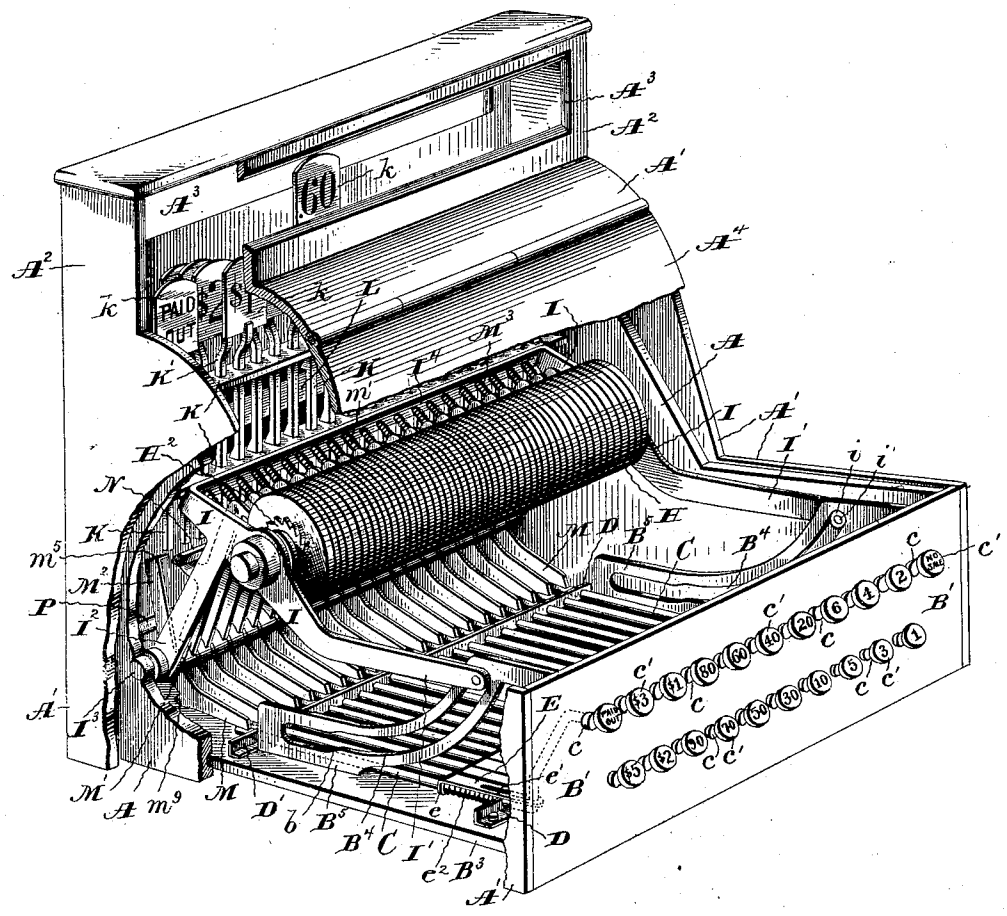
(No Model.) 7 Sheets—Sheet 1.

G. L. BARNES.

CASH REGISTER AND INDICATOR.

No. 567,066. Patented Sept. 1, 1896.

Fig. 1.



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(No Model.) 7 Sheets—Sheet 2.

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CASH REGISTER AND INDICATOR.

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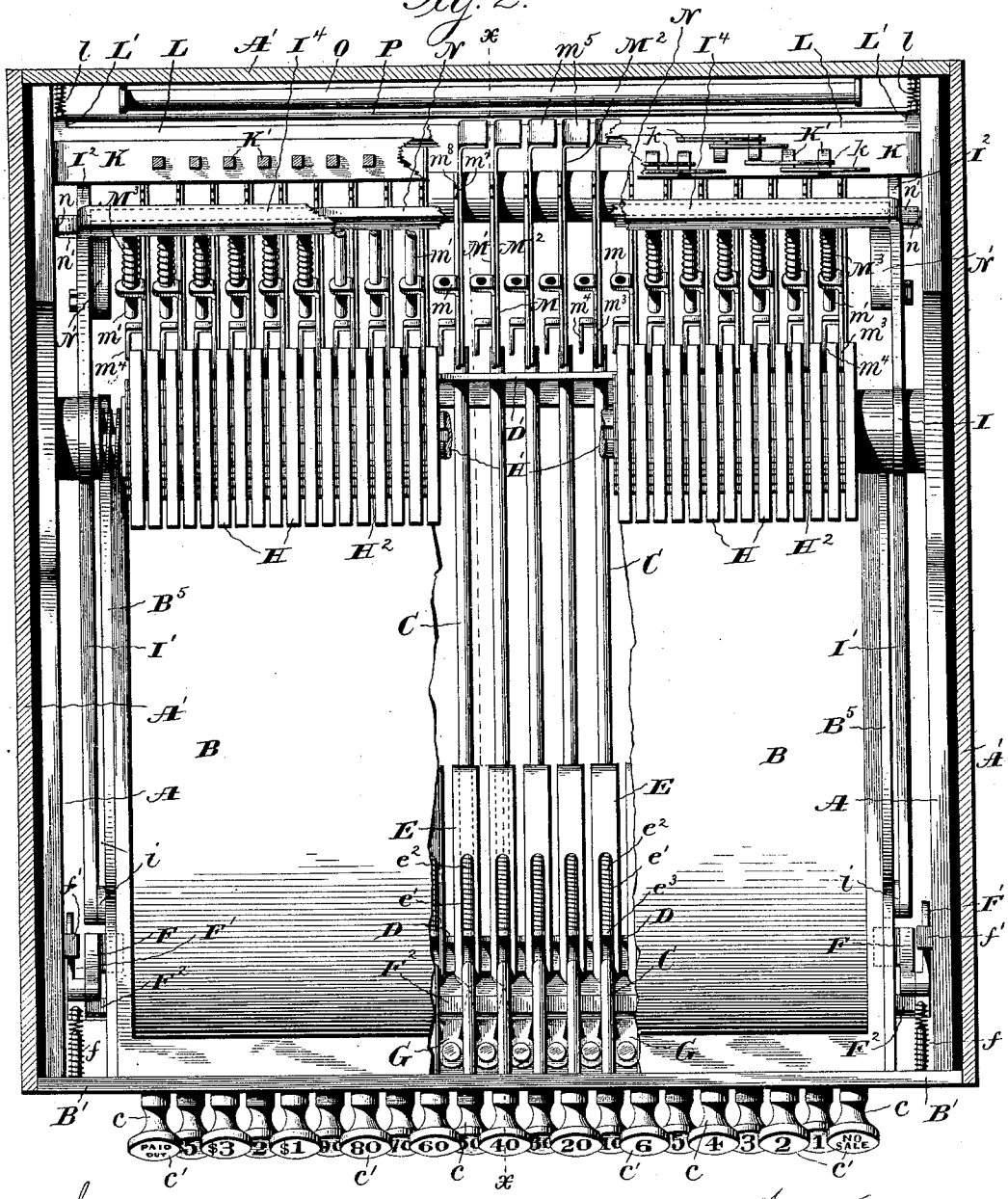
Fig. 2.



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(No Model.) 7 Sheets—Sheet 3.

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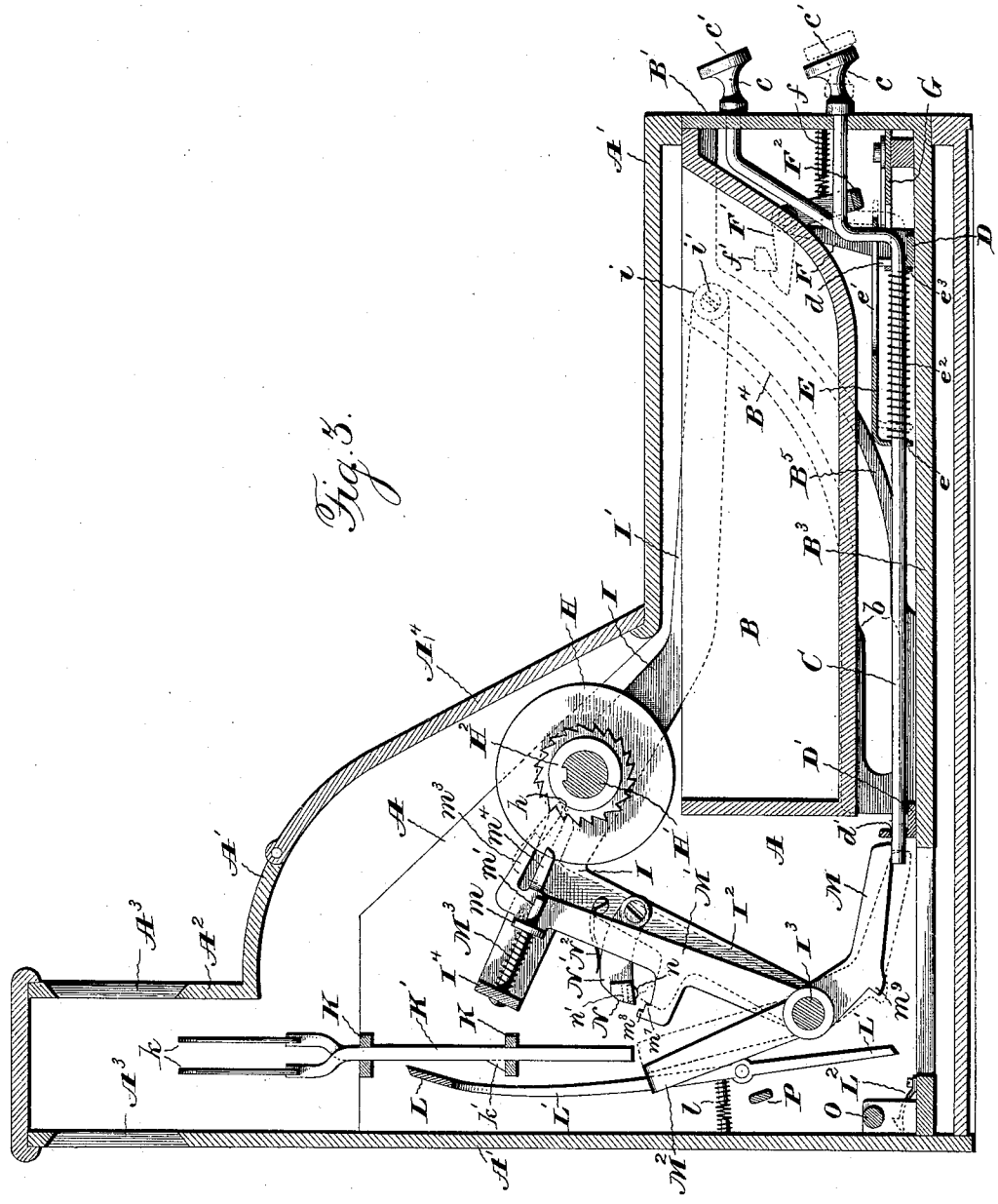
CASH REGISTER AND INDICATOR.

No. 567,066. Patented Sept. 1, 1896.

Fig. 3.



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(No Model.) 7 Sheets—Sheet 4.

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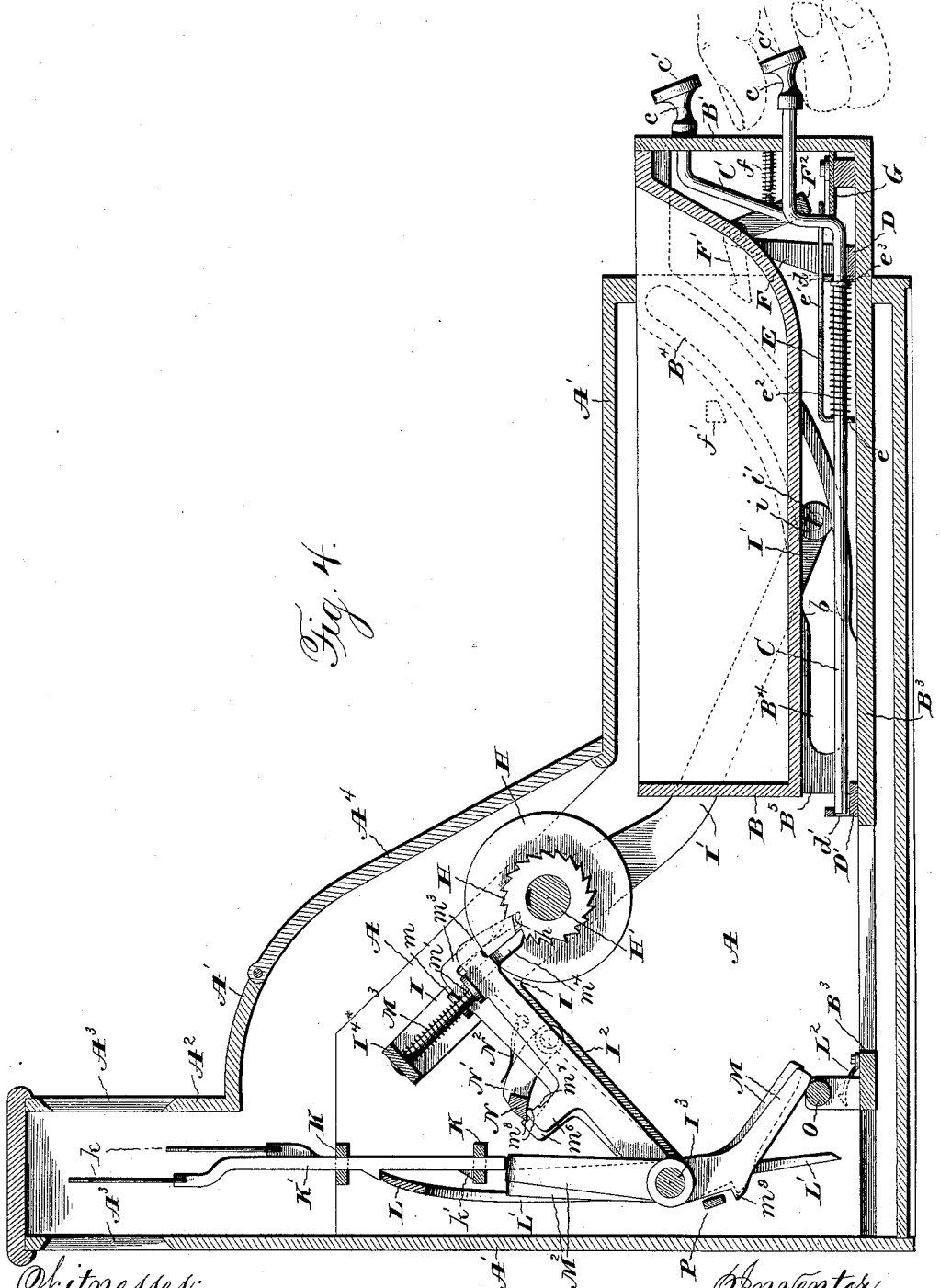

Fig. 4.

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(No Model.) 7 Sheets—Sheet 5.

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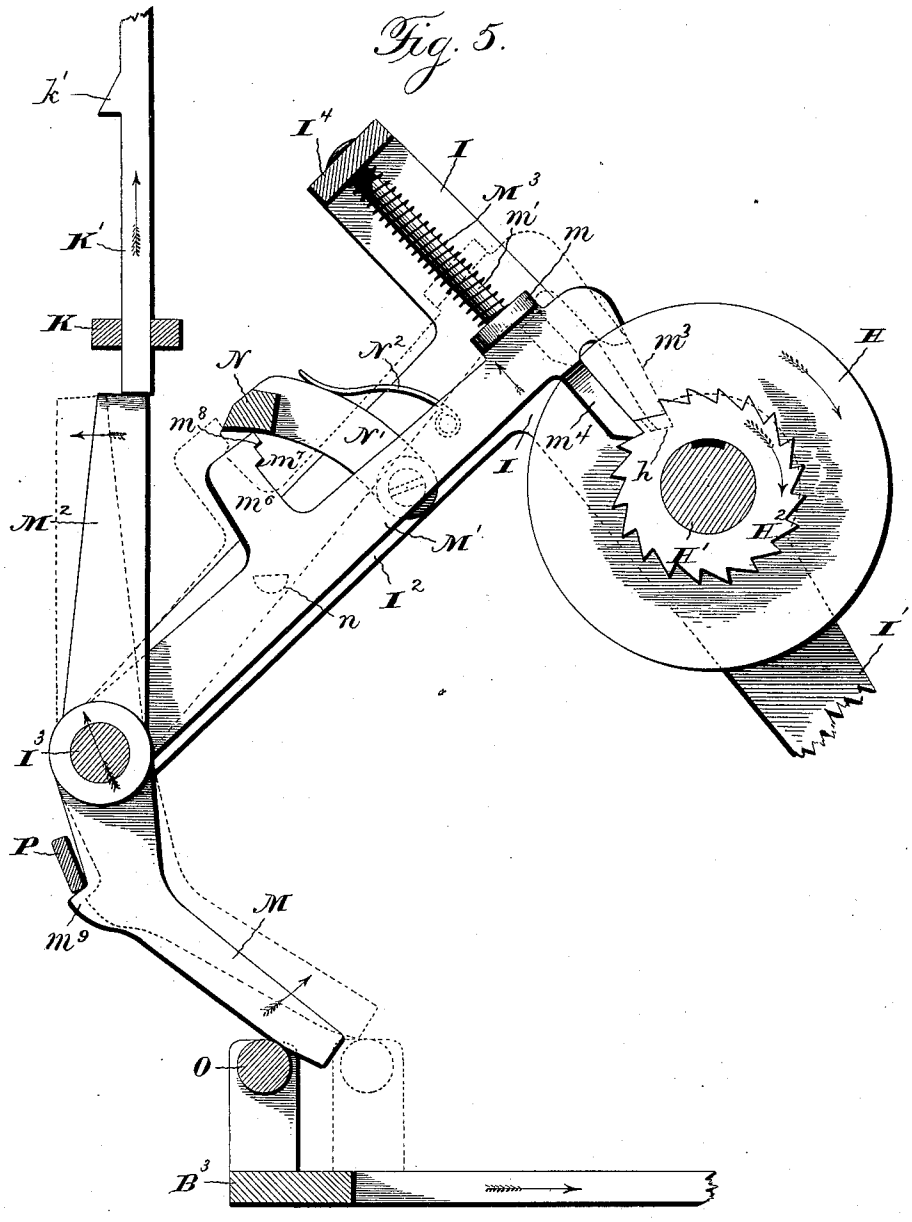
Fig. 5.



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(No Model.) 7 Sheets—Sheet 6.

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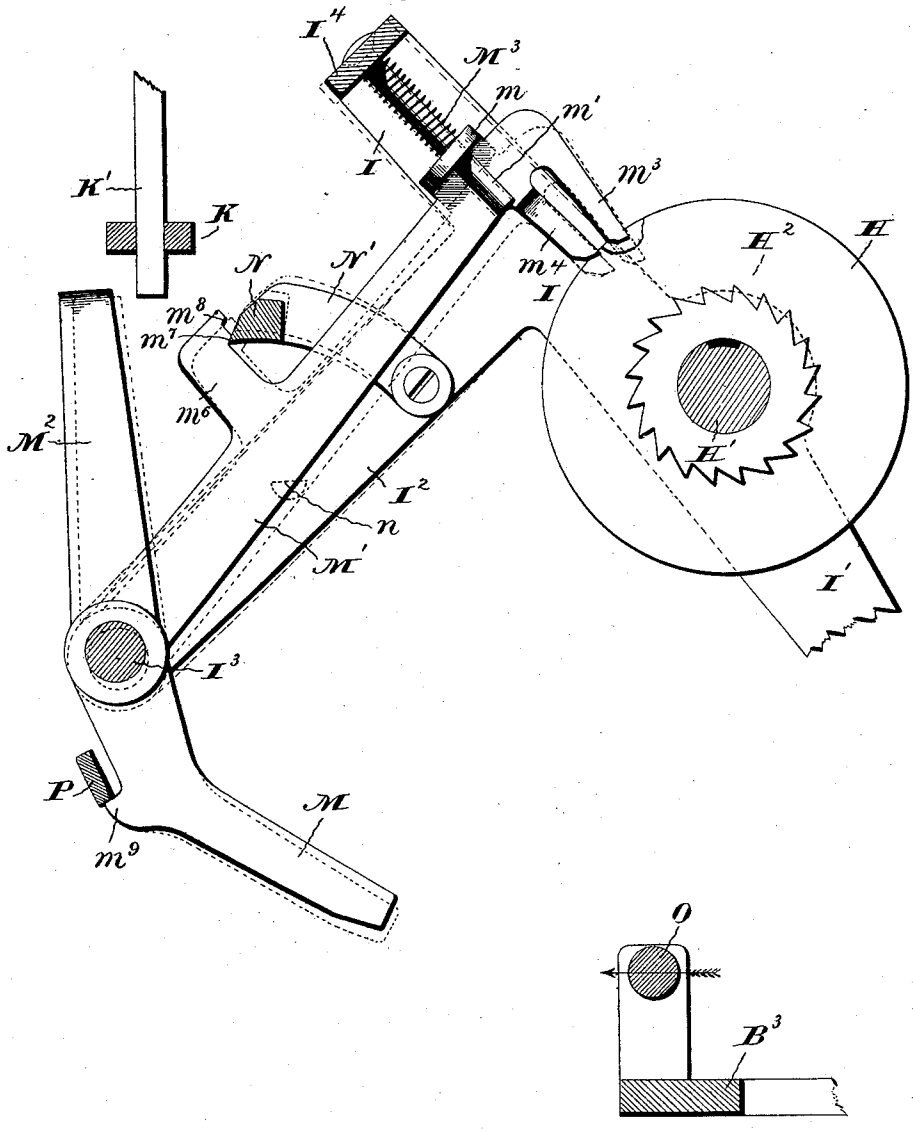
CASH REGISTER AND INDICATOR.

No. 567,066. Patented Sept. 1, 1896.

Fig. 6.



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(No Model.) 7 Sheets—Sheet 7.

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No. 567,066. Patented Sept. 1, 1896.

Fig. 7.

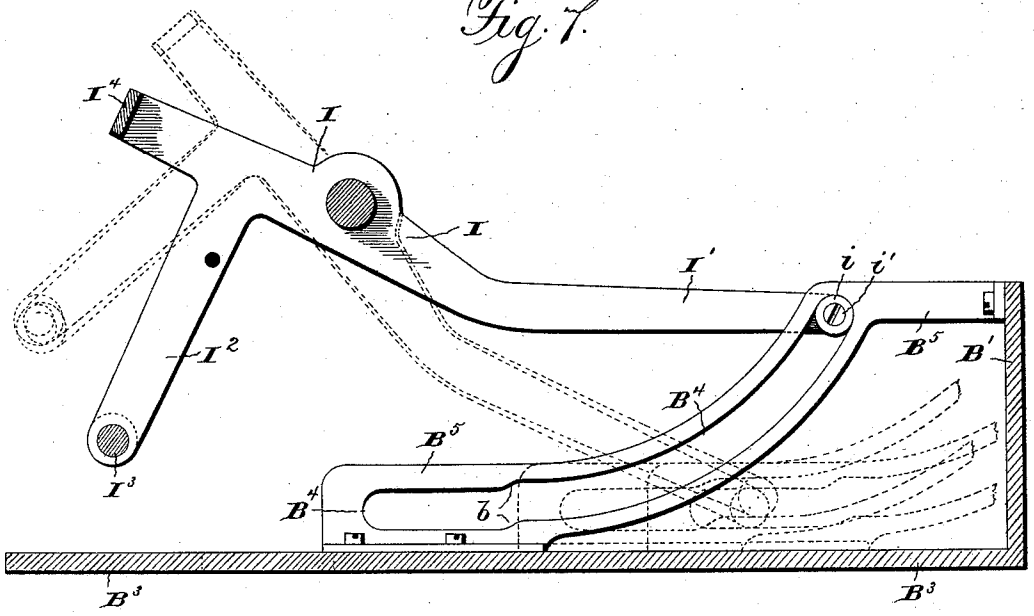


Fig. 8.

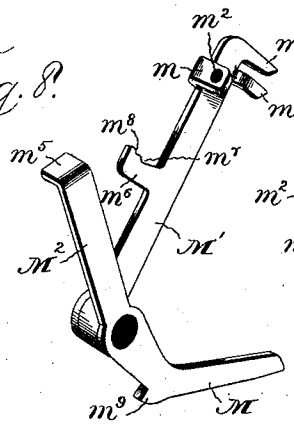
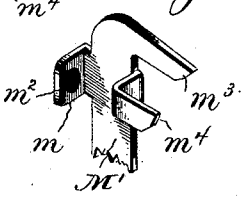


Fig. 9.



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UNITED STATES PATENT OFFICE.

GEORGE L. BARNES, OF NORTH HAVEN, CONNECTICUT.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 567,066, dated September 1, 1896.

Application filed July 17, 1895. Serial No. 556,242. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. BARNES, of North Haven, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Cash Registering and Indicating Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a perspective view of my machine with the outside casing broken away and the money tray or receptacle removed; Fig. 2, a plan view of the machine with the outside casing in section; Fig. 3, a view of a vertical section, on line *x x* of Fig. 2, with the parts shown in full lines in the positions which they occupy when the drawer is closed and the keys have not been moved and in dotted lines in the positions which they take after the movement of a key far enough to release the respective swinging piece engaged by it; Fig. 4, a similar view with the parts in position as when a key has been operated and the drawer has been partly opened; Fig. 5, a detail view, on an enlarged scale, showing one of the movable register and indicator engaging pieces in full lines in the position which it assumes just at the completion of its movement of the register and indicator and in dotted lines in the position to which it is moved immediately afterward by the continued outward travel of the drawer; Fig. 6, a similar view showing the same parts in the positions to which they are moved by farther travel of the drawer and swinging frame; Fig. 7, a similar view showing the different movements of the swinging frame at different points in the outward travel of the drawer; Fig. 8, a detail perspective view of one of the indicator and register actuating pieces removed from the swinging frame; and Fig. 9, a detail perspective view of the registering end of such piece, the scale being an enlarged one and the point of view being different from that of Fig. 8.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention has been to provide an improved cash registering and indicating machine; and to this end my invention consists in the machine and in the construction, arrangement, and combination of the parts thereof, as hereinafter specified.

In the drawings, A designates the frame for supporting the operative parts of the machine, and A′ designates the inclosing casing therefor, which can be of any desired form, construction, and material. As shown, it has the raised upright part A^2 provided with the two display-openings A^3 A^3, which are to be closed with glass in the usual way, and the lid or door A^4 to cover the front of the register wheels or disks.

A drawer B is guided in suitable ways in the lower horizontal part of frame A, so as to be capable of being slid out and in to bring its money-holding tray or receptacle B′ out of and within the casing A′. As in the cash register and indicator set forth in my pending application for United States Patent, Serial No. 556,241, this drawer carries a series of movable keys C C, the outer portions of which, projecting out through the front plate B′ of the drawer-frame, carry on their ends the knobs or handles *c c*, by which the keys can be pulled outward or forward with reference to the drawer. While the number of these keys may be varied, as desired, without departure from my invention, I show twenty-one of them. Their knobs are provided with the tablets or faces *c′ c′*, carrying markings to correspond with the desired different indications and registrations for which the machine is adapted. As shown, the knob-carrying parts of the keys being arranged in two rows have two of their number marked, respectively, "No sale" and "Paid out," while the others are provided with markings or figures to indicate different amounts of cash. Just as in the apparatus of my other pending application, the keys, consisting of rods, have the downwardly-bent portions within the drawer beyond the front plate B′. These portions extend down to a point near the bottom plate B^3 of the drawer. From such points the key-shanks, being bent again, extend rearward through the upright open slots *d* in the guide-plate D, attached to plate B^3, and then through the guide-openings *d′* in the second guide-plate D′, beyond which they project a short distance when the keys are in their normal positions, as shown in full lines in Fig. 3.

To hold the keys normally inward, and to

secure their return when they have been pulled outward and released, I prefer to employ the mechanism shown, described, and claimed in my other application referred to, such mechanism consisting of stirrup-plates E, one for each key, having the downwardly-bent part *e* provided with an opening through which the key-shank passes and the main part extending forward parallel with the key-shank and provided with a longitudinal slot *e'*, engaging the upwardly-bent part of the key. A spring e^2 on each key-shank between the part *e* of the stirrup-plate and a stationary abutment exerts its stress to force the stirrup-plate inward, and the plate transmits such stress to the key through the engagement of the forward end of the slot *e'* with the latter.

The stationary abutment for the forward end of the spring may be the guide-plate D or an annular plate e^3, resting against such plate.

Pivoted upon standards F F, on the bottom plate B^3 of the drawer, is the drawer-lock, consisting of the swinging notched arms F' F' and the transverse bar F^2, connecting such arms, extending across in front of the abruptly-bent portions of the keys, just behind the front plate B'. Springs *f f*, engaging arms F' F', force them inward to carry the bar F^2 toward the bent parts of the keys and lift the notched ends of such arms up into position to engage the lugs *f' f'* on the frame A, as shown in Fig. 3, so as to lock the drawer from being opened. While I have shown two of these lugs on opposite sides of the drawer, and both arms F' F' arranged to engage them, I contemplate using, where desired, only one lug and making only the corresponding arm F' with a notched part to engage the single lug.

The drawer-lock described is so constructed that the keys may be moved out a short distance with reference to the drawer before they will engage such bar and cause the drawer to be unlocked. The purpose of thus arranging the parts to allow preliminary movement of the keys before the drawer-lock is tripped will appear from the description to be given hereinafter. Where desired, a key-arrester may be used at G, adapted to prevent simultaneous operation or drawing out of any two of the keys, or of two keys in the same subdivision, where the entire series of keys is divided up into smaller series. As, however, the arrester forms no essential part of my present invention and can be of any of the well-known forms of devices for such purpose used with the keys of type-writers, registering apparatus, and other machines, I need not show or describe it more in detail herein.

The register wheels or disks H H of my register mechanism are journaled upon a transverse shaft H', supported on the frame A, and each one has rotating with or attached to it a ratchet-wheel H^2. As shown, there are two of these wheels, with their ratchets, for each key C, one of them being the primary wheel for registering units of the denomination indicated on the tablet of the key and the other being the secondary wheel, to which the registrations of the primary wheel are transferred each time that they reach a certain amount. These wheels, which are constructed and arranged like those fully shown and described in my application hereinbefore referred to, are preferably mounted upon the shaft in the same way, so that they can be rotated about the shaft independently of each other and will turn with the shaft as the latter is rotated to set the wheels back to zero. The devices for securing this setting may be of any suitable kind, such, for instance, as those shown and described in United States Patent No. 521,333.

The ratchet-wheel on each primary wheel has the space between two of its teeth made deeper than those between the others to form a deep notch *h*, for a purpose to be described.

Pivoted upon or concentric with shaft H' is the swinging frame I, having the arms I' I' provided with bearings *i i*, preferably in the form of antifriction-roliers journaled on studs *i' i'*, engaging the cam-slots B^4 B^4 in the plates B^5 B^5, attached to or moving with the drawer B. These slots extend from their forward or outer ends downward and inward toward the bottom plate B^3, then rearward parallel to such plate for a short distance, and then downward to a lower level, along which they run parallel to the plate B^3 or the line of travel of the drawers.

In transverse plates K K, supported on frame A, one above the other, I guide the series of indicator-rods K' K', one for each key, provided with indicating-tablets *k k*, having markings corresponding with those on the respective key-knobs. Each rod has also a retaining-shoulder *k'* to be engaged by the upper edge of the supporting-wing L, formed of a transverse plate supported on arms L' L', pivoted to frame A and engaged by springs *l l*, which force the arms in a direction to carry the plate toward the indicator-rods, as shown in Figs. 3 and 4.

A spring-pawl L^2 on the bottom plate B^3 of the drawer serves to engage one of the arms L' to trip the wing to cause it to release the shoulder of any raised rod as the drawer is being opened, such pawl being situated so as to reach and thus act upon the wing-arm before the engaging bearings *i i* on arms I' I' of frame I reach the lower ends of the downwardly-inclined forward or outer parts of slots B^4 B^4 during the opening movement of the drawer. Supported at its opposite ends upon arms I^2 I^2 of the swinging frame I is a transverse shaft I^3, upon which I pivot a series of levers, one for each key C, having the three arms M M' M^2, of which the first is adapted to be engaged and supported by the respective key before the latter is pulled out and while the drawer is closed. The second is adapted to actuate the respective registering devices in the manner to be described, and the third has a portion adapted to be moved

by a swing of the lever into position for engaging and actuating the respective indicator as the frame I is swung by the opening of the drawer.

The register and indicator engaging parts of each lever are so situated as to be brought into operative position by the same swing of the lever, so that as the frame is swung up the registering and indicating devices will be actuated together.

The key-engaging arm M of each lever is so arranged with reference to the others that while it is resting upon and supported by its unoperated key the indicator and registering device engaging parts on the other arms will be held retracted from their operative positions, as shown in full lines in Fig. 3.

While the weight of each lever would tend to hold it with its arm M pressed upon its respective key, and an additional weight may be used to assist that of the levers, I prefer to provide a spring M^3 for each lever, which, engaging arm M′, tends to force the lever forward or inward to depress its arm M. As shown, each of such springs has its outer end abutting against a bar I^4 of frame I and its inner end engaging a lug m on arm M′. For supporting each spring I have a pin m' attached to bar I^4 and projecting forward through the opening m^2 in lug m.

The register engaging and actuating part of each lever-arm M′ consists of the two fingers m^3 m^4 for engaging the primary and secondary ratchet-wheels, respectively. Of these fingers the former is made longer than the latter, so that when it is in engagement with any part of the primary ratchet-wheel except the deep notch h the other finger, m^4, cannot reach the teeth of the secondary ratchet-wheel. The notch h is of such depth that when at one point in the rotation of the primary ratchet-wheel the finger m^3 falls into it the shorter finger m^4 can drop in between two of the teeth of the secondary ratchet-wheel and both of such wheels will be moved together one step as the arm M′ is moved up by the swing of the swinging frame I, upon which it is carried. With this construction each time that one of the primary register-wheels completes one full rotation the corresponding secondary wheel will be moved one step, so that the registrations of the primary wheel will be transferred to or added up on the secondary wheel, which, as in registering mechanism heretofore made and used, is to have its periphery provided with markings representing amounts beginning with zero and increasing consecutively by a difference equal to the product of the amount indicated by the lowest marking next to the zero on the primary register-wheel, multiplied by the number of teeth on the primary ratchet-wheel.

Each lever-arm M^2 has a lug or table m^5 adapted to be brought under the respective indicator-rod K′ when the corresponding lever-arm M has been released by the pulling out of the supporting-key and the lever has been swung inward by its spring M^3, so as to bring the arm M′ into its described ratchet-wheel-engaging position, such lug m^5 being so situated on the arm M^2 that when the arm M is supported by the respective key it will stand to the rear and out of line with the lower end of the indicator-rod, as shown in Fig. 3. Upon each lever-arm M′ is a lug m^6, having the two shoulders m^7 m^8, the latter being situated to the rear of the former. For engaging these shoulders I have the swinging catch-bar N, supported on arms N′ N′, pivoted to the arms I^2 I^2 of the frame I. The weight of such bar tends to cause it to swing down toward the shouldered lugs m^6; but I contemplate assisting the weight in its action by one or more springs N^2.

The rear edge of the bar is formed so as to engage the shoulders m^7 or m^8 squarely, so as to hold the lugs m^6, and consequently the lever-arms M′ M′, positively against swinging forward or inward until the bar is raised out of its shoulder-engaging position, while the under side of the bar forward of such edge is inclined, so that any of the lugs m^6 m^6 engaging it will ride rearwardly easily under the same as the lever-arms M′, carrying the lugs, are swung backward or outward away from the registering devices.

The front or inner shoulder m^7 on each lug m^6 is so situated that when the catch-bar engages it the three-armed lever will be held back with its arm M raised, so that the respective key C can pass freely under it as the drawer is being closed, its arm M′ withdrawn to clear its fingers m^3 m^4 from the ratchet-wheels of the registering device, and its arm M^2 standing with its lug or table m^5 to the rear of the indicator-rod. The other shoulder, m^8, is so situated as to be just to the rear of the path of the rear edge of the catch-bar N when the arm M of the lever is resting upon its respective key C. When the drawer or till is closed and the swinging frame I is down, this catch-bar N is held raised above the shouldered lugs m^6 m^6 by the lugs n n on frame A, engaging bearings n' n' on the bar. These lugs n n are so situated as to engage and hold back bearings n' n' to stop the bar N only after the frame I has swung down far enough to bring the ends of lever-arms M M in over the respective keys C C.

As the shoulders m^7 m^7 on the lugs m^6 m^6 are carried down out of engagement with the arrested catch-bar by the continued swing of frame I the lever-arms M M will, by the action of springs M^3 M^3 upon lever-arms M′ M′, drop at once upon the respective key-shanks and be supported thereby.

As the drawer is moved out to cause the frame I to swing up in the manner described hereinbefore the shoulders m^8 m^8 of any levers which have not been released because of a pulling out of the respective keys pass up behind the rear edge of the catch-bar N before the opening movement of the drawer takes

the unoperated keys out from under the lever-arms M M. Such shoulders m^8 m^8 will then, as the movements of drawer and frame I continue to separate lever-arms M M and keys C C from each other, engage the catch-bar and hold the respective levers retracted enough to keep the arms M′ and M² out of position to engage and actuate, respectively, the registering devices and indicators during the upward swing of frame I. To retract any lever which, by the operation of its respective key, has been caused to move into register and indicator operating position, and which has, by the movement of frame I, completed the desired registration, I provide the bottom plate B³ of the drawer with a roller O, journaled in bearings *o o* at such a point that it will engage and lift the depressed arm of such lever to bring the shoulder m^8 into position to be engaged by the catch-bar N, as indicated in Fig. 5. Such movement of the lever takes the lever-arms M′ M² away from the registering and indicating devices, and the catch-bar, engaging the shoulder m^8 after the roller O has passed beyond the end of arm M, will hold the lever as so moved against the stress of its spring M³. In order that the levers may all be swung further back, so that the catch-bar will engage their shoulders m^7 m^7 and the lever-arms M M will be held high enough to pass over the keys C C as the drawer is being closed and the frame I swings down again, I provide at P a transverse stop-bar adapted to be engaged by shoulders m^9 m^9 on the rear side of lever-arms M M as the short downwardly-inclined portions *b b* of cam-slots B⁴ B⁴ are brought by the opening movement of the drawer into engagement with the bearings *i i* on the arms I′ I′ of frame I. These inclined portions of the slots give the frame a short additional swing, during which the lever-arms M M are swung upward by the bar P, so that the lever-arms M′ M′ are moved back farther to bring the shoulders m^7 m^7 to the rear of the catch-bar N, which immediately drops down in front of them. The bar, thus engaging all the shoulders m^7 m^7 on the levers, retains the latter in their retracted positions with their arms M M raised until, by the closing of the drawer, such arms have been moved in over their respective keys and the lugs *n n* have arrested the bar and caused it to stand above the shouldered lugs m^6 m^6. The levers, being thus released, swing forward or inward under stress of their springs M³ M³ until their arms M M rest on the keys, ready for another operation of the machine.

The spring-pawl L² for tripping the indicator-rod-supporting wing L, in the manner hereinbefore described, is situated so as to perform its wing-tripping action to cause the release of any previously-raised indicator rod or rods at about the time when the swinging frame has made a part (preferably, though not necessarily, one-third) of its upward swing to cause a new indication. The point at which this tripping is done can of course be varied, as desired, so that it will take place at any time before the completion of the swing of the frame I, due to the engagement of the main inclined portions of slots B⁴ B⁴ with the bearings *i i* on arms I′ I′ of such frame.

From the foregoing description and the drawings it will be seen that the levers, with their arms M′ M², are in effect double swinging pawls, each having portions to engage and actuate the respective registering and indicating devices when the lever has been swung forward and the frame I is raised by the described mechanism. These double pawls tend normally to swing into position for engaging the registering and indicating devices and are pressed toward such positions by their springs M³ M³, but are held back by the engagement of the keys C C with their arms M M when the drawer is closed. When the arms M M and the keys are separated from each other by the movement of the drawer B and frame I in opposite directions, all of these double pawls which have not previously been released by the drawing out of their respective keys are held retracted out of operative position by the catch-bar N, so that only the tripped or released ones actuate their respective registering and indicating devices during the upward swing of frame I.

While I have shown and described my apparatus as provided with a movable drawer carrying the money tray or receptacle, the movable keys, the cams for swinging the frame I, the roller for camming up any depressed lever-arms M M, the wing-tripping pawl, the drawer-lock, and the key-arrester, I contemplate using instead, where desired, a movable lid arranged to cover and uncover the money tray or receptacle, which can be supported within the machine independently of the lid. In such case the various parts just enumerated above as carried by the drawer can be supported upon a frame attached to or moving with the lid, so that as the latter is moved to open or close the till the indicator and register actuating devices will be caused to move in the same manner as they are where the movable drawer hereinbefore described and shown is employed.

The front plate B′, guiding the forward portions of the keys C C, can be attached to the lid, together with the plate B³ and the plates B⁵ B⁵, with their cam-slots B⁴ B⁴; or, where desired, the front plate B′ and the part supporting the shanks of the keys can be made stationary, and a movable lid can be used, carrying the cam-slotted plates B⁵ B⁵, and having a frame connected with it, carrying the roller O and the wing-tripping pawl L³. In such case the bearings for the roller O should be set low enough to allow the latter to pass below the keys, the arms M M of the levers being made to extend correspondingly farther down, so as to be engaged and cammed up by the roller as the latter travels outward

with the lid, just as are those in the described drawer form of apparatus. The described lock for locking the till would not have to be changed in form, but the lugs to be engaged by the notched arms of the lock would be on a part moving with the lid and not on a stationary frame, as before.

In all of the three described forms of my apparatus a movable part of the till is employed to cause actuation of the registering and indicating devices, and there are movable keys the actuation of which sets the machine in condition for causing registrations and indications corresponding to the moved keys when the movable part of the till is moved and unlocks such part, so that it can be moved to open and close the till.

The lower forward ends of lever-arms M M are, as shown best in Fig. 3, formed so as to offer a square abutting face to the ends of the respective keys C C when the latter have been pulled out to allow such arms to drop down and then released. Neither the stress of the key-returning springs nor any inward pressure on the key-knobs can then act to move the dropped arms up again, and the latter will remain down, so that the corresponding arms M′ M^2 will be in position for actuating the respective registering and indicating devices until the frame I has been swung up by movement of the movable part of the till. With this arrangement the machine may be set for the production of any desired combinations of several indications and registrations by the pulling out of the proper keys, either simultaneously or one at a time, before the drawer or lid is moved out to open the till. Where no key-arrester is used, any number or all of the keys can, if desired, be thus moved to set the machine for the simultaneous movement of any number of indicators into indicating position upon movement of the movable part of the till.

Where the keys are divided up into separate series, according to the different denominations to be registered and indicated by the machine, and any of the well-known forms of key-arresters are employed, adapted to prevent the operation of any two keys in one of the series, the machine may be set for any desired combination of single indications and registrations of different denominations by simultaneous or consecutive operation of the proper single keys in the different key series.

The operation of my apparatus, which will be understood from the foregoing description and the drawings, is briefly as follows: With the drawer closed and the keys all in their normal positions the lever-arms M M rest upon and are supported by the key-shanks, so that the respective arms M′ M′ stand with their register-actuating fingers withdrawn from the ratchet-wheels of the register and the corresponding arms M^2 M^2 stand with their lugs or tables m^5 m^5 to the rear of the lower ends of the indicator-rods, all as shown in full lines in Fig. 3. The catch-bar N is then held by lugs n n above the shouldered lugs m^6 m^6. Any indicator-rod which has been raised by previous operation of the machine will be held in its elevated position by the wing L, engaging its shoulder k'. If now any key is drawn out to the position indicated by dotted lines in Fig. 3, the respective pawl-lever will swing, as also indicated by dotted lines in said figure, so as to bring the arm M down in front of the key end, the arm M′ into position to engage the registering device, and the arm M^2 into position to have its lug m^5 under the respective indicator-rod. Pulling out of a key just beyond the amount necessary to release its respective pawl-lever causes the cross-bar of the till-lock to be moved outward to cause the notched locking-arms to be disengaged from the holding-lugs, so that the drawer or lid may be opened. Opening movement of this movable part of the till then causes the bearings i i on arms I′ I′ to be cammed down by the inclined portions of slots B^4 B^4, so that the frame I is swung up about the shaft H′, supporting the register-wheels, as an axis. This swing of the frame carries the levers supported thereon rearward and upward, so that the arms M M of those corresponding to the unoperated keys pass off of the key-shanks after the frame has moved a certain distance. Before these arms thus leave the supporting-keys the upward swing of the frame brings the shoulders m^8 m^8 of the lugs m^6 m^6 on the corresponding arms M′ M′ up behind the rear edge of catch-bar N, so that when the arms M M pass off of the keys said shoulders will, by the swing of the levers under stress of springs M^3 M^3, be brought into engagement with the catch-bar, which will then hold the levers carrying the engaged shoulders back to keep their arms M′ M^2 from the registering and indicating mechanisms, respectively. As the frame I swings upward the registering-device-actuating parts on the arms M′ of any levers which have been released by operation of their keys engage and move the respective registering devices one step, while the other arms M^2 M^2 of such levers move the respective indicator-rods up to indicating position by the engagement of their lugs or tablets m^5 m^5 with the rod ends.

During the raising of any rod or rods the pawl L^2, moving with the movable part of the till, engages one of the arms L′ L′ of the wing L and trips the latter to disengage it from the shoulder on any rod raised by previous operation of the machine. Such previously-raised rod then falls, and the wing-arm L′ being released by the pawl L^2 the wing flies inward again in position to engage the shoulder on any newly-raised rod. As the frame I continues its upward swing the shoulder k' on any of the indicator-rods being moved rides up by the edge of the wing, which, as the shoulder passes above it, snaps forward under the same to prevent dropping of the rod when the latter is released by the raising device. As the movable part of the till is

drawn farther out the roller O, while the bearings *i i* on the frame-arms I′ I′ are passing along the straight longitudinal parts of slots B^4 B^4, between the main inclined portions and the short inclined ones *b b*, and the frame I is consequently at rest, engages the depressed arm M of any tripped key and cams it upward to swing the lever into position parallel with the untripped ones and bring the shoulder m^8 on its lug m^6 into engagement with the edge of the catch-bar, so that the roller has passed arms M M, all of the levers will be held in the same position, with their ratchet-engaging fingers disengaged from the ratchet-wheels and their indicator-rod-raising lugs or tablets withdrawn to a position to the rear of the indicator-rods, as shown in dotted lines in Fig. 5.

As the described camming back of the levers by roller O causes any lugs or tablets m^5 m^5 which have been engaging and raising the indicator-rods to be moved out from under such rods, the latter drop slightly until their shoulders rest upon the supporting-wing L, which holds them in their elevated positions, with their targets or tablets *k k* showing through the display-openings A^3 A^3 in the casing until another operation of the machine takes place.

As the short inclined parts *b b* of the cam-slots B^4 B^4 reach and engage the bearings *i i* on arms I′ I′ the frame I is given a short additional upward swing, which, by engagement of the shoulders m^9 m^9 on the arms M M of the pawl-levers, causes the latter to be swung farther back to bring their shoulders m^7 m^7 into engagement with the catch-bar N, which then retains the levers, with their arms M M, raised far enough to not only clear the lever O during the downward swing of the frame I as the movable part of the till is being closed, but to pass well above the inner ends of the key-shanks as the closing of the till is being completed.

When the ends of the keys and arms M M have reached and passed each other a short distance, the lugs *n n*, engaging the bearings *n′ n′* on the catch-bar N, hold the latter back while the frame I continues its downward swing, so that the shouldered lugs m^6 m^6 on the lever-arms M′ M′ are released from the bar N and the levers are left free to swing inward until their arms M M rest upon and are supported by the keys again, and the machine is ready for another operation in the manner just described.

It will be noticed that with my mechanism shown and described, any pawl which may be in engagement with its respective registering device to actuate the same as the frame I is swung up is not retracted from such device by roller O until the frame has come to rest at the end of its main swing. With this construction and arrangement over-registration by overthrow of a registering device is effectually prevented, for when a pawl has been moved by the frame I far enough to move its respective registering device one step and comes to a rest, because of the short stopping of the swing of the frame, it will, because of its continued engagement with the registering device, bring the latter to a stop, too. At such time the registering device which has been moved could not continue its travel without a camming back of the spring-pressed pawl by the tooth next succeeding the one engaged by the pawl during the upward travel of the latter.

Having thus described my invention, what I claim is—

1. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable indicator-engaging piece, mounted on the frame and tending to move into position to engage the indicator, and a key to hold the piece out of such position, adapted to be moved to release the piece, substantially as and for the purpose specified.

2. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable indicator-engaging piece, mounted on the frame, yielding means pressing such piece toward its position for engaging the indicator, and a key to hold the piece out of such position, adapted to be moved to release the piece, substantially as and for the purpose shown.

3. In an indicating-machine, in combination with a movable indicator, a movable frame, a swinging indicator-engaging piece mounted on the frame, so as to be capable of being moved into and out of position to engage the indicator, and tending to move into such position, and a key for holding the piece retracted, adapted to be moved to release the latter, substantially as and for the purpose set forth.

4. In an indicating-machine, in combination with a movable indicator, a movable frame, a swinging piece mounted on the frame and having a part adapted to be brought, by the swing of the piece, into and out of position to engage and actuate the indicator, as the frame is moved, yielding means forcing the piece toward such position, and a key to hold the piece retracted, adapted to be moved to release it, substantially as and for the purpose described.

5. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable indicator-actuating piece mounted on the frame and tending to move into position to engage the indicator, a second moving frame, connections between the latter and the other frame, whereby movement of the second frame causes the other to move, and a key on the second frame, to hold the movable indicator-actuating piece out of indicator-engaging position, adapted to be moved to release such piece, substantially as and for the purpose specified.

6. In an indicating-machine, in combination with a movable indicator, a movable frame, a swinging piece mounted on the frame,

and having a part adapted to be brought, by the swing of the piece, into and out of position to engage and actuate the indicator, as the frame is moved, yielding means forcing the piece toward such position, a key to hold the piece retracted, adapted to be moved to release it, a moving frame, and connections between it and the other movable frame, whereby the latter is actuated as the former is moved, substantially as and for the purpose specified.

7. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable piece mounted thereon, and tending to move into position to engage and actuate the indicator, as the frame is moved, a key, to hold the piece retracted, adapted to be moved to release it, a till having a movable part, and connections between the latter and the movable frame, substantially as and for the purpose shown.

8. In an indicating-machine, in combination with a movable indicator, a movable frame, an indicator- actuating piece pivoted upon the frame, tending to move into position to engage the indicator, as the frame is moved, means for holding the piece away from such position, adapted to be moved to release it, and means for retracting the piece to disengage it from the indicator, when the movable frame has traveled a certain distance, substantially as and for the purpose set forth.

9. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces movably mounted on the frame, so as to be capable of movement into and out of position for actuating the indicators, as the frame is moved, and tending to move into such position, means for holding the separate pieces normally retracted, such means being made movable independently of the frame and adapted to be moved to release the indicator-actuating pieces before the frame is moved to cause the actuation of any indicator, substantially as and for the purpose described.

10. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces movably mounted on the frame, yielding means forcing such pieces toward their positions for engaging the respective indicators, and a series of movable keys for the respective pieces adapted to hold the latter normally retracted, and to be moved so as to release them, substantially as and for the purpose specified.

11. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces movably mounted on the frame, and normally tending to move into position to engage their respective indicators, a second movable frame, connections between the same and the other frame whereby movement of the second frame causes the other to move, and a series of keys movably mounted on the second frame, adapted to hold the movable indicator-actuating pieces normally retracted, and to be moved so as to release them, substantially as and for the purpose described.

12. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces mounted on the frame, and tending to move into position to actuate the respective indicators, as the frame is moved, a series of keys for holding the respective pieces normally away from such position, adapted to be moved to release them, and means for holding any piece, not released by movement of its key, retracted, while the frame is moved to cause an indication, substantially as and for the purpose shown.

13. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces mounted on the frame, and tending to move into position to actuate the respective indicators, as the frame is moved, a series of keys for holding the respective pieces normally away from such position, adapted to be moved to release them, and a catch-bar to engage a portion of each piece not released by movement of its respective key, and hold the same retracted, while the frame is moved to cause an indication, substantially as and for the purpose set forth.

14. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces pivoted upon the frame, and tending to swing into position for actuating the respective indicators, as the frame is moved, a series of movable keys for holding the pieces retracted, adapted to be moved to release them, and means for holding retracted, while the frame is moved to cause an indication, any piece not released by movement of its respective key, substantially as and for the purpose described.

15. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces pivoted upon the frame, and tending to swing into position for actuating the respective indicators as the frame is moved, a series of keys for holding the pieces retracted, adapted to be moved to release them, a device for holding retracted, while the frame is moved to cause an indication, any piece not released by movement of its respective key, and means for holding such device out of operative position, before the frame is moved, substantially as and for the purpose specified.

16. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces, pivoted upon the frame, and having shouldered portions, yielding means tending to force such pieces into position for ac-

tuating the respective indicators, as the frame is moved, a series of keys for holding such pieces normally retracted, adapted to be moved to release them, the catch-bar to engage the shoulders on the pieces, and hold the latter retracted, and means for holding such bar out of operative position when the frame is in its normal unmoved position, substantially as and for the purpose shown.

17. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces pivoted upon the frame, and tending normally to move into position for actuating the respective indicators as the frame is moved, and each having a shouldered portion, a series of keys for holding the pieces retracted, adapted to be moved to release them, a catch-bar on the frame to engage the shoulders on the pieces and hold the latter retracted, and one or more stops to arrest and hold such bar out of operative position, as the frame returns to its normal position, after having been moved to cause an indication, substantially as and for the purpose set forth.

18. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of indicator-actuating pieces pivoted thereon, tending normally to move into position for actuating the respective indicators as the frame is moved, and each having a portion with two shoulders, a series of keys for normally holding the pieces retracted, adapted to be moved to release them, the catch-bar to engage the shoulders of the pieces, means for retracting, after the frame has moved a certain distance, any piece which has been released by movement of its key, means for further retracting all the pieces, as the frame continues its travel, and one or more stops to arrest the catch-bar, just before the frame returns to its normal position again, substantially as and for the purpose described.

19. In an indicating-machine, in combination with a series of movable indicators, a swinging frame, a series of indicator-actuating pieces pivoted on the frame, tending normally to move into position for actuating the respective indicators as the frame is swung, a series of movable keys to engage such pieces and hold them normally retracted, adapted to be moved to release them, means for holding retracted, as the frame swings to cause an indication, any piece not released by movement of its key, and a bearing to engage an arm of any piece so released, and raise it, as the frame is swung, substantially as and for the purpose specified.

20. In an indicating-machine, in combination with a series of movable indicators, and a series of movable keys, a swinging frame, a series of indicator-actuating pieces pivoted on such frame, each having a portion to engage the respective indicator and an arm to be engaged by the respective key, means for holding retracted any piece which has not been released by movement of its key, and a retractor to engage the arm of any released piece, adapted to force such arm upward, to disengage the piece from its indicator at a certain point in the swing of the frame, substantially as and for the purpose shown.

21. In an indicating-machine, in combination with a series of movable indicators, and a series of movable keys, a swinging frame, a series of indicator-actuating pieces pivoted thereon, each having an arm to be engaged by one of the keys, and a portion with two shoulders, a catch-bar to engage such shoulders, a retractor to engage the arm of any piece which has been released by movement of its key, and raise such arm, to retract the piece from its respective indicator, a second bearing to engage the arms of all the pieces, as the frame continues its swing, and means for disengaging the catch-bar from the shoulders on the pieces, as the frame returns to its normal position with the arms of the pieces over the respective keys, substantially as and for the purpose set forth.

22. In an indicating-machine, in combination with a till having a movable part, a series of indicators, a movable frame, a series of indicator-actuating pieces mounted thereon, tending to move into position, for actuating the respective indicators, as the frame is moved, a series of keys to hold the pieces normally out of such position, adapted to be moved to release the respective pieces, and connections between the movable part of the till and the frame, whereby the latter is actuated, as the movable part of the till is moved, substantially as and for the purpose described.

23. In an indicating-machine, in combination with a till having a movable part, a series of indicators, a swinging frame, a series of indicator-actuating pawls pivoted on such frame, tending to swing into position for actuating the respective indicators as the frame is swung, a series of keys adapted to hold the pawls normally out of such position, and to be withdrawn to release them, shoulders on the pawls, the catch-bar to engage the pawl-shoulders, means for retracting at a certain point in the swing of the frame, any pawl that may be in indicator-engaging position, and connections between the movable part of the till and the frame, whereby the latter is caused to move by the former, substantially as and for the purpose specified.

24. In an indicating-machine, in combination with a till having a movable part, a series of indicators, a series of keys, a movable frame, a series of indicator-actuating pawls on such frame tending to move into position for actuating their respective indicators as the frame is moved, each of such pawls having an arm to engage the respective key, and a portion provided with a shoulder, the catch-bar movably supported on the frame, a retractor to engage a portion of any pawl which

is in indicator-actuating position after the frame has moved a certain distance, and retract such pawl, and connections between the movable part of the till and frame, whereby the latter is caused to move by the former, substantially as and for the purpose shown.

25. In an indicating-machine, in combination with a till having a movable part, a series of indicators, a series of keys, a movable frame, a series of indicator-actuating pawls on such frame tending to move into position for actuating the respective indicators and having key-engaging arms and portions provided with two shoulders, the catch-bar movably supported on the frame, a retractor, to engage any pawl which is in engagement with its indicator, and retract the pawl from the indicator, a bearing in the path of portions of the pawls, to still further retract the latter, as the frame continues its swing, means for disengaging the catch-bar from the shoulders of the pawls, when the frame returns to its normal position, and connections between the movable part of the till and the frame, whereby the latter is swung, as the former is moved, substantially as and for the purpose set forth.

26. In an indicating-machine, in combination with a till having a movable part, a series of indicators, a series of keys, a movable frame, connections between such frame and the movable part of the till, whereby motion of the latter actuates the frame, a series of indicator-actuating pawls on such frame, tending to move into position for actuating the indicators, when they are released by movement of their keys, and a pawl-retracting bearing moving with the movable part of the till, to engage and retract any pawl which is in indicator-engaging position, substantially as and for the purpose described.

27. In combination with a registering device, a movable frame, a pawl to actuate such device mounted on a frame, and tending to move into position to engage the registering device, a second movable frame, connections between the two frames, whereby movement of the second frame causes the other one to move, and a key movably mounted on the second frame, adapted to hold the pawl retracted and to be moved to release the same, substantially as and for the purpose specified.

28. In combination with a registering device, a movable frame, a pawl to actuate such device mounted on the frame and tending to move into position to engage the registering device, a key to hold the pawl retracted, adapted to be moved to release the same, and means for retracting the released pawl, after it has traveled a certain distance with the movable frame, substantially as and for the purpose specified.

29. In combination with a series of registering devices, a movable frame, a series of registering-device-actuating pawls mounted on the frame, and tending to move into position to engage such devices, a second movable frame, connections between the two, whereby movement of the second frame causes the first frame to move, and a series of keys mounted on the second frame, to hold the pawls normally retracted, adapted to be moved upon the second frame, so as to release the respective pawls, substantially as and for the purpose described.

30. In combination with a series of registering devices, a movable frame, a series of registering-device-actuating pawls mounted on the frame, and tending to move into position to engage such devices, a series of keys, to hold the pawls normally retracted, adapted to allow them to be moved into operative position, and means for retracting any pawl which may be in that position, after the frame has moved a certain distance, substantially as and for the purpose shown.

31. In combination with a series of registering devices, a movable frame, a series of pawls for actuating such devices, mounted on the frame, and tending to move into position to engage the respective registering devices, a series of keys to hold the pawls normally retracted, adapted to be moved to release the respective pawls, shoulders on the pawls, a retaining device to engage the shoulders, means, whereby, after the frame has moved a certain distance, any pawl which is in engagement with its registering device, is retracted, and means for tripping the retaining device to hold it away from the pawl-shoulders, as the frame returns to its normal position, substantially as and for the purpose set forth.

32. In combination with a series of registering devices, a movable frame, a series of pawls for actuating such devices, pivoted on the frame, means for swinging the pawls into engagement with the registering devices, a series of keys to hold the pawls normally retracted, shoulders carried by the pawls, the catch-bar to engage such shoulders, and a pawl-retractor, substantially as and for the purpose described.

33. In combination with a series of registering devices, a movable frame, a series of pawls for actuating such devices, pivoted upon the frame, and normally tending to move into engagement with their respective registering devices, each pawl having a portion with two shoulders, movable keys to engage the pawls, a retractor to engage and retract any pawl which is in engagement with its respective registering device, when the frame reaches a certain point in its travel, a bearing to engage all the pawls and retract them at a point farther on in the travel of the frame, a catch-bar movably supported upon the frame, and means for holding it away from the shouldered portions of the pawls, while the frame is in its normal unmoved position, substantially as and for the purpose specified.

34. In combination with a series of registering devices, a movable frame, a series of keys, a series of registering-device-actuating pawls

having arms to rest upon the keys, when the frame is in position preparatory to a registering operation, and portions provided with two shoulders, the catch-bar movably supported on the frame, a retractor to retract any pawl which may be in engagement with its respective registering device, the pawl-retracting bearing to engage and further retract all the pawls, and means for arresting and holding the catch-bar away from the shouldered portions of the pawls, as the frame returns to its position, preparatory for another registration, substantially as and for the purpose shown.

35. In combination with a till having a movable part, and a series of registering devices, a movable frame, connections between such frame and the movable part of the till, whereby movement of such part causes the frame to move, a series of pawls pivoted on the frame, a series of keys to hold such pawls normally retracted from the respective registering devices, adapted to be moved to release the pawls, to allow them to be moved into position to actuate the respective registering devices, substantially as and for the purpose set forth.

36. In combination with a series of registering devices, a movable frame, a series of pawls pivoted on the frame, means tending to move them into engagement with the respective registering devices, a series of keys to hold the pawls normally out of such engagement, adapted to be moved to release them, a second moving frame, connections between it and the other frame, whereby the latter is actuated by movement of the second frame, and a pawl-retracting bearing on the second frame, to engage and retract, from its operative position, any pawl that may be in engagement with the respective registering device, substantially as and for the purpose described.

37. In combination with a series of registering devices, a movable frame, a series of pawls pivoted thereon, means tending to move them into engagement with the respective registering devices, a series of keys to hold the pawls out of such engagement, adapted to be moved to release them, a catch device carried by the frame, to retain the pawls out of engagement with their respective registering devices, a second movable frame, connections between such frame and the pawl-carrying one, whereby the latter is actuated by movement of the former, a bearing carried by the second frame, to engage and retract any pawl which may be in engagement with a registering device, after the second frame has moved a certain distance, and means for holding the catch device out of operation, while the frame carrying it is in its normal position preparatory for a registering operation, substantially as and for the purpose specified.

38. In combination with a till having a movable part, the swinging frame having one or more arms, one or more cams moving with the movable part of the till, and engaging bearings on the frame-arms, a series of registering devices, a series of movable keys, a series of pawls pivoted upon the frame, and having arms to engage the keys, means for forcing the pawls toward their respective registering devices, and a catch device, to engage the pawls corresponding to any unmoved keys, before such pawls are moved by the frame to carry their arms off of the supporting parts of the keys, substantially as and for the purpose shown.

39. In combination with a till having a movable part, the swinging frame having one or more arms, cams moving with the movable part of the till, and engaging bearings on the frame-arms, a series of registering devices, a series of movable keys, a series of pawls pivoted upon the frame, each having a key-engaging arm, to engage the respective key, and a portion provided with two shoulders, yielding means for forcing the pawls toward their registering-device-engaging positions, the catch-bar movably supported on the frame, the two pawl-engaging bearings adapted to retract the pawls to different extents, at different points in the travel of the swinging frame, and means for engaging and holding back the catch-bar, as the swinging frame approaches its normal position, preparatory to another registering movement, substantially as and for the purpose set forth.

40. In a registering-machine, in combination with a series of registering devices, a series of keys, a till having a movable part, a swinging frame having one or more arms, one or more cams moving with the movable part of the till, each engaging a bearing on one of the frame-arms, and having the inclined part to give the frame its register-actuating swing, and a second incline to give the frame a supplemental swing, a series of registering-device-actuating pawls, pivoted on the frame, each having a key-engaging arm, and a portion provided with two shoulders, the catch-bar movably supported on the frame, a pawl-retracting bearing, moving with the movable part of the till, a second bearing, to engage the pawl-arms, during the supplemental swing of the frame, and one or more stops to arrest the catch-bar, as the frame returns to its normal position preparatory to another registration, substantially as and for the purpose described.

41. In an indicating-machine, in combination with a series of indicators, a series of keys, a till having a movable part, a swinging frame having one or more arms, one or more cams moving with the movable part of the till, each engaging a bearing on one of the frame-arms, and having the inclined part to give the frame its indicator-actuating swing, and a second inclined part to give the frame a supplemental swing, the series of indicator-actuating pawls pivoted on the frame, each having a key-engaging arm and a portion provided with two shoulders, the catch-bar movably supported on the frame, a pawl-retract-

ing bearing, moving with the movable part of the till, a second bearing to engage the pawl-arms, during the supplemental swing of the frame, and one or more stops, to arrest the catch-bar, as the frame returns to its normal position, preparatory to another indication, substantially as and for the purpose specified.

42. In a registering and indicating machine, in combination with a series of indicators and a series of registering devices, a till having a movable part, a series of keys, a swinging frame having one or more arms, one or more cams moving with the movable part of the till, each engaging a bearing on the frame-arm, and having the inclined part to give the frame its indicator and registering device actuating swing, and a second inclined part to give the frame a supplemental swing, the series of movable pieces mounted on the frame, each having parts to engage and actuate an indicator and a corresponding registering device, an arm to engage the respective key, and a portion provided with two shoulders, the catch-bar movably supported on the frame, a bearing to engage and retract any one of the movable pieces, which may be in engagement with its indicator and registering device, a second bearing to engage and still further retract the pieces on the frame, during the supplemental swing of the latter, and one or more stops to arrest the catch-bar, as the frame returns to its normal position, preparatory to another registration, substantially as and for the purpose shown.

43. In a registering and indicating machine, in combination with a series of indicators and a series of registering devices, a movable frame, a series of pawls mounted thereon, each being adapted to actuate both an indicator, and a corresponding registering device, and tending to move into position to engage such device and indicator, and a series of keys, for holding the pawls normally out of such position, adapted to be moved to release them, substantially as and for the purpose set forth.

44. In combination with a till having a movable part, a series of keys movably mounted on a frame moving with such part, a swinging frame, a series of pawls pivoted on the latter, and tending to move in one direction, each having an arm to engage one of the keys, connections between the movable part of the till and the pawl-carrying frame, a bearing moving with the movable part of the till, to retract the pawls, a catch device carried by the pawl-carrying frame, adapted to hold the pawls retracted, and means for holding such device out of operation during a certain portion of the movement of the pawl-carrying frame, substantially as and for the purpose described.

45. In a registering-machine, in combination with a till having a movable part, and the series of keys movably mounted on a frame, traveling with such part, registering devices, a swinging frame, a series of register-device-actuated pawls pivoted thereon, each having an arm to engage one of the keys, connections between the movable part of the till, and the swinging frame, whereby the latter is actuated, as the former is moved, a movable catch device for retaining the pawls out of their registering-device-engaging positions, a pawl-retracting bearing carried by the frame moving with the movable part of the till, and means for holding the catch device out of operation, when the pawls are in position to be engaged by the keys, substantially as and for the purpose specified.

46. In a registering-machine, in combination with a till having a movable part and the series of keys movably mounted on a frame traveling with such part, the registering devices, a swinging frame a series of register-ing-device-engaging pawls pivoted thereon, each having an arm to engage one of the keys, and a portion provided with two shoulders, connections between the movable part of the till, and the pawl-carrying frame, whereby the latter is swung by movement of the former, a movable device on the pawl-carrying frame to engage the shoulders of the pawls, a pawl-retracting bearing on the frame, which moves with the movable part of the till, a second pawl-retracting bearing on a stationary support, and means for holding the catch device out of operative position, while the pawls are in position to engage the respective keys, substantially as and for the purpose shown.

47. In an indicating machine, in combination with a till having a movable part, and the series of keys movably mounted on a frame, traveling with such part, a series of indicators, a swinging frame, a series of indicator-actuating pawls pivoted thereon, each having an arm to engage one of the keys, connections between the movable part of the till, and the swinging frame, whereby the latter is actuated, as the former is moved, a movable catch device for retaining the pawls out of their indicator-engaging positions, a pawl-retracting bearing carried by the frame, moving with the movable part of the till, and means for holding the catch device out of operation, when the pawls are in position to be engaged by the keys, substantially as and for the purpose set forth.

48. In an indicating-machine, in combination with a till having a movable part, and the series of keys movably mounted on a frame traveling with such part, a series of indicators, a swinging frame, a series of indicator-engaging pawls pivoted thereon, each having an arm to engage one of the keys, and a portion provided with two shoulders, connections between the movable part of the till, and the pawl-engaging frame, whereby the latter is swung by movement of the former, a catch device on the pawl-carrying frame to engage the shoulders of the pawls, a pawl-retracting bearing on the frame, which moves with the movable part of the till, a second pawl-retracting bearing on a stationary sup-

port, and means for holding the catch device out of operative position while the pawls are in position to engage the respective keys, substantially as and for the purpose described.

49. In a registering machine, in combination with a till having a movable part, a swinging frame, connections between such part and frame, whereby the latter is actuated by movement of the former, registering devices, pawls for actuating such devices carried by the swinging frame, a retractor moving with the movable part of the till, to retract any register-device-engaging pawl, after the frame has come to a rest, substantially as and for the purpose specified.

50. In a registering-machine, in combination with a till having a movable part, a swinging frame having one or more arms provided with bearings, one or more inclined cams on the movable part of the till, registering devices, a series of pawls for actuating the latter, mounted on the swinging frame, and a retractor moving with the movable part of the till, and adapted to retract any pawl that may be in engagement with a register device, after the swinging frame has come to rest, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of July, A. D. 1895.

GEORGE L. BARNES.

Witnesses:
HENRY C. HAZARD,
JAS. E. HUTCHINSON.