

No. 619,786.

Patented Feb. 21, 1899.

J. PFEIFER.

CHANGE MAKER AND INDICATOR.

(Application filed Mar. 12, 1895.)

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(No Model.)

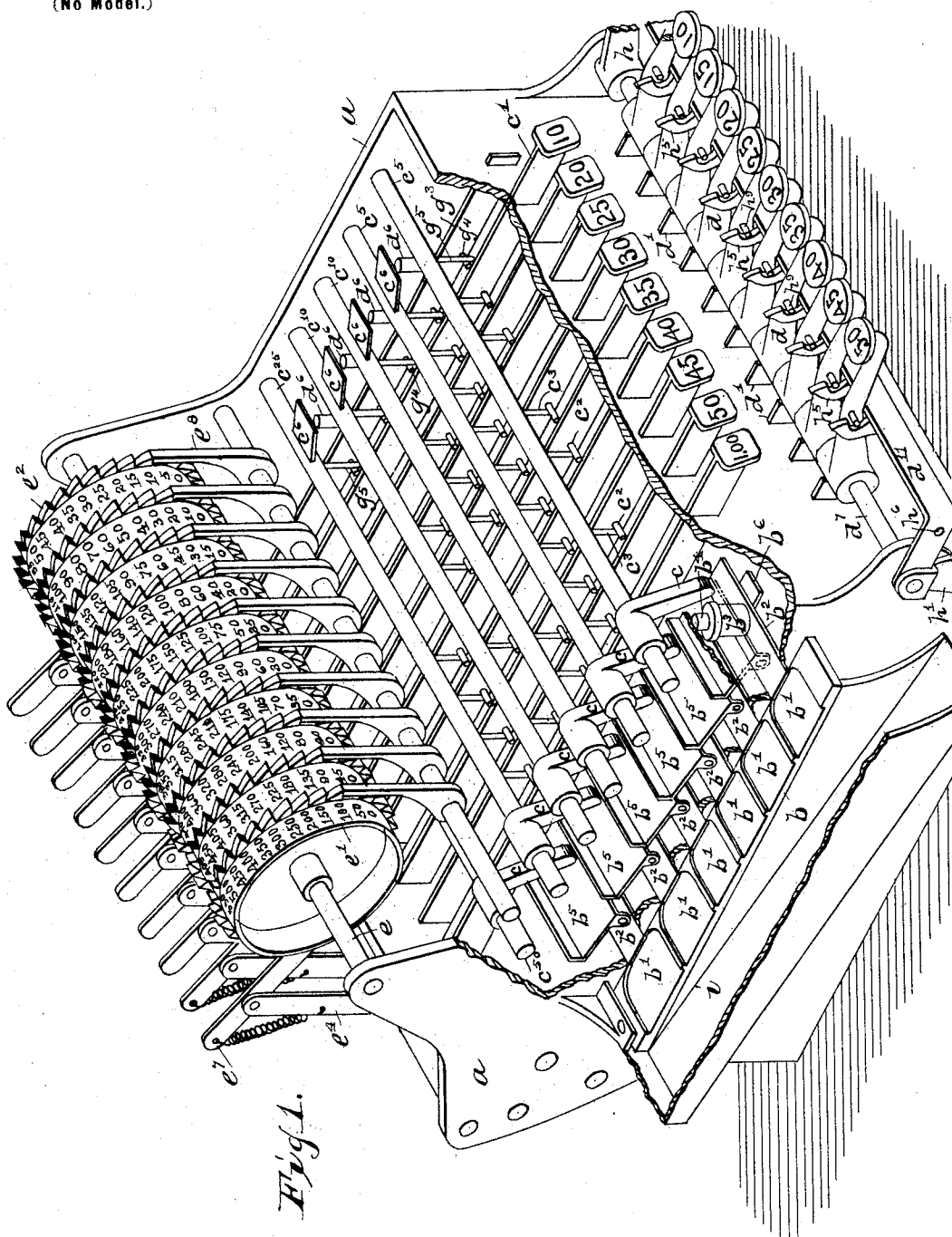


Fig. 1.

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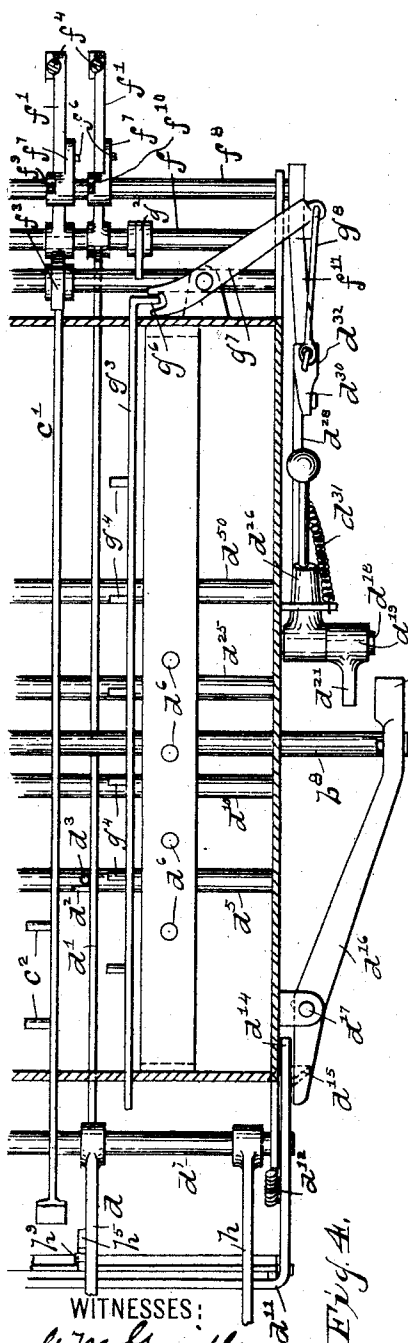
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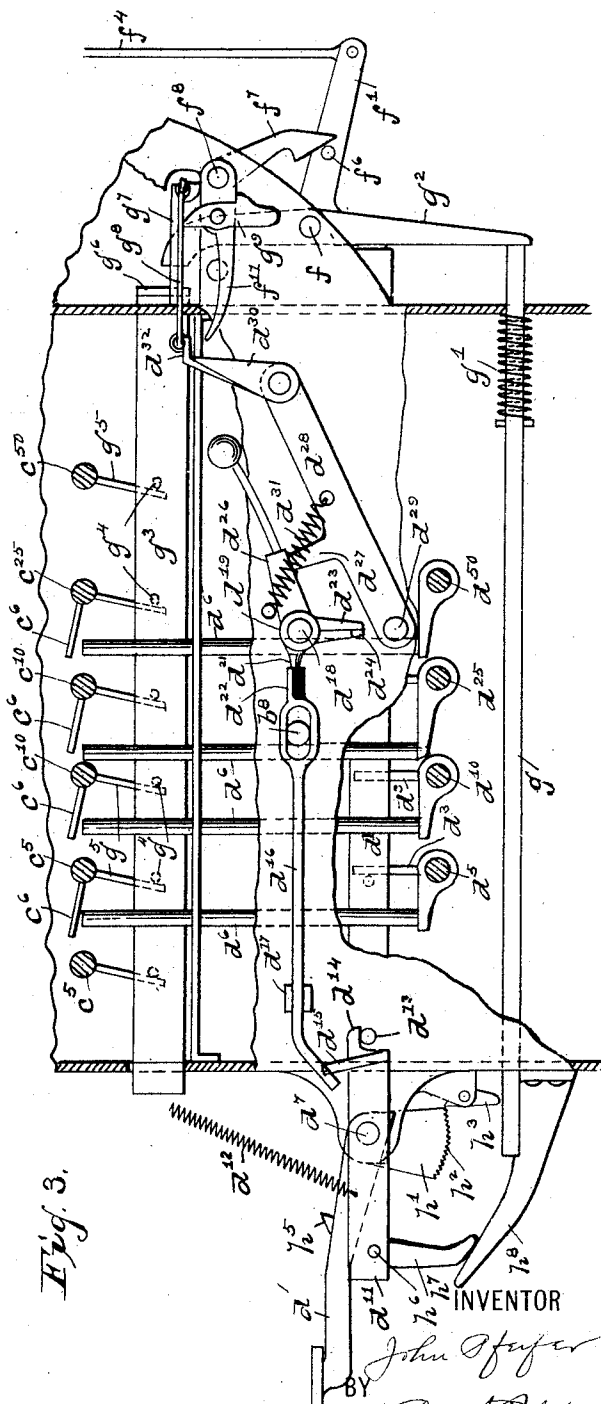
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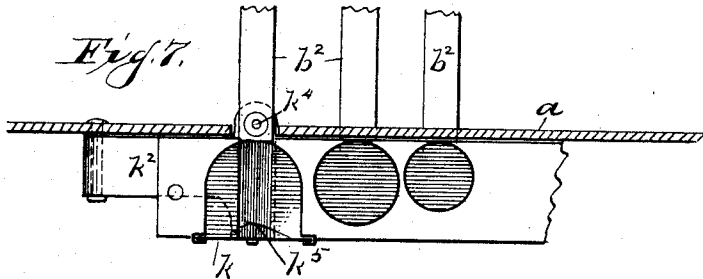
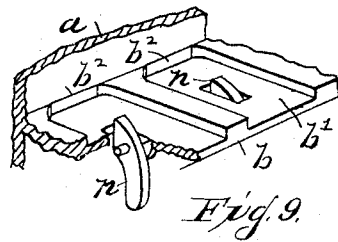
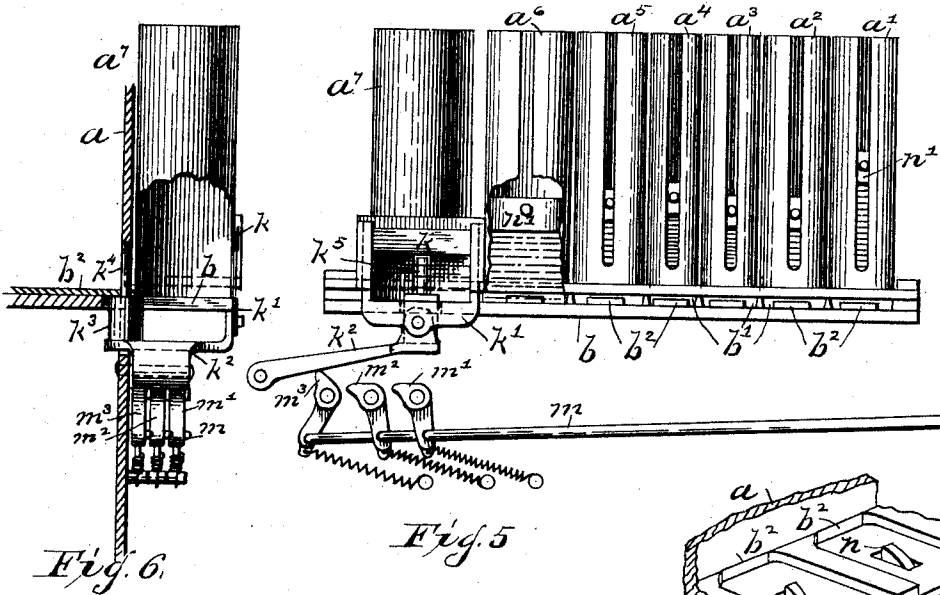
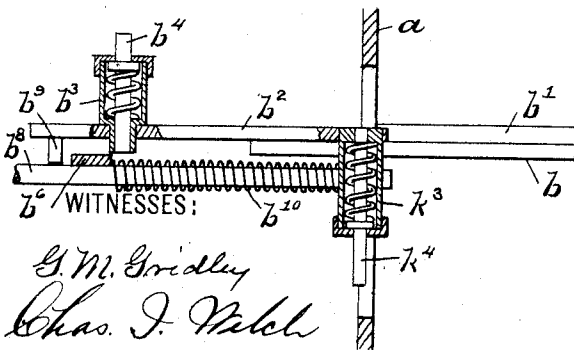


Fig. 8.



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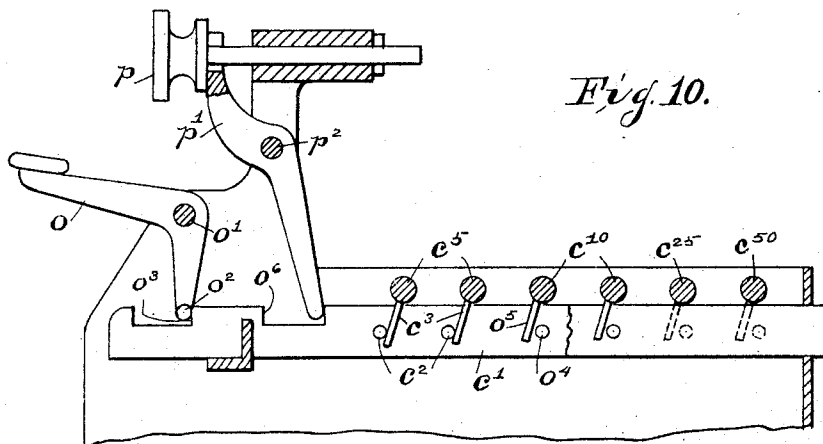


Fig. 10.

Fig. 11.

AMOUNT RECEIVED	
100	f ⁵
YOUR PURCHASE IS	
	15 f ⁵
WAIT FOR CHANGE	

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UNITED STATES PATENT OFFICE.

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CHANGE MAKER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 619,786, dated February 21, 1899.

Application filed March 12, 1895. Serial No. 541,508. (No model.)

To all whom it may concern:

Be it known that I, JOHN PFEIFER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have
5 invented certain new and useful Improvements in Change Makers and Indicators, of which the following is a specification.

My invention relates to a machine for automatically making change.

10 It also relates in its nature to an indicating device which shall indicate the amount received and the amount retained.

My invention is especially adapted for use in connection with cash-registering devices,
15 but is capable of being used simply as a change-maker.

The object of the invention is to provide means by which when change is desired for a certain piece of money the amount may be
20 indicated, and then by operating the machine the exact change for said amount will be automatically discharged from the machine.

A further object of my invention is to provide means whereby in a transaction in which
25 change is required by reason of the presentation of a larger sum than the amount involved in the transaction the proper change can be automatically discharged from the machine by the operation of the devices which
30 indicate the amount received and the amount involved in the transaction, the difference in the form of change being automatically computed and discharged from the machine.

A further object of my invention is to provide means by which the amount of any transaction shall be registered, while the difference between the said amount and a larger amount given in settlement therefor shall be
35 automatically computed and discharged from the machine, constituting the correct change.

I attain these objects by the constructions shown in the accompanying drawings, in which—

Figure 1 is an isometric view of a machine embodying my invention, some of the
45 parts being broken away to better illustrate the same. Fig. 2 is a sectional view of a portion of the same. Fig. 2^a is a detail showing a modification. Fig. 3 is a side elevation,
50 also partly in section, of a portion of the same,

the section being taken at a different plane from that of Fig. 2. Fig. 4 is a partial plan view of the parts shown in Fig. 3. Fig. 5 is an end elevation of the coin receiving and discharging devices. Fig. 6 is a rear elevation, partly in section; and Fig. 7 is a plan view, also partly in section, of the same. Fig. 8 is a sectional elevation of a portion of the discharging devices connected with the coin-holders. Fig. 9 is a detail view showing
60 the locking-pawls for the discharging devices. Fig. 10 is a detail view, partially in section, showing a modification. Fig. 11 is a front elevation of the display tablets or indicators.

Like parts are represented by similar letters
65 of reference in the several views.

In carrying out my invention I employ a series of coin-holders adapted to contain all the necessary coins which will be used in making change within the limits of the machine, there
70 being one holder for each denomination of coin used. The coin-holders are provided with discharging devices which when operated in their proper position will discharge a single coin from each holder. Means are provided
75 by which the discharging devices may be set into position for operation and when in such position will be operated by the other parts of the machine to discharge a single coin
80 from each coin-holder; but when thrown out of the operative positions the discharging devices will remain at rest.

One of the primary features of my invention consists in the employment of two sets of actuating devices, preferably in the form
85 of keys, each numbered to represent the amount with which it is to deal—that is to say, the numbers on one set of these devices, which for the purposes of this specification I will call “cash-keys,” represent the amount
90 received in any transaction. The numbers on the other set, which I will call “sale-keys,” represent the amount to be applied or involved in the transaction. Connected to these actuating devices is mechanism which
95 when a key of the first set is operated will set into position for operation the discharging devices of the coin-holders representing coins of different value enough to make up the amount of the cash-key, but in the form
100

of subsidiary coin or change. The other set of keys or actuating devices are so connected with the first that when one of these sale-keys is operated it releases or throws out of operative position the coin-discharging devices corresponding in value to the sale-key operated, so that the coin-discharging devices representing the difference between the two amounts indicated on the two sets of actuating devices will still be left in position for operation and when operated will discharge the proper change.

In the drawings, a represent a frame, which will usually be embodied with or inclosed in a casing which will cover up all the operating parts so as to be accessible only to the proprietor, who will carry a key, after the manner of the cash-registers now in general use. At one end of this machine is a series of coin-holders, preferably in the form of tubes a' a^2 a^3 a^4 a^5 a^6 a^7 . (See Fig. 5.) In the machine which I have illustrated, which, it should be stated, is made of the simplest character for the purpose of illustration, there are seven of these tubes. The machine is designed to operate in connection with transactions in which five or a multiple of five forms the unit. These tubes, therefore, are designed to hold nickels, dimes, quarters, half-dollars, and dollars. a' a^2 are for five-cent pieces or nickels; a^3 a^4 , for dimes; a^5 , quarters; a^6 , half-dollars; a^7 , dollars. These tubes or coin-holders rest on a base or shelf b , having on the top a depression b' , adapted to receive a single coin of the denomination of the tube which rests thereon. Immediately back of this shelf b and within the frame or casing is a slide b^2 , which when moved outwardly will pass through the depression b' and carry a single coin from the bottom of the tube or holder belonging thereto, there being an opening in the side of the tube at the bottom for this purpose. On each of the slides b^2 there is mounted a barrel or cylinder b^3 , through which there is extended a spring-actuated plunger b^4 . Above each of the plungers b^4 , resting normally thereon, is a hinged plate b^5 , and above each of the plates is an arm or finger c , each of which is secured to one of a series of rods c^5 , c^{10} , c^{25} , and c^{50} . These rods c^5 , &c., extend entirely across the machine immediately above a series of cash-keys c' , which are numbered to correspond with certain values which they are to represent, there being in the present case and for the purpose of illustration nine such keys, as shown in Fig. 1, with ten cents as the lowest and one dollar as the highest. It will be understood, however, that any number of such keys may be used, and their objects and functions will clearly appear from the following description. Each of these cash-keys, which is, in fact, a flat bar adapted to move longitudinally in suitable bearings at the front and rear of the casing, is provided with one or more pins c^2 in one side thereof, which are adapted to contact with pins or projections

c^3 , extending from the respective bars c^5 c^{10} , &c., so that when a key is pressed inwardly the bar or bars with which it is connected is partially rotated, so as to bring the finger or projection c in contact with the swinging plate b^5 and cause the same to move the plunger b^4 through the barrel b^3 , so as to project from the under side of the slide b^2 which corresponds to the rod or shaft c^5 , which is rotated.

The rods or shafts c^5 , &c., in the present machine correspond in value to the exponents of the letters employed—that is to say, c^5 represents in value five cents; c^{10} , ten cents; c^{25} , twenty-five cents, and c^{50} , fifty cents. The keys c' are each connected through the medium of the pins c^2 and projections c^3 with enough of said rods or shafts to make up the value of said key, but in fractional amounts—that is to say, such amounts as would represent change for the amount expressed on the key. For instance, the ten-cent key is connected to the two rods c^5 , each of which represents five cents, the total being ten cents, the amount of the key. The twenty-cent key or bar is connected to the two c^{25} 's and the c^{10} rod or shaft, the combined amount being twenty cents, the amount of the key. The one-dollar key is connected to the c^{50} , c^{25} , two c^{10} 's, and one c^5 , the total amount representing one dollar, the amount of the key, as before. It will be seen now that whenever a cash-key c' is pushed in the plungers on the slides b^2 which correspond to the fractional amounts making up the value of that key, will be pushed through the slides by the rotation of the shafts, which, acting through the arms c and vibrating plates b^5 , will depress said plungers, the construction being such that the rods and rotating fingers c will stand substantially in line over the plungers b^4 and will remain in this position and hold the plungers depressed until the rods are turned back to the normal position. (See Fig. 2.)

Immediately behind each of the plungers b^4 and below the slides b^2 is a bar b^6 , which extends along the entire series of slides b^2 . This bar b^6 is supported on each side on guides b^7 and is connected at or near the center to a reciprocating rod b^8 . When the rod b^8 is moved longitudinally by the means hereinafter to be described, the bar b^6 will engage with all the plungers b^4 which are depressed, and will therefore cause the slides b^2 to move outwardly through the tubes or coin-holders and will discharge from said coin-holders the bottom coin therein, the amount so discharged corresponding to the amount of the key which has been operated.

The device as thus described constitutes a simple change-maker, and by these constructions it will be seen that whenever one of the keys has been operated and its operation is followed by a longitudinal movement of the rod b^8 and the bar b^6 fractional coins sufficient to make up the amount of the key de-

pressed will be discharged from the coin-holders.

I shall now proceed to describe mechanism by means of which when an amount less than the amount indicated above is to be applied to a purchase, or as the basis of a certain transaction, then the amount so supplied will be subtracted from the amount indicated and the balance only of the amount first indicated be discharged from the coin-holders. This is accomplished as follows: In the casing, preferably below the series of keys c' , is a second series of keys d , each of which keys is adapted, when depressed, to operate a longitudinally-moving bar d' . These bars d' are also provided with projections or pins d^2 , which engage with fingers d^3 on rods or shafts d^5 d^{10} d^{25} d^{50} . These rods, like the rods c^5 c^{10} , &c., extend entirely across the machine and correspond in value to the exponents of the letters representing the same—that is to say, d^5 represents five cents; d^{10} , ten cents, &c. At or near one end of the casing or frame the rods d^5 d^{10} , &c., are provided with cam fingers or projections d^4 , which engage with vertical rods d^6 , the upper ends of which contact with projections or wings c^6 on the rods or shafts d^5 d^{10} , &c. The longitudinally-moving bars d' are connected through the pins d^2 and projections d^3 with just such bars d^5 d^{10} , &c., as correspond in value to the sale-keys d —that is to say, the bar representing five cents is connected to the five-cent rod, the bar representing ten cents to the ten-cent rod, the bar representing fifteen cents to a five-cent and a ten-cent, &c., each bar being connected to one or more of said rods, sufficient to make up the value of the sale-key which operates said bar. The keys d I have shown in the form of levers, which are journaled on a common rod d^7 , the inner end of each of said levers being formed cam-shaped, as shown at d^8 , to engage with the end of one of the bars d' , so that whenever said lever or key is turned about the shaft d^7 the bar d' will be pressed inwardly. Springs d^9 , connected to each of the bars d' , are adapted to return them to their normal positions.

The construction thus far described is such that whenever one of the cash-keys c' is operated the discharging devices connected to the coin-holders will be placed into operative position, so as to discharge an amount corresponding to the value of said-key. If now this operation is succeeded by the operation of a sale-key d' representing a smaller amount, the coin-discharging devices corresponding to this smaller amount will be returned to their normal positions by the partial rotation of the shafts d^5 d^{10} , &c., which, through the medium of the vertical rods d^6 , operating against the projections or wings c^6 , will return the shafts c^5 c^{10} , &c., corresponding to said amounts back to their normal positions, thus leaving in operative position only such discharging devices as correspond to the difference between the amounts represented on the

cash or sale keys successively operated. The result will be that if these operations are followed by a longitudinal movement of the rod b^8 an amount will be discharged from the coin-holders representing the change out of the amount first indicated after the second amount indicated has been applied to the transaction which it covers.

Means are also provided by which the amount of any given transaction may be registered at the same time the change, if there is any, is discharged. I shall now proceed to describe the mechanism for accomplishing this result; but it will be understood that the mechanism which I have described for this purpose is only a type of register, my invention being capable of use with various other types which are now well known and in common use or which may hereafter be devised.

Arranged in the top of the main casing on a rod e is a series of numbered wheels e' , provided with ratchet-teeth e^2 . Pivoted on a rod in the rear of the casing is a series of oscillating levers e^4 , each of which is connected by a suitable pin e^5 , operating in a slotted opening e^6 , to one of the bars d' . The lever e^4 carries at its upper end a pawl e^7 , which engages with the ratchet-teeth e^2 of one of the wheels e' , a spring-actuated pawl e^8 engaging with the ratchet to prevent it from turning backward as it is moved by the pawl e^7 . By this construction whenever the bar d' is operated the wheel e' corresponding to said bar is moved one notch, the numbers on the wheels being adapted to show the amount registered on each wheel, this being what is known as a "detail-adder."

Pivoted on a rod f in the rear of the casing is a series of levers f' , each of which has a projection f^2 , each alternate lever having its projection f^2 turned in an opposite direction. Those which project downwardly are in contact with the bars d' . Those which turn upwardly are connected by an oscillating lever f^3 with the bars c' . Each of these levers f' carries at its outer end an indicator-rod f^4 , which supports a tablet f^5 at its upper end, so that whenever a bar c' or d' is operated the tablet corresponding to said bar is elevated, so as to display the number corresponding to said bar at the top of the casing, the tablets being numbered to correspond to the keys on said bars. The top of the casing is provided with two display-openings, through which the tablets corresponding to the different sets of keys are displayed. These display-openings will be suitably lettered to show what the tablets indicate—as, for instance, the upper series will read "Amount received is \$1.00" and the lower series will read "The amount of your purchase is 15¢. Wait for change," as illustrated in Fig. 11, or any other words of like import. Each of the levers f' has thereon a projection f^6 , adapted as the lever is raised to be engaged by a hook f^7 , having a limited movement on a rod f^8 . This rod f^8 has a pin f^9 for each hook f^7 thereon, which

pin turns in a slotted opening f^{10} in the hub of the hook, the construction being such that the hooks f^7 are permitted a limited movement to engage with the projections f^6 without turning the shaft f^8 . Whenever the shaft f^8 , however, is turned a partial revolution, the pins will cause the hooks f^7 to turn with the shaft, so as to disengage the respective levers f' .

I will now proceed to describe the mechanism which I have illustrated for operating the discharging mechanism of the coin-holders and also for returning the various parts to their normal positions after an operation is completed.

Journalled on the rod d^7 , at each end of said rod, is a U-shaped frame d^{11} , which extends along under each of the keys d' . A spring d^{12} normally sustains this frame and returns it to its normal position, together with any of the keys d' which are operated, the stop projection d^{13} at one end of the frame being adapted to limit the movement of said frame, which has an extended lug d^{14} to contact with said projection. This frame d^{11} is also provided near the lug d^{14} with a wedge-shaped projection d^{15} , which extends laterally therefrom and rests in contact with one end of an oscillating lever d^{16} , pivoted at d^{17} to a suitable projection on the frame and connected near its other extremity to the longitudinally-moving rod b^8 , the construction being such that when the frame d^{11} is turned on the rod d^7 the lever d^{16} is caused to oscillate and move the rod b^8 longitudinally, so as to operate the discharging devices in the manner before described.

Pivoted on a stud d^{18} on the end of the frame is a bell-crank lever d^{19} , one arm d^{21} of which rests in contact with a wedge-shaped projection d^{22} on the end of the vibrating lever d^{16} , the other arm d^{23} of said bell-crank lever being adapted to contact with a projection d^{24} on a clapper-arm d^{26} , journalled on the same stud. The bell-clapper arm d^{26} rests in contact with a lug d^{27} on a vibrating lever d^{28} , pivoted at d^{29} to the end of the frame and carrying at its outer end a hinged arm or link d^{30} . A spring d^{31} , connected to the lever d^{28} , is adapted to return said lever and the bell-clapper arm d^{26} to their normal positions after they have been operated by the bell-crank lever d^{19} by contact with the arm d^{21} of said bell-crank lever with the cam-shaped projection d^{22} on the oscillating lever d^{16} . The bell-clapper arm d^{26} is adapted to operate in connection with a gong (not shown) to sound an alarm whenever a key is operated. The arm or link d^{30} is provided at the top with a laterally-extending projection d^{32} , which in its normal position stands in line with the end of a lever f^{11} , secured to the end of the shaft f^8 , which carries the hooks f^7 of the indicator-levers f' . Whenever the bell-clapper arm d^{26} is vibrated, the lever d^{28} is also vibrated, causing the projection d^{32} on the link d^{30} to engage with the arm f^{11} , and thus oscillate

the shaft f^8 to cause the hooks f^7 to disengage the indicator-levers f' and permit them to drop to their normal positions.

Extending through the main casing from front to rear near the bottom is a rod g , having thereon a spring g' , which presses said rod normally toward the front. This rod rests at the rear against the lower end of a pivoted lever g^2 , the upper end of which is adapted to contact with the end of a sliding bar g^3 , which has thereon projections g^4 , one for each of the rods or shafts c^5 c^{10} , &c. These projections g^4 are adapted to engage with arms g^5 on said shafts, so that a longitudinal movement of the bar g^3 will produce a partial revolution of the rods or shafts to return them to their normal positions. The front end of the rod g stands in the path of the U-shaped frame d^{11} , so that when a key d' is depressed to the limit of its stroke the rod g will be pressed inwardly, which, through the medium of the lever g^2 and bar g^3 , will return the rods forming part of the coin-discharging devices to their normal positions. The bar g^3 has its rear end turned laterally to form an engaging projection g^6 , which rests in the bifurcated end of a pivoted lever g^7 . The other end of this lever g^7 is connected by a link g^8 to the pivoted arm d^{30} . There is also on the arm f^{11} a pivoted latch g^9 , which lies in the path of the pivoted lever g^7 . This pivoted latch is so constructed that when the lever g^7 is moved by the bar g^3 it contacts with the latch g^9 and operates the lever f^{11} so as to move the hooks f^7 . When the lever moves in the opposite direction, the latch permits the lever to return to its normal position without moving the lever f^{11} . At the same time, through the link connection g^8 , it draws the projection d^{32} over the end of the lever f^{11} , so that if the lever d^{28} is vibrated the projection d^{32} engages with the lever f^{11} and moves the hooks f^7 so as to disengage the tablets. Now the object of this arrangement is as follows: Whenever one of the rods c^5 c^{10} , &c., is turned, it moves the bar g^3 . This oscillates the lever g^7 , which, engaging with the latch g^9 , releases all the tablets, which are displayed by oscillating the shaft f^8 and the hooks f^7 . The hooks and shaft, however, are immediately returned to their normal positions by a spring f^{12} as soon as the lever g^7 has passed the latch g^9 . Now the pins g^4 in the bar g^3 engage on one side only of the projection g^5 on the rods c^5 , &c., so that any of said rods are permitted to turn back to their normal positions without moving the bar g^3 . Now if one of the bars c' has been operated the tablet connected with the bar will be raised into view and held by the hook f^7 . The projection d^{32} will by the same operation be moved away from the end of the lever f^{11} , and if a key d' is depressed the lever d^{28} will be vibrated prior to the time the bar g^3 is returned to its normal position, so that the projection d^{32} will pass by the end of the lever f^{11} and will not disturb the tablets which are elevated, so that both of the

tablets representing the amount received and the amount registered, respectively, will remain in view until one of the bars c' is again operated, when the tablets will all be released by the contact of the oscillating lever g' with the latch g^9 . In case neither of the bars c' is operated in the next transaction—as, for instance, when cash representing the exact amount of the transaction is received—then the operation of one of the keys d' will elevate the proper tablet representing said amount and release all the other tablets by the engagement of the projection d^{32} with the lever f^{11} .

To provide for making change without making any registration, I employ a key or lever h , adapted when depressed to simply operate the U-shaped frame d^{11} . If the operation of one of the bars c' is followed by a depression of the key h , then the full amount indicated by the bar so operated will be discharged from the machine in the form of change and no registration will take place.

Connected to one end of the U-shaped frame is a segment h' , having on its periphery ratchet-teeth h^2 , adapted to engage in a swinging pawl h^3 as the U-shaped frame is oscillated on the shaft d^7 . This pawl h^3 will therefore prevent the return of said U-shaped frame until it has reached the limit of its movement, when the pawl, becoming disengaged from the ratchet-teeth on the opposite side of the segment, will swing by gravity to a vertical position, and as the frame returns to its normal position by reason of the spring d^{12} the pawl will engage with the ratchet-teeth in the opposite direction and prevent the downward movement of the frame until it has again reached its normal position. This prevents making an incomplete operation by the depression of a key. I also pivot to the front bar of the frame d^{11} a series of hooks h^5 , connected to a rod h^6 , which is journaled at each end in said U-shaped frame. This rod h^6 has at one end a projecting finger h^7 , adapted as the frame is depressed to contact with a cam-finger h^8 on the frame and turn said rod to cause the hooks to move forward in the frame. Each key d' is provided with a projecting pin h^9 , which in its normal position stands in line with the hook h^5 . If a key is depressed to move the frame, the downward movement of the frame will cause the hook belonging to said key to engage said projection, and thus unite the frame and key and cause them to move together to the limit of the stroke, thus preventing an incomplete operation of the key. At the same time the hooks relating to the other keys which are not moved will be turned to a position under the pins on said keys and prevent any one of said keys from being operated until all the parts have been returned to their normal positions.

At the end of the casing adjacent to the coin-holders I preferably provide an inclined trough or chute i , extending along at the side of and beneath the respective coin-holders, so

that as the coin is discharged therefrom it will drop into said trough and move by gravity to a common point at the front of the machine, so that the operator, by holding his hand at the end of the trough, will receive the entire amount of change from the coin-holders.

It is sometimes desirable that more than one coin of a single denomination be discharged. This of course can be provided for by multiplying the number of coin-holders. I have shown in the drawings two coin-holders, each for dimes and nickels. It may be desirable, however, in some cases, in order to simplify the machine, to provide means for discharging two or more coins from the same holder. I have shown means for accomplishing this in Figs. 5 to 8, inclusive, connected with the dollar-holder a' . Instead of having a single discharge-opening at the bottom of the holder of a width equal to the width of the coin I provide a sliding gate k , supported at each end by the arms of a yoke k' , which extends below the bottom of the coin-holder and is pivoted to a swinging plate k^2 . The slide b^2 is provided at the bottom with a barrel or cylinder k^3 , having a spring-actuated plunger k^4 , which is also carried by the plate k^2 , the construction being such that as the gate k is elevated the plunger k^4 is raised above the slide b^2 a corresponding amount. A slotted opening k^5 is provided at the bottom of the tube-holder of a width sufficient to permit the plunger k^4 to pass laterally through. Immediately under the plate k^2 are a series of cam-lugs m' m^2 m^3 , each of which is connected to a rod m , operated by a suitable key in the front of the machine. These cams are adapted to contact with and raise the plate k^2 to different heights. In the normal position the slide b^2 operates the same as any of the other slides, the gate being down, so that the opening at the bottom of the tube-holder is wide enough to allow a single coin to pass. If the cam m' is operated, the gate and the plunger will each be raised a distance equal to the thickness of one coin. The result will be that when the slide is operated the slide will press one coin and the plunger one, thus making two coins. If the cam m^2 is operated, two additional coins, or three in all, will be discharged. If the cam m^3 is operated, three additional coins, or four in all, will be discharged. By this construction four dollars may be discharged from the dollar-holder at a single operation. It is obvious that the same or substantially the same arrangement could be applied to any of the other coin-holders where two or more coins of the same denomination are required to make the requisite change. The rods m will be connected up in the manner described for the bars c' , and the connections will be such that such bars as are not needed in the operation of discharging the coin will be returned to their normal positions by operating a key which represents a transaction, as before.

To provide for locking the machine in the event that a coin-holder should become empty, when a coin of that denomination is necessary I provide means for preventing the operation of the slides unless a coin is in front of said slide or slides. This is accomplished as follows: In the bottom of each coin-holder is a pivoted pawl n , which is weighted, so that a coin of a given denomination will hold the pawl flush with the bottom of the tube-holder. The weight at the lower end of each pawl is such that when the weight of the coin is removed from the upper end it will turn by gravity, so as to project through the bottom of the tube-holder, and thus prevent the operation of the slide until a coin has been placed therein. For such tube-holders as are provided with means for discharging more than one coin at a time I provide additional means for locking the device, because it may happen that where two coins are desired and there was only one in the machine an operation would be performed which would not give the correct amount of change. To accomplish this, I place in each of the tube-holders a plug or stop n' , which rests on top of the coin and is of substantially the same diameter as the holder. This plug n' is formed of greater width than the coin to be discharged, so that it cannot be discharged through the opening in the bottom of the tube or holder. If at any time there is not sufficient coin in the tube to furnish the proper amount necessary to make the change, this plug will be engaged by the discharging mechanism and the operation of the machine will be prevented.

In Fig. 10 I have shown a modified construction in which the shafts d^5 d^{10} , &c., are dispensed with, the two sets of keys being adapted to operate the same set of rods and bars, the keys in one series being adapted to set said rods and bars into position to discharge the proper amount of coin represented by said keys and the keys in the other series being adapted to return such rods and bars as represent the value of said keys to their normal positions. In this case the change-keys are placed below and the registering-keys above. The bar c' is adapted to be operated by a series of keys o , which are strung on a rod o' , extending across the front of the machine, a projection o^2 engaging with a notch or shoulder o^3 on the bar c' . The pins c^2 on said bar engage with the projections c^3 on the rods, as before. The bar is further provided with a pin o^4 , which engages with a projection o^5 on that rod which corresponds to the value of the key. A registering-key p , which is adapted to operate any suitable form of registering device—such, for instance, as shown in my application filed February 25, 1895, Serial No. 539,700—is adapted when operated to contact with one end of a vibrating lever p' , journaled on a rod p^2 , the opposite end of which is adapted to engage with a shoulder o^6 on the bar c' and return said bar

to its normal position. The bar shown in the drawings represents the ten-cent bar, with its pins connected to the two five-cent rods. If the five-cent registering-key would be operated after the ten-cent change-key has been operated, one of these five-cent rods would be returned to its normal position by the five-cent key, which would have a projection to engage with said five-cent rod. The other one would remain in position to set the five-cent discharging devices. The bar for a twenty-cent change-key would be connected to the two rods c^5 and one rod c^{10} . If now the ten-cent registering-key, which is the one represented in the drawings, is operated, it would, by reason of the projection o^4 , return the rod c^{10} to its normal position, thus leaving the discharging devices corresponding to the rods c^5 to be operated, giving the proper change.

It is obvious that various other modifications may be employed to accomplish the same or substantially the same result without departing from my invention.

The invention will usually be employed in connection with cash-registers, which may be any of the well-known types now in general use, with a cash-receptacle which may be employed for keeping such of the cash as is not required for the coin-holders. The capacity of the machine may be extended indefinitely by providing additional rods and bars and keys for operating the same. When used in connection with cash-registers such as are now in use, the means for operating the discharging mechanism will be obtained from such moving part of the device as is best adapted for the purpose. The indicating-tablets and the registering mechanism may be the same as now in common use.

In Fig. 2^a I have shown a modification in a portion of the discharging devices. Instead of using the hinged plates b^5 , adapted to rest on the plungers b^4 , I substitute for the fingers on the rods c^5 , &c., cams r , which contact directly with the plungers. These cams are made of sufficient length to permit the movement of the slide-plungers longitudinally along the same.

It is obvious that other modifications may be employed. I do not therefore intend to limit myself in any way to the particular devices herein described; but

I claim, broadly, as my invention—

1. In a money-changer, a series of cash-keys and a series of sale-keys, money-holders, and normally-inoperative discharging devices for said money-holders; an intermediate connection between said discharging devices and said cash-keys whereby the discharging devices corresponding in amount to said cash-keys are brought into operative position on the operation of the cash-keys, and intermediate devices adapted to be operated by the sale-keys to return to their normal inactive positions discharging devices corresponding in amount to the sale-keys, substantially as specified.

2. In a money-changer, a series of money-holders, discharging devices for said money-holders, said discharging devices being normally in an inactive position, a series of cash-keys adapted when operated to set said discharging devices so as to discharge an amount corresponding to said keys, and a series of sale-keys adapted when operated to return to the normal inactive position discharging devices corresponding in amount to said sale-keys, and means for operating said discharging devices after the same have been set in operative position, as described, substantially as described.

3. In a money-changer, a series of money-holders, and a discharging device for each holder, each of said discharging devices being normally in an inoperative position, a series of cash-keys adapted when operated to move one or more of said discharging devices to an operative position, as described, and a series of sale-keys, and intermediate devices operated by said sale-keys to return to their normal inoperative positions discharging devices corresponding in amount to said sale-keys, and means substantially as described for operating the remaining or active discharging devices to discharge an amount representing the difference between the cash-keys and sale-keys operated, substantially as specified.

4. The combination in a money-changer having a series of coin-holders, of a normally-inoperative discharging device for each of said coin-holders, of a series of keys, each of which is adapted when operated to set in an operative position one or more of said discharging devices, of a series of indicators corresponding to said keys and adapted to be moved thereby to indicate the amount of said keys, of a common operating mechanism adapted to cause said discharging devices to discharge from said coin-holders the amount indicated by said indicators substantially as specified.

5. In a money-changer the combination with a series of coin-holders, of discharging devices therefor, of a series of cash-keys adapted to set said discharging devices in position for operation, of an indicator connected with each cash-key and operated thereby to indicate the amount which said key represents, of a series of sale-keys also adapted to be connected to said discharging devices, of means as described whereby the discharging devices corresponding in amount to the operated sale-key are caused to resume their normal inoperative position when said sale-key is operated, substantially as specified.

6. A series of coin-holders, a discharging device for each holder, and a series of cash-keys each adapted when operated to set into operative position one or more of said discharging devices, a series of sale-keys, and means connected therewith for returning one or more of said discharging devices to its normal position when a sale-key of said series is operated, and registering mechanism con-

nected with said series of sale-keys to register the amount of each of said sale-keys, substantially as specified.

7. A series of coin-holders, and a normally-inactive discharging device for each of said coin-holders, cash-keys connected to said discharging devices adapted when operated to set said discharging devices in an operative position, a cash-register also having a series of sale-keys, and mechanism for registering the amounts indicated by said sale-keys, and a connection from said sale-keys to the discharging devices whereby the discharging devices representing the amounts registered are returned to their normal inoperative positions, substantially as specified.

8. A money-changer having a series of coin-holders and discharging devices, and cash-keys for setting said discharging devices into operative position, in combination with a cash-register having registering-keys, and mechanism for registering the amounts represented by said keys, a connection from said registering-keys to said discharging devices whereby such of said discharging devices as correspond in value to the registering-key operated are moved to an inoperative position, and means as described for operating said discharging devices, substantially as specified.

9. A money-changer consisting of a series of coin-holders, and a discharging device for each holder, each of said discharging devices being normally in an inoperative position, a series of keys, and means connected with each key for setting one or more of said discharging devices corresponding in value to the said key, and an indicator also operated by each key to indicate the amount of said key, a cash-register having a series of keys, indicators operated thereby, and registering mechanism to register the amounts indicated by said keys and indicators, a connection from each of said registering-keys to the coin-discharging devices corresponding in value to the value of said key, and means as described for operating said registering devices and said discharging devices whereby coin representing the difference between the amount indicated by the first set of keys and that indicated by the registering-keys is discharged, substantially as specified.

10. In a money-changer, a series of coin-holders, and a slide arranged opposite an opening in the side of each coin-holder at the bottom, a moving bar adjacent to all of said slides, a movable projection for each slide normally out of the path of said bar but adapted to be moved into the line of travel thereof, a series of keys, and means connected with said keys to operate one or more of said movable projections to cause said slides to be operated by said movable bar, substantially as specified.

11. A series of coin-holders and discharging-slides adapted to travel across the bottom of said holder so as to discharge coins therefrom, movable projections on said slides, and

a series of rods, one for each slide, cam projections on said rods to operate said movable projections, a series of keys each connected with one or more of said rods, and a movable
5 bar adapted to contact with one or more movable projections when operated by said cams and move said slides, substantially as specified.

12. A series of coin-holders, and a series of
10 normally-inoperative discharging devices, one for each coin-holder, a series of rods having cam devices adapted to set said discharging devices into operative position, a series of keys connected to one or more of said rods
15 to cause said rods to operate the discharging devices corresponding in denomination to the key operated, and means as described for operating said discharging devices and returning said keys to their normal position, substantially as specified.

13. A series of coin-holders, and a discharging device for each coin-holder, a series of rods, one for each discharging device, a movable projection on said discharging device
25 adapted to be operated by said rods, and a movable device to contact with said movable projection and thus operate said discharging device, a series of keys each connected to one or more of said rods to cause the same when
30 moved thereby to operate the movable projection of said discharging device, and means as described for returning one or more of said movable projections to their normal position after said key has been operated, means as
35 described for operating said movable device to cause it to contact with the movable projections of the discharging devices which are in operative position, and means for returning all of said discharging devices to their
40 normal positions after the same have been operated, substantially as specified.

14. Coin-holders, and a normally-inoperative discharging device for each of said coin-holders, movable projections on said discharging devices adapted when operated to
45 cause said discharging devices to operate, oscillating slides having cams to operate said movable projections, longitudinally-moving bars having projections to engage with the
50 projections on said rods so that a movement of said bars will produce a partial rotation of said rods, each of said rods representing an amount equal to the denomination of one of the coins in said coin-holders, and each of
55 said bars representing an amount which can be made up of the amounts represented by two or more of said coins, and a second series of bars also adapted to operate said rods, but in an opposite direction from the first series, each of said second series of bars being
60 adapted to operate one or more of said rods which correspond in value to the amount represented by said bar whereby an operation of one of said bars of the first series followed by
65 the operation of a bar of the second series will leave in operative position the discharging device or devices of a coin holder or hold-

ers of an amount equal to the difference between the denominations of the first and second bars, substantially as specified. 70

15. A series of coin-holders, and discharging devices, one for each coin-holder, a series of bars, each connected with mechanism for setting one or more discharging devices into
75 operative position, a second series of bars, each connected to said discharging devices, but adapted when operated to return the same to the normal position, indicating-tablets, one for each bar, and means for elevating said tablets when said bars are operated, substantially as specified. 80

16. In a series of coin-holders, discharging devices, one for each coin-holder, and a series of keys each adapted to set into operative position one or more of said discharging
85 devices, an indicating-tablet for each of said keys, a second series of keys also connected to said discharging devices and adapted when operated to return certain of said discharging devices to their normal positions, said
90 second series of keys also having tablets, one for each key, to indicate the amount of said keys, means for retaining said tablets in position after said keys have been returned to their normal positions, and actuating devices
95 connected with the first series of keys to cause all of said tablets to be returned to their normal positions when one of said keys is operated, substantially as specified.

17. The combination with a series of coin-holders, and the discharging devices therefor, a series of keys connected with said discharging devices, and a series of indicators
100 connected with said keys, a second series of keys also connected with said discharging devices and adapted to operate the same in the opposite direction from the first set of keys, an indicator connected to each of said second series of keys, the indicators belonging to the different series of keys being arranged in different groups, substantially as specified. 110

18. A main frame, coin-holders arranged in said frame, slides, one for each coin-holder, adapted to discharge one or more coins therefrom, a common operating device for said
115 slides, and means for connecting and disconnecting each of said slides with or from said common operating device, a series of rods, one for each slide, adapted when turned to connect said rod to said operating device, and
120 keys for operating said rods, a second series of keys adapted when operated to return some of said rods to their normal positions, and mechanism connected with said keys for moving said common operating device when one of the keys of the second series is operated, substantially as specified. 125

19. The combination with the main frame and the coin-discharging devices, a common
130 operating device adapted to be connected to and disconnected from said coin-discharging devices, a series of parallel rotating rods, one for each coin-discharging device, and keys

for operating said rods, a second series of parallel rods, and keys for operating the same, and an intermediate connection between the rods of the second series and those of the first series so that one or more rods of the first series will be returned to their normal positions by the action of the rods of the second series, and means connected with the second series of keys for moving said common operating device, substantially as specified.

20. In a money-changer having coin-holders and a series of keys, normally-inactive discharging devices for said coin-holders, and a common operating device for said discharging devices, means connected with said keys for setting said discharging devices into an operative position, and a second series of keys adapted to return to the normal position discharging devices corresponding in amount or value to the keys depressed in the second series, and means for moving said common operating mechanism by the operation of any one of the second series of keys, substantially as specified.

21. In a money-changer, a series of coin-holders having normally-inoperative discharging devices, and a common operating device for said discharging devices, a series of keys, an intermediate mechanism connected therewith to set into operative position the discharging devices corresponding in value to the said keys to cause said discharging devices to be operated by said common operating device, a second series of keys each adapted to return to the normal position discharging devices corresponding in amount or value to the said keys, registering devices connected with the keys of said second series, and means, substantially as described, for moving the common operating device when either one of the second series of keys is operated, substantially as specified.

In testimony whereof I have hereunto set my hand this 8th day of March, A. D. 1895.

JOHN PFEIFER.

Witnesses:

OLIVER H. MILLER,
W. F. BAUROTH.