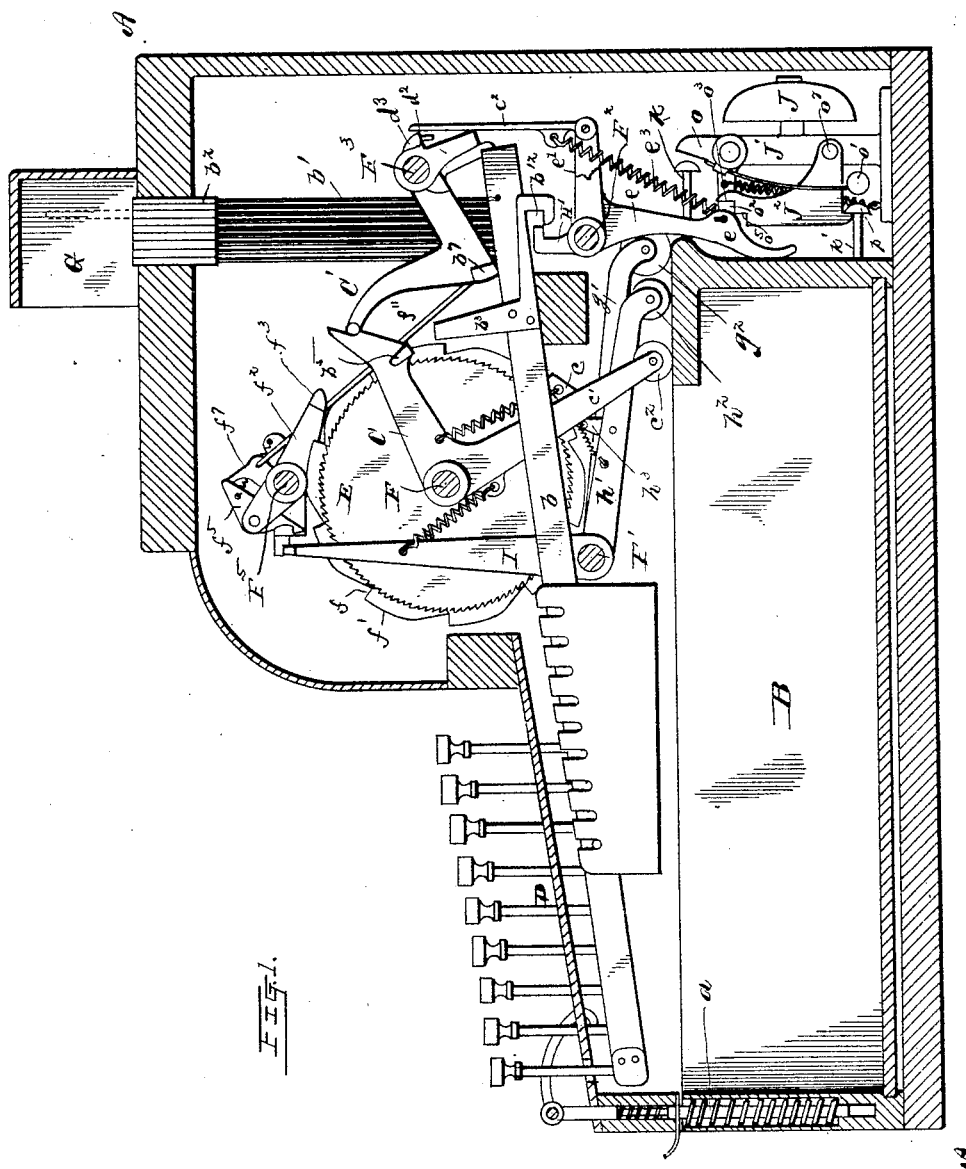


7 Sheets—Sheet 1.

No. 454,990.

Patented June 30, 1891.



J. H. Travel.
D. J. Graham.

Sam B. Math

BY *Staley and Shepherd*

ATTORNEYS

(No Model.)

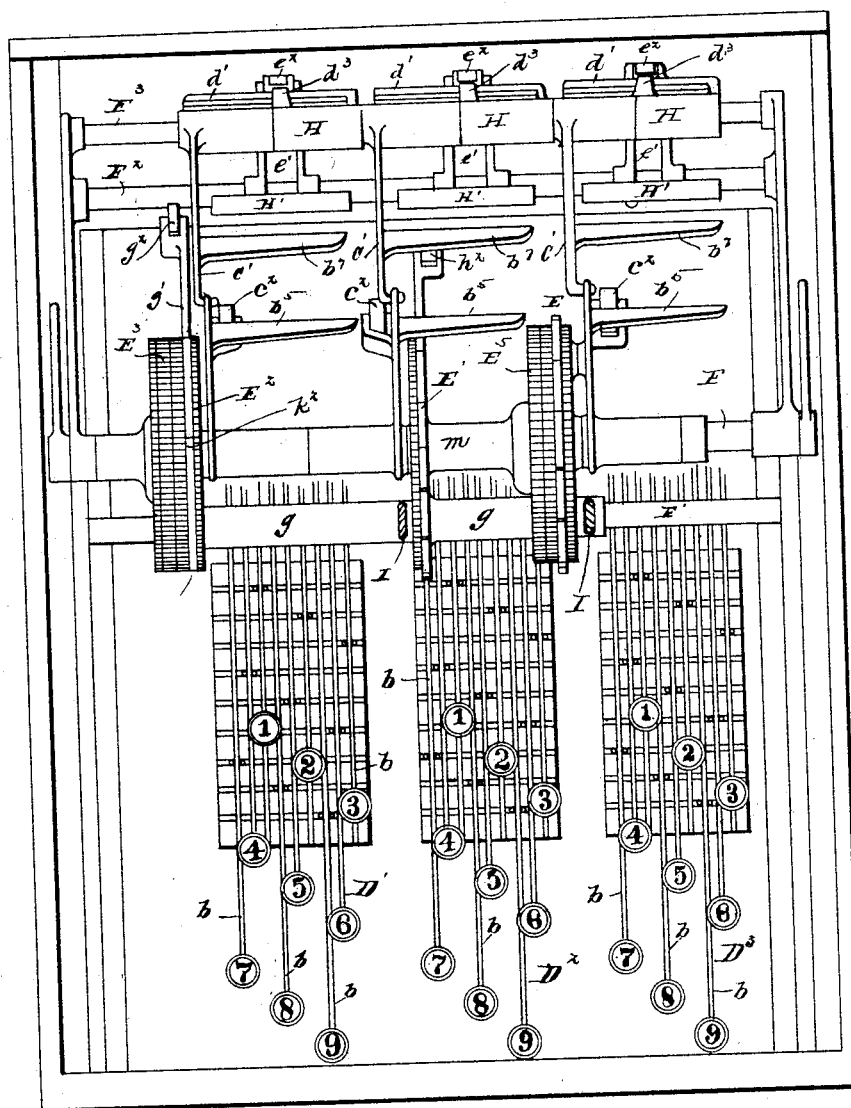
7 Sheets—Sheet 2.

S. P. WATT.
CASH REGISTER AND INDICATOR.

No. 454,990.

Patented June 30, 1891.

Fig. 2.



WITNESSES:

J. H. Gravel.
D. H. Graham

INVENTOR

S. P. Watt

BY

Staley and Shepherd

ATTORNEYS

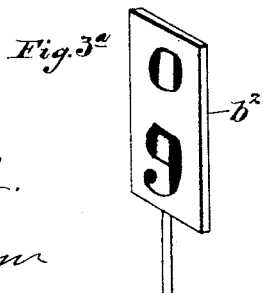
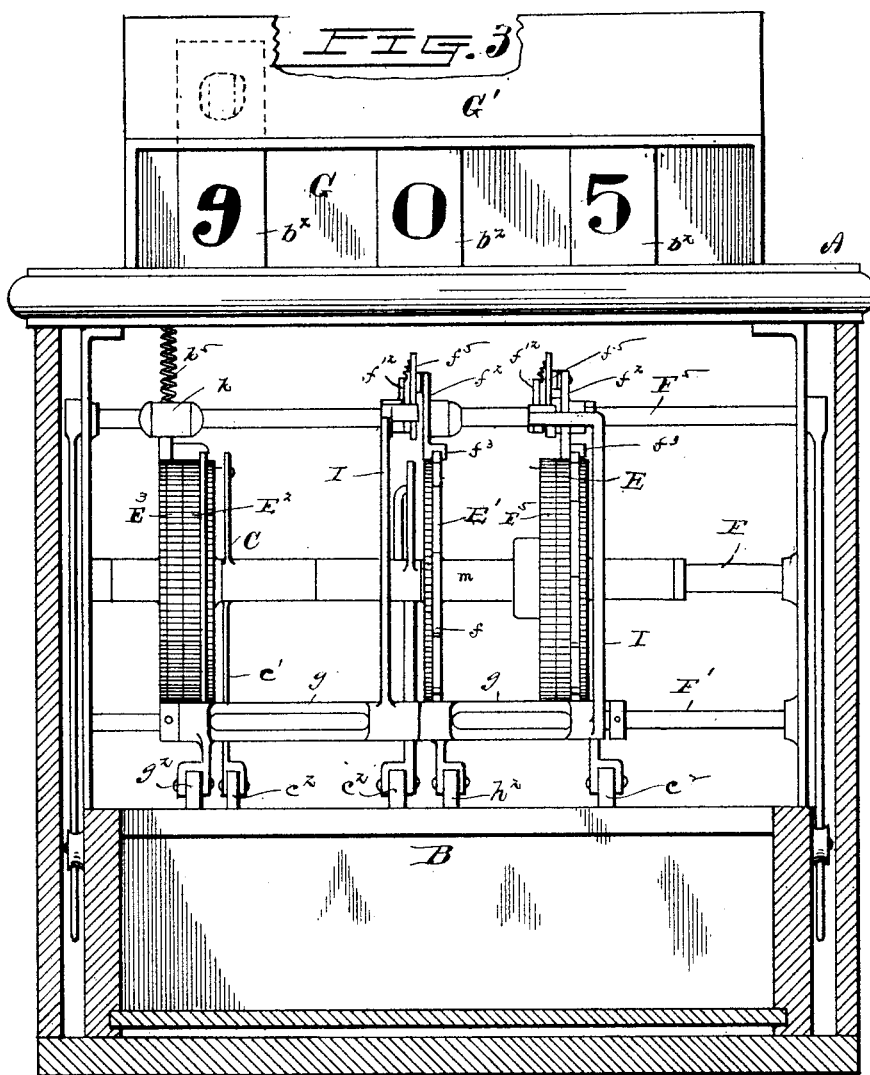
(No Model.)

7 Sheets—Sheet 3.

S. P. WATT.
CASH REGISTER AND INDICATOR.

No. 454,990.

Patented June 30, 1891.



WITNESSES:

J. N. Travel.
D. A. Graham

INVENTOR

Serv P. Watt

BY

Stacey and Shepherd

ATTORNEY.

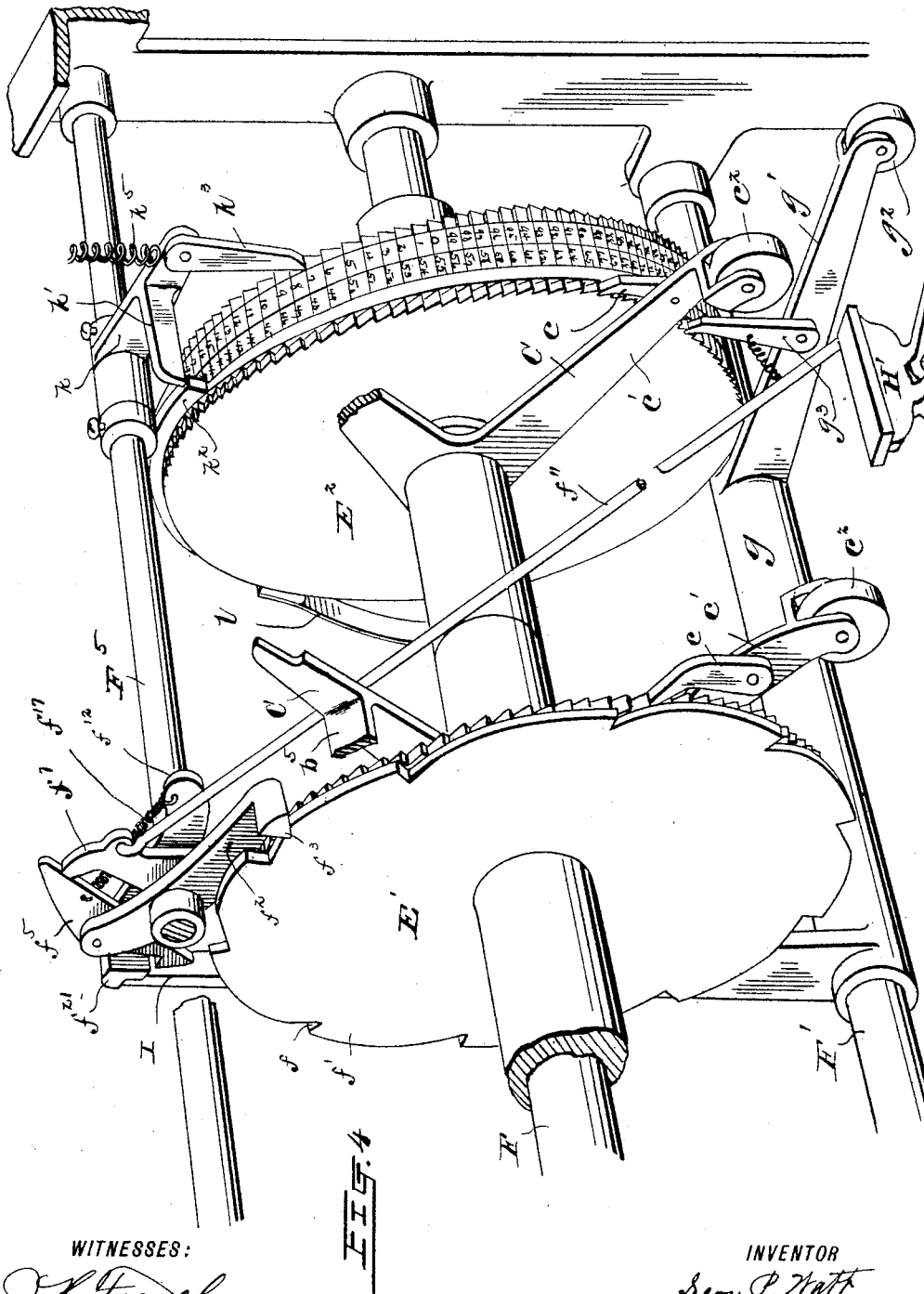
(No Model.)

7 Sheets—Sheet 4.

S. P. WATT.
CASH REGISTER AND INDICATOR.

No. 454,990.

Patented June 30, 1891.



WITNESSES:

J. H. Gravel.
D. H. Graham

FIG. 4

INVENTOR

Seru P. Watt
BY *Staley M. Shepherd*
ATTORNEYS

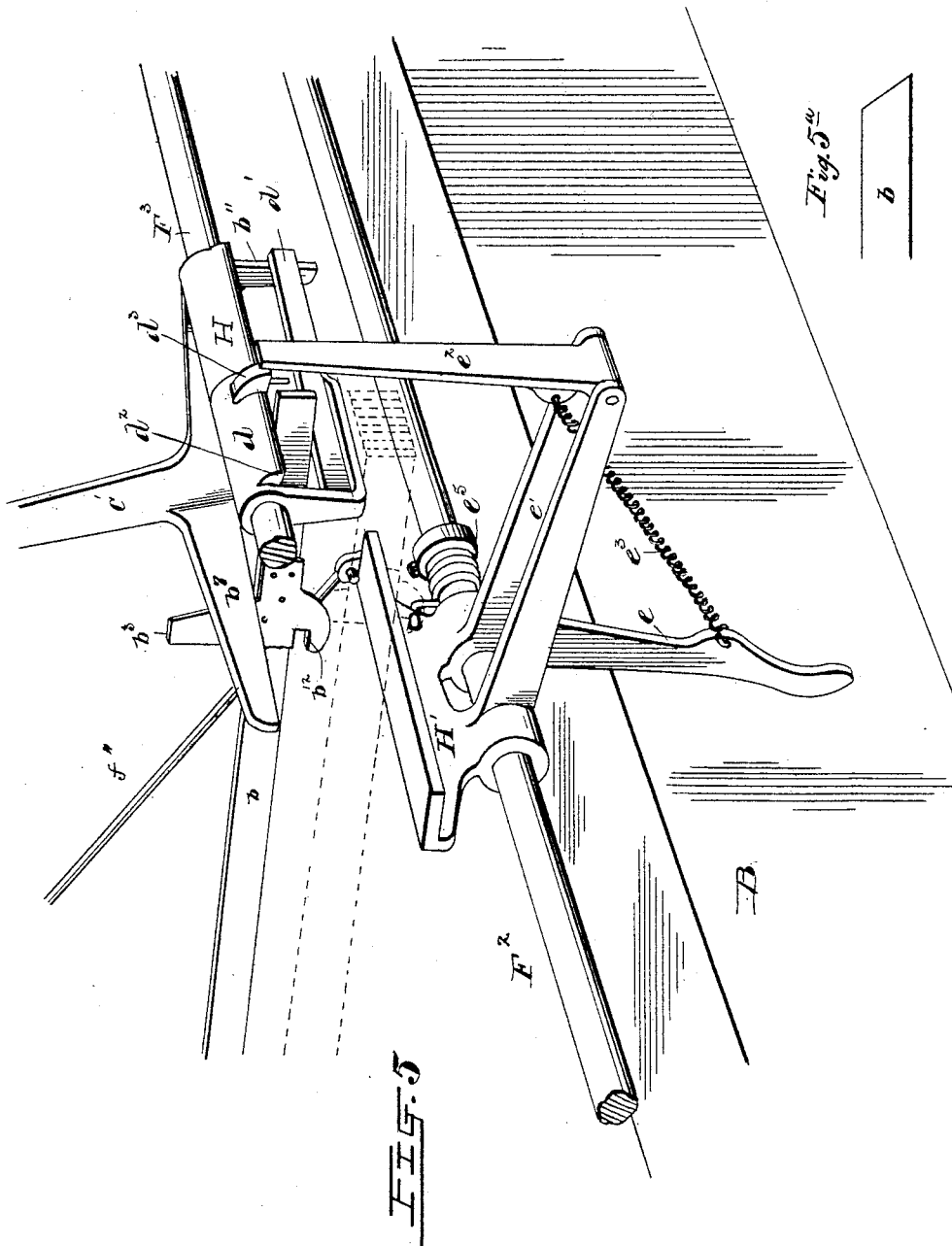
(No Model.)

7 Sheets—Sheet 5.

S. P. WATT.
CASH REGISTER AND INDICATOR.

No. 454,990.

Patented June 30, 1891.



WITNESSES:

J. A. Travel.
D. A. Graham

INVENTOR

S. P. Watt

BY

Staley W. Shepherd

ATTORNEYS

7 Sheets—Sheet 6.

No. 454,990.

Patented June 30, 1891.



J. A. Gravel.
D. H. Graham

INVENTOR

INVENTOR
Sam P. Watt
BY *Staley & Shepherd*
ATTORNEYS

7 Sheets—Sheet 7.

No. 454,990.

Patented June 30, 1891.

Fig. 9

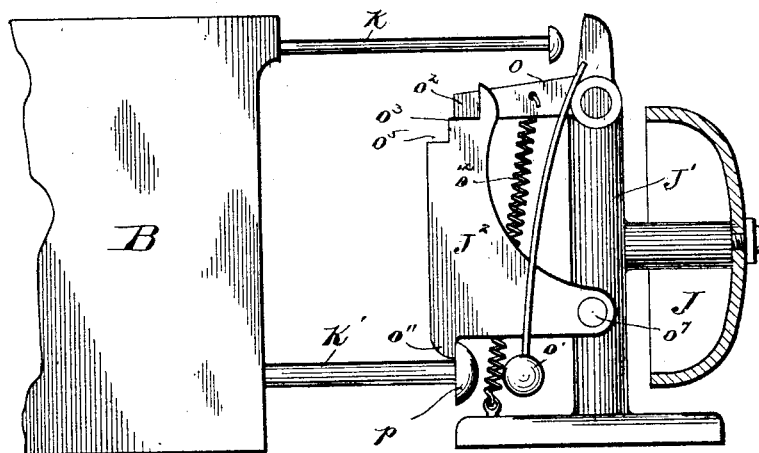


Fig. 10

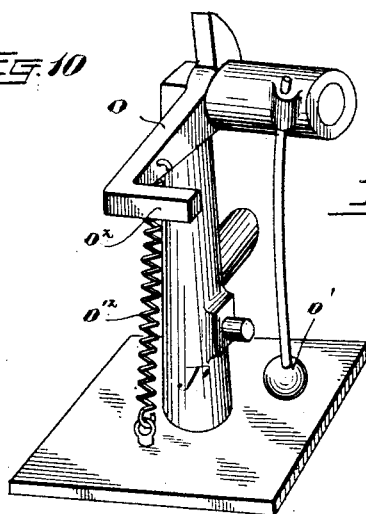
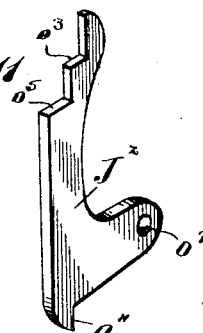


FIG. 1



WITNESSES:

J. H. Gravel.
D. H. Graham

INVENTOR

Sam B. Math

BY *Staley and Shephard*

ATTORNEY S.

UNITED STATES PATENT OFFICE.

SERN PERLEY WATT, OF CINCINNATI, OHIO, ASSIGNOR TO THE COLUMBUS CASH REGISTER COMPANY, OF OHIO.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 454,990, dated June 30, 1891.

Application filed October 8, 1890. Serial No. 367,444. (No model.)

To all whom it may concern:

Be it known that I, SERN PERLEY WATT, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a specification.

My invention relates to improvements in cash registers and indicators, and especially relates to improvements upon the devices shown in my former Letters Patent, No. 434,897, dated August 19, 1890.

The object of my invention is to provide novel means by which the different amounts registered shall be so added together that the total amount registered thereon may be read direct from the registering-wheels at any time.

A further object of my invention is to simplify the constructions heretofore employed.

To this end my invention consists in the arrangement, with the registering-wheels, of adding mechanism independent of the registering mechanism, but adapted to act in connection with the registering-wheels to transfer the amounts of one denomination to those of another as it becomes necessary by the registration of different amounts.

My invention further consists in the various constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of a device embodying my invention. Fig. 2 is a partial plan view of the same, some of the parts being removed and others shown in section to better illustrate the operation and construction of those parts which form the subject-matter of the present invention. Fig. 3 is a vertical sectional elevation of the same, some of the parts being omitted for perspicuity; Fig. 3^a, a detail of a part of the same. Fig. 4 is a perspective view of a portion of the registering and adding mechanism in detail, some of the parts being broken away to better illustrate the construction and operation thereof. Fig. 5 is a perspective view of the locking and releasing mechanism in detail; Fig. 5^a, a modification. Figs. 6, 7, and 8 are diagrammatic views of a portion of the registering mechanism in

detail. Fig. 9 is a partial sectional view of the mechanism for producing an alarm as the drawer is opened. Figs. 10 and 11 are details of the same.

Like parts are indicated by similar letters of reference throughout the several views.

In the said drawings, A A represent the outer casing, which may be of any suitable size and formed of any desired material.

B is a cash-receptacle, which is preferably made in the nature of a drawer adapted to slide in a suitable compartment in the bottom of the casing A A. The cash-receptacle is preferably held in a closed position within the casing by means of a spring-bolt *a*, adapted to engage in a suitable locking-plate, the spring-bolt being adapted to be operated by a suitable push-rod extending upwardly through the casing and provided with a knob or handle to operate the same to disengage the cash-receptacle and to permit the same to be opened, all of the above parts being arranged substantially the same as described in my former patent above referred to.

The key-board D is preferably provided with three series of keys D' D² D³, each having nine keys numbered from one to nine, the series being adapted to represent, respectively, dollars, dime, and cents. Each of these keys is provided with an operating-lever *b*, a connecting-link *b'*, and an indicator *b²*, all of which parts are preferably arranged in substantially the same manner as set forth in my prior patent referred to, the operating-levers being each provided with an upwardly-extending stop projection *b³*, adapted to form a stop for the registering-lever C, having a projecting spur *b⁵*, which projects laterally therefrom and is adapted to come in contact with the projection *b³* on any lever of its series.

C' is the retaining-lever, having a projecting spur *b⁷*, adapted to be engaged by any levers of its series.

The registering-levers C, there being one for each series of keys, are adapted to act on the registering-wheels E, E', and E², each of said registering-wheels being provided with a series of notches or ratchets on the periphery thereof, preferably one hundred in number, adapted to be engaged by a pawl *c* on said registering-lever.

The dollars, dimes, and cents are each registered on separate series of keys, the series farthest to the right being cents, dimes next, and dollars next, and so on in regular numerical order through as many series as is desirable, three only being shown in the machine herein described, this being the preferable number for a machine of ordinary capacity.

The registering-wheels and the registering-levers are all preferably journaled on a shaft F, which extends from side to side of the casing and forms a part of the inner main frame, upon which all the operating mechanism is supported. Similar shafts or rods F' F² F³ F⁴ are also extended from side to side of the casing parallel with the shaft F and adapted to form the supports for the principal operating mechanism in the manner hereinafter more fully specified.

The registering of the dollars, dimes, and cents and indicating the same at the top of the casing, preferably in the compartment G, in regular numerical order, is accomplished in the manner described in my previous Letters Patent referred to. The retaining-lever C', being operated upon by the key-lever b, releases the registering-lever C of its series, which is also retained in position by the extending arm c', having a friction-roller c², resting on the top of the drawer or cash-receptacle B. The opening and closing of the cash-receptacle B permits the registering-lever to move until the spur b⁵ strikes the projection b³, which causes the pawl c to pass over a number of notches equal to the number indicated on the depressed key. As the drawer or cash-receptacle is closed, the registering-lever is brought to its normal position, thus turning the registering-wheels, with which it engages, a number of notches equal to the number on the key depressed.

To provide for locking each of the operating or key levers b when depressed, I provide a key-lever hook H, journaled on the shaft or bar F³, which is arranged just above the rear end of said levers. This key-lever hook H consists of a sleeve d, journaled on the shaft F³, having an L-shaped arm d' connected to and extending downwardly therefrom, the lower or right-angled portion of said lever being extended parallel with said sleeve above and slightly in the rear of the inner ends of the key or operating lever b. These retaining-hooks H are held in their normal positions beyond the inner ends of said operating-levers by a projecting spur b¹¹ on the retaining-lever C'. (See Fig. 5 for detail.) When the retaining-lever C' is raised by the contact of an operating-lever with the spur b⁵, the retaining-hook H is released and falls by gravity under the end of the lever b, as shown in Fig. 5, thus locking said lever in position. The sleeve d, which forms a part of the key-lever hooks H, is also preferably provided on each side with projecting ribs d², which form a bearing-face or stop for the levers b when

the keys are depressed. The swinging of the key-lever hooks H under the lever b of a depressed key also prevents any other key of the series from being depressed, as the retaining-hook swings over its lever, and thus prevents any movement thereof. If desired, however, the inner ends of the operating-levers may be beveled slightly, as shown in Fig. 5^a, in which case as any other key of that series is depressed the key-lever hook will be forced back, thus permitting the lever already engaged thereby to fall to its normal position, while the new key will be retained by said hook. By having the key-levers beveled, as described, any mistake in indicating the amount may be corrected before the registration takes place. In the present machine, however, I preferably make the key-levers square, so that each key is locked when it is depressed, the remaining keys of the series being at the same time also locked, so that no change can take place or be effected until after the drawer has been opened and the amount indicated by said key registered.

To provide for locking all the key-levers which are not in use when the cash-receptacle is opened, I construct on each of said levers a hook-shaped projection b¹², preferably on the bottom thereof, the projections of all the levers being when in the normal position in line with each other and adapted to be engaged with a hook-shaped locking-lever H', journaled on the rod or shaft F², which is below the inner ends of the operating-levers. This locking-lever H' is provided with a downwardly-projecting finger or arm e and an outwardly-projecting bifurcated arm e'. The arm e rests against the inner end of the cash-receptacle, and the bifurcated arm e' carries a pivoted tongue or push-bar e², which projects upwardly and lies contiguous to a lug or projection d³ on the sleeve d of the key-lever hook H. As the cash-receptacle is opened, the locking-lever H' is moved into the notches formed in the hook-shaped projections b¹² on each of the levers b, which remain in their normal positions. At the same time the tongue or push-bar e² is moved downwardly and engages under the lug or projection d³ on the key-lever hook H, a spring e³, extending from the finger e to the tongue or push-bar e², being preferably used to hold the said bar in position to cause it to engage with the lug d³.

The locking-lever H' may be moved by gravity about the shaft F², or it may be assisted in its movement by a spring e⁵, as shown in Fig. 5. It will be understood that a locking-lever H' is provided for each series of keys, so that when the cash-receptacle is opened all the key-levers are securely locked against movement until the cash-receptacle is again closed, at which time the contact of the projecting fingers e of the locking-levers with the end of the cash-receptacle forces the locking-lever out of engagement with the hook-shaped projections on the key-levers, and at the same time, by an upward move-

ment of the push-bar e^2 on the lug d^3 of the key-lever hook, moves said hook to its normal position, thus releasing those levers which are retained, thereby permitting them also to return to their normal positions. As the key-levers are returned to their normal positions, the retaining-levers are also released and engage with the registering-levers. The push bar or tongue e^2 is preferably so located with reference to the L-shaped portion d' of the key-lever hooks that as said key-lever hook returns to its normal position it comes in contact with said tongue or push-bar e^2 , which is forced out of engagement with the projecting lug d^3 .

As before stated, there is one registering-wheel for each series of keys, said wheels being adapted to register, respectively, the dollars, dimes, and cents. Now, in order that the total amount registered on all the wheels may be read directly therefrom in the regular numerical order, it is necessary to provide means for moving the dimes-wheel one notch every time the cents-wheel is moved ten notches. It is necessary to move the dollars-wheel one notch every time the dimes-wheel is moved ten notches. The means to accomplish this must be also such as will not interfere with the proper registration of the dimes, dollars, and cents on their respective registering-wheels. This I accomplish in the following manner: The registering-wheels E and E', which are the cents and dimes wheels, respectively, are numbered on their periphery from 0 to 9, one number for each notch in the wheel, the numbers being continued in series around the periphery, preferably ten series being employed of ten numbers each, making a total of one hundred notches in each wheel, as before specified. The dollars-wheel is numbered from 0 to 99, making with the registering-wheels only a capacity for the machine of ninety-nine dollars and ninety-nine cents. Additional counting-wheels, however, are preferably provided adapted to count the revolutions of the dollars-wheel, thus increasing the capacity of the machine to any desired extent. I preferably use one such counting-wheel E³, having one hundred notches, numbered, respectively, from 0 to 99, adapted to count ninety-nine revolutions of the dollars-wheel, thus making a capacity for the machine of nine thousand nine hundred and ninety-nine dollars and ninety-nine cents.

To provide for changing the amounts registered of one denomination into the next higher denomination whenever a sufficient number of units in a lower denomination have been registered to make one unit of the next higher, I divide the registering-wheels into a number of equal parts, each of which parts will contain notches representing a sufficient number of units to make one unit of the next higher denomination. In the present case, for registering dimes, dollars, and cents, there will be ten such divisions on the

dimes and cents wheels, representing ten notches or units in each of said divisions. At each of these divisions I provide a notch or depression f , the periphery of the wheel being preferably extended outwardly in the nature of a rib or flange f' , in which these notches f are located, the top or periphery of this flange being thus elevated above the periphery of the registering-wheel proper and that portion thereof which contains the unit or registering notches. Immediately above each of these registering-wheels and supported on the rod or shaft F⁵ is a rocking-arm f^2 , having a lateral projection f^3 , adapted to travel on the periphery of the flange f' and drop into the depressions or notches f as said wheel is revolved. This rocking-arm f^2 carries at its opposite extremity and on the opposite side of the rod or shaft F⁵ a pivoted latch or hook f^5 . Journaled on the rod or shaft F⁵ at the side of the rocking arm f^2 is a stop arm or lever f^7 , connected by a link or rod f^{11} to the locking-lever H². This stop-lever f^7 is adapted normally to rest against the extended end of the latch or hook f^5 and hold it in the position indicated in Figs. 1 and 4. At the side of the stop-lever f^7 , and also preferably journaled on the shaft F⁵, is a vibrating arm f^{12} , which I term the "adding-lever stop," said arm being provided on its forward end with stop-faces f^{13} f^{15} , with which the end of an adding-lever I is adapted to come in contact. This adding-lever I is formed on a sleeve g , which is journaled on the supporting shaft or rod F' and extends along said rod to a point adjacent to the registering-wheel of the next higher denomination. This sleeve g is also provided with an extending arm or lever g' , preferably provided with a friction-wheel g^3 , adapted to come in contact with the end and top of the cash-receptacle B. A pawl g^2 , pivoted to said lever, is also adapted to engage with the registering-notches of that registering-wheel which is of a denomination next above the one to which the adding-lever I is connected by the mechanism herein just described.

The operation of the adding mechanism just described is as follows: As the cash-receptacle is opened, the connecting-rod f^{11} , by the movement of the locking-lever H', withdraws the stop-lever f^7 from contact with the latch or hook f^5 , which latch or hook is by the action of a spring f^{17} thrown forward immediately under a lateral projection f^{21} on the vibrating arm f^{12} . Now, as the cash-receptacle is closed, if the amount added to any registering-wheel—for instance, E' (see Fig. 4)—is sufficient to represent a unit of the next higher denomination the projection f^3 on the rocking arm f^2 is brought opposite one of the notches f on the registering-wheel, thus releasing said arm, which by action of gravity or a suitable spring causes the latch f^5 to engage with the projection f^{21} , raising the same sufficiently to release the adding-lever I from the stop-face f^{14} and permit it to come in con-

tact with the stop-face f^{15} . These stop-faces f^{13} and f^{15} are so arranged with reference to each other that the movement of the adding-lever I from one to the other is sufficient to permit the pawl g^3 to travel one notch on the registering-wheel of the next higher denomination. Now the arm g' , forming a part of the adding-lever I, is made sufficiently long to contact with the cash-receptacle B after the registering-levers have been returned to their normal positions, and consequently after the registering of the amounts indicated by the depressed keys has been completed. As the cash-receptacle is closed, the contact of said receptacle with the friction-rollers g^2 of the adding-levers returns said adding-levers to their normal positions, thus registering one unit on the registering-wheel of the one denomination for each ten units that have been registered on the wheel of the next lower denomination.

Now, in order that the total amount added to or registered by any registering-wheel may be carried to the next registering-wheel whenever a sufficient number of units of the lower denomination shall equal one of the higher, it is necessary that the adding mechanism of each successive denomination from the lowest to the highest shall be operated in successive order. For instance, if the amount represented on the registering-wheels was \$9.99 the registering of a single cent on cents-wheel should produce a movement of each of the other wheels. In order to accomplish this, I make the contact between the cash-receptacle and the adding-levers of each denomination in successive order, the contact of each adding-lever being after the complete movement of all the registering-levers, the adding-lever of the lowest denomination being adapted to come in contact with the receptacle as soon as the movement of the registering-lever is complete, and the adding-levers of the next higher denomination being adapted to contact with said cash-receptacle as soon as the movement of the registering-lever of the next lower denomination is complete, the successive order of rotation being indicated in Fig. 1 by the positions of the friction-rollers c^2 , h^2 , and g^2 . Upon the completed movement of the cash-receptacle the locking-lever H' is withdrawn, as described. The movement thereof is transferred to the stop-lever f^7 , which withdraws the latch f^5 , permitting the vibrating lever f^{12} to assume its normal position with reference to the adding-lever, the parts being thus held in their normal positions inactive.

In the organization of the machine thus described two adding-levers and their mechanism only are employed, one for transferring the cents to dimes and the dimes to dollars. To provide for an additional capacity for the machine, I place a counting-wheel E^3 at the side of the dollars-registering wheel E^2 . This counting-wheel E^3 is journaled loosely on the shaft F and is adapted to turn in the opposite

direction from the registering-wheel E^2 , it being numbered from 0 to 99 and provided with a notch for each number, the same as the registering-wheel, except that the numbers and notches are arranged in the opposite direction. Immediately above the registering-wheel and its counting-wheel is a swinging arm k , having a lateral projection k^2 , which extends outwardly and is adapted to be engaged with a cam-shaped rib or lug k^3 on the registering-wheel E^2 . A pivoted pawl k^3 on this arm k engages in the registering-wheel - notches on the counting-wheel E^3 , a spring k^5 being preferably used to force the lever k to its normal position when released by the cam projection k^2 . The cam projection k^2 is made of sufficient height to produce a movement of the swinging arm k sufficient to move the pawl k^3 one notch on the counting-wheel E^3 . It will thus be seen that as the registering-wheel E^2 completes one revolution the counting-wheel E^3 is moved one notch, thus registering or counting the revolutions of said wheel and indicating the amount by the numbers on the periphery thereof.

Now, in order that the total amount registered by all the registering and counting wheels may be read therefrom with facility, I place the dollars-counting wheel at the side of and contiguous to the registering-wheel, so that the amount indicated by the pointer or indicating-arm l on both wheels forms practically one number and is expressed in dollars. For the same reason I form the registering-wheel E' with a separate disk or dial E^5 , which lies adjacent to the registering-wheel E , this dial or indicating-wheel E^5 being connected to the dimes-registering wheel E' by a sleeve m , journaled on the supporting-shaft F. In this way the dimes and cents registered on the respective wheels are indicated in a single number by the indicating-arm l and are expressed in cents. For instance, as shown in Fig. 8, the amount shown by the wheels E^2 and E^3 is 397, representing that many dollars. The amount shown by the wheels E and E^5 is 95, representing that many cents, the total amount being read directly from the wheels being \$397.95.

All of the registering and counting wheels are preferably journaled loosely on the supporting-shaft F, and when the cash-receptacle is closed they may be turned freely on said shaft in the direction in which they are adapted to move, and thus be readily replaced to the starting-point at 0 on each wheel at any time, as desired, it being understood that the outer casing is provided with a suitable door normally locked, which may be opened to obtain access to each of said wheels.

The indicating-levers l are preferably made of resilient material and provided with bearing or friction faces l' , preferably of leather or similar material, adapted to bear against the numbered faces of the wheels, which are for this purpose turned off smooth, the friction

tion of these indicating-levers and their bearing-faces being adapted to prevent any accidental movement of said wheels.

Means are provided for giving an alarm 5 when the cash-receptacle is opened. This I preferably accomplish as follows: A gong J is supported on a suitable standard J', secured within the casing immediately back of the cash-receptacle B. A bell-crank lever o, 10 pivoted thereto, carries a vibrating hammer o'. The bell-crank lever has on one of its arms a projection o², adapted to come in contact with stop-faces o³ and o⁵ on a pivoted catch J², which is pivoted at o⁷ to the stand- 15 ard J'. This pivoted catch J² is also provided with a projecting lug o¹¹ at or near the bottom thereof. A spring o¹², connecting the bell-crank o and the base of standard J', serves to force the hammer o' in contact with the gong 20 J when released by the catch J² in the manner hereinafter described. The inner end of the drawer B is provided with two projecting studs K, the lower one K' being provided with a projecting head p, adapted to engage with 25 the projection o¹¹ on the pivoted catch J², as shown in Fig. 9. As the drawer is opened, the catch J² is turned on its pivotal point sufficient to release the lever o and permit the lateral projection thereon to drop down 30 to the stop-face o⁵, which movement permits the hammer o' to strike the gong J, and thus sound an alarm, the hammer-rod being preferably formed of resilient material, which will permit the hammer to strike the gong 35 and rebound slightly therefrom to prevent conflict with the vibrations of the gong. The parts remain in this position until the cash-receptacle is closed, when the stud K comes against the other arm of the bell-crank o, thus 40 withdrawing the hammer and bell-crank, permitting the catch J² to return to the normal position, so that the projection o² on said bell-crank rests on the stop-face o³ in position for another stroke when the cash-receptacle is 45 opened.

The machine as thus described, it will be seen, is simple in its operating parts and is adapted to register any number or combination of numbers up to the capacity of the 50 machine and add the whole to the amounts previously registered, the total amount being indicated at any time upon the registering-wheels, and may be read directly therefrom in the proper numerical order without the aid 55 of any mental calculation whatsoever.

In Fig. 3 I have shown the compartment G formed with an extended portion G', having a closed front, the lower part thereof being open in front. One of the tablets or indi- 60 cators b² of each series, preferably that tablet which represents 9 of each series, I extend above the other tablets of the series far enough to contain thereon, in addition to its regular numeral, a zero-mark or cipher, as shown in 65 Fig. 3^a and in dotted lines in Fig. 3. This extended or double tablet is arranged at the back of the series, so that when all the tablets

are in their normal position the zero-mark or cipher on each of these extended tablets projects upwardly within the compartment G 70 and is exposed at the front thereof. By this arrangement if any of the other tablets of that series are elevated it comes in front of the extended portion of the last tablet, and thus takes the place of the zero-mark or cipher 75 in said extended tablet. If the last or double tablet is elevated, the zero-mark or cipher is forced up into the extended portion G' of the compartment G, as indicated by dotted lines in Fig. 3, and is thus hidden from 80 view. This arrangement obviates the necessity of an extra zero-tablet or of the placing of the zero-marks stationary upon the back of said compartment.

It is obvious that the mechanism herein 85 described for accomplishing the functions ascribed to them may be variously modified without departing from the spirit of my invention. I do not, therefore, limit myself to these constructions, but claim, broadly, as my 90 invention—

1. In a cash-register, a normally-inactive registering mechanism adapted when released to be set into operation by the opening and closing of the cash-receptacle, said 95 registering mechanism being provided with a series of wheels representing units of different denominations, and an adding mechanism independent of said registering mechanism, but adapted to be set into operation thereby, said 100 adding mechanism being operated by the opening and closing of the cash-receptacle to transfer the amounts registered in one denomination to a higher denomination, substantially as specified. 105

2. In a cash-register, a normally-inactive registering mechanism adapted when released to be set into operation by the opening and closing of a cash-receptacle, and normally-inactive adding mechanism independent 110 of said registering mechanism, but adapted to be released thereby, said adding mechanism being operated by the opening and closing of said cash-receptacle after the registering mechanism has completed its operation, 115 substantially as specified.

3. In a cash-register, a normally-inactive registering mechanism adapted when released to be set into operation by the opening and closing of the cash-receptacle, said 120 registering mechanism being provided with a series of wheels representing units of different denominations, and an adding mechanism connected with each of the wheels of the lower denominations to transfer the amounts indicated thereby to the wheels of the higher den- 125 ominations, said adding mechanism being adapted to be released by the operation of the registering mechanism and operated by the opening and closing of the cash-receptacle after the registering mechanism has com- 130 pleted its operation and in successive order from lower to higher denominations, substantially as specified.

4. The combination, with a normally-closed cash-receptacle and a series of registering-wheels, each adapted to register units of different denominations, of an adding mechanism adapted to be released by the operation of a registering-wheel of a lower denomination whenever a sufficient number of units have been registered thereon to make a unit of the next higher denomination, and means independent of said registering mechanism for positively operating said adding mechanism by the opening and closing of the cash-receptacle to produce a movement of the registering-wheel of the next higher denomination corresponding to a unit thereon, substantially as specified.

5. In a cash-register, the combination, with a normally-closed cash-receptacle and two or more registering-wheels, each adapted to register units of different denominations, of an adding mechanism adapted to be released by the operation of a registering-wheel of a lower denomination, a stop-lever adapted to hold said adding mechanism in its normal position, and means for removing said stop-lever when said cash-receptacle is opened to permit said adding mechanism to be positively operated by the opening and closing of said cash-receptacle, substantially as specified.

6. In a cash-register, two registering-wheels located adjacent to each other and adapted to turn in opposite directions, each of said wheels being provided with a series of numbers on its periphery, the numbers on said wheels being arranged in the same numerical order but in different directions around the peripheries thereof, the numbers in each series being adapted to be read in the proper numerical order on the face of said wheels at a common point in the revolution of said wheels, a series of ratchets on one of said wheels and a pivoted pawl adapted to engage in said ratchets, a cam or projection on the other wheel, and an arm on said pawl to engage said cam or projection, whereby one of said registering-wheels is caused to advance one notch in one direction on a complete revolution of the other registering-wheel in the other direction and the respective series of numbers advanced so as to be read together at a common point in their revolution, substantially as specified.

7. The combination, with a normally-closed cash-receptacle, a series of registering-wheels, and registering mechanism connected to said wheels, of an adding-lever adapted to be released by one of said registering-wheels and provided with mechanism for engaging with and revolving another of said registering-wheels, and means independent of the registering mechanism for positively moving said adding-lever to its normal position, and thus moving the said registering-wheel by a movement of the cash-receptacle, substantially as specified.

8. The combination, with a series of regis-

tering-wheels and a registering-lever for each wheel, of a series of keys adapted to release said levers and determine the movement thereof, a normally-inactive adding mechanism adapted to register a unit of one denomination whenever a corresponding number of units have been registered on a wheel of a lower denomination, and a normally-closed cash-receptacle, and means for positively moving the registering mechanism and the said adding mechanism in successive series by the movement of said cash-receptacle, substantially as specified.

9. The combination, with registering-wheels representing units of different denominations, of ratchet-teeth on each of said wheels, one or more of said registering-wheels being provided with subdivisions corresponding to a unit of the registering-wheel of a higher denomination, an adding-lever having a pivoted pawl adapted to engage in the ratchets of a wheel of one denomination, and a releasing mechanism adapted to be operated by the revolution of a registering-wheel of a lower denomination at each subdivision thereof, and a normally-closed cash-receptacle adapted when opened and closed to return said adding lever to its normal position after the registering-wheels have been moved by their registering mechanism, substantially as specified.

10. The combination, with the registering-wheels E' E^2 , each having ratchet-teeth, as described, of an adding-lever adapted to be released by the notches f in the wheel E' and provided with a pivoted pawl adapted to engage with the ratchets in the wheel E^2 , and a normally-closed cash-receptacle adapted when opened and closed to move said lever to its normal position and thus move the wheel E^2 one notch whenever the adding-lever is released by the revolution of the other wheel, substantially as specified.

11. The combination, with two or more registering-wheels, of a pivoted lever f^2 , latch f^3 , stop-lever f^{12} , and an adding-lever I , said adding-lever being provided with a pawl adapted to engage with one of said registering-wheels, and said pivoted lever f^2 being adapted to be operated by the notches on another of said registering-wheels, and means, substantially as described, for moving said adding-lever when released by the operation of said pivoted lever, substantially as specified.

12. In a cash-register, a series of normally-inactive registering-wheels adapted to register, respectively, dollars, dimes, and cents, a normally-closed cash-receptacle adapted to be operated independent of said registering-wheels, a registering mechanism for each of said wheels, and a series of keys adapted to release said registering mechanism, said registering mechanism being adapted to be operated when so released to move said registering-wheels by the opening and closing of the said cash-receptacle, and means, substantially as described, operated by the opening

and closing of the cash-receptacle independent of the registering mechanism, for registering a unit on the dimes or dollars wheel when ten units have been registered on the next lower wheel, substantially as specified.

13. The combination, with a series of keys and levers, of a registering mechanism and a retaining-lever adapted to release said registering mechanism, said retaining-lever being operated by the said keys, a pivoted latch adapted to be released by said retaining-lever and engage the said key-levers when operated against said retaining-lever, a normally-closed cash-receptacle adapted by its operation to operate said registering mechanism, and means for releasing said pivoted latch and thus releasing said key-levers and retaining-lever when said cash-receptacle is closed, substantially as specified.

14. The combination, with the key-levers *b*, having the hook-shaped projections, of retaining-lever *C*, having an engaging projection *b*¹¹, a pivoted latch *H*, locking-lever *H'*, having the pivoted tongue *e*², adapted to engage with the latch *H*, and means for operating said locking-lever, substantially as specified.

15. The combination, with the operating keys and levers, of a normally-closed cash-receptacle and a locking-lever adapted to lock said keys when the cash-receptacle is opened, a registering mechanism adapted to be set into operation by the opening of said cash-receptacle, an adding mechanism adapted to be released by the operation of said registering mechanism, and a stop connected with the adding mechanism and operated by said locking-lever, substantially as specified.

16. The combination, with a registering-wheel and a pivoted registering-lever, of a series of keys and levers, each of said levers being provided with a stop projection and a hook-shaped projection, as described, and a pivoted locking-lever adapted to engage with said hook-shaped projections, said locking-lever and registering-lever being operated by the opening and closing of said cash-receptacle, substantially as specified.

17. The combination, with a series of keys and their operating-levers, each of said levers having a stop projection and a hook-shaped projection, as described, of a registering-wheel and registering-lever, a retaining-lever adapted to be engaged by each of said keys, and a pivoted locking-lever adapted to engage in said hook-shaped projection, said registering-lever and locking-lever being operated by the opening and closing of a cash-receptacle, substantially as specified.

18. In a cash-register, a sliding cash-receptacle, a registering-wheel and a registering-lever, a series of keys, each having means for limiting the movement of said registering-lever, a retaining-lever adapted to be engaged by each of said keys, and a locking-lever adapted to engage all of the key-levers in their normal positions, said registering-lever and locking-lever being operated by the opening and

closing of said cash-receptacle, substantially as specified.

19. In a cash-register, a sliding cash-receptacle, a registering-wheel and a registering-lever, pivoted key-levers, each provided with means for limiting the movement of said registering-lever, a retaining-lever adapted to be engaged by each of said key-levers, a pivoted catch adapted to be released by said retaining-lever and engage with said key-lever, and means, substantially as described, for operating said registering-lever and releasing said catch by the opening and closing of said cash-receptacle, substantially as specified.

20. The combination, with a sliding cash-receptacle, of a registering-wheel and a registering-lever, an adding mechanism adapted to be thrown in position for operation by a movement of said registering-wheel, and a stop-lever connected with said registering-mechanism adapted to be operated independently of the registering mechanism by the opening and closing of said cash-receptacle, substantially as specified.

21. The combination, with a sliding cash-receptacle, of a series of registering-wheels, each having a registering-lever, an adding mechanism adapted to be set in position by one of said registering-wheels to operate one or more of the other registering-wheels, and a stop-lever connected with said adding mechanism and adapted to be operated independent of the operation of the adding mechanism by the opening and closing of the cash-receptacle, substantially as specified.

22. The combination, with a series of registering-wheels and the registering-levers, of a movable cash-receptacle adapted to operate said registering-levers, an adding mechanism adapted to be set in position by one of said registering-wheels to operate one or more of the other registering-wheels, a locking device for said adding mechanism adapted to be operated by the opening and closing of the cash-receptacle, and means, substantially as described, for operating said adding mechanism after the movement of said registering-wheels has been completed and prior to the complete closing of said cash-receptacle, substantially as specified.

23. The combination, in a cash-register, with a movable cash-receptacle, of a stationary gong, a pivoted hammer, and a movable catch having stop-faces adapted to determine the position of said hammer, and means connected with said cash-receptacle for engaging said pivoted catch when said cash-receptacle is moved in one direction and withdrawing said hammer when moved in the other direction, substantially as specified.

24. The combination, with a stationary gong, of a bell-crank lever having a hammer adapted to operate with said gong, a pivoted catch to engage said bell-crank lever and determine the position of said hammer, and a movable operating mechanism adapted when moved in one direction to withdraw said hammer

and adapted when moved in the other direction to withdraw said catch, substantially as specified.

25. The combination, with the gong J, of bell-crank *o*, hammer *o'*, pivoted catch J², having stop-faces *o*³ *o*⁵, and the movable parts K K', substantially as specified.

26. The combination of a movable cash-receptacle having projections K K', a pivoted bell-crank and hammer, stationary gong, pivoted latch adapted to be engaged by the pro-

jection K', having stop-faces adapted to said bell-crank, said projection K being adapted to engage with the bell-crank and withdraw said hammer, substantially as specified.

In testimony whereof I have hereunto set my hand this 12th day of September, A. D. 1890.

SERN PERLEY WATT.

Witnesses:

JAS. J. MUIR,

LOUIS KETTERMAN.