

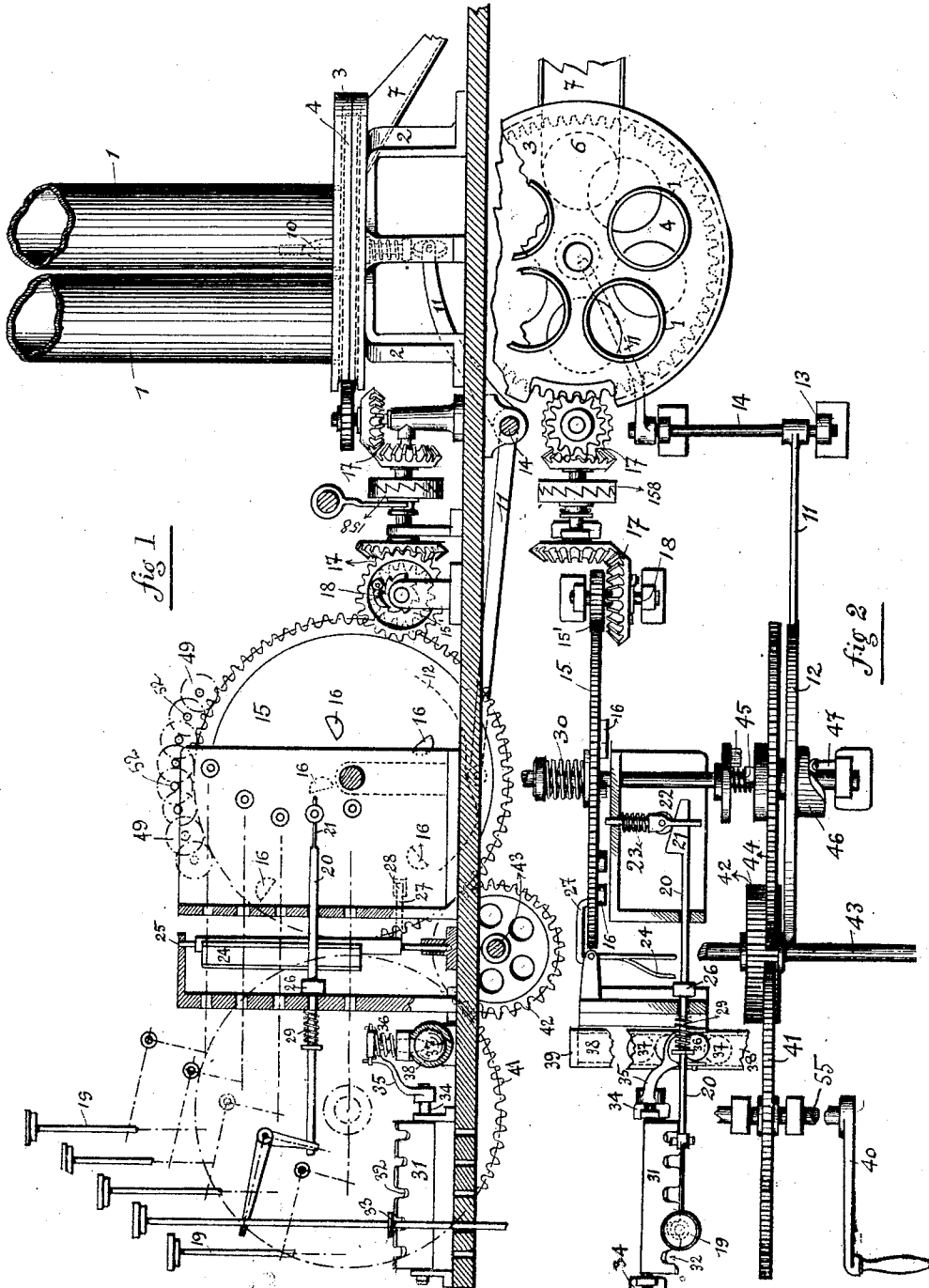
P. GREINDL.
AUTOMATIC CASHIER.

APPLICATION FILED APR. 29, 1913.

Patented Mar. 24, 1914.

5 SHEETS-SHEET 1.

1,090,846.



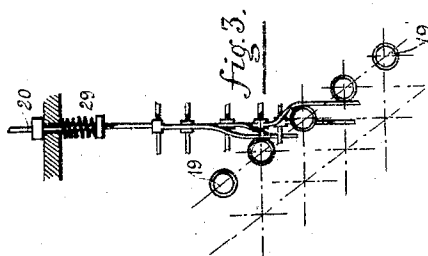
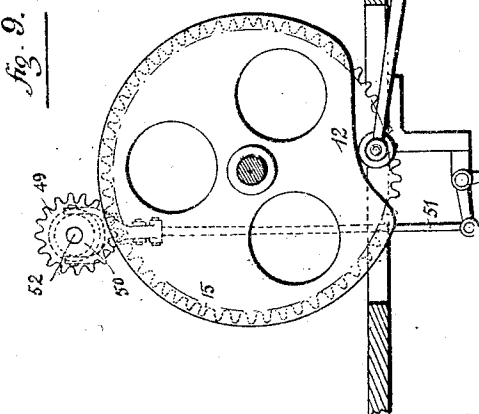
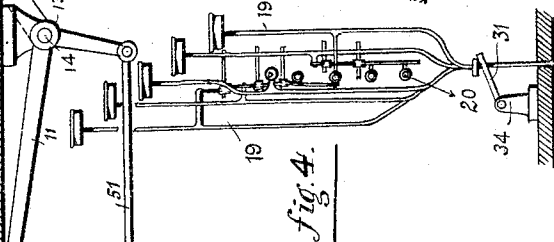
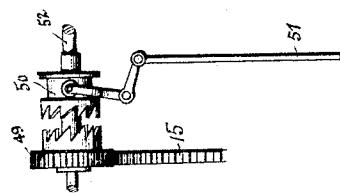
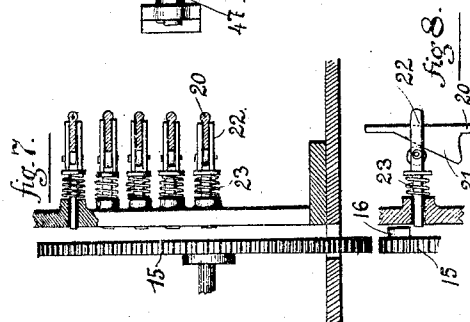
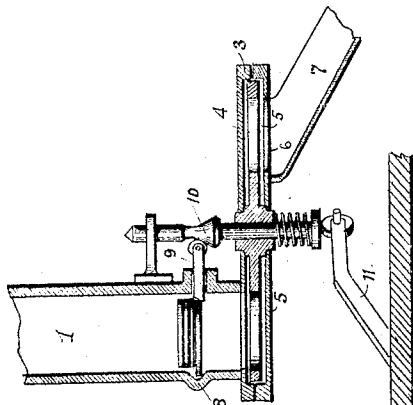
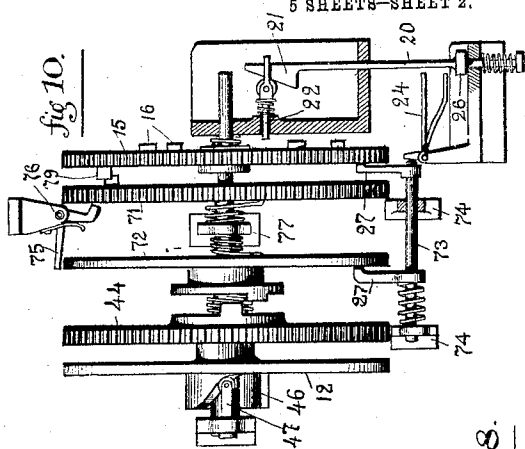
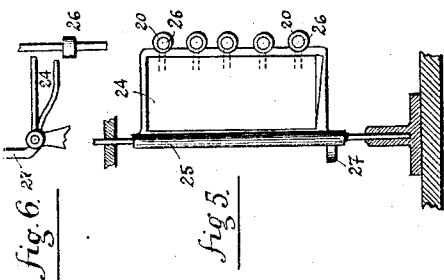
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5 SHEETS—SHEET 2.

1,090,846.



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5 SHEETS—SHEET 3.

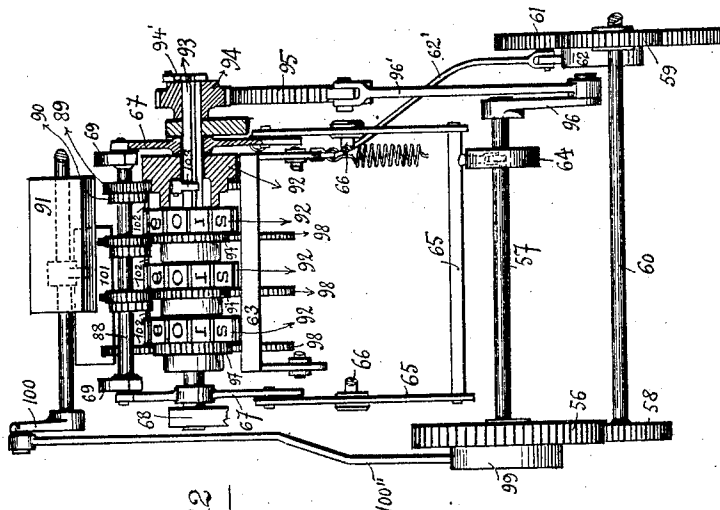


fig 12

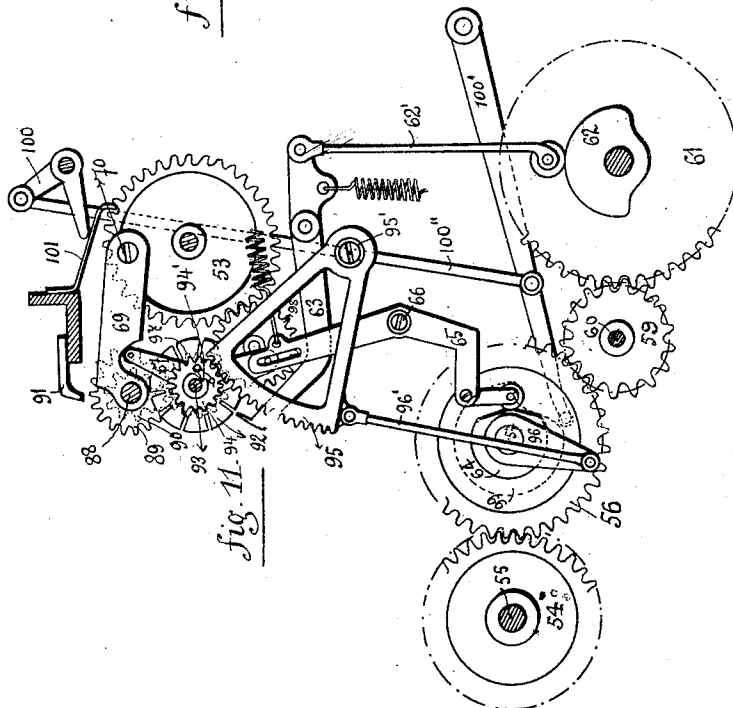


fig. 11

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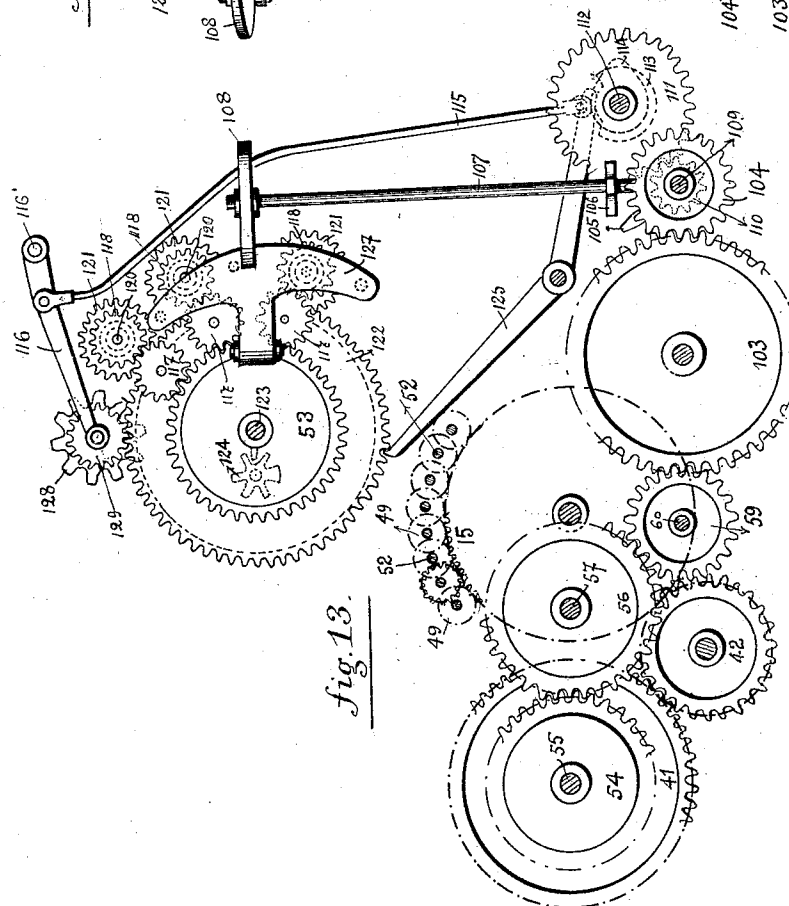
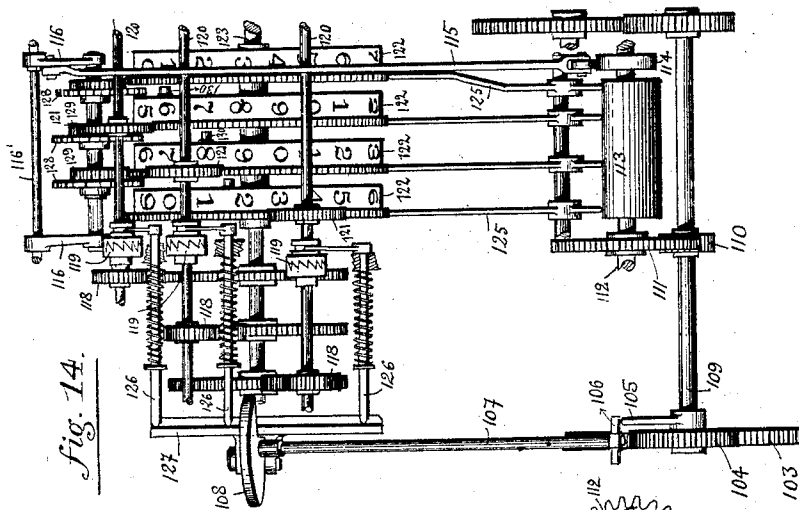
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1,090,846.

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APPLICATION FILED APR. 29, 1913.

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5 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CASHIER.

1,090,846.

Specification of Letters Patent.

Patented Mar. 24, 1914.

Application filed April 29, 1913. Serial No. 704,371.

To all whom it may concern:

Be it known that I, PAUL GREINDL, baron, a subject of the King of the Belgians, and residing at Brussels, Belgium, have invented certain new and useful Improvements in Automatic Cashiers, of which the following is a specification.

My present invention relates to automatic cashiers used for paying any desired number of coin and summing and recording the coin paid out, the object being to provide an automatic cashier of this kind, wherein the desired coin are discharged and recorded by the mere depression of the respective keys and the rotation of a crank-handle, the coin discharged from vertical conduits, being recorded upon an endless strip of paper as well as upon a ticket delivered to the person to whom the coin are paid, and the total sum paid, at each operation being shown to the person and to the cashier before the same is delivered and recorded.

In contradistinction to other automatic cashiers of this kind, the main feature of my invention consists in arranging a rotatable disk, provided with apertures, below the coin-conduits any desired number of which may be provided for each sort of coin, said rotatable disk being discharged from the weight of the column of superposed coin when operated for the discharge, and the angular movement of said disk being limited or controlled by a gear-wheel provided with stops, rotated according to the corresponding key depressed and actuating at the same time the recording and indicating mechanism through the agency of suitable gearings.

Other features of my invention will be fully described hereinafter, with reference to the accompanying drawings, illustrating my invention.

Figure 1.— is a side elevation of the complete machine without the recording mechanism, parts being shown in section and broken away; Fig. 2.— is a corresponding top plan view; Fig. 3.— is a top plan view of the keys of one row (for one sort of coin); Fig. 4.— shows an elevation of said row of keys; Fig. 5.— shows an elevation of the locking bolt used for preventing the keys from moving back to their initial positions before the coin discharging wheels are moved back to their initial positions; Fig. 6.— is a top plan view of said

locking bolt; Fig. 7.— shows an elevation of one of the coin discharging wheels and the latches limiting the angular movement thereof; Fig. 8.— is a partial plan view of same; Fig. 9.— is a side elevation and vertical section of a coin container, showing the device for removing the weight from the coin discharging disk. The view shows also the clutch connecting the coin discharging mechanism to the recording mechanism; Fig. 10.— is a top plan view of the device enabling the machine to deal with coin such as Belgian fr. 0.25 coin; Fig. 11.— is an elevation of the mechanism for adjusting the printing types corresponding to the sum which is about to be paid out; Fig. 12.— is a side elevation of said mechanism; Fig. 13.— shows an elevation of the record indicating mechanism; Fig. 14.— shows a side elevation of same; Fig. 15.— shows an elevation of the mechanism for printing and feeding the endless strip of paper and the ticket strip; Fig. 16.— shows the side elevation of same; Fig. 17.— is a detail side view of the ticket strip feeding device.

In Figs. 11 to 17 the frame of the machine is not illustrated except portions thereof where necessary for the disclosure of the operation.

Referring to the drawings 2 designates a stationary frame, on which are arranged series of vertical tubular conduits or containers 1, the lower ends of which are secured in a flat casing 3, within which is rotatably journaled a circular toothed disk 4 having a plurality of circular apertures. The bottom of the casing has a recess 5 (Fig. 9) serving to minimize friction and an opening 6 for the discharge of coin through the chute 7. For each sort of coin there are several containers 1 arranged above a common disk 4, the rotation of which is controlled by the corresponding group of keys as herein-after described. The tubular containers 1 are bulged as 8 and arranged in the plane of this bulged part is a slide 9, adapted to be actuated by the beveled pin 10, raised and lowered by a two-armed lever 11 pivoted at 12 and actuated in turn by the cam disk 12. The machine has as many series of containers as there are sorts of coin, but it has only a single cam-disk 12, actuating the beveled pins 10 of all series of containers through the agency of the shaft 14.

Corresponding to the discharge disks 4

are toothed wheels 15, having laterally projecting lugs 16, arranged at different distances from the centers of said wheels. Each wheel 15 is connected to the corresponding discharge disk by two pairs of beveled pinions 17. The toothed wheel 15 meshes continuously with a toothed wheel 15' (Figs. 1 and 2), the shaft of which is connected by a clutch 18 with one of the beveled pinions 17 in such a way that upon rotation of the wheel 15 owing to the depression of a key, the small toothed wheel 15' does not move the beveled pinions 17, while the latter are actuated when the toothed wheels 15, 15' are moved in opposite direction, for example by the crank handle 40. Therefore the wheel 15 may be adjusted by the depression of a key without influencing the corresponding disk. The several angular positions of the wheel 15 controlled by the lugs 16, correspond to the number of coin to be discharged. For each sort of coin I provide a plurality of keys 19, each of which actuates a horizontally slidable bar 20, moved back to its normal position by the action of a spring 29. The wedge-shaped end 21 of each bar 20 moves through a slot 22 in the spring supported pin 23. If the bar 20 is moved longitudinally, the pin 23 will be brought nearer to the wheel 15 so as to extend into the way of the corresponding lug 16, whereby the wheel 15 is enabled to turn through a given angle. The machine illustrated has five keys 19 for each sort of coin, the first of which acts to discharge one coin, while the second discharges two, the third three and so on coins from the corresponding containers 1.

Arranged on each bar 20 is a lug 26, adapted to be engaged by a double wing 24 arranged on a vertical rotatable shaft 25. Said wing 24 carries a hooked arm 27, which engages a recess 28 of the wheel 15 when the latter is in its normal position. In this position the wing 24 is disengaged from the lug 26.

In order to prevent two keys of two different groups of keys from being depressed simultaneously, I have provided the following arrangement: This arrangement consists of a horizontally rotatable wing 31, provided with recesses 32 for the passage of the key-rods 19. Each key-rod carries a fixed disk 33, whereby the wing 31 is rotated around the pivot-pins 34 upon the depression of the key. One of said pivot-pins carries a bifurcated arm 35, actuating a spring supported bolt 36, the free end of which is adapted to be inserted between balls 37, in order to move the same apart from each other. The balls 37 are arranged to roll in a tubular guide-way 38, closed at opposite ends as shown at 39. The space between these closed opposite ends is just large enough to contain the balls and enable one

bolt 36 to be inserted between the same, so that if two keys of different groups of keys are depressed simultaneously, only one key can be depressed completely as only one bolt 36 can and will be inserted between the balls 37. After the various members are adjusted and controlled as described, said members will be actuated by a crank-handle 40 through the agency of gear-wheels 41, 42, 44. The gear-wheel 42 is fast on a shaft 43, which carries as many gear-wheels 42 as there are discharge devices. The gear-wheel 44 carries a spring-clutch 45 and is connected to the cam disk 12. The latter carries a lateral cam socket 46, bearing against an arm 47, secured to the frame and provided with a roller at its free end.

The machine comprises an adding device, composed of gear-wheels 49 meshing with the toothed wheels 15 and loosely arranged on shafts 52, each of which is provided with a clutch 50. The latter is operated by the lever 11 through the agency of a rod 51 and a forked lever (Fig. 9). Said shafts 52 extend to the adding mechanism hereinafter described.

The machine so far described, operates as follows:—If a key is depressed, the associated bar 20 will be moved horizontally, so that the wedge-shaped head 21 thereof causes the corresponding stop-pin 23 to be advanced. At the same time the lug 26 of the bar 20 causes the wing 24 to swing, whereby the hook 27 will be disengaged from the recess 28 of the wheel 15, which is rotated through a given angle (limited by the pin 23) by the action of the spring 30, until one of its lugs 16 strikes against the advanced pin 23. Owing to the arrangement of the clutch 18, the beveled pinions 17, which connect the wheel 15 to the discharge disk, will remain inoperative. As the key 19 is depressed the lug 33 thereof brings the wing 31 into its horizontal position so that the fork 35 acts to insert the bolt 36 between the balls 37, whereby any key of any other group is prevented from being depressed at the same time. As the wheel 15 rotates, it will rotate the wheel 49; which actuates the shaft 52 and therefore the adding and recording mechanism (hereinafter described) through the agency of the clutch 50. After the keys corresponding to the sum to be paid out are depressed, the crank-handle 40 will be rotated, whereby the shaft rigidly connected to the wheel 15 will be rotated through the agency of the gear-wheels 41, 42, 44 and the clutch 45 operated by the cam-socket 46. Thus the wheel 15 will be rotated together with the beveled pinions 17, which cause the corresponding disk 4 to rotate for discharging a corresponding number of coins. At the same time the cam-disk 12 will be rotated to actuate the shaft 14 through the agency of the lever 11. The latter raises the beveled

pin 10, whereby the slide 9 will be moved inwardly into the coin container for the purpose of relieving the weight of the superposed coins from the rotatable disk 4. By the rotation of the shaft 14 through the medium of the lever 11, the wheel 49 will be released through the agency of the rod 51 and the clutch member 50. If it is desired to discharge pieces of frs: 0.25, a corresponding bar 20 will be actuated as for other coin. The lug 26 of said bar engages and moves the wing 24 (Fig. 10), which moves longitudinally a bolt 73, guided in bearings 74 and carrying two hooked fingers 27, 27, normally engaging recesses in the wheels 15 and 72. If the bolt 73 is shifted by the depression of a key, the wheels 15, 72 will be released and the wheel 15 will be rotated by its spring and arrested by the stop-pin 22, while the wheel 72 will make a complete revolution and disengage by its cam shaped periphery the pivoted bolt 75 from the toothed wheel 71. The latter is then also allowed to rotate and it will be arrested by the stop-lugs 79 engaging each other. As the mechanism is wound up by the handle 40 the clutch 45 of the wheel 72 will rotate the latter until it engages a pin of the shaft, whereupon the shaft and therefore the wheel 15 will be moved in unison. The wheel 15 will move the wheel 71 through the agency of the lugs 79.

The part of machine which records the sums paid out comprises gear-wheels 49, meshing with each of the toothed wheels 15. Said gear-wheels 49 actuate relatively long shafts 52 which in turn actuate three toothed wheels 53 through the agency of suitable intermediate gearings. The three wheels 53 correspond to the units, the tens and the hundreds respectively.

The recording mechanism of my machine may be divided into three main parts: the arrangement for adjusting the type-wheels, the arrangement of the indicators and the printing mechanism. These three parts will now be described in detail.

As the wheels 15 are rotated for adjustment as above described, the wheels 53 (Figs. 11 and 12) will be rotated through the agency of the shafts 52 and said wheels 53 will rotate and adjust the type-wheels 92 through the agency of the gear-wheels 97 and 98. Upon each complete revolution of a type-wheel the next adjacent type-wheel must be turned to the extent of a unit. This result is obtained by means of fingers 102 arranged in the well known way to engage sprocket-wheels 90 attached to toothed pinions 89 meshing with the gear-wheels 97. In order to prevent the type-wheels from being moved during the printing operation, and also to rectify their positions, I have provided a locking device 62', 63, operated by the cam 62, the blade 63 of said

device being inserted into radial slots provided in the type-wheels 92 for holding the latter against accidental movement. After the printing operation, the type-wheels 92 must be moved back to their zero positions by the crank-handle 40 carried by the shaft 55, provided with a toothed wheel 54 meshing with a toothed wheel 56 secured to a shaft 57. The latter has a crank 96, pivotally connected with a rod 96' which causes the toothed segment 95 to turn about its pivot-pin 95'. When turning upwardly, said segment 95 rotates the toothed pinion 94, mounted loosely upon the shaft 93 of the type-wheels. When swinging downwardly said segment rotates the pinions 94 in reverse direction, whereby a pawl 94' carried by said pinion will engage a groove in the shaft 93 and rotate the latter. The type-wheels 92, which are also mounted loosely on the shaft 93, are likewise provided with pawls 103 (Fig. 12) adapted to engage said groove in the shaft 93 and therefore said type-wheels will be rotated together with the shaft 93 in succession according as the respective pawls 103 engage the said groove. The pinion 94 and segment 95 are proportioned in such a way that the shaft 93 makes a complete revolution, and the longitudinal groove is arranged so that each type-wheel will be turned back to its zero position after the complete revolution of the shaft 93, produced by the downwardly swinging segment 95. In order to enable the type-wheels 92 to be turned back to their zero positions, said wheels must be previously disengaged from the wheels 53. This is obtained by means of a cam 64, carried by the shaft 57 and acting upon a bell-crank lever 65 pivoted as at 66 and carrying the bearing of the intermediate pinions 98. When caused to swing by the cam 64, said lever 65 disengages the pinions 98 from the wheels 53 whereby the type-wheels 92 may be turned backwardly. The fingers 102 must also be released from the sprocket-wheels 90, attached to the toothed pinions 89 before the type-wheels can be moved back to zero. To this end the shaft 88 of said pinions 89 is carried by arms 69, pivoted at 70 and provided with a cam-like recess engaged by two armed levers 67, loosely mounted on shaft 93 and pivotally connected with the bell-crank levers 65. When the latter are caused to swing as described, the levers 67 raise the arms 69 together with the pinions 89 and sprocket-wheels 90, so that the latter are disengaged from the fingers 102. The pinions 89 are moved against an alining blade 91, which holds them against accidental rotation. At the same time a spring blade 101 is depressed by a bell-crank lever 100 and inserted between the teeth of the wheels 53 to aline them and hold them against accidental rotation. Said bell-crank

lever 100 is actuated by a cam 99 of the shaft 57 through the agency of a pivoted arm 100' and a connecting-rod 100''.

The indicating mechanism (Figs. 13 and 14) is as follows:—As already described the wheels 53 are actuated by the rotation of the wheels 15. Arranged on the shaft 55 of the crank-handle 40 is a toothed wheel 54 meshing with a toothed-wheel 56 on the shaft 57. Said wheel 56 transmits motion to a toothed wheel 104 through the agency of gear-wheels 59 and 103, said wheel 104 being mounted on a shaft 109 and provided with a finger 105, arranged to actuate a cross-shaped member 106, carried by the inclined shaft 107, the upper end of which carries a cam-disk 108. The shaft 109 carries also a toothed pinion 110, meshing with a toothed wheel 111, the shaft 112 of which carries a cam-roller 113, engaged by pivoted levers 125, adapted to engage the toothed peripheries of the indicating wheels 122 to hold the latter against accidental rotation. The shaft 112 carries also a cam-disk 114 engaged by a lever 115 arranged to operate the frame 116 pivoted at 116'. The toothed wheels 53 are operatively connected to gear-wheels 118 by intermediate pinions 117, said gear-wheels 118 being arranged on shafts 120, provided with clutches 119 and carrying other gear-wheels 121, meshing with the toothed peripheries of the indicating wheels 122 as shown. Said indicating wheels 122 are loosely mounted on the shaft 123 and connected with the latter by means of spiral springs (not shown) one end of which is secured to the shaft, while the other end is secured to the respective indicating wheel. The rotation of the indicating wheels 122 produced by the action of said spiral springs is limited by a rotatable cross-member 124. The clutches 119 are operated by spring actuated bars 126, adapted to be shifted by a suitably shaped swinging member 127 actuated by the cam 108. After a wheel 122 has completed one revolution, it causes the next wheel 122 to turn to the extent of a unit by the fact that its laterally projecting finger 130 engages and moves the sprocket-wheel 128, attached to the pinion 129 meshing with the toothed periphery of the next indicating wheel 122. The indicating wheels are adjusted at the same time as the type-wheels already described to show the operator the sum which will be discharged upon the operation of the crank-handle 40. If the sum indicated in this way is not right, the operator needs only operate the clutch 158 (Figs. 1 and 2) by means of a key (not shown) provided to this end and turn the handle 40 for bringing all the members of the machines back to their initial positions without discharge of money.

The record feeding and printing mechanism is shown in Figs. 15, 16 and 17. The

type-wheels 92 are inked by any suitable inking device such as 131. The endless record strip is fed from a roller 141 and passes over guide-rollers 142, 143 upwardly between two pressure rollers 143' and around the larger printing roller 144 to be finally wound upon a store roller 145 driven by the shaft 55 of the handle 40 through the agency of a relatively loose belt 154. The pressure rollers 143' and the printing roller 144 are carried by a frame 132 adapted to swing about a stationary shaft 134. The endless strip of paper passes below two wedge-shaped spring actuated members 137, 138, the member 137 of which is carried by a slide 139 guided in the frame 132 and pivotally connected to an arm 135, pivoted on a fixed pin 136 secured to the frame of the machine. It will be seen that if the frame 132 swings in the direction of the arrow (Fig. 15), the slide 139 will be moved downwardly and the strip of paper will be pulled forwardly by the wedge member 137. If the frame 132 is swung in the opposite direction the slide 139 will be moved upwardly and the wedge member 137 slides freely over the strip of paper which is held at this time by the wedge member 138. The swinging movements of the frame 132 are produced by a cam 133 arranged on the shaft 57 and having two successive recesses, whereby the frame 132 is swung twice in rapid succession toward the type-wheels 92, once for making an impression upon the endless record, and once for making a similar impression upon the ticket strip supplied from a roller 153 and brought between the endless strip and the type-wheels 92 as will be presently described. The ticket strip passes below two spring actuated wedge-members 151, 152, one 151 is pivotally arranged on the stationary guide 150', while the other 152 is pivotally arranged on a slide 150, movable on said guide 150' and actuated by a cam 147 on shaft 146 through the agency of a pivoted bell-crank lever 148 pivoted at 149. Arranged below each wedge member 151 and 152 is a flat plate 151' and 152' over which passes the strip of paper. If the slide 150 is moved downwardly the member 152 grips the strip of paper and pulls it downwardly, the paper sliding freely below the member 151. If the slide 150 is moved upwardly again, the member 151 grips and holds the paper and the member 152 slides freely over the latter. At each downward movement of the slide 150, the latter will feed a portion of the strip corresponding to the desired form of ticket to be delivered by the machine. Said portion will be inserted between the printing roller 144 and the type-wheels 92 and printed when the frame 132 makes its second swing toward the type-wheels 92. After the ticket is printed, it will be cut off by a pivoted cutter 157 suitably connected

with an arm 156 actuated by a cam 155 on shaft 57 through the agency of a bar 156' and a pivoted lever 156". The shaft 146 is actuated by the shaft 55 of the operating handle 46 through the agency of gear-wheels 56, 58 and 145, as clearly shown in Fig. 15.

From this disclosure it will be seen that the money discharged from my automatic cashier will be first shown on indicating wheels, arranged in front of a suitable opening in the casing of the machine, and then discharged and simultaneously recorded on a stationary record and a ticket delivered by the machine by the operation of a single crank-handle, bringing all the parts simultaneously back to their initial positions.

I wish it to be understood that I do not wish to limit my invention to the precise form and arrangement of the parts described, as many changes and modifications may be resorted to without departing from the scope of my invention.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In an automatic cashier of the class described, the combination of vertical tubular coin containers, a suitable coin ejecting disk, rotatably arranged in a horizontal plane below each of said coin containers, a bulged portion in the wall of each container, a horizontally movable slide, adapted to be inserted partially into said bulged portion, means for actuating said slide at the same time as the ejecting disk, a key board, suitable connections between the keys and the ejecting disk for controlling the angular movements of the latter, a recording and a ticket printing mechanism, and means for causing the latter to be controlled at the same time as the ejecting disk, substantially as set forth.

2. In an automatic cashier of the class described, a key board, horizontally movable bars actuated by the keys, stop-pins movable at right angles to said bars and adapted to be actuated by the latter, a vertically arranged toothed wheel laterally projecting lugs on said wheel cooperating with said stop-pins, a spring actuating said wheel when it is released, a latch, normally locking said wheel against rotation and adapted to be unlocked by said bar, a horizontally rotatable coin ejecting disk, suitable gear-wheels between the toothed wheel and said disk, a clutch for said gear-wheels whereby the latter do not actuate the disk if the toothed wheel is rotated by its spring, a crank-handle, a shaft carrying the same, suitable gearings between the latter and the shaft of said toothed wheel, whereby the latter is rotated in opposite directions when the crank-handle is rotated, a recording mechanism, suitable connections between the latter and the toothed wheel, a ticket print-

ing mechanism and suitable connections between the latter and the shaft of the crank-handle, substantially as set forth.

3. In an automatic cashier of the class described, the combination of a key-board, horizontally movable bars, actuated by the keys, stop-pins movable at right angles to said bars and actuated by the same, a vertical toothed wheel, laterally projecting lugs cooperating with said stop-pins, a spring for actuating the toothed wheel to an extent limited by the adjusted stop-pin, a crank-handle, suitable gearings between the same and the toothed wheel for rotating the latter in opposite direction, an elongated guide-way, balls arranged within the same, and a bolt adapted to be inserted between said balls upon the depression of a single key for preventing another key from being depressed simultaneously, a horizontally rotatable coin ejecting disk, suitable gearings between the latter and the toothed wheel whereby the disk is actuated only when the crank-handle is rotated, a group of vertical tubular coin containers arranged above said ejector, and a recording mechanism actuated by the toothed wheel, substantially as set forth.

4. In an automatic cashier of the class described, the combination of a key-board, a toothed wheel a spring actuating the same in one direction, means for controlling the angular movement of said wheel by the depression of a key, a rotatable coin ejector, suitable connections between the toothed wheel and said ejector, a shaft, a crank-handle on said shaft and connections between the latter and the toothed wheel, the ejector being actuated only as the crank-handle is rotated, toothed gear-wheels corresponding to units, tens and hundreds, operative connections between the same and the said toothed wheel, type-wheels operatively connected to said gear-wheels, an inking device for said type-wheels, recording wheels also operatively connected to said gear-wheels, means for feeding an endless strip of paper in front of the type-wheels, another strip of paper, means for feeding the same between the endless strip and the type-wheels, means for cutting off said second strip to the ticket length, and means for pressing the paper against the inked type-wheels, substantially as set forth.

5. In an automatic cashier of the class described, the combination of a key-board, a toothed wheel, a spring actuating the same upon the depression of a key, means operated by the keys for controlling the angular movements of said wheel, a crank-handle for actuating the latter in opposite direction, a rotatable coin ejecting disk, connections between the same and the toothed wheel whereby said disk is actuated only as the crank-handle is operated, type-wheels and recording indicating wheels, operative con-

nections between said wheels and the said toothed wheel, an oscillating frame over which passes an endless strip of paper and arranged in front of the type-wheels, paper
5 feeding means carried by said oscillating frame, suitable connections between the crank-handle and said oscillating frame whereby the latter is caused to swing toward and away from the type-wheels, an inclined
10 guide for the same for another strip of paper, reciprocating feeding means a said guide, connections between the crank-handle and said feeding means for reciprocating the same and feeding the second strip of paper between the type-wheels and the end- 15 less strip of paper, substantially as set forth. In testimony whereof I affix my signature in presence of two witnesses.

BARON PAUL GREINDL.

Witnesses:

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CHAS. ROY NASMITH.