

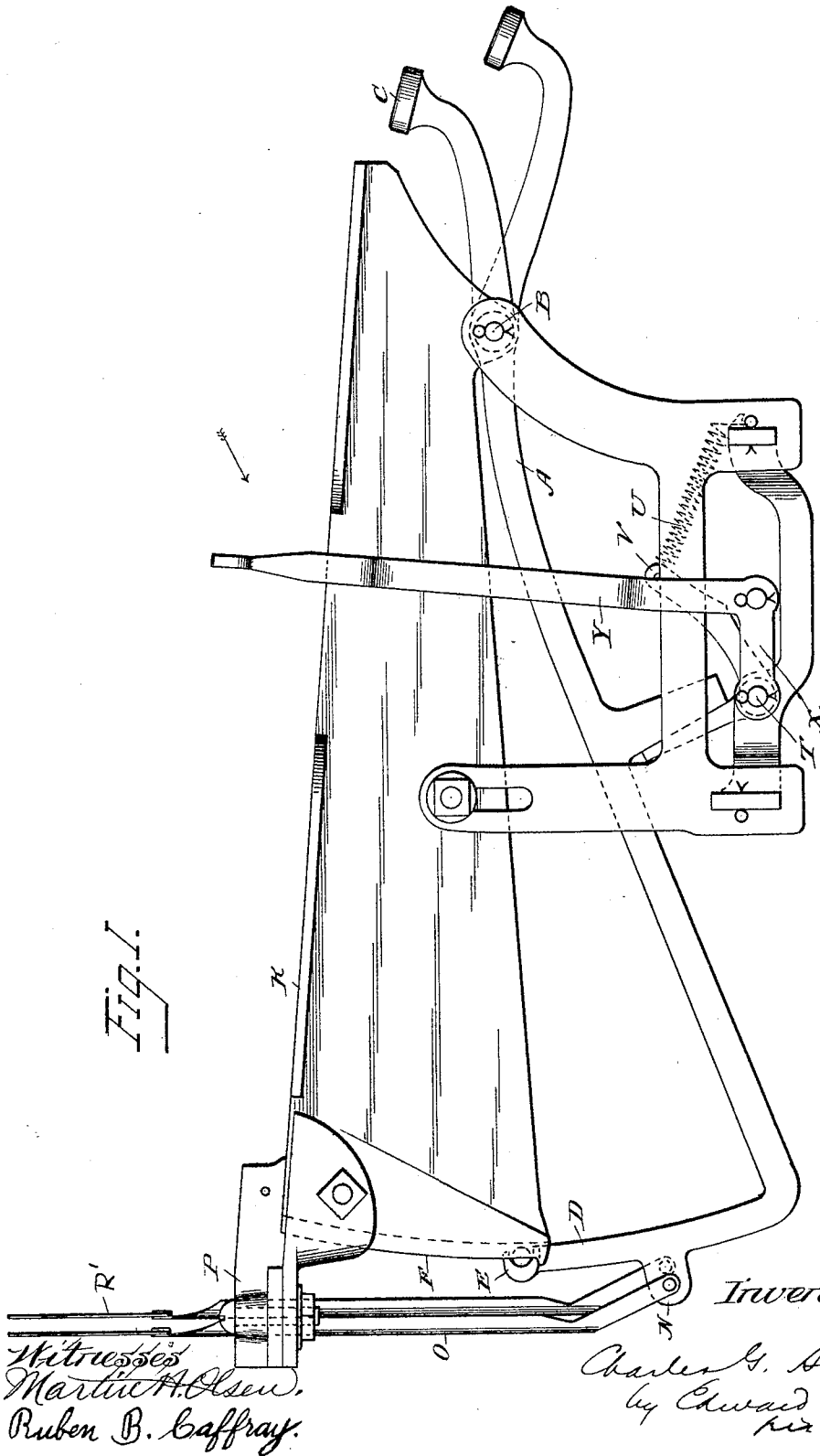
(No Model.)

3 Sheets—Sheet 1.

C. G. SMYTH.
CASH REGISTER.

No. 521,678.

Patented June 19, 1894.



(No Model.)

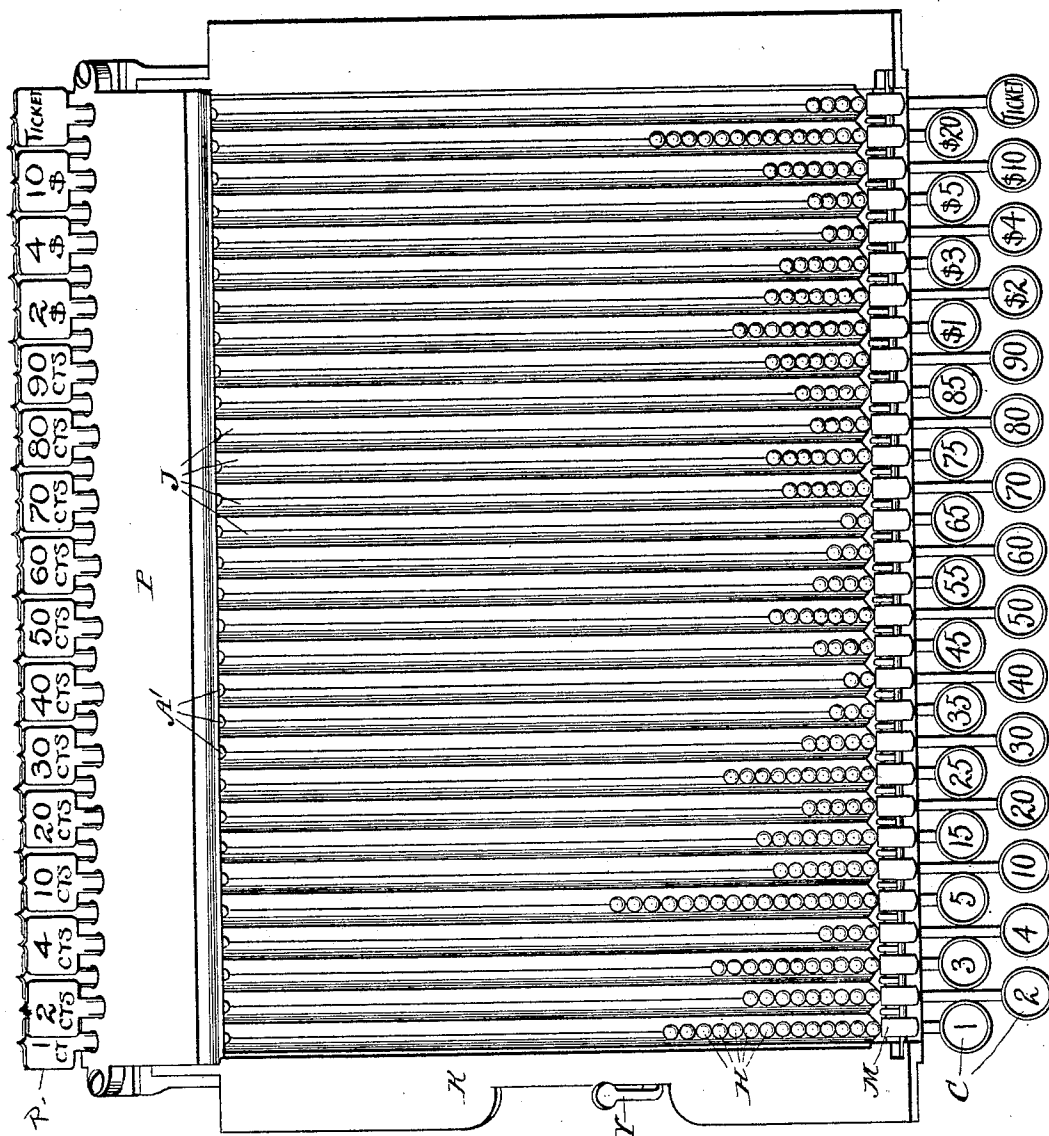
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Fig. 2.



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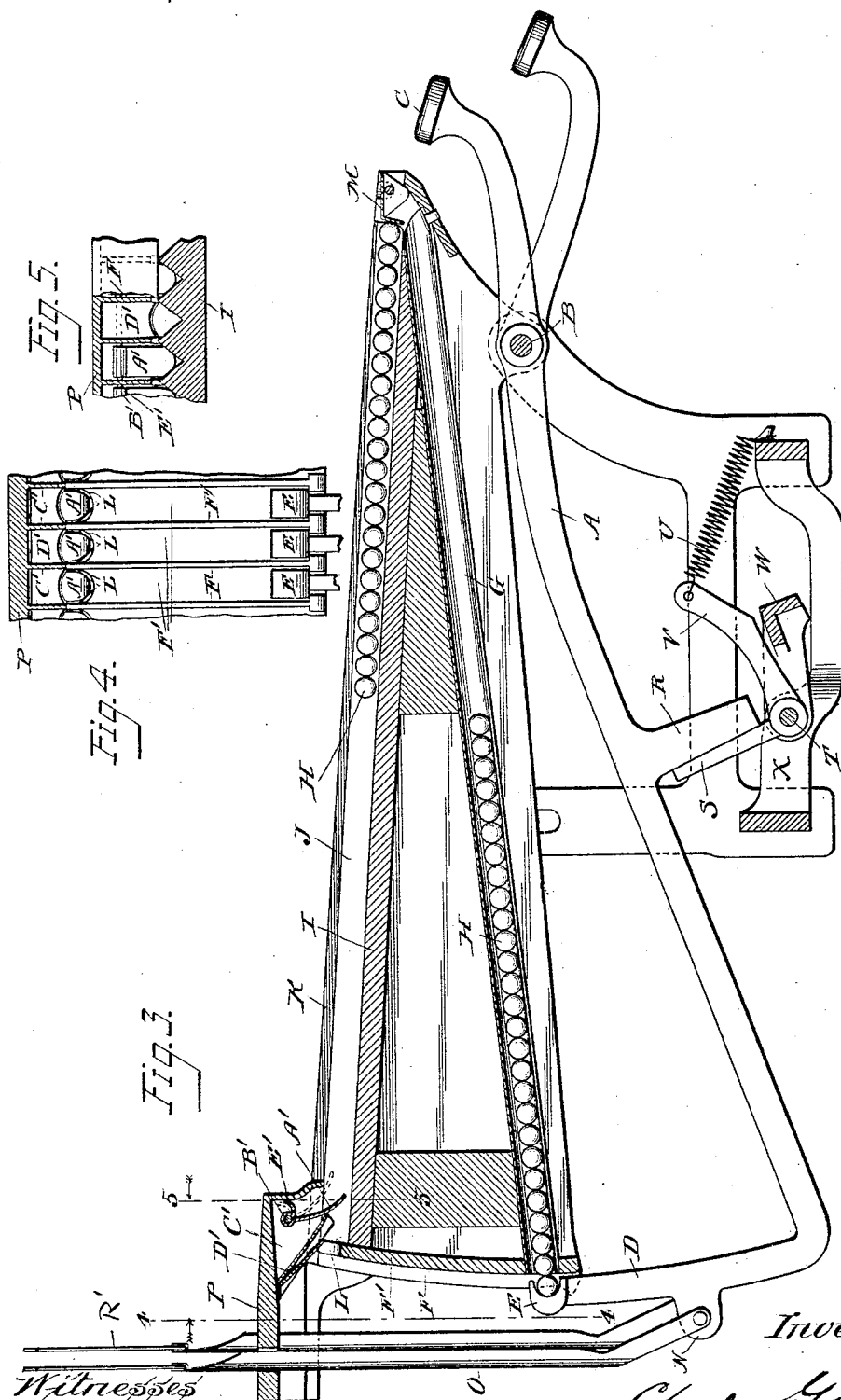
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UNITED STATES PATENT OFFICE.

CHARLES G. SMYTH, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 521,678, dated June 19, 1894.

Application filed April 14, 1893. Renewed April 30, 1894. Serial No. 509,593. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. SMYTH, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, 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 relates to that class of machines in which the record or register of the values of the operated keys is preserved by means of a series of counters, preferably in the form of balls, which are moved from a supply-compartment to a registering-compartment by the operations of the machine, and my invention has for its object the improvement of the construction of this class of machines whereby fraudulent manipulation of them is more effectually prevented. Its novelty will be hereinafter set forth and particularly pointed out in the claims.

In the accompanying drawings Figure 1 is a side elevation of such machine, with the casing removed; Fig. 2 a top view looking at the machine in the direction of the arrow in Fig. 1; Fig. 3 a vertical section; Fig. 4 a detail view of the rear side of the grooved guide-plate at the rear of the machine; and Fig. 5 a sectional detail showing the swinging plates and associated devices.

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

The operating keys of the machine consist of levers A hung upon a fulcrum-rod B and provided upon their front ends with the usual numbered finger-buttons C. The rear up-turned ends D of these key-levers are provided at their upper ends with cups or pockets E which fit in channels F upon the rear side of the rear frame-plate F' of the machine and by which the rear ends of the keys are guided in their vertical movement, Fig. 4. Extending from front to rear of the machine are a series of inclined tubes G, open at both ends, and one overlying each of the key-levers A. These are the supply-compartments in which is kept the supply of counters H. Located above these tubes G, and forming substantially the entire top of the machine, is a board

or plate I, inclined toward the front of the machine, and provided with a series of longitudinal grooves J, one immediately over and corresponding with each of the supply-tubes G. This grooved board I is covered by a glass plate K, located at such distance above the board as to permit free travel of the balls H in the grooves and at the same time prevent their being displaced from their respective grooves, each groove, with the overlying glass plate, thus forming a distinct receptacle. The supply-tubes G communicate with the respective grooves J by the channels F upon the rear frame-plate F' and openings L in said plate at the upper ends of said channels and co-incident with the grooves J in the board I. As seen in Fig. 3 the rearmost ball H in each of the supply-tubes G normally rests in the cup E upon the upper end of the corresponding key lever. When the front end of the lever is depressed said ball will be carried upward in said cup, the walls of the channel F preventing its escape therefrom, until the cup is brought opposite the opening L at the upper end of the channel whereupon the ball will escape from the channel and roll forward in the corresponding groove J in the top board I. The forward edges of the vertical extensions D of the key levers are curved in the arc of a circle struck from the fulcrum of the keys, as is also the rear side of the plate F' having the channels F, so that when any key is operated and the ball which is in its pocket E is lifted the forward edge of the extension D of the key prevents the escape of the remaining balls from the supply-tube. When the key is released, in the manner hereinafter described, and returns to normal position, the rearmost ball in the supply-tube will enter the cup E, ready for the next operation of the key.

The grooves J in the board I are assigned different values according to the respective keys with which they co-operate, and to enable the amount registered by the balls in the groove to be ascertained without the necessity of counting the balls the grooves are preferably provided with registering numbers, the number opposite the rearmost ball in any groove indicating the amount registered.

tered by the number of balls in said groove. The registering grooves J communicate at their forward ends with the forward ends of the supply-tubes G, but the passage of the
 5 balls from the grooves to the tubes is normally prevented by pivoted arresting plates M, one opposite the end of each groove and provided at its rear end with a depending
 10 flange against which the balls in the groove rest. By pressing down the front end of any one of these plates and tilting up its rear end the balls in the groove will be allowed to escape and will roll down into the corresponding
 15 supply-tube G. When the machine is within the casing these plates are all locked in the position shown by a hinged bar of the casing, which is itself controlled by a lock whose
 20 key may be kept in the possession of the proprietor, so that the clerk or operator cannot manipulate the plates M to release the balls from the registering grooves.

The extensions D of the key levers are provided on their rear sides with ears N to which are pivoted the lower ends of indicator rods
 25 O passed through apertures in a guide plate P and carrying at their upper ends indicating tablets R' bearing numbers corresponding to those upon the respective keys. Each of the key levers A is also provided upon its under
 30 side, about mid-way of its length, with a pendent plate R. These plates R co-operate with the rear arms S of a series of bell-cranks strung upon a rod T and extending entirely
 35 across the machine, one beneath each key and co-operating with its plate R. A series of springs U connected to the upper ends of the front arms V of the bell-cranks tend to rock them forward, but the engagement of their
 40 rear arms S with the plates R upon the keys, when the latter are in normal position, holds them from movement. When any key is operated and its plate R thereby lifted until its
 45 lower end clears the upper end of the arm S and its co-operating bell-crank the spring U connected to such bell-crank will immediately rock the bell-crank slightly forward, until it
 50 engages and rests against a cross-bar W of a rocking frame X hung upon the rod T. This movement of the bell-crank carries the upper end of its arm S beneath the lower end of the
 55 plate R of the operated key, and when the latter is released it is supported in elevated position by the arm S, and its connected indicating tablet Q held exposed to view at the usual window in the casing of the machine.
 60 By means of a lever Y fast at its lower end to the swinging frame X and projecting at its upper end through an opening in the casing, into position to be grasped by the operator, the frame X may be rocked and the
 65 cross-bar W thrown upward to carry back to normal position all of the bell-cranks which are out of such position, and thereby release all of the operated keys and permit them to return to normal position.

This much of the machine is old, and not of my invention, but as so constructed the machine has been found defective and impracticable as a reliable register, by reason of the
 fact that the balls H are liable to escape from the registering grooves J, so that an inaccurate registry will be preserved. The openings
 75 or notches L in the upper edge of the plate F' are not so deep as the registering grooves J, Fig. 5, and it is intended that the plate F' will arrest the balls and prevent their escape from the grooves in case the front end of the machine
 80 should be tilted upward by accident or design; but the openings L must necessarily be of sufficient size to permit the ready passage of the balls from the cups E of the operating keys
 85 to the grooves, when the keys are operated, and such being the case it has been possible to cause the balls to escape from the grooves through these openings by shaking the machine, if they would not do so by simply lifting
 90 its front end. When the balls escaped from the grooves in this manner they would either drop down inside the casing of the machine, or if the rear end of any key were at the time in elevated position the rearmost
 95 ball in the corresponding groove would enter the cup E in said key, and when the key was released and returned to normal position the ball would be carried downward in the cup and become the rearmost ball in the row in
 100 the supply-tube G. In this manner, after the clerk had operated a key and caused it to lift a ball H and deliver it into the proper groove, he could, by tilting the front end of the machine upward and perhaps shaking it, cause
 105 said ball to roll backward and re-enter the cup E of the key, and then release the key and cause it to carry the ball down with it, thus indicating the value of the operated key to the customer and bystanders but preserving
 110 no record of it. My invention is intended to overcome these defects by providing means for preventing the escape of the balls from the rear ends of the grooves when the front end of the machine is lifted and the machine jarred or shaken. The means I have
 115 provided in this instance consists of a series of swinging plates or gates A' strung upon and depending from a rod or wire B' extending horizontally across the rear end of the board I and secured at its opposite ends to the
 120 flanged plates C' of the guide-plate P. There is one of these swinging plates A' immediately over each of the registering grooves J and its lower end extends into the groove sufficiently to stand in the path of the balls H
 125 in the latter. Secured to the under side of the plate P are a series of guide-plates D' of inverted trough shape, and extending downwardly and forwardly over the rear ends of the registering-grooves, one guide-plate over
 130 each groove. The gravity of the swinging plates A' causes them to rest, when in normal position, against the front ends of the plates

D', though the plates A' may, if desired, be provided with forwardly projecting fingers E' adapted to engage the depending flange along the forward edge of the plate P and thereby limit the rearward movement of the plates A'.

Under the construction above described, when a key is operated the ball carried in the cup upon its rear end is delivered through the opening L at the rear end of the corresponding registering-groove and as it rolls forward in the latter it will tilt the plate A' above it to the position shown by the dotted lines and pass by it, whereupon the plate will swing back to normal position. If the front end of the machine be lifted the balls in the registering-grooves will roll backward until the rearmost ball in each groove strikes the lower end of the plate A' co-operating with that groove, whereupon the balls will be arrested, and they cannot escape from the grooves no matter how much the machine may be tilted or shaken. The guide-plates D' prevent the balls being thrown up into the space behind the upper portions of the plates A' in case the keys be quickly or violently operated, and direct the balls downward and forward against the lower ends of the swinging plates A'.

From the foregoing description it will be understood that after a ball has been deposited in any one of the registering grooves J by the operation of a key said ball cannot possibly escape from said groove and must remain in it until the plates M at the forward ends of the grooves are unlocked by the proprietor and the balls permitted to pass into

the supply-tubes, after he has taken the registry from the machine.

Having thus fully described my invention, I claim—

1. In a machine such as described, the combination, with the board or plate having the registering-grooves J, of the swinging plates A' hung above their rear ends and operated automatically by the balls to permit the passage of the balls into the grooves and prevent their escape therefrom, substantially as described.

2. In a machine such as described, the combination, with the board or plate having the registering-grooves J, of the swinging plates A' hung upon their rear ends and co-operating therewith to permit the passage of the balls into the grooves and prevent their escape therefrom, and the guide-plates D' arranged in rear of the swinging plates A', substantially as described.

3. In a machine such as described, the combination, with the board or plate having the registering-grooves J, of the plate P having the depending flange along its forward edge, the swinging plates A' strung upon the rod B' beneath the plate P' and behind its flange, and the guide-plates D' secured to the under side of the plate P' and extending downwardly and forwardly toward the lower ends of the plates A', substantially as described.

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