(No Model.) 6 Sheets--Sheet 1.

G. L. BARNES.

CASH REGISTER AND INDICATOR.

No. 573,435. Patented Dec. 22, 1896.

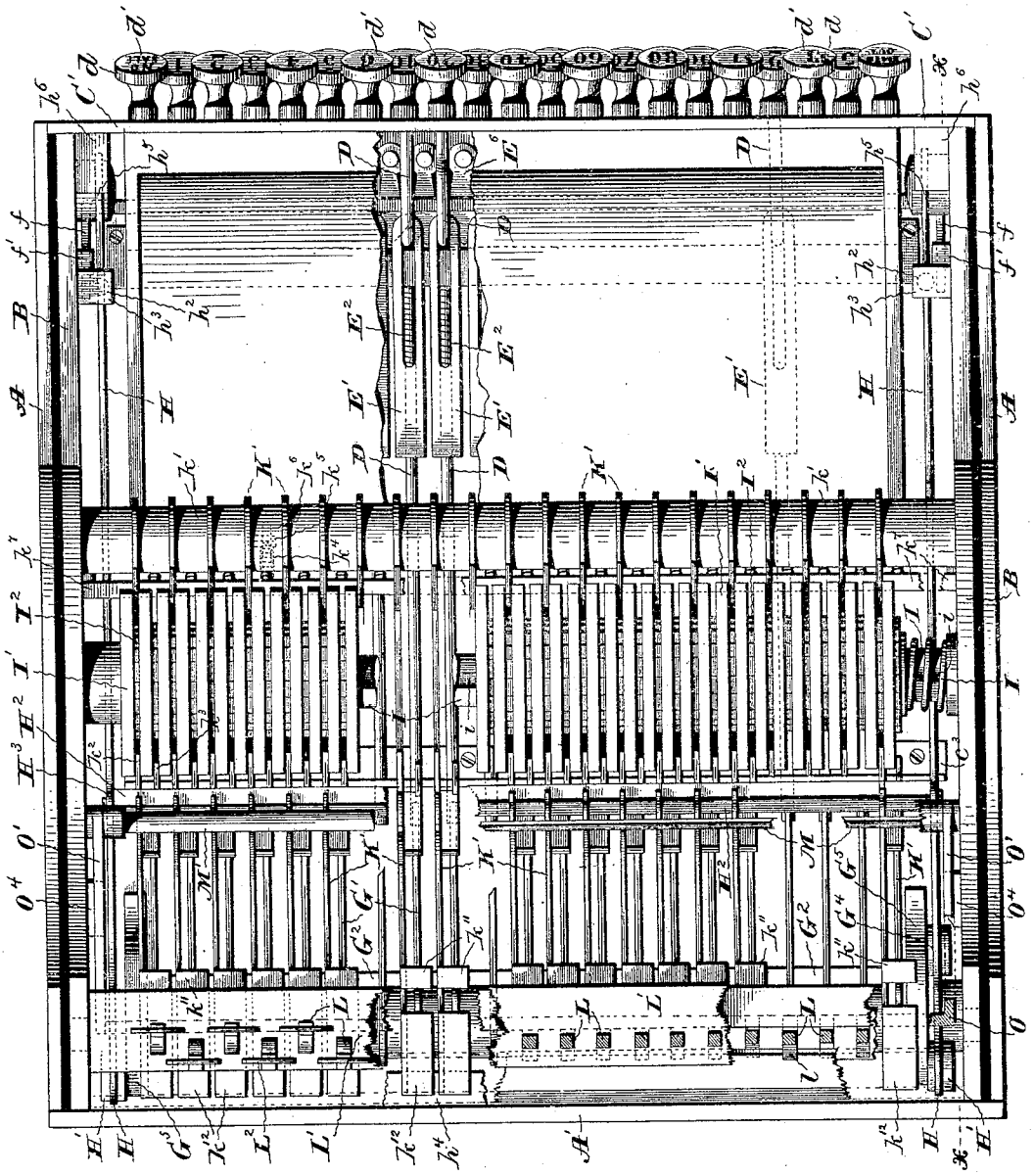


Fig. 1.

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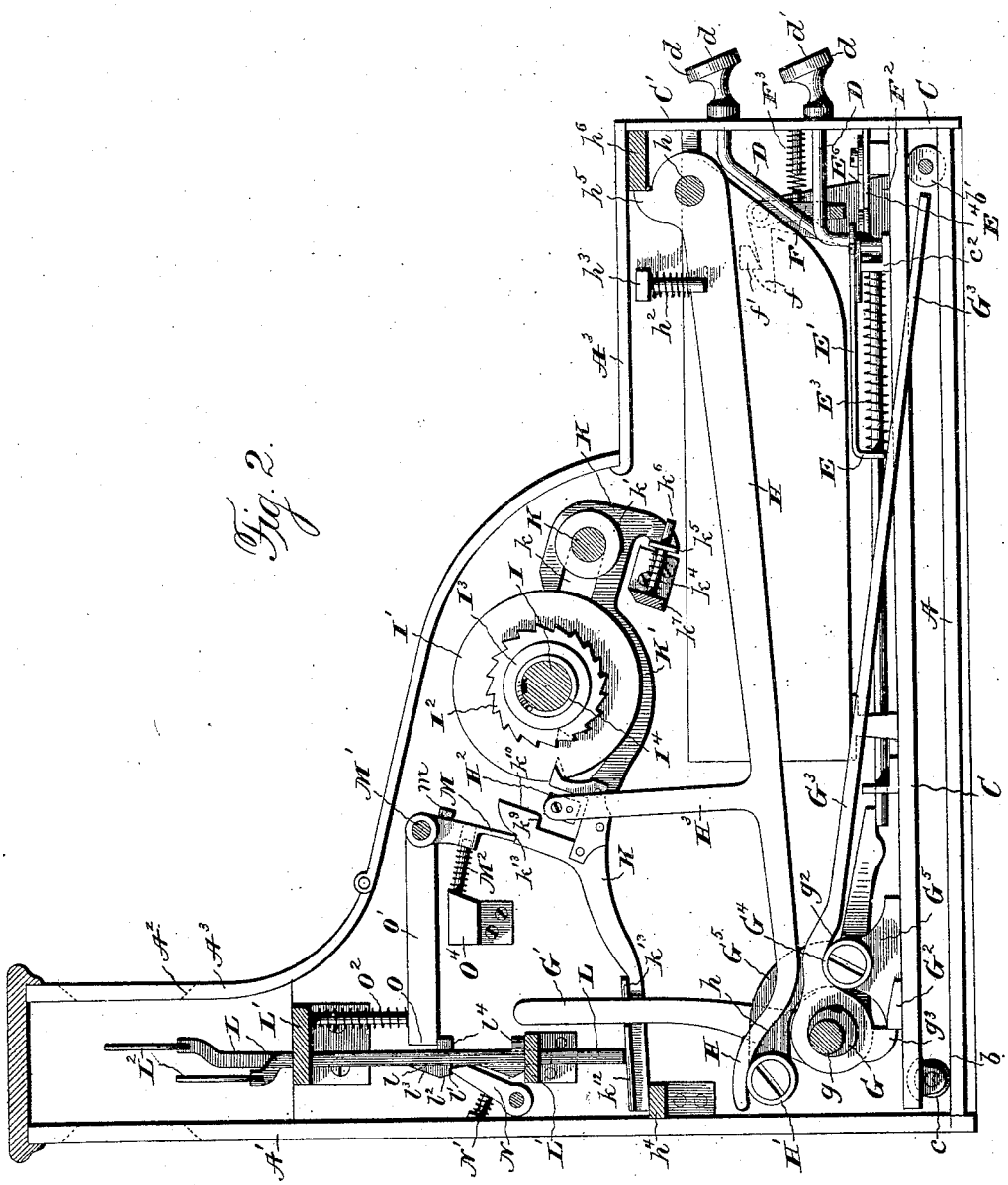
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Fig. 2.



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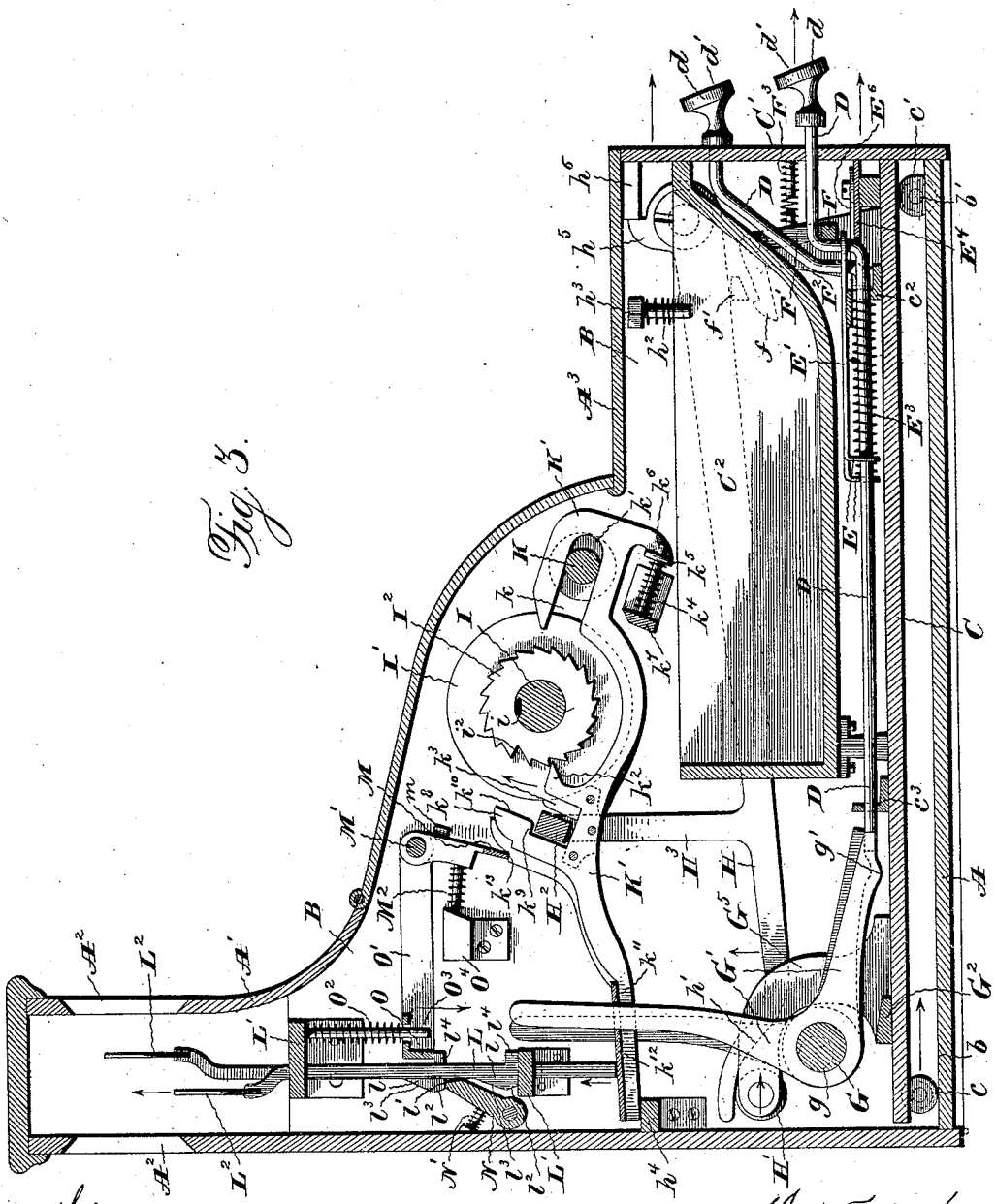
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Fig. 3.



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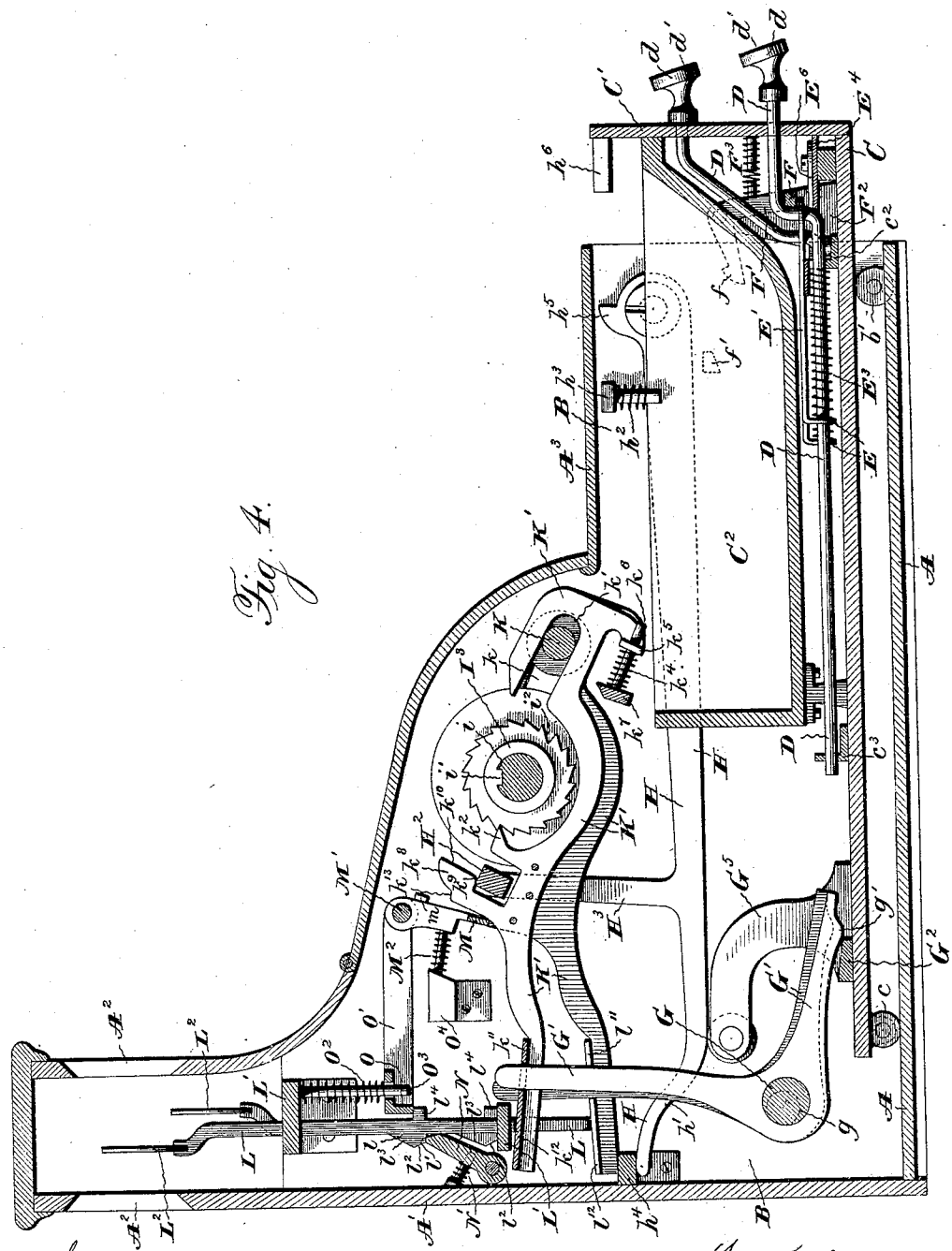
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Fig. 4.



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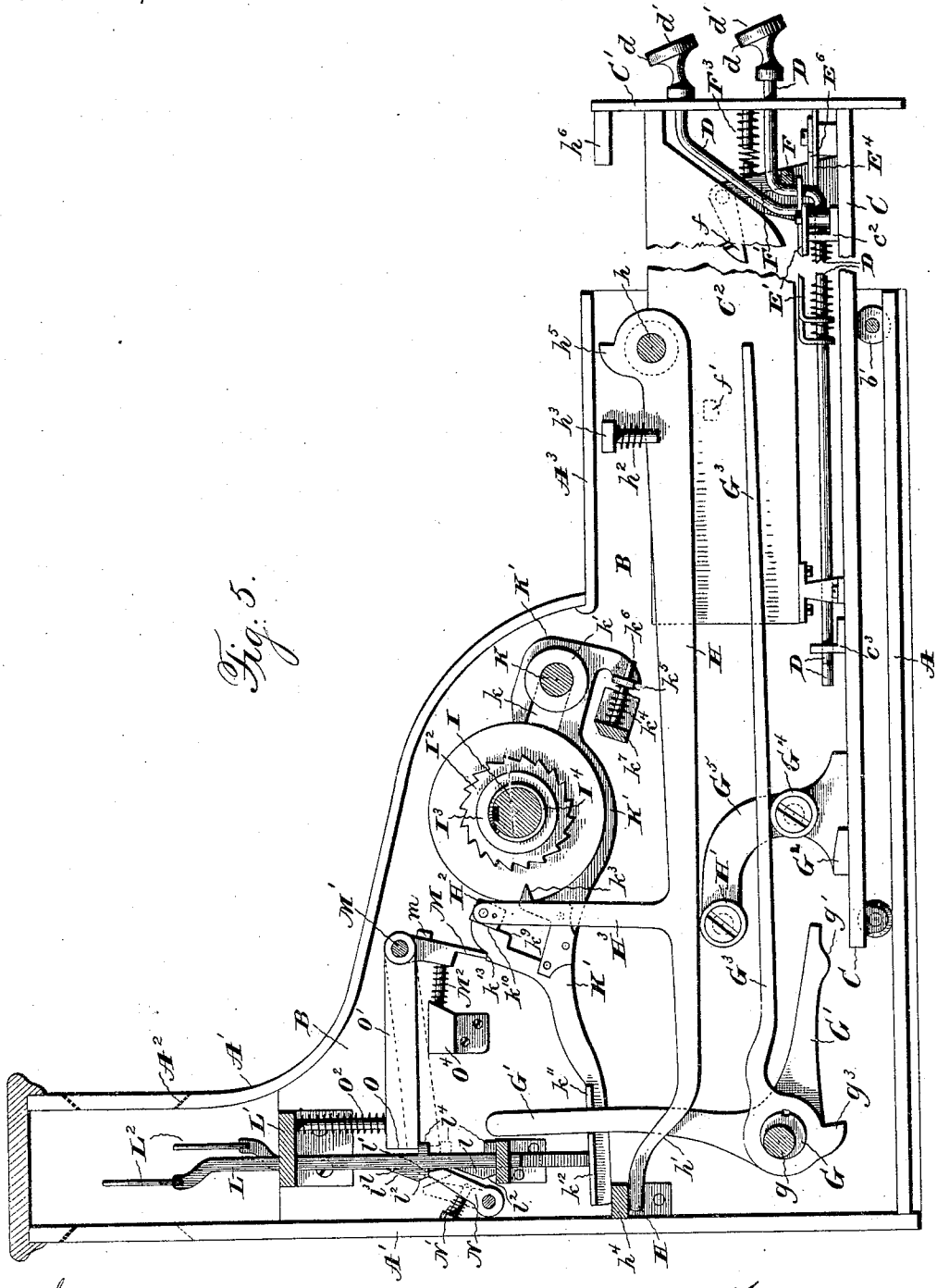
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No. 573,435. Patented Dec. 22, 1896.

Fig. 5.



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CASH REGISTER AND INDICATOR.

No. 573,435. Patented Dec. 22, 1896.

Fig. 6.

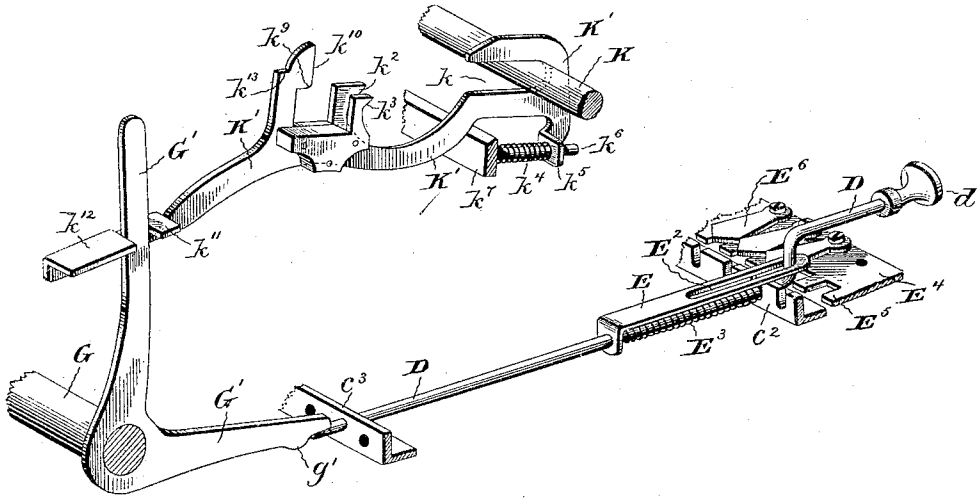


Fig. 7.

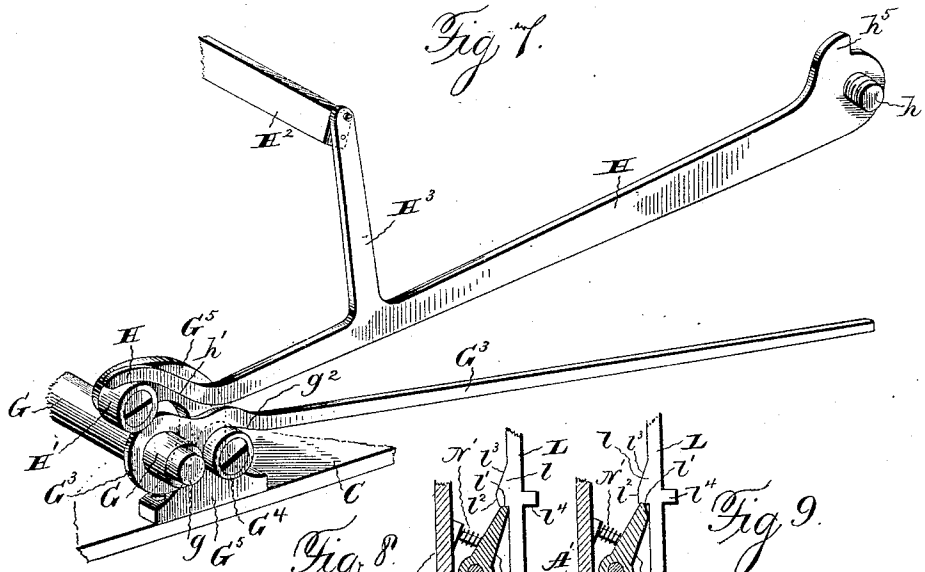


Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE.

GEORGE L. BARNES, OF MONTOWESE, CONNECTICUT.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 573,435, dated December 22, 1896.

Application filed November 21, 1895. Serial No. 569,727. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. BARNES, of Montowese, in the township of North Haven, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Cash Registers and Indicators; 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 plan view of my machine with parts of the casing in section and portions of the mechanism removed to show the construction of the operative devices; Fig. 2, a view showing the machine in elevation with the side of the casing and of the frame removed; Fig. 3, a view of a vertical section on line *x x* of Fig. 1, the parts being shown in position as when a key has been moved to set the machine for a registering and indicating operation and the set pawl-lever being shown with one of its ratchet-wheel-engaging fingers removed and the other in engagement with the ratchet-wheel of the respective primary register-wheel; Fig. 4, a view of a similar section with the parts in the positions assumed by them when the drawer has been partly opened; Fig. 5, a view showing the machine in elevation with the side of the casing and supporting-frame removed and the parts in position as when the drawer is opened farther than it is in Fig. 4; Fig. 6, a detail perspective view showing one of the pawl-levers, the respective key, and the connecting mechanism between the two; Fig. 7, a detail perspective view of the means for actuating the pawl-lever-lifting bar and raising and lowering the fulcra of the elbow-levers; Fig. 8, a detail view showing in elevation another form of my indicator-rod-supporting device, and Fig. 9 a similar view showing another form of such device.

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 machine for registering and indicating receipts of different payments of money; and to this end my invention consists in the machine and in the construction, arrangement, and combination of the parts thereof, as hereinafter specified.

While the special purpose of my invention has been to provide certain improvements in that class of cash registers and indicators in which the movement of any key sets the apparatus for a registering and indicating operation, and then the registration and indication for which the mechanism has been set is caused to be made by the opening of the drawer or till, and, while I shall show and describe hereinafter my invention as embodied in a cash register and indicator of that kind, I desire it to be understood that I do not limit myself to such application or use of my invention, but contemplate applying it or parts of it for use in machines for registering, indicating, or registering and indicating other things than payments or receipts of money, whatever the moving part may be which is employed to actuate the mechanism to cause completion of the registration, indication, or registration and indication after the setting operation of any key. I desire it also to be understood that parts of the machine made in accordance with my invention are applicable for use in apparatus in which the registering and indicating devices are operated otherwise than through connections with a moving frame, and the keys are employed for other purposes than merely to set the mechanism for operation.

In the drawings, A designates the casing, which, as usual in cash registers and indicators, has the raised part A′ for the accommodation of the upper ends of the indicator-rods and the tablets thereon, to be described hereinafter, and the sight-openings A^2 A^2 in its front and rear sides, through which the marking on any raised tablet may be seen. Within such casing is secured the frame B for supporting the operative parts of the machine, and upon such frame is supported the sliding drawer, which has the bottom frame C, the upright front plate C′, closing the front of casing A when the drawer is closed, and the cash-receiving tray or holder C^2, having its front or outer edge a short distance to the rear of the front plate C′, so that the drawer has to be drawn outward a little before any portion of the tray will pass from under the part A^3 of the casing, so as to be accessible from without.

To support the drawer so that it can be most easily slid in and out, I provide the bot-

tom plate or frame C with a roller *c* at each side of its rear or inner end, to run upon a rail or portion *b* of frame B, extending inward from the side of the latter.

At each side of the drawer-way, near its front end, I provide a roller *c'*, journaled upon a stud *b'* and engaging the under side of frame C.

If desired, the pairs of rollers *c c* and *c' c'* could, without departure from my invention, be replaced by single long rollers extending across below the frame C, the one journaled therein and the other supported in bearings on frame B.

The keys D D, of which there is one for each denomination of registration and indication to be made by the machine, have their outer portions extending out through suitable openings in the front plate C' and provided on their outer ends with knobs or handles *d d*, having faces *d' d'*, carrying markings to correspond with the indications, to be secured, after movement of the respective keys, in a manner to be described hereinafter.

The knob-bearing ends of the keys are preferably arranged in two banks or series, one above the other, as shown.

Beyond the rear side of the front plate C' the rods of which the bodies of the keys are formed are bent and extend downward to a point near the upper side of the bottom frame C of the drawer, where they are again bent, but in the opposite direction, so that they extend rearward over the top of frame C, passing on their way through the guide-plates c^2 and c^3 on such frame.

The extreme inward or rear ends of the keys extend well beyond guide-plate c^3, for a purpose to be explained.

The portion of each key between the two bends and near the second one is preferably made to stand at or nearly at a right angle to the body of the key running rearward from the second bend, so as to afford on its front side an abrupt face to be engaged by the means for drawing the key inward.

Each key has its shank between the two guide-plates c^2 c^3 passing through an opening in the downturned portion E of the stirrup-plate E', which has its forward or outer part slotted at E^2 to embrace the upright part of the key above the lower bend. The forward end of the slot then engages the abrupt face on the front side of such part.

A spring E^3 on each key, between the part E of plate E' and the guide-plate c^2, pulls the plate rearward, and so draws the key inward after it has been pulled out and serves to hold it normally as so drawn, with its knob *d* resting against the front of plate C', as shown in Fig. 2.

To limit the outward movement of the keys with reference to the drawer, so that any key may be used as a pull to open the drawer, if it is still pulled upon after being drawn outward on the drawer a short distance against the stress of its spring E^3, I provide at E^4 an abutment fixed upon the frame C in the path of the abruptly upwardly extending portions of the keys.

As shown in the drawings, such abutment consists of a plate having the rearwardly-extending fingers E^5 E^5, between which the keys pass as they are pulled out.

For the purpose of preventing the simultaneous outward movement of adjoining keys the plate of the abutment E^4 may be provided with any desired one of the well-known forms of key-arresting devices used in registers, registers and indicators, or type-writers. As such devices are common and well known and form no part of my present invention, I need not describe further the ones shown at E^6 E^6 in the drawings.

The drawer-lock for holding the drawer shut until a key has been actuated or pulled out consists of a swinging frame having the cross-bar F extending across in front of the keys, just above the lower bends in the latter, and the two arms F' F', pivoted to the standards F^2 F^2 on the drawer-frame C, and having the notched pawl-like ends *f f*, adapted to engage the lugs *f' f'* on the frame B when the drawer is shut and no key has been pulled out.

A spring F^3, engaging one of the arms F' F' and the plate C', serves to hold the lock normally in engagement with lugs *f' f'*, the bar F then standing close to the abrupt front sides of the unretracted keys.

To the rear of the inner end of keys D D and extending across above the inner end of drawer-frame C is a rocking shaft G, having on its ends eccentric pivot-studs *g g*, journaled in suitable bearings on frame B. Upon this shaft I pivot a series of elbow-levers G' G', one for each key, each having an upwardly-extending arm, for a purpose to be described, and a lower forwardly-extending one adapted to rest upon and be supported by a part of the key when the latter is unretracted and the drawer is closed. This key-engaging arm has on its under side, to the rear of the part which is to rest upon the key, a rounded boss *g'*, to be engaged by a cam G^2 on the drawer-frame C when the latter is drawn outward, as indicated in Fig. 4.

For rocking the shaft G on its eccentric pivot as the frame C is moved out and in at the beginning of the opening and the latter part of the closing movement of the drawer I attach to such shaft the lever G^3, having at a short distance from the shaft a downwardly-inclined part g^2, the under side of which is in position to be engaged and cammed upward by a roller G^4, carried by an arm G^5 on the frame C, when the latter is moved outward from its normal position, in which it is shown in Fig. 2. Beyond the inclined part g^2 the lever G^3 is made straight, so that as the roller G^4 travels along under it, after leaving the inclined part, the lever will be without further movement.

The eccentric pivots of shaft G are so placed

on the shaft that the body of the latter will be raised to elevate the pivotal portions of the levers G′ G′ as the lever G^3 is cammed upward by the roller G^4 in the manner described above.

To insure the complete descent of lever G^3 to rock the shaft G back again to lower the levers G′ G′ as the frame C is moved inward to close the drawer, I provide the under side of the lever G^3 with a lug or arm g^3, in position to be engaged by the rear abrupt side of the cam G^2 on the frame C, as indicated in Figs. 2 and 3.

With the lever G^3 made long enough to remain in engagement with the roller G^4 during the full movement of the same with the frame C, as the drawer is opened to its fullest extent, such lever would of its own gravity be quite sure to return to its lowest position when the drawer was closed; but I prefer to employ the described lug or arm g^3 on the lever, arranged to be positively engaged by the cam G^2 on the frame C as the latter reaches the limit of its inward travel.

Without departure from my invention a spring might be employed to assist gravity in holding the lever down upon roller G^4 and in swinging such lever down as the roller passes rearward over the under side of the inclined portion of the lever.

The weight of the elbow-levers G′ G′, tending, as it does, to rotate the shaft G downward on its eccentric bearings, aids in the swinging down of the lever G^3, attached to the shaft.

The two levers H H, pivoted upon pivot-studs h h on the frame B B, on opposite sides of the front part of the drawer, extend rearward within such frame, and are adapted to engage and rest upon the rollers H′ H′, journaled upon suitable bearings, the one on the same arm G^5 with roller G^4, hereinbefore described, and the other on a similar arm G^5 on the other side of frame C. These levers are near their inner or rear ends bent upward and rearward to form the inclines h' h', beyond which the levers are again bent, so that their rear raised ends are adapted to rest squarely upon the rollers H′ H′ when the drawer-frame C is in its normal position at the limit of its inward travel.

Springs h^2 h^2, engaging the levers and lugs or bearings h^3 h^3 on the frame B, serve to force the levers downward to keep them pressed upon the rollers H′ H′ as the latter move forward and back with frame C.

When the drawer is closed, and the frame C is in its normal position, and the raised portions of the inner ends of the levers beyond inclines h' h' are over the rollers H′ H′, the levers H H are depressed to their lowest limit, as shown in Figs. 2 and 3, ready to be cammed upward into the position indicated in Fig. 4, by the passage of the rollers under inclines h' h' during the first part of the outward travel of the frame C as the drawer is pulled open. When the levers have been so raised that the rollers can pass onward under their straight lower sides, forward of the inclines, their rear ends come in contact with the bar h^4 on the frame B. The pivotal points of these levers H H and the under faces of the levers are so arranged that when the levers have been swung up against the described stops such under faces will be parallel to the line of the travel of the rollers and in position to act as guides to hold the rollers and consequently the frame C down in place, and so effectually prevent any possibility of tilting of such frame or the drawer as the latter is pulled outward over the rollers c' c' or other supports provided for it in the forward part of the frame B or casing A.

A cross-bar H^2 connects the upper ends of the arms H^3 H^3, extending upward from the levers H H, and makes with such arms and levers a rigid frame, which is swung up and down as the frame C is moved out and approaches the limit of its inward movement. This bar has its front and rear faces, which are parallel, inclined upward and forward at a slight angle, as shown, the angle being such that the faces are in planes which are tangential to curves struck from the axis of motion of the levers H H as a center, though I do not limit myself to this precise construction.

The rear face or both faces of the bar could, if desired, be curved, the plane of curvature being concentric with the plane of travel of the bar as the levers H H swing on their pivots.

In front of bar H^2 is a fixed transverse shaft I, supported at its ends in the opposite sides of frame B. This shaft carries, journaled upon it, the series of register wheels or disks I′ I′, of which there are two for each elbow-lever G′, and therefore for each key D. Of these register wheels or disks each carries fixed to and revolving with it a ratchet-wheel I^2.

To separate the wheels or disks from each other, so that they can rotate independently on the shaft, I place between each wheel and the ratchet-wheel on the next one a washer I^3, which is held from rotation on the shaft by a groove i in the latter engaging a lug i' on the washer. With this construction the washers are free to be moved longitudinally upon the shaft, so that they and the register-wheels, with their attached ratchet-wheels, may be pressed together to bring such friction to bear upon the wheels as will effectually prevent any accidental movement or overthrow of the wheels during operation of the machine. To thus press the wheels and washers together on the shaft, I employ a spring I^4 on one end of the shaft, engaging and pressing inward a washer engaging the outer face of the ratchet-wheel rotating with the end one of the series of register-wheels.

While I prefer the above-described construction and arrangement of the wheels, washers, and shaft, I desire it to be under-

stood that I do not limit myself thereto, but contemplate using instead, where desired, any other arrangement of register-wheels, with any suitable form of means for preventing accidental turning of the wheels or overthrow of any one of them as it is turned by the respective wheel-turning device during operation of the machine.

Instead of having a pair of register-wheels for each key D there may of course, without departure from my invention, be a greater or less number of such wheels for any key. Where, as shown in the drawings, there are two wheels for each key, the one on the right of the pair is the primary or units wheels, to be moved one step by each movement of the respective register-actuating device, to be described, and the other is the secondary wheel, to which the registrations of the primary wheel are to be transferred and which is to be moved through one of its step-by-step movements at each full revolution of the primary wheel.

The ratchet-wheels on the two register-wheels have twenty teeth each, the primary ratchet-wheel having the space i^2 between two of its teeth made deeper than the spaces between the other teeth, for a purpose to be explained.

The peripheries of the register wheels or disks are, as usual in registering mechanisms, to be provided with a series of figures or markings, twenty in number, those on the primary wheel beginning at zero and increasing successively by the amount indicated by the marking on the knob or handle d of the respective key, while those on the secondary wheel begin at zero and increase successively by an amount equal to twenty times that indicated by the said marking on the key.

In front of the series of register-wheels I' I' there is a transverse rod K, which, being fixed at its opposite ends to the sides of frame B, forms a support or fulcrum for the forward ends of a series of pawl-levers K' K', of which there is one for each pair of register-wheels. These levers, which extend rearward between the lower sides of the primary and secondary register-wheels of the respective pairs, have their forward portions slotted at k to allow the passage through them of the rod K and to provide for a forward-and-back longitudinal movement of the pawl-levers upon such rod.

To facilitate the placing of a pawl-lever in position upon the rod, the rear end of the slot k is left open, as shown in the drawings.

To steady the forward ends of the pawl-levers on the rod K as they move forward and back and swing thereon, I provide the washers k' k', placed on the rod between adjoining levers.

Each of the pawl-levers, at a point to the rear of the ratchet-wheels, carries a finger k^2, to engage the respective primary ratchet-wheel, and a finger k^3, to engage the secondary ratchet-wheel, the former of such fingers being made longer than the other, so that while it is in engagement with and is actuating the primary ratchet-wheel the other finger is kept out of engagement with its ratchet-wheel at all times except when the finger k^2 passes into the deep notch or recess i^2 in the primary ratchet-wheel. When the long finger k^2 is in this notch, the finger k^3 reaches and engages a tooth of the secondary ratchet-wheel, so that as the pawl-lever is swung up both the primary and secondary register-wheels will be turned together through one space.

As the pawl-lever is subsequently moved to bring the finger k^2 into engagement with the tooth to the rear of notch i^2 the finger k^3 cannot reach the secondary ratchet-wheel, and the latter will consequently be unmoved. It will then remain without further movement until, by the step-by-step rotation of the primary register-wheel, the deep notch is again brought around in position to receive the long finger k^2 and the pawl-lever is moved to carry such finger into the notch and is swung to rotate both wheels together in the manner described above.

Springs k^4, engaging bearings k^5 on the respective pawl-levers, act to draw the latter forward to carry their fingers k^2 k^3 toward the respective ratchet-wheels.

Each of such springs is preferably supported upon a pin k^6, which, being attached to the rigid cross-bar k^7, extends forward therefrom through an opening in the bearing k^5 on the lever. The bar k^7 then forms an abutment for the rear end of the spring, which is compressed between the bar and the lever-bearing k^5.

The secondary pawl-finger k^3 can be formed in one piece with the pawl-lever, or can be made separately and attached thereto, as indicated in Figs. 3, 4, and 6.

Each pawl-lever K', extending rearward just beneath the cross-bar H^2, carried by the arms H^3 H^3 of levers H H, has an upwardly-projecting arm k^8 to the rear of the cross-bar, provided with a shoulder k^9, adapted to be brought over the top of the bar by the forward movement of the pawl-lever necessary to bring the latter into its register-wheel-actuating position, as indicated hereinbefore.

The shoulder which, when the pawl-lever is withdrawn to take the pawl-finger k^3 clear of the primary ratchet-wheel, stands to the rear of the rear face of bar H^2, so that the latter can rise freely past it, is so situated as to project clearly over the upper edge of the bar, in position to be engaged positively thereby as the bar rises, when the pawl-lever has been moved forward enough to bring its finger k^2 into engagement with the primary ratchet-wheel.

The rising of the bar H^2 will then cause the pawl-lever to swing upward upon the rod K as a fulcrum and turn either the primary ratchet-wheel or both it and the secondary one, according as the long pawl-finger k^2 is out of or in the deep notch i^2 in the primary ratchet-wheel.

Above the shoulder k^9 the arm k^8 has a plane upwardly-extending face k^{10}, up past which the bar H^2 can travel when the pawl-lever is in its normal retracted position, with its finger k^2 to the rear of and out of engagement with the primary ratchet-wheel, as shown in Fig. 2. This face is so situated that its engagement with the rear side of bar H^2, as the latter moves up and down, will keep the respective pawl retracted out of register-actuating position. The corner where the face k^{10} meets the under side of the shoulder k^9 is preferably rounded off or beveled, as shown in the drawings.

Each pawl-lever K′ is held normally retracted by the upwardly-extending arm of one of the elbow-levers G′ G′ engaging with its front and rear sides, respectively, bearings k^{11} and k^{12} on the pawl-lever. These bearings are formed of side lugs on the lever, of which the rear one, k^{12}, is extended rearward to form a table to engage and raise the indicator-rods L L.

The arrangement of the upwardly-extending arm of each lever G′ is such that when the forwardly-extending arm thereof is resting upon and being supported by a key D, in the manner hereinbefore described, the respective pawl-lever K′ will be held retracted, as shown in Fig. 2, with both of its pawl-fingers k^2 and k^3 out of engagement with the respective ratchet-wheels and the shoulder k^9 just to the rear of the path of the rear face of the bar H^2.

With the parts in the described position the extreme rear end of each pawl-lever rests upon the bar h^4 on frame B.

On the rear side of each of the arms k^8 k^8 is an upwardly-turned shoulder k^{13}, which, when the machine is unoperated, is engaged by a pendent stop-wing M, pivoted upon the transverse rod M′, supported in frame B. A spring M^2, engaging this wing, acts to hold it normally pressed forward against a stop m on frame B, in which position the wing has its lower edge situated just above the shoulders k^{13} k^{13} of the arms k^8 k^8 on the retracted pawl-levers K′ K′, so as to effectually prevent the upward swing of any of such levers. Each shoulder k^{13} is of such extent that the forward movement of any pawl-lever which is necessary to bring the latter into its hereinbefore-described register-actuating position will carry the said shoulder out from under the stop-wing M, so that the lever is left free to be raised to cause a registration. As the shoulder k^{13} thus passes from under the wing the shoulder k^9 moves forward to stand over the bar H^2, as shown in Fig. 3.

The indicator-rods L L, of which there is one for each pawl-lever K′, are guided so as to be reciprocable vertically in suitable openings in the guide-plates L′ L′. Their lower ends, when the rods are down in their normal non-indicating positions, rest upon the tables or bearings k^{12} k^{12} on the respective pawl-levers. On their upper ends these rods carry the indicating-tablets L^2 L^2, each bearing on its front and rear faces markings corresponding to those on the faces of tablets d' d on the knobs d d of the respective keys D D. These tablets L^2 L^2 are so situated that their markings can be seen through the display-openings A^2 A^2 when the rods are raised, and will be hidden within the raised part A′ of the casing when the rods are down in their normal positions. The raising of the rods to indicating position is caused by the upward swing of the respective pawl-levers K′ K′, which, in the manner hereinbefore described, causes actuation of the registering devices.

In order to retain each raised rod, so that the tablet will remain in position to be seen through the display-openings until the machine is again operated to cause a new registration and indication, I provide each indicator-rod with a projection l on its rear side, such projection having the abrupt under face l', substantially at right angles to the rod, the short upwardly and rearwardly inclined face l^2, extending up from face l', and the forwardly and upwardly inclined face l^3 on its upper side.

It is not necessary that the faces l^2 and l^3 should be in the form of straight inclines. They might be formed by rounding off the rear side of the rod projection l, so that it would have the same general shape as that shown, though with convex instead of flat faces. In both cases there would be a short upwardly and rearwardly inclined face just above the abrupt under side of the projection and the higher oppositely-inclined face.

A wing N, pivotally supported from frame B and forced toward the indicator-rods L L by one or more springs N′, serves to engage and hold up with its upper edge the abrupt under side of the projection l on any rod which has been raised to indicating position. As a rod is being raised the upper inclined face l^3 of its projection l, engaging the edge of this wing, forces it back to allow the projection to pass.

When the projection has, by the movement of the rod, been raised above the upper edge of the wing, the latter will, by the action of its spring N′, be snapped in under the face l' of the projection, so that when the pawl-lever K′, being raised, has been dropped the wing will prevent the descent of the rod and will retain it in its elevated position, with its tablet L^2 showing through the display-openings A^2 A^2, so that any observer may know from the markings on the tablet which key has been operated and what kind of a registration has been made by the operation of the machine. When any indicator is thus held up, if another rod be raised by a subsequent operation of the machine the projection on the rod being raised will cam the wing N back, so that its upper edge will be forced off of the abrupt under face l' of the projection of the

previously-raised rod, so that the latter can descend to its normal position with its tablet below the display-openings.

Since the part of the projection above face l' extends well to the rear of the rearward edge of such face, the required camming back of the upper edge of the wing, to take it well away from the abrupt under side of the projection, is insured, even after long-continued use of the machine and in spite of any possible wear of the projections during use. The wing would always be cammed back at least far enough to bring the inclined face l^2 on the projection of the previously-raised rod in contact with the wing edge, so that the wing would have but a slight frictional hold on the projection, which could be easily overcome by the weight of the rod and tablet alone or assisted by a spring device, to be described.

With the projection l on each indicator-rod formed as shown and described, with a part extending well to the rear of the face l', and the spring N', which forces the wing N toward the indicator-rod, made light, the dropping of any previously-raised rod, when another rod is being elevated to take the part of its projection l which is at the angle between the faces l^2 and l^3 past the wing, will be insured, even without the aid of any spring device to force the rod down. This will be so even if the upper edge of the wing be shaped as shown in Fig. 8, having its upper edge formed with a flat face to bear squarely against the under face of the rod projection; but I prefer to bevel off the forward side of the wing edge in the manner indicated in Figs. 2, 3, and 4, so that when the wing is swung back to clear its narrow top from the face l' of the rod projection the engagement of the bevel on the wing with the inclined face l^2 of the projection will tend to cause an easy camming back of the wing to let the rod fall.

If the wing be beveled in the manner above described, the rear side of the rod projection between the abrupt face l' and the incline l^3 may be made parallel with the rod, as shown in Fig. 9; but I prefer the construction shown in Figs. 2, 3, and 4, with the beveled wing and the inclined face l^2 on the projection, because I consider that it will best insure the easy dropping of any rod when another one is being raised to make a new indication.

On the forward side of each indicator-rod is a lug or shoulder l^4, which is to be engaged by the cross-bar O, extending across in front of the whole series of rods and at its ends connected with the side arms O' O', pivoted upon the rod M' beyond the opposite ends of stop-wing M.

One or more springs O^2, each surrounding a pin O^3, extending from the upper guide-plate L', and bearing at its opposite ends against the latter and cross-bar O, press the bar downward, so that it bears upon the lug l^4 of any raised indicator-rod and will force such rod downward, when the wing is swung back, to disengage it from the abrupt under face l' of the projection on the rod.

As long as any indicator-rod is raised to indicating position the bar O will be supported upon the lug l^4 of such rod.

Should all the rods be depressed at any time, as before the operation of the machine to cause any registration and indication, such bar will be prevented from dropping too low by the engagement of one of the arms O' with the lug or stop O^4 on the frame B.

Each spring k^4, engaging and pressing, as it does, against a lug or bearing k^5 on the arm k on the respective pawl-lever K' at a point well below the fulcrum-rod K, not only serves to force the lever longitudinally forward to move its pawl-fingers toward the respective ratchet-wheels, but also acts to assist in swinging the pawl-lever down when it has been raised by bar H^2 and is disengaged from the latter by the rearward movement of the pawl-lever caused by the backward swing of the engaging arm of the respective elbow-lever G'.

To insure that the levers H H shall be down in their normal positions with their rear ends resting upon rollers H' H' when the drawer or till is closed, I provide each lever with a lug k^5, adapted to be engaged by a block k^6, carried by the front plate C' of the drawer, in such way as to force the levers downward, should they not be fully depressed, as the drawer reaches the limit of its closing movement.

The operation of my improved machine, which will be understood from the foregoing description and the drawings, is briefly as follows: With the parts in the positions in which they are shown in Fig. 2 the machine is ready for the making of a new registration and indication, the indicator-rod, which is shown raised, being the one which has been elevated by the previous operation of the machine. If now the key marked with the amount to be indicated and registered be pulled out, with reference to the drawer, against the stress of its retracting-spring E^3, as is the lower key shown in Fig. 3, its rear end will be withdrawn from the lower forwardly-extending arm of the respective elbow-lever G'. The result of this withdrawal is that the respective pawl-lever K' is left free to be moved longitudinally forward by its spring k^4, since the elbow-lever connected with such pawl-lever is no longer held from swinging. The movement of the pawl-lever under stress of its spring k^4 then swings the elbow-lever to the position indicated in Fig. 3 and brings the long pawl-finger k^2 into engagement with the primary ratchet-wheel. Should the deep notch i^2 in such wheel be in position for the finger k^2 to pass into it, the pawl-lever will be moved farther forward by its spring to bring the shorter pawl-finger k^3 into engagement with the secondary ratchet-wheel, so that as the pawl-lever is subsequently swung up both of the ratchet-wheels will be moved together through the space of one tooth. The first movement of the pawl-

lever consequent upon the pulling out of the key brings the shoulder k^9 on the upwardly-extending arm k^8 over the upper edge of the lifting-bar H^2, so that when the latter is raised, in the manner to be described, by the lifting of levers H H the set pawl-lever will be elevated by it, as shown in Fig. 4. The drawer remains locked until after the outward pulling of the key to an extent sufficient to insure the described setting of the pawl-lever has been completed. A slight further outward movement of the key then brings the abrupt face of the key, which is just above the lower bend in the latter, against the cross-bar F of the drawer-lock, and, carrying such bar outward, trips the lock to disengage the notched pawl-like ends $f\,f$ of the arms F' F' from the lugs $f'\,f'$ on the frame B, leaving the drawer free to be drawn outward or opened by a continued pull on the key or by power applied otherwise to the drawer than through the key itself. As the drawer begins to move outward, the rollers H' H', engaging the inclines $h'\,h'$ on arms H H, force the latter upward to the position indicated in Fig. 4, thereby raising the lifting-bar H^2 and the set pawl-lever K, the shoulder k^9 of which is engaged by the upper side of such bar. The set pawl-lever is free to be thus moved, because its setting, consequent upon the pulling out of the respective key D, has moved its shoulder k^{13} forward from under the lower edge of the stop-wing M, which, since it stands over the shoulders $k^{13}\,k^{13}$ on the other unset pawl-levers, effectually stops them from being raised by friction of the bar H^2 on their upwardly-projecting arms k^8 or by any engagement of the upper edge of the bar with the corners between their shoulders k^9 and the faces k^{10}. To prevent such accidental catching of the bar upon the shoulders of any unset pawl-levers, the angle between the abrupt face of the shoulder k^9 and face k^{10} is preferably beveled or rounded off, as indicated in the drawings. The swinging up of the set pawl-lever by the bar H^2 causes the lever to move the respective primary register-wheel through one of its step-by-step movements if the longer pawl-finger k^2 only is in engagement with its ratchet-wheel, or to move both the primary and secondary register-wheels should both pawl-fingers k^2 and k^3 be in engagement with their respective ratchet-wheels. The upward swing of the levers H H being dependent upon the length of the inclines $h'\,h'$ on the levers, and the travel of the lever ends being limited by the stop-bar h^4, the movement of the levers as the drawer is opened must always be uniform in extent, and consequently the space through which the register-wheels are rotated by each swing of their respective pawl-levers will always be the same, so that with the construction and arrangement of the register-wheels with their frictional washers hereinbefore described there is no possible danger of any overthrow to cause overregistration.

Before the drawer-frame C has been moved outward far enough to take the supporting rear ends of the unoperated keys out from under the engaging arms of the respective elbow-levers G' G' the bar H^2 has risen far enough to stand in front of a portion of the upright faces $k^{10}\,k^{10}$ on the arms $k^8\,k^8$ of the unset pawl-levers. The engagement of such faces $k^{10}\,k^{10}$ with the rear side of the bar will then effectually hold back the unset pawl-levers when the supporting key ends are carried by the opening of the drawer away from under the forwardly-extending lower arms of the elbow-levers. The described upward swing of the set pawl-lever to cause registration in the manner set forth also causes the elevation of the indicator-rod resting on its table k^{12}, so that its tablet L^2 can be seen through the display or sight openings in the casing. As the rod rises the inclined upper side of its projection l engages and cams back the rod-supporting wing N, so that the upper edge of the latter is moved to the rear from under the abrupt under face l' of the projection l on the previously-raised rod. The latter rod is then thrown quickly down by the spring-pressed bar O engaging its lug l^4, so that the passage of its projection by the wing is insured, and the rod will certainly drop to its normal non-indicating position. The engagement of the incline l^2 on the projection of the descending rod with the wing serves to assist in the forcing back of the wing and prevents such catching of the projection on the wing as would interfere with the downward throw of the rod by the bar O.

With the construction of rod projection and wing shown in Figs. 2 and 3, or that appearing in either Fig. 8 or Fig. 9, the dropping of each raised rod as another is being elevated toward its indicating position is by the spring-pressed bar O made certain and is not liable to be prevented by any such wear on the rod projections $l\,l$ or the wing as may be caused during long-continued use of the machine. As the bar O flies down in giving the raised rod its throw which is to insure the passage of the projection by the wing it meets the lug l^4 on the rising rod and is raised again by it into position to act upon this newly-raised rod, just as it did upon the former rod, when the machine is again operated to cause a new registration. When the rod just being raised has traveled far enough to bring its tablet L^2 up into indicating position, the wing N snaps in under the abrupt lower face of its projection l to hold the rod elevated when its pawl-lever K' drops.

Should the same indication and registration be desired twice in succession, there will be no actuation of the wing N or dropping of the raised rod. The indicator-rod bearing the proper tablet will simply remain up in indicating position until another rod is raised to make a different indication. Each set pawl-lever K' is retracted at the upper end of its throw by the engagement of the cam G^2 on

frame C with the rounded projection g' on the under side of the lower arm of the respective elbow-lever G'. (See Fig. 4.) This swings the elbow-lever far enough to carry its upwardly-extending arm back to retract the pawl-lever until its shoulder h^5 passes off of the rear edge of bar H^2. The pawl-lever then drops at once to its lowest position, with its rear end resting upon bar h^4 and the face h^{10} on the front of its arm h^8 engaging the rear side of the still raised bar H^2. (See Fig. 5.) During the first outward movement of frame C the roller G^4, by its engagement with the inclined part g^2 of lever G^3, cams such lever upward to rock the shaft G on its eccentric pivotal supports, so as to raise the shaft bodily, and so lift the elbow-levers G' G' a short distance. This lifting of the levers connected with the unset pawl-levers, which have their arms h^8 h^8 bearing against the rear of lifting-bar H^2, causes the forward ends of the lower arms of the elbow-levers to be raised above the planes of the tops of the ends of their respective keys, so that the key ends can pass freely under them as the frame C returns when the drawer is being closed. The cam G^2, by its engagement with the rounded projection on the lower arm of the set elbow-lever, cams such arm up to stand with the corresponding arms of the other levers above the plane of the key ends. As the drawer-frame C is moved outward after the completion of a registration and indication the rollers H' H' run outward under the horizontal under side of the levers H H, which, being held down by bar h^4, act then as rails to keep the rollers down, and so prevent any upward tilting of the rear or inner end of the drawer as the latter is pulled further open. This arrangement, because it keeps the frame C squarely down upon its supports, insures the greatest ease and freedom of movement of the drawer. When the drawer is being closed again, the rear or inner ends of all of the keys D D pass inward under the lower arms of the respective elbow-levers G' G' a certain distance just before the inclined part g^2 of lever G^3 is reached by the roller G^4 moving with frame C, and therefore just before the shaft G and the elbow-levers thereon are lowered by the downward swing of lever G^3 and the consequent turning of the shaft on its eccentric supports. Just as the closing movement of the drawer is being finished the full descent of lever G^3 is insured by the contact of the back of cam G^2 with the arm g^3 on the lever. When during the closing of the drawer the rollers H' H', moving with frame C, come to the inclines h' h' of levers H H, the latter swing downward to lower the lifting-bar H^2 to its normal position, the descent of the levers being caused by their weight and that of the bar H^2, assisted by springs h^2 h^2. As the drawer reaches the limit of its inward movement the blocks h^5 h^5 on plate C' will, if the levers H H are not fully down, strike the lugs h^4 h^4 on the levers and force the latter down to seat their rear ends on rollers H' H'. The machine is now ready for operation to cause another registration and indication, the indicator and register actuating parts having resumed the positions which they occupy in Fig. 2, the raised indicator-rod remaining up to indicate the amount registered at the last operation of the machine, and the sum of such amount, added to what had previously been registered, being shown by the register, so that it can be read through a suitable reading opening or slot.

Where there is no key-arrester, the machine can, by the movement of the proper keys, be set for securing any desired combination of registrations and indications when the drawer is subsequently opened. The drawer-lock is arranged to keep the drawer closed during such setting and until one of the keys is drawn out more than enough to secure the setting of its respective pawl-lever in the manner hereinbefore described. Upon the subsequent opening of the drawer all the registrations and indications for which the machine has been set will be made simultaneously.

With the key-arrester arranged in the usual way to prevent the movement of more than one key in any one of the several subseries into which the keys are divided the machine can be set for the simultaneous causing of several registrations and indications by the pulling out of a key in each subseries before the drawer is opened.

It will be noticed from the description hereinbefore given and the drawings that in my present machine the registering and indicating devices are actuated from a swinging frame, which is caused to swing up and down as another frame, preferably one connected with the drawer or movable part of a money-receiving till, is reciprocated. This swinging frame can be made quite light, so as not to retard or interfere materially with the easy movement of the primary actuating-frame.

It will also be noticed that during the operation of the machine to cause a registration and indication the swinging frame in rising has to lift only the pawl-lever which corresponds to the registering and indicating device to be actuated and that the other unset pawl-levers remain unmoved, with none of their weight brought upon the swinging frame.

With this construction and the register and indicator actuating pawl-levers made as shown and described the operation of the machine, to cause a registration and indication, or two or more registrations and indications together, causes very little resistance to be offered to the opening of the drawer. A light pull on the drawer, either through the medium of one of the key-knobs or any other handle, after one or more keys have been operated to set the machine and unlock the drawer, will be enough to move it

outward and cause the operative parts of the machine to be moved.

With the indicator-rods having the projections constructed as shown and described, the supporting-wing, and the spring-pressed rod-throwing bar, to engage the lugs on the rods, the dropping of any raised rod, when another is being elevated to indicating position, is made certain of without danger of failure because of any wear of the projections on the rods or of the wing, even during long-continued use of the machine.

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 a support independent of the indicator and adapted to be moved into and out of position to be engaged by the movable frame, and means for moving it into and out of such position, 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 a support independent of the indicator and having a portion to be engaged by the frame, a spring tending to move the piece into position to be engaged by the frame, and means for moving it out of such position, substantially as and for the purpose shown.

3. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable indicator-engaging piece having a portion to be engaged by the frame, means for moving the piece into position to be engaged by the frame, a lever connected with the piece, and a key to hold such lever, to keep the movable indicator-engaging piece out of position to be engaged by the frame, adapted to be moved to release the lever, substantially as and for the purpose set forth.

4. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable piece engaging the movable indicator and provided with a portion to be engaged by the frame, a spring to move the piece into position to be engaged by the frame, a lever connected with the piece, a movable key to hold the lever in position to keep the movable piece out of position to be engaged by the frame, adapted to be retracted to release the lever, and means for moving the lever back again into position to be reëngaged by the key, substantially as and for the purpose described.

5. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable piece engaging the indicator and having a portion to be engaged by the frame, a spring to move the piece into position to be engaged by the frame, a lever connected with the movable piece, a second movable frame, connections between the two frames, whereby movement of the second frame causes the other frame to move, a movable key on the second frame, to engage and hold the lever in position to keep the movable indicator-engaging piece out of position to be engaged by the first frame, and means, on the second frame, for swinging the lever, substantially as and for the purpose specified.

6. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable piece engaging the indicator, having a portion to be engaged by the frame, a spring to move the piece into position to be engaged by the frame, a lever having one arm connected with the movable piece, so as to move therewith, as it moves into and out of position for engagement with the movable frame, a second movable frame, a key movably mounted thereon, to engage and support the other arm of the lever, and a cam on the second frame, to swing the lever to move the movable indicator-engaging piece against the stress of its spring, substantially as and for the purpose shown.

7. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable piece engaging the indicator having a portion to be engaged by the frame, a spring to move the piece into position to be engaged by the frame, a lever having an arm extending up between bearings on the movable indicator-engaging piece, a second movable frame, a key movably mounted thereon, to engage and support the other arm of the lever, and means carried by the second frame to move this arm to cause the lever to move the indicator-engaging piece out of engagement with the first frame, substantially as and for the purpose set forth.

8. In an indicating-machine, in combination with a movable indicator, a movable frame, a movable piece engaging the indicator having a portion to be engaged by the frame, means tending to move the piece into position to be engaged by the frame, a lever having an arm extending up between bearings on the movable piece, a second movable frame, connections between the two frames whereby movement of the second frame causes movement of the first one, a key to engage the other arm of the lever, movably mounted on the second frame, and means on the latter frame for engaging and moving the lever, when such frame has moved a certain distance, substantially as and for the purpose described.

9. In an indicating-machine, in combination with a movable indicator, a movable frame, a swinging lever engaging the indicator, having a portion to be engaged by the frame, and mounted on a fulcrum, so as to be movable with reference thereto to bring its frame-engaging portion into and out of position to be engaged by the frame, means tending to move the lever with reference to its fulcrum, to bring it into position to be engaged by the frame, and means for moving and holding

the lever out of such position, substantially as and for the purpose specified.

10. In an indicating-machine, in combination with a movable indicator, a movable frame, a swinging lever engaging the indicator, having a portion to be engaged by the frame and mounted on its fulcrum so as to be movable with reference thereto, to bring its frame-engaging portion into and out of position to be engaged by the frame, a spring to move the lever into position to be engaged by the frame, and means for moving and holding the lever out of such position, substantially as and for the purpose shown.

11. In an indicating-machine, in combination with a movable indicator, a movable frame, a lever engaging the indicator and having a portion to be engaged by the frame, a fulcrum-support for such lever, adapted to allow it to be swung and moved into and out of position to be engaged by the frame, a spring to move it into such position, and a second lever, to retract the first lever, connected with it, so as to allow it to swing with the frame, when it is in engagement therewith, substantially as and for the purpose set forth.

12. In an indicating-machine, in combination with a movable indicator, a movable frame, a lever engaging the indicator and having a portion to be engaged by the frame, a fulcrum upon which the lever has a sliding bearing, a spring to move the lever into position to be engaged by the frame, a second lever having an arm engaging a bearing on the first lever, and a movable key to hold the second lever swung back, to retract the first lever against the stress of its spring, substantially as and for the purpose described.

13. In an indicating-machine, in combination with a movable indicator, a movable frame, an indicator-engaging lever mounted on its fulcrum, so as to be capable of sliding as well as swinging thereon, and having a shoulder to be engaged by the movable frame, a spring to move the lever, to bring its shoulder in the path of the frame, a second lever engaging a bearing on the first lever, to hold it back against the stress of its spring, and a movable key for holding the second lever, adapted to be moved to release the same, substantially as and for the purpose specified.

14. In an indicating-machine, in combination with a movable indicator, a movable frame, an indicator-engaging lever, having a shoulder to be engaged by the movable frame, a fulcrum for such lever engaging a slot in the latter, a spring to slide the lever on its fulcrum, to bring the shoulder on the lever into the path of the movable frame, a second lever engaging a bearing on the first lever, a second movable frame, connections between the two frames, whereby movement of the second frame causes the other to be moved, a key movably mounted on the second frame, to engage and hold the second lever against the stress of the spring acting upon the first lever, and a cam on the second frame to move the second lever, to retract the first one out of engagement with the first movable frame, substantially as and for the purpose shown.

15. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces mounted on supports independent of the indicators and having portions to be engaged by the frame, and means for moving the pieces independently, to bring such portions into and out of position to be engaged by the frame, substantially as and for the purpose set forth.

16. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces mounted on supports independent of the indicators and having portions to be engaged by the movable frame, springs to move such pieces into position to be engaged by the frame, and separate means for moving them out of such position, substantially as and for the purpose described.

17. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces, having portions to be engaged by the movable frame, means to move such pieces into position to be engaged by the movable frame, a series of retractors for the separate pieces, to move and hold them out of position to be engaged by the frame, and a series of keys engaging such retractors, substantially as and for the purpose specified.

18. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces having portions to be engaged by the movable frame, means to move such pieces in position to be engaged by the frame, a series of retractors for the separate pieces, to move and hold them out of position to be engaged by the frame, and means for actuating such retractors, substantially as and for the purpose shown.

19. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces having portions to be engaged by the movable frame, springs to move the pieces into position to be engaged by the frame, a series of retractors connected with the pieces, to move and hold them back against the stress of their springs, and a series of movable keys to engage and hold the retractors, to keep the respective indicator-actuating pieces out of position to be engaged by the movable frame, substantially as and for the purpose set forth.

20. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces having portions to be engaged by the frame, springs to move the pieces into position to be engaged by the frame, a series of retractors connected with the pieces, to

move and hold them back against the stress of their springs, a second moving frame, a series of keys movably mounted thereon, for normally supporting the retractors in their piece-retracting positions, connections between the two frames, whereby movement of the second frame causes the first one to move, and means, on the second frame, for camming back any retractor, which has been released by its key before the second frame is moved, substantially as and for the purpose described.

21. In an indicating-machine, in combination with a series of movable indicators, a movable frame, a series of movable indicator-engaging pieces having portions to be engaged by the frame, springs to move the pieces into position to be engaged by the frame, a series of retracting-levers connected with the pieces, a second movable frame connected with the first frame, so as to actuate the same, a series of keys movably mounted on the second frame, and having portions to engage and support the respective retracting-levers, adapted to be disengaged from the same by movement of the keys with reference to the second frame, and means on the latter for camming back any retracting-lever, which has been released by its key, before movement of the second frame, substantially as and for the purpose specified.

22. In an indicating-machine, in combination with a series of movable indicators, a movable frame having a bar, a series of levers for actuating the indicators, each having a sliding bearing upon its fulcrum, and an arm provided with a shoulder adapted to be brought into the path of the bar, by a sliding of the lever on its fulcrum, springs engaging the levers, retracting-levers to move and hold the indicator-actuating levers against the stress of their springs, and means for holding the retracting-levers, adapted to be moved to release any one of them, substantially as and for the purpose shown.

23. In a registering-machine, in combination with a movable registering device, a movable frame, a movable piece for actuating the registering device having a portion to be engaged by the movable frame, a spring to move the piece into position to be engaged by the frame, and a retracting-lever connected with the piece, to move it against the stress of its spring, substantially as and for the purpose set forth.

24. In a registering-machine, in combination with a movable registering device, a movable frame, a movable piece for actuating the registering device, having a portion to be engaged by the movable frame, a spring to move the piece into position to be engaged by the frame, a retracting-lever engaging the piece and a movable key engaging such lever, substantially as and for the purpose described.

25. In a registering-machine, in combination with a movable registering device, a movable frame, a movable piece for actuating the registering device having a portion to be engaged by the movable frame, a spring to move the piece into position to be engaged by the frame, a retracting-lever connected with the piece, a movable key engaging such lever, a second moving frame, and connections between the two frames whereby movement of the second frame actuates the other, substantially as and for the purpose specified.

26. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of movable pieces for actuating the respective registering devices, each having a portion to be engaged by the movable frame, springs to move the pieces into position to be engaged by the frame, retractors connected with the pieces, to move and hold them back against the stress of their springs, and movable keys to engage and hold the retractors, substantially as and for the purpose shown.

27. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of movable pieces for actuating the respective registering devices, each having a portion to be engaged by the movable frame, springs to move the pieces into position to be engaged by the frame, retractors connected with the pieces, to move and hold them back against the stress of their springs, a second movable frame connected with the first one, so as to actuate the same, a series of movable keys to engage and hold back the retractors, and means, on the second frame, for swinging back any retractor which has been released by its key, substantially as and for the purpose set forth.

28. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of movable pieces for actuating the registering devices, each having a portion to be engaged by the movable frame, springs to move such pieces into position to be engaged by the frame, retractors connected with the pieces to move and hold them against the stress of their springs, a second movable frame, connections between the two frames, whereby movement of the second frame causes actuation of the first one, a series of retractor-engaging keys movably mounted on the second frame, and a cam on the latter frame to retract any key-released retractor, substantially as and for the purpose shown.

29. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of movable pieces each having a portion to be engaged by the frame and a part to engage and move the respective registering device, springs to move the pieces to bring them into position to be engaged by the frame and engage the registering devices, retractors connected with the respective pieces, a series of movable keys engaging the retractors, and means for swing-

ing back any retractor which has been released by its key, substantially as and for the purpose specified.

30. In a registering mechanism, in combination with a series of movable registering devices, a movable frame, a series of movable pieces each having a portion to be engaged by the frame and a part to engage and move the respective registering device, the springs engaging such pieces, the series of retractors connected with the respective pieces, a second movable frame, a series of retractor-engaging keys movably mounted upon the second frame, connections between the two frames whereby movement of the second frame causes actuation of the first one, and means for moving back any retractor which has been released by its key, substantially as and for the purpose shown.

31. In a registering-machine, in combination with a movable registering device, a movable frame, a swinging and reciprocating pawl-lever having a portion to be engaged by the frame, and a part to engage and actuate the registering device, a spring to reciprocate the lever, to bring it into position to be engaged by the frame and to engage the registering device, a retracting-lever connected with the pawl-lever, and a movable key to engage and hold the retracting-lever in its pawl-lever-retracting position, substantially as and for the purpose set forth.

32. In a registering-machine, in combination with a movable registering device, a movable frame, a reciprocating and swinging pawl-lever having a shoulder to be engaged by the movable frame, and a part to engage the registering device, a retracting-lever to hold the pawl-lever normally retracted, to keep its shoulder out of the path of the frame, and its registering-device-engaging part out of engagement with such device, a spring to reciprocate the pawl-lever, and a key to engage the retracting-lever against the stress of such spring, substantially as and for the purpose described.

33. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of reciprocating and swinging pawl-levers each having a part to engage the registering device, adapted to be brought into and out of such engagement by reciprocation of the pawl-lever, and a portion to be engaged by the movable frame, adapted to be brought into and out of position to be engaged by the movable frame, as the pawl-lever is moved to bring its registering-device-engaging part into and out of operative position, the springs engaging the pawl-levers, the retracting-levers connected with the pawl-levers, and the series of movable keys to engage the retracting-levers, substantially as and for the purpose specified.

34. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of pawl-levers each having a pawl-finger, to engage and actuate the respective registering device, and a shoulder, to be engaged by the movable frame, sliding pivotal bearings for the pawl-levers, springs engaging such levers, retracting-levers connected with the respective pawl-levers, and a series of movable keys, each adapted to engage one of the retracting-levers, substantially as and for the purpose shown.

35. In a registering-machine, in combination with a series of movable registering devices, a movable frame, a series of pawl-levers each having a pawl-finger to engage and actuate the respective registering device, and a shoulder, to be engaged by the movable frame, sliding pivotal bearings for the pawl-levers, springs engaging such levers, retracting-levers connected with the pawl-levers, a second movable frame, connections between the two frames whereby movement of the second frame causes the first frame to be actuated, a series of movable keys to engage the retracting-levers, and means for moving back any retracting-lever that has been released by movement of its key, substantially as and for the purpose set forth.

36. In combination with a series of movable indicators, the series of indicator-actuating levers each having an arm with a shoulder, sliding pivotal bearings for the levers, springs to slide the levers on their bearings, a movable frame having a bar extending across the series of arms on the levers, and adapted to engage the shoulder on any lever which is slid forward by its spring, a series of retractors connected with the actuating-levers, and a series of movable keys to engage the retractors, substantially as and for the purpose described.

37. In combination with a series of movable registering devices, the series of actuating-levers therefor, each having a part to engage and actuate the respective registering device, and an arm with a shoulder, sliding pivotal bearings for the levers, springs to slide the levers on their bearings, a movable frame having a bar extending across in front of the arms on the levers, a series of retractors connected with the levers, and a series of movable keys to engage the retractors, substantially as and for the purpose specified.

38. In combination with a series of movable indicators and a series of movable registering devices, the series of actuating-levers each having an arm with a shoulder, a part to engage the respective indicator, and a part to engage and actuate the respective registering device, sliding bearings for the levers, springs to reciprocate the levers to carry their registering-device-actuating parts into operative position, a movable frame having a bar extending across in front of the arms on the actuating-levers, in such position, that the movement of any lever, to bring its registering-device-actuating part into engagement with such device, will bring the shoulder of the arm on such lever into the path of the

frame-bar, a series of retractors connected with the respective actuating-levers, and a series of movable keys to engage the retractors, substantially as and for the purpose shown.

39. In combination with the series of actuating-levers, for moving parts of the machine, each having an arm provided with a shoulder and having an upwardly-extending face beyond the shoulder, pivotal bearings for the levers, adapted to allow them to be reciprocated, the movable frame having a bar extending across in front of the arms on the levers, springs to move the levers to bring the shoulders on their arms in the path of such bar, a series of retractors connected with the levers, and a series of movable keys to engage the retractors, substantially as and for the purpose set forth.

40. In combination with the series of actuating-levers, for moving parts of the machine, each having an arm provided with a shoulder and with a face extending up above such shoulder, pivotal bearings for the levers, adapted to allow them to be reciprocated, the movable frame having a bar extending across in front of the arms on the levers, springs to move the levers to bring the shoulders on their arms into the path of the bar, a series of retractors connected with the levers, a series of movable keys to engage the retractors, and means for moving back any retractor, that has been released by movement of its key, substantially as and for the purpose described.

41. In combination with the series of actuating-levers for moving parts of the machine, each having an arm provided with a shoulder and with an upwardly-extending face above such shoulder, pivotal bearings for the levers, adapted to allow them to be reciprocated, a movable frame having a bar extending across in front of the series of arms on the levers, springs to move the levers to bring the shoulders on their arms into the path of the bar, a series of retractors connected with the levers, a second moving frame, connections between the two frames, whereby movement of the second frame causes the first one to be actuated, a series of retractor-engaging keys movably mounted upon the second frame, each adapted to be moved to release the respective retractor, before the second frame is moved to raise the cross-bar on the first frame above the shoulders on the arms of the actuating-levers, and means for returning to its normal lever-retracting position any retractor so released by its key, substantially as and for the purpose specified.

42. In combination with the series of actuating-levers for moving parts of the machine, each having an arm provided with a shoulder and with an upwardly-extending face above such shoulder, pivotal bearings for the levers, adapted to allow them to be reciprocated, a movable frame having a bar extending across in front of the arms of the levers, springs to move the levers, to carry the arms thereon toward the bar, a series of retracting-levers connected with the actuating-levers, a second movable frame, connections between the two frames, whereby movement of the second frame causes the first one to be actuated, keys to engage arms of the retracting-levers, movably mounted upon the second frame, and means actuated by the latter frame to raise the pivotal supports of the retracting-levers, substantially as and for the purpose shown.

43. In combination with the series of actuating-levers, for moving parts of the machine, each having an arm provided with a shoulder and with an upwardly-extending face above such shoulder, pivotal bearings for the levers adapted to allow the levers to be reciprocated, springs to move the levers to carry the arms thereon toward the bar, a series of retracting-levers connected with the actuating-levers, the rocking shaft upon which the retracting-levers are pivoted having eccentric bearings in a supporting-frame, a second movable frame, connections between it and the first movable frame, whereby movement of the second movable frame causes the first one to be actuated, keys to engage the retracting-levers, movably mounted on the second movable frame, a bearing carried by such frame, and a cam-lever attached to the rocking shaft, adapted to be moved and swung by the bearing, as the frame carrying the latter is moved, substantially as and for the purpose set forth.

44. In combination with a movable frame, the series of actuating-levers for moving parts of the machine, each having an arm provided with a shoulder adapted to be brought into the path of the frame by longitudinal movement of the lever, and with a second oppositely-turned shoulder, a stop-wing having its edge in position to engage the second shoulder on the lever-arm, when the lever is moved to take its first shoulder out of the path of the movable frame, pivotal bearings for the levers, adapted to allow them to be reciprocated, and means for moving the levers, to bring the bar-engaging shoulders on their arms into and out of the path of the movable frame, substantially as and for the purpose described.

45. In combination with a movable frame, a series of actuating-levers, for moving parts of the machine, each having an arm provided with the shoulder to be engaged by the frame, and with a second oppositely-facing shoulder, the spring-pressed stop-wing having its edge adapted to engage the second shoulder on the lever-arm, when the lever is moved longitudinally, to take its first shoulder from the path of the movable frame, pivotal bearings for the levers, adapted to allow them to be moved longitudinally to take the first shoulders on their arms into and out of the path of the frame, and means for so moving the levers, substantially as and for the purpose specified.

46. In combination with a series of movable

registering devices, the series of actuating-levers provided with pawl-fingers to engage the ratchet-wheels of the respective registering devices, and with arms having shoulders, pivotal supports adapted to allow the levers to be moved longitudinally to bring their pawl-fingers into engagement with the respective ratchet-wheels, the springs engaging arms on the levers, and a moving bar into the path of which the shoulders on the arms of the levers are brought by the movement of the levers to bring the pawl-fingers into engagement with the ratchet-wheels, substantially as and for the purpose shown.

47. In combination with a series of movable indicators, each having a retaining projection, the movable indicator-supporting wing to engage the projection on any raised indicator, and a movable bar, forced down by a yielding pressure, situated in the path of portions of the indicators, so that such portions will engage it only after the indicators have been raised to a certain distance above their normal non-indicating positions, substantially as and for the purpose specified.

48. In combination with a series of movable indicators each having a retaining projection and a lug, the movable indicator-supporting wing to engage the projections and hold the indicators, when raised to indicating position, and a spring-pressed movable bar, situated in the path of the lugs on the indicators, at a distance from the lugs, when the indicators are down in non-indicating position, so that it will be engaged by the lug on any indicator, only after the latter has been raised above its normal non-indicating position, substantially as and for the purpose shown.

49. In combination with the movable supporting-wing and the spring-pressed movable bar, the series of movable indicators having the retaining projections with abrupt under faces, and upwardly and outwardly inclined faces at the outer sides of the abrupt faces, and pressure-bar-engaging bearings, standing at a distance below the bar, when the respective indicators are in non-indicating position, and adapted to engage the bar only after the indicators carrying them have been raised above such position, substantially as and for the purpose described.

50. In combination with the movable drawer or till and the frame moving therewith, bearings on such frame, and a swinging frame having arms with cam portions, by engagement with which, as the drawer is being opened, the bearings cam the frame up, and portions which, when the frame is so cammed up, are parallel with the outward travel of the bearings on the drawer-frame, and serve to hold them down to keep the inner end of the drawer-frame down upon its supports, substantially as and for the purpose shown.

51. In combination with the movable drawer or till and the frame moving therewith, the swinging frame having arms with inclines or cam portions, means for limiting the upward swing of such arms, and bearings on the drawer or till frame, engaging the under sides of the arms, substantially as and for the purpose set forth.

52. In combination with the movable drawer or till and the frame moving therewith, the swinging frame having the arms provided with the inclines, bearings on the movable drawer or till frame engaging these arms, to cam them upward, as the drawer or till is opened, abutments on the moving drawer or till frame, and arms on the swinging frame, to be engaged thereby, as the drawer is closed substantially as and for the purpose described.

53. In combination with a movable part of a till, a swinging frame, cam connections between such movable part and the frame, a series of actuating-levers for moving parts of the machine, having shoulders to be engaged by parts of the swinging frame, and means whereby any of such levers may be set into position to be actuated by the frame, substantially as and for the purpose specified.

54. In combination with a movable part of the till and a frame moving therewith, a series of keys movably mounted on such frame, a movable frame, cam connections between it and the other frame, a series of registering devices, a series of levers for actuating the same, having portions to be brought into the path of the movable frame by movement of the levers, and means for actuating the respective registering devices, springs for moving the levers into position to be engaged and actuated by the movable frame, and retracting-levers connected with the actuating-levers, and having arms to be engaged by the keys, substantially as and for the purpose shown.

55. In combination with a movable part of the till and a frame moving therewith, a series of keys movably mounted on such frame, a movable frame, cam connections between it and the other frame, a series of movable indicators, a series of actuating-levers each having a part to engage one of the indicators and a portion to be moved into the path of the movable frame by movement of the lever, springs for moving the levers into position to be engaged and actuated by the movable frame, and retracting-levers connected with the actuating-levers, and having arms to be engaged by the keys, substantially as and for the purpose set forth.

56. In combination with a movable part of the till and a frame moving therewith, a series of keys movably mounted on such frame, a movable frame, cam connections between it and the other frame, a series of movable indicators, a series of registering devices, a series of levers each having a portion to engage one of the indicators, means for actuating the corresponding registering device, and an arm provided with a shoulder to be brought, by movement of the lever, into and out of the path of the movable frame, springs for mov-

ing the levers to bring the shoulders on their arms into the path of the movable frame, and the retracting-levers connected with the actuating-levers, and having arms to be engaged by the keys, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of November, 1895.

GEORGE L. BARNES.

Witnesses:
LINUS BARNES,
WILLIS BARNES.