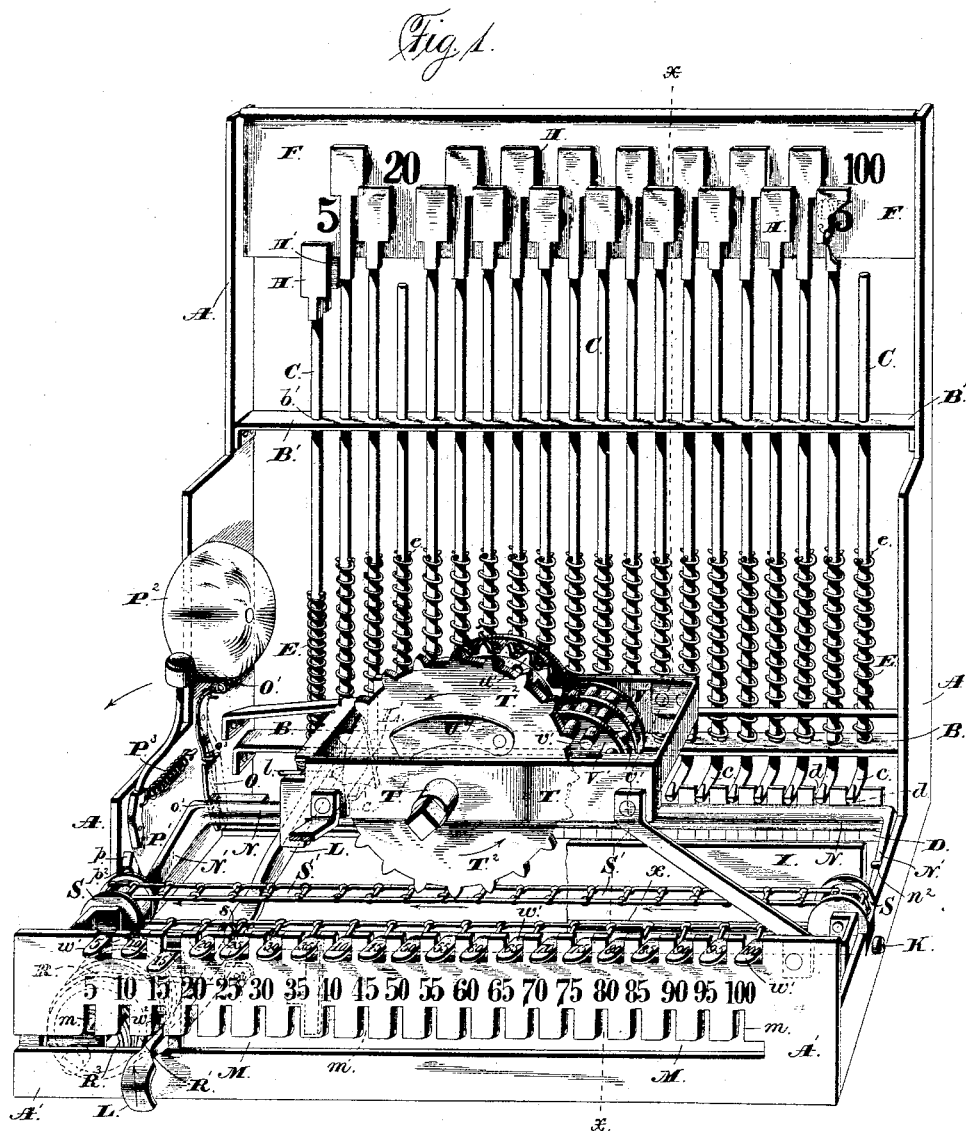


C. B. HOPKINS.

CASH REGISTERING AND INDICATING APPARATUS.

No. 384,692.

Patented June 19, 1888.



Witnesses:
Just C. Hutchinson
Henry C. Hazard

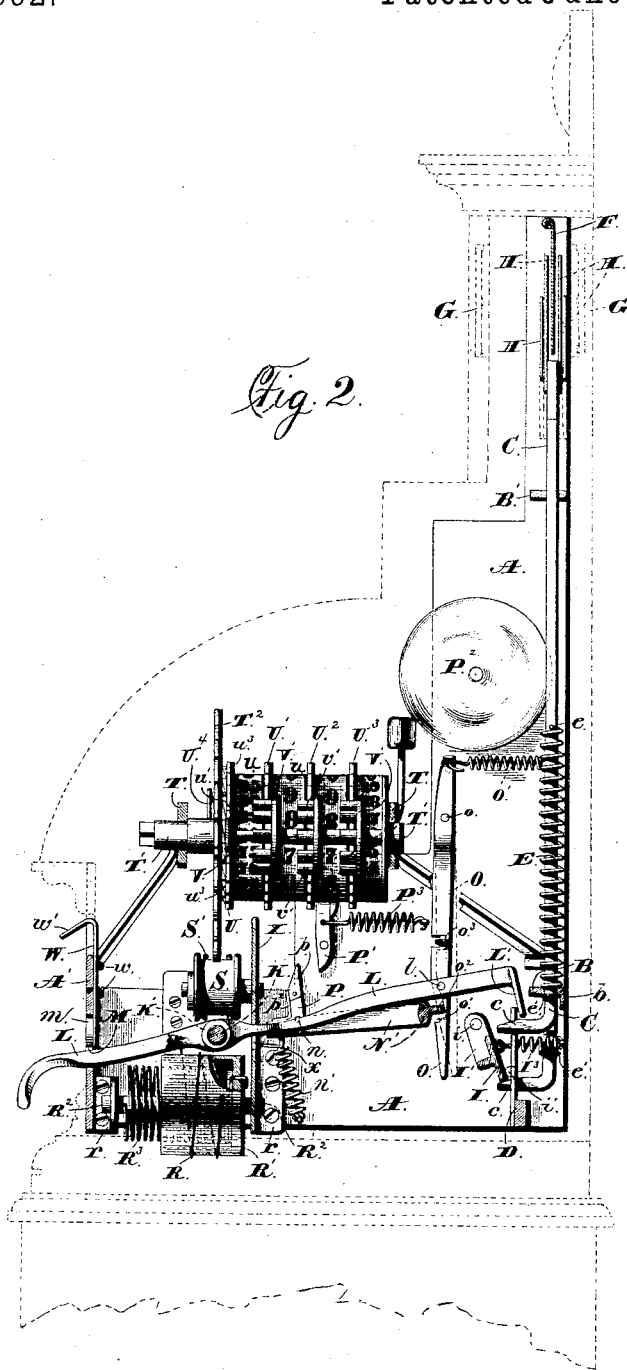
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Fig. 3.

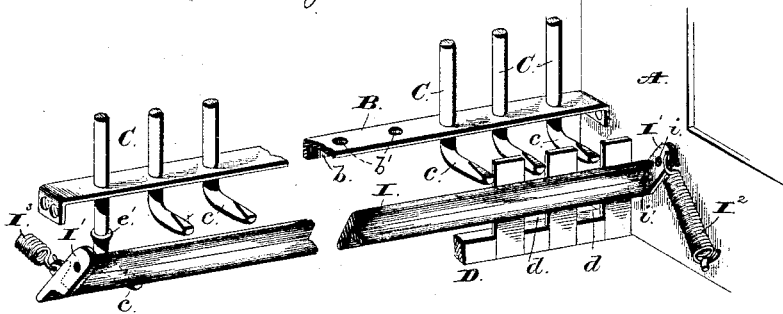


Fig. 5.

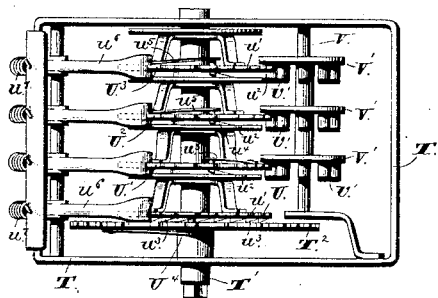


Fig. 6.

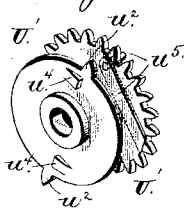
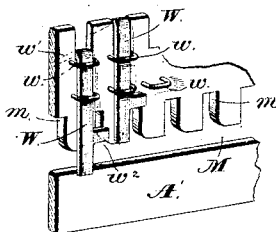


Fig. 4.



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UNITED STATES PATENT OFFICE.

CABEL B. HOPKINS, OF LOUISVILLE, KENTUCKY.

CASH REGISTERING AND INDICATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 384,692, dated June 19, 1888.

Application filed March 10, 1887. Serial No. 230,425. (No model.)

To all whom it may concern:

Be it known that I, CABEL B. HOPKINS, of Louisville, in the county of Jefferson, and in the State of Kentucky, have invented certain new and useful Improvements in Cash Registering and Indicating Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

10 Figure 1 shows a view in perspective of my indicating and registering mechanism with the casing removed; Fig. 2, a sectional view of the same, with the section taken on line *x* *x* of Fig. 1; Fig. 3, a detail perspective view of the swinging wing or catch for the indicator-rods; Fig. 4, a similar view of a portion of the slotted front or key plate and the sliding gages or stops on the back thereof; Fig. 5, a plan view of the registering mechanism, and Fig. 6 a detail perspective view of the second one of the series of registering-wheels.

Letters of like name and kind refer to like parts in each of the figures.

25 The object of my invention is to provide an improved cash registering and indicating apparatus; and to this end my invention consists in the apparatus and in the construction, arrangement, and combination of the parts and elements thereof, as hereinafter specified.

30 In the drawings, A A designate the upright sides of the frame which I provide for supporting the operative parts of my apparatus. Such frame is preferably of metal, and is made so that it can be bodily set into or removed from the inclosing-casing which may be used for the apparatus. With such construction and arrangement the various parts of the apparatus can be properly assembled within the frame before the latter is fastened in or inclosed by the casing. I have not shown any particular form of said casing, except in so far as is shown in Fig. 2 by dotted lines, for any desired form or kind of the same can be used without affecting the operative parts of the apparatus and without departure from my invention.

45 The frame-sides A A are connected at their front edges by the front plate, A', which forms the key plate or board of the apparatus. Extending across at the back of the frame, and attached at their ends to the frame-sides A A, are the two bars B B', one vertically above

the other. The lower one of these (the bar B) is preferably made in the form of an angle-bar, with a downwardly-extending flange or rib, *b*, at its rear side, though I do not limit myself to such form or construction.

In the bars B B' are corresponding series of holes or openings *b' b' b'*, those in bar B' being vertically opposite those in bar B. Extending through and guided in these openings in the two bars are the indicator rods or bars C C C, twenty in number, as shown in the drawings, but which can be increased or diminished in number, as desired, to suit any purpose. At their lower ends, below the guide-bar B, each of these rods is bent forward at a right angle to form the short forwardly-projecting arm *c*. Each of these arms projects forward into and is guided as the respective rod is raised or lowered by a slot, *d*, in a plate, D, which extends across within the frame and is at its end attached to the frame-sides A A. By the engagement of the slots *d d d* in plate D with the arms *c c c* on the indicator-rods C C the arms are kept projecting directly forward and the rods themselves are held from any axial rotation as they are moved up or down.

50 The guide-plate D can be made of a simple flat plate turned up on edge and slotted, as indicated in the drawings. It can be formed of a series of upright tongues or narrow plates extending upward from a bar which forms the base of the plate.

55 Around each rod C is a spiral spring, E, at its lower end resting on bar B, and at its upper end engaging a pin, *e*, on the rod. To limit the upward throw of the rods under stress of the springs, each rod is provided with a stop for engaging the under side of the bar B. Such stop I have shown in the form of a collar, *e'*; but it could, of course, be a pin or shoulder instead.

I do not intend to limit myself to the form of springs shown for holding the indicator-rods elevated and raising them again when depressed. Any desired form of spring for this purpose, engaging the rods in any desired way and at any point, can be used without departure from my invention.

100 Instead of using the slotted guide-plate D for preventing rotation of the rods C C, I contemplate making the rod-receiving openings *b'*

$b'b'$ in the bars $B B'$ square or angular in shape, and having the bars correspondingly shaped, so as to fit the openings.

Extending across the top of the frame directly over rods $C C$ is the plate F , attached at its opposite ends to the upper portion of the side frame-plates, $A A$. Upon the front and back of this plate are corresponding series of figures or numbers. Such numbers are made to indicate different amounts of cash from five cents up to one dollar, and each number is located above one of the indicator-rods. I have shown in the drawings twenty of these numbers, beginning on the left of the front of the plate with five, and from that increasing by five up to one hundred, or the dollar-mark at the right. On the rear side of the plate the numbers are correspondingly arranged, but increase from right to left as they are looked at from the rear of the apparatus.

The casing to be used for the apparatus is to have the usual display-openings across the front and rear of its upper portion, as indicated at G and G' in Fig. 2, and such display-openings are situated opposite the series of numbers on the plate F , so that when any of the numbers are uncovered they can be seen from outside of the casing.

I have shown the numbers on the plate not arranged in one line, but alternately above and below a certain horizontal line across the plate. The upper numbers are above or over the division lines or spaces between the lower numbers. This arrangement is mainly to economize space, and so that the numbers can be made large and plain without crowding them and without increasing the length of plate F and the width of the apparatus.

Upon the upper end of each of the indicator-rods C are two upright plates, $H H'$, extending up in front and rear, respectively, of the plate F , on which are the indicating or display numbers. These plates serve, as shown, to hide all of the numbers on the plate F when the rods are all in their elevated position. When any rod is depressed or drawn down, as described hereinafter, the numbers on the front and the back of the plate F corresponding to the rod will be uncovered, so that they can be seen through the display-openings at the front and the back of the casing. To catch and hold the arm c on any of the rods that may be depressed, I have provided the swinging plate I , extending across within the frame in front of the lower ends of the indicator-rods. This plate is at its ends supported by the arms $I' I'$, which are pivoted on pins or studs $i i$ on the frame-sides $A A$. To swing the lower edge of the plate rearward toward the indicator-rods, so that it will be in position to engage and be engaged by the arms $c c$ on the rods $C C$ when the latter are drawn down, I carry one of the arms $I' I'$ up above its pivot and attach to its upper end the spring I^2 , which at its other end is attached to the frame-side, as shown best in Fig. 3. If desired, the other arm I' can also be extended up above its

pivot, and a second spring can be attached to this arm to act upon it just as the spring already described does on the other arm; or, as indicated in the drawings, a spring, I^3 , can be attached to the rear side of the plate itself, so as to draw such plate rearward. Instead of a plate, as shown, with its supporting pivotal arms, obviously a simple bar supported upon pivotal arms somewhat longer than those shown can be used for the same purpose.

Stop-pins $i' i'$ serve to limit the rearward swing of the plate I , stopping it in such position that its lower edge normally stands under and to the rearward of the forward ends of arms $c c$.

Extending across near the front side of the frame and supported at its opposite ends in the frame-sides is the rod K , upon which is journaled the sleeve K' , free to slide and rotate on the rod. Attached to or carried by this sleeve is the lever L , whose forward end extends out through the longitudinal slot M in the front or key plate, A' , and is then turned downward, as shown, to form a finger-piece, by which the lever can be easily and conveniently engaged by the finger and moved along or raised. In the plate A' , and extending up from the upper side of slot M , are the vertical slots $m m m$ —one for each one of the indicator-rods. These slots, which, like the indicator-rods, are equidistant the one from the other, are designated by numbers marked on the plate, such numbers for the various slots corresponding with the numbers on plate F above the respective rods.

The rear end of lever L is provided with the downwardly-extending arm or plate L' , which, when the lever is moved along until its front end comes under one of the slots $m m$, will be directly over the arm c on the indicator-rod corresponding to the slot. If then the forward end of the lever be raised up in the slot m , the arm L' will engage and depress the arm c and draw the indicator-rod down so as to expose the number above the rod on plate F . As the arm c descends, its end engages the rear side of the wing or swinging pawl-plate I and swings such plate forward. As the arm passes down off of the plate, the latter, under stress of the springs $I^2 I^3$, swings rearward again over the arm in position to hold it depressed when it is released by the arm L' of the lever L . With this construction, obviously, when another indicator-rod is depressed so that its arm engages the wing or plate I and rides down over it, the arm c on the rod previously depressed and held down by the lower edge of the plate will be released by the forward swinging of the plate, and such rod will be thrown up again by its spring E .

On the left side of lever L , near its rear end, is the pin or stud l , for a purpose to be described.

Extending across the frame under the rear end of the lever L is the bar N , having at its ends the forwardly-extending arms $N' N'$, each pivoted on a stud, n , on the respective

frame-side. To these arms, forward of their pivotal points, are attached the springs $n' n'$, which are so attached to the frame-sides as to draw the forward ends of the arms downward to raise the bar N. A stop-pin, n^2 , is adapted to engage one of the arms N' and act as a stop to limit its upward swing. It is so situated as to stop the arm when the bar N has risen up to stand just below the rear end of the lever L when the latter is in its elevated position. Pivoted to the left side of the frame above the bar N is the pawl O, which is adapted to swing on its pivot o in a plane parallel to the frame-side. The lower portion, at least, of the pawl is made of spring material, so that its lower end normally stands out a short distance from the frame-side. On its front side, near its lower end, the pawl O is provided with a notch, o' , adapted to engage a lip or lug, o^2 , on the bar N. Below this notch the front side of the pawl is inclined downward and rearward, so that when the bar N has been depressed and rises again the lug o^2 thereon, engaging the incline on the pawl, will swing the pawl rearwardly. To swing the pawl forward again when the lug o^2 comes to the notch o' , I have provided the spring O' , attached to an arm of the pawl above its pivot. The lug o^2 is so situated on the bar N and is of such extent that when the lower spring end of the pawl stands out from the frame-side in the position which it normally would take the front edge of the pawl is in position to engage the rear side of the lug o^2 , as shown in dotted lines in Figs. 1 and 2.

Any pressure upon the inner side of the pawl O will swing it outward, so as to disengage its front edge from the lug. The pin l on the side of lever L is, as shown, in position to strike the pawl and spring it outward off of the lug o^2 .

To limit the outward springing as well as the forward swing of the lower end of the pawl O, I have provided the hook form of stop o^3 on the frame-side, as shown in the drawings, the main part of the hook being adapted to engage a notch on the front side of the pawl, and its outer part being turned rearward on the inner side of the pawl.

Projecting upward from the pivotal arm N' of the bar N, which is on the same side of the apparatus with pawl O, is the short arm or lug P, on which is pivoted the spring dog or pawl p . Such dog is beveled on the front side of its upper end, and is pivoted so as to be free to swing rearwardly but not forwardly on the lug P. A spring, p^2 , tends to hold it normally upright on the lug. Projecting into the arc of movement of the upper end of this dog as the bar N is lowered and raised is the lower end of the hammer-lever P' , pivoted to the frame-side, as shown, and carrying on its upper end a suitable striker for striking the bell P^2 . A spring, P^3 , draws the lever toward the bell to deliver a stroke thereon when the lever has been swung forward and released.

Attached to the lever L is the cord R, which

at its other end is attached to the rotary drum R' , journaled on the stationary shaft R^2 , supported in lugs $r r'$ on the frame-side. A spring, R^3 , attached at one end to the shaft and at the other to the drum, tends to rotate the drum, so as to wind the cord up thereon and draw the lever L and sleeve K' along to the left of the apparatus. With this construction, as the lever is moved to the right along slot M in plate A' , the cord is unwound from drum R' , and when the lever is released it will, by the stress of spring R^3 rotating the drum to wind up the cord, be drawn quickly back to the left end of the slot again. As the lever is thus returned to its starting-point, its pin or stud l engages the lower spring portion of the pawl O and forces it outward off of the rear edge of lug o^2 on the bar N.

I do not, of course, limit myself to the form of spring-drum and spring therefor as shown in the drawings. Any other form of the same or any other means for automatically returning the lever to its normal starting-point at the left side of the apparatus can be used without departure from my invention.

Where space would allow, a weighted cord could be attached to or connected with the drum, so as to rotate it in the same way as spring R^3 .

The operation of my apparatus, as far as described, is as follows: With the lever L in its normal position at the left of the apparatus and the lower spring end of pawl O resting against the end of lug o^2 on bar N, if an amount of cash—say seventy-five cents—is to be indicated, the lever is seized by the finger and moved along the slot M until it reaches the vertical slot m marked with the number 75. The key or handle end of the lever is then raised up into the slot. The rear end of the lever is thus depressed, and the arm thereon engages the arm c on the seventy-five-cent indicator-rod C, and carries such arm and rod downward, so that the plates H and H' on the upper end of the rod uncover the number 75 on the front and rear of plate F. As the rod is depressed, the forward end of its arm c rides down over the inclined rear side of the wing or swinging plate I and pushes the plate forward, as already described. As soon as the arm c passes down below the edge of the plate I, the latter is swung rearward quickly by its springs, so as to catch and hold the arm c down when the rear end of lever L is raised again. As the lever is operated to depress the indicator-rod, as just described, its rear end bears down the bar N, causing the dog p to draw back and release the bell-hammer lever to strike an alarm on the bell. As the bar N is thus swung down, the end of lug o^2 on it rides down over the inner side of pawl O until such a point of the incline on the lower portion of the pawl is reached that the lug end ceases to engage the pawl-side, and the pawl springs outward again behind the lug. When the depressed lever is released, the bar N, under the stress of its raising-springs $n' n'$, flies upward, raising the rear

end of the lever L, so as to swing its front end down out of slot *m*. The action of the spring-drum and cord then causes the lever to travel quickly back along the slot M to its starting position again. As the arm N rises, its lug *o*², engaging with its rear edge the front inclined edge of the lower end of pawl O, swings such pawl rearward until the notch is reached, when the pawl flies quickly forward and locks the bar in its elevated position by the engagement of the notch with the lug *o*². The pawl continues thus to lock the bar N until the lever L travels back to its starting-point, and the pin or stud on the lever strikes the inner side of the pawl and presses the latter outward beyond the end of the lug *o*² into its position as first set forth in the description of the operation. As the pawl is thus tripped from the lug *o*² only when the lever is moved clear back to its starting-point, obviously the lever cannot be actuated so as to draw down another indicating-rod before it is returned to its starting-point.

The arm L' on the lever is made of such length that the arm *c* on the indicator-rod engaged by it is carried clear below the lower edge of the wing or pawl-plate before the bell-striking mechanism is fully operated. This insures that the indicator-rod will be properly locked down when the lever has been actuated far enough to cause the alarm to be struck and is released. The lug *o*² on the arm N is so situated with reference to the notch *o*¹ on the pawl O that the notch engages the lug *o*² before the arm L' on the lever rises above the series of arms *c c*, so that the lever could be moved to one side or the other into position to depress another indicator-rod. With this construction, before the key-lever arm is raised into position to be moved over the arms *c c* on the indicator-rods, the bar N is locked, so as to prevent the rear end of the lever being depressed until the lever has been moved back to its starting-point again to cause the unlocking of the arm N, as described. As the key-lever must after each indication be returned to the same starting-point, it always has to travel a certain fixed distance in order to be in position to make a certain indication. As the numbered slots *m m* are equidistant from each other, the amount of travel of the lever to make any indication would, if measured or registered, clearly show what indication was made. I take advantage of this fact in the construction and arrangement of my registering devices, to be described.

Journalled in suitable supports on each frame-plate A A, directly above the end of the shaft K, upon which the key-lever sleeve slides and rotates, is a roller or pulley, S, preferably flanged, as shown. Over these two pulleys passes an endless chain, S', attached at *s* to the key-lever or its sleeve. With this construction the chain will obviously be drawn back and forth over the pulleys as the lever is moved back and forth along the rod K. Supported in bearings on a suitable frame, T, above the

chain S' is the fore-and-aft-extending shaft T', provided at its forward end for the reception of a key, for a purpose to be described. On this shaft is loosely journaled the toothed wheel T², whose teeth, corresponding in number to the number of indicator-rods, mesh with the links in the chain S'. The teeth on the wheel shown are twenty in number. As they are equidistant, the wheel will obviously be turned by the chain S' certain determined distances as the key-lever is moved into position to make the several indications. On the shaft T', in rear of wheel T², are several register-wheels, U, U', U², and U³. Of these the three U, U', and U² are loosely journaled upon, and the rear one, U³, is fixed to, the shaft. Each of these wheels has the plain cylindrical portion *u*, for receiving the series of register-numbers, and is provided with the series of teeth *u' u' u'*, twenty in number, as shown in the drawings. Such teeth are preferably situated around the forward edges of the cylindrical portion of the wheels, as shown. The wheel U is provided with a single tooth or projection, *u*², situated close to the teeth *u' u'* on the wheel next in rear of it. The wheels U' U² are each provided with two similarly-situated teeth, *u*² *u*², diametrically opposite each other. The front wheel, U, is, on its front side, close to the toothed disk or wheel T², provided with a series of ratchet-teeth, *u*³ *u*³, and the wheel T² is provided with a spring-pawl, U⁴, adapted to engage these teeth in such way as to cause the wheel U to turn with wheel T² as the latter wheel turns in the direction indicated by the arrow in Fig. 1. Such is the direction, obviously, in which the wheel T² is turned by the chain S' when the key-lever L is moved along into position to make an indication. As the lever returns and the chain and wheel T² are moved in the opposite direction, the pawl U⁴ rides over the ratchet-teeth *u*³ *u*³ without turning the wheel U. The wheel U is on its cylindrical portion provided with a series of numbers, beginning at five, and then increasing by five up to ninety-five. Beyond the ninety-five there is a cipher instead of the one-hundred mark, to agree with the indicating-numbers on plate F. On the wheels U' U² there are twenty numbers; but such numbers run increasing by one from 0 up to 9, and then, beginning again with 0, run up to 9 again. Upon the shaft V, parallel to the shaft T, are journaled the carrying-wheels V' V', having pins *v' v'*, which on each wheel mesh with the teeth on one of the wheels U' U² U³, and are adapted to be engaged by the tooth *u*² on the wheel next in front of the wheel with whose teeth they mesh. The numbers on the last or rear wheel, U³, run from 0 up to 19, consecutively. With this construction of register-wheels, for every complete turn of the wheel U, which represents one dollar, the next wheel, U', is turned one tooth. The wheel U' will thus register the dollars up to nine. When it is turned another tooth for the tenth dollar, its tooth or projection *u*² will en-

gauge the pins on the carrying-wheel V', and, turning this wheel, will turn wheel U' one tooth to register the number of ten dollars. The amounts to be registered will be thus carried from one wheel to the other, so that the entire amount indicated and registered can be read off at once. The wheel U will show the number of cents, the wheel U' the number of dollars below ten, the wheel U² the tens of dollars, and the wheel U³ the hundreds of dollars up to nineteen.

With the four register-wheels shown an amount of cash up to one thousand nine hundred and ninety-nine dollars and ninety-five cents can obviously be registered.

The zeros on the several wheels all have the same positions with relation to the single teeth *w*² *w*² on the wheels, and on each of the wheels coincident with each tooth *w*² thereon is the ratchet-shaped projection *w*⁴.

On each of the wheels U' U² U³, substantially on the same radius with the teeth *w*² *w*², is a spring-pawl, *w*⁵, for engaging the projection on U⁴, the wheel next in front. (See Figs. 5 and 6.)

The forward end of the shaft T' is made angular, as shown, to receive a setting-key, by which the shaft can be turned to revolve the wheel U³, fixed to it, forward. As the wheel is thus turned, its pawl *w*⁵ encounters the projection *w*⁴, so that the wheel U² is turned with wheel U³. The wheel U² rotates until its pawl *w*⁵ engages the projection *w*⁴ on wheel U', and then the latter wheel rotates with the others. In this all the wheels of the series are taken up, and as the zeros on the wheels have the same positions with relation to the projections *w*⁴ and the pawls *w*⁵ on the wheels, the zeros, when the wheels are all taken up, will be in line with each other. A slot in a shield or plate or other guide for reading is of course to be used in connection with the register-wheels, and the wheels, when they are reset, are to be turned until their zeros come to the slot or reading-point. Pawls *w*⁵ *w*⁵, held by springs *w*⁵ *w*⁵ in contact with the teeth *w*⁴ on the register-wheels, serve to keep such wheels from turning backward. To facilitate the raising of the handle or key end of the lever L up into the slots *m* *m*, as desired, the slots are at their lower left-hand sides rounded or beveled. To facilitate the raising of the lever end up into the right slot, as desired, I have provided stops or gage-keys W W, consisting of narrow plates held in guides *w* *w* on the rear side of plate, just to the right of the respective slots *m* *m* in connection with which they are to act. At their upper ends they project out through slots in the plate A' to form keys *w*⁵ *w*⁵, by which they can be pushed down, as desired. Such keys are, as shown, numbered to correspond with the numbers of the respective slots *m* *m*. On the left-hand side of each of these gage-keys is a projection, *w*², adapted to project across the respective slot *m* when the key is pushed down. The lower end of the gage-key W then projects down across the lever-slot M in plate A', so as to stop the lever L

directly under the slot *m* as said lever is moved along to the right to make an indication. As the lever is raised up into slot *m* to make such indication, it engages projection *w*² and raises the gage-key so as to clear its lower end from slot M.

It is intended to make the gage-keys of spring material and support them frictionally in their guides and against the rear face of plate A', so that when raised they will stay up until pushed down again.

To prevent any tampering with the indicator-keys from the front through slotted plate A', I have provided a shield-plate, X, extending across within the frame, just behind the chain S' and the shaft on which the lever L is supported. This plate has a longitudinal slot, *x*, for permitting all desirable movements of the lever L.

Instead of a sprocket-chain for turning wheel, I contemplate using, if desired, a metal or other band or tape provided with holes or projections for engaging the teeth of the wheel, or a cord provided with knots or loops for the same purpose.

Having thus described my invention, what I claim is—

1. In combination with the plate provided with the series of numbers or indicating-marks on its opposite sides, the series of movable rods provided with the number-hiding plates, situated on both sides of the numbered plate, substantially as and for the purpose shown.

2. In an indicator, in combination with a plate provided with the series of indicating-numbers, the series of rods below, a plate on each of the rods adapted to hide the numbers on the plate when the rods are raised, and suitable springs for raising the rods and holding them raised, substantially as and for the purpose set forth.

3. In combination with the numbered plate or surface, the indicator-rods below such plate or surface provided with plates to cover the numbers when the rods are raised, spiral springs surrounding the rods and forcing them upward, and suitable stops for limiting the upward travel of the rods, substantially as and for the purpose described.

4. In combination with the plate or surface provided with the series of numbers, the rods provided with plates for hiding the numbers, and with arms or projections, the springs for actuating the rods in one direction, and a lever adapted to be brought at will into engagement with any one of the projections or arms on the rods, substantially as and for the purpose specified.

5. In combination with the series of rods provided with arms or projections, the lever-supporting shaft and the lever supported thereon so as to be capable of being slid along the shaft, with its end passing over the series of arms on the rods, and of being rocked on the shaft, substantially as and for the purpose shown.

6. In combination with the series of rods

provided with arms or projections, the shaft parallel to the series of arms and the lever supported on the shaft so as to be free to be moved along the same and rocked thereon, as desired, substantially as and for the purpose set forth.

7. In combination with the series of arms or projections, the key-lever adapted to be moved along the series and rocked to engage any desired one of the arms, and means, substantially as described, for returning the lever to its starting-point when it is released, substantially as and for the purpose shown and described.

8. In combination with the series of indicator-rods and arms or projections thereon, the lever-supporting shaft, the loose sleeve thereon, and the lever carried by the sleeve, the spring-drum, and the cord connected with the drum and the lever, substantially as and for the purpose specified.

9. In combination with the series of indicator-rods provided with portions adapted to be engaged by a lever, the sliding and swinging lever, the swinging frame having the bar under the lever, and the springs for raising the frame, substantially as and for the purpose shown.

10. In combination with the series of indicator-rods provided with portions adapted to be engaged by a lever, the sliding and rocking lever adapted to be moved along the series and rocked to actuate any one of the rods, the rotary drum, a spring for rotating the same, and a cord attached to the drum and to the lever, substantially as and for the purpose set forth.

11. In combination with the sliding and rocking key-lever, the swinging frame having the bar extending across below the lever and a pawl for locking the frame in an elevated position, substantially as and for the purpose described.

12. In combination with the series of indicator-rods and the sliding and rocking lever for actuating them, the swinging frame having the bar extending across in front of the rods and below the lever, and bell-striking mechanism connected with the frame, so as to be operated thereby as it is swung down by the lever, substantially as and for the purpose specified.

13. In combination with the sliding and rocking key-lever, the swinging frame having the bar engaging the lever, the springs connected with the frame, a bell-striking lever, and a tripping device for the same on the frame, substantially as and for the purpose shown.

14. In combination with the series of indicating devices in an indicator and the sliding and rocking lever adapted to actuate any one of such devices, as desired, a swinging frame adapted to hold the lever out of engagement with the indicating devices, a spring-dog for locking the frame, and suitable means on the lever for tripping such dog when the lever is at its starting-point, substantially as and for the purpose set forth.

15. In combination with the series of indicating devices and the sliding and rocking lever for actuating the same, the frame having the bar extending under the lever, the springs for raising such frame to support the lever, a spring-dog adapted to lock the frame in its elevated position when it has been depressed and allowed to rise again, and a suitable trip on the lever for tripping such dog, substantially as and for the purpose described.

16. In combination with the swinging frame and the lug or lip thereon, the swinging pawl provided with a notch to engage the lug and having its notched portion made yielding, so that it can be pushed off of the lug, and the spring for swinging the pawl, substantially as and for the purpose specified.

17. In combination with the swinging frame and the lug thereon, the swinging pawl adapted to engage the rear edge of the lug and having its engaging portion made yielding, so that it can be pushed off of the lug, and the spring for swinging the pawl into engagement with the lug, substantially as and for the purpose shown.

18. In combination with the swinging frame and the lug thereon, the pawl pivoted to swing toward and from the edge of the lug and made yielding in a direction at right angles to its swing, and the spring for swinging the pawl against the edge of the lug, substantially as and for the purpose set forth.

19. In combination with the swinging frame and the lug thereon, the swinging pawl having its lower portion made of spring material to yield in a direction at right angles to its swing, and having its lug-engaging edge notched and cut away below the notch to a point beyond the arc of movement of the lug as the frame swings, and the pawl-spring, substantially as and for the purpose described.

20. In combination with the swinging pawl having its lower portion made of spring material adapted to yield in a direction at right angles to the plane of its swing, a stop adapted to limit its swing, and also the springing of its lower end, and the spring for swinging the pawl, substantially as and for the purpose specified.

21. In combination with the swinging frame and the key thereon, the swinging pawl, whose lower end is of spring material and normally tends to stand out in position to be swung against the rear edge of the key, and is provided with a lug-engaging notch and below such notch is cut away or inclined rearward beyond the path of the rear edge of the lug, and the pawl-actuating spring, substantially as and for the purpose shown.

22. In combination with the swinging frame and means for automatically locking the same in elevated position when the frame has swung down and risen again, one or more springs for raising the frame, and the sliding key-lever provided with means for tripping the frame-locking device when the lever is slid to its

starting-point, substantially as and for the purpose set forth.

23. In combination with the series of indicator-rods and the springs for raising and holding them up, arms or shoulders on the rods, and the swinging wing or pawl-plate, substantially as and for the purpose described.

24. In combination with the series of indicator-rods having the arms on their lower ends, the springs for raising the rods and holding them up, the swinging plate, and a spring or springs acting to hold the plate with its lower edge in the path of the arms on the rods as such rods are depressed, substantially as and for the purpose specified.

25. In combination with the series of indicating devices and the sliding and rocking lever adapted to be moved into position to actuate any of the indicating devices and rocked or swung to engage and move such device, the plate having the longitudinal slot along which the lever is moved and the series of upright slots to allow movement of the lever to actuate the different indicating devices, substantially as and for the purpose shown.

26. In combination with the series of indicating devices and the sliding and rocking lever for actuating the same, the plate provided with the longitudinal slot through which the lever projects, and with the series of upright slots extending up from such slot, so situated that when the lever is below any one of them it will be in position to actuate one of the indicating devices and numbered to agree with the indicating-numbers, substantially as and for the purpose set forth.

27. In combination with the sliding and rocking key-lever, the plate provided with the longitudinal slot and the series of upright numbered slots extending up from the upper edge of the longitudinal slot, and sliding gages or stops on the plate beside the upright slots adapted to be moved separately, so as to project down across the longitudinal slot in the plate, substantially as and for the purpose described.

28. In combination with the series of indicating devices and the sliding and rocking key-lever, the plate provided with the longitudinal slot, and with the upright slots extending up from such slot, so situated as to allow the lever to be rocked when it has been slid into position to actuate any of the indicating devices, and suitable movable stops adapted to be moved into position to stop the lever under any of the upright slots, substantially as and for the purpose specified.

29. In combination with the plate having the longitudinal slot and the series of upright slots at the upper side thereof, the sliding gage plates or stops on the slotted plate close beside the upright slots, and adapted to be moved in position across the longitudinal slot, substantially as and for the purpose shown.

30. In combination with the plate provided with the longitudinal slot and the series of slots

at right angles thereto, the sliding stops on the plate close beside the several slots of the series, provided with projections adapted to stand across such slots when the stops are moved to cause their ends to stand across the longitudinal slot in the plate, substantially as and for the purpose set forth.

31. In combination with the sliding and rocking lever, the plate slotted longitudinally and provided with the series of upright slots extending up from said slot, the series of stops or gages, each adapted to be moved to stand across the longitudinal slot close beside one of the upright slots, and provided with an arm or projection extending over across the upright slot when the stop is so moved, substantially as and for the purpose described.

32. In combination with the series of indicating devices and the sliding and rocking lever for actuating the same, the longitudinally-slotted plate provided with the series of upright slots up which the lever is moved to actuate the different indicating devices, and the stops or gages alongside the respective slots, each having a suitable handle, and being marked with a number corresponding to the number on the indicating device which will be actuated if the lever be raised up the slot under which the gage stops the lever in its movement along the longitudinal slot in the plate, substantially as and for the purpose specified.

33. In combination with the sliding and rocking key-lever, the registering mechanism and suitable connections between the same and the lever, whereby as the latter is slid in one direction the registering mechanism is actuated, substantially as and for the purpose shown.

34. In combination with the lever pivot-shaft and the lever rocking and sliding thereon, registering mechanism and the band connected with the lever and adapted to actuate the registering mechanism, substantially as and for the purpose set forth.

35. In combination with the lever-supporting rod or shaft and the key-lever adapted to be slid along the same, the chain attached to the lever and passing around suitable pulleys, and the registering mechanism having a toothed wheel to mesh with the chain, substantially as and for the purpose described.

36. In combination with the registering-wheels proper and the toothed wheel connected therewith by a pawl-and-ratchet connection, the chain, the two pulleys around which the chain passes, and the sliding key-lever connected with the chain, substantially as and for the purpose specified.

37. In combination with the register-wheel shaft and the toothed register-wheel fixed thereto, the spring-pawl on the wheel, two or more toothed register-wheels loosely journaled on the shaft, and each provided on its one side with one or more ratchet-shaped projections and on its other side with a spring-pawl to engage the projection on the next wheel, one

or more teeth projecting out from the periphery of each wheel close to the series of teeth on the next wheel, the carrying-wheels, and the pawls engaging the series of teeth on
5 the several wheels, substantially as and for the purpose described.

In testimony that I claim the foregoing I

have hereunto set my hand this 7th day of March, 1887.

CABEL B. HOPKINS.

Witnesses:

CHAS. H. GIBSON,
O. E. ROBINSON.