

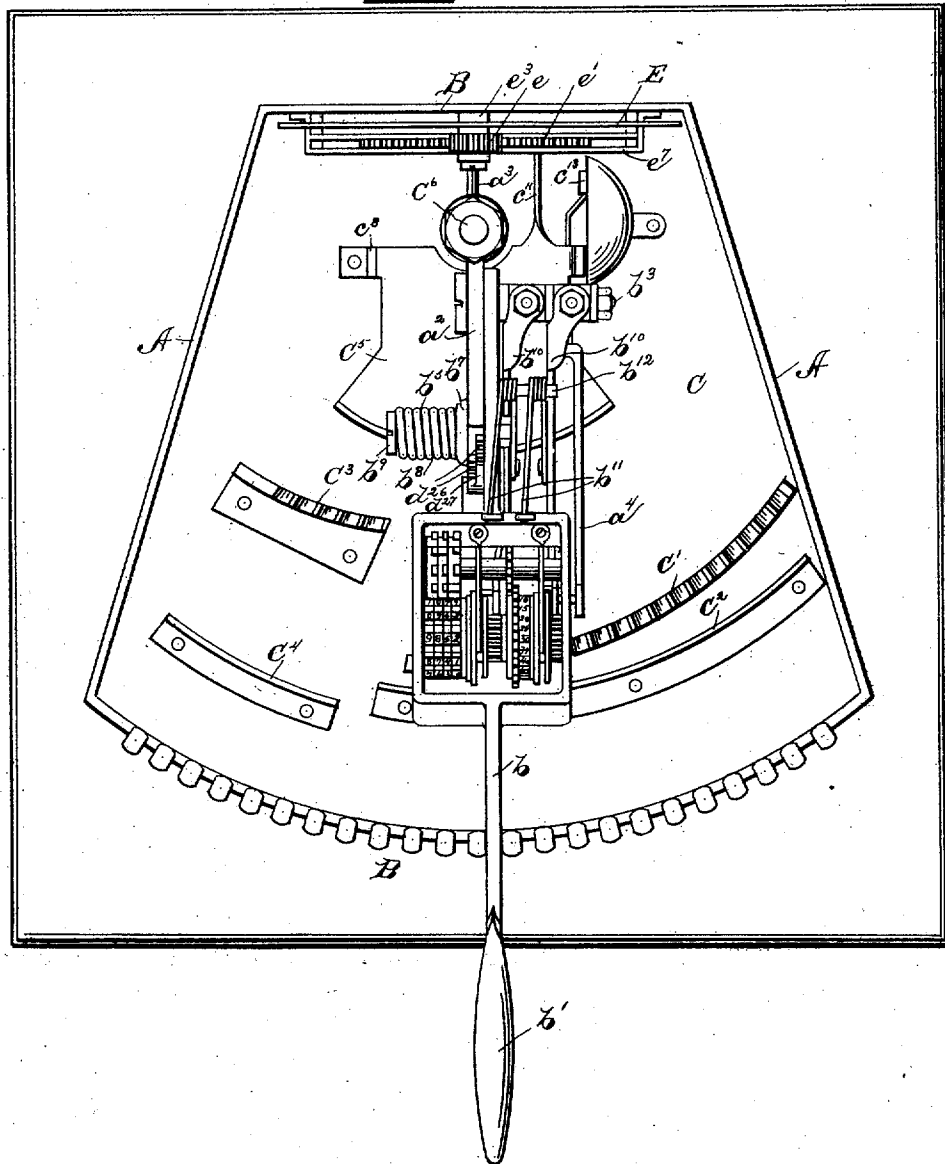
C. D. GRIMES.
CASH REGISTER AND INDICATOR.
APPLICATION FILED JULY 16, 1903.

987,131.

Patented Mar. 21, 1911.

4 SHEETS-SHEET 1.

Fig 1



Witnesses
J. L. Lavellyn, Walter
Chas. J. Welch

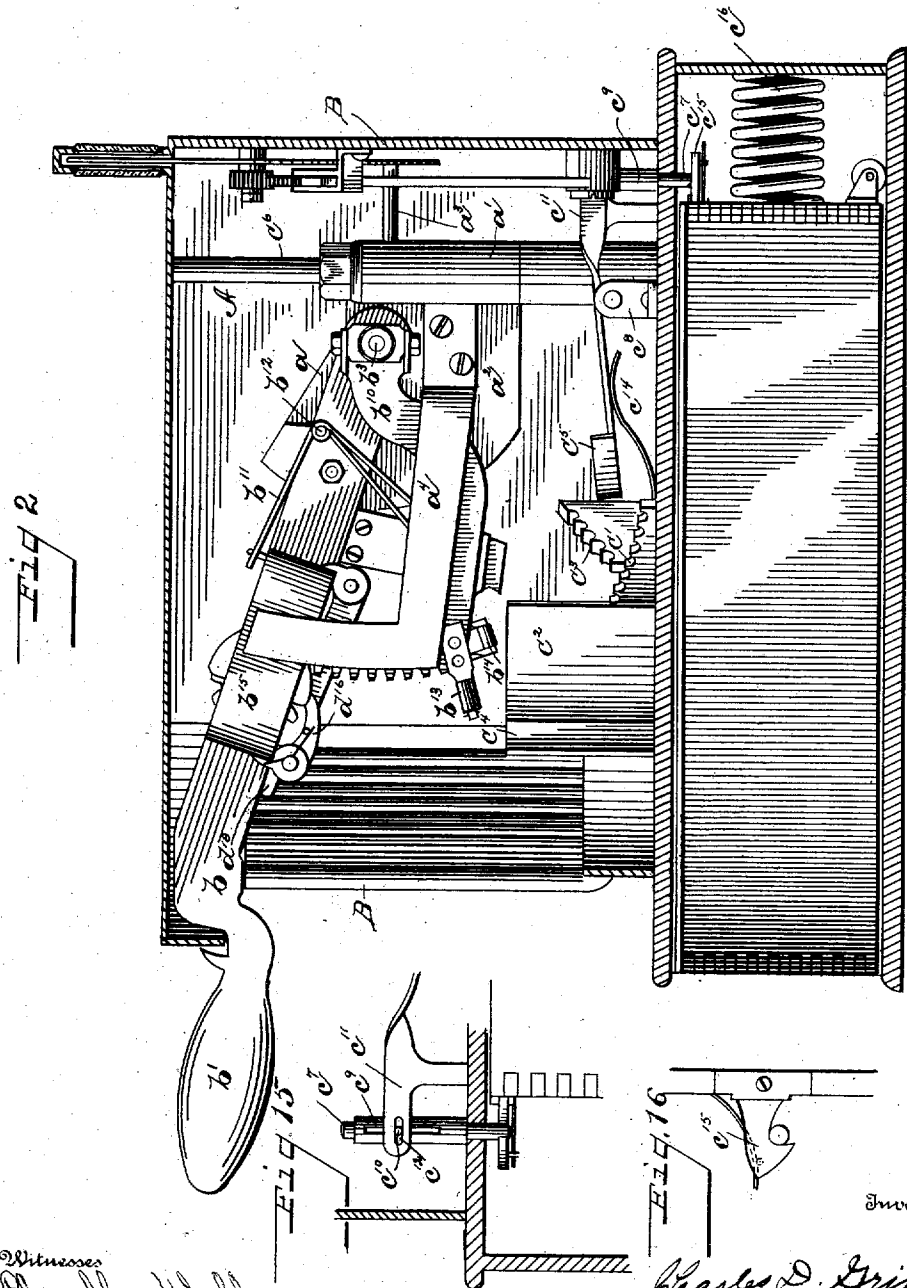
Inventor
Charles D. Grimes
By
Staley & Bowman
Attorneys

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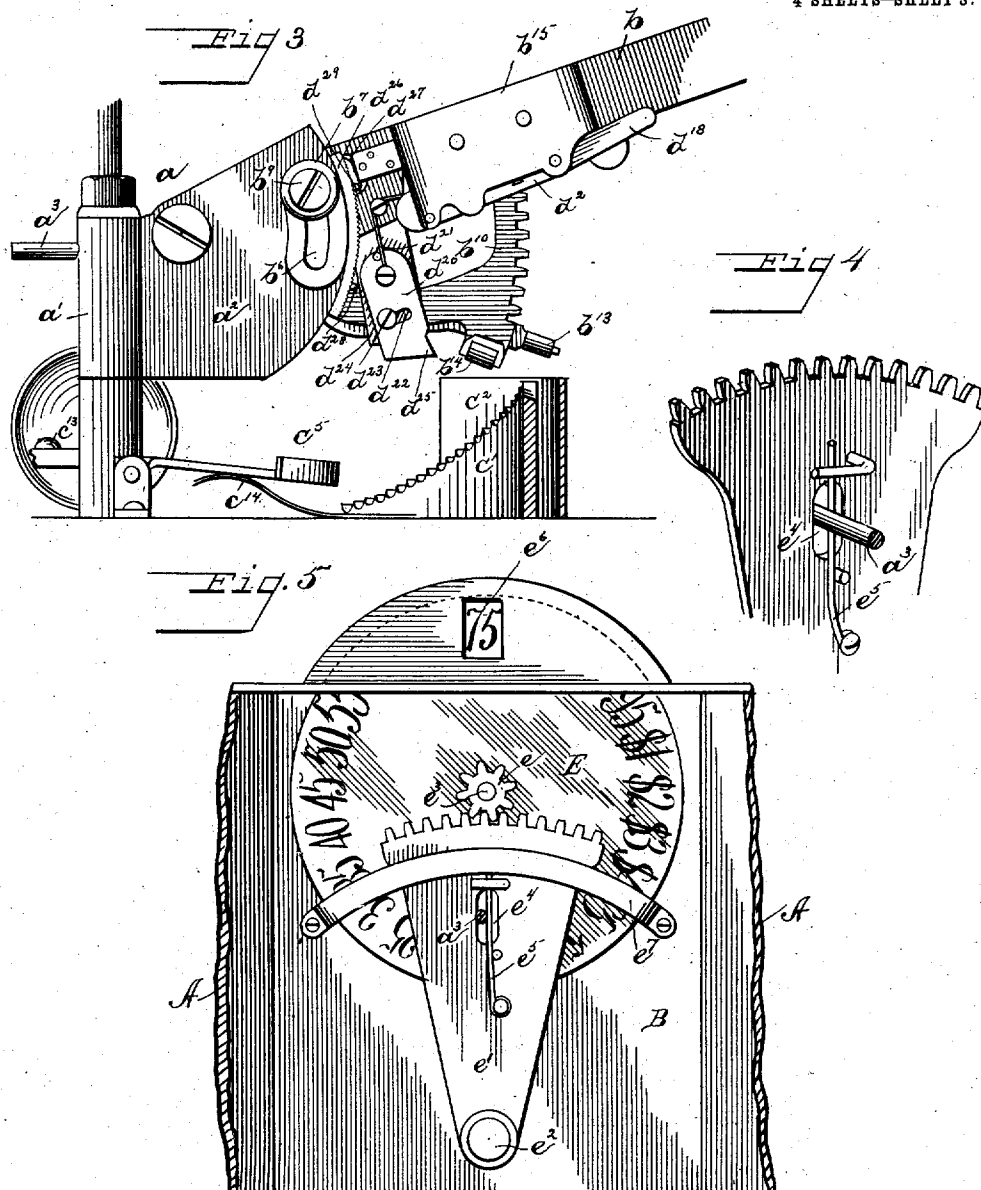


Witnesses
J. Lowell Walker
Chas. J. Welch

Inventor
Charles D. Grimes
Staley & Bowman
Attorneys

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4 SHEETS—SHEET 3.



Witnesses
J. Lowlynn Walker
Chas. J. Walsh

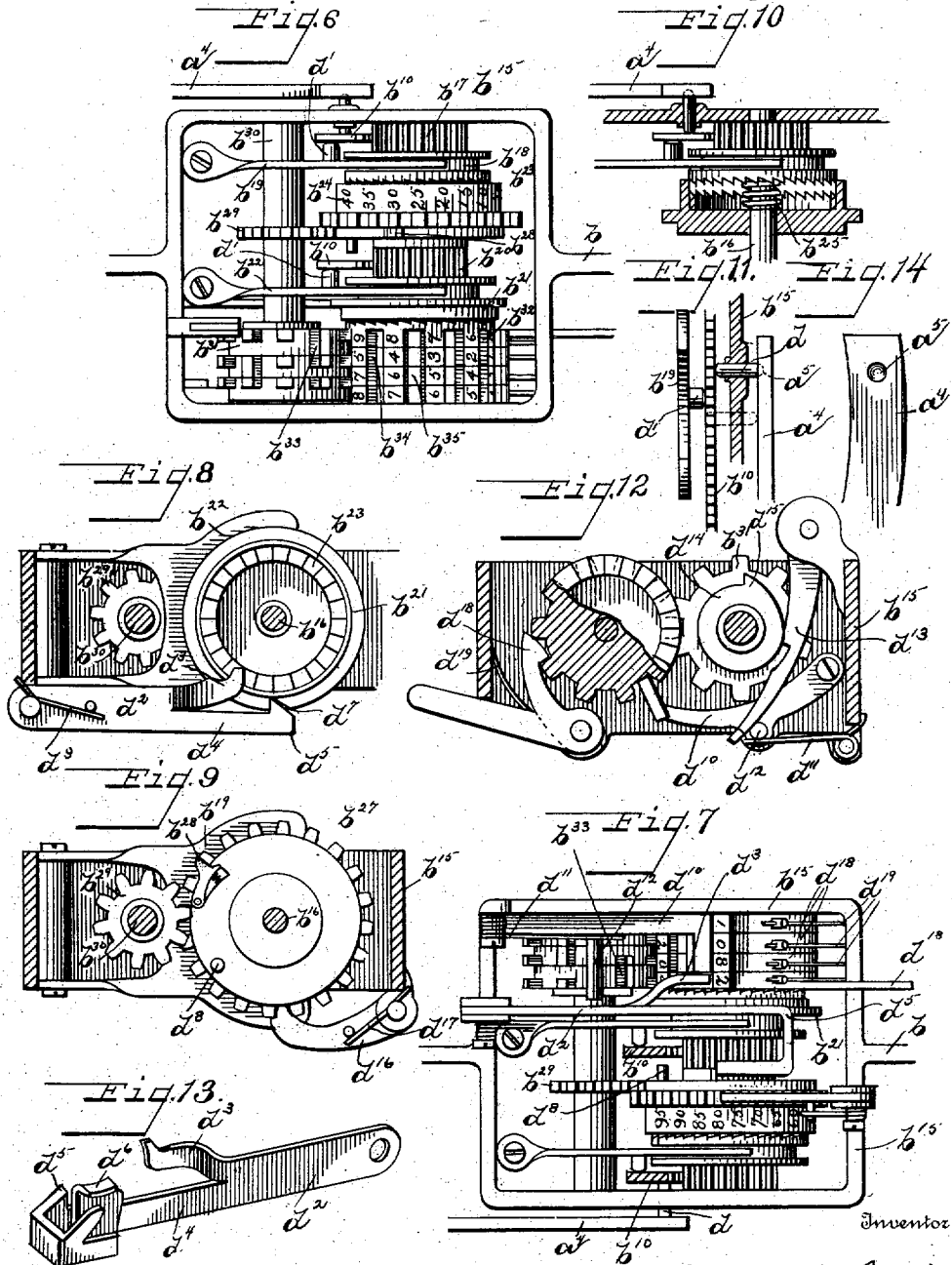
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Staley & Bowman
Attorneys

UNITED STATES PATENT OFFICE.

CHARLES D. GRIMES, OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

CASH REGISTER AND INDICATOR.

987,131.

Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed July 16, 1903. Serial No. 165,782.

To all whom it may concern:

Be it known that I, CHARLES D. GRIMES, citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a specification.

The invention relates to an improved cash register and indicator.

The improvements consist in the construction of a compact and simple machine, including a total adder, having a single operating arm, the operation of which is adapted to unlock the cash drawer, ring the bell, register and indicate varying amounts, thereby dispensing with the usual number of key levers or key stems.

With these and incidental objects in view, the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims, and a preferred form of embodiment of which is hereinafter described with reference to the drawings which accompany and form part of this specification.

In the drawings, Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a side elevation of the main operating arm to the right thereof. Fig. 3 is a detail of said arm, parts thereof being removed, viewed from the left side thereof. Fig. 4 and 5 are detail views of the indicator wheel and connections. Figs. 6 and 7 are plan views of the registering and adding wheels, together with the actuating devices. Figs. 8 to 14 inclusive are detail views of parts of the registering and adding wheels. Figs. 15 and 16 are details of the drawer locking device. Fig. 16 is a horizontal view of the drawer latch and plunger shown in Fig. 15.

Throughout the views like reference characters indicate like parts.

In a general way the novelty of the device consists in the fact that the registering and adding wheels are supported in a frame which is carried on the main operating arm, which arm is in turn pivoted on a main frame pivoted on the frame of the machine. The machine is provided with a single indicating wheel which is also operated by the main operating arm, but this specific form of indicating device is not regarded as material.

The main operating arm is constructed so as to be capable of lateral adjustment for registering. There is shown in this specific machine a cents wheel capable of registering in multiples of 5, to begin with 5 cents and registering up to 1 dollar. Adding wheels have been shown consisting of a wheel for the units dollar denomination and wheels for the tens, hundreds and thousands of dollars, are provided, but it is not desired to limit the invention to any specific number or arrangement of the registering wheels. The wheel for units dollar denomination is used as a registering wheel as will be more fully explained hereinafter.

The front of the machine, as shown in Fig. 1, is formed with open spaced slots such that the main operating arm may be depressed within these slotted openings, and a space is formed between the tops of the slats forming the frame of the machine and the top of the machine, as shown in Fig. 2 for the purpose of allowing for the lateral movement of the operating arm. The frame of the machine is formed with the sides A A and the back is marked B. The slats constituting the front of the machine are also marked B, as shown in Fig. 1. The base of the machine is marked C, and below the base is shown a drawer or cash receptacle, as shown clearly in Fig. 2, which is normally locked, but is released upon the depression of the main operating arm. As shown in Fig. 1, the base of the machine is provided with stepped or notched plates, C' and C². The plate C' is for the cents denomination and contains nineteen notches or steps graduated from right to left in different heights, as shown clearly in Fig. 2. The notch at the extreme righthand end of said plate (standing at the front of the machine as in Fig. 1) is for the lowest cents indication or registration, to-wit, 5 cents, and the notch at the extreme left end of the said plate C' is for the highest indicator or registration, to-wit, 95 cents. The plate C² at the left side of the machine is for the dollars denomination. There are five notches or steps in said plate for registering from 1 to 5 dollars.

The plates C² and C⁴ are formed of the same height and upon the extreme downward movement of the main operating arm the upper periphery of said plates contact

against the main operating arm and limit the downward movement thereof so that the main operating arm always moves downwardly the same distance whether registering in the cents or dollars denomination and whether registering the lowest amount or the highest amount.

The machine is shown as provided with holding pawls for preventing over-throw of the units dollar wheel and the other adding wheels, and the pawl for the units dollar wheel is adapted to contact against the plate so that when the main operating arm is quickly and carelessly thrown down, the contact of the main operating arm with the pawl of the plate will hold the pawl in engagement with the adding wheels so as to prevent an over-throw, but these pawls are not necessary under certain conditions as will be explained hereinafter. There is also shown in the base of the machine (see Fig. 1) a pivoted frame plate C^5 , which is connected to the locking device for the drawer and the device for ringing the bell, so that upon the extreme downward movement of the main operating arm, said plate will be depressed and the drawer thereby unlocked and the bell rung.

The machine is provided with a main shaft or support for the parts hereinafter described as marked C^6 . The main operating frame is marked a (see Fig. 2) and same consists of a plate a^2 , formed integral with a sleeve a' , which sleeve is also integrally formed with a projecting pin, a^3 . This main frame is pivoted on the shaft C^6 by reason of the fact that the sleeve, a' , is formed to fit over said shaft so that the frame rotates freely around said shaft.

The main operating arm is marked b and is pivoted to said main frame, a . There is also rigidly connected to said frame an L-shaped guide piece, a^4 , and said guide piece has its upwardly projecting arm formed with an aperture, a^5 , (Figs. 11 and 14). The main operating arm, b , is formed with a handle b^1 , which extends beyond the front of the machine and is the means used for operating the arm. (See Fig. 2.) This operating arm, b , is pivoted to the main frame, a , by means of a shaft or stud, b^3 , which extends laterally from said frame. The pin or stud, b^5 , projects from the main operating arm, b , (Fig. 1) and extends through the slotted opening, b^6 , in the main frame, a , in such a way that the stud b^5 moves within said slot. A collar b^7 is journaled loosely on the stud, b^5 , and is spring-pressed against the main frame by a spring b^8 , which is held on the stud by a head, b^9 , (see Figs. 1 and 3). The slotted opening b^6 is shown as formed with an incline such that the main operating arm will be held in any of its varying positions and remain in the position to which it is moved if the operator removes

his hand from the handle of the main operating arm. It will thus be seen that the main frame can easily be rotated about the shaft C^6 and the main operating arm will move with said frame. Said main operating arm is further capable of vertical movement about the pivot or shaft b^3 , independent of the frame, a , and during this vertical movement the collar b^7 slides over the face of the main frame, while the pin or stud b^5 , projecting from the main operating arm, b , slides freely within the slotted opening, b^6 . The construction is such that the main operating arm is held yieldingly against the main frame and is capable of vertical movement independent of the movement of said frame. There is also pivoted on the shaft or stud, b^3 , (Figs. 2 and 3) auxiliary actuating rack arms, b^{10} . There is one of these arms for the cents denomination and one for the units dollar denomination. They are normally held in the extreme downward position, as shown in Fig. 2, by the springs b^{11} , which are fastened at their respective upper ends to the main operating arm b , as shown in Fig. 2, and are coiled at the center about a pivot, b^{12} , and fastened at the lower end to the rack arm, b^{10} . Said cents rack-bar is pivoted on the shaft, b^3 , at the extreme right thereof, as shown in Fig. 1, and said rack bar is formed with a projecting roller, b^{13} , shown in Fig. 2, whereas the dollar rack-bar is formed with a downwardly projecting roller marked b^{14} , also shown in Fig. 2.

In general explanation it may be said that the main operating arm is moved laterally to a slotted opening in the front of the machine corresponding to the value which is to be indicated and registered. The arm is then depressed and moved downwardly on the pivot, b^3 , and is guided by the slotted opening and held against any further lateral movement until it is returned again. Means are provided as hereinafter described for preventing any upward movement of the arm after the operator begins to depress the same. No registration is made until one of the rollers, b^{13} or b^{14} , strikes against a stepped plate, C' or C^3 , and whenever this occurs, the rollers will fall within one of the notched openings in said plate and the rack arms will be stopped.

The registering frame, b^{15} , is formed integrally with the main operating arm, b , and the shaft, b^{10} (see Fig. 10) supports the registering elements herein shown as wheels and is in turn supported by the frame b^{15} . The auxiliary actuating rack arm, b^{10} , for the cents denominations gears with a pinion, b^{17} , which is loosely journaled on said shaft, b^{10} , and said pinion is formed integral with a clutch, b^{18} . There is a clutch arm, b^{19} , for the cents pinion. The other auxiliary actuating rack arm, b^{10} , for the dollars denomination, gears with a pinion, b^{20} , which is

also journaled loosely on the shaft, b^{16} , that is formed integral with the clutch, b^{21} , and there is also a clutch arm b^{22} , for the dollar denominations (see Figs. 6, 7, and 10). The
 5 clutches b^{18} and b^{21} , are formed with ratchet teeth, b^{23} . These ratchet-teeth are shown for engagement with ratchet-teeth on the corresponding counter wheel for the cents denomination and the counter or registering
 10 wheel for the units dollar denomination. There are 20 ratchet-teeth because of the fact that there are 20 different registrations or spaces for each of said wheels. When the ratchet-teeth of the clutches are in engage-
 15 ment with the ratchet-teeth formed on the corresponding register or counting wheels, the clutches are held locked in engagement with the registering wheels and same are held locked until the clutches are thrown
 20 out of engagement as hereinafter explained. The counter wheel for the cents denomination, b^{24} , is journaled loosely on the shaft b^{16} . The spring, b^{25} , normally holds the clutch b^{18} for the cents denomination in dis-
 25 engaging position and in this position the ratchet-teeth b^{23} are disengaged from the ratchet-teeth b^{26} formed on the said counter or registering wheel b^{24} (see Fig. 10). There is a corresponding spring for holding
 30 the clutch of the units dollar denomination in disengaging position. As shown the numbers on the counter wheels begin with 5 and run in multiples of 5 as high as 95, but obviously two or more counter wheels can
 35 be substituted for one counter wheel for the cents denomination and thereby increase the capacity of the machine. Said wheel b^{24} is formed integral with a pinion b^{27} as shown in Figs. 7 and 9. Said pinion b^{27} has a
 40 spring pressed tooth b^{28} for transferring purposes, and upon one complete revolution of said counter-wheel the spring-pressed tooth b^{28} is adapted to engage the teeth of the pinion, b^{29} (Figs. 6 and 9), journaled
 45 rigidly on the shaft b^{30} , which is also supported by the frame b^{15} , and said pinion b^{29} is thereby moved a distance corresponding to one tooth of said pinion. The tooth is spring-pressed to prevent any movement of
 50 counter wheel when the units dollar wheel is moved, which movement would occur if the tooth b^{28} happened to be in engagement when the units dollar wheel began to move. On the left end of said shaft, b^{30} , viewing
 55 same from the front, there is rigidly secured a pinion, b^{31} , which gears with adding or units dollar wheel, b^{32} . This first adding wheel is loosely journaled on shaft b^{16} . There is formed on said pinion, b^{31} , one
 60 tooth b^{33} (see Fig. 6) which is wider than any of the other teeth on said pinion wheel and extends within the path of movement of the teeth of the adding wheel, b^{34} , which adding wheel gears with a pinion journaled
 65 loosely on said shaft, b^{30} . The adding wheel,

b^{34} , is for the tens of dollars denomination. The next adding wheel, b^{35} , is the hundreds and the next the thousands dollar wheel. It will thus be seen that whenever the pinion, b^{31} , makes one complete revolution, it will
 70 move the next adding wheel, to-wit, the tens of dollar wheel, b^{34} , a distance equal to one tooth by reason of the contact of the teeth, b^{33} , with the teeth of said adding
 75 wheel, b^{34} , and whenever the adding wheel, b^{34} , has made one complete revolution, it will have caused the pinion wheel with which it gears to move one complete revolution, and by reason of the said pin-
 80 ion wheel having a tooth corresponding to the tooth, b^{33} , which extends within the path of movement of the teeth of the next succeeding adding wheel, to-wit, the hundreds dollar wheel, b^{35} , said wheel, b^{35} , will be
 85 moved a corresponding distance of one tooth, and whenever said adding wheel b^{35} has made one complete revolution, it will cause a movement of the highest dollar wheel a corresponding distance of one tooth by
 90 the same means as that just described.

Means are provided for moving laterally the auxiliary actuating rack-arm, b^{10} , for the cents denominations at the beginning of the depression of the main operating arm so as to throw the clutch, b^{18} , into gear with
 95 the counter wheel, b^{24} , so that whenever the auxiliary actuating arm is moved vertically through the register frame it will cause the counter wheel to move therewith. The pin-
 100 ion b^{20} of the dollars denominations, gears with the auxiliary actuating arm, b^{10} , and means are provided for forcing said actuating arm, b^{10} , toward the left and thereby en-
 105 gaging the clutch, b^{21} , with the adding wheel of the dollars denomination, b^{32} , whenever the said actuating arm, b^{10} , of the dollars denomination is moved, there being this difference that the auxiliary actuating arm of the cents denomination throws the clutch
 110 into engagement with the counter wheel of the cents denominations at the beginning of the depression of the main operating arm, whereas in registering in the dollars denominations the clutch is not thrown into
 115 gear until the auxiliary actuating arm of that denomination begins to operate. Either means may be employed, though the means shown for cents denomination is more positive.

An indicator wheel marked E, has been
 120 shown which is journaled loosely on a stud or shaft, e^3 , extending from the frame of the machine. A spur wheel, e , is formed integral with said indicating wheel E and a rack arm, e' , (see Fig. 5) engages with the
 125 teeth of said spur wheel, e . The rack arm is pivoted on the shaft e^2 which also projects from the frame of the machine. The pin, a^3 , which is formed integral, as heretofore explained, with the main frame, a , fits within
 130

an opening, e^4 , formed within the rack-arm, e' . The opening, e^4 , is formed so that the pin, a^3 , has lateral movement therein. A spring, e^5 , presses against the pin, a^3 , as shown in Fig. 5, and the construction is such that when the main frame, a , and the main operating arm, b , are moved laterally, the pin, a^3 , will operate the rack-arm, e' , and cause it to move from one side of the machine to the other and move the indicating wheel so as to indicate the amounts from 5 cents up to 5 dollars through the slotted opening, e^6 , (shown in Fig. 5). In Fig. 5 a guide plate, e^7 , over said rack-arm, e' has also been shown. As shown in Fig. 4 the spring e^5 takes care of the lost motion and will permit the pin a^3 , to move from one side of the slot, e^4 , to or near the opposite side, but will hold said pin yieldingly in proper position.

In the operation of the registering and adding devices of the cents denomination, the clutch b^{18} , is thrown to the left, as heretofore explained, at the beginning of the downward movement of the main operating arm, b . This is effected by the pin, d , (see Fig. 11) which normally extends within the aperture, a^5 , of the L-shaped arm, a^4 , on the main frame, a . This pin is supported within the registering frame, b^{15} . So soon as the main operating arm, b , is depressed, the pin d is pushed out of the aperture a^5 , and sliding on the face of the L-shaped arm, a^4 , is forced at the other end against the rack actuating arm, b^{10} , which in turn presses against the pin, d' , (see Fig. 6) formed on the clutch arm, b^{19} , which forces the clutch b^{18} to the left and engages the ratchet-teeth, b^{23} , of said clutch b^{18} , with the ratchet-teeth of the counter wheel, b^{24} , the same are locked into engagement until the return of the operating arm, so that whenever the actuating rack arm, b^{10} , is operated, the counter wheel will rotate therewith and be moved a corresponding distance. In the dollars denomination the machine has been so constructed that the rack actuating arm, b^{10} , is moved toward the left, when the roller, b^{14} , contacts within any one of the notches of the plate C^3 (Fig. 2) and these notches are formed so that when the roller touches the notch it will be gradually forced to the left and force therewith the actuating rack-arm, b^{10} , of the dollars denomination, so as to throw the clutch arm, b^{22} , by reason of the contact of the actuating rack arm, b^{10} , against the pin, d' , formed on said clutch arm, b^{22} , and cause the ratchet teeth of the clutch, b^{21} , to engage with the ratchet teeth of the dollar wheel of the units denomination marked b^{32} (see Fig. 6). It is obvious that the L-shaped piece for the dollars actuating arm can be duplicated, which will be a more positive lock for holding the clutch and registering wheel together.

The general operation of the machine, therefore, is as follows: The movement of the main operating arm to the right or to the left by the force of the operator applied at the handle, b' , easily moves the main frame, a , and all of the registering and adding parts therewith until the main operating arm, b , reaches a position for the proper value to be registered and indicated. In the machine shown, the amount is indicated through the slot e^6 , as heretofore explained, so soon as the main operating arm is moved to its proper position and before same is depressed. It will therefore be apparent that the operator can determine when the proper position has been reached by observing the indicator E. If amounts are to be registered, added and indicated of the cents denomination, the main operating arm moves to the right side of the machine, and the clutch, b^{18} , of the cents denomination is thrown into engagement with the counter wheel, b^{24} , so soon as the arm begins its downward movement, and after the main operating arm, b , has been depressed in the initial movement, the roller, b^{13} , formed on the lower end of the actuating rack arm, b^{10} , of that denomination, contacts with the proper notch or step formed in the plate C^1 , and during the balance of the downward movement of the main operating arm, b , the actuating rack-arm, b^{10} , is stopped by the contact of the roller, b^{13} , within said notch and the counter wheel is moved a corresponding distance by means of the engagement of the ratchet-teeth of the gear with those on the counter wheel.

If the registration is in the dollars denomination, the main operating arm is moved to the left side of the machine (viewing same from the front thereof) and upon the downward depression of said main operating arm, b , the roller, b^{14} , formed on the actuating arm, b^{10} , for the dollars denomination, contacts with the proper notch on the plate C^3 and immediately the clutch, b^{21} , is thrown into engagement with the dollars wheel, b^{32} , of the units denomination, and during the further downward movement of the said main operating arm, b , the rack-arm, b^{10} , is moved a proper distance to register on the units dollar wheel, b^{32} , the amount to be registered by means of the engagement of the ratchet teeth on the gear with the ratchet teeth on the dollar wheel. It will thus be seen that the lateral adjustment of the operating handle, and thereby the register elements and actuating rack arm, determines the amount to be registered upon the counter wheels. The vertical movement of the operating handle effects an invariable vertical movement of the register frame at each operation of the machine. The vertical movement of the actuating rack arm, however, is variable and is dependent

as to extent upon the lateral displacement of the operating handle from normal zero position. The registering movement is effected after the actuating rack arm has been arrested in its movements, by the stepped plate mounted on the base of the machine. If "95¢" is to be registered, the actuating rack arm will be arrested at the beginning of the movement of the operating handle and the counter wheel will be given a movement over the entire rack. If "50¢" is to be registered, the rack will be moved to an extent which will allow a sufficient portion of the rack to remain in the path of the counter wheel to effect a registration of the desired amount. It will thus be seen that the amount registered is commensurate to the difference in the vertical movements of the register frame and the actuating rack frame.

A holding pawl, d^2 , has been shown for the wheel b^{32} of the units dollars denomination (see Figs. 7, 8 and 9). This holding pawl is bifurcated at its end, having two separate arms, d^3 and d^4 . The end of the arm d^3 is normally in engagement with the teeth of the wheel of the units of dollars denomination. The arm, d^4 , is L-shaped, as shown in Fig. 7, and at the end, d^5 , said arm normally engages with the groove or slot, d^7 , (Fig. 8) formed on the periphery of the clutch, b^{21} , so that whenever the clutch, b^{21} , begins to operate, the register wheel of the units of dollars denomination will be released from the holding pawl, d^2 . A projecting piece, d^6 , formed on the arm d^2 , extends into the path of movement of a pin, d^8 , formed on the flange of the pinion b^{27} (see Fig. 9) and whenever the counter wheel and this pinion, b^{27} , for the cents denomination make one complete revolution, the pin, d^8 formed on said pinion, will contact against the arm, d^6 , and release the dollar wheel of the units denomination for transferring purposes. Consequently, whenever the cents have been registered and indicated sufficient to cause a complete revolution of the counter wheel the units dollar wheel will be released from its holding pawl for the purpose of transferring and adding one dollar on said units dollar wheel. A spring, d^9 , on said holding pawl d^2 , (Fig. 8) normally holds said pawl in proper engaging position. For the adding wheels other than the units dollar wheel there is a pawl, d^{10} , (Figs. 7 and 12) which is formed to hold simultaneously all of said adding wheels other than said units dollar wheel. The spring, d^{11} , normally holds said holding pawl in engaging position. A projecting pin, d^{12} , is formed on said pawl and normally contacts against an arm, d^{13} , which is pivoted to a bracket on the register frame, b^{15} . A hub, d^{14} , of the pinion, b^{31} , (Fig. 12)

which is the pinion corresponding with the dollar wheel of the units denomination, is formed with a cam, d^{15} , so that upon a complete revolution of the pinion, b^{31} , the cam, d^{15} , will contact against the notch (Fig. 12) formed on the arm d^{13} , which in turn presses against the pin, d^{12} , and releases all the adding wheels other than the units denomination for the purpose of transferring amounts to said wheel. Consequently whenever the pinion and the dollar wheel of the units denomination make one complete revolution the adding wheels of a denomination higher than said units denomination are released so as to move one tooth for the purpose of adding thereon the amount already registered, and said wheels are immediately locked thereafter to prevent overthrow. The notch formed in said arm, d^{13} , insures a quick movement of the pawl. For the counter wheel b^{24} a pawl marked d^{16} has been provided (see Fig. 9). A spring d^{17} normally holds said pawl in proper engaging position. This pawl is for the purpose of preventing any back movement of the counter wheel, b^{24} , consequently said wheel is rotated only in one direction and so long as the arm b^{10} is connected with said counter wheel through the pinion, b^{17} , and the clutch, b^{18} , with its ratchet-teeth, the rack-arm cannot be moved to its normal position on account of this holding pawl, d^{16} . This return movement of the rack-arm will be prevented until the main operating arm, b , is restored to its normal position or extreme upper position, when the pin, d , will again enter the aperture, d^5 , (see Figs. 11 and 14) and thereupon the spring, b^{25} , (Fig. 10) will throw the clutch b^{18} out of engagement with the counter wheel and the rack arm b^{10} will at once be thrown to downward or normal position by its spring b^{11} , and the parts are then ready for another registration and indication.

A series of pivoted pawls, d^{18} (Figs. 7 and 12) are provided for the purpose of preventing any back movement of the adding wheels. There is one of these pawls for each adding wheel and same are pressed into normal position by a series of springs, d^{19} . As heretofore stated, these pawls are unnecessary excepting under certain conditions. If, instead of relying upon the notches in the plate or moving the units dollar actuating arm laterally, the L-shaped arm, d^4 , of the cents denomination be duplicated and the pin, d , and other parts, such that the actuating rack arm for the dollars denomination will be moved laterally at the beginning of the downward movement of the main operating arm, causing thereby the ratchet teeth of the clutch to engage with the ratchet teeth of the units dollar denomination and hold said clutch locked in engagement with the registering wheel until the return of the

main operating arm to its upper normal position, there will be no danger of any overthrow of the units dollar adding wheel by careless or willful operation of the machine.

5 But in the construction, to-wit, using simply the notches in the plates of the base of the machine for moving the rack arm of the units dollar denomination laterally, there is danger of overthrow unless pawls like those
10 marked d^{18} are used. When the main operating arm reaches its limited downward movement, the projecting arm of the pawl, d^{18} , will contact against the plate and any severe or careless operation of the main operating arm will result in forcing the pawl
15 d^{18} into engagement with the dollars adding wheel and same will be held in engagement by contact against the plate so as to prevent any possible overthrow of the adding
20 wheels.

The pawl, d^{20} , (Fig. 3) is for actuating the locking devices for the drawer. A spring, d^{21} , is fastened at one end to said pawl and is shown bent around a pin on the
25 operating arm, b , and fastened at the other end to said arm. There is formed in said pawl, d^{20} , a slot, d^{22} , and a pin, d^{23} , which projects from a plate, d^{24} , supported on said main operating arm, b , projects within the
30 slotted opening, d^{22} , and moves freely therein. When the arm, b , has reached nearly its extreme downward movement, the end, d^{25} , of the pawl, d^{20} , contacts against the flange of the pivoted frame plate C^5 . Said
35 frame plate is pivoted on brackets formed in the base of the machine and connects with the locking devices for the drawer and the hammer for the bell. The plunger, c^7 , is held loosely within a guide sleeve, c^9 . The
40 brackets for the plate frame, C^5 , are shown at c^8 (Figs. 2 and 15.) A pin, c^{10} , is formed on the plunger, c^7 , and extends laterally therefrom. The arm, c^{11} , which is a part of the pivoted frame, C^5 , extends rearwardly
45 from said frame and is formed with a slotted opening at c^{12} , within which fits the pin, c^{10} . A bell hammer, c^{13} , is also connected to the pivoted frame plate, C^5 . A spring c^{14} normally holds the pivoted frame
50 plate in its upward position. As just explained, the end, d^{25} , of the pawl, d^{20} , contacts against the flange of the frame plate, C^5 , and forces same downwardly against the tension of the spring, c^{14} , until the end, d^{25} , slides past the flange of the frame plate C^5 .
55 During the return movement of the operating arm, b , the pawl, d^{20} , is moved rearwardly against the tension of the spring, d^{21} , and the end, d^{25} , passes freely over the flange of the frame plate, C^5 . When the
60 frame plate is depressed, the rearwardly extending arm, c^{11} , is raised and raises therewith the plunger, c^7 . This plunger at its lower end engages with a latch, c^{15} , for the
65 drawer (see Fig. 2) and so soon as the plun-

ger, c^7 , is raised, the drawer is released and the spring c^{16} , forces it open. The latch, c^{15} , is normally spring-pressed to the left so that whenever the plunger, c^7 , is raised the latch will immediately be spring-pressed to
70 the left and the latch itself will prevent the plunger from again dropping back into locking position, until the drawer is opened. When the drawer is pushed inward to locking position the beveled end of the latch, c^{15} , (Fig. 16) will contact against the plun-
75 ger and the latch will be moved laterally against the tension of the spring shown in said figure until the plunger is again engaged and the drawer locked as hereinbefore explained. When the drawer has been
80 opened the latch upon the return movement of the drawer will contact against the end of the plunger, c^7 , and the said latch will be moved to the right against the tension of its
85 spring until the end of the latch drops into engagement with the end of said plunger. By this construction the drawer when once unlocked will remain unlocked until open and thereby a drawer spring can be dis-
90 pensed with.

The bell hammer, c^{13} , is raised when the front end of the frame plate is depressed and the bell is operated so soon as the end, b^{25} , of the bell, b^{20} , passes the flange of the
95 frame plate C^5 , which occurs at the end of the downward movement of the main operating arm, b . This is true for the reason that the front end of the frame plate, C^5 , is immediately raised by the spring, c^{14} , and
100 upon the upward movement of the front end of the frame plate C^5 the hammer strikes the bell.

Ratchet teeth are formed on the plate, a^1 , of the main frame, a , for preventing the return movement of the main operating arm, b , until a complete depression thereof, or a
105 partial depression of said arm, b , during its upward movement and until the complete return of said arm. (Figs. 1 and 3.) There are two rows of ratchet teeth shown in Fig. 1, marked d^{26} . A double pawl, d^{27} ,
110 has one end extending in the path of one row of ratchet teeth. The other end of said pawl extends in the path of the other row of ratchet teeth. During the downward movement of the main operating arm, b , the upper end of the double pawl, d^{27} , engages with one row of ratchet teeth until at the
115 extreme downward movement of said operating arm the upper end of said pawl is forced rearwardly and the downward end of the pawl is forced into engagement with the other row of ratchet teeth by the contact of the pin, d^{28} , against the upper end of
120 said pawl. Upon the return movement upwardly of the main operating arm, b , the lower end of the pawl, d^{27} , engages with its corresponding ratchet teeth so as to prevent any downward movement of the operating
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arm, *b*, until upon the extreme upward movement of said operating arm, *b*, the lower end of the pawl, *d*²⁷, is forced upwardly by contact against the pin, *d*²⁹, and the upper end of the pawl is then thrown into engagement with its corresponding ratchet teeth.

While the form of mechanism herein shown and described is admirably adapted to fulfil the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein disclosed, for it is susceptible of embodiment in various forms all coming within the scope of the claims which follow.

Having thus described my invention, I claim:

1. In a cash register, the combination with a register, of supporting means for same permitting a movement of the register in one direction to determine the entry thereon and a movement of the register in another direction to cause the entry on the register to be made, together with devices for causing said entries to be made.

2. In a cash register, the combination of a pivoted main frame, a main operating arm pivoted on said main frame, registering devices supported by said main operating arm and moving therewith, and actuating devices for said registering devices for registering amounts when said main operating arm is depressed, for the purpose specified.

3. In a cash register and indicator, the combination of a pivoted main frame and indicator connected with the main frame and operated thereby, a main operating arm pivoted to said main frame, registering devices supported by said main operating arm and adapted to be operated during a part of the movement of the same.

4. In a cash register, a main operating arm, registering devices supported by said main operating arm, means for supporting said main operating arm, said arm being adapted to be moved both laterally and vertically, for the purpose specified.

5. In a cash register and indicator, a main frame with an operating arm supported thereby, registering devices supported on said operating arm, means for rotating the frame laterally together with the main operating arm, and means for moving the main operating arm vertically independent of said main frame, for the purpose specified.

6. In a cash register, a shaft supported by the machine frame, a main frame pivoted to said shaft, a main operating arm pivoted to said frame, and auxiliary actuating devices also pivoted to said frame and adapted to be moved independent of the movement of the main frame, registering devices supported by said main operating arm and adapted to be operated by the auxiliary ac-

tuating devices during the movement of the main operating device, for the purpose specified.

7. In a cash register, a main pivoted frame, a main operating arm, a register frame supported on said main operating arm and movable therewith, registering devices supported by said register frame, actuating devices pivoted to said main frame, and means for causing the operation of the registering devices by the actuating devices during the movement of the main operating arm, for the purpose specified.

8. In a cash register, the combination of a main frame, a main operating arm pivoted to said main frame, a register frame supported by said main operating arm and moving therewith, a series of registering devices supported by said register frame, a series of auxiliary actuating devices pivoted to said main frame, and means for operating said actuating devices, for the purpose specified.

9. In a cash register, a pivoted main frame capable of lateral oscillation, a main operating arm pivoted to said main frame, a series of registering wheels supported by said main operating arm and moving therewith, a series of auxiliary actuating devices pivoted to said main frame, means for operating any one of the series of auxiliary actuating devices during the vertical movement of the main operating arm, for the purpose specified.

10. In a cash register, a main pivoted frame, a main operating arm pivoted to said main frame, a series of registering wheels supported by the main operating arm, a series of actuating devices pivoted to said main frame, means for moving any one of said series of actuating devices independent of the other actuating devices during the movement of said main operating arm, for the purpose specified.

11. In a cash register, a main frame, a main operating arm pivotally supported by said main frame, registering wheels supported by the main operating arm, actuating devices for said registering wheels, means for operating said actuating devices and registering wheels during the downward movement of the main operating arm and for moving said actuating devices independent of the registering wheels during the return movement of said main operating arm, for the purpose specified.

12. In a cash register, a main frame, a main operating arm pivotally supported by said main frame, registering wheels supported by the main operating arm, actuating clutches for said registering wheels, auxiliary actuating arms for moving the actuating clutches and registering wheels during the downward movement of the main operating arm and for moving said actuating

clutches independent of the registering wheels at the end of the return movement of said main actuating arm, for the purpose specified.

- 5 13. In a cash register, a main frame, a main operating arm pivotally supported by said main frame, registering wheels supported by the main operating arm, actuating clutches for said registering wheels, and actuating arms supported on said main frame for actuating said actuating clutches and registering wheels during the downward movement of said main operating arm and for moving said actuating clutches independent of the registering wheels at the end of the return movement of said main operating arm, for the purpose specified.

- 10 14. In a cash register, a main frame, a main operating arm pivotally supported by said main frame, registering wheels supported by the main operating arm, actuating devices for said registering wheels normally disengaged from said registering wheels but adapted to be thrown into engagement therewith during the downward movement of said operating arm and to be disengaged therefrom during the return movement of said operating arm, for the purpose specified.

- 15 15. In a cash register, a main frame, a main operating arm pivotally supported by said main frame, registering wheels supported by the main operating arm, actuating clutches normally disengaged from said registering wheels but adapted to be thrown into engagement therewith at the beginning of the downward movement, auxiliary actuating arms for moving the actuating clutches and registering wheels during the downward movement of the main operating arm and for moving said actuating clutches independent of the registering wheels at the end of the return movement of said main actuating arm, for the purpose specified.

- 20 16. In a cash register, a main frame, a main operating arm pivotally supported by said main frame, registering wheels and clutches for said registering wheels normally disengaged therefrom but adapted to be thrown into engagement therewith at the beginning of the downward movement of the operating arm, actuating arms supported on said main frame for operating said actuating clutches and registering wheels during the downward movement of said main operating arm and for moving said actuating clutches independent of the registering wheels at the end of the return movement of said main operating arm, for the purpose specified.

- 25 17. In a cash register, a pivoted main frame, a main operating arm pivoted to said frame, a series of registering wheels and a series of actuating clutches, and a series of auxiliary actuating arms pivoted

to said frame, means for holding normally disengaged the actuating clutches from the registering wheels, means for engaging the actuating clutches of one series with its corresponding registering wheel at the beginning of the downward movement of the main operating arm, and means for also engaging the other actuating devices with the corresponding register wheels at the beginning of the movement of the main operating arm, and means for operating the auxiliary actuating arms, for the purpose specified.

- 30 18. In a cash register, a main pivoted frame, a single main operating arm pivotally-supported thereby, registering devices supported by the main operating arm, an actuating arm pivoted to the main frame, and a guide piece also supported by the main frame, means for moving the end of the actuating arm laterally during the downward movement of the main operating arm, for the purpose specified.

- 35 19. In a cash register, a main pivoted frame, a main operating arm pivotally supported thereby, a spring-pressed actuating arm pivotally supported on said main frame and capable of a limited lateral movement, a guide piece rigidly supported on the main frame and adapted to cause the end of the actuating arm to move laterally during the downward movement of the main operating arm.

- 40 20. In a cash register, a main pivoted frame, a main operating arm pivotally supported thereby, a spring-pressed actuating arm pivotally supported by said main frame with its end capable of a limited lateral movement, a guide piece rigidly supported on the main frame and adapted to cause the end of the actuating arm to move laterally at the beginning of the downward movement of the main operating arm.

- 45 21. In a cash register, a main supporting shaft on the machine frame, a main frame pivoted on said shaft, a main operating arm pivotally supported on said main frame, an actuating arm also pivotally supported on said main frame, plates on the base of said machine adapted to operate the actuating arms during the downward movement of the main operating arm, for the purpose specified.

- 50 22. In a cash register, a main supporting shaft on the base of the machine frame, a main frame pivoted thereon, a single operating arm pivotally supported by the main frame, registering devices supported by the main operating arm, a series of actuating arms pivoted on the main frame, a series of plates on the base of the machine for operating the respective actuating arms, for the purpose specified.

- 55 23. In a cash register, a main supporting shaft on the base of the machine frame, a

main frame pivoted thereon, a single main operating arm pivotally supported by the main frame, registering devices supported by the main operating arm, a series of actuating arms pivoted on the main frame, a series of plates on the base of the machine and graduated notches on said plates for operating the respective actuating arms, for the purpose specified.

24. In a cash register, a main supporting shaft on the base of the machine frame, a main frame pivoted thereon, a single main operating arm pivotally supported by the main frame, registering devices supported by the main operating arm, a series of actuating arms pivoted on the main frame, rollers on the actuating arms, plates on the base of the machine adapted to contact against the rollers during the downward movement of the main operating arm.

25. In a cash register, a pivoted main frame, a main operating arm pivoted to said main frame, a pin or stud formed on said main operating arm, and a slotted opening in the main frame, a spring supported by the pin or stud, means for yieldingly holding the main operating arm against the guide surface of the main frame during the movement of the said main operating arm independent of the movement of the main frame, for the purpose specified.

26. A pivoted main frame capable of lateral oscillation, a main operating arm supported on said main frame and adapted to be moved vertically independent of the main frame, but yieldingly held against the face of said main frame during said vertical movement, bell ringing devices operated by said main operating arm at its extreme downward movement, for the purpose specified.

27. In a cash register, a main frame pivotally supported on the machine frame, a main operating arm pivoted to said main frame and adapted to be moved vertically independent of the movement of the main frame but rotated laterally in unison with said main frame, a spring-pressed pawl supported on said main operating arm, locking devices and bell ringing devices adapted to be operated by said pawl at the end of the downward movement of said main operating arm, for the purpose specified.

28. In a cash register, a single main operating arm, a register frame formed on said arm, registering wheels supported by said frame, actuating devices for said registering wheels operated during the movement of said main operating arm, holding pawls for said registering wheels supported by said register frame, means for raising and lowering said holding pawls during the movement of the actuating devices, for the purpose specified.

29. In a cash register, a main frame, a

main operating arm supported on said frame and adapted to move vertically independent thereof, a slotted opening in the main frame, an incline formed on the sides of said slotted opening, and means connected with said arm for yieldingly holding the arm against the frame supported by said incline in its varying positions.

30. In a cash register, the combination with an operating handle having lateral differential movements for adjustment for registration of different valuations, and a vertical movement for effecting registration, of registering devices mounted on the handle and actuated upon such vertical movements of said handle.

31. In a cash register, the combination with registering devices of means supporting same permitting a lateral movement of said devices to determine the entry thereon, and a vertical movement to cause the said entry to be made on said registering devices, with devices for causing said entries to be made.

32. In a cash register, the combination with registering devices, of a pivoted frame supporting said devices, means for moving said frame in one direction to determine the entry on the register and in another direction to cause the entry to be made, with means for operating the register.

33. In a cash register, the combination with registering devices, of operating racks for same, means for moving said devices and racks laterally to determine the entry to be made, and for moving the devices vertically to cause the entry to be made, with stops for limiting vertical movement of said racks.

34. In a cash register, the combination with registering devices, of a pivoted frame supporting same, operating racks for said devices, and a common means supporting said frame and said racks, and a handle for giving said pivoted frame a lateral and a vertical movement.

35. In a cash register, the combination with registering devices, of operating racks for same, a support common to said devices and racks, means for moving said support to determine the entry on the registering devices and for then moving the registering devices over the racks to cause the entry to be made.

36. In a cash register, the combination with registering devices, and operating racks for same, of means for moving said devices and racks in two directions, and means for obstructing movement of said racks in one of the directions.

37. In a cash register, the combination with registering devices and operating devices for same, of means for moving said devices and racks together, and means for obstructing the movement of said racks at different points of their travel.

38. In a cash register, the combination with registering devices, of supporting means for same adapted to give the registering device differential amount determining movement in one direction and a constant movement to effect the registration in another direction, with devices for causing a registration when said registering device is given said constant movement.
39. In a cash register, the combination with a register element, of means for giving the said register element a lateral movement to determine the amount to be registered and a vertical movement to effect the registration.
40. In a cash register, the combination with a movable frame, of a registering element and an actuating device therefor, both supported by said movable frame, and means for giving the registering element an invariable movement and the actuating device a variable movement for the purpose specified.
41. In a cash register, the combination with a movable frame, of a registering element and an actuating device therefor, both supported by said movable frame, and means for giving the registering element invariable movement and the actuating device a variable movement for actuating the registering element to an extent commensurate with the difference in movement of the registering element and actuating device.
42. In a cash register, the combination with a register element, and an actuating device therefor, of means for giving said element and said device a lateral movement to determine the amount to be registered and a vertical movement to effect the registration.
43. In a cash register, the combination with a registering element and an actuating device therefor, of means for first giving said element and device a lateral movement to determine the amount to be registered and then giving the element an invariable vertical movement, and the device a variable vertical movement commensurate with its lateral movement, for the purpose specified.
44. In a cash register, the combination with a registering element and an actuating device therefor, of means for first giving said element and device a lateral movement to determine the amount to be registered and then giving the element an invariable vertical movement, and the device a variable vertical movement commensurate with its lateral movement for actuating the registering element to an extent commensurate with the difference in vertical movements of the registering element and actuating device.

In testimony whereof, I have hereunto set my hand this 6th day of July, 1903.

CHARLES D. GRIMES.

Witnesses:

T. A. LEGLER, Jr.,
I. L. KUHN.