



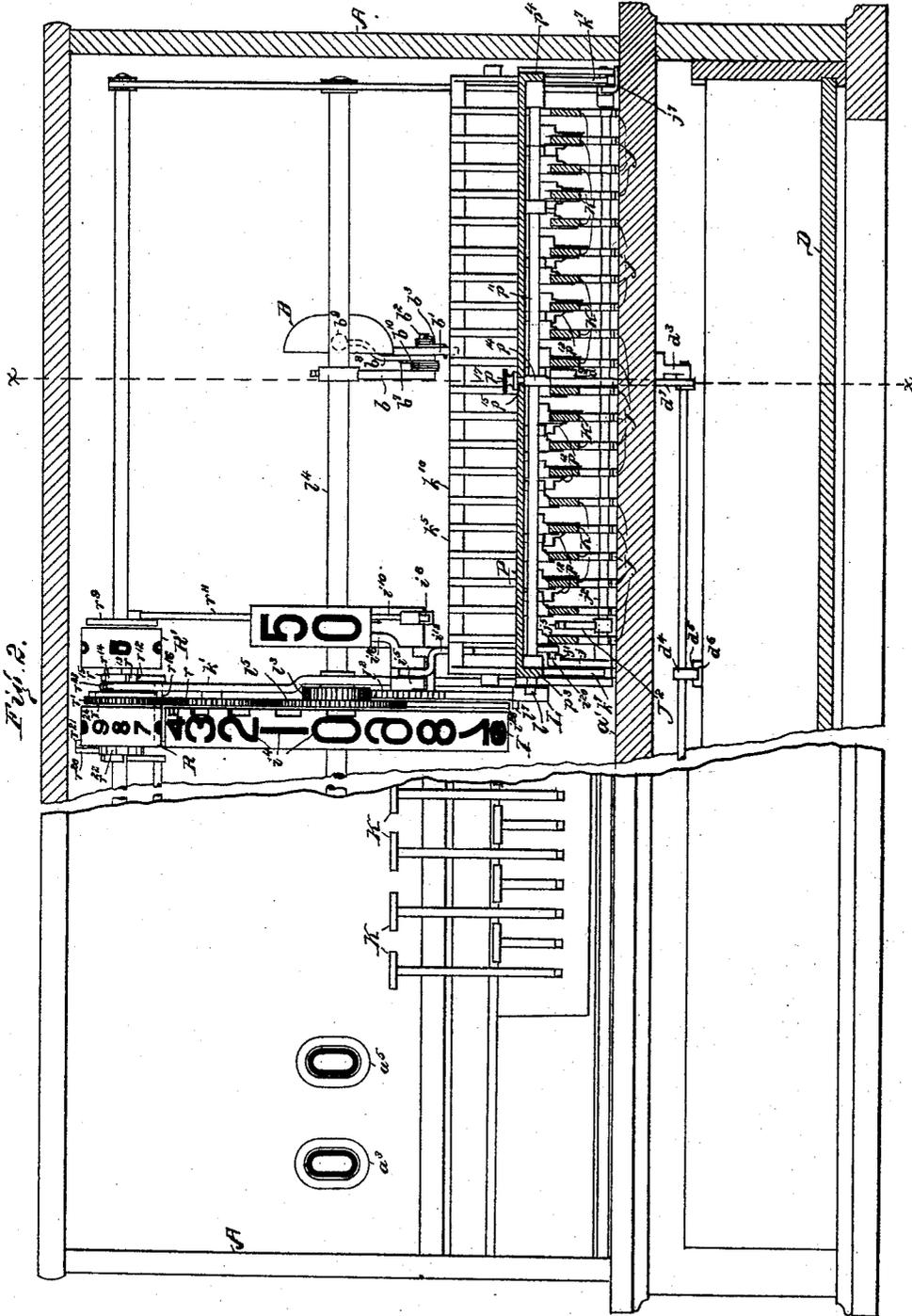
(No Model.)

6 Sheets—Sheet 2.

J. J. WEBSTER.  
CASH REGISTER AND INDICATOR.

No. 484,887.

Patented Oct. 25, 1892.



Witnesses—  
*Hirshley Hyde,*  
*Myrtie L. Beale.*

INVENTOR—  
*Jerome J. Webster,*  
*By Albert W. Moore,*  
*His Attorney.*

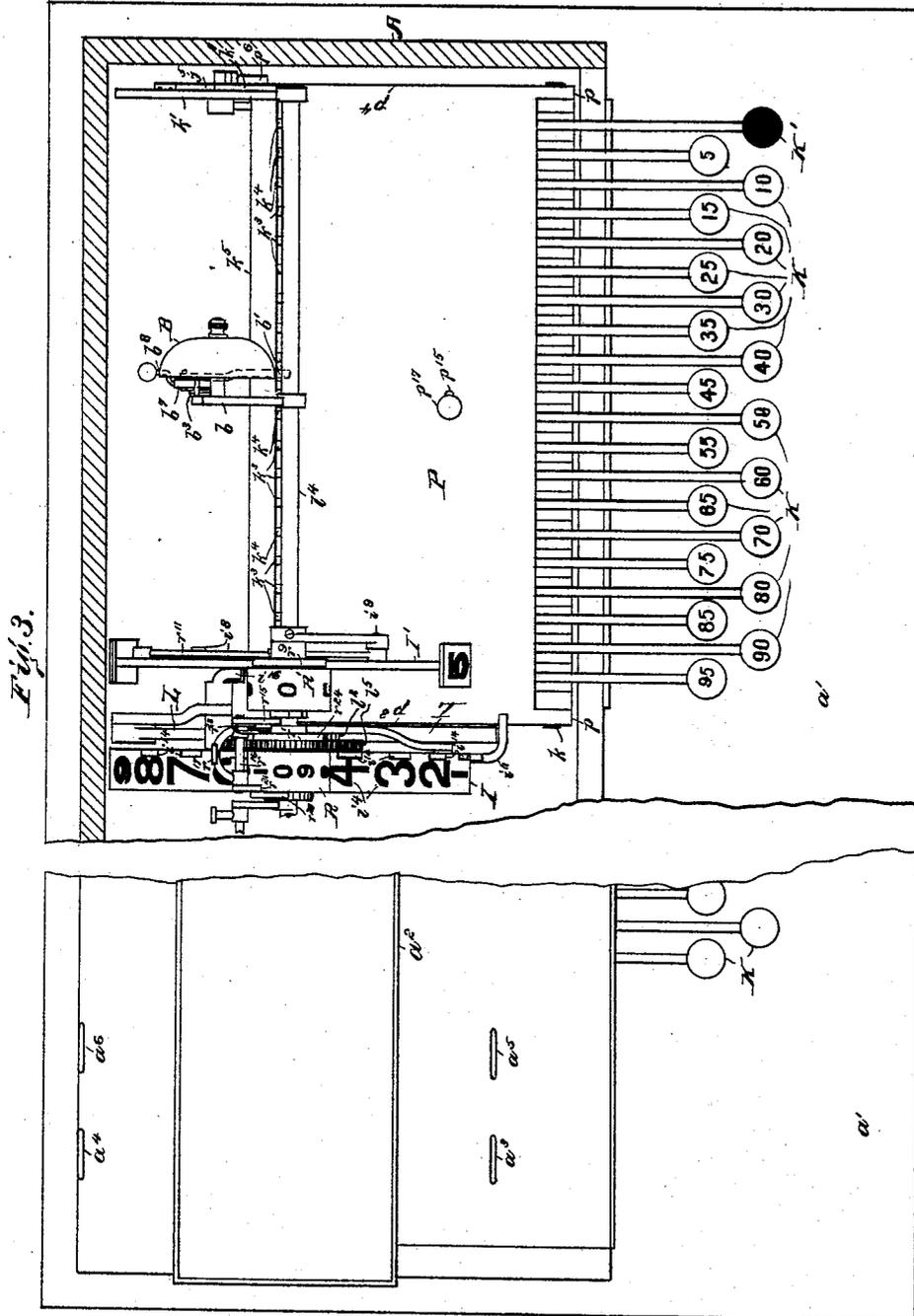
(No Model.)

6 Sheets—Sheet 3.

J. J. WEBSTER.  
CASH REGISTER AND INDICATOR.

No. 484,887.

Patented Oct. 25, 1892.



Witnesses—

*Hinkley Hyde,*  
*Myrtle C. Beale*

INVENTOR—  
*Jerome J. Webster,*  
*By Albert M. Moore,*  
*His Attorney.*

(No Model.)

6 Sheets—Sheet 4.

J. J. WEBSTER.  
CASH REGISTER AND INDICATOR.

No. 484,887.

Patented Oct. 25, 1892.

Fig. 4.

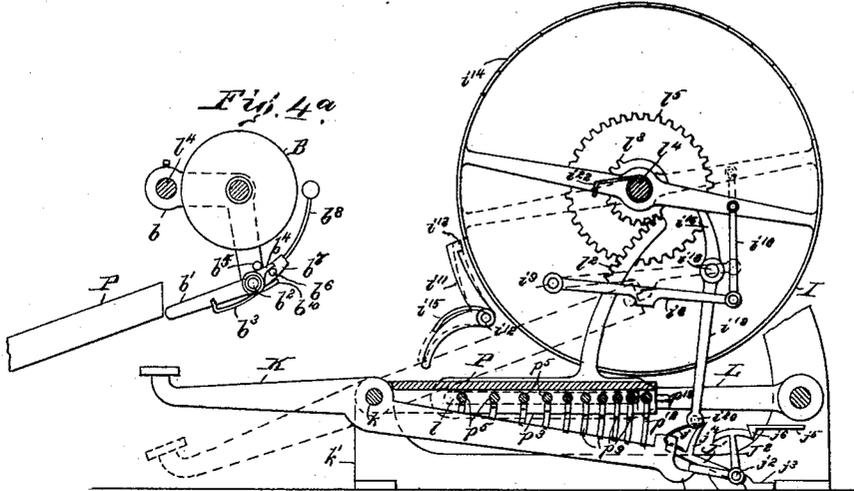


Fig. 5.

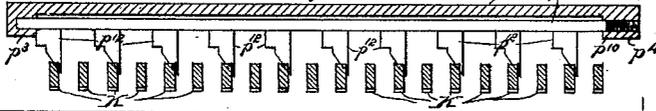


Fig. 6.

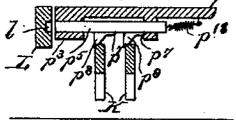


Fig. 7.

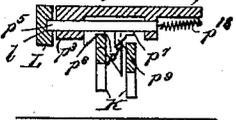
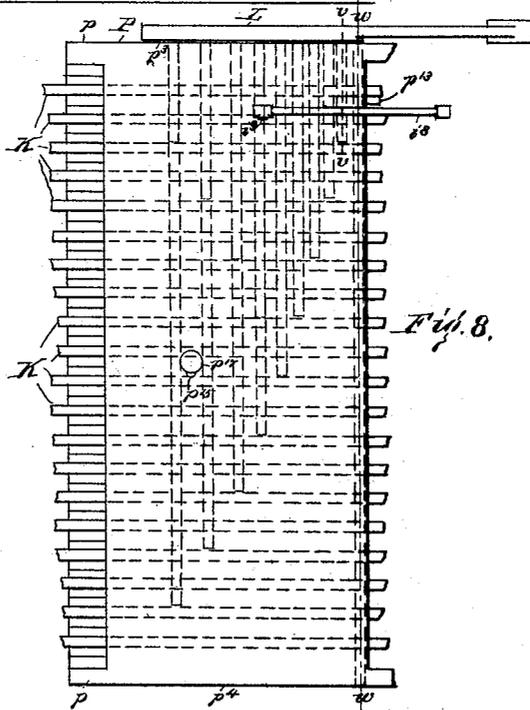


Fig. 8.



Witnesses—

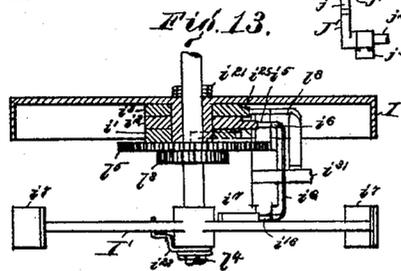
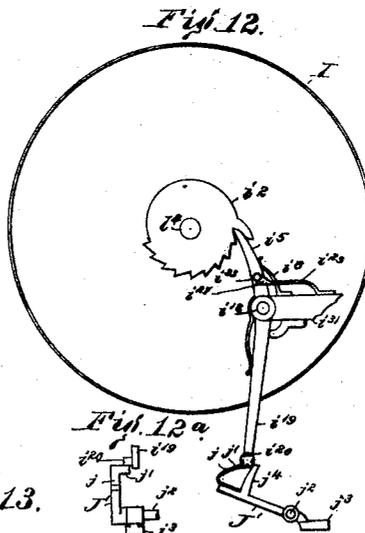
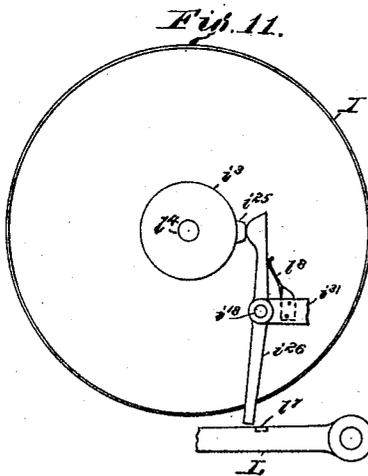
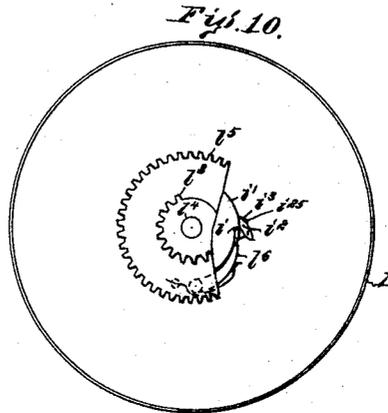
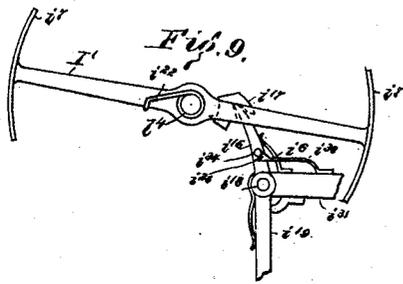
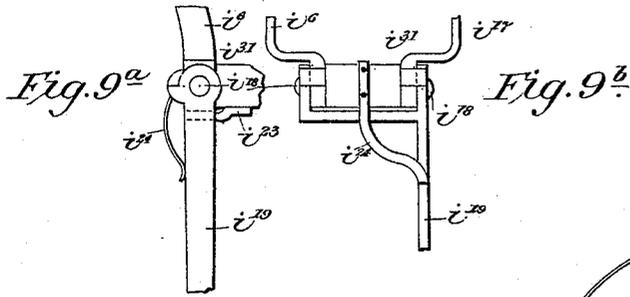
*Hickley Hyde.*  
*Myrtle C. Peale.*

INVENTOR—  
*Jerome J. Webster,*  
*By Albert M. Moore,*  
*His Attorney.*

J. J. WEBSTER.  
CASH REGISTER AND INDICATOR.

No. 484,887.

Patented Oct. 25, 1892.



Witnesses—

*Hirshley Hyde.*  
*Wynne C. Roale.*

Inventor—

*Jerome J. Webster,*  
*By Albert M. Moore,*  
*His Attorney.*

J. J. WEBSTER.  
CASH REGISTER AND INDICATOR.

No. 484,887.

Patented Oct. 25, 1892.

Fig. 14.

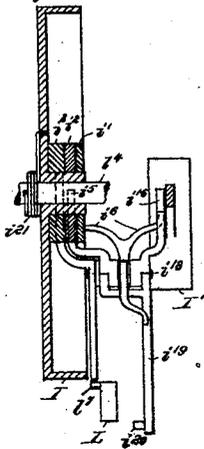


Fig. 15.

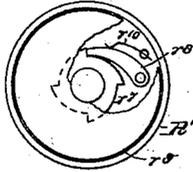


Fig. 16.

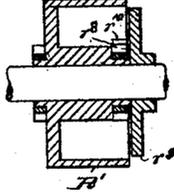


Fig. 17.

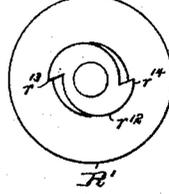


Fig. 18.



Fig. 19.

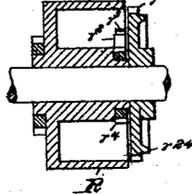


Fig. 20.

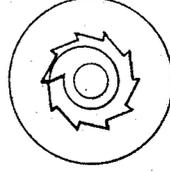


Fig. 21.

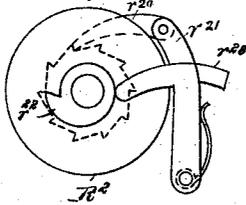


Fig. 22.

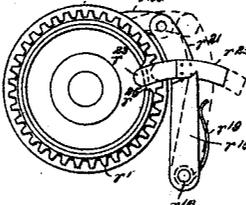


Fig. 23.

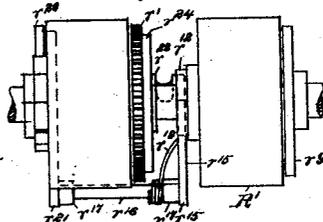


Fig. 25.

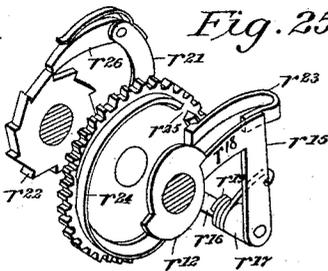
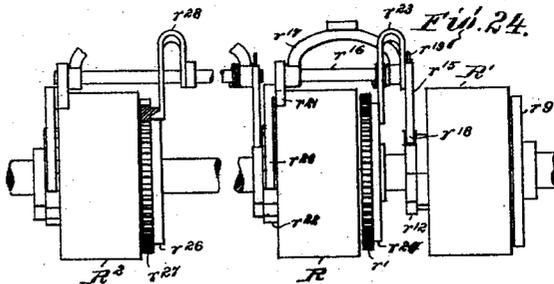


Fig. 24.



Witnesses—

*Hirshley Hyde,*  
*Myrtle C. Beale.*

Inventor—  
*Jerome J. Webster,*  
*By Albert M. Moore,*  
*His Attorney.*

# UNITED STATES PATENT OFFICE.

JEROME J. WEBSTER, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR, BY  
MESNE ASSIGNMENTS, TO THE BOSTON CASH REGISTER COMPANY,  
OF PORTLAND, MAINE.

## CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 484,887, dated October 25, 1892.

Application filed January 2, 1889. Serial No. 295,137. (No model.)

*To all whom it may concern:*

Be it known that I, JEROME J. WEBSTER, a subject of Victoria, Queen of the United Kingdom of Great Britain and Ireland, residing at  
5 Somerville, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Cash Indicators and Registers, of which the following is a specification.  
10 My invention relates to cash indicators and registers; and it consists in the devices and combinations hereinafter described and claimed, and which have for their object to indicate on both sides of the machine the  
15 amount registered by a single operation of the machine, to retain the indicating-numbers exposed to view after any operation of the machine until the next operation thereof, to prevent the simultaneous depression of two  
20 or more keys, to prevent a partially-depressed key from returning to its normal position until after its complete depression, and to indicate by the depression of a single key units on one indicating-wheel and tens on another indicating-  
25 wheel; also, in a series of registering-wheels, each adapted to register ten and to cause by a complete revolution of any wheel the wheel registering numbers of the next highest denomination to make one-tenth of a revolution, to  
30 enable in such a series of registering-wheels each of said wheels to be operated independently to register numbers of its own denomination and also to operate the wheel that registers numbers of the next higher denomination and to retard the operation of the registering-wheel of the higher denomination due to the action of the registering-wheel of the  
35 next lower denomination until its independent operation has been completed, to keep the drawer normally locked and to prevent it from being opened except by the operation of the keys, and to prevent the keys and the indicating and registering mechanism from being operated when the drawer is open.  
40 In the accompanying drawings, on six sheets, Figure 1 is a vertical section of a cash indicator and register containing my improvement on the line  $x x$  in Fig. 2; Fig. 1<sup>a</sup>, a side elevation of the rocking plate, a key and its  
45 rack, the pawl which engages said rack, and

a part of the mechanism which releases the pawls that retain the indicating-wheels in their indicating position, the position of said plate, key, and first-named pawl when the key is depressed being shown in dotted lines; Fig. 1<sup>b</sup>, a  
55 side elevation of a part of a key and a vertical section of part of the rocking plate and part of the drawer, showing the drawer-locking mechanism, the dotted lines showing the position of the rocking plate and locking mechanism  
60 when the plate is raised to unlock the drawer; Fig. 1<sup>c</sup>, a vertical section of a part of the rocking plate and its hook and the drawer-locking lever engaged by said hook; Fig. 2, a representation of such indicator and register, partly in  
65 elevation at the left of the figure and partly in vertical transverse section, on the line  $y y$  in Fig. 1; Fig. 3, a representation partly in plan at the left of the figure and a horizontal section on the line  $z z$  in Fig. 1; Fig. 4, a  
70 side elevation of a key, the registering-lever, the units-indicating wheel or five-cent wheel, and the tens-indicating wheel and a section on the line  $x x$  in Fig. 2 of the rocking plate, the fulcrum-rod, and the pivot of the registering-lever, the dotted lines showing the position  
75 of the key and of said wheels when the key is depressed; Fig. 4<sup>a</sup>, a side elevation of the rocking plate, bell, and bell-ringing mechanism; Fig. 5, a transverse vertical section of the rocking  
80 plate on the line  $w w$  in Fig. 8 and of the keys in the same plane; Fig. 6, a section on the line  $v v$  in Fig. 8 of a portion of the rocking plate and registering-lever and of the rear  
85 portion of two adjacent keys, both keys being in their normal position; Fig. 7, a similar section of the registering-lever and rocking plate to that shown in Fig. 6, except that one of the keys is represented as depressed—that is, with its rear arm raised; Fig. 8, a plan of  
90 the rocking plate, the registering-lever, and portions of the rear arms of the keys, parts of the keys and the stop-pins being shown by dotted lines; Fig. 9, a right side elevation of the units-indicating wheel and its retaining-pawl; Fig. 9<sup>a</sup>, a right side elevation, and Fig. 9<sup>b</sup> a  
95 front elevation, of a part of the pawl-lever and parts of the pawls united thereto by a rule-joint; Fig. 10, a right side elevation of the tens-indicating wheel, the segmental gear, the  
100

transfer-wheel, partly broken away, the single-toothed pinion, its pawl and spring, the long tooth of the retaining-ratchet, and the unlocking-cam of the cam-wheel; Fig. 11, a right side elevation of a part of the frame, the tens-indicating wheel, the cam-wheel fast on the hub of the tens-indicating wheel, the unlocking-lever, and part of the registering-lever, showing by dotted lines the projection on the registering-lever which prevents the registering-lever from rising except when said indicating-wheel indicates "0;" Fig. 12, a right side elevation of the tens-indicating wheel, the cam-wheel and long-toothed ratchet-wheel secured to the hub of said indicating-wheel, the retaining-pawl, which by engaging with said ratchet prevents the indicating-wheel from returning to its "0" point until another operation of the keys, and means of releasing the pawls; Fig. 12<sup>a</sup>, a front elevation of the releasing mechanism shown in Fig. 12; Fig. 13, a plan of the units-indicating wheel, of the shaft on which it turns, and of the mutilated pinion and transfer-wheel and a central horizontal section of the tens-indicating wheel, the cam-wheel, the long-toothed ratchet-wheel, and the single-toothed ratchet-wheel; Fig. 14, a vertical central section of the tens-indicating wheel, the cam-wheel, the long-toothed ratchet-wheel, the single-toothed ratchet, the units ratchet-wheel, and their pawls; Fig. 15, a right side elevation of the units-registering wheel, a part of the pawl-carrying plate being broken away to show the pawl which impels said wheel, the four-toothed ratchet engaged by said pawl, and the spring which holds said pawl in engagement with said ratchet, a part of said ratchet being shown by dotted lines; Fig. 16, a vertical central section of the parts shown in Fig. 15 and a front elevation of the shaft on which the units-registering ratchet turns; Fig. 17, a left side elevation of said units-registering wheel; Fig. 18, a right side elevation of the tens-registering wheel, a part of the pawl-carrying disk or pinion being broken away to show the ratchet-pawl and spring by which said tens-registering wheel is actuated; Fig. 19, a vertical central section of the parts shown in Fig. 18 and a front elevation of the shaft supporting the same; Fig. 20, a left end elevation of the tens-registering wheel, showing the cam which actuates the carrying devices; Fig. 21, a right side elevation of the cam which transfers from a lower denomination to a higher the transferring-arm and the impelling arm and ratchet of the registering-wheel of the next higher denomination; Fig. 22, a right side elevation of any registering-wheel except that of the lowest denomination and its impelling-pawl and retarding-spring; Fig. 23, a front elevation of two registering-wheels of different denominations, the shaft which supports them, and the transferring or carrying devices; Fig. 24, a plan of the same and of another registering-wheel of

still higher denomination; Fig. 25, an isometric perspective view of the carrying devices, showing the cam-lever, the rod to which it is secured, the cam-wheel, the pawl-lever and pawl, the ten-toothed ratchet, and registering-gear.

The case A consists of a lower rectangular part *a*, in which slides a till or drawer D, the table *a'* or top of the part *a*, supporting the operating mechanism of the indicator and register, and an upper portion *a*<sup>2</sup>, which conceals said operative mechanism. The drawer when released is caused to protrude from the case by a drawer-opening spring *d'*, the above-named parts being of any usual construction, except that the upper part of the case is preferably shaped to conform partially to the actual requirements of the space occupied by the operating mechanism. The keys K turn upon a fulcrum-rod *k*, supported by two or more brackets or posts *k'*, secured to the table *a'* of the case A in substantially the usual manner.

The keys, as in other indicating-machines, may be arranged in convenient groups, one to be employed in registering and indicating cents, another group to be used in registering and indicating dimes or dollars, and so on, the keys being numbered to correspond to signals which are brought into view by the depression of the keys. The keys K all have a uniform range of motion and in the drawings are numbered from "5" to "95" in multiples of five, the key K' at the extreme right being intended not for registering purposes, but merely to unlock the drawer, sound the alarm, and return the signals to "0", as hereinafter more fully explained. Every other key K (beginning at the right and excluding the non-indicating key K') is marked "5" or some number represented in part by a "5" in the units-place, and the alternate keys are marked "10" or some multiple thereof.

The rocking plate P is provided with arms *p*, through which the fulcrum-rod is passed, the plate extending over all the keys of the group and in its normal position being arranged just above the keys of said group, so that the depression of any key to its fullest extent will cause said rocking plate to turn upon the fulcrum-rod *k*, a spring *p*<sup>2</sup> restoring the rocking plate to its normal position when the key has returned to its position.

On the under side of the rocking plate P, in brackets *p*<sup>3</sup> *p*<sup>4</sup>, one of said brackets *p*<sup>3</sup> being a rib which extends along the left side of said rocking plate, slide nine actuating and stop bolts *p*<sup>5</sup>, arranged in a common plane, said bolts being parallel both with the top of said rocking plate and with the fulcrum-rod *k*, the left ends of these bolts *p*<sup>5</sup> being held flush with the left side of said plate P by springs *p*<sup>18</sup>, attached to said bolts and to the under side of said plate, and by stops or shoulders *p*<sup>7</sup> on said bolts, which limit the motion of said bolts to the right. Although, as above stated, the complete depression of any key

rocks the rocking plate, this is not the first action caused by a partial depression.

Each bolt  $p^5$  is provided on its under side with two inclines  $p^8 p^9$ , secured thereto, which are essentially alike and are placed at the same distance apart from each other as two adjacent keys K and above a pair of keys, one of which is marked by a number, which is "10" or a multiple thereof, and the other by a number greater than said multiple by five, as "10" and "15," "20" and "25," or "90" and "95," the inclines  $p^8 p^9$  being so arranged that the depression of either of the keys of such pair and the raising of the rear arm of said key against one of the inclines will cause the bolt to which said inclines are secured to project from the left of the rocking plate an equal distance, and one of the bolts  $p^5$  will thus be caused to project from the rocking plate by the depression of any key numbered higher than five. Each of the bolts  $p^5$  projected enters a horizontal slot  $l$  in the right side of a registering-lever L, arranged at right angles to said bolts and turning upon a horizontal fulcrum parallel to the fulcrum-rod  $k$  back of said keys, said slot being long enough to admit the ends of all of said bolts at a time and wide enough vertically to admit them freely, but without allowing them any vertical play therein. It will be seen that slightly depressing two non-adjacent keys will cause two bolts to enter the slot  $l$  in the registering-lever L; but, the rocking plate and registering-lever having their fulcrums at some distance from each other and rising in opposite directions and the bolts lying in the same horizontal plane and fitting said slot, it is evident that neither the rocking plate nor the registering-lever can be raised when two bolts are in the slot  $l$ , and therefore two corresponding keys arranged under the rocking plate cannot be completely depressed. It follows that only two keys of the same pair—that is, two keys which operate the same bolt—can be simultaneously depressed to their fullest extent and two keys of the same pair cannot be depressed, except by intention, because, as will be seen in Fig. 3, every two keys of the same pair are arranged in different ranks, the keys denoting "10" and multiples thereof being in the front rank and the keys denoting "5" and odd multiples thereof being in the rear rank, and the buttons of the two ranks are some distance apart. It will appear hereinafter that when two keys of the same pair are depressed the indication and registration due to the key bearing the higher number only will be accomplished. For anything that appears thus far the depression of either of the keys of the same pair would accomplish the same results, and so far as their action upon the registering-lever is concerned this is true, the keys of each pair from right to left moving the registering-lever through a greater arc than the keys of the pair next to the right thereof, because

the bolt operated by the keys of the lower pair is nearest to the fulcrum of the rocking plate, and therefore swings through the smallest arc and also acts upon the registering-lever at a greater distance from the fulcrum of said lever, the bolts operated by the successive pairs of keys being placed at greater distances from the fulcrum-rod as the successive pairs are farther from the right of the rocking plate, as shown in Fig. 8.

The indication and registration due to the movement of the registering-lever are always "10" or multiples thereof, other means, hereinafter described, being used to indicate and register "5" and odd multiples thereof.

To the registering-lever L, concentric therewith, is secured a toothed arc or segmental gear  $l^2$ , which engages a mutilated pinion  $l^3$ , turning loosely on a stationary horizontal shaft  $l^4$  (see Figs. 1, 4, 10 to 14, 18 to 20, and 22 to 24) and secured to a transfer wheel or gear  $l^5$ . A pawl  $l^6$  is pivoted on the side of the transfer-wheel  $l^5$  and engages the tooth  $i$  of a single-toothed ratchet-wheel  $i'$ , which, together with the mutilated or long-toothed ratchet-wheel  $i^2$  and the cam-wheel  $i^3$ , is rigidly secured on the hub of the indicating-wheel I, so that depressing a key and raising the registering-lever causes all said wheels I  $i' i^2 i^3$  to be rotated together.

The indicating-wheel I is provided on its face with two sets of figures  $i^4$ , from "0" to "9," inclusive, (see Figs. 2 and 3,) the same figures of the two sets being diametrically opposite each other—that is, one "0" is opposite the other "0" and one "9" is opposite the other "9," and so of the intermediate figures—and said wheel I in its normal position, or before the machine is operated, displays through each of the windows  $a^3 a^4$  in the case A the figure "0" at the front and back of said case. When any key numbered "10" or more is depressed the indicating-wheel I is turned to display at said windows a figure which is the same as the figure which occupies the ten-space on said key. Thus if the "10" or "15" key is completely depressed the figure "1" appears at the windows; if the "80" or "85" key is depressed the figure "8" is displayed, and said indicating-wheel is held from returning to its normal or "0" position by a pawl  $i^5$ , which being pressed by the spring  $i^6$  engages the proper tooth of the ten teeth of the mutilated or long-toothed ratchet-wheel  $i^2$ , the pawl  $l^6$ , the transfer-wheel  $l^5$ , which carries it, and the pinion  $l^3$  returning to their normal position when the key is let go and the rocking plate and registering-lever return to position.

The units-indicating wheel I' consists in effect of two opposite sectors  $i^7$  of a wheel, the face of each sector showing a "0" and a "5," the diametrically-opposite figures being alike, and "0" being normally displayed at each of the windows  $a^5 a^6$  in the front and back of the case.

Sliding in brackets or ribs  $p^3 p^{10}$  at the op-

posite sides of the rocking plate is a units-bolt  $p^{11}$ , provided with as many inclines or cams  $p^{12}$  as there are keys denoting odd multiples of five, these inclines  $p^{12}$  being arranged  
 5 over said keys, so that when any such key is depressed and its rear arm strikes said incline said units-bolt is moved, preferably, in a direction opposite to that of the bolts  $p^5$ , above described, in order to equalize the pressure of the inclines  $p^9 p^{12}$  on the keys. The units-bolt  $p^{11}$  is provided with a backward projection  $p^{13}$ , which when said bolt is moved, as above described, is brought under a lever  $i^8$ , pivoted at its front end at  $i^9$  to the frame  
 10 of the machine and at its rear end connected by a link  $i^{10}$  to the units-indicating wheel back of its center, so that when the rocking plate is raised by the complete depression of a key marked with any odd multiple of five the projection  $p^{13}$  strikes the lever  $i^8$  and turns the units-indicating wheel far enough to display the "5" marked thereon. Thus when the key marked "85" is depressed the "8" is shown on the tens-indicating wheel I and the  
 15 "5" in the units-wheel I'. The tens-indicating wheel I is prevented from turning too far and thereby showing too high a number by a bell-crank lever  $i^{11}$ , which turns on a horizontal pivot  $i^{12}$ , the upper end of said lever  $i^{11}$  having a backwardly-projecting tooth  $i^{13}$ , which enters one of a series of notches  $i^{14}$  in the face of said wheel when the rocking plate strikes the lower arm of said lever and is disengaged from said notch  $i^{14}$  when said  
 20 plate falls by a spring  $i^{15}$ , wound around said pivot and pressing upon said lower arm, there being as many notches  $i^{14}$  as there are figures on one-half of said wheel I—that is, ten notches.

40 The indicating-wheels I I' continue to show the indicating-figures after the same are once displayed until another depression of the same or another key. The first effect of such second depression is to allow both of said indicating-wheels to return to their normal position—that is, to the position in which "0" is indicated at each of the windows. Until the tens-indicating wheel I is so restored to the "0" position, the registering-lever L is  
 45 prevented from operating by the unlocking-lever  $i^{26}$ , which turns on the horizontal rod  $i^{18}$ , supported on the frame of the machine, the lower end of said unlocking-lever being forced by the spring  $i^8$  backward over a lateral projection  $i^7$  whenever the registering-lever is in its lowest position; but when said tens-indicating wheel is in the "0" position a cam projection  $i^{25}$  on the cam-wheel  $i^3$  (said cam-wheel being, as above stated, secured to the hub of the tens-indicating wheel) presses against the upper arm of said unlocking-lever and turns the lower end of said unlocking-lever forward out of the way of the projection  $i^7$  and allows the registering-lever to rise.

65 The retaining of the indicating-wheels in the indicating position is accomplished by means of pawls  $i^5 i^{16}$ , one of which  $i^5$  engages

the teeth of the long-toothed ratchet-wheel  $i^2$ , as above stated, (see Fig. 12,) and the other  $i^{16}$  of which engages a two-toothed ratchet  $i^{17}$ ,  
 70 secured to the hub of the units-indicating wheel I'; these pawls  $i^5 i^{16}$  being held in engagement with their respective ratchets by a spring  $i^6$ , (shown in Fig. 14,) supported on the frame and pressing against both of said pawls.  
 75 The pawls  $i^5 i^{16}$  are pivoted on the above-named rod  $i^{18}$ , which also serves as a fulcrum for the pawl-lever  $i^{19}$  and unites both of said pawls  $i^5 i^{16}$  to said pawl-lever, by a rule-joint such that a forward motion of the lower end  
 80 of said pawl-lever causes the upper ends of both of said pawls to be thrown out of engagement with the teeth of their respective ratchets, and said pawls are held out of such engagement by lateral projections  $i^{23} i^{24}$  on  
 85 said pawls, respectively passing over ribs  $i^{27} i^{28}$  on the free ends of spring-latches  $i^{29} i^{30}$ , supported on a bracket  $i^{31}$ , secured on the frame of the machine and supporting the rod  $i^{18}$ , until said pawls are again thrown into such  
 90 engagement by the long teeth of their respective ratchets when the indicating-wheels are returned to their 0-indicating positions, said long teeth being too long to pass by said pawls, and thereby preventing the indicating-  
 95 wheels when returning to position from passing their 0-indicating positions.

The rear end of each key K K' is provided with a projecting finger  $k^2$ , which when the key is depressed rises against a releasing-  
 100 plate J, (or a series of rigidly-connected fingers, one for each key, would accomplish the same purpose,) rigidly secured to the releasing-rod  $j^2$ , which extends back of all the keys and turns in brackets  $j^3$ , secured to  
 105 the table  $a'$ , there being secured to said releasing-rod  $j^2$  a lever J', bearing a leaf-spring  $j$ , which curves upward and backward and has at its upper end a lateral ear  $j'$ , (see Figs. 1, 2, 4, 12, and 12<sup>a</sup>.) which strikes a horizontal  
 110 stud  $i^{20}$ , projecting from the lower end of said pawl-lever  $i^{19}$ , and throws said lower end forward and allows said indicating-wheels I I' to be returned to their normal positions by coiled springs  $i^{21} i^{22}$ , secured to said wheels, respectively, and to the shaft on which they turn, the long teeth of the ratchet striking the  
 115 pawls  $i^5 i^{16}$  and preventing said wheels from passing the "0" points in their return motions. As soon as the ear  $j'$  of the spring  $j$   
 120 passes above the stud  $i^{20}$  the pawl-lever is free to be swung backward to position and against a stop  $i^{23}$  by a leaf-spring  $i^{24}$ , secured to the frame of the machine. (See Fig. 9<sup>a</sup>.) The post  $j^4$  on the lever J' is merely to support  
 125 the upper end of the spring  $j$  when said spring is pressed up against the stud  $i^{20}$ , said spring being quite light to allow said stud  $i^{20}$  to move it aside when the releasing-plate and said lever J' are returned to position. A T-shaped  
 130 lever J<sup>2</sup> is secured to the releasing-rod  $j^2$  (see Figs. 1, 1<sup>a</sup>, and 4) and turns with it, and a spring  $j^5$ , supported from the inside of the back of the upper part  $a^2$  of the case A, is

provided with a catch  $j^6$ , which when said releasing-plate is raised by the depression of a key to its greatest height reaches over the top of said lever  $J^2$  and holds said releasing-rod  $j^2$  from returning to position until an arm  $p^6$ , projecting downward from the rocking plate P, in being restored to position strikes an arm  $j^7$ , which projects from said releasing-rod below said arm  $p^6$ .

10 The registering is accomplished simultaneously with the indicating, the registering of tens by the transfer-wheel  $b^5$  engaging an intermediate gear  $r$ , which engages the registering-gear  $r'$ , the latter carrying a pawl  $r^2$ , which is kept by the spring  $r^3$  in engagement with a ten-toothed ratchet  $r^4$ , concentric with said registering-gear  $r'$  and with the tens-registering wheel R and rigidly secured to the latter, the ten figures of registration ("0" 20 to "9") being marked on the face  $r^5$  of said registering-wheel R, which, together with the units-registering wheel R', is concealed by the case, which can be opened only by a key carried by the proprietor or some trusted 25 person. (See Figs. 1, 2 to 4, and 18 to 24.)

The units-registering wheel R' is similar to the tens-registering wheel R in having secured to its hub a concentric ratchet  $r^7$ , which, as shown in Fig. 15, has, however, only four 30 teeth (but may have a larger even number of teeth) and has on its face only the figures "0" and "5," (half as many of each as there are teeth in the ratchet,) alternating with each other, the units-registering wheel being actuated by a pawl  $r^8$ , carried by a plate or disk  $r^9$ , concentric with said wheel R', and ratchet  $r^7$ , said pawl  $r^8$  being held in engagement with said ratchet  $r^7$  by a spring  $r^{10}$ , also secured to said plate, and said plate  $r^9$  being rotated at each movement of the units-indicating wheel an angular distance equal to the angular distance measured by a single tooth of the ratchet  $r^7$ —that is, as these parts are represented in the drawings, ninety degrees—a stud on the pawl-plate  $r^9$  being connected by a link  $r^{11}$  to one of the arms of the units-indicating wheel I', the pawl  $r^8$  drawing back over the teeth when said units-indicating wheel returns to "0" from "5" and at each forward 50 movement of said units-indicating wheel from "0" to "5," turning the ratchet  $r^7$  and units-registering wheel one tooth. When the units-registering wheel moves the angular distance measured by two teeth of the ratchet  $r^7$ , "10" 55 must be registered, and this is accomplished by rotating the tens-registering wheel R one-tenth of its circumference at every alternate forward movement of the units-registering wheel R'. A cam-wheel  $r^{12}$ , Figs. 2, 3, 17, 24, 60 and 25, is secured to the left end of the units-registering wheel or cast in one piece with it and concentric therewith, said cam-wheel having two cam-surfaces  $r^{13}$   $r^{14}$ , each extending half-way around said cam-wheel and dropping suddenly to the other cam-surface thereof. A cam-lever  $r^{15}$  is rigidly secured at its 65 lower end to a rod  $r^{16}$ , extending from the

left side of the units-registering wheel to the left side of the tens-registering wheel and supported and turning in a bracket  $r^{17}$ , Fig. 70 1, secured to the inside of the back of the case A, and said cam-lever  $r^{15}$  is provided with a projection  $r^{18}$ , which bears against the face of the cam-wheel  $r^{12}$ , being held thereto by a spring  $r^{19}$ , so that at each half-revolution of 75 said cam-wheel  $r^{12}$ , or, in other words, at every other time the units-registering wheel makes a forward movement, said projection  $r^{18}$  runs off the end of one of the cam-surfaces of said cam-wheel and allows said cam-lever 80  $r^{15}$  and a pawl-lever  $r^{21}$ , also secured to the rod  $r^{16}$ , and a pawl  $r^{20}$ , pivoted to the upper end of said pawl-lever  $r^{21}$  and engaging a ten-toothed ratchet  $r^{22}$ , secured to the tens-registering wheel concentrically therewith, to 85 move forward a sufficient distance to rotate said tens-registering wheel one-tenth of a revolution; but obviously this is not all that is required, because, to illustrate, if the units-registering wheel already registered "5" and 90 it were desired to register "85" the sum-total of the two registrations should be "90"—that is, after the second registration the units-registering wheel should show a "0" and the tens-registering wheel should show a "9;" 95 but without other mechanism than that above described the complete depression of the eighty-five-cent key would cause the tens-registering wheel to register "8," and, moving the units-registering wheel the value of one tooth, 100 would cause said units-registering wheel to register "0," so that the sums of the two registrations would appear to be "80" instead of "90," owing to the fact that the action of the units-registering wheel on the tens-register- 105 ing wheel would be simultaneous with the independent action of said tens-registering wheel due to the action of the registering-pawl  $r^2$  and gear  $r'$ . The "8" is therefore registered simultaneously with the movement 110 of the units-registering wheel from "5" to "0," and the action of the pawl  $r^{20}$  and the pawl-lever  $r^{21}$  is delayed until these registrations have been made, said cam-lever  $r^{15}$  being provided with a spring-arm  $r^{23}$ , which in the 115 forward movement of said cam-lever and pawl-lever strikes against an annular flange  $r^{24}$  of the registering-gear  $r'$ , and thereby prevents said pawl  $r^{20}$  from operating the tens-registering wheel R until said tens-register- 120 ing gear  $r'$  is restored to position by the dropping of the registering-lever L, said flange  $r^{24}$  having a slot  $r^{25}$ , which when said registering-gear is so restored to position allows said spring-arm  $r^{23}$  to pass within the flange and 125 the pawl-lever  $r^{15}$  to be drawn forward by a spring  $r^{19}$ , above named, and by its pawl  $r^{20}$  to turn the tens-registering wheel one-tenth of a revolution. The sides of the slot  $r^{25}$  are rounded to allow the spring-arm to enter the 130 slot more readily. The inner edge of the flange  $r^{24}$  is beveled, as well as the adjacent surface of the free end of the spring-arm  $r^{23}$ , as shown at the left of Fig. 24, where the

registering-wheel  $R^3$  represents a registering-wheel adapted to register hundreds or dollars, but which is a mere duplicate of the wheel  $R$ ,  $r^{26}$  representing the flange on the dollar or hundreds registering gear  $r^{27}$  and  $r^{28}$  representing the corresponding spring-arm, and said last-named flange and spring being represented partly in section to show their beveled surfaces above referred to. In the way indicated the registering devices may be duplicated indefinitely and the excess of ten be carried from one registering-wheel to the registering-wheel of the next place above.

To compel a complete depression of the keys  $K$ , and therefore a full indication and registration of the proper amount, each key is provided with an upward projection  $k^3$ , having on its rear edge a rack  $k^4$ , the teeth of which point downward and engage a swinging pawl  $k^5$  or wing, Figs. 1, 1<sup>a</sup>, 2, and 3, which extends back of all the keys of the machine and is pivoted at about its lower edge on opposite sides at  $k^6$  and has downhanging arms  $k^7$ , which each rest upon a leaf-spring  $k^8$ , supported at its rear end on the base or table  $a'$  and bent transversely upward into a V-shaped rib  $k^9$ , so that when the lower edges of said arms are back of the rib  $k^9$  the upper edge of the pawl  $k^5$  is thrown forward to engage the racks  $k^4$  and when the lower ends of said arms are in front of said rib  $k^9$  said pawl is held out of engagement with said racks. The pawl is thrown out of engagement with the racks by the backwardly-projecting ends of the downhanging arms  $p^6$  of the rocking plate  $P$  striking the pawl  $k^5$  when the key is fully depressed and thrown into position for engagement again by said projecting ends striking the lower arms of said pawl  $k^5$ . The pawl  $k^5$  is also provided with a notch  $k^{10}$ , which when the keys and rocking plate are in their normal position reaches over the rear edge of said rocking plate and prevents the rising of the same, the upper ends of the projections  $k^3$  being cut away at  $k^{11}$  to allow the pawl to fall forward far enough for this purpose. When any key is first depressed, therefore, it throws out a bolt into the slot  $l$  of the lever  $L$ , as above described, and does not throw back the pawl  $k^5$  until the concentrically-curved part  $k^{11}$  has risen above the top of the pawl, by which time the bolt has been projected to its greatest extent. The rocking of the plate  $P$  also releases the drawer and allows the spring lever  $d^2$  to throw the drawer  $D$  open. A bell-crank lever  $d^2$  is pivoted to a bracket  $d^3$ , secured to the under side of the top of the lower part  $a'$  of the case  $A$ , and its lower nearly-horizontal arm  $d^4$  is provided with a hook  $d^5$ , adapted to reach over a catch  $d^6$ , secured to the top of the drawer or to a partition therein, said catch and hook being beveled, as shown, to allow the catch to be shoved under said hook and to be retained by the hook dropping down in front of said catch. The nearly-vertical arm  $d^7$  of said lever reaches up through the top of the part  $a$  of the case and terminates in a hook  $d^8$  and beveled end  $d^9$ , said hook being

adapted to be engaged by the hook  $p^{14}$ , secured to the rocking plate  $P$  and reaching down (see Fig. 1) below the top of the hook  $d^8$ , when, the drawer being open, the horizontal arm  $d^4$  of the lever  $d^2$  is thrown downward and the upper arm of said lever is thrown forward. When the drawer is closed, the hooks are disengaged, and the lower end of the hook  $p^{14}$  when the rocking plate rises strikes the curved part  $d^{10}$  of the lever  $d^7$  above the hook  $d^8$  and raises the horizontal arm of said lever and releases the drawer. When the rocking plate falls, the drawer being open, the hook engages the lever and prevents the rocking plate from rising, and therefore prevents the keys from being operated. The hook  $p^{14}$  is adjustable laterally in a slot  $p^{15}$  in the rocking plate  $P$  to allow said hook  $p^{14}$  to be moved out of range of the hook  $d^8$  of the lever  $d^7$  and to allow the keys and rocking plate to be operated when the drawer is open, said hook  $p^{14}$  being held by a shoulder  $p^{16}$  on said hook  $p^{14}$  and a thumb-nut  $p^{17}$ , turning on the upper end of said hook above said rocking-plate, so that loosening said thumb-nut allows the hook  $p^{14}$  to be, adjusted as above stated.

When the rocking plate  $P$  is raised to highest position, an alarm is sounded simultaneously with the opening of the drawer  $D$ . A bracket  $b$  is secured to the rod  $l^2$  and supports a gong or small bell  $B$ , and pivoted below the bell  $B$ , at  $b^2$ , is a lever  $b'$ , in such a position that the free front end of said lever  $b'$  will be raised by the rising of the rocking plate, but will slip off from said rocking plate about the time when said rocking plate reaches its highest position and will be carried down again by a spring  $b^{10}$ , hereinafter described, (see Fig. 2,) until the rear arm  $b^4$  strikes against a stop  $b^5$ , projecting laterally from said bracket  $b$ . A bell-hammer lever  $b^7$ , having an elastic wire arm  $b^8$  and striker  $b^9$ , is pivoted on the same pivot  $b^2$  with the lever  $b'$  and has a laterally-projecting stop  $b^6$ , which is held by a spring  $b^{10}$  (which, as shown in Fig. 2, surrounds and is secured to said pawl  $b^2$  and at its free end bears against the under side of said lever  $b^7$ ) against the under side of the rear arm of the lever  $b'$ . Hence when the front end of the lever  $b'$  is raised by the rocking plate the bell-hammer lever  $b^7$  is moved with it, carrying the striker  $b^9$  away from the bell  $B$ , and when said front end of said lever  $b'$  slips off from said rocking plate both levers are restored to their normal position by said spring  $b^{10}$ , and, being suddenly checked by the lever  $b'$  striking the stop  $b^5$ , the momentum of the striker  $b^9$  carries it against the bell, the elastic arm  $b^8$  yielding for that purpose and immediately after drawing the striker away from the bell. When the rocking plate falls, the front arm of the lever  $b'$  yields to allow said plate to pass said lever, and is then restored to position by the spring  $b^3$ , which is weaker than the spring  $b^{10}$  and at one end is secured to said pivot  $b^2$

and surrounds the same and with its other end reaches under the front arm of said lever *b'*.

I claim as my invention—

1. The combination of a series of keys having a common fulcrum and each having an arc-shaped rack concentric with said fulcrum, a wing or pawl adapted to engage the rack of any partially-depressed key and to prevent the return of such key until such key is fully depressed, and a rocking plate having the same fulcrum with said keys and rocked by the depression of any of said keys and adapted when any such key is fully depressed to strike said wing or pawl and move it out of engagement with the rack of such key, as and for the purpose specified.

2. The combination of a series of keys having a common fulcrum and each having an arc-shaped rack concentric with said fulcrum, a wing or pawl adapted to engage the rack of any partially-depressed key and to prevent the return of such key until such key is fully depressed, and a rocking plate having the same fulcrum with said keys and rocked by the depression of any of said keys and provided with backwardly-extending downhanging arms adapted when any such key is fully depressed to strike said wing or pawl and move said pawl out of engagement with the rack of such key, as and for the purpose specified.

3. The combination of a series of keys, each provided with a rack and having a common fulcrum, a pivoted pawl adapted to engage any one of said racks when its key is partially depressed to prevent a return of said key or to be turned out of engagement with said racks, said pawl having a downhanging arm, a spring pressing against the lower end of said arm to hold said pawl in either of said positions, and a rocking plate adapted to be rocked by the depression of any of said keys and when any key is fully depressed to strike said pawl above its pivot and throw the same out of engagement with the rack of such key to allow said key to return to its normal position and then to strike said pawl below its pivot and to throw said pawl into position to engage the rack of the key next depressed, as and for the purpose specified.

4. The combination of a series of keys, each provided with a rack and having a common fulcrum, a pivoted pawl adapted to engage any one of said racks when its key is partially depressed to prevent a return of said key or to be turned out of engagement with said racks, said pawl having a downhanging arm, a leaf-spring pressing against the lower end of said arm and having an upward projection to hold said pawl in either of its positions, and a rocking plate adapted to be rocked by the depression of any of said keys and having an arm adapted when any key is fully depressed to strike said pawl above its pivot and throw the same out of engagement with the rack of such key to allow said key to return to its normal position and then to strike said pawl below its pivot and to throw

said pawl into position to engage the rack of the key next depressed, as and for the purpose specified.

5. The combination of the case, the drawer sliding therein, a series of pivoted keys, the rocking plate adapted to be rocked by the depression of any of said keys and having a downhanging hook secured thereto, the bell-crank lever pivoted on said case and having a lower horizontal arm provided with a hook, and a catch secured on the top of said drawer and adapted to be engaged by said last-named hook to hold said drawer closed, the upper arm of said lever being arranged to be struck by said hook on said rocking plate when said plate is so rocked to release said drawer and allow the same to be opened, as and for the purpose specified.

6. The combination of the case, the drawer sliding therein, a series of pivoted keys, the rocking plate adapted to be rocked by the depression of any of said keys and having a downhanging hook secured thereto, the bell-crank lever pivoted on said case and having a lower arm provided with a hook, a catch secured to the top of said drawer and adapted to be engaged by said last-named hook to hold said drawer closed, the upper arm of said lever being arranged to be struck by said hook on said rocking plate when said plate is so rocked to release said drawer, and a spring to throw said drawer open when so released, as and for the purpose specified.

7. The combination of the case, the drawer sliding therein, a series of pivoted keys, the rocking plate adapted to be rocked by the depression of any of said keys and having a downhanging hook secured thereto, the bell-crank lever pivoted on said case and having a lower arm provided with a hook, and a catch secured to the top of said drawer and adapted to be engaged by said last-named hook to hold said drawer closed, the end of said lower arm being beveled to allow said catch and drawer to be pushed under said lower arm and the upper arm of said lever being arranged to be struck by said hook on said rocking plate when said plate is so rocked to turn said lever on its fulcrum to release said drawer and allow the same to be opened, as and for the purpose specified.

8. The combination of the case, the drawer sliding therein, a series of pivoted keys, the rocking plate adapted to be rocked by the depression of any of said keys and having a downhanging hook secured thereto, the bell-crank lever pivoted on said case and having a lower arm provided with a hook, and a catch secured to the top of said drawer and adapted to be engaged by said last-named hook to hold said drawer closed, the end of said lower arm being beveled to allow said catch and drawer to be pushed under said lower arm and to raise the same, the upper arm of said lever being provided with a hook adapted to engage the hooks secured to said rocking plate when said drawer is open and at such times

to prevent the rocking of said plate and the depression of said keys, but to be thrown out of engagement therewith by the closing of said drawer, as and for the purpose specified.

9. The combination of the case, the drawer sliding therein, a series of pivoted keys, the rocking plate adapted to be rocked by the depression of any of said keys, the bell-crank lever pivoted on said case and having a lower arm provided with a hook, a catch secured to the top of said drawer and adapted to be engaged by said hook to hold said drawer closed, the end of said lower arm being beveled to allow said catch and drawer to be pushed under said lower arm, and a downhanging hook adjustably secured to said rocking plate and normally arranged to engage a hook with which the upper end of said bell-crank lever is provided and to prevent said rocking plate from being rocked and said keys from being depressed when said drawer is open, but adapted to be moved aside to clear said last-named hook and allow said rocking plate and keys to be operated at all times, as and for the purpose specified.

10. The combination of the case, the drawer sliding therein, a series of pivoted keys, the rocking plate adapted to be rocked by the depression of any of said keys and provided with a slot, the bell-crank lever pivoted on said case and having a lower arm provided with a hook, a catch secured to the top of said drawer and adapted to be engaged by said hook to hold said drawer closed, the end of said lower arm being beveled to allow said catch and drawer to be pushed under said lower arm, and a downhanging hook arranged in said slot and having below said plate a shoulder and normally arranged to engage a hook with which the upper end of said bell-crank lever is provided and to prevent said rocking plate from being rocked and said keys from being depressed when said drawer is open, but adapted when said nut is loosened to be moved aside to clear said last-named hook and allow said rocking plate and keys to be operated at all times, as and for the purpose specified.

11. The combination of a series of keys having a common fulcrum, a rocking plate having the same fulcrum with said keys and extending across all of said keys, a series of bolts sliding in said plate, parallel with the fulcrum of said plate, and normally drawn into said plate, but each adapted to be projected beyond said plate by the depression of some one of said keys, and an arm pivoted on a horizontal fulcrum back of all of said bolts and provided with a slot arranged to receive the projecting ends of said bolts when said bolts are in their lowest position and prevent the simultaneous depression of two keys, as and for the purpose specified.

12. The combination of a series of keys having a common fulcrum, a rocking plate having the same fulcrum with said keys and extending across all of said keys, a series of

bolts sliding in said plate and arranged in a common plane parallel with the fulcrum of said plate and normally drawn into said plate, but each adapted to be projected beyond said plate by the depression of some one of said keys, and an arm pivoted on a horizontal fulcrum back of all of said bolts and provided with a slot arranged in the plane of said bolts when said bolts are in their lowest position to receive the projecting ends of said bolts and prevent the simultaneous depression of two keys, as and for the purpose specified.

13. The combination of a series of keys having a common fulcrum, a rocking plate having the same fulcrum with said keys and extending across all of said keys, a series of bolts sliding in said plate, parallel with the fulcrum thereof at different distances from said fulcrum, and normally drawn into said plate, but each adapted to be projected beyond said plate by the depression of some one of said keys, a segmental gear provided with an arm and turning upon a horizontal pivot back of said bolts, said arm having a slot arranged to receive the projecting ends of all of said bolts when said bolts are in their lowest position at right angles with said slot, a pinion engaging said segmental gear, a pawl carried by said pinion, an indicating-wheel, and a single-toothed ratchet concentric with and turning with said indicating-wheel and engaged by said pawl, whereby the depression of any key will rotate said indicating-wheel, as and for the purpose specified.

14. The combination of a series of keys, a rocking plate having a common fulcrum with all of said keys and extending across all of said keys and adapted to be raised by the depression of any of said keys, a series of bolts sliding in said plate, parallel with the fulcrum thereof, and each provided with an incline adapted to be struck by one of said keys when the same is depressed, whereby said bolt is caused to project beyond said plate, and an arm pivoted back of said plate and provided with a slot adapted to receive the ends of all said bolts when said rocking plate is in its lowest position, whereby the depression of a single key will raise said plate and arm and whereby the complete simultaneous depression of two or more keys is rendered impossible, as and for the purpose specified.

15. The combination of a series of keys, a rocking plate having a common fulcrum with all of said keys and extending across all of said keys and adapted to be raised by the depression of any of said keys, a series of bolts sliding in said plate parallel with the fulcrum thereof, and each provided with an incline adapted to be struck by one of said keys when the same is depressed, whereby said bolt is caused to project beyond said plate, an arm pivoted back of said plate and provided with a slot adapted to receive the ends of all of said bolts when said rocking plate is in its lowest position, a segmental

gear secured to or formed in one piece with said arm, a pinion engaging said segmental gear, a pawl carried by said pinion, an indicating-wheel, and a single-toothed ratchet concentric with and turning with said indicating-wheel and engaged by said pawl, whereby the depression of any key will rotate said indicating-wheel, as and for the purpose specified.

16. The combination of the frame provided with windows, the rocking plate, a bolt sliding in said plate and having a projection extending back of said plate and having an incline, a numbered key adapted when depressed to strike said incline and to move said bolt endwise and when further depressed to raise said rocking plate and bolt until said projection strikes a lever pivoted at one end to the frame, said lever, an indicating-wheel normally arranged to display "0" indications at said windows, and a link pivoted at one end to said wheel outside the center thereof and at the other end to the free end of said lever to give a partial rotation to said wheel and to expose indicating - numbers corresponding with the numbers on said key, as and for the purpose specified.

17. The combination of a series of keys having a uniform range of motion and a common fulcrum, a rocking plate having the same fulcrum with said keys and extending across all of said keys, a series of bolts sliding in said plate, parallel with the fulcrum of said plate, and normally drawn into said plate, but each adapted to be projected beyond said plate by the depression of some one of said keys, an arm pivoted on a horizontal fulcrum back of all of said bolts and provided with a slot arranged to receive the projecting ends of said bolts when said bolts are in their lowest position and prevent the simultaneous depression of two keys, and a pawl or wing pivoted at its lower edge and extending back of all of said keys and having a rib or projection which reaches over the free edge of said rocking plate and prevents said plate from being rocked until said bolts are projected, said keys being provided with upward projections adapted to strike and turn said wing to release said rocking plate after said bolts have engaged said slot, as and for the purpose specified.

18. The combination of a series of keys numbered with odd multiples of five, an equal series of keys numbered with "10" and multiples of ten or even multiples of five, the rocking plate extending over all said keys and having a common fulcrum with all of said keys, a series of bolts sliding in said plate, parallel with the fulcrum thereof, and lying at different distances from said fulcrum and equal in number to the keys of either of said series, each of said bolts being provided with two inclines, one arranged above a key designating a multiple of ten and the other arranged above the key which designates the next greater odd multiple of five, a registering-arm provided with a slot adapted to re-

ceive the ends of any of said bolts when said bolts are in their lowest position, whereby the complete depression of any one of said keys will project one of said bolts into said slot and will thereafter raise said registering-arm an angular distance depending upon the distance of said bolt from the fulcrum of said rocking plate, indicating devices adapted to indicate "10" or a multiple thereof and operated by the movement of said registering-arm, and another bolt sliding in said plate and provided with a backward projection and with as many inclines as there are keys of said first-named series, each of said inclines being arranged over one of said last-named keys, whereby the depression of any of said first-named series of keys will cause said last-named bolt to be moved endwise, a lever turning at one end upon a fixed pivot, and a link connecting the other end of said lever to a units-indicating wheel outside the center of said wheel, said last-named indicating-wheel being normally arranged to display "0" indications and by a partial rotation thereof on the depression of any key of said first-named series to display a "5," whereby by depressing any of said first-named series of keys the number designated by such key will be registered, the tens of said number by said first-named indicating devices and the fives or units of said number by said units-indicating wheel, as and for the purpose specified.

19. The combination of a series of numbered keys, indicating - wheels normally displaying "0" indications, connecting mechanism whereby said indicating-wheels are partially rotated upon the depression of any key to display numbers corresponding to the numbers on said key, ratchets turning with said indicating-wheels, a pawl-lever having separate upper arms, a horizontal stud projecting from the lower arm of said pawl-lever, retaining-pawls pivoted on the upper arms of said pawl-lever and engaging said ratchets to prevent said indicating-wheels from returning to their 0 - indicating positions, a vertical releasing-rod free to turn about its axis, a releasing-plate secured to said releasing-rod and extending over the rear ends of all said keys, a lever or arm secured to said releasing-rod, and a leaf-spring secured to said lever or arm and having a lateral ear adapted when said releasing-plate is raised by any key to strike said stud and to swing said pawl-levers and disengage said pawls from said ratchets, as and for the purpose specified.

20. The combination of a series of numbered keys, indicating - wheels normally displaying "0" indications, connecting mechanism whereby said indicating-wheels are partially rotated upon the depression of any key to display numbers corresponding to the numbers on said key, ratchets turning with said indicating-wheels and having as many teeth as there are numbers to be displayed by said wheels, a pawl-lever having separate upper arms, a horizontal stud projecting from the lower arm

of said pawl-lever, retaining-pawls pivoted on the upper arms of said pawl-lever and engaging said ratchets to prevent said indicating-wheels from returning to their 0-indicating positions, a pivoted releasing-rod free to turn about its axis, a releasing-plate secured to said releasing-rod and extending over the rear ends of all said keys, a lever or arm secured to said releasing-rod, a leaf-spring secured to said lever or arm and having a lateral ear adapted when said releasing-plate is raised by any key to strike said stud and to swing said pawl-levers and disengage said pawl from said ratchets, and springs to return said indicating-wheels to their "0" positions when said pawls are disengaged therefrom, said ratchets each being provided with a tooth longer than the other teeth of said ratchet and said longer teeth being adapted to strike said pawls when said indicating-wheels return to their 0-indicating position and to prevent said indicating-wheels from passing by said last-named positions in their return movements, as and for the purpose specified.

21. The combination of a series of numbered keys, indicating-wheels normally displaying "0" indications, connecting mechanism whereby said indicating-wheels are partially rotated upon the depression of any key to display numbers corresponding to the numbers on said key, ratchets turning with said indicating-wheels, a pawl-lever having separate upper arms, a horizontal stud projecting from the lower arm of said pawl-lever, retaining pawls pivoted on the upper arms of said pawl-lever and engaging said ratchets to prevent said indicating-wheels from returning to their 0-indicating positions, a pivoted releasing-rod free to turn about its axis, a releasing-plate secured to said releasing-rod and extending over the rear ends of all of said keys, a lever or releasing-arm secured to said releasing-rod, a leaf-spring secured to said releasing-arm and having a lateral ear adapted when said releasing-plate is raised by any key to strike said stud and to swing said pawl-levers and disengage said pawls from said ratchets, springs to return said indicating-wheels to their 0-indicating positions, said pawls having each a projection, and springs to engage said projections and to hold such pawls out of engagement with said ratchets, said ratchets each being provided with a tooth longer than the other teeth thereof to strike said pawls and to prevent said indicating-wheels from passing their 0-indicating positions in their return movements and to throw said pawls into engagement with said ratchets, as and for the purpose specified.

22. The combination of an indicating-wheel provided with a ratchet concentric therewith and having a series of shorter teeth of uniform length and a tooth longer than a tooth of said series, a pawl-lever, a retaining-pawl pivoted to said lever and adapted to engage said teeth and provided with a projection, and a spring to engage said projection when said pawl-le-

ver is thrown out of engagement with said shorter teeth to hold said pawl out of engagement with said ratchet until said pawl is struck by said longer tooth, as and for the purpose specified.

23. The combination of an indicating-wheel, a cam-wheel secured thereto concentrically therewith, the registering-lever, and the unlocking-lever bearing against said cam-wheel and arranged in the path of said registering-lever when said registering-lever is in its normal position, except when said indicating-wheel is in its 0-indicating position, said unlocking-lever being moved by said cam-wheel when said indicating-wheel returns to its last-named position out of said path, as and for the purpose specified.

24. The combination of an indicating-wheel, a cam-wheel secured thereto concentrically therewith, the registering-lever, the unlocking-lever, and a spring holding said unlocking-lever against said cam-wheel and in the path of said registering-lever when said registering-lever is in its normal position, except when said indicating-wheel is in its 0-indicating position, said unlocking-lever being moved by said cam-wheel when said indicating-wheel returns to its last-named position out of said path, as and for the purpose specified.

25. The combination of an indicating-wheel, a cam-wheel secured thereto concentrically therewith, the registering-lever provided with a projection, an unlocking-lever pivoted above said projection, and a spring holding the upper end of said unlocking-lever against said cam-wheel, the lower end of said unlocking-lever being adapted to be held out of the path of said projection by said cam-wheel when said indicating-wheel is in its 0-indicating position, but at all other times when said registering-lever is in its normal position to be drawn by said spring over said projection to prevent the rising of said registering-lever, as and for the purpose specified.

26. In a registering-machine, the combination of a series of registering-wheels, registering-numbers in different decimal places, each independently of the other, adapted to register from "0" to "9," and connecting mechanism whereby a complete revolution of any wheel will cause the wheel registering numbers of the next higher denomination to make one-tenth of a revolution, thereby adding one of the lower denomination to the total registration, and whereby the movement of any wheel due to the action of a wheel of the next lower denomination is delayed until its independent operation has been completed, as and for the purpose specified.

27. The combination of the units-registering wheel, a cam-wheel rotating therewith, a cam-lever having a projection to rest against said cam-wheel, a pawl-lever movable with said cam-lever, a pawl pivoted thereto, a spring to hold said projection against said cam-wheel, the tens-registering wheel, a ten-

toothed ratchet rotating therewith and adapted to be engaged by said pawl and to be rotated thereby the distance measured by one tooth thereof when said cam-lever is allowed  
 5 by said cam-wheel to move forward, a pawl-carrying plate, a pawl pivoted thereon and engaging another ten-toothed ratchet concentric with and rotating with said tens-registering wheel, said pawl-carrying plate having an  
 10 annular flange provided with a slot and said cam-lever having an arm which rests against said flange and prevents the forward movement of said cam-lever until said slot is presented to said arms, and connecting means  
 15 whereby said pawl-carrying plate is rotated to operate said tens-registering wheel and before another registration by said last-named wheel presents said slot to said arm of said cam-lever, as and for the purpose specified.

20 28. The combination, with an operating-key provided with a rack, of a wing or pawl arranged to engage said rack when the key is partially operated and to be disengaged therefrom when the key has been fully operated,  
 25 means, as a spring-catch, for holding the pawl and rack out of engagement while the key is being reset, and means, as a rocking plate, for resetting the pawl.

30 29. In a cash register and indicator, the combination, with a series of operating-keys, each provided with a rack, of a wing or pawl extending across the entire series of keys and arranged to engage and act as a pawl for each  
 35 of said racks to prevent any key of the series being reset when only partially operated and to be disengaged therefrom when the key has been fully operated and means for holding the pawl and rack out of engagement while the key is being reset, substantially as described.  
 40

30. In a cash register and indicator, the combination, with a series of operating-keys, each provided with a rack, of a wing or pawl extending across the entire series of keys and  
 45 arranged to engage and act as a pawl for each one of said racks when its key is partially operated and to be disengaged from the rack of said key when the latter has been fully operated, means for holding said pawl and rack

out of engagement while the key is being re- 50  
 set, and means, as a rocking plate, to release the holding means, substantially as described.

31. In a cash register and indicator, the combination, with a series of operating-keys of different values, each provided with a rack, 55  
 and a registering-wheel actuated to different degrees by the different keys to register their respective values, of a wing extending across the entire series of keys and arranged to engage and act as a pawl for each one of said 60  
 racks when its key is partially operated to compel its full operation and the registration of its full value and to be disengaged from said rack when the key has been fully operated and means for holding the pawl or wing 65  
 and rack out of engagement while the key is being reset, substantially as described.

32. In a cash register and indicator, the combination, with a series of operative keys, of a horizontal wing or bar extending across 70  
 said keys and arranged to engage a partially-operated key and prevent its being reset and to be disengaged therefrom when the key has been fully operated, means for holding said bar out of engagement with the key while the 75  
 latter is being reset, and means, as a rocking plate, to release the holding means, substantially as described.

33. The combination of a series of keys, each provided with an arc-shaped rack, a pawl engaging the rack of any such key when said 80  
 key is partially depressed to prevent the return of said key to its normal position, and a rocking plate operated by the depression of any such key and having a projection adapted 85  
 to throw said pawl out of engagement with the rack of such key when said key is fully depressed to allow said key to return to its normal position, as and for the purpose specified. 90

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 30th day of November, A. D. 1888.

JEROME J. WEBSTER.

Witnesses:

ALBERT M. MOORE,  
 MYRTIE C. BEALS.