

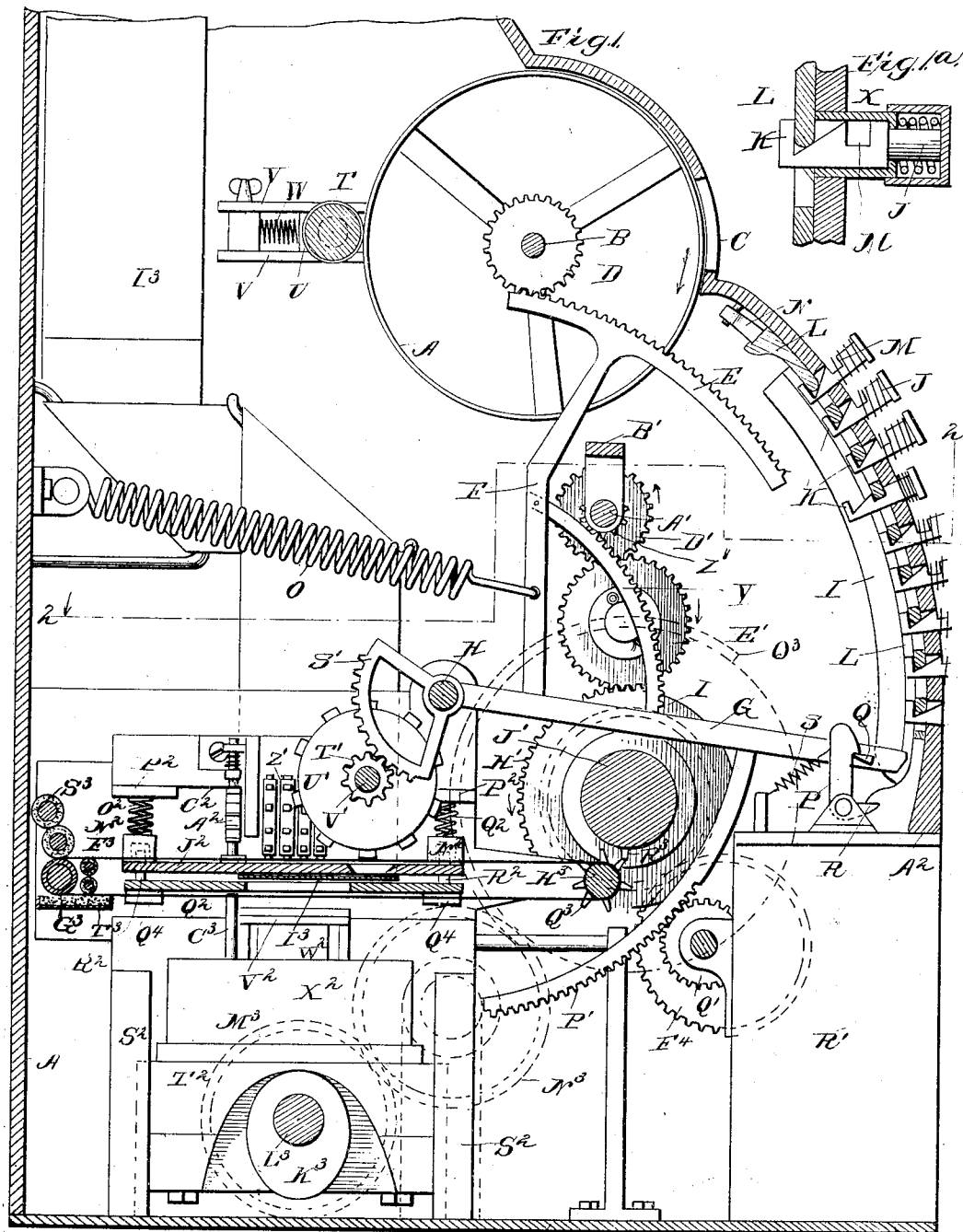
(No Model.)

3 Sheets—Sheet 1.

E. B. HESS.
CASH REGISTER.

No. 498,716.

Patented May 30, 1893.



Witnesses
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R. B. Caffray.

Inventor
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By Edward Reitor
his Attorney

(No Model.)

3 Sheets—Sheet 2.

E. B. HESS.
CASH REGISTER.

No. 498,716.

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Fig. 2.

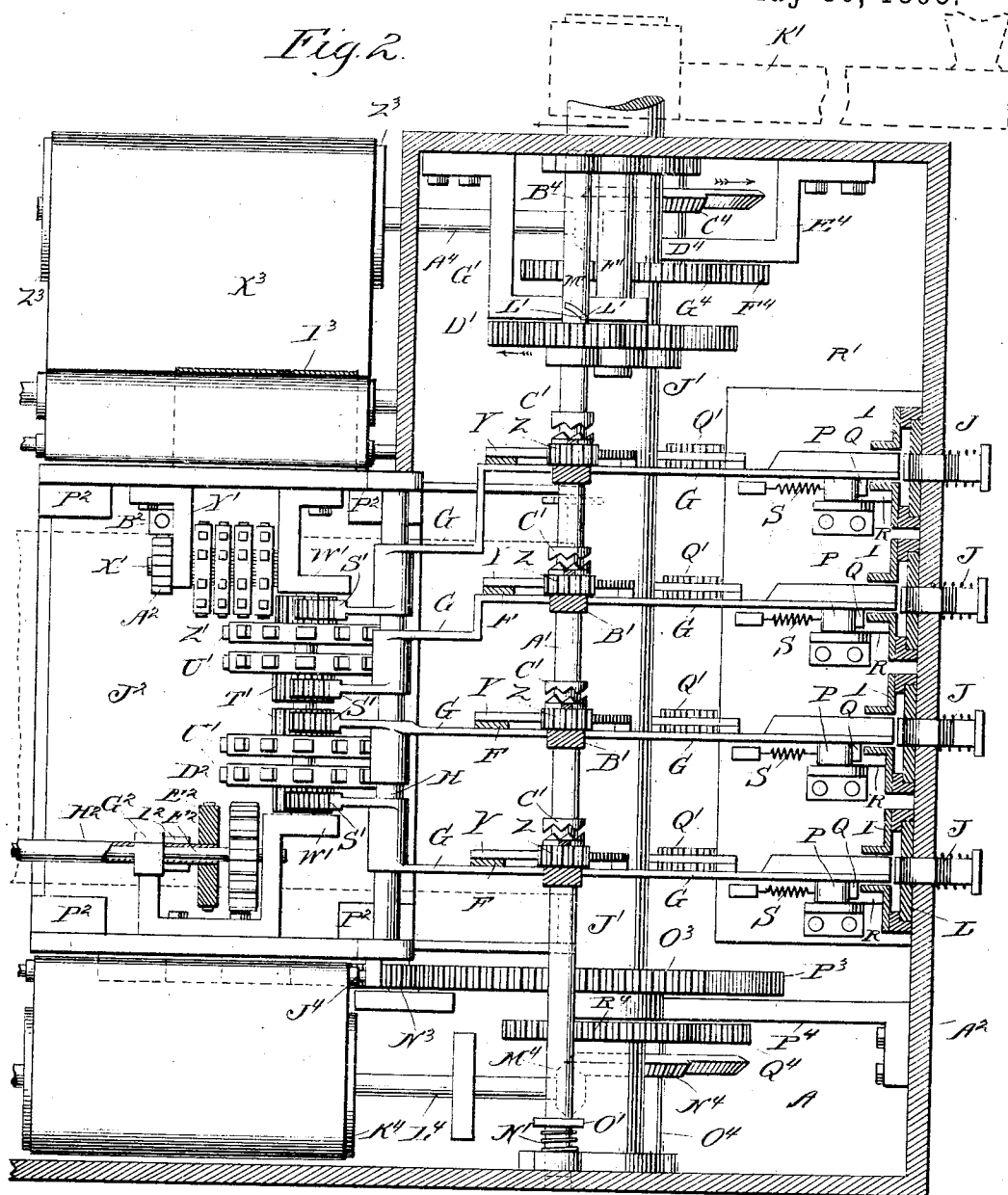
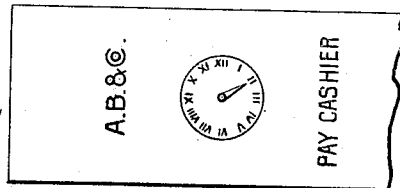


Fig. 7.

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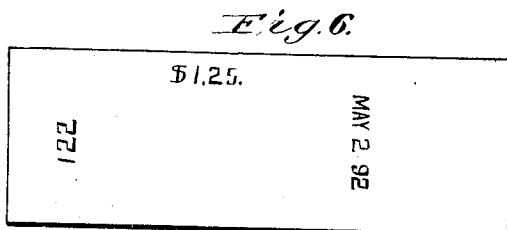
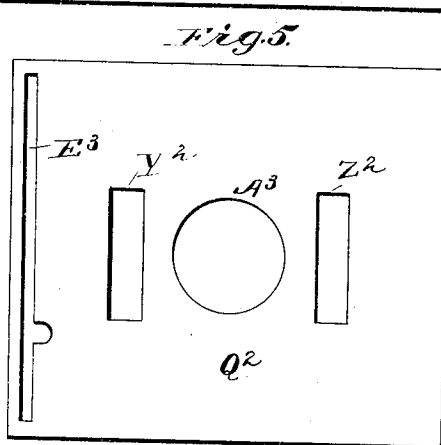
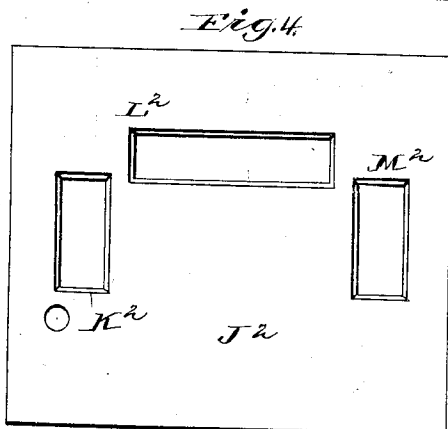
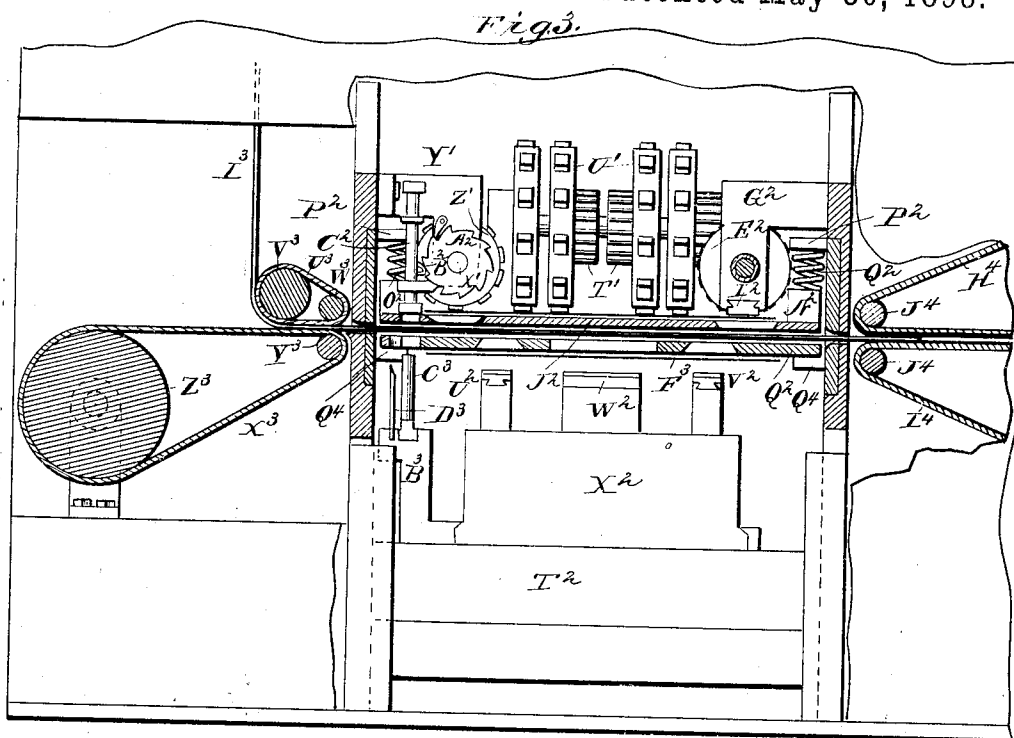
(No Model.)

3 Sheets—Sheet 3.

E. B. HESS.
CASH REGISTER.

No. 498,716.

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Witnesses

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UNITED STATES PATENT OFFICE.

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CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 498,716, dated May 30, 1893.

Application filed September 3, 1892. Serial No. 445,025. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. HESS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Cash-Registers, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its object the production of an improved machine of this class, in which the amounts of various sales may be indicated and registered and printed upon a strip of paper, which latter may be either preserved as a record within the machine or cut into separate checks, one of which is delivered from the machine at each operation.

The novelty of my invention consists in the new constructions, arrangements and combinations of the parts, which will be hereinafter set forth and pointed out in the claims.

In the accompanying drawings Figure 1 represents a vertical section through the middle of the machine; Fig. 1^a a sectional detail of one of the keys and associated parts; Fig. 2 a horizontal section approximately on the line 2—2 of Fig. 1; Fig. 3 a vertical section of the printing attachment; Figs. 4 and 5 plan views of the impression platens; and Figs. 6 and 7 plan views of the upper and lower sides of a printed ticket.

The same letters of reference are used to indicate identical parts in all the figures.

The indicators of the machine consist of wheels A loosely mounted upon a transverse shaft B in the upper forward part of the machine, and provided on their faces with ten equidistant indicating numbers, from zero to nine inclusive, adapted to be exposed singly through sight openings C in the front of the casing, Fig. 1. The machine illustrated in the drawings is capable of indicating and registering all of the different amounts, excepting fractions of cents, from one cent to ninety-nine dollars and ninety-nine cents, and to that end is provided with four of these indicator wheels, whose numbers, beginning with the wheel on the right, represent units of cents, tens of cents, units of dollars, and tens of dollars, respectively, as is usual in this class of machines. Only one of these indicators is

shown in the drawings, that in Fig. 1, but inasmuch as this arrangement of them is common in machines of this class it will be understood without further illustration. Each indicator wheel has fast upon its side or hub a pinion D which meshes with a curved rack E which is carried by an arm F secured to and extending upwardly from a lever G hung upon a shaft H, Figs. 1 and 2. The middle portion of the casing of the frame is curved in the arc of a circle concentric to the shaft H and the front ends of the levers G are adapted to play up and down in guides I, Fig. 2, secured upon the inner side of this curved portion of the frame. Mounted in this curved portion of the frame are four rows of keys or stops J adapted to co-operate with the front ends of the levers G, one row being immediately in line with the front end of each of the levers, as seen in Fig. 2. These keys J are surrounded by coiled springs confined between their heads or buttons and the outer face of the framework, which springs yieldingly hold them in and return them to their outer positions. They are prevented from being thrown entirely out of their guides by hooks K upon their inner ends which co-operate with sliding curved plates L fitting against the inner side of the frame and confined between the guides I before described, Fig. 2. These plates L are slotted and the keys J pass through the slots, and the engagement of the hooks K with the portions of the plates between the slots holds the keys in place. The body of each key adjacent to its hook is beveled or inclined, and at the upper or outer end of the beveled surface the key is provided with a notch M. When any one of the keys is pushed inward its beveled surface, riding against the upper wall of its slot in the plate L, will lift said plate until the beveled surface passes beyond said plate, whereupon the latter will drop down again and the wall of the slot will engage the notch M of the key and lock it in its inward position. The downward movement of the plates L may be produced by their own gravity, or aided by springs N bearing against the upper ends of the plates.

There are nine of the keys J in each row and the buttons upon their outer ends bear a

series of numbers from one to nine in each row, counting upward, the one key in each row being at the bottom and the nine key at the top. These four rows of keys correspond

5 to and co-operate with the four indicator wheels A, the row of keys on the extreme right, Fig. 2, representing units of cents, the second tens of cents, the third units of dollars, and the fourth tens of dollars.

10 Connected to each of the arms F which carry the racks E meshing with the pinions on the indicator wheels is a strong coiled spring O, Fig. 1, secured at its rear end to the framework and at its forward end to the arm

15 F. These springs O normally tend to pull the arms F rearward and throw the front ends of the levers G upward, and the arms and levers are held in their normal positions, against the tension of these springs, by latches

20 P which hook over lugs Q upon the sides of the arms G near the front ends of the latter. The toes R of these latches project forward beneath the lower ends of the plates L, the latter resting upon them and holding the up-

25 per ends of the latches thrown forward in engagement with the lugs Q. Light coiled springs S connected to the latches P and to fixed points of the machine tend to pull the latches rearward, but the gravity of the plates

30 L and pressure of the springs N at their upper ends are sufficient to overcome the strength of the springs S and normally hold the latter in the position shown. When, however, one

35 of the keys J in any row is pushed inward until its notch M is engaged with its plate L, the latter will be lifted by the beveled portion of the key before it engages the notch of the key, and its lower end will be carried away from the toe of the latch P, whereupon the

40 spring S will pull the latch rearward and release the lever G, and the spring O will then pull the arm F rearward and carry the front end of the lever G upward until it strikes and is arrested by the operated key which

45 stands in its path of travel. This upward movement of the lever G and rearward movement of the arm F will cause the curved rack E to turn the pinion D and indicator wheel in the direction of the arrow.

50 When the levers G and racks E are in their normal positions the zeros upon the wheels A are exposed at the openings C and the adjustment of the parts is such that the travel of the front end of any lever G from its normal

55 position to the position of any one of the keys in its row is just sufficient to turn the corresponding wheel A forward far enough to expose at the opening C the number corresponding to such key. Thus, in Fig. 1 the sixth key

60 from the bottom has been pushed inward, and the travel of the front end of the lever G upward from its normal position until it engages said key will turn the wheel A forward just far enough to expose its number six at the

65 opening C. When the levers G are returned to normal position, by the means hereinafter described, the beveled rear sides of the lugs

Q will ride over the rounded upper ends of the latches P and force the latter rearward until the lugs pass below and are re-engaged 70 by the hooks of the latches. This rearward movement given the upper ends of the latches by the lugs Q causes their toes R to lift the plates L and release the operated keys.

75 From the foregoing description it will be seen that in order to make an indication it is only necessary to press inward the proper keys in the proper rows, whereupon the springs O will turn the wheels A to positions to ex- 80 pose the proper numbers at the opening C. For the purpose of preventing too violent operation of the parts by the action of the springs O I apply to each indicator wheel A a friction roller T journaled in a sliding bearing U 85 mounted in guides V V and pressed by a spring W against the periphery of the wheel, as seen in Fig. 1.

In Fig. 1^a I have shown a modified form of the keys J, in which it will be seen that each key is mounted in a support or guide way X 90 fastened in the framework and has secured upon its outer end a cap in which is confined the coiled spring, and which is adapted to slide over the guide X when the key is pushed inward. In this way a better guide way for 95 the key is secured and the coiled springs are entirely hidden and protected from injury.

The means for returning the levers G to normal position and restoring the indicator wheels to zero may now be described as fol- 100 lows: Secured to each of the levers G is a curved rack Y whose upper end is secured to the corresponding arm F, the rack operating as a brace for the lever G and arm F. These racks mesh with pinions Z, Fig. 2, loosely 105 mounted upon a transverse shaft A' adjacent to hangers B' in which said shaft is mounted. The pinions Z have clutch teeth formed upon their right sides, Fig. 2, and these clutch teeth co-operate with clutch members O' which are 110 fast on the shaft A'. Near its right hand end the shaft A' has loose upon it a pinion D' which meshes with a gear E' loose upon a supporting shaft F' which is mounted in a bracket G' and in the side of the framework. 115 Beneath the gear E' and adapted to mesh with it is a segmental rack H' formed on the periphery of a disk I' fast upon the main driving shaft J' of the machine. This shaft has 120 secured upon its right hand end outside the framework, an operating handle K' and is given one complete revolution at each operation of the machine. The gear D', Fig. 2, has projecting from its right hand side a pin L' whose outer end is bent inward toward the 125 shaft A' and fits in a cam groove M' cut in said shaft. The shaft A' is capable of slight longitudinal play in its bearings, being movable from normal position toward the left in Fig. 2 against the pressure of a spring N' confined 130 between its left hand bearing and a collar O' upon the shaft. When the pinion D' is turned in the direction of the arrow it moves at first independently of the shaft A', its pin L' trav-

eling through the length of the cam groove M' and forcing the shaft A' to the left and engaging the clutch members C' with the clutch teeth upon the pinions Z, and when the pin 5 L' reaches the end of the groove M' the pinion D' turns the shaft A' and pinions Z with it. The length of the rack H' and the size of the gears are such that the shaft A' and pinions Z will be turned approximately a complete revolution at each complete revolution 10 of the operating handle and main driving shaft J' and this movement will be imparted to them during the last half of the revolution of the handle and driving shaft.

15 It will be seen from the foregoing description that the pinions Z are always free to turn loosely on the shaft A' except when the clutch members C' have been engaged with them by the turning of the operating handle and driving shaft, so that whenever one of the operating keys in any row is pushed inward and the corresponding lever G thereby released and thrown upward by its spring O the rack Y will turn the pinion Z as it travels upward. 20 Upon giving the operating handle a revolution the pinion Z will be turned a complete revolution in the reverse direction and carry the rack Y downward and reset the lever C.

It will be seen from the drawings that whenever the parts are in normal position the extreme upper tooth of the rack Y is in mesh with the pinion Z, and the pinion may be turned in the direction of the arrow, its teeth slipping over the upper tooth of the rack Y 35 and slightly depressing the rack and lever G as each tooth passes. It will therefore be seen that, while the pinions Z are all turned a complete revolution at each operation of the machine, they may move the racks Y different 40 distances, depending upon the positions in which the racks have been left by the operations of the keys, each pinion operating to move its rack downward until the parts are carried to normal position and then slipping 45 over the upper tooth of the rack during its further movement. Thus, though the operated key in a given row should be one of the lower values the pinion would reset the rack after it had been turned a very small portion 50 of a revolution, and during the remainder of its revolution its teeth would slip over the upper tooth of the rack, whereas if the operated key were one of the higher values it would require a greater portion of the revolution of the pinion to reset the rack and a 55 less number of its teeth would have to slip over the upper tooth of the rack during the continued movement of the pinion.

From the foregoing description it will be 60 understood that at each operation of the machine the proper keys are pressed in and the springs O turn the indicator wheels to make the indication, and that the operating handle is then given a revolution and during the last 65 half thereof returns the indicators to zero and resets the parts to normal position. The levers G also have secured to and depending

from them curved racks P' which mesh with the driving pinions Q' of a train of adding wheels inclosed within a casing R', which 70 may be of any usual or suitable construction and arrangement and need not be illustrated and described in detail.

The next feature of my invention relates to the printing mechanism, by which the amounts 75 indicated and registered, and also, if desired, the date and the hour and minute and the consecutive number of the sale, may be printed upon a paper strip or ticket. The rear ends of the levers G have secured to or 80 formed integral with them curved racks S' which mesh with pinions T' fast upon type wheels U' loose on a shaft V' mounted at its opposite ends in brackets W' upon the framework, Fig. 2. The type numbers upon these 85 wheels correspond to the indicating numbers upon the wheels A, and the adjustment of the parts is such that when any number upon a wheel A is brought to the sight opening C the same number upon the corresponding 90 type wheel will be brought to the printing point beneath the wheels U'. Upon a shaft X' mounted at right angles to the shaft V' in one of the brackets W' and a bracket Y' is a series of consecutive-numbering type 95 wheels Z'. These wheels are operated by suitable devices actuated by a ratchet A² fast on the end of the shaft X' and arranged to be turned one notch at each operation of the machine by a spring tooth B², Fig. 3, on a 100 vertically-guided rod C² which is lifted at each operation of the machine by the means hereinafter described and reset by a coiled spring surrounding it. At the opposite end of the type wheels U' are two dating wheels D² E², 105 Fig. 2, the former bearing type letters indicating months and secured upon a shaft F² journaled in one of the brackets W' and another bracket G², and the latter bearing type numbers indicating the days of the month 110 and secured upon a sleeve H² surrounding the shaft F². The shaft and sleeve extend outside the framework and may have secured upon their outer ends suitable devices for turning them to change the date. In a guide 115 way in the lower end of the bracket G², Figs. 2 and 3, is fitted a type block I² having upon its under side in the same printing line with the wheels D² and E² type numbers representing the year. The type numbers on the 120 several wheels above described, when brought to the printing line, all stand in the same plane so that an impression may be taken from all of them at once and thereby print upon one side of the paper strip or ticket the 125 amount of the sale, the consecutive number of the sale or ticket, and the day, month and year. Located immediately beneath the type wheels above described is a plate or platen J², Fig. 4, provided with three openings K², L², and 130 M², through the former of which the type numbers on the consecutive-numbering wheels Z' are adapted to pass, while the numbers upon the wheel U' pass through the opening L², and

the numbers upon the wheels D², E² and block I² pass through the opening M². The plate J² is provided at its four corners with blocks N² to which are secured the lower ends of coiled springs O² which are secured at their upper ends to fixed plates P² of the framework and by which the plate J² is suspended. Beneath the plate J² and slightly separated from it is a second plate Q², Fig. 5, resting upon lugs Q¹ on the framework and provided with upwardly projecting pins R² at its corners, which pass through holes in the plate J² and fit in bores or guides in the blocks N². In normal position the plate Q² rests a short distance beneath the plate J² but is capable of being lifted, and lifting the plate J² with it, until its upper surface bears against the types upon the wheels before described through the openings K², L², M² in the plate J². Mounted and vertically guided in up-rights S² of the framework is a reciprocating frame T², Figs. 2 and 3, carrying upon its upper side two electrotypes U², V² and a circular time-printing stamp W² actuated by clock-work within the casing X² in the usual or any suitable manner. The electrotypes U², V² are adapted to pass through two openings Y², Z² in the plate Q² and bear against the under side of the plate J² while the time stamp W² is adapted to pass through a circular opening A³ in the plate Q² and bear against the plate J². Upon a bracket B³ carried by the frame T², at its left hand side in Fig. 3, are secured a rod C³ adapted to pass through holes in the plates Q² and J² and actuate the rod C² before described, and a cutter D³ adapted to pass through a slot E³ in the plate Q² and enter a groove in the under side of the plate J², to sever the paper strip hereinafter described. An endless inking ribbon F³ is carried upon rollers G³, H³ and passed over the plate J², between it and the type wheels above it, and beneath the plate Q², between it and the types below it, as seen in Fig. 2. The paper strip I³ upon which the printing is to be done is led downward from a suitable source of supply, not shown, and carried by feeding devices hereinafter described between the plates J² and Q², Figs. 2 and 3.

From the foregoing description it will be seen that the plate J² operates as an impression platen for the types carried by the reciprocating frame T², while the plate Q² operates as an impression platen for the type wheels Z¹, U¹, D¹ and E¹ and block I¹ above the plate J², and that at each lifting of the frame T² the type wheels Z¹, U¹, D¹ and E¹ will print upon the upper side of the paper strip I³ the numbers and letters which have been brought to the printing line and the type upon the block I¹ will print the year, while the electrotypes U², V² will print their matter upon the under side of the paper strip and the time stamp W² will print the hour, and minute or fraction thereof, upon the under side of said strip. The electrotypes U², V² may bear any desired matter, as the name of the proprietor

on one and a direction to pay cashier upon the other.

In Fig. 6 is shown the upper side of one of the printed tickets, exhibiting the matter printed thereon by the consecutive-numbering wheels Z¹, the cash recording wheels U¹, and the dating wheels D¹, E¹ and block I¹, while in Fig. 7 is shown the under side of the same ticket, exhibiting the matter printed upon it by the electro-types U², V² and time stamp W².

The frame T² is reciprocated by means of a cam K³, Fig. 1, fast on a shaft L³ and co-operating with a bearing surface in the frame T². The shaft L³ is driven by the main driving shaft J' through the medium of a gear M³ fast on the shaft L³, and a loose gear N³ meshing with the gear M³ and adapted to mesh with a segmental rack O³ formed on the periphery of a disk P³ fast upon the driving shaft J', Figs. 1 and 2. The rack O³ occupies one half of the periphery of the disk P³, and during the first half of the revolution of the operating handle it revolves the shaft L³ and causes the cam K³ to lift the frame T² and effect the printing.

The right hand roller H³ upon which the inking ribbon is carried, Fig. 1, has fast upon it a sprocket wheel Q³ with which co-operates a tooth R³ upon the driving shaft J', to turn the sprocket wheel and move the inking ribbon at each revolution of the shaft J'. The inking ribbon is inked by rollers S³ to which ink may be supplied, and which bear against the left hand roller G³ over which the ribbon passes. Beneath the roller G³ is a distributing pad T³ bearing against the ribbon and operating to distribute the ink over it more evenly than is done by the rollers S³.

The feeding devices for the record strip consist of a series of rollers and endless bands or aprons passed over them, as shown in Figs. 2 and 3. As seen in the latter figure the record strip at its entrance to the printing devices passes between an endless apron U³ carried on rollers V³, W³, and a second endless apron X³ carried upon rollers Y³, Z³. The roller Z³ is fast upon a shaft A⁴ which has upon its forward end a beveled gear B⁴, Fig. 2, which meshes with a beveled segment C⁴ fast upon a short shaft D⁴ journaled in a bracket E⁴ and in the side of the framework, and geared to the driving shaft J' by gears F⁴, G⁴. The beveled segment C⁴ turns in the direction of the arrow in Fig. 2, and as the segment is only about a half circle in length the shaft A⁴ and feeding devices driven by it remain stationary during the first half of the revolution of the driving shaft J', while the printing is being effected, but are moved, to advance the record strip, during the second half of the revolution of the driving shaft, after the printing has been done. At the opposite side of the printing device, Fig. 3, the record strip passes between two endless aprons H⁴, I⁴ carried upon rollers J⁴, K⁴, K⁴. One of the latter rollers is fast upon a shaft

L⁴ which has secured upon its front end a beveled gear M⁴ which meshes with a beveled segment N⁴ fast on a short shaft O⁴ journaled in a bracket P⁴ and the side frame of the machine, and geared to the driving shaft by gears Q⁴ R⁴. Like the roller Z³ at the opposite end of the machine the roller K⁴ remains stationary during the first half of the revolution of the driving shaft J' and is turned during the second half of its revolution.

The operation of the feeding devices above described is as follows: At the end of each operation of the machine the paper strip is left in the position shown in Fig. 3, its free end having passed between the rollers J⁴ and being confined between the aprons H⁴ I⁴. During the first half of the operation of the machine the frame T² is lifted, the printing effected, and the paper strip severed by the knife D³. During the second half of the operation the feeding devices are actuated, the aprons H⁴ I⁴ draw forward the printed ticket and deliver it outside the machine, while the aprons U³ X³ draw forward the body of the record strip and advance it between the plates J² and Q² until its free end is caught by the aprons H⁴ I⁴ passing around the rollers J⁴, ready for the next operation.

Where it is desired to insert separate tickets or checks in the machine and print them, instead of printing and cutting the tickets from the continuous strip I³, it may be readily done by simply severing the strip I³ and inserting the separate tickets between the aprons U³ X³ at the left hand side of the printing device, in Fig. 3. When it is desired to resume the printing of tickets from the strip I³ it is only necessary to insert the end of the strip between the aprons U³ X³ again. In this manner the tickets may be either printed and cut from the strip I³, or be printed from a supply of separate tickets, and the change be readily made from the use of one to the other.

I am aware that it has heretofore been proposed to combine an oscillating rack with an indicator and type wheel geared to the rack, a spring for moving the rack in one direction, a latch or detent for holding it against movement by the spring, and a series of operating keys co-operating with the latch and with the rack to release the latter and arrest it at different points determined by the positions of the different keys, and I therefore do not claim such combination broadly.

Having thus fully described my invention, I claim—

1. In a cash indicator and recorder, the combination of an indicator wheel, a type wheel, an oscillatory frame or lever, a rack carried by said frame and geared to the indicator wheel, a second rack carried by the frame and geared to the type wheel, a spring for moving the frame in one direction, a latch for holding the frame in normal position against the tension of said spring, a releasing device

for the latch, a series of stop-keys co-operating with the releasing device and the operation of any one of which releases the oscillatory frame and carries the key into its path of travel to arrest it at a point determined by the position of the key, and a platen co-operating with the type wheel, substantially as described.

2. In a cash indicator and recorder, the combination of an indicator wheel, the type wheel, an oscillatory frame or lever, a rack carried by said frame and geared to the indicator wheel, a second rack carried by it and geared to the type wheel, a spring for moving the frame in one direction, a latch for holding the frame against movement under the impulse of the spring, a spring connected to the latch and tending to move it to release the frame, a movable plate co-operating with the latch to normally hold it in engagement with the oscillatory frame, a series of stop-keys co-operating with the movable plate to disengage it from the latch and permit the latter to release the oscillatory frame, the operation of any one of which keys carries it into the path of travel of the frame and arrests the latter at a point determined by the position of the key, and a platen co-operating with the type wheel, substantially as described.

3. In a cash indicator and recorder, the combination of the indicator wheel A provided with the pinion D, the type wheel U' provided with the pinion T', the oscillatory frame composed of the arm F and lever G, the rack E carried by the arm F and meshing with the pinion D, the rack S' carried by the lever G and meshing with the pinion T', the spring O for moving the oscillatory frame, the latch P co-operating with the catch Q on the lever G and having a toe R, the spring S connected to the latch P, the curved sliding plate L resting upon the toe R of the latch and provided with a series of slots, the stop-keys J provided with the beveled surfaces and notches M co-operating with the plate L, and a platen co-operating with the type wheel U', substantially as described.

4. In a cash indicator, the combination of an indicator wheel, an oscillatory frame or lever geared thereto, a spring for moving said frame in one direction, a latch for holding it against movement under the impulse of the spring, a series of stop-keys co-operating with the latch to release the oscillatory frame and arrest it at different points determined by the positions of the keys, a second rack carried by the frame, a revoluble driving shaft, and means for throwing said shaft into gear with said second rack for restoring the oscillatory frame and indicator wheel to initial position by the revolution of said shaft, substantially as described.

5. In a cash recorder, the combination of a type wheel, an oscillatory frame or lever geared thereto, a spring for moving said frame in one direction, a latch for holding it from

movement under the impulse of the spring, a series of stop-keys co-operating with the latch to release the frame and arrest it at different points determined by the positions of the keys, a revoluble shaft, a second rack carried by the oscillatory frame, means for throwing the revoluble shaft into gear with said second rack to return the oscillatory frame and type wheel to initial position; and a platen co-operating with the type wheel, substantially as described.

6. In a cash indicator and recorder, the combination of the indicator wheels A, the type wheels U', a platen co-operating with the type wheels, the oscillatory frames composed of the arms F and levers G, the racks E carried by the arms F and geared to the indicator wheels A, the racks S' carried by the levers G and geared to the type wheels U', the springs O connected to the oscillatory frames, the latches P co-operating with the lugs Q on the levers G for holding the frames in normal position against the tension of the springs O and provided with the toes R, the springs S connected to the latches P, the slotted plates L resting on the toes R of the latches, and the series of stop-keys J provided with the beveled surfaces and notches M co-operating with the plates L, substantially as described.

7. In a cash indicator and recorder, the combination of the indicator wheels A, the oscillatory frames composed of the arms F and levers G, the racks E carried by the arms F and geared to the wheels A, the curved racks Y carried by the frames, the springs O connected to the frames, the latches P co-operating with the lugs Q on the levers G, the springs S connected to the latches P, the curved slotted plates L resting on the toes R of the latches, the stop-keys J co-operating with the plates L and levers G, the revoluble shaft A', the pinions Z loose thereon and meshing with the racks Y, and the clutches for locking the pinions to the shaft for the purpose of returning the oscillatory frames to initial position by the revolution of the shaft A', substantially as described.

8. In a cash indicator, the combination of the oscillatory frames for moving the indicators, the racks Y carried by the frames, the revoluble and longitudinally movable shaft A', the pinions Z loose thereon and meshing with the racks Y and having clutch teeth on their hubs, the clutches C' fast upon the shaft A', the driving gear D' loose on the shaft A', and the pin L' carried by the gear D' and co-operating with the groove M' in the shaft A', substantially as and for the purpose described.

9. In a cash indicator, the combination of the indicator wheels A, the oscillatory frames geared to said wheels, the springs for moving the frames in one direction, latches for holding the frames against movement under the impulse of the springs, the series of stop-keys co-operating with the latches and with the frames, to release the frames and arrest them at different points determined by the posi-

tions of the keys, and the friction rollers T' spring-pressed against the peripheries of the indicator wheels, substantially as and for the purpose described.

10. In a cash indicator, the combination of the curved frame-plate, the slotted plates L fitting the inner face of the frame plate, the housings or guides X secured in apertures in the frame plate, the keys J fitting in the housings X and provided with the beveled surfaces and the notches M co-operating with the plates L, said keys also having the shoulders fitting against the ends of the housings X and the reduced portions projecting without the housings, the caps secured to the outer ends of the keys and fitting over the housings X, and the coiled springs surrounding the reduced portions of the keys within the caps, substantially as described.

11. In a printing attachment for cash registers, the combination of two plates or platens between which the paper strip or ticket to be printed is passed, the types located above and below said platens, those above passing through apertures in the upper plate and co-operating with the lower plate as a platen, and those below passing through apertures in the lower plate and co-operating with the upper plate as a platen, and an inking ribbon above and below the paper strip or ticket for effecting the printing on opposite sides thereof, substantially as described.

12. In a printing attachment for cash registers, the combination of the movable plates or platens J² Q² provided with apertures and having the paper strip passed between them, the inking ribbon F³ passed above and below them, the types above the plate J² in line with its apertures, the reciprocating frame T² carrying the type matter in line with the apertures in the lower plate Q², and the cam K³ for lifting the frame T², substantially as described.

13. In a printing attachment for cash registers, the combination of the types and vertically reciprocating platen co-operating therewith, of the endless aprons U³ X³ carried upon rollers at one side of the printing point, for delivering the paper strip or ticket between the types and platen, the endless aprons H⁴ I⁴ carried upon rollers at the opposite side of the printing point, for moving the printed strip or ticket away, a revoluble driving shaft, and gearing connecting said shaft with one or more of the rollers at each side of the printing point, substantially as described.

14. In a printing attachment for cash registers, the combination of the vertically-movable plate J² suspended from supports on the frame by coiled springs O² and provided with the apertures K² L² M², the set of consecutive-numbering wheels Z' located above the aperture K², the set of cash printing wheels M' located above the aperture L², and the dating wheels D² E² located above the aperture M², the vertically-movable plate Q² sup-

ported below the plate J² and provided with the circular aperture A³, the reciprocating frame T² carrying the circular time stamp W² adapted to pass through the aperture A³, and means for lifting the frame T², substantially as described.

15. In a printing attachment for cash registers, the combination of the two vertically-movable plates or platens J² Q² provided with apertures for the passage of the types, the consecutive numbering wheels, cash printing wheels and dating wheels located above the plate J², the ratchet A² for actuating the consecutive-numbering wheels, the reciprocating rod C² carrying a spring tooth or pawl for turning the ratchet A², the reciprocating frame T² carrying the time stamp W² and the pin C³ adapted to pass through co-incident holes in the plates J² Q² and lift the rod C², the knife D³ also carried by the frame T² and adapted to pass through a slot E³ in the plate

O², to sever the paper strip, and means for lifting the frame T², substantially as described.

16. In a printing attachment for cash registers, the combination of the types and vertically reciprocating platen, the endless aprons U³ X³ carried upon rollers V³ W³, Z³ Y³, at one side of the printing point, the endless aprons H⁴ I⁴ carried upon rollers J⁴ J⁴, K⁴ K⁴, at the opposite side of the printing point, the revoluble driving shaft J⁴, the gears G⁴ R⁴ fast thereon, the revoluble shafts D⁴ O⁴, the gears F⁴ Q⁴ fast thereon and meshing with the gears G⁴ R⁴, and the gear-toothed segments C⁴ N⁴ fast on the shafts D⁴ O⁴ and meshing with beveled pinions B⁴ M⁴ on the shafts A⁴ L⁴ of the rollers Z³ K⁴, substantially as described.

EDWARD B. HESS.

Witnesses:

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F. E. KREMBE.