

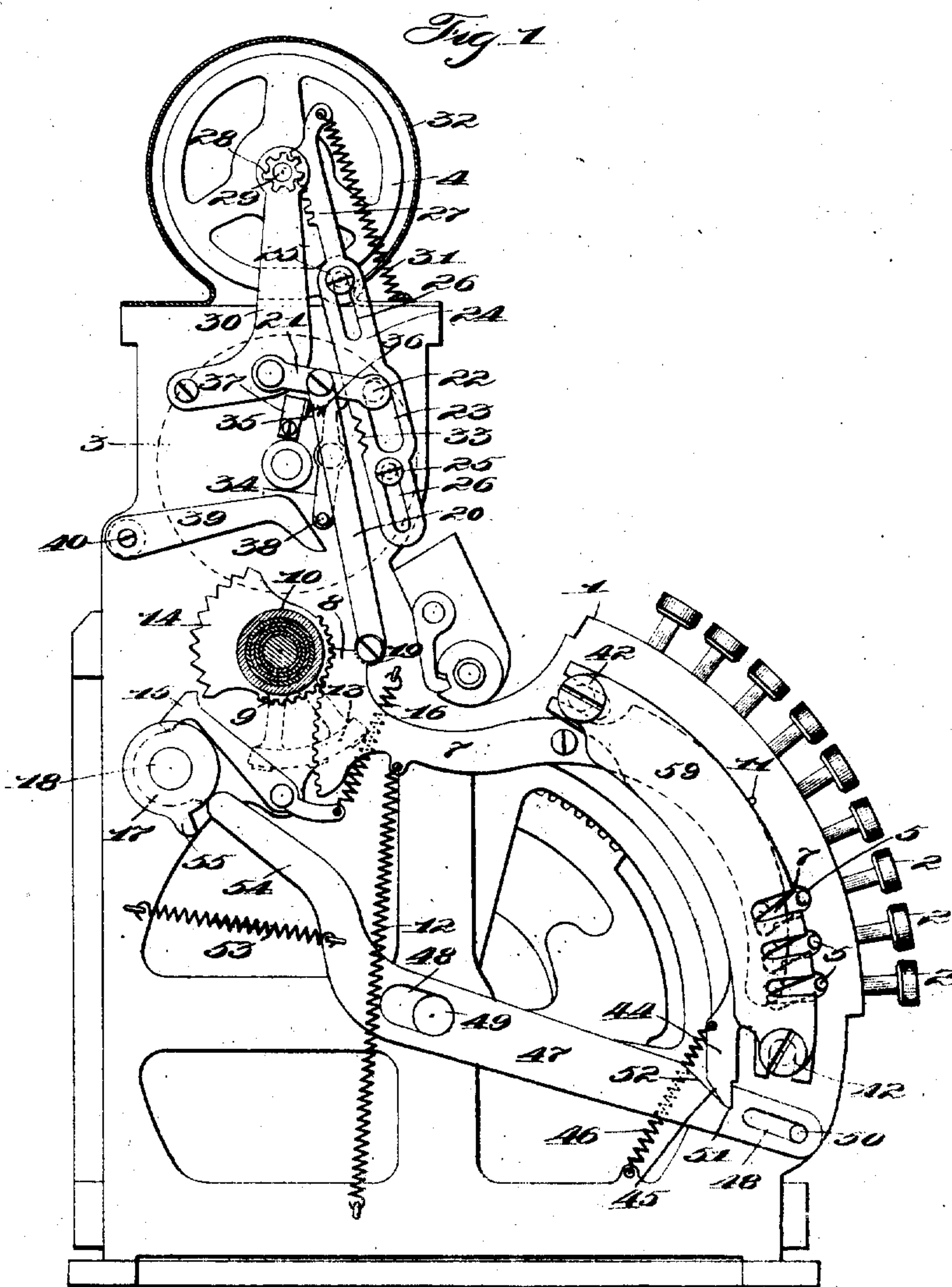
No. 897,575.

PATENTED SEPT. 1, 1908.

F. H. BICKFORD.  
CASH REGISTER.

APPLICATION FILED APR. 7, 1899. RENEWED NOV. 29, 1907.

3 SHEETS—SHEET 1.



Witnesses

*Wm. McCarthy*  
*William Muzzey*

Inventor

*Frank H. Bickford*  
By *Alvan Macarley*  
his Attorney

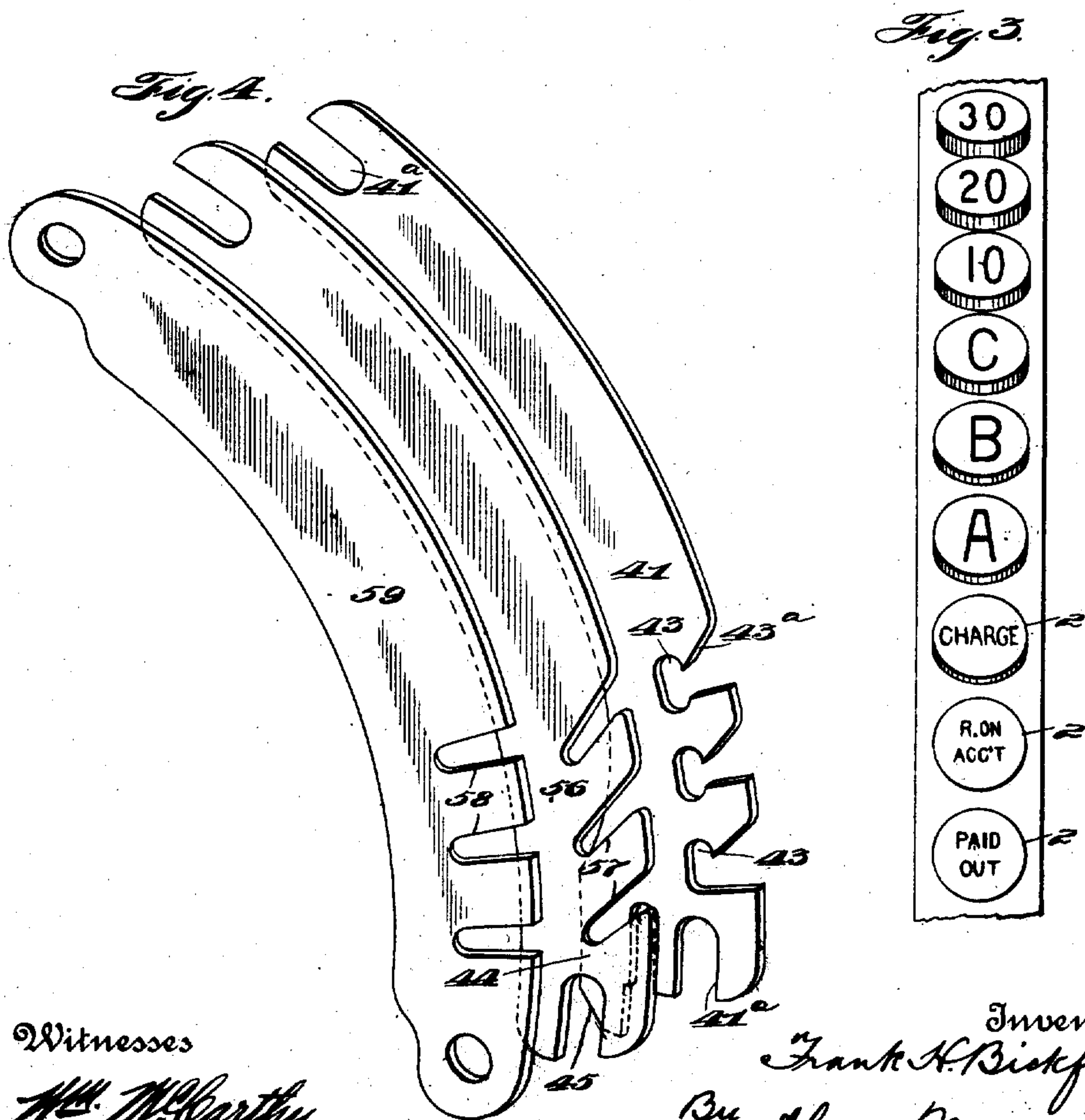
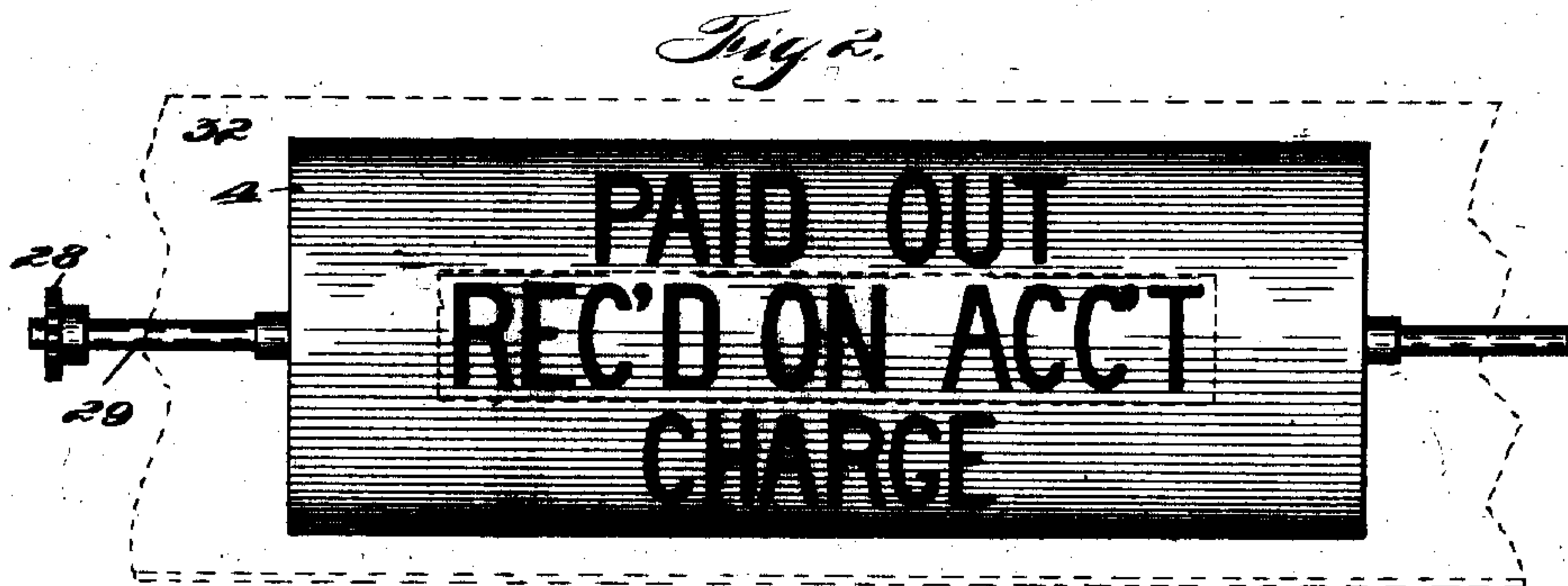
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*William Muzzey*

Inventor  
*Frank H. Bickford*  
By *Alvan Macaulay*  
Attorney

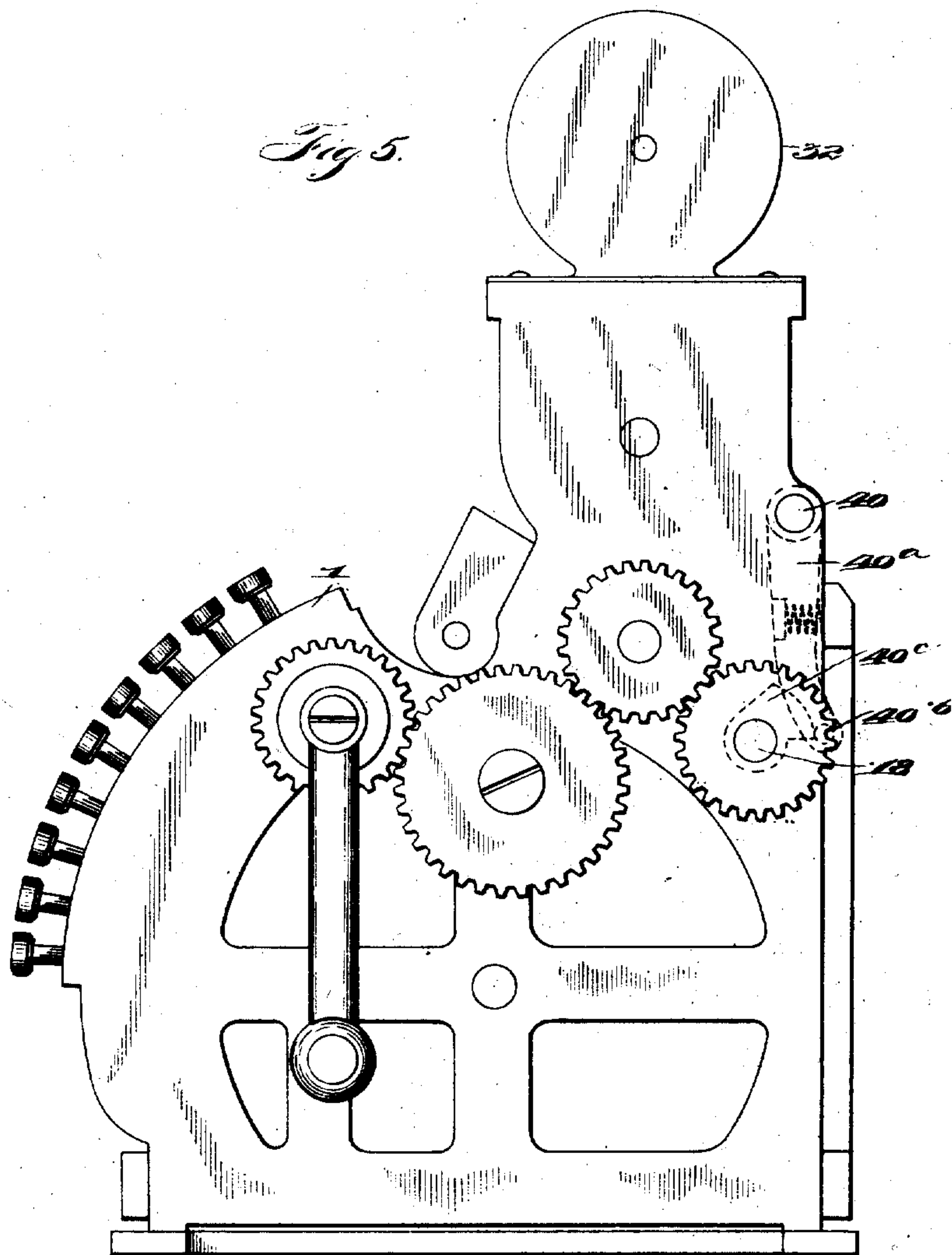
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8 SHEETS—SHEET 3.



Witnesses  
*W. McCarthy*  
*William Muzzey*

Inventor  
*Frank H. Bickford*  
By *Alvan Macaulay*  
*Attorney*



# UNITED STATES PATENT OFFICE.

FRANK H. BICKFORD, OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

## CASH-REGISTER.

No. 897,575.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed April 7, 1899, Serial No. 712,049. Renewed November 29, 1907. Serial No. 404,375.

To all whom it may concern:

Be it known that I, FRANK H. BICKFORD, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash-Registers, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in cash registers and has more particular relation to improvements in the class of machines patented to Frank H. Bickford, August 31, 1897, and numbered 589,114 and Cleal and Reinhard, No. 580,378, April 13, 1897.

In the type of machines above referred to, and as illustrated in the present drawings, the left hand bank of keys is divided into keys of two classes, the three lower keys of the same representing the special transactions such as "Paid out," "Charge" and "Received on account," while the remaining keys of the bank represent amounts, clerk's initials or anything that may be desired.

As the present invention relates only to the three lower special keys and their connections with the special indicator hereinafter described I will limit my description to the same and refer to the aforesaid patents for a detail description of the remaining parts.

One of the several objects of the invention is to provide a machine of the class mentioned with an improved special indicator for indicating the character of each transaction whether it be a cash, credit, paid out or received on account transaction.

In the appended drawings forming part of this specification, Figure 1 represents a side elevation, partly in section, of the device embodying my invention applied to a machine of the type designated. Fig. 2 represents an enlarged detail front elevation of the special indicator, its supporting shaft, and the apertured indicator casing; the latter being shown in dotted lines. Fig. 3 represents a detail front elevation of the special key bank. Fig. 4 represents an enlarged detail perspective view of the detent, locking plate and guide plate; the same being slightly separated to more clearly show the formation of the slots therein. Fig. 5 represents an end elevation of the machine showing the usual gearing for actuating the rotation and rock shafts.

In the said drawings 1 represents the frame of the machine; 2 the special transac-

tion keys; 3 the regular indicators and 4 the special indicator extending transversely above the regular indicators.

The regular keys, registering mechanism, regular indicators and printer operate substantially as set forth in the aforesaid patent of Cleal and Reinhard. The special transaction keys also cooperate with their respective counters as shown in the said patent to Frank H. Bickford and in addition are provided each with a laterally projecting pin 5. These pins are so located as to project into proximity to the periphery of a segmental lever 7 which is suitably pivoted on the frame 1 and is provided at its rear end with a segmental rack 8. This rack meshes with a partial gear 9 formed on a sleeve 10 so as to impart movement to said sleeve according to the degree of movement of said lever. As will readily be seen by reference to the drawings, this lever receives a varying degree of movement according to the special key operated, for, while all of said keys have the same movement, the pins of said keys are so arranged as to lie at different distances from the periphery of said lever when in normal position so as to engage it sooner or later as the case may be. This lever is held in its normal position with its curved periphery against a stop pin 11 by a coil spring 12 which connects said lever to the frame of the machine. The aforesaid sleeve 10 carries a special printing segment 13 which cooperates with the regular printing device to print a character designating the character of the transaction as represented by the three special keys. Said sleeve is further provided with a toothed stop and alining segment 14 which is adapted to be engaged by a pawl 15 pivoted upon the main frame and normally held out of engagement with said stop segment by a coil spring 16 which connects it with the main frame. This pawl is arranged to be forced into engagement with the said stop segment by a cam 17 upon which it rests and which is mounted upon the outer end of the usual revolution shaft 18 of the machine. It will be observed from the above that when one of the said special keys is operated the sleeve 10 is moved a distance corresponding to the value of said key and the printing segment 13 (shown in dotted lines in Fig. 1) carried by said sleeve is thus adjusted to the proper positions to print the designation of the special key operated, in connection with the other



characters which are printed, upon the detail strip and check in the usual manner. The said segment 8 is provided with an ear 19 to which is pivotally connected the lower end of a bar 20. This bar is also pivotally connected at its upper end to a short lever 21 which is pivoted at its left hand end (Fig. 1) upon one of two vertical standards 30 and is provided at its right hand or free end with a laterally projecting pin 22. This pin projects into an elongated slot 23 formed in a slide 24; screws 25 pass through other elongated slots 26 formed in said slide and screw into the main frame whereby said slide is held movably in position upon the frame. The upper end of said slide is formed with a rack 27 which meshes with a pinion 28 fast upon one end of a transverse shaft 29 which is journaled in the standards 30 mounted on the main frame at its opposite sides. A horizontal cylindrical indicator 4 is mounted fast on said shaft 29 and is provided at diametrically opposite points upon its outer surface with similar characters for designating the respective special transactions as well as the cash transactions; a suitable indication of which latter transactions must be displayed when neither of the special keys is operated and the special indicator is in normal position. A spring 31 connects the said rack bar to the main frame so as to normally draw the slide 24 downward and thus leave the cash indications or characters exposed through the sight openings in the front and back of the casing 32 which surrounds the said indicator 4.

The slide 24 is further formed with a series of alining teeth 33 which are arranged to be engaged by a pawl 34 pivotally mounted on the main frame and normally forced forward into engagement with said teeth by a coil compression spring 35. One end of this spring is mounted about a stud 36 on the back of the pawl while its opposite end is supported by a similar stud mounted on a bracket 37 secured to the main frame. The lower end of the pawl is provided with a pin 38 which is arranged in the path of a cam arm 39 mounted rigidly on a shaft 40 which is connected to the movable parts of the machine so as to be oscillated during each operation thereof as follows: A pendent spring pressed arm 40<sup>a</sup> is mounted on said shaft 40 at its opposite end and is provided with a pin 40<sup>b</sup> which is engaged and oscillated by a cam 40<sup>c</sup> fast on the shaft 18 which latter receives motion through suitable gears which connect it with the operating crank handle (see Fig. 5).

When one of the special keys is operated the bar 20 is forced upward as before described and thus raises the lever 21 and the pin 22 so that the latter moves to the upper end of the slot 23 and raises the slide 24. The above described action results if the slide is in one of its lower positions and the last spe-

cial key operated represents indication which can only be set by a further raising of said slide. When a previous indication has raised the slide to one of its upper positions the subsequent operation of a key governing a lower position of said slide will simply raise the pin 22 in the slot 23. Should the operating handle now be operated the pawl 34 is disengaged from the alining teeth 33 which allows the slide 24 to descend under the impulse of the spring 31 until it is stopped by the pin 22 abutting against the upper end of the slot 23. The releasing movement of the pawl 34 is effected during the initial movement of the operating handle so as to permit the slide 24 to descend if the operated key demands such action. Subsequently during the same operation of the machine the pawl 34 is allowed to again engage the rack teeth of the slide to lock the latter in position. As the keys 2, 2 are independent of the remainder of the keys of the bank in which they are located and do not coöperate with the detent of the same it is necessary to provide means for locking said keys in their depressed positions and for preventing the successive operation of more than one of said keys during a single operation of the machine. I accomplish the first object by means of a movable detent 41, shown in Fig. 1, and in detail in Fig. 4 and which is secured movably in position by screws 42 which pass loosely through suitable slots 41<sup>a</sup> formed in the ends of said detents. This detent is further formed with notched recesses 43 each having an incline wall 43<sup>a</sup> and also with an operating extension 44 having an incline wall 45. The studs or pins 5 extend in alignment with the recesses 43 so that when one of the special keys is operated the sleeve 6 of its stud will contact with the incline wall 43<sup>a</sup> of its respective recess and thus raise said detent 41 against the tension of a spring 46 which connects it to the main frame, until the stud reaches the notched portion of the recess in which it becomes seated and locked by the detent being drawn down over the same by its spring. The subsequent raising of the detent is accomplished by means of a slidable latch bar 47 formed with elongated slots 48; one for the reception of the main shaft 49 and the other for the reception of a guiding screw or pin 50. The said bar 47 is formed near its forward end with a recess 51 having an incline wall 52 and arranged to receive the projection 44 of the said segment. The bar is normally drawn rearward by a coil spring 53 which connects a rearwardly extending arm 54 of the same to the main frame. This arm 54 projects into the path of a cam 55 mounted upon the rotation shaft 18 so that said bar is forced forward against the tension of its spring upon each operation of the machine. The forward movement of the bar causes the incline wall 52 of recess 51



to contact with the incline wall 45 and thus raises the segment 41 and releases the key which has been previously operated. In order to prevent the consecutive operation of two or more of the special keys 2 during a single operation of the machine I provide a stop segment 56 shown in detail in Fig. 4. This segment is slidably mounted in the same manner as the segment 41 and is located beside the same so that the pins 5 will project into alinement with incline slots 57 formed in said segment.

It will be seen by reference to the drawings that when a special key is operated its pin 5 will enter its respective slot 57 and thus contact with one of the incline walls of said slot and move the segment upward which action will bring the solid portions of the periphery of said segment into alinement with the remaining pins and prevent their movement until the segment has returned to its normal position. The outer ends of said pins are guided in slots 58 formed in a stationary segment 59 which is secured in position outside of the segments 41 and 56 by the aforesaid screws 42.

By the peculiar constructions above described I am enabled to secure a large special indication of the character of the transaction in connection with the indication of the amount. Further the setting of the special indicator also results in a similar setting of the special printing segment whereby the detail strip and check receives a record of the nature of each special transaction.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination with a series of keys, a detent for said keys, an indicator, a movable spring actuated member for operating said indicator, devices moved by the keys for positioning the spring actuated member, means for latching said member and an operating mechanism common to said latching means and the key detent.

2. In a cash register, the combination with a series of keys, of an indicator, a rack bar for operating said indicator, a pivoted segment arranged to be operated by said keys, a printing device connected to said segment and means connecting the segment and rack bar whereby the segment moves the bar but the latter may move independently of said segment.

3. In a cash register, the combination with a series of operating keys, a pivoted segment, an indicator, a rack bar for operating said indicator formed with an elongated slot, a pivoted lever carrying a pin which projects into said slot and means for connecting said lever and segment.

4. In a cash register, the combination with a series of keys, of a pivoted segment arranged to be operated by the same, an indi-

cator, a rack bar for operating said indicator formed with an elongated slot, and ratchet teeth, a pivoted lever carrying a pin which projects into said slot, a pawl arranged to engage the ratchet teeth and means connected to the movable parts of the machine for operating said pawl.

5. In a cash register, the combination with a series of keys, of a pivoted segment arranged to be struck and operated by said keys, a slidable rack bar having an elongated slot formed therein, a pivoted lever arranged to be operated by the segment and carrying a pin which projects into said slot, devices for holding the slidable rack in the position to which it is adjusted independently of said segment and an indicator arranged to be operated by said rack bar.

6. In a cash register including keys and an operating handle, an indicator, means for moving the indicator into proper position by the operation of a key, devices for latching the indicator in a set position and independent of the movements of the keys and means for operating said latching device by the operation of the handle.

7. In a cash register, the combination with a series of keys, of a pivoted segment, a sleeve carrying a gear meshing with said segment and a type segment, a series of keys for operating the pivoted segment, a slidable rack bar having an elongated slot formed therein, a pivoted lever arranged to be operated by the first pivoted segment and carrying a pin which projects into said slot, devices for holding the slidable rack in the positions to which it is adjusted independently of said pivoted segment and an indicator arranged to be operated by the said rack bar.

8. In a cash register, the combination with a series of keys, of an indicator, a type-carrier, means having a one way connection with and operated by the keys for setting both the indicator and the type-carrier, with provisions for returning the type-carrier to normal position with the return of the key to its normal position; and mechanism operated independently of the keys for holding the indicator and the type-carrier in their set positions.

9. In a cash register, the combination with a series of keys, having projecting pins of a pivoted segment arranged to be struck and moved different distances by said pins, a type segment operated by the pivoted segment, an alining rack connected to the type segment, a rotary shaft carrying a cam, a pawl normally out of engagement with said alining rack but adapted to be moved into engagement with it to aline the type segment, by said cam, during a part of the movement of the rotary shaft.

10. In a cash register, the combination with a series of keys, of a differentially movable member set to graduated distances by



contact with and on the movement of said keys; an indicator; means connected with said indicator and positively moved by said movable member for positioning said indicator; yielding latching means for latching the indicator in set position; and means independent of said keys for releasing said latch and permitting the indicators to assume the position predetermined by said indicator positioning means.

11. In a cash register, the combination with a series of keys, of a differentially movable member positioned in proximity to said keys and controlled thereby in its differential extents of movements; an indicator; a setting element for said indicator directly connected with said differentially movable element; an indicator actuating member connected with said indicator to position the same; and a spring for causing said actuator to engage said setting element.

12. In a cash register, the combination with a series of keys, of a differentially movable lever pivoted in proximity to said keys, said differential movements being controlled by said keys; a differentially movable indicator; a setting projection connected with said lever to partake of the differential movements of the same; an indicator actuating rack arranged to engage said setting projection; and a spring for normally causing said rack to engage said projection.

13. In a cash register, the combination with a series of keys, of a differentially movable lever pivoted in proximity to said keys, said differential movements being controlled by said keys; a differentially movable indicator; a setting projection connected with said lever to partake of the differential movements of the same; an indicator actuating rack arranged to engage said setting projection; a spring for normally causing said rack to engage said projection; and a latch for holding said indicator actuating rack in set position independently of said setting projection.

14. In a cash register, the combination with a series of setting keys, of a differen-

tially movable lever positioned in proximity to said keys and having its differential movements controlled thereby; a differentially movable indicator; a setting pin connected with said lever to partake of its differential setting movements; an indicator actuating rack connected to the indicator and having an extension formed with a slot engaging said setting pin; a spring for drawing said rack in one direction to cause the same to engage said pin; and a latch pawl for holding said rack in set position independently of said pin.

15. In a cash register, the combination with a series of setting keys, of a differentially movable lever positioned in proximity to said keys and having its differential movements controlled thereby; a differentially movable indicator; a setting pin connected with said lever to partake of its differential setting movements; an indicator actuating rack connected to the indicator and having an extension formed with a slot engaging said setting pin; a spring for drawing said rack in one direction to cause the same to engage said pin; a latch pawl for holding said rack in set position independently of said pin; a segment rack connected to said differentially movable lever; and a type carrier connected with said segment rack.

16. In a cash register, the combination with a printing device, a driven element positively connected to said device, keys for determining the position of said driving element, and a spring tending to restore said driving element to a constant position, of an indicating device, a spring tending to move said indicating device to a constant position, a bar connected to said driving element and determining the position of said indicating device, and means for locking said bar in any one of a plurality of positions.

In testimony whereof I affix my signature, in the presence of two witnesses.

FRANK H. BICKFORD.

Witnesses:

ALVAN MACAULEY,  
CHARLES R. GILLIES.

It is hereby certified that in Letters Patent No. 897,575, granted September 1, 1908, upon the application of Frank H. Bickford, of Dayton, Ohio, for an improvement in "Cash-Registers," an error appears in the printed specification requiring correction, as follows: In line 79, page 4, the word "driven" should read *driving*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of October, A. D., 1908.

[SEAL.]

C. C. BILLINGS,  
Acting Commissioner of Patents.



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