

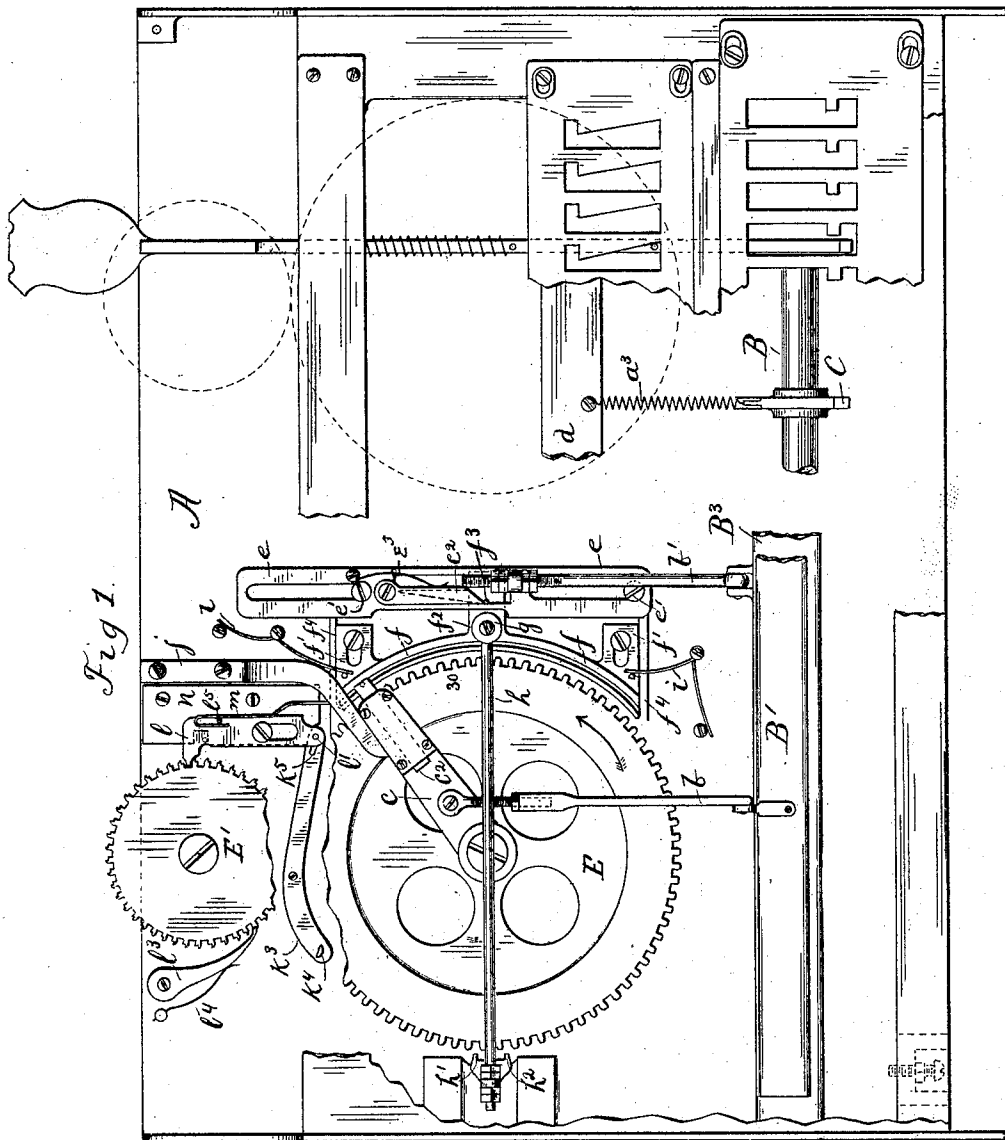
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5 Sheets—Sheet 1.

J. B. AUFULDISH.
CASH REGISTER AND INDICATOR.

No. 516,856.

Patented Mar. 20, 1894.



WITNESSES:
Ewing French
L C Leoty

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Toulmin M. Carthy
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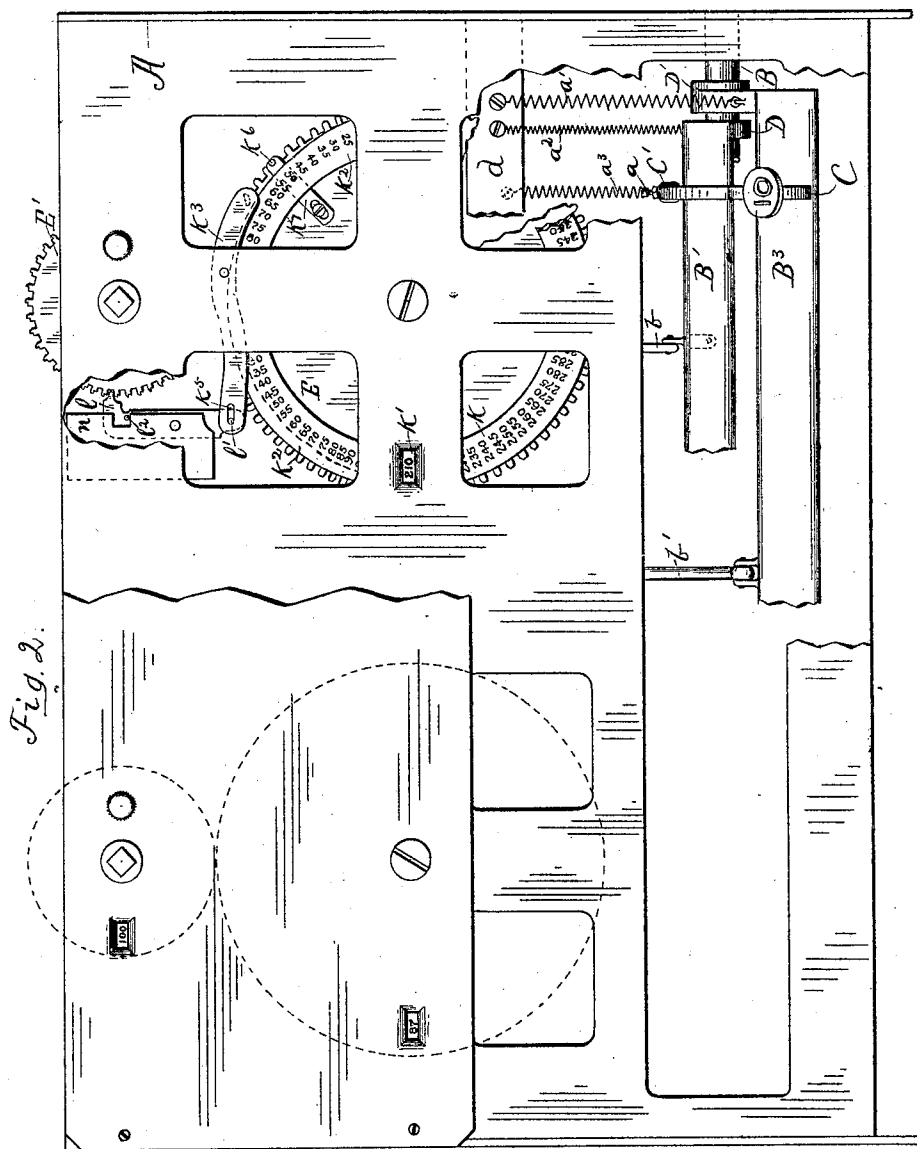
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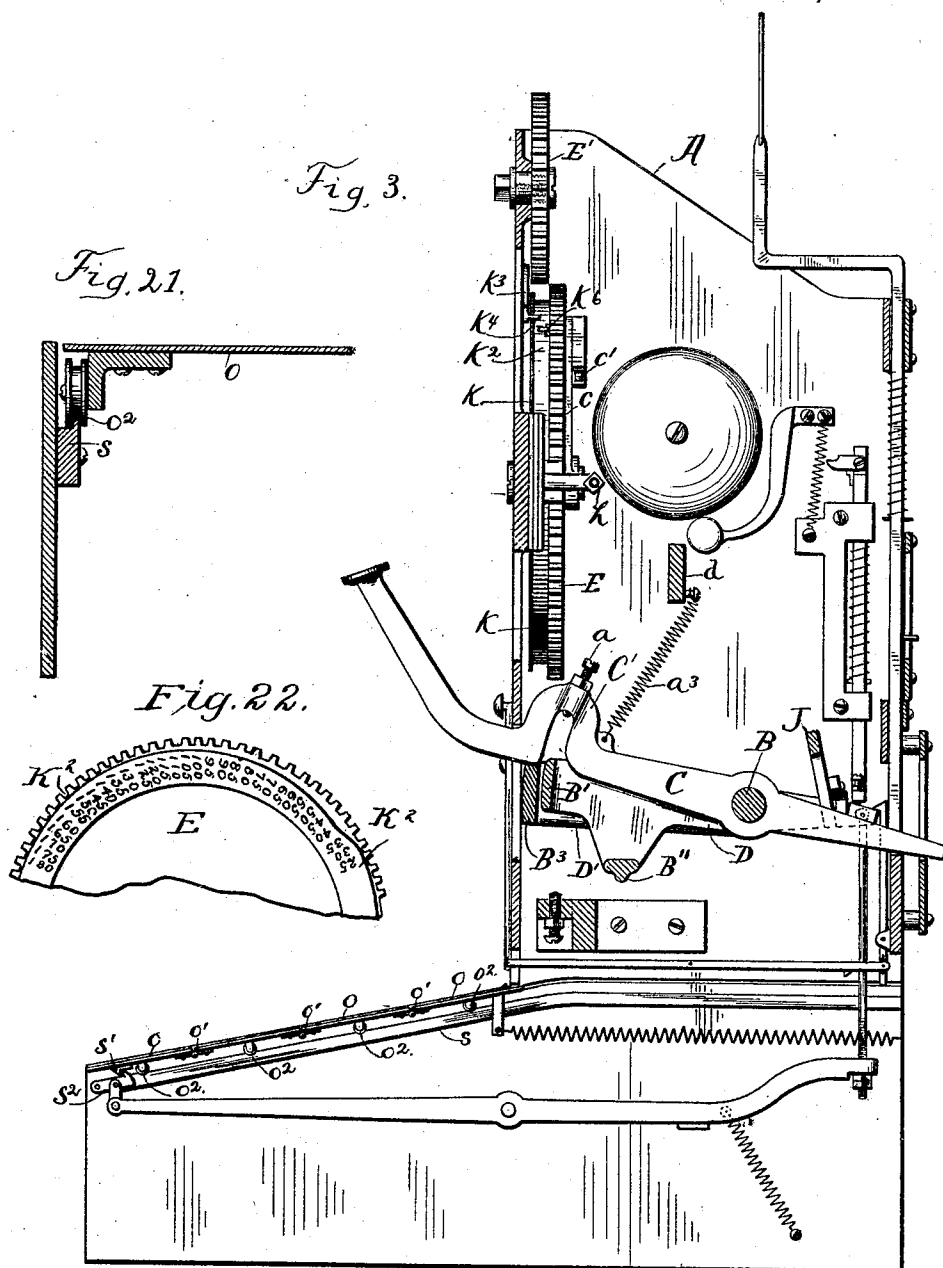
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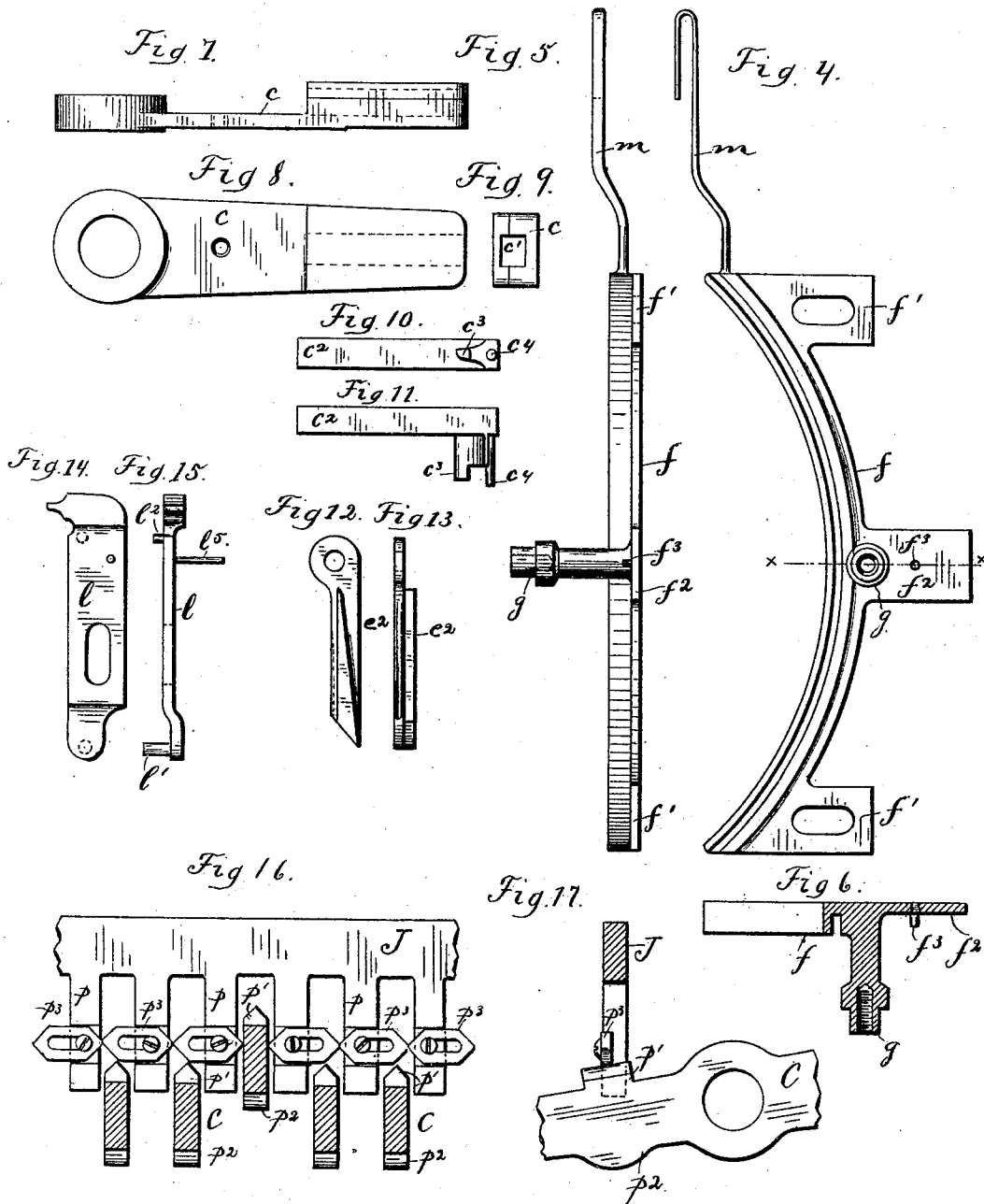
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5 Sheets—Sheet 4.

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CASH REGISTER AND INDICATOR.

No. 516,856.

Patented Mar. 20, 1894.



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(No Model.)

5 Sheets—Sheet 5.

J. B. AUFULDISH.
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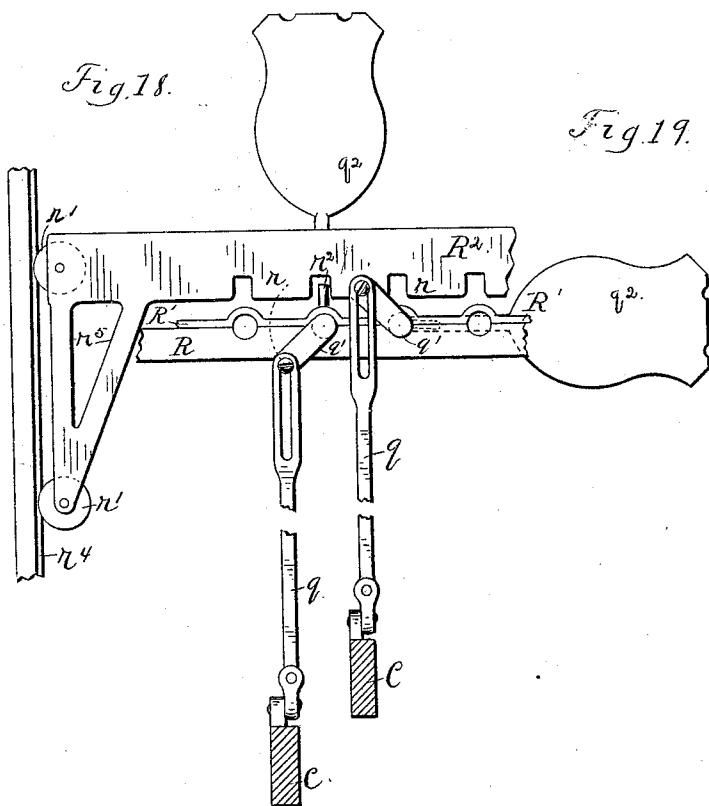


Fig. 19.

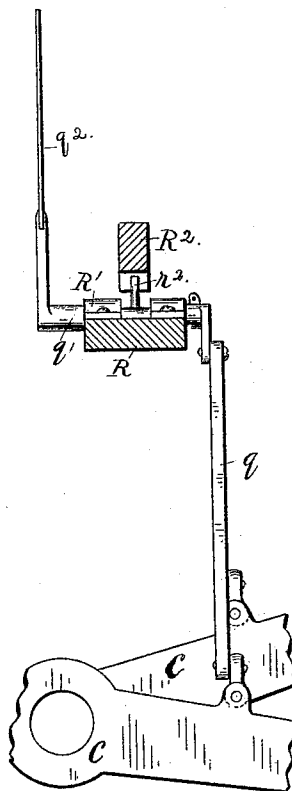
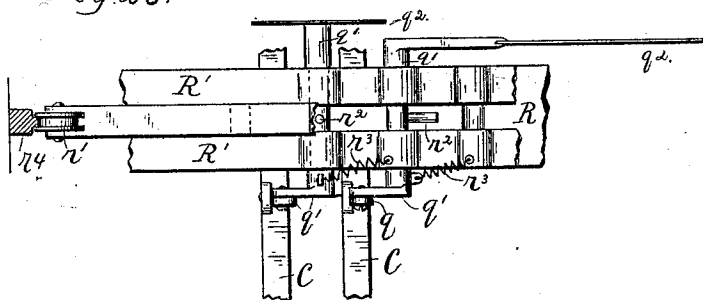


Fig. 20.



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UNITED STATES PATENT OFFICE.

JOHN B. AUFULDISH, OF DAYTON, ASSIGNOR TO THE COLUMBIA CASH REGISTER COMPANY, OF MIAMISBURG, OHIO.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 516,856, dated March 20, 1894.

Application filed January 23, 1893. Serial No. 459,501. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. AUFULDISH, of Dayton, county of Montgomery, State of Ohio, have invented a new and useful Improvement in Cash Registers and Indicators, of which the following is a specification.

My invention relates to improvements in cash registers and indicators.

The object of the invention is to simplify the construction of the same by reducing the number of operative parts, and yet produce a register meeting all the requirements of a cash registering and indicating medium, and further, to so arrange the registering mechanism that the registration of a sale is made by the return or upward trip of the key-lever last operated, while the amount is indicated on the tablet by the downward trip of the key-lever.

To these ends my invention consists in various mechanical elements through the agency of which sums of money may be registered and indicated.

The elements comprising the improvements will be fully described in the specification, and the several combinations thereof, set forth in the claims.

The drawings herewith presented as supplemental to the specification, illustrate the salient features thereof.

The same reference characters will be used to indicate corresponding parts in the different views, of which—

Figure 1. is a vertical view, showing a rear plan of the registering mechanism, with the rear of the casing broken; Fig. 2. a vertical view, looking from the front, showing the transferring mechanism, that carries values from the wheel of a lower, to that of a higher denomination; Fig. 3. a side elevation of the machine, partly in section with a side thereof removed; Fig. 4. a detached, detail view of the segmental grooved sliding plate; Fig. 5. an edge view of the same; Fig. 6. a cross section, horizontally through the center of Fig. 4, on line $x-x$; Fig. 7. a detached, detail side view of the main wheel registering arm; Fig. 8. a detached, detail plan view of the same; Fig. 9. a detail, detached end view of the same, showing the slot therein; Fig. 10. a detached, detail view of the sliding bar adapted

to work in the slot mentioned in Fig. 9; Fig. 11. a detached, detail view of the same showing the rounded tooth, and the pin thereof; Fig. 12. a detached, detail view of the pendant cam, showing a plan of the inner surface; Fig. 13. a detached, detail side view of the same; Fig. 14. a detached view, in detail, showing a plan of the slotted pawl of the transfer or secondary wheel; Fig. 15. a detached, detail side view of the same; Fig. 16. a detached, horizontal view in detail, of the key-locking attachment, parts being broken away from both ends; Fig. 17. a detached, detail view of a key, showing the locking plate in section, and the key out of locking contact therewith. One of the sliding cams p^3 is shown in the slot in its respective bar p . Fig. 18. is a front elevation of a portion of the tablet-indicating system, showing two keys in section; Fig. 19. a side elevation of a portion of the tablet-indicating system, showing a portion of two key-levers, with the vertically rolling notched bar, and the bearing for the bell cranks, by the partial means of which the tablets are exposed, in section; Fig. 20. a plan view of the tablet-indicating system, looking from above, in which one indicator tablet is exposed, and the other concealed. Parts are broken away, one of the tracks for the rollers is shown in section. Fig. 21. is an enlarged sectional view of one of the corners of the money receptacle, showing a part of the rolling cover, the side of the cabinet in section, and a roller, the track for the rollers also appears in section. Fig. 22. is a detached, detail view of the main registering wheel showing the cam ring thereon, the lower, portion of the wheel broken away.

A indicates the housing or inclosing case for the operative parts, into the sides of which the main shaft B is journaled. Upon this shaft a series of curved or graduated key-levers C are fulcrumed, having finger tips upon the outer ends, bearing numbers representing different sales to be recorded. Upon the main shaft, forwardly projecting arms D support the horizontal oscillating adding bar B', this adding bar is divided into sections, each section having its arms independent of the adjacent section, and designed to operate a main or primary wheel E upon which the cent or values of a lower denomination are

registered. I have shown in the drawings but a portion of one of the sections of this oscillating bar, and but one arm extending from the main shaft B, it will be understood
 5 however, that two or more arms D are requisite to give the bar a suitable connection with the main shaft. A horizontal brace B'', shown in section in Fig. 3, is used for the purpose of giving the parts a suitable and substantial
 10 bracing and thereby prevent any possible lateral or uneven movement under the action of the keys. The graduated or curved portion C' of the key-levers C, through which the adjustable set screw *a* extends, operates
 15 the bar, to depress it a distance corresponding to the value of the key-lever, which valuation is measured according to the extent of the curve C' or the distance from the point of the adjustable set screw and the straight
 20 part of the key-lever. A vertical pitman *b* is pivoted to the bar B', at the rear of the main wheel E, the upper end of which is pivoted to the reciprocating registering arm *c* pivoted to the axis of the main wheel and extending radially to the circumference thereof.
 25 This arm is provided with a rectangular slot *c'* horizontal to the axis of the arm, into which a similar shaped sliding piece *c''* provided with a rounded surface tooth *c''* and a pin *c''*
 30 in close proximity to each other, though adapted to perform distinct and separate functions both of which will be hereinafter fully detailed. A second horizontal vibrating bar B³ is pivoted to the main shaft in a
 35 similar manner to that of B', by forwardly projecting arms, one of which is shown at D' in Figs. 2 and 3. This bar, together with the bar B' and the key-levers, is brought to a normal upward position by springs *a'*, *a''*, *a'''*
 40 attached to a horizontal bar *d*, rigidly attached to the ends of the casing at a suitable distance from the vibrating mechanism. To the bar B³ is pivoted a vertical rod or pitman *b'*, which is immediately and adjustably connected at its upper end to a vertical sliding
 45 plate *e* having slots through which are inserted screws *e'* securing it slidably against smooth surface bearings on the rear of the front part of the casing. A pendent cam *e''*
 50 is pivoted to this vertically sliding plate, and is maintained in the position shown in Fig. 1 by a wire spring *e'''* bearing against the edge thereof. The shape of the inner surface of this cam has much to do with the successful
 55 operation of my invention, and will be dwelt upon at greater length as other conjoint or co-operative parts are mentioned. At an intermediary point between the plate *e* and the toothed wheel E, a segmental grooved sliding
 60 plate *f* is secured by means of slotted ears *f'* and *f''*, through which broad headed screws are inserted; guides or flanges *f'''* projecting from the casing furnish additional means to prevent an uneven movement of the same.
 65 From the center of this plate an extension *f''* is provided upon which is placed a pin *f'''* adapted to occupy a position in one of the

slots in the vertical plate *e* and adjacent to the cam *e''*; a post *g* also extends at right angles from the extension *f''*, to which is rigidly
 70 attached one end of a transverse, adjustable rod *h*, the other end of said rod being secured likewise, to a sliding piece having teeth *h'*, *h''*, which are adapted to slide in and out of
 75 engagement with the teeth on that side of the wheel.

It will be seen that the segmental grooved plate *f*, controls in its operation, all parts that are directly attached to it, to-wit, the transverse rod *h* with the plate having the teeth
 80 *h'* and *h''*, and the bar *c''* that fits in the slot in the arm *c*, and therewith the tooth *c''*, while the cam *c''* controls, when actuated by the downward movement of the vertical plate
 85 *e*, the segmental grooved plate, by compelling the pin *f'''* to trip the inclined surface of the cam *e''* thereby withdrawing the segmental grooved plate in the direction of the cam, and
 90 allowing it to return again to its former position after the trip of the pin has been made, and thereby release the segmental grooved
 95 plate, to engage with a tooth and effect a registration by its backward movement in the direction of the arrow, Fig. 1, the extreme limit of which is shown in the position of the arm
 100 *c*, a position it is normally in, prior to the operation of a key. The operation of this mechanism to effect a primary registration is as follows: Looking at Fig. 3, it will be observed
 105 that the adding bar B', having an operating connection with the registering arm *c*, is actuated by the curved or graduated part of the key-lever to travel a distance downwardly, corresponding to the value of the key, which
 110 valuation is measured on the toothed wheel E, by a certain number of teeth; different numbers of teeth indicating the different values of the keys; for instance, for the five cent key, the wheel would be moved to the extent of one
 115 tooth, while for the ninety five cent key, it would be rotated a distance of nineteen teeth, the registration being effected as the key-lever returns to its former position, and not as it is being depressed; the values however, may be regulated to suit the character of business.
 120 Referring now to bar B³, this bar as before stated, is located directly in front of the adding bar B' and bears against the level part of the key-levers, therefore it is not affected when depressed, by the different graduations
 125 of the keys, but descends the same distance for each key, this imparts to the vertical sliding plate *e* a regulated, systematic movement, and therewith the pendent cam *e''*. In Fig. 1, it will be noted, the extreme lower point of the cam bears immediately on the pin *f'''* on
 130 the segmental grooved sliding plate *f*, and against a side of the central slot in the plate *e*, upon the depression of the bar B³ by any one of the key-levers, the cam is brought downwardly, the pin makes the trip of the cam, as shown in dotted lines in Fig. 1, and assumes its former position. As the cam descends, the segmental grooved plate *f* is drawn horizontally

to the right, looking at Fig. 1, as the pin begins the travel of the right hand side of the cam, the grooved plate thus actuated, draws with it, the sliding bar c^2 having the tooth c^3 , which action frees the tooth from the teeth of the wheel, while the registering arm c is being carried downwardly, and in the same instant the grooved plate f draws the transverse rod h , having the plate with teeth h' and h^2 , the said teeth thereby becoming engaged with the teeth at that side of the wheel, to hold it firmly, while the registering arm is descending to engage with a tooth, which it is permitted to do when the pin f^3 trips the cam; the springs $i-i$ serve to slide the segmental grooved plate back to its normal position, when the pin f^3 has completed its trip of the cam.

To practically illustrate a registration, the key having the value say of thirty cents, is pressed, the pin f^3 trips the cam c^2 , at the same moment the tooth c^3 on the registering arm c arrives at 30 on the wheel E, and is permitted to engage therewith by the grooved plate sliding to the left, looking at Fig. 1; this action also backs the teeth h' and h^2 out of gear and the wheel is thereby permitted to be carried backward in the direction of the arrow to complete the registration, thus it will be seen that the wheel E is under absolute control at all times.

Suitable stops may be employed to prevent the slightest vibration incident to the momentum imparted to the wheel from carrying the arm c , a trifle too far, by providing small stops or projections on the ends of the casing against which the bar B' stops, also an angle piece, j is attached to the casing, for the registering arm c to come against when said arm has reached the limit of its upward travel. A ring k , is secured to the front of wheel E indicating the value of each tooth, which successively appears through a sight opening k' ; the contour of the rim of this ring is irregular, to form a cam surface as shown at k^2 ; a transferring arm k^3 having a laterally projecting stud k^4 at one end, and a slot k^5 at the other, is pivoted adjacent to said rim, in a way to project the stud k^4 at right angles to and parallel with the periphery of the rim, upon which, the arm has a normal tendency to rest. The pin k^6 , attached to the adjustable piece k^7 secured between the ring and the wheel E, is carried around by the rotation of said wheel; and passes over the pin k^4 thereby pressing that end of the arm into the cam surface k^2 , and causing the arm to vibrate in its pivot, which in turn actuates the pawl l to move one tooth in the wheel E'. A stud l' projecting from the lower end of this pawl penetrates the slot k^5 and is drawn downwardly by the arm k^3 . This pawl is further, provided with a pin l^5 extending through it at right angles near the upper end, the inner end of which is inclosed in the downward curve of the connecting finger m , attached to the upper end of the segmental grooved sliding plate f , see

Fig. 1 this is the means by which the tooth of the pawl is withdrawn from the tooth of wheel E', at the same time the transfer arm k^3 slides the pawl up one tooth. The outer end of the pin l^2 regulates the movement of the pawl, by being confined within the limits of a rectangular recess in the plate n , attached to the casing, and against which the pawl is pivoted. A checking pawl l^3 with spring l^4 , maintains the wheel securely when the registering pawl l is withdrawn by the action of the segment plate f , and the pawl is freed from contact with the wheel.

I employ an improved means to prevent the operation of more than one key at a time, detail, detached views of which are set forth in Figs. 16 and 17. A horizontal plate or grid J having alternate bars and spaces, is secured to the ends of the casing at a suitable distance to allow each key-lever to penetrate the space between the bars. The grid is located on a horizontal line at right angles to and between the fulcrum and the rear end of the key-levers, and the key-lever at that point requires specially designed features as shown at p' , p^2 for purposes to be hereinafter mentioned.

The bars $p-p$, are provided with a transverse slot in which a series of individual sliding cams p^3 are adapted to slide, being provided with longitudinal slots, through which screws enter, to secure them slidingly in said slots, see Fig. 17.

Fig. 16 shows several keys in section, one of them occupying a position midway between the points of two cams, in which position it prevents the passage of any other key. The inclined portion p' of a key readily separates the points of these pieces by engaging with their inclined surfaces, which has the effect of closing up all the adjacent spaces so that another key cannot enter, and thus it will be seen, that should two keys be actuated at the one time, each will in effect press the cams toward the other, thereby preventing either from ascending the space between the bars of the grid, until pressure is removed from one. When the key-lever has traveled the full extent of the space the rounded offset p^2 still separates the adjacent cams and readily returns by the pressure exerted by the spring a^3 to its former place. Sheet 5 is confined to detached detail illustrations of the tablet-indicating mechanism included as an elemental part of my invention; though not shown relatively associated with other parts, its operation will be understood. Each key is provided with a separate and independent slotted lever q pivoted thereto at a suitable point and in a suitable way in the front of the fulcrum; one end of a bell crank q' is pivoted to the slotted end of the lever, the other end of the bell crank supports the tablet q^2 . Suitable bearings are provided in the horizontal bar R rigidly secured to the ends of the casing in a central position, the horizontal bar R' being secured to the upper surface of the bar R

whereby suitable boxes for the crank shafts are formed. The ends of the bar R are bifurcated so as to straddle the downwardly projecting parts r^5 of the horizontal grid R^2 which is provided with anti-friction rollers r' at both ends by which the grid R^2 is subjected to a vertical movement; a vertical track r^1 shown in cross section Fig. 20 is located on the ends of the casing and furnishes a rolling surface and a guide for the rollers. Fig. 18, shows two tablets, in elevated and lowered position; a pin or detent r^2 secured to the shaft of the bell crank maintains the tablets in their respective positions when elevated or lowered; in the former instance, the detent, in the rotation of the bell crank by the depression of a key-lever, is brought against the under surface of the grid R^2 which is raised until the detent reaches the space therein, when the grid rolls downwardly to its former position with the detent inclosed vertically in the space, and the tablet raised, all of which is shown in Fig. 18. In the operation of elevating the tablet the lever connecting arm of the crank makes the travel shown in dotted lines; the lever travels a distance upwardly corresponding to the length of the slot therein before the arm of the crank is affected by its movement. A tablet thus elevated remains exposed until the depression of another key operates its respective crank, the pin or detent on which is rotated against the surface of the grid thereby elevating the same, and releasing the pin or detent of the tablet exposed; the same instant that this detent is released, the one that releases it enters its respective space and exposes another tablet. Spiral springs r^3 apply tension to the bell crank by which the detent r^2 and the tablet are drawn to the horizontal position shown in full and dotted lines in Fig. 18. The tablet is prevented from falling to a lower plane by the detent coming in contact with the surface of the bar R, as appears in Fig. 20. The cash receptacle is provided in the base of the cabinet, and is stationary. The cover therefor consists of a plurality of panels o , connected longitudinally by hinges o' , each panel has a roller o^2 attached to its under surface at each end, a track s is secured to the ends of the cabinet upon which the rollers travel, a detent s' secured to the lower panel at both ends adapted to engage with a similar detent s^3 is pivoted to the ends of the cabinet, and actuated to release detent s' and thereby permit the panels to slide backwardly, under the tension of a spring that may be secured to the rear panel and to the rearward part of the cabinet.

In an application filed by myself jointly with Alvin D. Terrill, August 8, 1892, Serial No. 442,491, we have shown and described a series of adjustable and graduated key-levers, a horizontal reciprocating bar with pitmen pivoted thereto, a rotatable disk with two sets of contrary extending teeth on its periphery, and ratchet pawls actuated by said shaft and

pitmen to start and stop the wheel, and while the said key-levers and reciprocating shaft are similar to those described in this application, I do not claim herein the combination of the adjustable graduated key-levers and the reciprocating shaft with registering mechanism similar in other respects, to that described in said application.

What I claim is—

1. In a cash register and indicator, the combination with the adjustable and graduated key-levers having their fulcrum on a main shaft, of a reciprocating bar attached to arms pivoted to the main shaft adapted to be actuated by the operation of any key, a toothed wheel, a registering arm pivoted to the axis of said wheel and provided with a sliding bar having a tooth and pin on its outer end, a sliding plate having a segmental groove adapted to receive said pin, a vertical adjustable rod to connect the reciprocating bar with the registering arm, substantially as herein described.

2. In a cash register and indicator, the combination with the adjustable and graduated key-levers having their fulcrum on a main shaft, of a reciprocating bar supported on arms pivoted to the main shaft and adapted to be depressed by the operation of a key-lever, a vertical rod pivoted to the reciprocating bar, a toothed wheel, a registering arm provided with a sliding piece with a tooth and pin thereon: said arm being pivoted to the axis of the wheel, and also to the vertical rod, a segmental grooved sliding plate, and a sliding plate having teeth, diametrically opposite the segmental grooved plate, joined thereto, and adapted to move therewith by a transverse rod, substantially as herein described.

3. In a cash register and indicator, the combination with a series of adjustable graduated key-levers having their fulcrum on a main shaft, of the reciprocating bar B^3 supported on arms pivoted to the main shaft, and adapted to be pressed downwardly by the action of a key-lever, an adjustable vertical rod pivoted to the reciprocating bar, a vertical sliding plate attached to the vertical rod, a pendent cam pivoted to the vertical sliding plate, a segmental grooved cam or sliding plate with a pin thereon adapted to trip the cam, when the vertical sliding plate is carried downwardly by the action of a depressed key-lever, substantially as herein described.

4. In a cash register and indicator, the combination with the adjustable and graduated key-levers having their fulcrum on a main shaft, of a horizontal reciprocating bar B^3 supported beneath said key-levers on forwardly projecting arms pivoted to the main shaft, a vertical sliding plate connected to the bar B^3 by an adjustable rod, a pendent cam provided with an inclined surface, pivoted to the vertical sliding plate, a segmental grooved sliding plate mounted adjacent to the toothed wheel and the vertical sliding plate, a trans-

verse rod secured to said segmental plate at one end, and at the other end, to a toothed plate, the segmental plate also provided with a pin, adapted to trip the cam upon the downward movement of the vertical sliding plate thereby alternately releasing and engaging the teeth of the wheel with those of the toothed plate, and the registering arm, substantially as herein described.

5. In a cash register and indicator, the combination with the adjustable and graduated key-levers having their fulcrum on a main shaft, of the horizontal reciprocating bar B^3 , a vertical sliding plate connected thereto by a vertical rod, a pendent cam pivoted to the vertical sliding plate, a segmental grooved sliding plate provided with a pin adapted to trip said cam, whereby the segmental grooved plate is withdrawn from its normal position, and therewith, the sliding bar of the registering arm, to release the tooth thereon from engagement with the wheel, and permit said registering arm to be borne downwardly to become re-engaged with a tooth in said wheel at the end of the downward travel of the actuating key-lever, and effect a registration by the return of the arm to the normal position and therewith, the wheel, substantially as herein described.

6. In a cash register and indicator, the combination with the adjustable and graduated key-levers having fixed values, a registering wheel provided with teeth, horizontally reciprocating bars pivoted to the main shaft and extending transversely beneath the key-lever and adjacent thereto, vertical rods connecting the reciprocating bars with a vertical sliding plate, and the registering arm, a cam pivoted to said vertical sliding plate; a horizontal sliding plate provided with a segmental groove adapted to receive the pin on the sliding bar of the registering arm, a transverse rod attached at one end to a toothed slide, and at the other end, to the segmental grooved sliding plate, the latter also provided with a pin adapted to trip the cam on the vertical sliding plate, substantially as herein described.

7. In a cash register and indicator, the combination of a series of adjustable and graduated key-levers, horizontal reciprocating bars, pivoted to the main shaft, a primary toothed registering wheel, a horizontal sliding plate provided with a pin and segmental groove, a toothed sliding plate, which, together with the segmental grooved plate, is slidably mounted adjacent to the registering wheel, and diametrically opposite to each other, a transverse rod connecting said toothed and segmental grooved plates, a vibrating registering arm provided with a sliding bar at its outer end, a tooth and pin on said sliding bar, the former to engage with the teeth of the registering wheel, the latter to engage with the groove in the segmental plate, a vertical sliding plate, a pendent cam pivoted thereto, adapted to actuate the segmental grooved plate by causing

the pin thereon to make a circuit of the cam, interconnecting vertical rods between said registering arm, and vertical sliding plate, and the horizontal reciprocating bars, substantially as herein described.

8. In a cash register and indicator, the combination with a series of adjustable and graduated key-levers, having their fulcrum on a main shaft, horizontal reciprocating bars pivoted to said shaft, and a registering mechanism operated thereby, substantially as herein described, of a ring having a cam surface on its periphery and adapted to be secured against the outer face of the registering wheel, an adjustable bar attached to said ring, having a pin extending at right angles over the periphery thereof, a transferring arm pivoted transversely adjacent to said rim, provided with a stud at one end projecting above said rim at right angles, a transfer wheel pivoted above said arm, a vertical sliding ratchet pawl pivoted adjacent thereto, to a recessed bearing plate, and to the transfer arm, substantially as described.

9. In a cash register and indicator, the combination with a series of adjustable and graduated key-levers, of a series of vertical slotted levers pivoted to said key-levers, a series of bell cranks provided with bearings in a horizontal bar attached in the upper portion of the casing, one arm of said bell crank pivoted to the slotted vertical lever, the other arm supporting an indicating tablet, a horizontal grid or grate provided with alternate bars and spaces and with rollers at each end and adapted to move vertically above the bearing shaft, on vertical tracks provided for said rollers a pin attached to the shaft of the bell crank adapted to bear against the under surface of the grid, until a space therein is reached wherein the pin becomes secured and a tablet rocked into exposition, substantially as herein described.

10. In a cash register and indicator, the combination with the adjustable and graduated key-levers, the horizontal bars pivoted to the main shaft, and the registering mechanism herein described, of a series of vertical slotted levers pivoted to said key-levers, a horizontal bar rigidly attached in the upper portion of the casing to the ends thereof, a horizontal grid mounted horizontally above said bar having anti-friction rollers adapted to engage with a vertical track on the end of said casing, a series of bell cranks having their bearings on said horizontal bar, an indicating-tablet and a pin carried on said bell crank, the latter adapted to bear against the grid until a space therein is reached whereby the pin becomes secured and the tablet maintained in a raised position, a resetting spring attached to said bell crank and the horizontal bar, by means of which the pin is withdrawn from said space when the grid is elevated by a pin on the next actuated bell crank, substantially as herein described.

11. In a cash register and indicator, the com-

10 combination with the adjustable and graduated key-levers, of a series of bell cranks pivoted in the upper part of the casing, actuated by their respective key-levers, and supporting 5 their respective indicating-tablets, and a pin or detent, a horizontal grid above said bell crank, the latter adapted to be actuated vertically by said pin or detent, to raise a tablet, a resetting spring attached to said bell crank, 10 by which a tendency is exerted to withdraw said pin or detent from engagement with the grid, substantially as described.

12. The combination with the main registering wheel, of a vibrating arm pivoted to 15 the axis thereof, and having a slot at its outer end, a bar provided with a tooth and pin slidingly mounted in said slot, a sliding plate to maintain said tooth from engagement with the wheel while the arm is making a down- 20 ward trip, and to permit such engagement when the limit of the downward trip is reached, a sliding plate to maintain the wheel in a fixed position while the downward trip of the arm is being made, and to release the 25 wheel when the limit of said downward trip is reached, in order that the arm may rotate the wheel backward to effect a registration, substantially as described.

13. In a cash register and indicator, the combination with the key-levers, reciprocating 30 bars actuated thereby, and the main registering wheel, of a vibrating arm having a sliding bar with tooth and pin thereon, a segmental sliding plate having a slot for said 35 pin, and a pin, a vertical sliding plate mounted adjacent to the segmental plate, said vertical plate having a pendent cam thereon to trip the pin on the segmental plate, pitman 40 connections between the arm the vertical sliding plate, and the reciprocating bars, substantially as herein described.

14. The combination with the key-levers and the main wheel, of a vibrating arm having a slot, the sliding bar c^2 with tooth c^2 and 45 pin c^4 , a segmental plate with a groove, and a sliding plate with teeth, mounted adjacent to said wheel on opposite sides thereof, said plates adapted to simultaneously slide in the same horizontal direction by being connected 50 by a transverse rod, so that the tooth c^3 on the sliding bar, and the teeth h' and h^2 on the

sliding plate will alternately engage and release the registering wheel, substantially as herein described.

15. The combination with the key-levers 55 and the main registering wheel, of the vibrating registering arm herein described, the toothed sliding plate, the segmental sliding plate with a groove therein and a pin there- 60 on, a pendent cam to trip said pin, and there- by subject the sliding plates to a horizontal reciprocating movement at which time the registering wheel is alternately engaged and 65 released by the registering arm and one of said sliding plates, and the mechanism between said arm, pendent cam, and the key- levers, as herein described.

16. In a cash register and indicator, the combination of the main wheel provided with a cam ring on a side thereof, a bar with a pin, 70 attached to said ring so as to place said pin across the lowest portion of the cam surface, a vibrating transfer arm provided with a slot at one end and a stud at the other, pivoted 75 transversely to and above the main wheel so as to project the stud in the path of the pin on the cam ring, the slotted pawl l pivoted to a recessed bearing plate, and having a piv- 80 otal connection with the slotted end of the transfer arm, the segmental sliding plate with the finger m inclosing the pin l^2 on the pawl l , and the transfer wheel pivoted adjacent to said arm and pawl, substantially as described.

17. In a cash register, the combination of a series of graduated key levers, a horizontal 85 plate provided with vertical bars and spaces, the bars having transverse slots therein on a horizontal plane with each other, a series of pointed cams slidingly mounted in said slots, said cams being provided with oblong 90 openings through their center through which means are inserted to maintain said cams within the slot in the vertical bars, and where- in said cams are permitted to slide the extent 95 of the oblong slots therein, as herein described.

In testimony whereof I have hereunto set my hand this 18th day of January, 1893.

JOHN B. AUFULDISH.

Witnesses:

GEORGE H. WOOD,
C. E. MENTEL.