and locks it, as before described. Thus the resetting-lever is locked between its successive operations until the key has been struck.

I preferably provide means for preventing the retrograde movement of the setting-lever, and this may consist of the device shown in Fig. 14, where I have shown a gravity-pawl Z, pivoted to the rear end of the resetting-lever and adapted to engage with the rack Z' upon a part of the frame in rear of the said resetting-lever. As soon as the resetting-lever has started on its movement, this pawl, engaging with the rack, will prevent its retrograde movement until it has completed its stroke, when it may be inclined upwardly to allow the lever to return to its normal position.

The pawl Z is prevented from inclining upward by the proximity of the rack Z' and bar II. As it reaches the top of the rack it is free to move up and thereby allow the bar II to fall.

The operation is as follows: When the amount "\$4.09" is to be registered, recorded, and indicated, the operator first presses down the key bearing the number "9" thereon, which elevates the plate E to the extent of the movement of the long arm of the key-lever. The movement of the plate forces up the rod b, which is normally located above the units-finger a of the plate. The upward movement of rod b rotates the first printing-wheel j by the rack g engaging the gear on the wheel, and at the same time rotates the indicating-wheel s, the extent of the movement of the rod being sufficient to expose the figure "9" on both the units printing and indicating wheels, the former to the opening and the latter to the hammer. This upward movement of the rod carries the shoulder N thereon into engagement with the first of the series of yokes I, lifting the same from the rest N² and carrying it upward a distance sufficient to register the added amount "9" on the units-register wheel of the series, the handle M having previously been turned to throw the cam L² out of engagement with the frame L', allowing the spring L to force the pinions J into engagement with the adding-racks I' of the yokes, and at the same time the rear lug S' engages the lug S² on the arm Q, rocking the same toward the front and causing the engagement of its lower end into the outer notch of the pawl Q', thereby carrying and holding the arm P² into the path of or engagement with one of the lugs S on the flange of the units-register wheel, causing a lock in the direction of the adding movement of the pin-

ion J and the register-wheel. When the frame carrying the register-wheels is moved by the spring into the adding position, the cord r' is drawn forward, lifting or drawing the plate r up and alining the plus sign thereon with the platen or hammer. The rod b having been elevated, it is held in its elevated position by the pawl i', which, as stated, is held normally in engagement with the teeth i² thereon by the individual pressure-springs. Before the key 9 has been pressed down the dog d on the arm c of the plate E is held in the last notch of the sliding rack e', the latter being forced back to its extreme limit. As the plate E is raised the dog d is moved forward into the groove of the stationary rack e, and as the plate E falls when pressure is taken from the key the dog enters the second groove in the sliding plate (the latter having been moved forward by the spring f when the dog was in the stationary rack) and the spring F on the plate forces the movable rack back so that the notch in which the dog rests will be opposite the second groove in the fixed rack, thus allowing the spring F to carry the plate E one notch toward the left of the machine, and thereby carrying finger a' beneath the rod b'. While in this position the operator presses down the cipher-key, raising the plate E a limited distance, (owing to the length of the lever-arm,) which raises the rod b' and actuates the printing and indicating wheels to present the cipher sign to the platen or hammer and the cipher on the tens-indicating wheel to the opening in the casing. The limited play of the rod between the yoke I and shoulder N prevents the cipher-key from actuating the tens-yoke. The rod b' is held in its elevated position by its pawl i, and the plate E is moved one notch farther toward the left, carrying the finger a² below the rod b². The key bearing the figure "4" is now pressed down, and in a manner similar to that of the first key actuates and sets the dollar printing and indicating wheels and actuates the dollar-recording wheel. While the rods b, b', and b² are in their elevated position, the indicating-wheels set to expose the figures "409" and the printing-wheels set to present the figures "409" to the hammer, the resetting-lever II is pressed down, (the keys having assumed their normal position,) turning the lever X on its fulcrum, thereby forcing open the drawer, the lug X² moving out of engagement with the rear of the drawer as the resetting-lever is moved up. The upward movement of the resetting-lever forces up the rod g', turning the numbering-wheel one point and presenting the proper number to the hammer. The further movement of the resetting-lever strikes the hammer-arm n' and forces the hammer against the paper strip, making the imprint of the figures thereon. The downward movement of the forward end of the resetting-lever carries the same into engagement with the horizontal arm of the bell-cannk g, as shown in Fig. 11, forces the vertical arm

thereof in against the plate E, and moves this plate back to its initial position, the dog *d* on the end of the arm *c* passing over the ribs on the bar *e'* and finally coming to rest in the first notch thereof, directly opposite the first notch of the stationary rack *e*, in proper position for subsequent operation of the keys. The upward movement of the long arm of the resetting-lever forces up the bar *V*⁶, which raises the hood *V*⁷ and exposes the numbers on the indicating-wheels. As the bar *V*⁶ is raised the pawl *V*⁸ engages in the notch therein and holds the bar in its elevated position and the tripper *V*⁹ directly opposite the end of the sliding bar *U*³ and the lever *V*⁵. When the long arm of the resetting-lever falls, it rotates the friction-wheel *M*³ of the paper-carrier one notch, thereby carrying the printed matter below the type. The parts being in the position above indicated, the downward movement of a key in making the next entry forces the slide *V*³ toward the left against lever *V*⁵, throwing the inner end of this lever against the tripper *V*⁹ and moving the sliding bar *U*³ to the right and the pins *U*⁴ into engagement with the pawls *i* and *U*³, releasing the hood-bar and the bars *b b'* and allowing the same to fall. When the amount is to be subtracted, the register-wheel frame is tilted by the cam *L*² until the pinions *J* engage the racks *I*². The operation of the several parts is the same as during the addition, with the exception of the reversing of the swinging pawl *Q* of the register-wheels and the replacement of the plus character by the minus character, which movement is caused by the slackening of the cord *r'*.

What I claim as my invention is—

1. In a cash-register, the combination of registering-wheels having movable supports, means for moving the supports to change the positions of the wheels, a single actuating mechanism therefor adapted to impart a progressive or retrograde movement thereto, a series of keys, and connected mechanism actuated by the keys for actuating the actuating mechanism.

2. In a registering mechanism, the combination with an actuating gear-wheel, a numbered register-wheel, a reversible pawl connection between the two, and racks for actuating said gear-wheel in opposite directions, substantially as described.

3. In a registering mechanism, the combination with an actuating gear-wheel, a numbered register-wheel, a pawl connecting the two, racks for actuating said gear-wheel in opposite directions, and means for causing an engagement between said gear-wheel and either rack, and for reversing said pawl, substantially as described.

4. In a registering-machine, the combination with a single series of operating-levers and a series of actuating devices for different denominations, of a plate actuated by all the levers, having fingers adapted to engage with the actuating devices of a higher de-

nomination at each successive operation, substantially as described.

5. In a registering-machine, the combination with a single series of operating-levers, and a series of actuating-bars for mechanism of different denomination, of a lifting plate actuated by all the levers and fingers on said plate adapted to engage with the actuating-bars of higher denominations at each successive operation, substantially as described.

6. In a registering-machine, the combination with a single series of operating-levers, and a series of actuating-bars for mechanism of different denomination, of a lifting plate actuated by all the levers, fingers on said plate adapted to engage with the actuating-bars of a higher denomination at each successive operation, and a shifting and return mechanism for said plate, substantially as described.

7. In a registering-machine of the kind described, a series of actuating-bars of different denominations, a lifting plate having a corresponding number of fingers and means for engaging said fingers successively with the bars of successively higher denomination, substantially as described.

8. In a cash-register, of the kind described, the combination with the lifting plate, of a shifting device therefor, comprising a spring, a stationary rack-bar, a corresponding shifting rack-bar, an arm on the plate and a spring-pawl on said arm engaging with the rack-bars, substantially as described.

9. In a cash-register of the kind described, the combination with the lifting plate, of a shifting device therefor, comprising a spring, a stationary rack-bar, a corresponding shifting-bar, an arm on the plate, a spring-pawl on said arm engaging with the rack-bar, and a lever for returning said plate to its initial position substantially as described.

10. In a recording mechanism for cash-registers, the combination with the type-wheels and printing mechanism, of a numbering-wheel having its figure arranged in a decimal mark, substantially as described.

11. In a cash-register, the combination of indicating-wheels having a blank normally exposed to view, a cipher sign and the nine digits and mechanism for exhibiting any of said figures, substantially as described.

12. In a cash-register, the combination of indicating-wheels, having a cipher sign and the nine digits thereon, a blank on said wheels normally exposed, a series of digits-keys and a cipher-key, and connecting mechanism for actuating the indicating-wheels, whereby upon the actuation of a key a figure corresponding to its value is exhibited on the wheel, substantially as described.

13. In a cash-register, a cash-drawer, a series of keys, and means on the keys for locking the drawer during the movement of a key, substantially as described.

14. In a cash-register, a cash-drawer, a series of keys, means on the keys for locking

the drawer during the movement of a key, and a lever for releasing the lock and throwing open the drawer, substantially as described.

5 15. In a cash-register, a cash-drawer, a series of keys, means depending from the keys for locking the drawer during the movement of a key, and a lever for releasing the lock and throwing open the drawer, substantially
10 as described.

16. In a cash-register, the combination of a series of keys, a series of actuating-rods, a latch for holding said rods in their adjusted position, a tripping device for said latch, a lever for throwing said tripping device into operative position, and means for operating said tripping device upon the succeeding operation of a key, substantially as described.

17. In a cash-register comprising a series of
20 keys, a series of register-actuating bars and a single actuating-plate, of a resetting-lever, a lock for said lever applied after its actuation and means for withdrawing said lock upon the actuation of a key, substantially as
25 described.

18. In a cash-register, the combination of the plate E, the resetting-lever H, the lock Y, latch Y³, arm Y¹, and hook Y², substantially as described.

30 19. In a cash-register, the combination with a series of actuating-rods, a ratchet-bar on each rod, an independent spring-pawl for each rod, a tripping-bar common to all the pawls, and a tripper actuated by the operation of a
35 key, substantially as described.

20. In a cash-register, the combination with

the tablet-rods, of a vertically-movable hood for obscuring the indication, a series of keys for moving the rods, a resetting-lever for the rods and for moving said hood to expose the
40 indication, substantially as described.

21. In a cash-register, the combination with the keys and tablet-rods, of a resetting-lever, a vertically-movable hood, means for moving said hood upon the operation of a key to ob-
45 scure the indication, and means for moving said hood to expose the indication upon the operation of the resetting-lever, substantially as described.

22. In a cash-register, the combination with
50 the keys, the resetting-lever, the hood, the hood-rod V⁶, the actuating-rods, the pawl i' for holding up said rods, the pawl V⁸ for the hood-rod, the tripper V⁹, lever V⁵, and means on the keys for actuating said lever, substan-
55 tially as described.

23. In a cash-register, the combination with the resetting-lever and means for preventing a retrograde movement of said lever until it has completed its stroke, comprising a pawl
60 pivotally secured to the lever, a fixed rack of a length less than the length of the movement of the pawl-carrying portion of the lever, the weighted locking-plate Y pivoted above the plane of the lever, and the catch Y³, substan-
65 tially as described.

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

JOSEPH A. TREAT.

Witnesses:

M. B. O'DOHERTY,
JAS. WHITEMORE.