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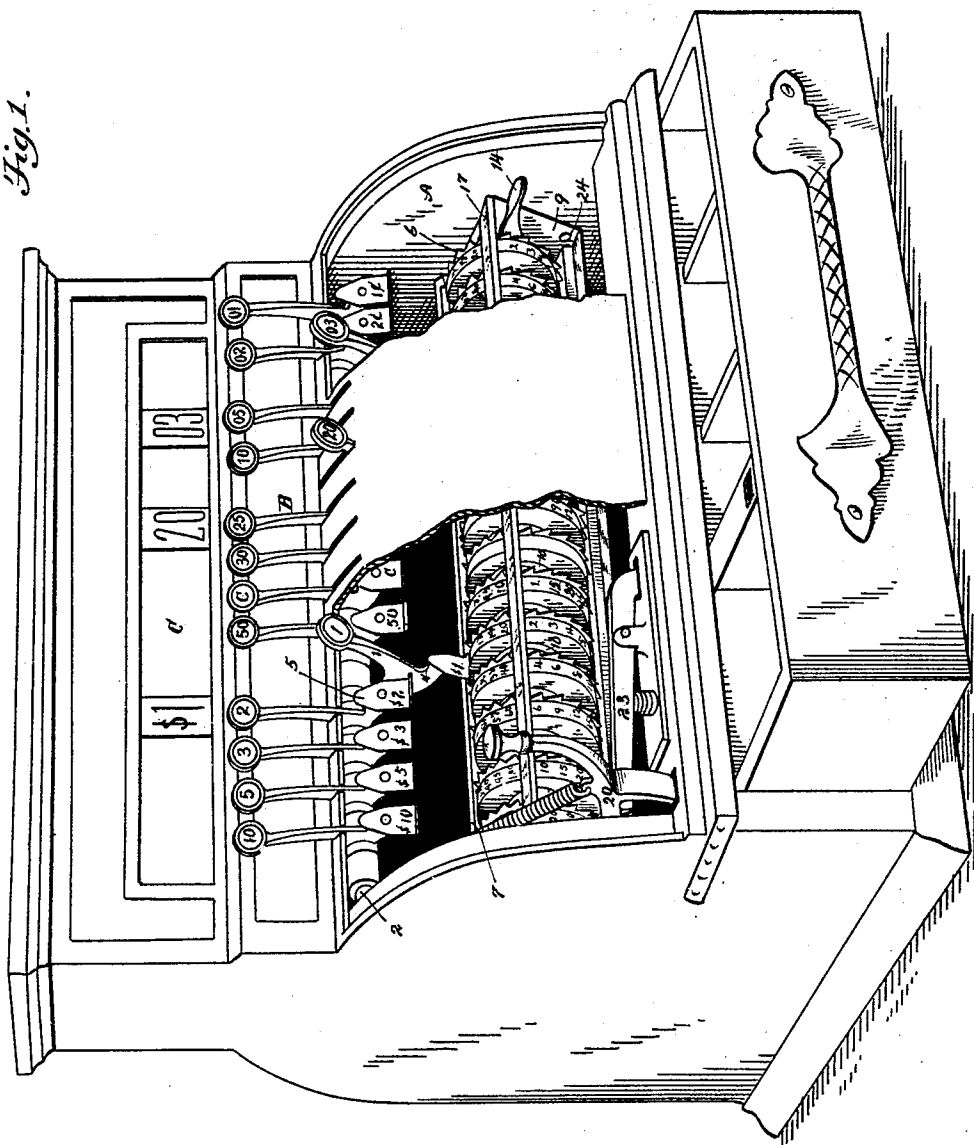
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W. T. McGRAW.
CASH REGISTER AND INDICATOR.

No. 519,922.

Patented May 15, 1894.

Fig. 1.



WITNESSES

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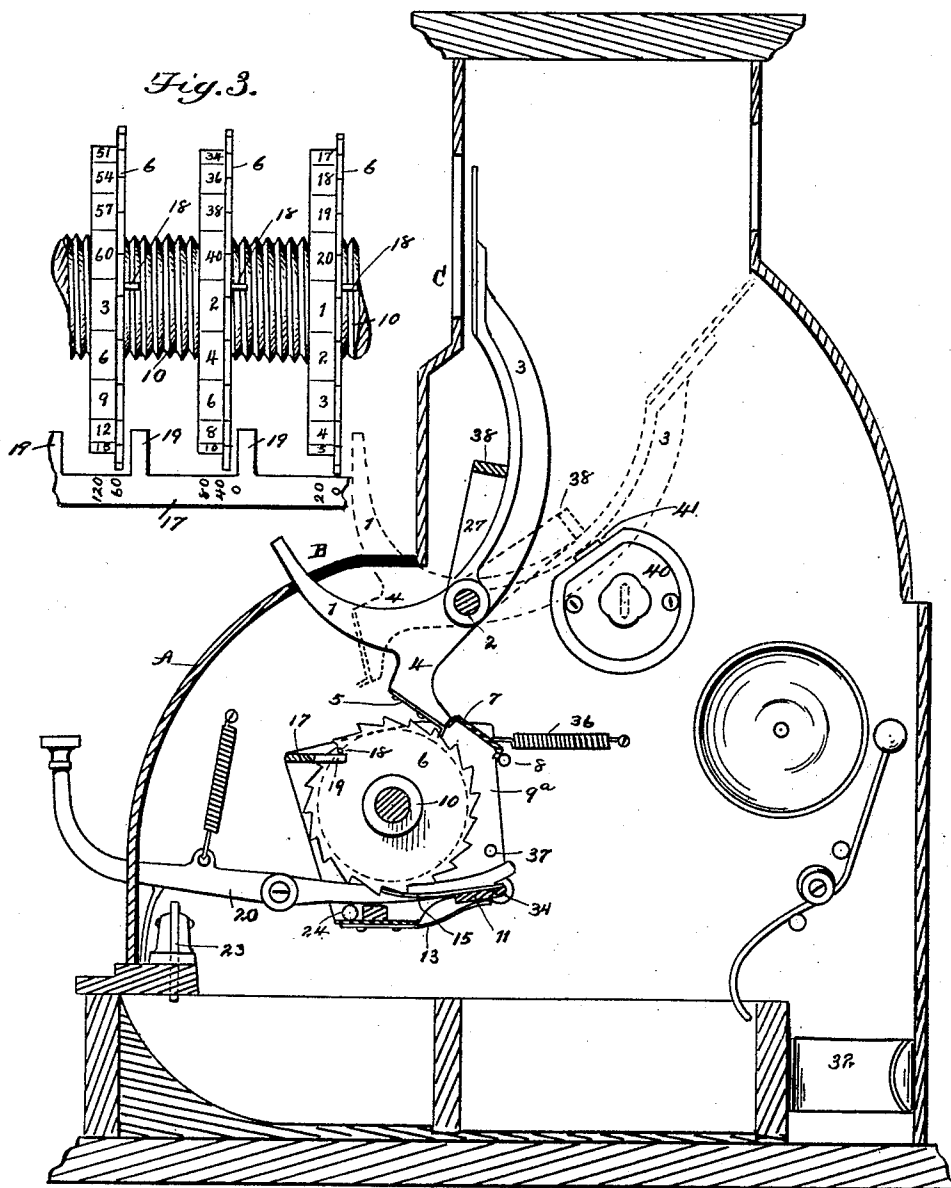


Fig. 2.

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3 Sheets—Sheet 3.

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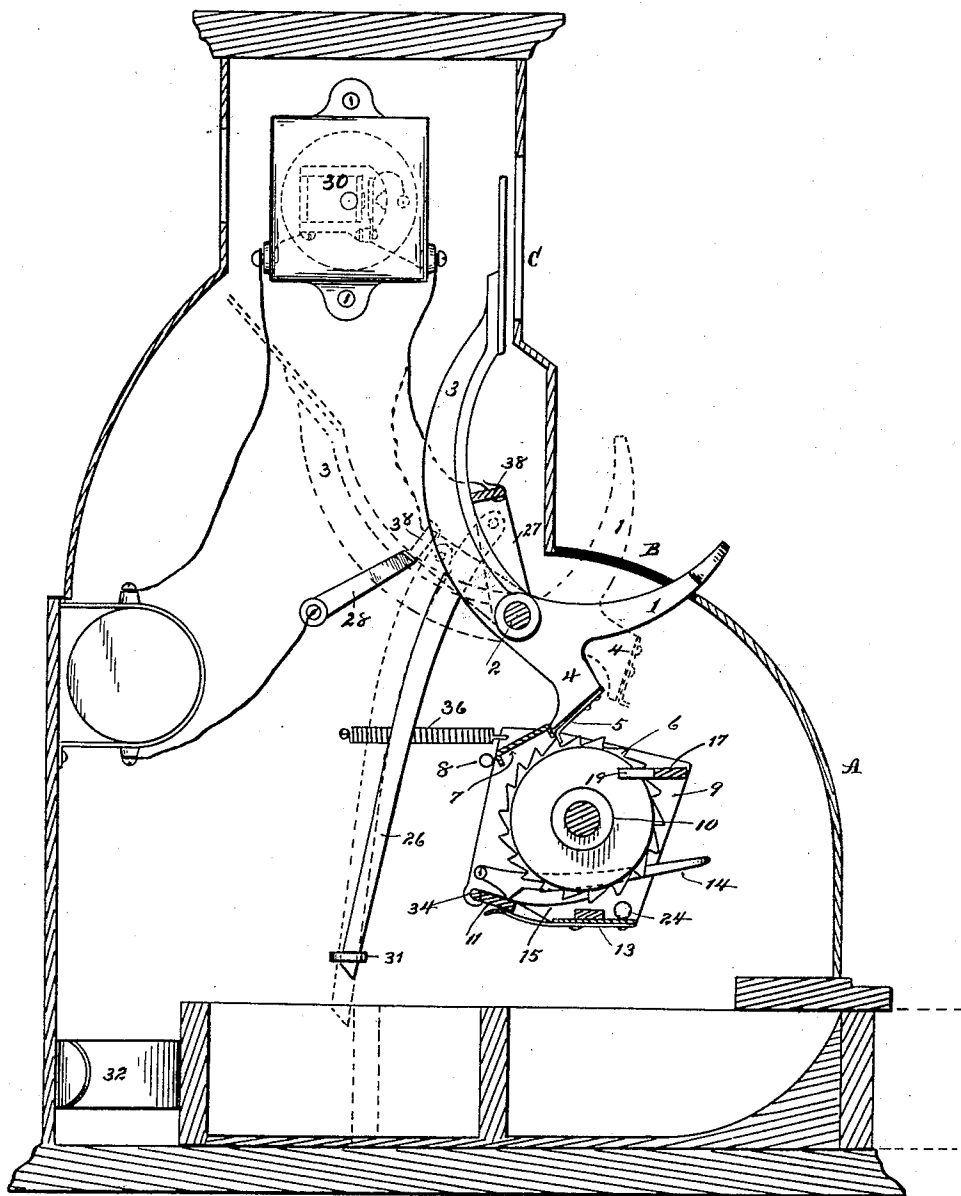


Fig 4

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM T. MCGRAW, OF DETROIT, MICHIGAN.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 519,922, dated May 15, 1894.

Application filed October 5, 1893. Serial No. 487,278. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. MCGRAW, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Cash-Registers; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to cash registers, and has for its object improvements pertaining to the registering mechanism employed in connection with what are known as tablet machines. The registering device in machines of this kind is intended to enable the user of the machine to know, from an inspection of the register, how many times any particular part of the machine has been operated, how many times any particular tablet key has been used and its tablet exposed, and how much money ought to be found in the drawer connected with the machine to correspond with the indicating operations that have been performed on the machine.

The apparatus devised by me to produce this result consists primarily of a screw on which are a number of threaded ratchet wheels or burrs, having peripheral ratchet teeth that run on the threads of the screw, a forward motion to the ratchet wheel being produced at each indicating operation of the key in connection with which it operates. The periphery of the ratchet wheel is divided into numbers corresponding to the number upon the indicating tablet operated in connection with the same key, and at each revolution of the ratchet wheel, it advances along a scale bar which lies parallel with the axis of the screw, and indicates to the user at a glance how many times the ratchet wheel revolved on its own axis, the scale on the ratchet wheel itself indicating what part of a revolution on its own axis the ratchet wheel has made in addition to the number of complete revolutions indicated on the scale bar. There is thus at once indicated on the scale bar and the ratchet wheel the number of strokes that have been given to the key and the number of times that the indicating tablet operating

in connection with that key has been exposed to view, and the operator or examiner knows what amount of money he should find in the cash drawer to correspond with the indications on the register mechanism.

Other improvements will be described and pointed out in the specification and claims.

In the drawings, Figure 1 shows in perspective a cash register with my registering device inclosed therein, a part of the front case being broken away to show the interior work. Fig. 2 is a sectional elevation showing the action of a single key on the registering ratchet wheel and the readjusting device by which the keys are released from the ratchet. Fig. 3 is an enlarged detail view of the screw ratchet wheel and readjusting bar. Fig. 4 is a sectional elevation, showing a ratchet wheel and its connection with the other parts of the register, and showing the readjusting lever by means of which the ratchet wheels are released from all holding pawls to enable the operator to turn them backward and readjust them at the zero point.

A indicates the case or shell of a register, of which the key-board (or protruding ends of the keys) is at B, and the slot for the inspection of tablets that have been lifted for purposes of inspection is at C. I prefer to use a tablet key made in a single piece in the form of a bell crank lever having a protruding finger piece end 1, an interior tablet carrying end 3, and a depending register actuating end 4. These are journaled on a bar 2, which extends across the frame from end to end. The depending register actuating arm 4 extends radially from the shaft 2, and terminates at its extremity with the hardened plate 5 that travels in a circular arc partially around the center of the bar 2, in an arc which interferes with the line of travel of a ratchet wheel 6 mounted on a screw 10. The face piece 5 has a length parallel with the axis of the screw 10 sufficient to enable it to continue to engage the teeth of the ratchet wheel 6 while the ratchet is traversing the screw 10 by turning along the screw and several revolutions around it. The screw 10 itself is journaled in an auxiliary frame, of which the two end pieces are indicated at 9 and 9^a. (The end piece 9 is shown in Fig. 4, and the end piece 9^a is shown in Fig. 2.) The two

end pieces 9 and 9^a, properly held together by bars that extend between them lengthwise of the case of the register, turn upon pins 24. The bars which connect the two end pieces 9 and 9^a are utilized for other purposes, as well as holding the end pieces rigidly together. One of them, 17, is used as a scale bar; another one, 7, is utilized as a stop against key lever strikes. The pins 24 are utilized to form the journals on which the entire frame rocks, and the bar 34 is utilized to form the journal on which some of the holding pawls are rocked. When in position for registering, this frame is held against a stop bar or pin 8 by a spring 36. When in this position, the stop bar 7 is properly located to prevent the over-reaching of the hanging arm 4 in its actuating engagement with the ratchet wheel 6. Below the ratchet wheel 6 is a holding pawl 15. This ratchet 15 is secured to and springs from the rocking bar 11, that reaches across a frame between the end pieces 9 and 9^a, and is itself held in position by a pressure spring 13 secured to the auxiliary framework composed of the pieces 9, 9^a, and the connecting bars. There are in the register a number of ratchet wheels similar to the ratchet wheel 6. They will number from twelve to fifteen or eighteen, according to the capacity of the machine, and each one of these wheels is provided with its individual pawl spring 15; and, in order to throw them all out of the engaging contact with their respective ratchet wheels when the register is set at zero, they are all attached to a single rocking bar 11, and the rocking bar itself is held up by a separate pressure spring 13. The rocking bar 11 is turned on its hinges, and all the pawls 15 connected with all the registering wheels, are thrown out of engagement with the ratchets by depressing lever 14, one end of which is hinged to the frame or end piece 9, and a bearing which presses against the upper side of the rocking bar 11. At the same time, the entire framework, 9, 9^a and its connecting rods, are rocked forward, and the rear lower corner rocked upward on the pin 24 by depressing the outer end of the lever 20, the inner end of which engages with the pin 37 on the end 9^a, and the middle of which is fulcrumed to the main case. When the frame work is rocked forward, it carries with it the screw and ratchet wheels and the stop bar 7, and lifts the hanging arm 4 of the key until the engaging plate 5 is out of engagement with the teeth of the ratchet wheel, and the key has been returned to its non-indicating position. When in this forward position, with the lower pawls thrown out of engagement the ratchet wheels are free to move along the screw in either direction for a limited distance, and are moved backward until the pins 18, of which there is one pin in each ratchet wheel, are in engagement with teeth 19 that project from the index bar 17 between the wheels 6. Each pin is so set in the

face of its own wheel with respect to the graduations around the periphery of the wheel, that the pin stops the backward movement of the wheel by contacting the teeth 19 at a point where there will be no indicating figure shown on the wheel. 70

I do not place a zero character on my wheel, because I find it unnecessary, but consider that as the zero point which lies between the highest point indicated and the lowest point indicated on the periphery of the wheel in passing from the highest onward to the beginning again. The wheels being set at the zero point, the frame is rocked back by releasing two levers, when it takes its proper position through the tension of the holding spring 36, the pawls 15 engage with the ratchet teeth of the wheels, and the arm 4 is in position to actuate the wheel when the key 1 is operated. The depression of the key 1 swings the arm 4, and rotates the wheel 6 forward one notch, and a repetition of this action continues to move the wheel 6 forward. During the first revolution of the wheel, the toothed part of it, which may be considered as an index or pointer, lies opposite or nearly opposite the zero of the scale on the scale bar 17, the amount of its own rotation being indicated by the figures on the scale around the periphery. At the end of one complete revolution, the toothed part of the wheel lies opposite or nearly opposite the first indicating number on the scale, as, for instance, the number 20 appearing at the right end of Fig. 3. At the end of the first revolution of the register wheel, that wheel is passed along the screw far enough to permit the pin 18 to pass the tooth 19 without engaging it, and the register wheel is free to move in this forward direction until it shall be stopped by contact with the succeeding tooth, at which time it must be set at the zero point if further action is desired. It is evident that the rocking forward of the frame containing the register wheels will lift the arm 4 out of engagement with the toothed wheels without actuating them. 80 85 90 95 100 105 110

As a check upon the operation of the keys, I place in the machine an electrically actuated bell 30, which I arrange to give an alarm if the drawer is opened without depressing the keys. The mechanism for producing this result consists of a bar 38 which traverses the frame from end to end above and in front of the tablet supporting ends, 3, of the keys. The depression of the protruding end and the lifting of the inner end of the key bar, throws this bar 38 upward and forward by turning it on its central supporting shaft 2. The bar 38 forms one terminal of an electric circuit; and a metal arm 28, against which the bar 38 rests when no keys are depressed, forms the other terminal. The drawer is thrown open by depressing the outer end of the lever 20, which engages with a locking lever 23 and lifts the locking end of that lever out of engagement with the catch in the drawer, and 115 120 125 130

allows the drawer to be thrown open by a spring 32 that is secured at its rear side. But the depression of the outer end of the lever 20 rocks forward the upper side of the frame 9 and throws down the indicating tablets, lifting the key ends upward, and allows the contact bar 38 to contact the arm 28 and sound an alarm. This alarm continues to sound until one of the keys have been again depressed.

In order that the drawer may not be shut in before the depression of the key and the showing of the tablet, I employ a locking bolt 26, which swings from the arm 27, that supports the contact bar 38; its lower end is guided and held by a staple 31. When in its lifted position, as shown in full lines in Fig. 4, the drawer can be closed in, but it can only take this lifted position through the action of one of the keys when that key is depressed. If none of the keys are depressed, the locking bolt 26 has the position shown in dotted lines, with its lower end extending below the rear side of the drawer, and when in position the drawer cannot be closed.

As it is sometimes desirable to break the connection between the battery and the bell without interfering with the manipulation of the drawer, I arrange to do this by means of a lock provided with a key which can be used from the outside. Such a lock and bolt are indicated in Fig. 2 at 40, where the bolt is shown at 41 as arranged to engage with the under side of the contact bar 38, and lift with it slightly from the arm 28.

What I claim is—

1. In a cash register, in combination with a plurality of actuating key levers, a plurality of registering wheels of which the hubs are threaded internally, a screw engaging with said wheels and serving as an arbor therefor, the said wheels being adapted to traverse the screw and to progress a definite distance with each actuating movement of the key lever.

2. In a cash register, the combination with a plurality of actuating key levers, a plurality of wheels of which the hubs are threaded internally, a screw serving as a common arbor for all of said wheels, and a scale arranged

to indicate the revolutions of the wheels on the screw, each of said wheels being adapted to traverse the screw and to progress a definite distance with each actuating movement of the key lever, substantially as and for the purpose specified.

3. In a cash register, the combination of actuating key-levers, a rocking frame and a screw mounted therein, and registering wheels adapted to traverse said screw and to be actuated by said key levers, substantially as described.

4. In a cash register, the combination of a key lever, a rocking frame and a screw mounted therein, a registering wheel adapted to traverse said screw and to be actuated by said key-lever, a stop forming a part of said frame-work and adapted to prevent the overthrow of said key, substantially as described.

5. In a cash register, the combination of a register wheel, a screw traversed thereby, a spring pawl held on a rocking support, and a pressure spring adapted to hold said support with a spring pawl in contact with the register wheel, substantially as described.

6. In a cash register, the combination of a key, an electric alarm bell, a contact piece adapted to be thrown out of contact by the depression of the key, a readjusting lever arranged to unbolt the cash drawer and to readjust said key, thereby making electric contact with the alarm bell, substantially as described.

7. In a cash register, the combination of a screw, a register wheel adapted to traverse said screw and be actuated by a key of said register, an index bar lying parallel with said screw and provided with teeth extending inward parallel with the radius of said register wheel, a pin projecting from the face of said register wheel, adapted to engage with the teeth from the index bar, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIAM T. MCGRAW.

Witnesses:

ERLE V. BEALS,

CHARLES F. BURTON.