

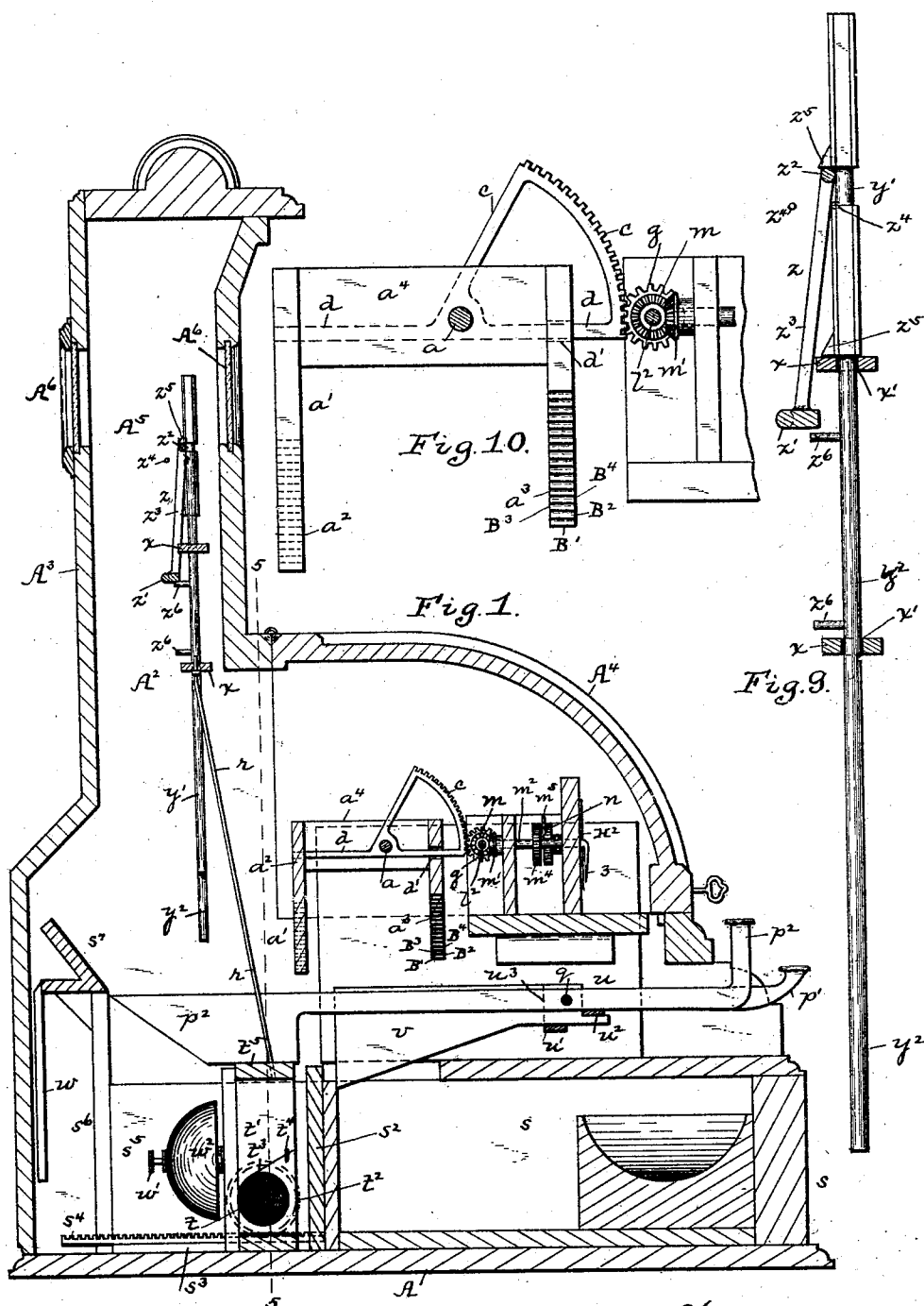
(No Model.)

5 Sheets—Sheet 1.

J. J. LAWRENCE, Jr.  
CASH REGISTER AND INDICATOR.

No. 556,756.

Patented Mar. 24, 1896.



Witnesses:  
D. L. Dorsey.  
Wm. J. Martin.

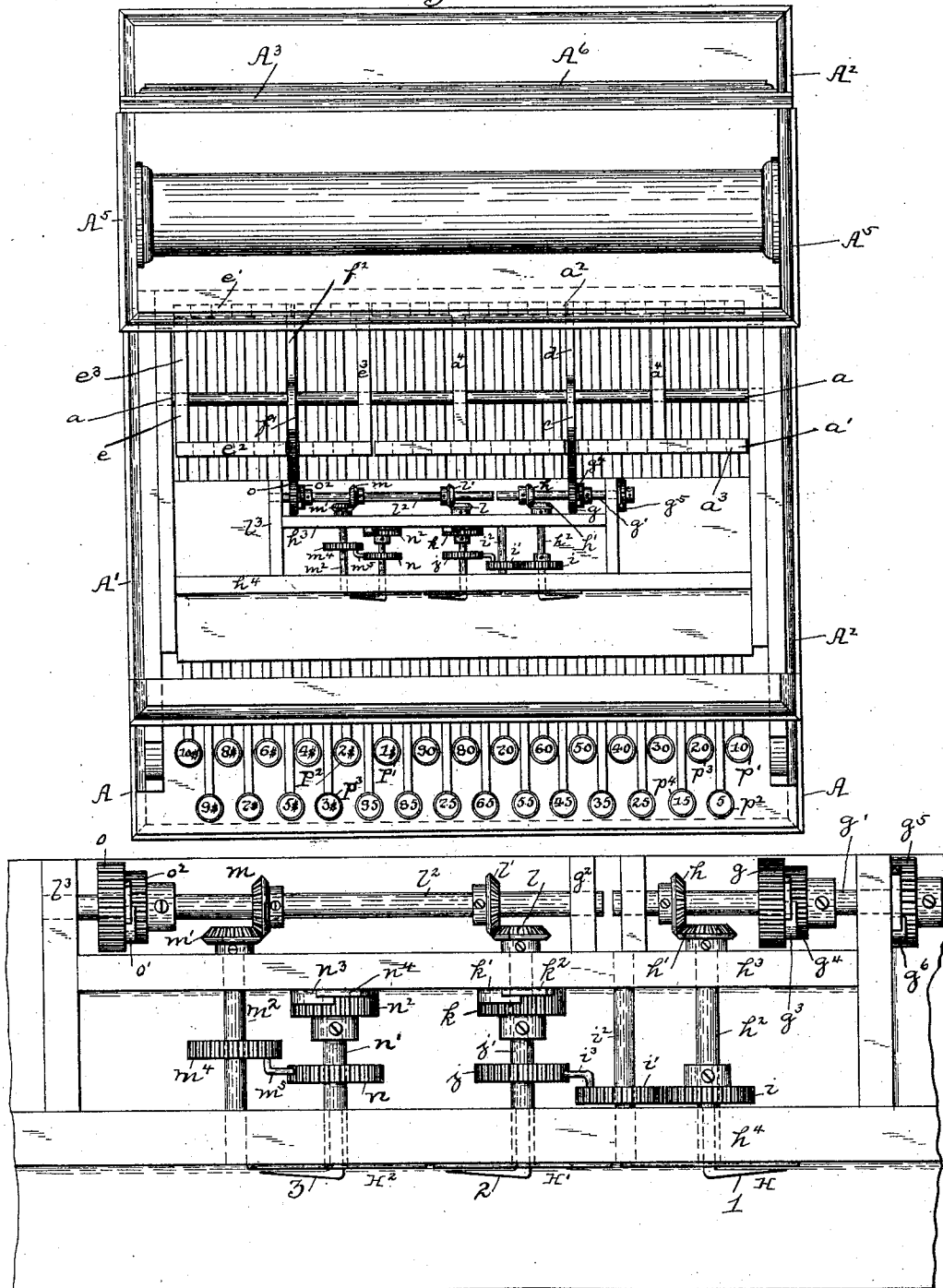
Inventor:  
John J. Lawrence Jr.  
By Kay, Tatten & Cooke  
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J. J. LAWRENCE, Jr.  
CASH REGISTER AND INDICATOR.

No. 556,756.

Patented Mar. 24, 1896.

Fig. 2.



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Fig. 2.

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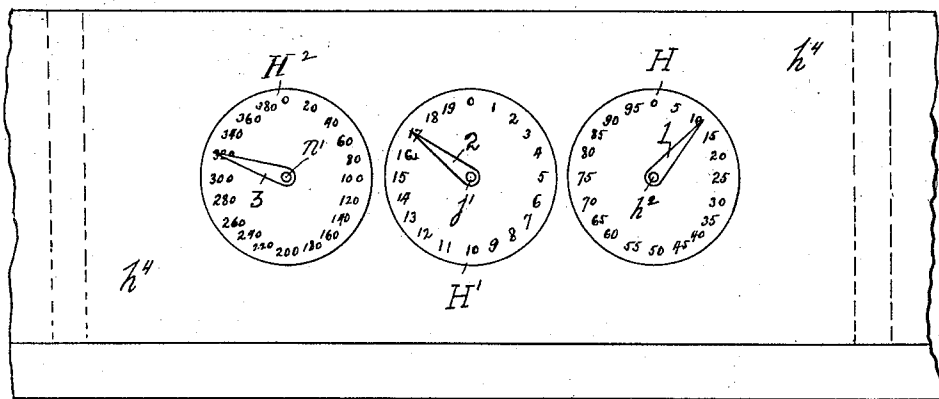
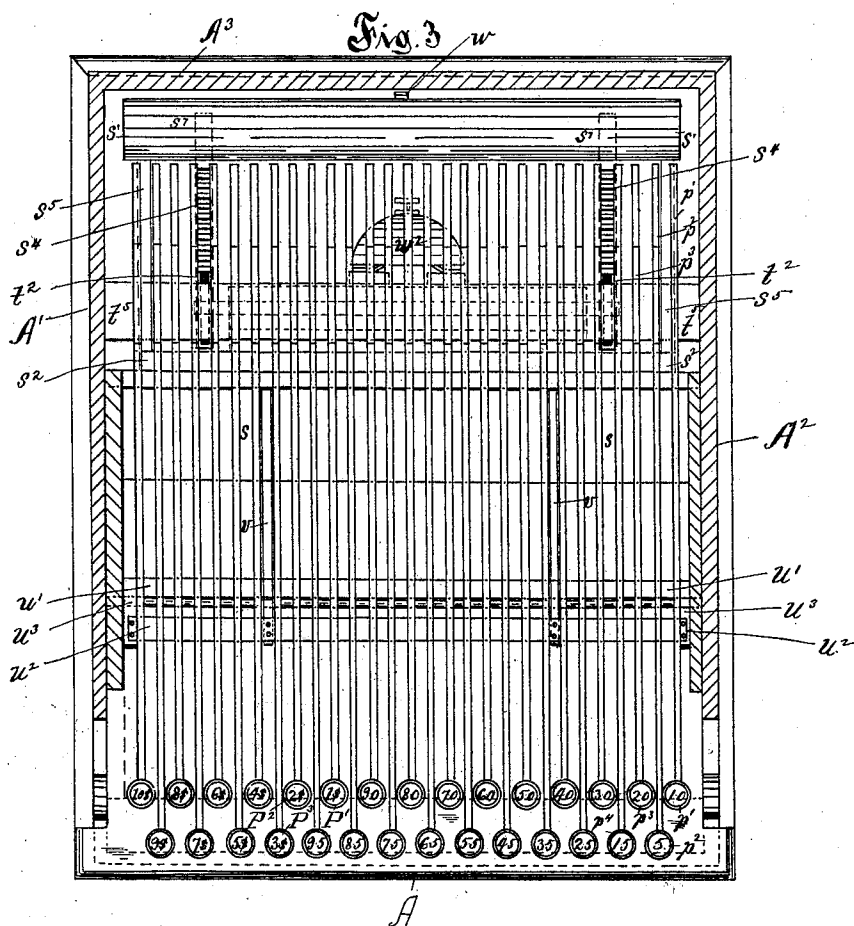
(No Model.)

5 Sheets—Sheet 3.

J. J. LAWRENCE, Jr.  
CASH REGISTER AND INDICATOR.

No. 556,756.

Patented Mar. 24, 1896.



Witnesses  
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Fig. 8.

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(No Model.)

5 Sheets—Sheet 4.

J. J. LAWRENCE, Jr.  
CASH REGISTER AND INDICATOR.

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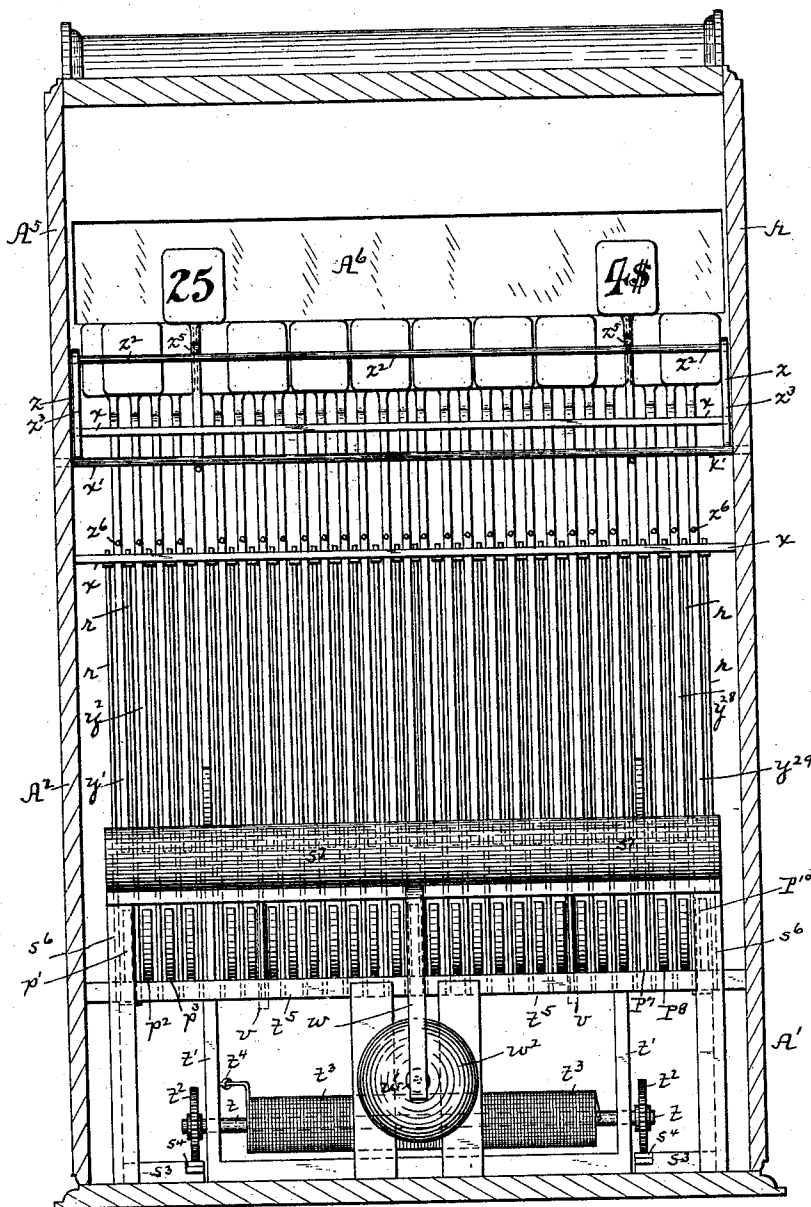


Fig. 4.

Witnesses:

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Wm. J. Hartman

Inventor

John J. Lawrence Jr.

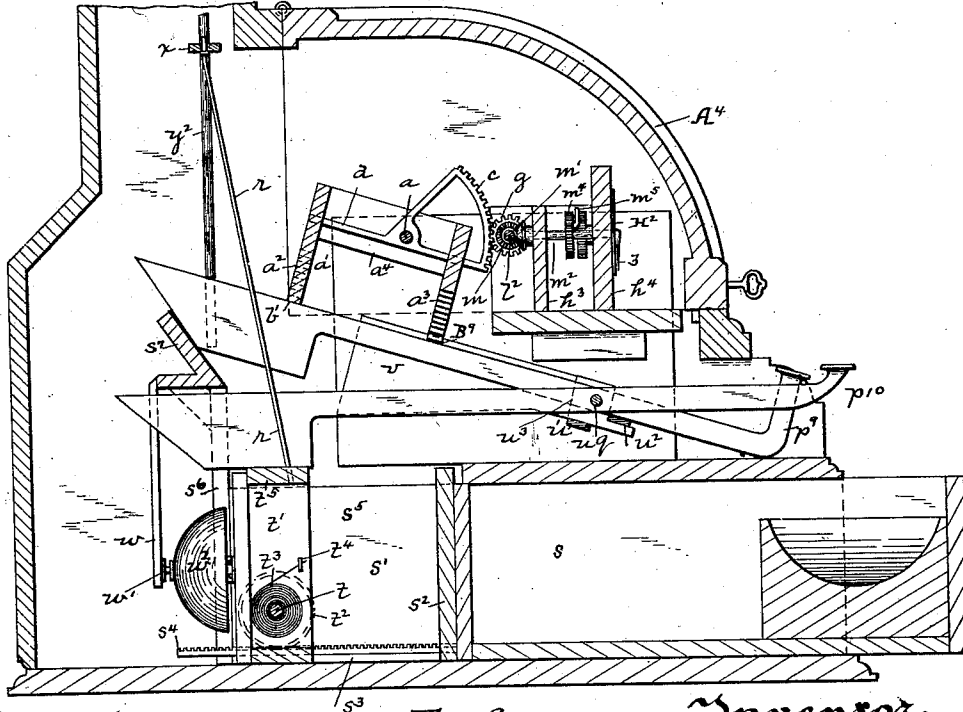
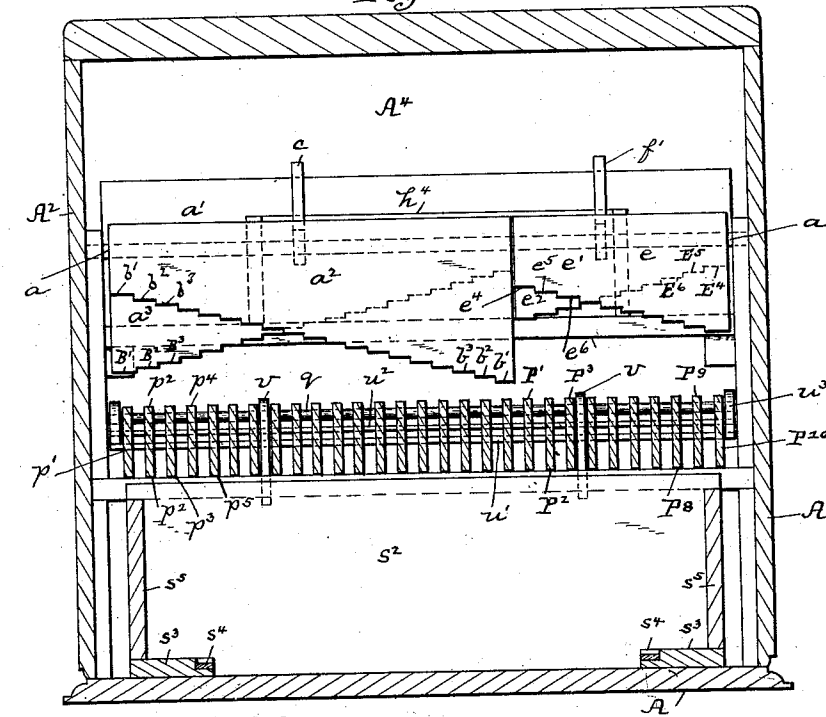
By Ray, Tatten & Cooley  
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CASH REGISTER AND INDICATOR.

No. 556,756.

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Fig. 5.



Witnesses:  
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Fig. 6.

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# UNITED STATES PATENT OFFICE.

JOHN J. LAWRENCE, JR., OF PITTSBURG, PENNSYLVANIA.

## CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 556,756, dated March 24, 1896.

Application filed November 29, 1892. Serial No. 453,470. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. LAWRENCE, JR., a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Cash Registers and Indicators; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to what are commonly termed "cash registers or indicators," its object being to construct a simple form of apparatus which is free from the complicated mechanism and multiplication of parts which mark the machines now in use, and which not only increase their cost, but also their liability to get out of order.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of my improved cash-register. Fig. 2 is a top view of same with the cover removed. Fig. 3 is a top view with the recording apparatus removed and showing the operation of the levers and drawer. Fig. 4 is a rear view. Fig. 5 is a section on the line 5 5, Fig. 1, showing the construction of the tilting frame. Fig. 6 is a central sectional side elevation showing the position of the tilting frame with one of the keys depressed. Fig. 7 is an enlarged plan view of the gearing mechanism which operates the registering-dials. Fig. 8 is a face view of the dials. Fig. 9 is an enlarged sectional view of the card-releasing device, and Fig. 10 is an enlarged sectional view of the tilting frame and recording mechanism.

Like letters and figures indicate like parts in each of the views.

The box or casing which incloses the mechanism may be formed of wood or metal, as desired, and it consists of the base-plate A, the ends A' A<sup>2</sup>, the rear plate A<sup>3</sup>, and the hinged cover or lid A<sup>4</sup>, which is preferably curved to add to the appearance of the apparatus, and by which access is obtained to the working parts of the same. Secured in the ends A' A<sup>2</sup> of the box and extending longitudinally thereof is the shaft a, and loosely secured to said shaft is the tilting frame a'. The said tilting frame a' consists of the parallel bars a<sup>2</sup> a<sup>3</sup>, connected by suitable cross-braces a<sup>4</sup>,

the bar a<sup>2</sup> having the steps or gradations b' b<sup>2</sup> b<sup>3</sup> b<sup>4</sup>, &c., formed thereon and beginning at the left-hand end thereof, as viewed from the rear on the section 5 5, as clearly illustrated in Fig. 5. The bar a<sup>3</sup> of the tilting frame a' has the steps or gradations B' B<sup>2</sup> B<sup>3</sup>, &c., but said bar a<sup>3</sup> is arranged with the narrowest portion of said bar a<sup>3</sup> opposite to the widest portion of the bar a<sup>2</sup>, and vice versa, in order that the operating-levers may only tilt the frame a' sufficiently to register the desired amount, as will fully appear in the description of the operation of the register hereinafter set forth. To further provide for the tilting of the frame a' to a sufficient degree to operate the gearing mechanism connected thereto, the said frame is preferably secured to the shaft a in such position that said shaft will pass through said frame at points slightly off a central line passing longitudinally thereof, whereby a greater tilting action can be imparted to said frame. Secured to the shaft a is the toothed sector c. To further support said toothed sector c, it may be formed with an arm d secured to the bar a<sup>2</sup> of the tilting frame. The bar a<sup>3</sup> of said tilting frame is provided with the slot d' adapted to receive a portion of the toothed sector c. It is apparent that the tilting frame may be constructed in different ways without departing from the spirit of my invention, and that it may be made larger or smaller, according to the size of the machine.

A second tilting frame, e, is mounted on the shaft a, and, as in the case of the tilting frame a', said frame is loosely mounted on said shaft, so that it may be tilted independently of any like movement on the part of the tilting frame a', for the purpose more fully hereinafter set forth. This second tilting frame, e, is similar in construction to the tilting frame a', but is usually made of shorter length, as it operates to register "dollars," while the tilting frame a' operates to register "cents" in the ratio of fives. Accordingly said tilting frame e is formed of the bars e<sup>1</sup> e<sup>2</sup>, connected by cross-arms e<sup>3</sup>, the said bar e<sup>1</sup> having the steps or gradations e<sup>4</sup> e<sup>5</sup> e<sup>6</sup>, &c., and the bar e<sup>2</sup> having the steps or gradations E<sup>4</sup> E<sup>5</sup> E<sup>6</sup>, &c., all arranged in the same manner as the tilting frame a'. There is also a toothed sector f' mounted loosely upon the

shaft *a* and secured by the arm *f*<sup>2</sup> to the frame *e*. Further, said frame *e* is mounted on the shaft *a* on a line slightly off a central line passing longitudinally of said frame, for the purpose hereinbefore set forth.

The toothed sector *c* is adapted to mesh with a gear-wheel *g*, mounted loosely on the shaft *g*<sup>1</sup>, said shaft being journaled in suitable standards erected within the box or casing.

In order to turn the shaft *g*<sup>1</sup> to operate the registering mechanism, as hereinafter set forth, said gear-wheel *g* is provided with a pawl and ratchet *g*<sup>3</sup>, adapted to engage the ratchet-wheel *g*<sup>4</sup>, secured to the said shaft *g*<sup>1</sup>, whereby upon the revolution of said gear-wheel *g* in one direction the pawl will turn the ratchet-wheel *g*<sup>4</sup> and the shaft *g*<sup>1</sup>, but upon the revolution of said gear-wheel *g* in an opposite direction the said pawl will pass over the teeth of said ratchet-wheel without turning the shaft *g*<sup>1</sup>. An additional ratchet-wheel, *g*<sup>5</sup>, is secured to the end of the shaft *g*<sup>1</sup> with the ratchet-and-pawl device *g*<sup>6</sup>, whereby said shaft *g*<sup>1</sup> is permitted to turn in one direction.

A bevel-pinion *h* on said shaft *g*<sup>1</sup> meshes with a bevel-pinion *h*<sup>2</sup> on the shaft *h*<sup>2</sup>, which is journaled in the standard *h*<sup>3</sup>, and the plate *h*<sup>4</sup>, carrying the registering-dials II II' II<sup>2</sup>. On the outer end of the shaft *h*<sup>2</sup>, adjacent to the inner face of the plate *h*<sup>4</sup>, is secured the gear-wheel *i*, adapted to mesh with a gear-wheel *i*<sup>1</sup>, mounted loosely on the stud *i*<sup>2</sup> projecting between the standards *h*<sup>3</sup> and *h*<sup>4</sup>. This gear-wheel *i*<sup>1</sup> is provided with a rigid pawl or finger *i*<sup>3</sup>, which is adapted upon each complete revolution of the gear-wheel *i*<sup>1</sup> to engage with a gear-wheel *j*, rigidly secured to a shaft *j*<sup>1</sup>, and impart a partial revolution thereto. The shaft *j*<sup>1</sup> is journaled in the plate *h*<sup>4</sup> and in the standard *h*<sup>3</sup>. Back of the gear-wheel *j* is the ratchet-wheel *k*, secured to the shaft *j*<sup>1</sup>. A ratchet *k*<sup>1</sup> engages with said ratchet-wheel *k* and is held in engagement therewith by means of the spring-arm *k*<sup>2</sup>, whereby said ratchet-wheel is only permitted to move in one direction. On the inner end of the shaft *j*<sup>1</sup> is the bevel-pinion *l*, adapted to mesh with a bevel-pinion *l*<sup>1</sup>, secured to the shaft *l*<sup>2</sup>, said shaft being journaled in suitable bearings in the standards *g*<sup>2</sup> and *l*<sup>3</sup>. A similar bevel-pinion, *m*, secured to the said shaft *l*<sup>2</sup>, meshes with a bevel-pinion *m*<sup>1</sup> on the shaft *m*<sup>2</sup>, said shaft being journaled in the standard *h*<sup>3</sup> and the plate *h*<sup>4</sup>.

Rigidly secured to the shaft *m*<sup>2</sup> is the wheel *m*<sup>4</sup>, provided with the rigid finger *m*<sup>5</sup>, which is adapted upon each complete revolution of the wheel *m*<sup>4</sup> to impart a partial revolution to the gear-wheel *n* secured to the shaft *n*<sup>1</sup> journaled in the standard *h*<sup>3</sup> and plate *h*<sup>4</sup>. To prevent any backward movement on the part of said gear-wheel *n* and the shaft *n*<sup>1</sup>, a ratchet-wheel *n*<sup>2</sup> is secured to said shaft, with which the ratchet *n*<sup>3</sup> engages, held in position by the spring-arm *n*<sup>4</sup>. Finally a gear-wheel *o* on the shaft *l*<sup>2</sup> meshes with the toothed sector *f*<sup>1</sup> on the tilting frame *e*. Said gear-wheel *o* is pro-

vided with the pawl and ratchet *o*<sup>1</sup>, adapted to engage the ratchet-wheel *o*<sup>2</sup> secured to the shaft *l*<sup>2</sup>. This completes a description generally of the gearing mechanism operated by the tilting frame and through which the registering on the dials is accomplished. In the description of the operation of the machine, hereinafter set forth, the purpose of such gearing mechanism will be clearly apparent when taken with the other parts of the apparatus.

The dials II II' II<sup>2</sup> have been referred to and said dials may be constructed of any suitable material and the numbering on the faces of said dials will correspond to the number of keys and the registering capacity of the device. The shafts *h*<sup>2</sup> *j*<sup>1</sup> *n*<sup>1</sup> may be termed the "index-shafts," as it is to the ends of said shafts that the index-fingers 1 2 3 are secured. As I have illustrated my invention in connection with a register having three dials, the first dial, II, is for registering cents and is divided into twenty parts, numbered 0 5 10 15 20, &c., up to 95; the dial II' is for registering dollars and is numbered 0 1 2 3 4 5, &c., up to 19; and the dial II<sup>2</sup> is also arranged to register dollars, but it may more properly be termed the "adding-dial," as it sums up the amounts registered by the dials II and II'. As the dial II' is capable of registering up to twenty dollars, when that amount has been registered on said dial the index-finger on the dial II<sup>2</sup> will move from 0 to 20, and accordingly said dial is marked 0 20 40 60 80, &c., up to 380.

In order to operate the tilting frames *a*<sup>1</sup> and *e*, levers *p*<sup>1</sup> *p*<sup>2</sup> *p*<sup>3</sup> *p*<sup>4</sup> *p*<sup>5</sup>, &c., and levers *P*<sup>1</sup> *P*<sup>2</sup> *P*<sup>3</sup>, &c., are employed respectively. The said levers *p*<sup>1</sup> *p*<sup>2</sup> *p*<sup>3</sup> *p*<sup>4</sup>, &c., are arranged on the shaft *q* journaled in the ends *A*<sup>1</sup> *A*<sup>2</sup> of the box or casing. The number of the levers *p*<sup>1</sup> *p*<sup>2</sup> *p*<sup>3</sup> *p*<sup>4</sup>, &c., and *P*<sup>1</sup> *P*<sup>2</sup> *P*<sup>3</sup>, &c., corresponds to the number of the steps or gradations *b*<sup>1</sup> *b*<sup>2</sup> *b*<sup>3</sup>, &c., *B*<sup>1</sup> *B*<sup>2</sup> *B*<sup>3</sup>, &c., and *e*<sup>1</sup> *e*<sup>2</sup> *e*<sup>3</sup>, &c., *E*<sup>1</sup> *E*<sup>2</sup> *E*<sup>3</sup>, &c., on the tilting frames *a*<sup>1</sup> and *e*, respectively, and each lever engages with two of said steps. For instance, the lever *p*<sup>1</sup> engages with the steps *b*<sup>1</sup> *B*<sup>1</sup>, the lever *p*<sup>2</sup> with the steps *b*<sup>2</sup> and *B*<sup>2</sup>, and so on throughout the series, and likewise the lever *P*<sup>1</sup> with the steps *e*<sup>1</sup> *E*<sup>1</sup>, and so on in the same manner. In order to hold each lever in position, so that it will always engage with its corresponding steps or gradations on the tilting frames, guides *r* are provided for each lever. The outer ends of said levers *p*<sup>1</sup> *p*<sup>2</sup> *p*<sup>3</sup> *p*<sup>4</sup>, &c., are provided with suitable keys marked 5 10 15 20 25, &c., while the levers *P*<sup>1</sup> *P*<sup>2</sup> *P*<sup>3</sup>, &c., are provided with similar keys marked \$1 \$2 \$3 \$4 \$5, &c.

The drawer *s* for containing the cash fits in the lower part of the box or casing and is adapted to slide to and fro in suitable guides. Back of said drawer *s* is the carriage *s*<sup>1</sup>, which is adapted to exert sufficient force against the back of said drawer to open the same. This carriage *s*<sup>1</sup> consists of the bar *s*<sup>2</sup> normally in contact with the back of the drawer, the

guide-bars  $s^3$  resting on the base A of the box or casing, the rack-bars  $s^4$  secured to said guide-bars, the end pieces  $s^5$  and the standards  $s^6$ , which support the locking-bar  $s^7$ , whose particular function will more fully hereinafter appear. In order to operate the carriage  $s'$  so that sufficient force will be imparted to it to open the drawer, a shaft  $t$  is journaled in suitable standards  $t'$  in the rear of the box or casing, said shaft having mounted on the ends thereof the toothed wheels  $t^2$ , adapted to mesh with the rack-bars  $s^4$  on the carriage  $s'$ . A coiled spring  $t^3$  is wound about the said shaft  $t$ , said spring being secured at one end to the said shaft and at the other end to a fixed support, such as the bar  $t^4$ . This spring  $t^3$  must be of sufficient strength to drive forward the carriage  $s'$  with force enough to open the drawer, and as said drawer may often contain a great deal of coin it may be necessary from time to time to increase the impelling force of said carriage. Accordingly the shaft  $t$  may be made to extend beyond the end wall A' of the box or casing, where it can be provided with a key or handle for winding up the spring  $t^3$  to obtain the necessary increase of power to open the drawer.

As hereinbefore mentioned, the carriage  $s'$  supports the locking-bar  $s^7$ , said locking-bar acting to lock the remaining levers  $p' p^2 p^3$ , &c., and  $P' P^2 P^3$ , &c., after one of said levers has been operated in registering the amount of a purchase, whereby only one lever can be operated at a time and no opportunity is given to register falsely. This locking-bar  $s^7$  is supported on the carriage  $s'$  at an inclination in order to correspond with the inclined ends of the levers  $p' p^2 p^3$ , &c., and  $P' P^2 P^3$ , &c., said levers being provided with inclined ends in order to permit of the advance of the locking-bar with the carriage, for otherwise, if said levers were formed with square ends, it would be necessary to provide for the raising of the inner ends of said levers to a greater height to give the required clearance, and this could only be accomplished by increasing the length of said levers and the size of the machine. The inner ends of the levers  $p' p^2 p^3$ , &c., and  $P' P^2 P^3$ , &c., rest upon the supporting-bar  $t^5$ .

In order to retain the drawer  $s$  normally in its closed position, a rocking frame  $u$  is mounted on the shaft  $q$ , said rocking frame consisting of the bars  $u' u^2$ , connected by the rockers  $u^3$ , through which the shaft  $q$  passes. A dog or detent  $v$  is secured to the rocking frame  $u$  and the shaft  $q$ , said dog or detent extending rearwardly therefrom and engaging with the back wall of the drawer  $s$ , whereby the impelling force of the carriage  $s'$  is counteracted and the drawer is held in its closed position until the dog or detent  $v$  is released upon the depression of one of the key-levers  $p' p^2 p^3$ , &c., and  $P' P^2 P^3$ , &c., as will more fully hereinafter appear.

The carriage  $s'$  carries a suitable striker  $w$ , which is adapted upon the advance of the carriage to impinge the knob  $w'$  of a suitable gong or bell  $w^2$ , secured in any convenient manner within the box or casing.

The rear portion of the box or casing is elevated above the main portion in order to provide for the exposing of the cards containing the amount of the last purchase, which is generally one of the functions performed by these cash-registers. Horizontal bars  $x$  are arranged the one above the other, said bars being supported by the standards  $A^5$  of the box or casing, and having formed therein at regular intervals a series of openings  $x'$ , the position of the openings in the upper bar coinciding with those of the lower bar. Rods  $y' y^2 y^3$ , &c., are adapted to enter the openings  $x'$  and move readily up and down therein, a number of said rods corresponding to the number of the key-levers  $p' p^2 p^3$ , &c., and  $P' P^2 P^3$ , &c., and the lower end of each rod  $y' y^2 y^3$ , &c., is arranged to be engaged by the inner end of the corresponding key-lever, whereby upon the elevation of the inner end of one of said levers the corresponding rod will likewise be elevated. The upper end of each rod  $y' y^2 y^3$ , &c., carries a card or check, of any suitable material, bearing a number on it corresponding to the number on the key of the lever which operates said rod.

As hereinbefore mentioned, in cash-registers of this class it is customary to expose to view a card or check bearing the amount of the last purchase, and this card or check remains in full view until another purchase is made, when, upon striking another key to register the amount, the first-mentioned card or check drops out of sight and a different card or check is thrown into full view, having a different amount thereon. In this manner the amount of each purchase is always exposed to the purchaser, and the amount of the last purchase is always known. In order, therefore, to provide for the lowering of the exposed card or check upon the elevating of another which indicates the amount of the next purchase, a tilting frame  $z$  is journaled in the standards  $A^5$ , said frame comprising the rods  $z' z^2$  joined at their ends by the cross-pieces  $z^3$ . The tilting frame  $z$  extends above the upper one of the bars  $x$  and is normally slightly tilted toward said bars  $x$ , the amount of the tilting action of said frame being regulated by the stops or pins  $z^4$  on the standards  $A^5$ . The rods  $y' y^2 y^3$ , &c., are formed with the inclined lugs  $z^5$ , which project toward the tilting frame  $z$ , so that upon the elevation of the rods  $y' y^2 y^3$ , &c., through the levers  $p' p^2 p^3$ , &c., and  $P' P^2 P^3$ , &c., the inclined faces of said lugs will come in contact with the upper rod,  $z^2$ , of the tilting frame  $z$  and throw back said frame until said lugs pass above said rod  $z^2$ , when the tilting frame will resume its normal position of inclination. In this manner, with the lugs  $z^5$  resting upon the

upper rod,  $z^2$ , of the tilting frame, the said rods  $y' y^2 y^3$  are supported in their elevated position.

In order to lower the rods  $y' y^2 y^3$ , &c., said rods are provided with the studs or pins  $z^6$ , which upon the raising of said rods are adapted to come in contact with the lower rod,  $z'$ , of the tilting frame  $z$ . Although the lugs  $z^5$  act to tilt the frame  $z$ , yet the pins  $z^6$  further insure such a result. This will act to throw back the upper rod,  $z^2$ , of said frame and disengage said rod  $z^2$  from the rods  $y' y^2 y^3$ , supported by the lugs  $z^5$ , whereby said rods  $y' y^2 y^3$  will drop of their own accord to their original positions. The cards or checks on the rods  $y' y^2 y^3$ , &c., are arranged to overlap each other when in their lowered position, in order that they may be compacted within a smaller space.

The elevated portion of the box or casing is provided on its front and back face with the opening  $A^6$ , which may be covered with glass, and through which the cards or checks when raised are exposed to full view.

Having described the several parts which comprise my improved cash-register, I will now describe the manner in which they operate in conjunction with each other.

If a purchase amounting to five cents has been made, and it is desired to register that amount, the operator strikes the key 5, which acts to lower the outer end of the lever  $p'$  attached thereto and elevate the inner end thereof. The inner end of said lever  $p'$ , traveling in its corresponding guide, first comes in contact with the step or gradation  $b'$  on the tilting frame  $a'$  with sufficient force to tilt forward said tilting frame  $a'$  until the said lever also comes in contact with the step  $B'$ , as shown in Fig. 6, whereupon, the lever  $p'$  being in contact with the steps  $b' B'$  of said tilting frame  $a'$  on different sides of the shaft  $a$ , said tilting frame is not free to tilt further. The lever  $p'$  is thus arranged to come in contact with the second step,  $B'$ , when the tilting frame  $a'$  has tilted sufficiently to move the index-finger 1 the proper distance over the face of the dial II, as will presently appear. As the teeth of the sector  $c$  mesh with the gear-wheel  $g$ , it is at once apparent that as said tilting frame tilts forward said sector will impart a partial revolution to said gear-wheel  $g$ . The amount of this revolution of the gear-wheel  $g$  is predetermined by the distance between the numbers on the dial II, it being necessary to impart sufficient movement to said gear-wheel to move the index-finger of the dial II from 0 to 5. Accordingly as said gear-wheel revolves the ratchet-wheel  $g'$  also revolves, together with the shaft  $g'$  and the bevel-pinion  $h$ . Through the bevel-pinion  $h$  and like pinion  $h'$  on the shaft  $h^2$  the index-finger 1 will move from 0 to 5 over the face of the dial II. At the same time the gear-wheel  $i$  on the shaft  $h^2$  imparts a partial revolution to the gear-wheel  $i'$  on the stud  $i^2$ .

Simultaneous with the operation of the reg-

istering mechanism just described, as the inner end of the key-lever  $p'$  rises the corresponding rod  $y'$  in contact therewith is elevated until the inclined lug  $z^5$  thereon passes beyond the upper rod,  $z^2$ , of the tilting frame  $z$  when the card or check carried thereby and bearing the figure 5 appears in full view at the opening  $A^6$  of the box or casing. In like manner simultaneously with the depression of the key 5 the rocking frame  $u$  will be tilted forward, thereby releasing the dog or detent  $v$  carried by said rocking frame. Upon the release of the said dog or detent  $v$  the carriage  $s'$ , impelled by the spring  $F^3$ , will advance, the toothed wheels  $t^2$  engaging with the rack-bars  $s'$  on said carriage and will force out the drawer  $s$ . As the carriage  $s'$  advances, the locking-bar  $s^7$  carried thereby likewise advances and passes over the remaining key-levers  $p^2 p^3 p^4$ , &c., and  $P' P^2 P^3$ , &c., so that any attempt to depress another lever while the lever  $p'$  is depressed is impossible. As the further upward movement of the rear end of said lever is prevented by the said lever being in contact on both sides of the shaft  $a$  with the steps  $b' B'$  of the tilting frame  $a'$ , it is thus apparent that said key is locked against any movement until the drawer is closed, and it is impossible to depress it further to register a greater amount than it represents. At the same time as the carriage  $s'$  advances the striker  $w$  comes in contact with the knob  $w'$  of the gong or bell  $u^2$  with sufficient force to sound said gong or bell and to indicate that the drawer has been opened. The operator then deposits the coin in the drawer, and having taken therefrom, if necessary, the correct amount of change closes the drawer. As the carriage  $s'$  recedes and resumes its former position, the locking-bar  $s^7$  releases the key-levers  $p^2 p^3 p^4$ , &c., and  $P' P^2 P^3$ , &c., and permits the inner end of the key-lever  $p'$  to descend to its normal position with relation to the other key-levers. The rod  $y'$ , however, which was elevated by the depression of the key 5, remains in its elevated position, the lug  $z^5$  thereon having passed above the upper bar,  $z^2$ , of the tilting frame  $z$  and acting to support said rod in its elevated position by engaging with said bar  $z^2$ . In this manner provision is made for exposing to view, even after the lever  $p'$  has resumed its normal position, the card or check bearing the amount of the purchase last registered.

If the next purchase amounts to ten cents, the operator depresses the key 10, when the parts operate in the same manner as before, with the exception that the inner end of the lever  $p^2$  engaging with the step or gradation  $b^2$  will impart a greater tilting action to the tilting frame  $a$  than that imparted by the lever  $p'$  engaging with the step or gradation  $b'$ , the consequence being that the sector  $c$  will impart a greater movement to the gear-wheel  $g$  and it, through the mechanism described, a greater movement to the index-finger 1, whereby said finger will move over the face

of the dial H from 5 to 15. The depression of the key 10 will elevate the rod  $y^2$ , carrying the card or check bearing the amount of the purchase; but as said rod  $y^2$  is elevated the pin or stud  $z^6$  coming in contact with the lower rod,  $z'$ , of the tilting frame  $z$  will throw back the upper rod,  $z^2$ , thereof sufficiently to release the lug  $z^5$  on the rod  $y'$ , previously elevated, from engagement with said upper rod,  $z^2$ , whereby said rod  $y'$  descends of its own weight to its normal position. The lug  $z^5$  on the rod  $y^2$ , however, engages with the upper rod,  $z^2$ , and is held in its raised position with the card or check in full view.

15 If the next purchase amounts to twenty-five cents, upon depressing the twenty-five-cent key the inner end of the lever  $p^5$  will engage with the step or gradation  $b^5$ , whereupon the tilting frame  $a'$  will tilt sufficiently to cause the index-finger 1 to move over the face of the dial H from 15 to 40, while the check or card bearing the amount of the last purchase drops out of sight and the newly-registered amount appears in its place, as before described. In this manner the amounts from 25 five cents up to one dollar may be registered on the dial H. When the index-finger 1 has moved over the entire face of the dial H and arrived again at 0, the gear-wheel  $i'$ , which 30 is revolved by the gear-wheel  $i$ , will have made one complete revolution, whereupon the rigid finger  $i^3$ , carried by said gear-wheel  $i'$ , will engage with the teeth of the gear-wheel  $j$  and impart a partial revolution thereto sufficient to move the index-finger 2 over the face of the dial H' from 0 to 1, thereby indicating that amounts to the sum of one dollar have been registered on the dial H. In the same manner when the index-finger 1 has moved a 40 second time over the face of the dial H, the gear-wheel  $i'$  will again revolve sufficiently to move the index-finger 2 from 1 to 2 on the dial H' to indicate that amounts to the sum of two dollars have been registered on the dial 45 H. Thus by glancing at the dial H' the total amount registered is readily apparent.

I have confined the description of the operation of my improved register thus far to the registering of amounts from five cents up 50 to one dollar; but I will now proceed to describe its operation in the registering of amounts from one dollar up.

As pointed out in the description, the machine is provided with a second tilting frame, 55  $e$ , similar in construction to the tilting frame  $a'$ , but mounted loosely on the shaft  $a$ , so that it can be operated independently of the tilting frame  $a'$ . If the amount of the purchase is one dollar, the key carrying the mark of \$1 is depressed, whereupon the inner end of the lever  $P'$  will come in contact with the step or gradation  $e^4$  and operate to tilt said tilting frame  $e$ . This will cause the sector  $f$  to turn the gear-wheel  $o$  and through the 60 ratchet-wheel  $o^2$  the shaft  $l^2$ . Upon the revolution of the shaft  $l^2$ , the bevel-pinion  $l'$ , engaging with the bevel-pinion  $l$ , will turn the

shaft  $j'$ , whereby the gear-wheel  $j$  is revolved sufficiently to move the index-finger 2 from 0 to 1 over the face of the dial H'. The other 70 parts of the mechanism operate as before, and the rod  $y^2$  carrying the card or check bearing the mark \$1 will remain exposed to view until it is lowered by the registering of the next purchase. When the amounts registered on the dials H H' have reached a total 75 equal to twenty dollars, the wheel  $m^4$  will have made one complete revolution and the rigid finger  $m^5$  carried thereby will have imparted a sufficient movement to the gear-wheel  $n$  to move the index-finger 3 over the 80 face of the dial H<sup>2</sup> from 0 to 20.

By adding more tilting frames, similar in construction and manner of operation to those described, the machine may be made to register sums smaller than five cents or larger than twenty dollars, as may be desired.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cash-register, the combination with 90 a box or casing, of a tilting frame mounted therein, a series of key-levers adapted to engage with said tilting frame on different sides of the points where said frame is mounted, a dial, and connections from said tilting frame 95 to said register for operating the same, substantially as and for the purposes set forth.

2. In a cash-register, the combination with a box or casing, of a tilting frame mounted therein and composed of two parallel bars, 100 steps or gradations formed on said bars, the lowest step of one bar being in line with the highest step of the other bar, and vice versa, a series of key-levers adapted to engage with said steps on opposite sides of the points at 105 which said frame is mounted, a dial, and connections from said tilting frame to said register for operating the same, substantially as and for the purposes set forth.

3. In a cash-register, the combination with 110 a box or casing having the dials H H', the tilting frame  $a'$ , the main shaft  $g'$ , the toothed sector  $c$ , the gear-wheel  $g$  on said shaft  $g'$  meshing with the toothed sector  $c$ , the ratchet-wheels  $g^4$   $g^5$  and pawls and ratchets  $g^3$   $g^6$ , the 115 bevel-pinions  $h$   $h'$ , the shaft  $h^2$ , the gear-wheel  $i$  on said shaft  $h^2$ , the gear-wheel  $i'$  mounted loosely on the stud  $i^2$ , the finger  $i^3$ , the gear-wheel  $j$  adapted to be turned by said finger  $i^3$  upon a complete revolution of said 120 gear-wheel  $i$ , substantially as and for the purposes set forth.

4. In a cash-register, the combination with a box or casing having two dials H' H<sup>2</sup>, of a 125 tilting frame  $e$ , a main shaft  $l^2$  parallel therewith, the toothed sector  $f'$ , the gear-wheel  $o$  on said shaft  $l^2$  meshing with the toothed sector  $f'$ , the ratchet-wheel  $o^2$  and ratchet and pawl  $o'$  on said main shaft  $l^2$ , the bevel-pinion  $l'$  meshing with the bevel-pinion  $l$ , said 130 bevel-pinion being mounted on the index-shaft  $j'$ , the ratchet-wheel  $k$  on said shaft and the ratchet and pawl  $k'$   $k^2$ , the bevel-pinion  $m$  on the shaft  $l^2$ , a bevel-pinion  $m'$  on the

- shaft  $m^2$  adapted to mesh with said bevel-  
pinion  $m$ , a wheel  $m^4$  on said shaft  $m^2$ , the  
finger  $m^5$  on said wheel  $m^4$ , the index-shaft  
 $n'$ , the gear-wheel  $n$  on said shaft adapted to  
5 be turned by said finger  $m^5$  upon a complete  
revolution of said wheel  $m^4$ , the ratchet-wheel  
 $n^2$  on said shaft  $n'$ , and the ratchet and pawl  
 $n^3 n^4$ , substantially as and for the purposes  
set forth.
- 10 5. In a cash-register, the combination with  
a box or casing, of a drawer, a sliding spring-  
actuated carriage in the rear of said drawer,  
a releasing-dog for holding said drawer in  
its closed position, substantially as and for  
15 the purposes set forth.
6. In a cash-register, the combination with  
a box or casing, of a carriage in the rear  
thereof, rack-bars on said carriage, a spring-  
actuated shaft, toothed wheels on said shaft  
20 adapted to engage with said rack-bars, a  
drawer in the path of said carriage, a releas-  
ing-dog for holding said drawer in its closed  
position, substantially as and for the pur-  
poses set forth.
- 25 7. In a cash-register, the combination with  
a box or casing, of a drawer, a sliding spring-  
actuated carriage in the rear of said drawer,  
a locking device for holding said drawer in  
its closed position, key-levers for releasing  
30 said drawer, and a locking-bar carried by  
said carriage and adapted to lock the remain-

ing key-levers when the drawer is opened, sub-  
stantially as and for the purposes set forth.

8. In a cash-register, the combination with a  
box or casing, of a carriage in the rear thereof, 35  
rack-bars on said carriage, a shaft encircled  
by a coiled spring, said spring having one of  
its ends secured to said shaft and the oppo-  
site end to a permanent support, toothed  
wheels on said shaft adapted to engage with 40  
said rack-bars, a drawer in the path of said  
carriage and mechanism for releasing said  
drawer, substantially as and for the purposes  
set forth.

9. In a cash-register, the combination with 45  
a box or casing, of a tilting frame mounted  
therein, composed of two parallel bars, said  
bars being wider at one end than at the other,  
the wide end of one bar being opposite the  
narrow end of the other, and vice versa, a 50  
series of key-levers adapted to engage said  
bars on the opposite sides of the points at  
which said frame is mounted, a register, and  
connections from said tilting frame to said  
register for operating the same, substantially 55  
as set forth.

In testimony whereof I, the said JOHN J.  
LAWRENCE, Jr., have hereunto set my hand.  
JOHN J. LAWRENCE, JR.

Witnesses:

ROBT. D. TOTTEN,  
J. N. COOKE.