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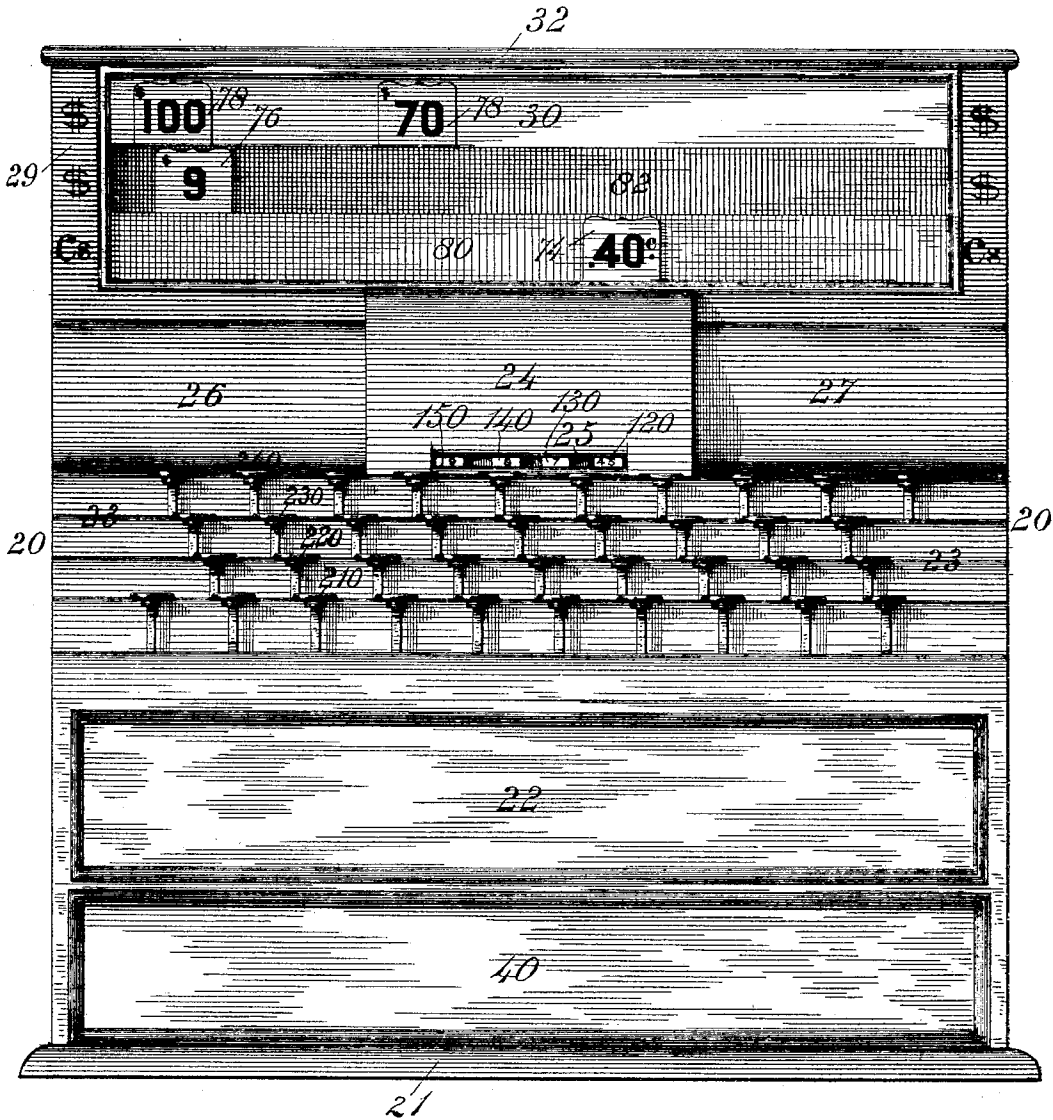
8 Sheets—Sheet 1.

W. K. NICHOLS.
CASH REGISTER.

No. 480,208.

Patented Aug. 2, 1892.

Fig 1.



WITNESSES

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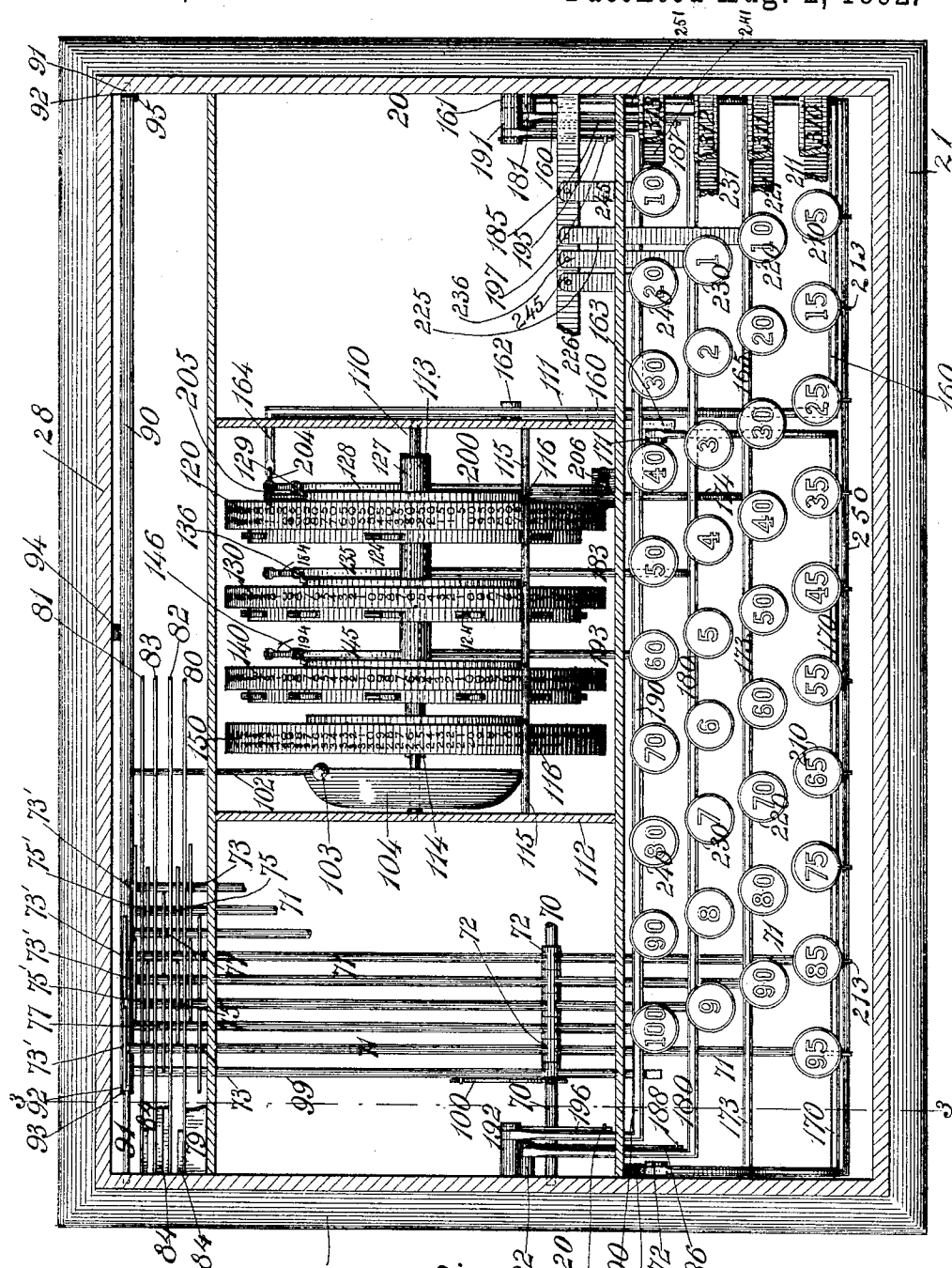
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8 Sheets—Sheet 2.

W. K. NICHOLS.
CASH REGISTER.

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Patented Aug. 2, 1892.



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Fig 2:

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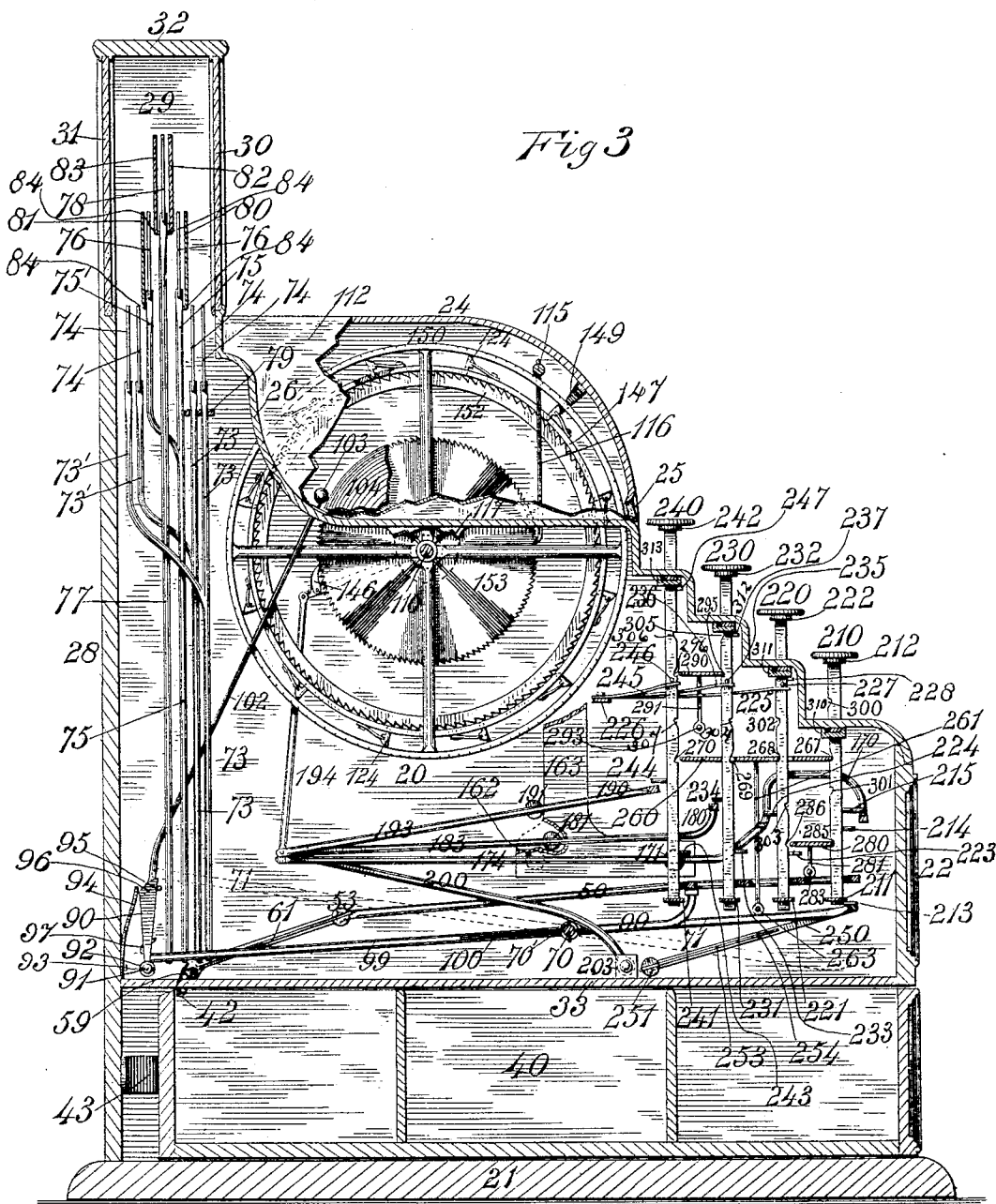
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W. K. NICHOLS.
CASH REGISTER.

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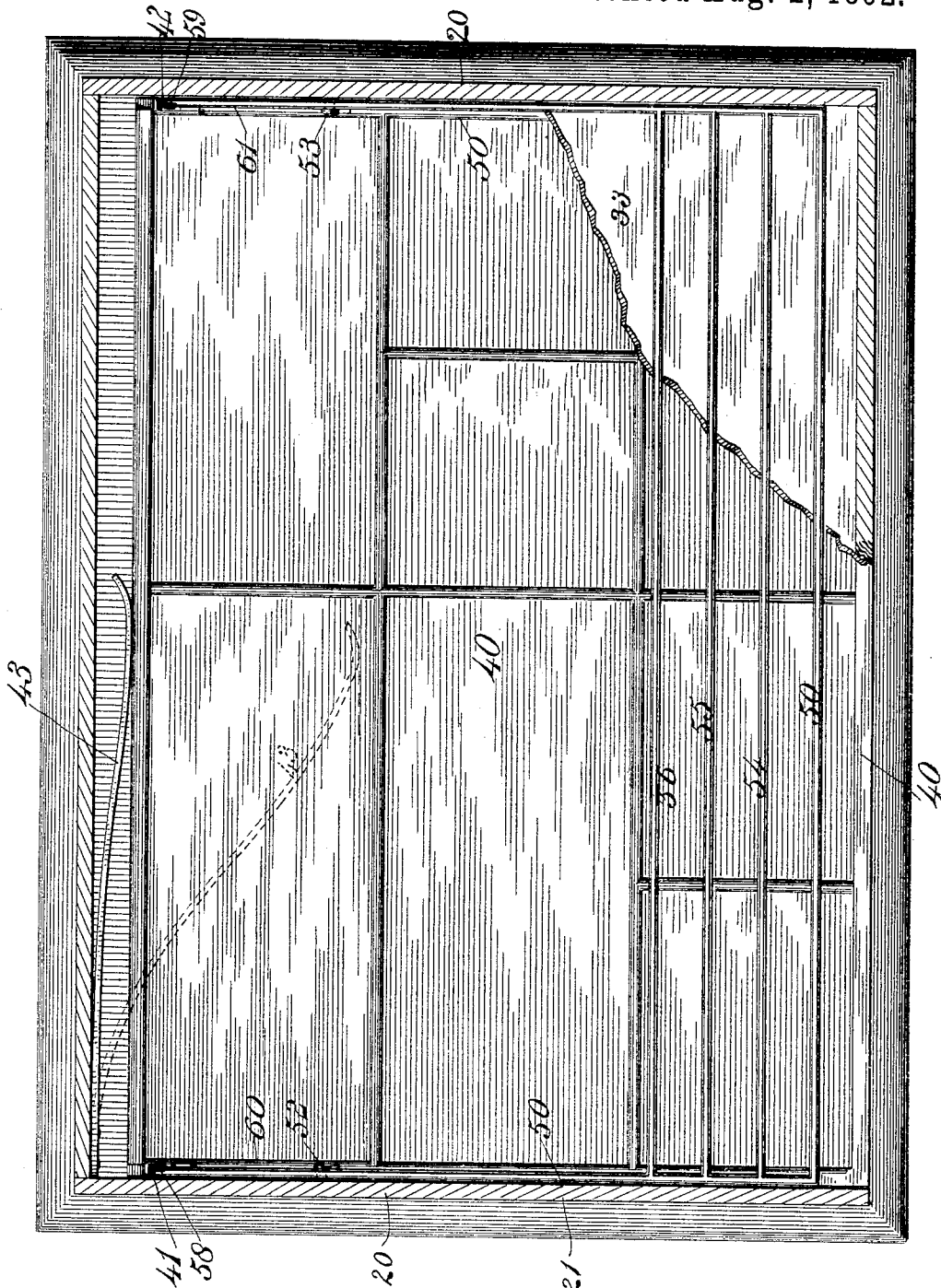
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W. K. NICHOLS.
CASH REGISTER.

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Fig. 4.

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CASH REGISTER.

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Fig 7

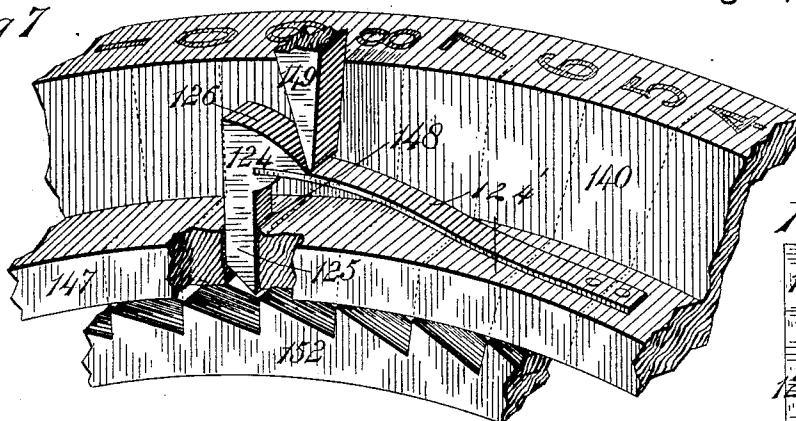


Fig 8

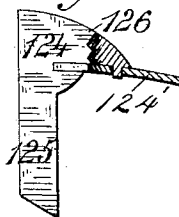


Fig 6

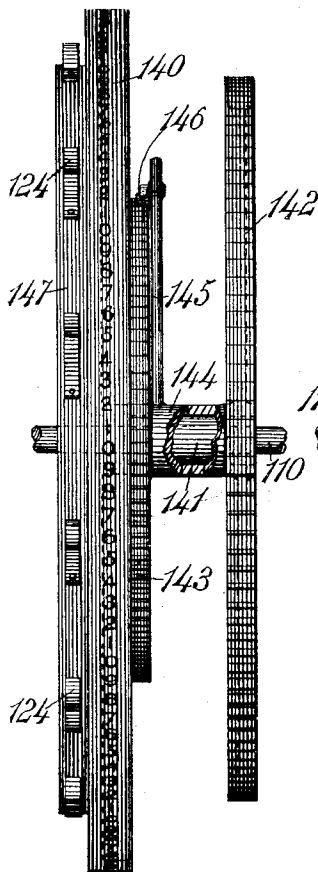
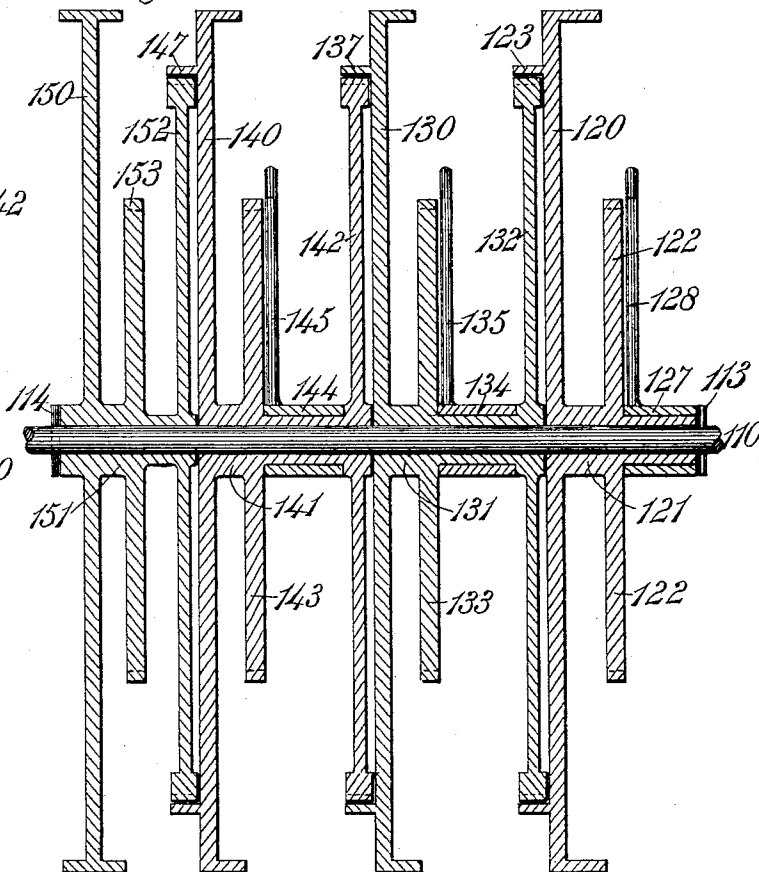


Fig 5



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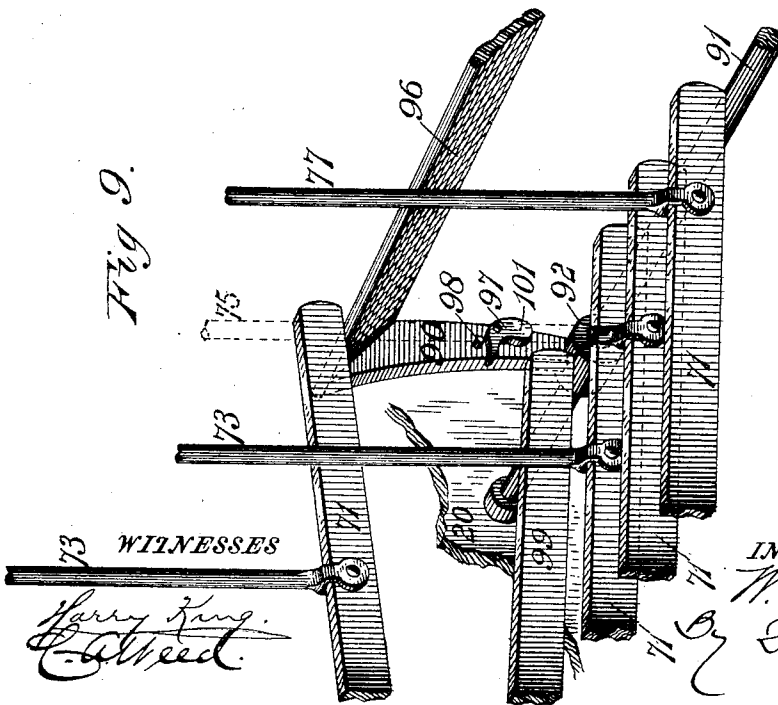
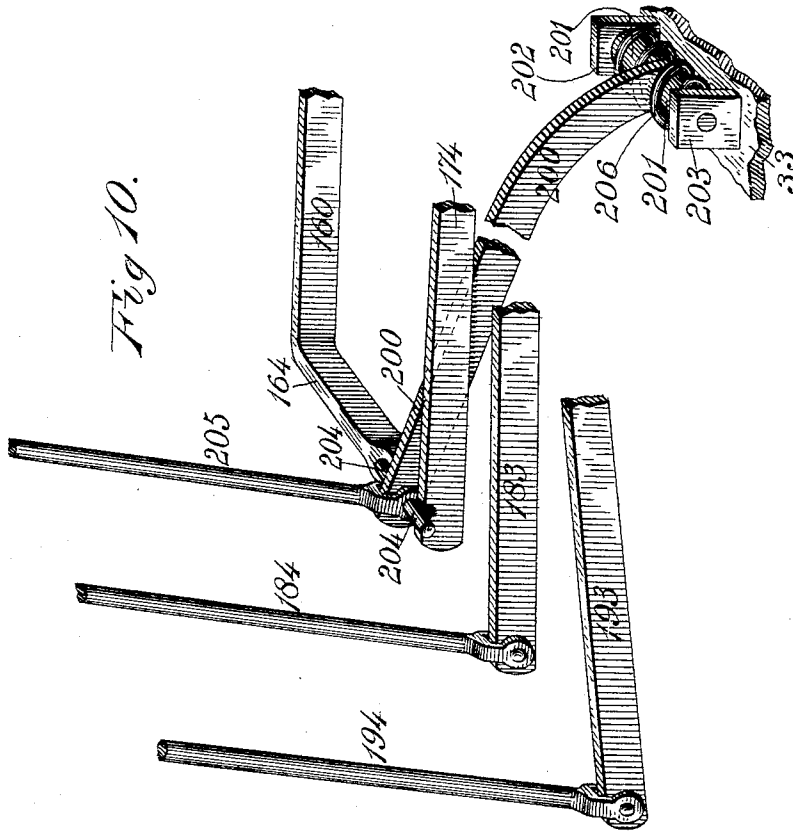
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Patented Aug. 2, 1892.



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(No Model.)

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No. 480,208.

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Fig 11.

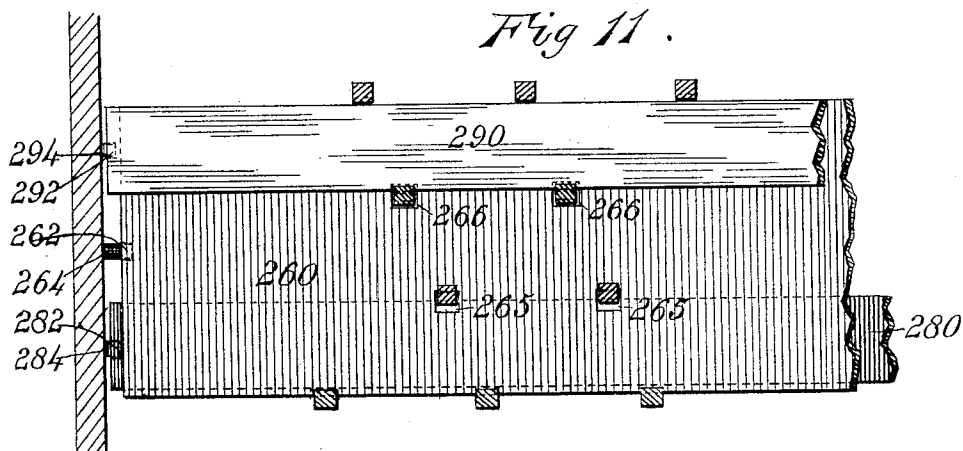
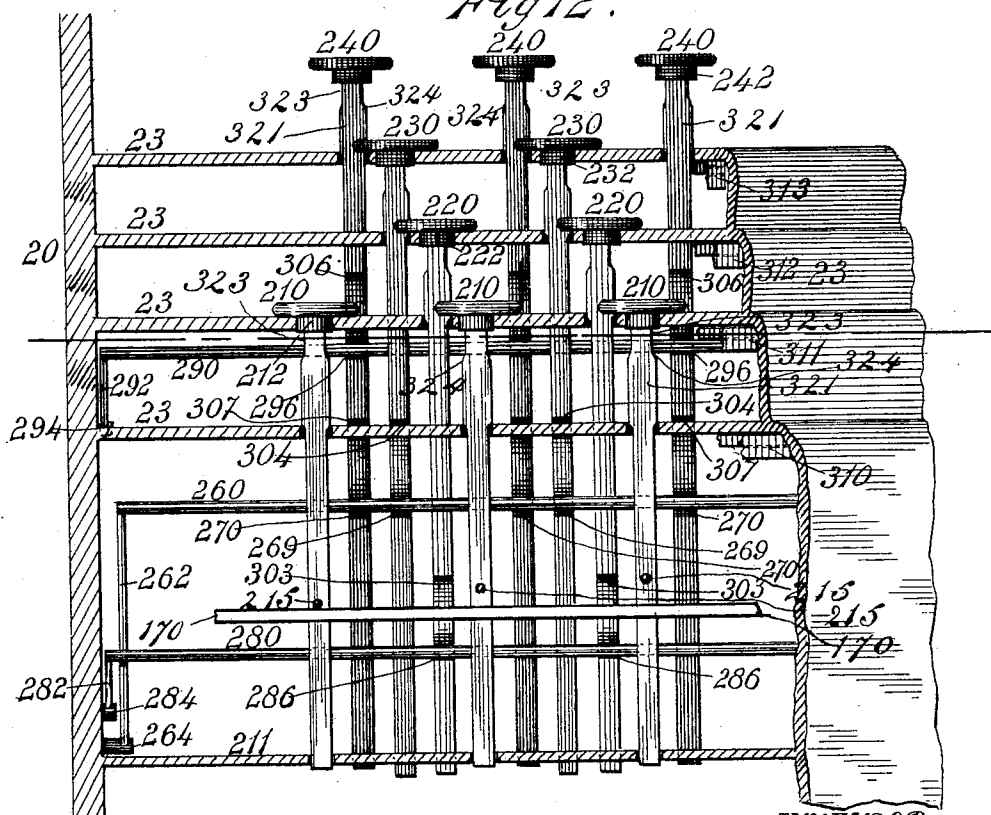


Fig 12.



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CASH REGISTER.

No. 480,208.

Patented Aug. 2, 1892.

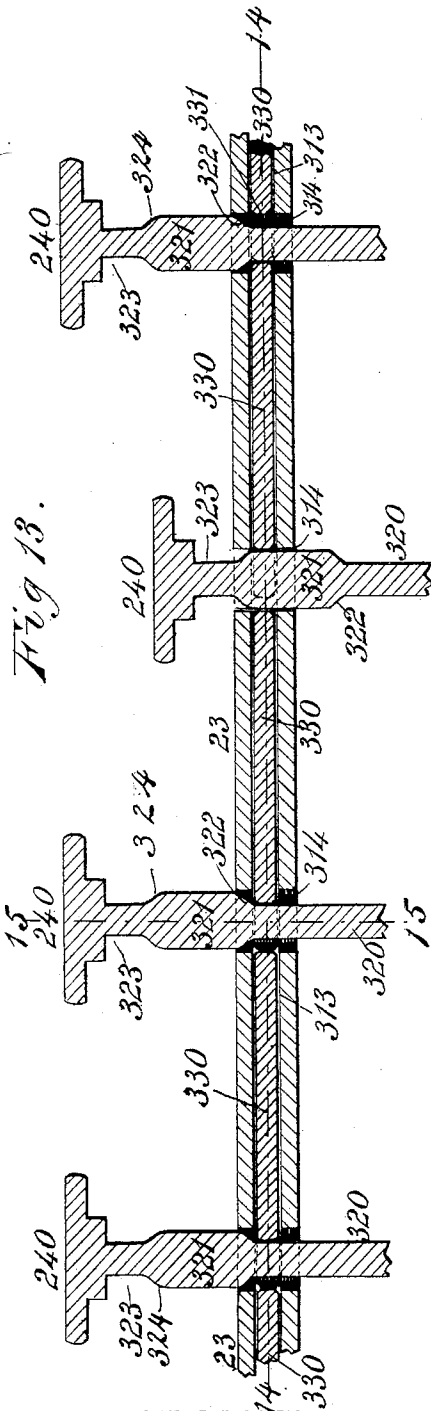


Fig. 13.

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Ed. Fred

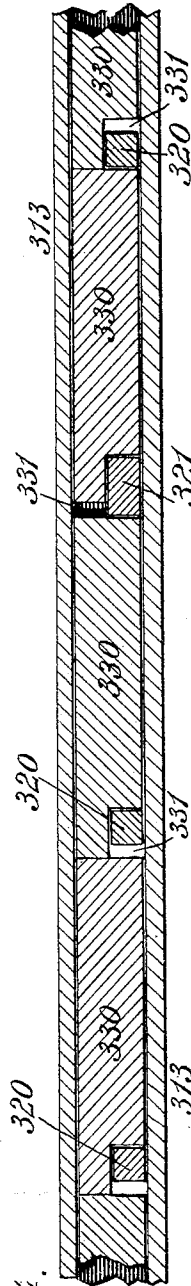


Fig. 14.

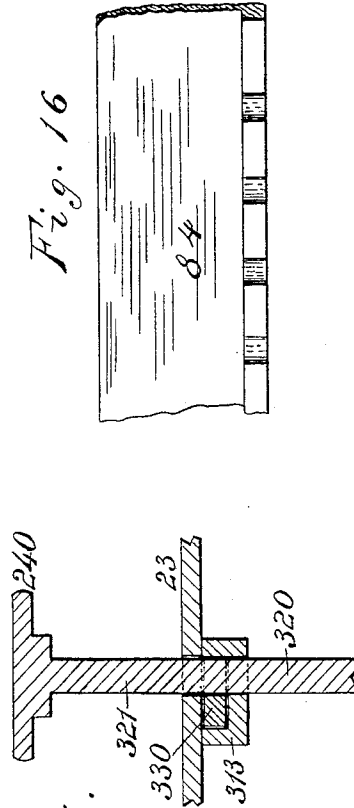


Fig. 15.

Fig. 16

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UNITED STATES PATENT OFFICE.

WILLIAM K. NICHOLS, OF SAN FRANCISCO, CALIFORNIA.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 480,208, dated August 2, 1892.

Application filed January 4, 1892. Serial No. 417,045. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. NICHOLS, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California, have invented a new and useful Improvement in Cash-Registers, of which the following is a specification.

This invention relates to a cash-register having series of indicators, which are thrown in sight to indicate the amount of the purchase or other registration, and which contains a registering mechanism for registering the aggregate of purchases or of other registrations for any required period.

The objects of this invention are to provide a cash-register in which the mechanism will be simple for an apparatus of this character; which will register accurately the aggregate of a long series of transactions extending over weeks, months, or years, thereby affording a check against false entries at the close of each day or other short period; which is locked against false registration; which is permanently sealed, affording no access to the interior of the case, whereby tampering with the registering mechanism is prevented, and which is substantially perpetual or continuous in its registration, no setting back of its registering-wheels being required.

Figure 1 of the accompanying drawings represents a front elevation of this cash-register, the indicating-plates being thrown up to show a sale of "\$179.40," the total registration showing through the reading-slot being in this instance "\$987.45." Fig. 2 is a plan thereof, the upper casing, the key-locking mechanism, and the drawer-releasing mechanism being omitted. Fig. 3 represents a transverse section of this improved cash-register on line 3 3 of Fig. 2, a portion of the left-hand end of the dome and a portion of the bell being broken out to show the mechanism beyond. Fig. 4 represents a horizontal section showing the drawer-compartment, the drawer therein, the mechanism for releasing and locking the drawer, and the spring for throwing it out when released, the top plate of said compartment being broken out, except at the lower right-end corner of the figure. Fig. 5 represents on an enlarged scale a diametrical section of the registering-wheels and their supporting-arbor. Fig. 6 represents an enlarged

plan of one of the registering-wheels, the sleeve to which it is attached, the ratchet-wheel on said sleeve which is actuated by the keys and the ratchet-wheel on said sleeve which is actuated by the adjacent registering-wheel to the right, the pawl-carrying arm actuated by the keys, its sleeve which rides upon the sleeve of the numeral-wheel between its two actuating-wheels, the arbor on which the sleeve of the numeral-wheel rides, and the flange on said numeral-wheel carrying the pawls for actuating the next adjacent numeral-wheel to the left. Fig. 7 represents a perspective view, on an enlarged scale, of a segment of the periphery of one of the numeral-wheels in a modified form, and also a segment of the periphery of the actuating-wheel for the adjacent numeral-wheel to the left, the dog for communicating motion from one of said wheels to the other, and the lug for depressing said dog, said lug being broken off from the case. Fig. 8 represents on an enlarged scale the dog for communicating motion from one of the numeral-wheels to the other and a fragment of its supporting-spring. Fig. 9 represents on an enlarged scale a perspective view of a portion of the mechanism for lifting the bars of the indicator-plates and for holding them in position and the mechanism for releasing said indicator-bars. Fig. 10 represents a perspective view, on an enlarged scale, of a portion of the mechanism for actuating the registering-wheels and the device for retracting or depressing to its normal position the pawl-carrying lever of the cents-wheel, which lever is lifted by two separate arms connected with different sets of keys and engaging a pin on opposite sides of the retracting-bar. Fig. 11 represents on an enlarged scale a plan of the mechanism for locking the different rows of keys. Fig. 12 represents on an enlarged scale a front view of said mechanism for locking the different rows of keys, a portion of the front of the casing being broken out to bring this mechanism into view. Fig. 13 represents on an enlarged scale a vertical section through a number of keys of the same row and through the mechanism for locking different keys on the same row, one of said keys being represented as partially depressed and the others as locked. Fig. 14 represents a horizontal section of the parts represented in Fig. 13 on

line 14 14 of said figure. Fig. 15 represents a transverse vertical section on line 15 15 of Fig. 13 through one of the keys and the locking mechanism therefor. Fig. 16 represents an inner face view of one of the screens, a row of indicating-plates when in their normal positions, and the notched flange on said plate which serves as a guide for the rods of the indicator-plates.

Similar numerals of reference indicate corresponding parts in all the figures.

The case 20 of this improved cash-register comprises a base-plate 21, a paneled front plate 22, having a drawer-slot, a stepped plate 23 above said paneled plate for the different rows of keys, a curved central dome 24 above said stepped plate, covering the registering mechanism and being provided with a reading-slot 25, closed by a transparent plate, through which the aggregate of the registrations may be read, receding curved plates 26 and 27 above said stepped plate on opposite sides of the central dome, a back plate 28, and an elevated compartment 29, surmounting the rear portion of the case and extending longitudinally thereof. This elevated compartment is provided with windows 30 and 31 on both its front and rear faces for exhibiting the indicating-plates of the amounts registered in both directions toward the front and rear. These windows are of sufficient vertical width to exhibit two or more indicating-plates on different planes corresponding to the different denominations of the keys of the keyboard. The top of this compartment is closed by a plate 32. A horizontal partition 33, disposed above the base-plate 21, together with said base-plate and with the end and back walls, forms a drawer-compartment in the lower part of the case.

The construction of the casing may vary more or less from that above described, and it is preferably firmly united and unprovided with any lid, door, or other opening which would afford access to the interior thereof, the object being to permanently seal the case, so as to protect the registering mechanism against tampering and to prevent false entries therefrom, as the mechanism does not require to be set back to zero and shows the aggregate amounts registering from day to day.

The drawer 40, which slides within the drawer-compartment, is provided with two teeth 41 and 42, disposed at its rear and at opposite sides thereof, which teeth are engaged by the locking mechanism, hereinafter described, for holding the drawer closed. A spring 43, attached to the inner face of the back plate of the casing, bears at its free end against the rear end of said drawer and tends to throw out the drawer when the latter is released from its locking mechanism. The elevated compartment 29 is provided on its front and rear faces, near its opposite ends, with the signs for indicating cents, disposed opposite the lower portion of the windows of said com-

partment where the indicating-plates representing the cents registered are displayed, and with dollar-signs on the planes in which the dollar-plates are displayed.

The particular species of drawer-locking mechanism which I consider as of my invention will now be described. This species includes a yoke-shaped lever 50, fulcrumed on pivots 52 and 53, projecting inward from opposite ends of the case above the drawer-compartment. The front bar of this yoke-shaped lever extends longitudinally of the keyboard in position to be actuated by the keys of the front row, as hereinafter described, and it is provided with a number of longitudinal bars, as 54, 55, and 56, adapted to be actuated, respectively, by the keys of the other rows. The inner ends of this yoke-shaped lever are provided with spring-dogs 58 and 59, which engage the teeth 41 and 42 on the ends of the drawer 40. The said teeth are beveled inwardly to act as latches for lifting said dogs when the drawer is pushed in. The drawer-locking lever is held in its normal position for locking the drawer and returned to said position when released from the keys by springs 60 and 61.

The mechanism for indicating the individual sums registered may be of any suitable character adapted to be actuated by the keys of this machine; but I have herein illustrated a particular species of indicating mechanism for throwing up, holding, and releasing the indicating-plates which I consider of my invention, as hereinafter pointed out in the claims. This mechanism will now be described. A horizontal rod 70 extends longitudinally through the case from end to end thereof above the drawer-compartment, and a number of levers 71, corresponding with the number of keys in the machine, are fulcrumed on said rod 70 by means of sleeves 72, the ends of which abut along the rod. These levers are of substantially the same construction, excepting that they are of different lengths, terminating at their front ends under the different rows of keys. A number of vertical rods 73, corresponding with the number of cents-keys, are pivoted at their lower ends near the inner ends of those of the levers 71, which extend under and are actuated by the cents-keys. These rods are provided near their upper ends with branches 73'. Indicating-plates 74 are attached to the tops of the rod 73 and to the tops of the branches 73'. These plates 74 are provided on their outer faces with numerals corresponding to those on the cents-keys which they respectively represent. Vertical rods 75 are connected at their lower ends with those of the levers 71, which are actuated through the units-dollar keys, said rods being also provided with branches 75'. These rods and their branches are provided with indicating plates 76, having numerals representing units of dollars and corresponding with the numeral on the units-dollar keys of the keyboard. Vertical rods 77 are connected at their lower

ends to those of the levers 71 which are actuated through the keys representing tens of dollars. These rods 77 are provided with indicating-plates 78, containing figures representing tens of dollars, the several plates corresponding, respectively, with the tens-dollar keys of the keyboard. The several series of vertical rods 73, 75, and 77 are connected to the levers 71 at slightly-different distances from the inner ends thereof. A guide-bar 79 extends longitudinally of the machine near the upper ends of the rods 73 and is provided with a number of holes, through which the rods 73 slide and by which they are guided and steadied in their movements. The vertical rods of the cents-plates, units-dollar plates, and tens-dollar plates are of three different lengths, so as to project their respective plates into different planes opposite the windows through which said plates are displayed when the corresponding keys are actuated. When in their normal positions, the cents-plates are below said windows.

The elevated compartment 29 is provided with two screens 80 and 81, which extend longitudinally thereof and hide the dollar-plates from the view of either window when in their normal positions, and this compartment is also provided with two screens 82 and 83, which also extend longitudinally thereof in a plane substantially above the screens 80 and 81 and in vertical planes which extend between said screens 80 and 81. These screens 82 and 83 hide the tens-dollar plates from view through either window when said plates are in their normal positions. The screens 80 and 81 are provided with notched flanges 84, which serve as guides for steadying the rods of the units-dollar plates, and the screens 82 and 83 are provided with like flanges 84, which serve as guides for the rods of the tens-dollar plates. The cents-plates 74, attached to the rods 73, show through the front window in front of the screen 80 and the cents-plates attached to the branch rods 73' show through the rear window in front of the screen 81. The units-dollar plates 76, attached to the rods 75, show through the front window in front of the screen 82 and above the screen 80, and the units-dollar plates attached to the branch rod 75' show through the rear window in front of the screen 83 and above the screen 81. The double-faced ten-dollar plates 78, attached to the rods 77, show through both the front and rear windows 30 and 31 in a plane above the display-planes of the other plates and above the screens 82 and 83. In view of this arrangement of the indicating-plates and screens the cents-keys can be arranged in complete rows, the dollar-keys in a complete row or rows, and the tens-dollar keys in a complete row or rows, all the plates being thrown in sight by the same extent of upward movement, and it is impossible for the plates of one denomination to obscure the plates of another denomination when two or more plates are elevated to their respective indicating-planes.

Means are provided for locking the elevated indicator-plates in their exhibiting positions for one registration until a key is struck for the next registration and for returning said plates to their normal positions when a succeeding registration is made. The means herein shown for this purpose constitute a feature of this invention and may be employed in cash-registers in which other features differ from those herein shown. A fixed rod 91 extends longitudinally of the case, at the rear thereof, just above the drawer-compartment. A yoke-shaped rocking frame 90 is disposed on said rod and extends longitudinally within the case, being provided with a pivot-sleeve, as 92, abutting against the right-hand end of the case, and with a pivot-sleeve 92, abutting against a pin 93 in said rod 91, near the left-hand end of the case. The inner ends of the levers 71 rest on the rod 91 when in their normal positions, and when lifted they rest upon the top of the yoke-shaped frame 90. A spring 94, attached to the rear plate of the case, bears against the rocking frame 90 and tends to swing it forward. A pin 95 on the right-hand end of the case serves as a stop for said rocking frame in its forward movement and holds the same in its normal position. The longitudinal bar of this yoke-shaped frame has an inner inclined cam-face 96 extending throughout its length, and one of its end bars is provided with a pivoted dog 97 and with a stop-pin 98 above said dog. A lever 99 is pivoted on the rod 70, its sleeve abutting against the locking-pin 70' and the sleeve 72 of the left-hand lever 71. The outer end of this lever 99 extends forward and upward under the drawer-releasing lever 50 or under one of the cross-bars thereof. When a key is struck, the front end of said lever 99 is depressed and the rear end thereof elevated. In its upward movement the inner end of said lever comes in contact with the tongue of the dog 97 and swings said dog against the stop-pin 98. The lever then rides over the dog, whereby said rocking frame is swung backward a distance sufficient to release those of the levers 71 of the last registration which remained supported on the yoke. After the lever 99 has passed over said dog the yoke-shaped frame is released and returned to normal position by action of the spring 94. Then the lever 71 of the depressed key engages the cam-face 96 of said yoke-shaped frame and swings it backward. When the end of said lever 71 is elevated to a plane above the top of said frame, the spring 94 again swings said frame forward, and it latches under and supports the inner end of said lever, holding the indicator-plates thereof in elevated position until the next registration is made. After the depressed key or keys are released and returned to their normal positions the drawer-releasing lever 50 is also returned to its normal position, thereby releasing said lever 99, which is restored to its normal position by a spring 100. In its descent the inner end of said lever 99 comes in contact with

the tongue of the dog 97 and swings said dog out of its path. After the descent of the released lever 99 the weighted tail 101 of the dog swings said dog back to its normal position, where it is ready to be again engaged by the lever 99 when the latter is again lifted. By this means any one or more of the indicating-plates which have been thrown up to indicate a given registration or the amount of a single purchase will remain displayed until the next registration is made.

The rocking frame 90 is provided with a striking-arm 102, having a bell-hammer 103 at its outer end, which strikes the signal gong-bell 104 whenever the rocking-plate swings forward to engage one of the levers 71. The gong-bell 104 may be supported at any convenient position within the case.

The registering mechanism herein shown will now be described. A fixed rod 110 extends longitudinally of the dome 24, being supported in ears 117, depending from the ends 111 and 112 of said dome. This rod is provided near its opposite ends with transverse locking-pins 113 and 114. The registering-wheels are journaled on this rod between said pins. The number of these wheels varies in different machines, according to the denominations of the keys of the keyboard. In the machine herein illustrated four registering or numeral wheels are employed, to wit: a cents-wheel 120, a units-dollar wheel 130 to the left of the cents-wheel, a tens-dollar wheel 140 to the left of the dollar-wheel, and a final wheel 150, representing hundreds of dollars disposed at the left of the tens-dollar wheel and solely actuated thereby. A sleeve 121 is disposed on the rod 110, its right-hand end resting against the locking-pin 113 and its left-hand end abutting against the sleeve of the units-dollar wheel 130. This sleeve carries the cents-wheel 120 at its inner end and an actuating-disk 122 to the right of said cents-wheel, said wheel and disk being fixed to or cast with said sleeve. The peripheral rim of the cents-wheel is connected with the hub thereof either by spokes or a web. In the machine shown the periphery of the cents-wheel has six general divisions, each division having a series of twenty numerals from "00" to "95," arranged in multiples of five. This wheel is provided on its left face with a flange 123, having six holes, as 148, one for each general division of the wheel. Six spring-dogs 124 are attached to springs 124', disposed on this flange, each dog having a beveled tooth 125 and a cam-face 126. The teeth of these dogs project through their respective holes in said flange and engage the actuating-disk of the units-dollar wheel for turning it one tooth whenever the cents-wheel passes from "95" to "00." A fixed pointed lug, as 149, disposed on the inner face of the dome 24, comes in contact with the cam-faces 126 of the dogs 124 and actuates said dogs. The ratchet-wheel 122, attached to the sleeve of the cents-wheel, has a number of teeth corresponding to the

number of numerals on said cents-wheel, which in the machine shown is one hundred and twenty. A sleeve 127 is disposed on the extended sleeve of the cents-wheel between its actuating-disk 122 and the locking-pin 113. This sleeve is provided with a radial arm 128, which carries a spring-pawl 129, which engages the ratchet-teeth of said actuating-disk 122 for turning said disk and actuating the cents-wheel. This radial arm is connected with a system of levers, hereinafter described, for lifting and depressing it under the action of the keys. A sleeve 131 is disposed on the rod 110, its right-hand end abutting against the sleeve of the cents-wheel and its left-hand end against the sleeve of the tens-dollar wheel. This sleeve carries a ratchet-disk 132, cast with or fixed to it at its right-hand end, the units-dollar wheel 130, cast with or fixed to it at its left-hand end, and a smaller actuating-disk 133, fixed on said sleeve between said units-dollar wheel and said actuating-disk. The disk 132 at the outer end of said sleeve shuts under the flange 123 of the cents-wheel and is engaged at regular intervals, as aforesaid, by one of the dogs 124, disposed on said flange. A sleeve 134 is disposed on the sleeve 131 between the two actuating-disks thereof and is provided with a radial arm 135, carrying a pawl 136, which engages the teeth of the intermediate actuating-disk 133. This radial arm is connected with a system of levers actuated by the units-dollar keys of the keyboard, whereby said arm is lifted, turning said disk and actuating the units-dollar wheel. The periphery of said dollar-wheel is separated into twelve general divisions in the machine herein illustrated, each division having a series of ten numerals comprising all the digits arranged in order from "0" to "9," said numerals representing units of dollars, the total number of numerals shown being one hundred and twenty. The disks 132 and 133 have each a number of teeth corresponding to the number of numerals on said units-dollar wheel. This dollar-wheel is provided on its left face with a flange 137, which carries a number of spring-dogs 124, similar to those on the flange of the cents-wheel and corresponding in number to the number of general divisions on the units-dollar wheel. The teeth of these dogs pass through holes, as 148, in said flange and engage the teeth of one of the actuating-wheels connected with the tens-dollar wheel. These dogs are actuated by a lug, as 149, on the casing whenever the dollar-wheel passes from "0" to "9." A sleeve 141 is disposed on the rod 110 and abuts against the sleeve of the units-dollar wheel on its right-hand end and against the sleeve of the final numeral-wheel 150 at its left-hand end. This sleeve carries at its right-hand end an actuating-disk 142, at its left-hand end a tens-dollar wheel 140, and between said tens-dollar wheel and disk 142 a smaller actuating-disk 143. The disk 142 at the outer end of said sleeve shuts under the flange 137

of the units-dollar wheel and is engaged at regular intervals, as aforesaid, by one of the dogs 124, disposed on said flange. A sleeve 144 is disposed on the sleeve 141 between the two actuating-disks thereof and is provided with a radial arm 145, carrying a pawl 146, which engages the teeth of the intermediate disk 143 for turning said disk to actuate the tens-dollar wheel. This radial arm is connected with a system of levers actuated by the tens-dollar keys of the keyboard, whereby said arm is lifted, turning said disk 143, the sleeve 141 and the tens-dollar wheel 140 on said sleeve being rotated therewith. The periphery of this tens-dollar wheel is divided in the same manner as the periphery of the units-dollar wheel, and each of its actuating-disks 142 and 143 has a number of teeth corresponding with the number of numerals on said wheel. This tens-dollar wheel is provided on its left face with a flange 147, which carries a number of spring-dogs 124, the same as the dogs on the flange of the units-dollar wheel and arranged the same distances apart. These dogs are actuated in the same manner as the dogs of the units-dollar wheel by lug 149 on the casing, and the actuating-disk of the final numeral-wheel is thus turned one step whenever the tens-dollar wheel passes from "9" to "0." A sleeve 151, disposed on said rod 110, abuts at its right-hand end against the sleeve 141 and at its left-hand end against the locking-pin 114. This sleeve is provided at its right-hand end with a ratchet-disk 152, similar to the ratchet-disk 142, at its opposite end with the numeral-wheel 150, and between said numeral-wheel and the disk 152 with a disk 153, similar to the disk 143 on the adjacent sleeve. The disk 152 shuts under the flange 147 of the tens-dollar wheel and is engaged at regular intervals, as aforesaid, by one of the dogs 124, disposed on said flange, and is moved one tooth whenever the tens-dollar wheel passes from "9" to "0." The periphery of this final numeral-wheel is preferably provided with one continuous series of numerals. The series illustrated extends from "0" to "119." Means for actuating this wheel directly from the keyboard are preferably omitted when the machine is not required to register large sums at a single registration. The flanges 123, 137, and 147 may be in the form of segments of flanges or lateral projections or pins sufficient to carry the dogs. A rod 115 extends longitudinally from end to end of the dome 24, and spring check-pawls 116 are disposed on said rod opposite the several actuating-disks 122, 133, and 143 of the cents, units-dollar, and tens-dollar wheels and opposite the disk 153 of the final numeral-wheel. These check-pawls permanently engage said disks and prevent accidental turning of said wheels. Each of the numeral-wheels 120, 130, and 140 is actuated directly from the keyboard by one or more levers, each of said levers being worked by any number of keys of the same denomination as the wheel to which they impart rotation. In the machine illustrated in the drawings two separate levers 160 and 170 are employed for actuating the cents-wheel. A single lever 180 is employed for actuating the units-dollar wheel, and one lever 190 is employed for actuating the tens-dollar wheel. A bent lever 200, provided with lateral studs 201, is pivoted in lugs 202 and 203, attached to the plate 33. The outer free end of this lever 200 is connected by an extended pivot-pin 204 with the lower end of a vertical rod 205, the upper end of which is connected with the radial arm 128, which carries the spring-pawl 129 for engaging the actuating-disk of the cents-wheel. A torsional spring 206, fastened at one end to the lug 202 and at the other end to one of the studs 201, acts torsionally to depress the inner free end of said lever 200, restoring it to its normal position and retracting the pawl 129 on the actuating-disk 122. The lever 160 is worked by the cents-keys from "5" to "30," and the lever 170 is worked by the cents-keys from "35" to "95," inclusive. The lever 160 is yoke-shaped and pivoted on one side to a stud 161 at one end of the casing and on the other side to a stud 162, attached to a dependent arm 163, connected with the end 111 of the dome 24. The inner arm of the yoke-shaped lever 160 is extended rearward past the stud 162 to a point slightly beyond the periphery of the actuating-disk 122 of the cents-wheel. This arm is provided at its inner end with a lateral arm 164, extending toward the left at an angle to the body of the yoke. The inner end of this short arm terminates under the right-hand end of an extended pivot-pin 204, which connects the rod 205 with the depressing-lever 200, being thus in position to lift said rod and lever when worked by the keys, as hereinafter described. The yoke-shaped lever 160 is provided with a cross-bar 165, disposed in position to be worked by the ten, twenty, and thirty cents keys, the outer end of said lever being in position to be worked by the five, fifteen, and twenty-five cents keys. The lever 170, also for actuating the cents-wheel, consists of a yoke pivoted at one end to a lug 171, projecting from the arm 163, and at the other end to a lug 172 at the left-hand end of the case. The outer end of this yoke-shaped lever is in position to be worked by the thirty-five, forty-five, fifty-five, sixty-five, seventy-five, eighty-five, and ninety-five cents keys, and it is provided with a cross-bar 173, disposed in position to be worked by the forty, fifty, sixty, seventy, eighty, and ninety cents keys. An arm 174 extends rearward from the cross-bar 173 and terminates under the left-hand end of the extended pivot-pin 204, which connects the depressing-lever 200 with the rod 205, said rod being pivoted at its upper end, as aforesaid, to the radial arm 128, carrying the pawl 129, which actuates the disk 122 on the sleeve of the cents-wheel. The inner end of this arm is then in position to elevate the mechanism for turning the actuating-disk of

the cents-wheel when any of its cents-keys are depressed. When such keys are released, the depressing-lever 200 restores the lever 170 to its normal position and retracts the pawl on the actuating-disk. The object of using two levers of different leverages for actuating the cents-wheel instead of one lever for that purpose is to reduce the inequality of the movements required in actuating the wheel for registering the lower and higher numbers of cents. The lever 180 for actuating the units-dollar wheel is also in the form of a yoke and is pivoted at its opposite ends to the studs 181 and 182, disposed at the ends of the casing. The front of this lever is in position to be worked by the entire row of units-dollar keys, and it is provided with a rearwardly-extending arm 183, which is connected at its inner end by a vertical rod 184 with the radial arm 135, carrying the pawl 136, which engages the actuating-disk 133 of the units-dollar wheel 130. This lever is restored to its normal position after being worked by a units-dollar key by springs 185 and 186, attached to the end of the fulcrums 181 and 182, engaging pairs of pins 187 and 188 on the ends of said yoke-shaped lever. The lever 190 for actuating the tens-dollar wheel is also in the form of a yoke and is pivoted at its opposite ends to studs 191 and 192, disposed at the inner ends of the casing. The front of this yoke is in position to be actuated by any of the keys of the tens-dollar row and is provided with a rearwardly-extending arm 193, which is pivoted at its inner end to a vertical rod 194, said rod 194 being connected at its upper end with the radial arm 145, which carries the pawl 146, which engages the ratchet-disk 143 for actuating the tens-dollar wheel 140. This lever is restored to its normal position after being depressed by one of the tens-dollar keys by means of springs 195 and 196, having their inner ends disposed in slots in said studs 191 and 192 and their outer ends placed between pairs of pins 197 and 198 in the ends of said lever. The levers 160 and 170 are bent upward and downward, as shown in Fig. 3, to avoid interfering with other mechanism hereinafter described, and the lever 180 is bent upward, as shown in said figure, to avoid interference with the levers 160 and 170.

In the machine herein shown the keyboard is arranged with four rows of keys, the first or lower row 210 representing cents in odd multiples of five from "5" to "95," the second row of keys 220 representing cents in even multiples of ten from "10" to "90." The third row 230 represents units of dollars in all the digits from "1" to "9," and the four row 240 represents dollars in multiples of ten from "10" to "100." The several rows of keys are arranged on different planes, one above the other, in steps. The key-stems are angular in shape and extend through slots in the stepped plate 23, their lower ends projecting through and being guided by slotted bars 211, 221, 231, and 241, respectively. The stems, being angu-

lar in cross-section, are prevented from turning in their slots. Each stem is provided at its upper end with the usual cap-plate containing the index number or character of the key. These plates are provided on their undersides with stop-collars 212, 222, 232, and 242, which come in contact with the stepped plate 23 when the keys are depressed and determine the stroke thereof. A yoke-shaped frame 250 is pivoted on interior lugs 251 and 252 at the opposite ends of the frame. Springs, as 253, are disposed in the lugs 251 and 252 and engage at their free ends pairs of pins, as 254, on said yoke. These springs tend to swing the yoke upward and hold the front bar thereof in contact with the lateral studs 213, attached to the several key-stems of the lower row of keys 210. This spring-yoke thus acts to restore any of the keys of said lower row to their normal positions after being depressed. The several stems of the lower row of keys 210 are provided with lateral pins, as 214, which extend forward from said stems at a proper elevation to engage the front bar of the drawer-releasing lever 50 and depress said lever the requisite distance for releasing the drawer without interfering with the guide-bars 211, 221, 231, and 241. These key-stems are also provided lateral front pins, as 215, which are disposed on their several stems in proper positions to engage the lever 160 or the lever 170, being placed at different heights in said stems, so as to depress said levers the requisite distances for registering the sums indicated on the respective keys of said lower rows. The stems of the keys 220 belonging to the next row are provided with lateral pins 223, all of which are disposed in the same plane in proper positions to engage the cross-bar 54 of the drawer-releasing lever 50 and depress it a sufficient distance to release the drawer without interfering with the guide-plates for guiding the lower ends of the key-stems. These key-stems are provided with back pins, as 224, which are disposed in position to engage the cross-bar 165 of the lever 160 or the cross-bar 173 of the lever 170, said pins being placed at different heights on the different stems, so as to depress said levers different distances for registering sums indicated on their respective key-plates. These key-stems are restored to their normal positions, after being depressed, by springs 225, which are attached at their inner ends to a fixed bar 226, extending from end to end of the machine. These springs bear upward against pins 227 on said stems. These stems are provided with stop-pins 228, which determine the extent of their upward movements under the action of the retracting-springs. The stems of the keys 230 belonging to the third row are provided with front studs 233, disposed in the same horizontal plane in proper position to engage the cross-bar 55 of the drawer locking and releasing lever 50 and depress said levers the requisite distance to release the drawer without interfering with the

lower guide-bars of the key-stems. The stems of these keys are provided with back studs, as 234, which are disposed in positions to engage the lever 180 for actuating the units-dollar wheel. These back studs are also placed at different heights, so as to depress said lever different distances for registering the respective sums indicated on the keys of the third row. These stems are provided with lateral studs 235, which are engaged by lifting-springs 236, attached to the cross-bar 226, said springs serving to restore any of said keys to their normal positions after being depressed. These stems are also provided with studs 237 for limiting the extent of their upward movements when retracted by the springs 236. The stems of the fourth row of keys 240 are provided with front studs 243, disposed in position for engaging the bar 56 of the drawer locking and releasing lever 50, said studs being disposed at the proper elevation for depressing said lever a sufficient distance to release the drawer without interfering with the guide-plates at the lower ends of the key-stems. These stems are provided with back studs, as 244, disposed in positions for engaging the lever 190 for actuating the tens-dollar wheel. These studs are disposed at different heights on the different stems, so as to depress said lever different distances for registering the respective sums indicated on the keys of the fourth row. These keys are restored to their normal positions after depression by springs 245, attached to the fixed bar 226 and engaging lateral studs 246 on said stems. These stems are provided with stops 247 to determine the extent of their upward movements when restored to their normal positions by the action of the lifting-springs.

To avoid false registrations by the depression of two keys simultaneously, locking mechanisms are employed, which when one key is depressed cause the locking of all the other keys of the keyboard until the depressed key reaches the end of its downward stroke. These locking mechanisms, as herein shown, comprise a locking mechanism which operates upon the different rows of keys and a locking mechanism which operates upon the several keys of the respective rows. The locking mechanism for the rows of keys consists of a broad movable plate 260, extending from end to end of the keyboard and supported by upright arms 261 and 262, pivoted on studs, as 263 and 264, at the opposite ends of the case. This plate is of a width which slightly more than spans the space between the first and fourth rows of keys, and it is provided with two series of slots 265 and 266 for the passage of the stems of the keys 220 of the second row and of the stems of the keys 230 of the third row. Each of these slots is of a width to permit the stems to fit and slide therethrough, and the two series of slots 265 and 266 are of slightly-greater distance apart than the distance between the stems of the said two rows of keys. The stems of the keys of the row 210 are provided on their inner faces with notches 267. The stems of the second row are provided with rear notches 268. The stems of the third row are provided with front notches 269, and the stems of the fourth row are provided with front notches 270. The said notches are all on the same horizontal plane when the keys are in their normal positions and are approximately in the same plane with the locking-plate 260. These notches are beveled upward to permit the key-stems to slide through the slots of the locking-plate and against the sides thereof, said beveled faces serving as wedges to shift said plate when a key is depressed and swing it out of the notches of the third and fourth rows of keys and into the notches of the first and second rows of keys for locking them, or vice versa. A locking-plate 280 extends from end to end of the keyboard between the first and second rows of keys and is of a width slightly greater than the space between the stems of the keys of said rows. This locking-plate is supported on arms 281 and 282, pivoted on studs 283 and 284 at the ends of the case. The stems of the first row of keys are provided on their inner faces with notches 285 and the stems of the second row of keys are provided with notches 286, said notches 285 and 286 being on the same horizontal plane throughout the keyboard and in substantially the same plane as the oscillating plate 280. These notches are also beveled upward, and said plate when swung to the right engages the notches of the first row and when swung to the left engages the notches of the second row. A third locking-plate 290, similar to the plate 280, is disposed between the third and fourth rows of keys, being supported on arms 291 and 292, which are pivoted on studs 293 and 294, disposed at the inner ends of the casing. This plate also extends throughout the length of the keyboard and is of a width slightly greater than the space between the third and fourth rows of keys. The stems of the keys of the third row are provided with back notches 295 and the stems of the keys of the fourth row are provided with front notches 296, said notches 295 and 296 being in substantially the same plane with each other and with the locking-plate 290 and being beveled upward to permit the stems to pass downward. This locking-plate when rocked forward engages the notches of the stems of the third row of keys and when rocked backward engages the notches of the stems of the fourth row of keys, locking the third row in the one position and the fourth row in the other. The stem of each key of the front row is provided with two releasing-notches 300 and 301, the notch 300 being disposed at a sufficient distance above the notch 267 to come opposite the locking-plate 260 when the key is fully depressed, whereby said plate is free to move and the several keys are released. The notch 301 is disposed in such position above the locking-plate 280 as to come opposite the edge of

said plate when the key is fully depressed, thereby permitting said plate to oscillate freely, releasing the second row of keys. The stems of the second row of keys are provided with notches 302 and 303, the notch 302 being disposed a sufficient distance above the plate 260 to come opposite said plate when the key is fully depressed, whereby the plate is free to move and the keys, which have been locked thereby during the operation of depressing the given key, are released. The lower releasing-notches 303 are disposed a sufficient distance above the locking-plate 280 to come opposite the inner edge thereof when one of said keys is fully depressed, whereby said oscillating plate is free to oscillate and the keys of the first row are unlocked. The stems of the third row of keys are provided with releasing-notches 304 and 305, the releasing-notch 304 being disposed a sufficient distance above the locking-plate 260 to come opposite the plane of said plate when the keys are fully depressed, whereby said plate is released and the keys unlocked. The notches 305 are disposed a sufficient distance above the locking-plate 290 to come opposite the said plate when the keys are fully depressed, whereby said plate is released and the keys of the fourth row unlocked. The stems of the fourth row of keys are provided with releasing-notches 306 and 307, the former being disposed a sufficient distance above the locking-plate 290 to release said plate and unlock the keys of the third row when a key of the fourth row is fully depressed and the notch 307 being disposed a sufficient distance above the plate 260 to release said plate and unlock the first and second rows of keys when the key for the fourth row is fully depressed. All the releasing-notches are beveled downward to permit the keys to be readily retracted. A partial depression of one of the keys of the first row 210 swings the locking-plate 260 backward and causes it to engage the locking-notches 269 and 270, whereby the third and fourth rows of keys are locked. The same depression swings the locking-plate 280 into the locking-notches 286, whereby the second row of keys is locked. When the depression of one of the first row of keys, as aforesaid, is completed, the locking-plates are released and the several rows of keys are unlocked, as hereinbefore explained, by means of the releasing-notches on the fully-depressed key. A partial depression of one of the keys of the second row 210 causes a backward oscillation of the locking-plate 260, whereby the third and fourth rows of keys are locked in the same manner as by the partial depression of a key of the first row, and by the action of the same key-stem the locking-plate 280 is swung forward, engaging the notches 285, whereby the first row of keys is locked. When the given key of the second row is fully depressed, its releasing-notches unlock the keys of the other rows, as before explained. When a key of the third row 230 is partially depressed, the oscillating

plate 260 is thrown forward and engages the locking-notches 267 and 268, whereby the first and second rows of keys are locked, and by the same partial depression of the same stem of the third row the locking-plate 290 is swung backward and caused to engage the notches 296, whereby the fourth row of keys is locked. When the given key of the third row of keys is depressed to its full extent, its releasing-notches release the locking-plates and unlock the other rows of keys. When a key of the fourth row 240 is partially depressed, it moves and holds the locking-plate 260 in its forward position, whereby said plate engages the notches 267 and 268 and the first and second rows of keys are thereby locked. The same partial depression of the given key of the fourth row swings and holds the locking-plate 290 in its forward position and causes it to engage the notches 295, whereby the third row of keys is locked. When the given key of the fourth row is depressed to its full extent, its releasing-notches release the locking-plates and unlock the keys of the other rows. The locking mechanism for locking different keys of the same row is adapted to operate when one key of a row is partially depressed in such manner as to lock all the other keys of that row until the key is fully depressed. Pockets 310, 311, 312, and 313 are disposed immediately beneath the stepped plate 23 of the casing and extend longitudinally of the keyboard in planes passing through the several rows of key-stems, the said stepped plate serving as a top for the several pockets. These pockets are each provided with vertical slots 314, through which the key-stems play. Each of the key-stems 320 is provided on its opposite sides near its upper end with cams 321, having downwardly-inclined faces 322 and upwardly-inclined faces 324. Recesses 323 are formed on the key-stems between the cams and the stop-collar of the key-plate. Slides 330 are placed in each of the pockets, one between each two of the key-stems. Each slide is provided with a recess 331, through which a key-stem passes. The extreme length of each slide is equal to the distance from center to center between any two of the keys, and the length of the slide from one end thereof to the end of the recess is equal to the distance from the straight face of the cam of one key to the opposite face of a stem of the next key. When a key is depressed, as shown in Figs. 13 and 14, the cams 321 thereof descend into one of the slots 314 and one of the inclined faces 322 enters the recess of one of the slides and the other inclined face 322 comes in contact with the straight end of the adjacent slide, said inclined faces acting as a wedge to separate said slides a sufficient distance to permit the cams 321 to descend. This separation of the slides adjacent to the depressed key presses said slides and all the other slides of the row in contact with the narrow stems of the other keys and locks said keys, there being no room for the descent of another cam until the de-

pressed key reaches the extent of its downward stroke. In such case the recesses 323 come opposite the plain and recessed ends of the adjacent slide. When the key is thus fully depressed, another key may be depressed for effecting a partial registration in the same row of keys. When the second key is depressed during the depression of the first key, the slides are separated in the same manner by the second key, one of said slides entering one of the recesses 323 in the first key.

The operation of this apparatus is as follows: In Fig. 1 the reading-slot 25 shows an aggregate of registrations of "\$987.45," the last registration, as shown by displayed indicating-plates, being "\$179.40." Supposing it is desired to register eight dollars and fifty-five cents, the key of the units-dollar row having the index 8 is depressed. In its descent the lug 233 of the key-stem comes in contact with the yoke-shaped lever 50, whereby the dogs 58 and 59 are raised out of contact with the teeth 41 and 42 and the drawer 40 released. The spring 43 then throws out the drawer. The depression of the yoke-shaped lever 50, which controls the drawer-locking mechanism, depresses the front end of the lever 99 and raises the rear end thereof. This lever 99 then swings back the rocking frame 90 by contact with its dog 97, and the levers 71, supporting the rods which carry the indicating-plates of the last registration, are released from the top bar of said rocking frame and fall into their normal positions on the rod 91. The lower end of the stem of the eight-dollar key comes in contact with its lever 71 and raises the rear end thereof until it passes the cam-face of the rocking frame 90, and said frame then swings forward and latches under said lever and holds it in an elevated position. This elevation of said lever 71 throws up into displayed position two of the indicator-plates 76, each containing the eight-dollar sign, said plates showing in opposite directions through the windows 30 and 31. When the releasing-lever 99 passes the dog 97 and the rocking frame 90 swings forward, it causes the bell-hammer 103 to strike the bell 104. In the descent of the eight-dollar key the locking-notch 269 on the stem thereof oscillates the locking-plate 260 toward the first and second rows of keys and causes it to engage the notches 267 and 268 of said first and second rows and lock the keys thereof, and the locking-notch 295 on said stem of the eight-dollar key swings backward the locking-plate 290 into the locking-notches 296 of the fourth row of keys and locks all of said keys. In its descent this key also by the wedging action of its cams or broadened shank 321 slides the slides in the pocket 312 and locks the other keys of the same row. When the eight-dollar key is finally depressed, the keys of the same row are released by the recesses 323, and the keys of the other rows are released by the releasing-notches 304 and 305 of said key-stem. The fifty-five-cents key is

then depressed, the eight-dollar key being held down during such depression. The action of the fifty-five-cents key upon its lever 71 throws the fifty-five-cents plate into position opposite the windows 30 and 31 in the lower plane of display, the said plates being held in displayed position by the action of the rocking frame 90, which latches under the inner end of the lever 71, actuated by the fifty-five-cents key. During the act of depressing this cents-key the keys of the other rows are locked by the action of the locking-plates 260 and 280, and the keys of the same row are likewise locked by the action of the slides of the pocket 310. This temporary locking of the other keys during the depression of one of them prevents false registrations, which might occur by the depression of two or more keys simultaneously.

The registering action of the keys depressed as aforesaid will now be described. The depression of the eight-dollar key causes its pin 234 to come in contact with the lever 180 and actuates said lever a sufficient distance to turn the actuating-disk 133 on the sleeve 131 of the units-dollar wheel 130 a distance of eight teeth, thereby moving said wheel from the numeral "7" of one of its general divisions to the numeral "5" of its next general division. The units-dollar wheel during this movement passes from "9" to "0," and one of the dogs 124, attached to its flange, engages the actuating-disk 142 on the sleeve of the tens-dollar wheel, whereby said wheel is actuated a distance equal to one numeral of its periphery, the "8" being carried out of the reading-slot and a "9" brought into position therein. When the fifty-five-cents key is depressed, the lateral pin 215 on the stem thereof engages the lever 170 and depresses it a sufficient distance to cause the pawl 129 to rotate the actuating-disk 122 a distance of eleven notches. This movement of the actuating-disk causes the cents-wheel attached to the sleeve of said disk to shift the numeral "45" from the reading-slot and bring "00" into position therein. During this movement of the cents-wheel one of its dogs 124 comes in contact with a pointed lug, as 149, on the case, whereby said dog is depressed and made to engage the actuating-disk 132 of the units-dollar wheel 130 and said wheel is moved forward one notch, thereby shifting its figure in the reading-slot from "5" to "6." The aggregate registrations appearing in the reading-slot will then be "\$996.00." After each registration in which two or more keys are used the several keys are released one at a time in succession and are restored to their normal positions by the retracting-springs, hereinbefore described. After each registration the money-drawer is pushed in and caught by the dogs and remains locked until a key is pressed for the next registration.

The register shown in the drawings has a capacity of twelve thousand, and when this exact sum is reached the numeral-wheels are

all at "0." In case the last individual registration is more than sufficient to carry the wheels past the zero-points, the excess thereof will appear in the reading-slot. It is obvious
 5 that the capacity of the machine may be varied by increasing or diminishing the number of registering-wheels and their connecting mechanisms or by varying the divisions on said wheels.

10 I claim as my invention--

1. A cash-register having a permanently-closed case, a series of registering-wheels inclosed within said case and adapted to be actuated independently of each other, a series
 15 of registering-keys extending through said case, and adjunctive mechanism connecting said keys with said registering-wheels for operating said wheels to register given sums, said registering-wheels being solely accessible by
 20 means of said registering-keys.

2. A cash-register having a permanently-closed case, a series of registering-wheels inclosed within said case and adapted to be actuated independently of each other, a series
 25 of registering-keys extending through said case, adjunctive mechanism connecting said keys with said registering-wheels for actuating the latter to register given sums, and connecting mechanism between said wheels for
 30 transferring the sum of one wheel to the next, said registering-wheels being solely accessible by means of said registering-keys.

3. A cash-register having a permanently-closed case, a series of numeral-wheels inclosed within said case and adapted to be actuated independently of each other, indicating
 35 mechanism also inclosed within said case, a series of registering-keys extending through said case, and adjunctive mechanism connecting said numeral-wheels and said indicating mechanism with said keys, said indicating
 40 mechanism and numeral-wheels being solely accessible by means of said registering-keys.

4. A cash-register having a permanently-closed case, a spring-actuated drawer at the bottom of said case, a series of numeral-wheels inclosed within said case and adapted to be
 45 actuated independently of each other, a series of registering-keys extending through said case, a drawer locking and releasing mechanism also inclosed within said case and actuated by said keys, and adjunctive mechanism
 50 connecting said keys with said numeral-wheels, said numeral-wheels being solely accessible by means of said registering-keys.

5. A cash-register having a permanently-closed case, a spring-actuated drawer at the bottom of said case, a series of numeral-wheels inclosed within said case and adapted to be
 60 actuated independently of each other, indicating mechanism also inclosed within said case, a drawer locking and releasing mechanism also inclosed within said case, and a series of registering-keys extending through
 65 said case, and an adjunctive mechanism connecting said keys with the said numeral-

wheels and indicating mechanism, said indicating mechanism and numeral-wheels being solely accessible by means of said registering-
 70 keys.

6. In a cash-register, the combination of a case, registering and adjunctive mechanisms therein, several rows of vertically-sliding keys for actuating the several mechanisms, a slid-
 75 ing spring-actuated drawer, a horizontal yoke-shaped lever pivoted within said case and provided with a latching-dog for engaging said drawer, said lever having bars fixed thereto and disposed in position to be en-
 80 gaged by any key of either row for releasing said drawer, and means for restoring said lever to its normal position.

7. In a cash register and indicator, the combination of a number of indicator-levers, keys
 85 actuating said levers, vertical rods actuated by said levers and provided with branches, and numeral-display plates attached to the different branches, the display-plates attached to the branches projecting in one direction exhibit-
 90 ing their numerals on one side and the duplicate display-plates attached to the branches projecting in the other direction exhibiting their numerals on the opposite side.

8. In a cash register and indicator, the com-
 95 bination of a number of indicator-levers, keys actuating said levers, vertical rods of different lengths actuated by said levers, numeral-display plates attached to said rods in different planes, and fixed screens for hiding the
 100 plates of the lower planes when in their normal positions.

9. In a cash register and indicator, the combination of indicator-levers, keys actuating
 105 said levers, vertical rods actuated by said levers, numeral-display plates attached to said rods in different planes, and screens for hiding some of said plates when in their normal positions, said screens serving as guides for
 110 said rods.

10. In a cash register and indicator, the combination of a series of sliding keys, a series of levers the front ends of which are engaged by said keys, rods directly engaged by
 115 said levers and lifted thereby, numeral-display plates disclosed by the movement of said rods, a rocking frame latching under said levers for holding said rods in elevated position, an independent releasing-lever for re-
 120 tracting said rocking frame, adjunctive mechanism between said rocking frame and releasing-lever, and an actuator for said releasing-lever common to the several keys.

11. In a cash register and indicator, the combination of indicator-levers, rods actuated
 125 by said levers, numeral-display plates disclosed by the movement of said rods, a rocking frame for holding the rods in elevated position, a stop on said rocking frame, a weighted pivoted dog on said rocking frame
 130 adjacent to said stop, and an indicator-releasing lever adapted to engage said dog for swinging back said rocking frame to release the elevated display-plates.

12. In a cash register and indicator, the combination of indicator-levers, keys for actuating said levers, a pivoted rocking frame having a cam-faced bar for latching under said levers when raised, rods connected with said levers and carrying numeral - display plates, a stop on said rocking frame, a weighted pivoted dog on said rocking frame adjacent to said stop, a drawer-releasing lever actuated by said keys, and an indicator-releasing lever adapted to engage said dog for swinging back said rocking frame to release the elevated display-plates, the front end of said indicator-releasing lever extending under and being actuated by said drawer-releasing lever.

13. In a cash-register, the combination of an arbor, a series of numeral-wheels disposed on said arbor, one of said numeral-wheels having sets of numerals, the numbers in each set ranging from "0" to "95" in multiples of five, and another of said numeral-wheels having sets of numerals, the numbers in each set ranging from "0" to "9," transferring mechanism for transferring the totals of one wheel to the next, a series of cents-keys having numerals from "0" to "95" in multiples of five, actuating mechanism between said cents-keys and the first numeral-wheel, a series of dollar-keys, actuating mechanism between said dollar-keys and the second numeral-wheel, a final numeral-wheel on said arbor disconnected from the keys and having a single continuous series of numerals, and transferring mechanism for carrying the totals of the preceding wheels to said final numeral-wheel.

14. The combination of a series of sliding keys of different values, a yoke-shaped lever having a bar disposed adjacent to said keys, lateral studs disposed on the stems of said keys at different distances from said bar, a spring for retracting said yoke-shaped lever, a registering-wheel, and connecting mechanism between said yoke-shaped lever and registering-wheel.

15. The combination of a series of vertically-sliding keys of different denominations and of different values in each denomination, a series of numeral-wheels of different denominations corresponding with the denominations of the keys, yoke-shaped levers for the several numeral-wheels, having their bars disposed adjacent to the said keys, springs for retracting said levers, lateral studs disposed on the stems of said keys at different distances from said bars, and connecting mechanism between said levers and said numeral-wheels.

16. The combination of a series of sliding keys of different denominations and of different values in each denomination, the stems of said keys being provided with lateral studs disposed in different planes, a series of numeral-wheels of different denominations corresponding with the denominations of the keys, yoke-shaped levers for the several numeral-wheels, having bars disposed in the paths of the studs of their respective keys,

and connecting mechanism between the numeral-wheels for transferring the sum from the wheel of one denomination to the wheel of the next denomination.

17. The combination of a series of numeral-wheels representing different denominations of figures, a yoke-shaped lever for each numeral-wheel of higher denomination, two yoke-shaped levers for the numeral-wheel of lowest denomination, connecting mechanism between said levers and said wheels for actuating the latter, connecting mechanism between the numeral-wheels for transferring the sum of a wheel of one denomination to a wheel of the next higher denomination, and a series of sliding keys provided with lateral studs disposed in different planes on the key-stems for engaging said levers to actuate said wheels.

18. In a cash register and indicator, the combination of a series of sliding keys, the stems of which are provided with separate series of lateral studs, the studs of one series being disposed in different planes, a drawer-releasing lever engaged by one series of said studs, indicator-levers for actuating the indicating display-plates disposed in position to be engaged by said key-stems, a registering mechanism comprising a series of numeral-wheels, and levers for actuating said numeral-wheels disposed in position to be engaged by the lateral studs of different planes on the key-stems.

19. In a cash-register, the combination of a case, a registering mechanism therein, two or more rows of vertically-sliding keys for actuating said mechanism, a spring-actuated sliding drawer, a horizontal yoke-shaped lever pivoted within said case and provided with a latching pivoted dog engaging said drawer, said lever having bars corresponding to the rows of keys and disposed adjacent to said rows respectively, whereby said lever is directly actuated by any key of either row for releasing said drawer, and means for restoring said lever to its normal position.

20. In a registering mechanism, the combination of a series of numeral-wheels provided with lateral projections, two ratchet-disks fixed on the sleeve of each numeral-wheel after the first, one of said disks shutting within the projections of the adjacent wheel, spring-dogs disposed on said projection, means for depressing said dog to actuate the succeeding numeral-wheel, arms swiveled on the sleeves of said numeral-wheels and carrying pawls engaging the other disks, and means for actuating said pawl-carrying arms.

21. In a cash-register, the combination of rows of sliding keys, the stems of which are provided with locking notches or projections, and locking-plates disposed between said rows, said plates being shifted by contact of a key-stem belonging to either row into engagement with the notches or projections of the key-stems of the other rows, thereby locking the keys of said other rows.

22. In a cash-register, the combination of two rows of sliding keys, the stems of which are provided with locking notches or projections, and a locking-plate disposed between
5 said rows, said plate being shifted by contact of a key-stem belonging to either row, so as to lock the keys of the other row.

23. In a cash-register, the combination of two rows of sliding keys, the stems of which
10 are provided with locking and releasing recesses or projections disposed in different planes, and a locking-plate disposed between said rows, said plate being shifted into position to engage the locking notches or projec-
15 tions on the stems of either row on the partial downstroke of any key of the other row and released on the full downstroke of said key.

24. In a cash-register, the combination of
20 four rows of sliding keys, the stems of which are provided with locking notches or projections, a locking-plate disposed between the first and fourth rows of said keys and provided with slots through which the keys of
25 the second and third rows play, said plate being swung into engagement with the stems of the third and fourth rows of keys on the depression of a key of the first or second row and into engagement with the stems of the
30 keys of the first and second rows on the depression of a key of the third or fourth row, a locking-plate disposed between the first and second rows of keys and adapted to engage the stems of either row on the depression of a key
35 of the other row, and a locking-plate disposed between the third and fourth rows of keys and adapted to engage the stems of either row on the depression of a key of the other row.

25. In a cash-register, the combination of
40 four rows of sliding keys, the stems of which are provided with locking and releasing notches or projections, a locking-plate disposed between the first and fourth rows of said keys and provided with slots through

which the keys of the second and third rows 45 play, a locking-plate disposed between the first and second rows of keys, and a locking-plate disposed between the third and fourth rows of keys.

26. In a cash-register, the combination of 50 two rows of sliding keys, the stems of which are provided with cams and with locking notches or projections, pockets extending along said rows of keys and provided with transverse slots through which said stems play, 55 a series of locking-slides in each of said pockets, provided with end notches of less depth than the cam-faced stems, and a locking-plate disposed between said rows, whereby on the depression of a key of either row said plate 60 is shifted into engagement with the notches or projections of the key-stems of the other row and said slides are moved into position to lock the key-stems of the same row.

27. In a cash-register, the combination of 65 two rows of sliding keys, the stems of which are provided with locking notches or projections, a locking-plate disposed between said rows, said plate being shifted on the depression of a key of either row into position to 70 lock the keys of the other row, and mechanism for locking the other keys of the row to which the depressed key belongs.

28. In a cash-register, the combination of a numeral-wheel, an actuating-disk therefor, 75 an arm carrying a pawl for engaging said disk, a spring-actuated depressing-lever, a rod connected at its upper end to said pawl-carrying arm and at its lower end with said depressing-lever, two lifting-levers for lifting said de- 80 pressing-lever and the mechanism connected therewith, and two sets of keys for actuating said lifting-levers.

WILLIAM K. NICHOLS.

Witnesses:

F. C. SOMES,
O. A. WEED.