

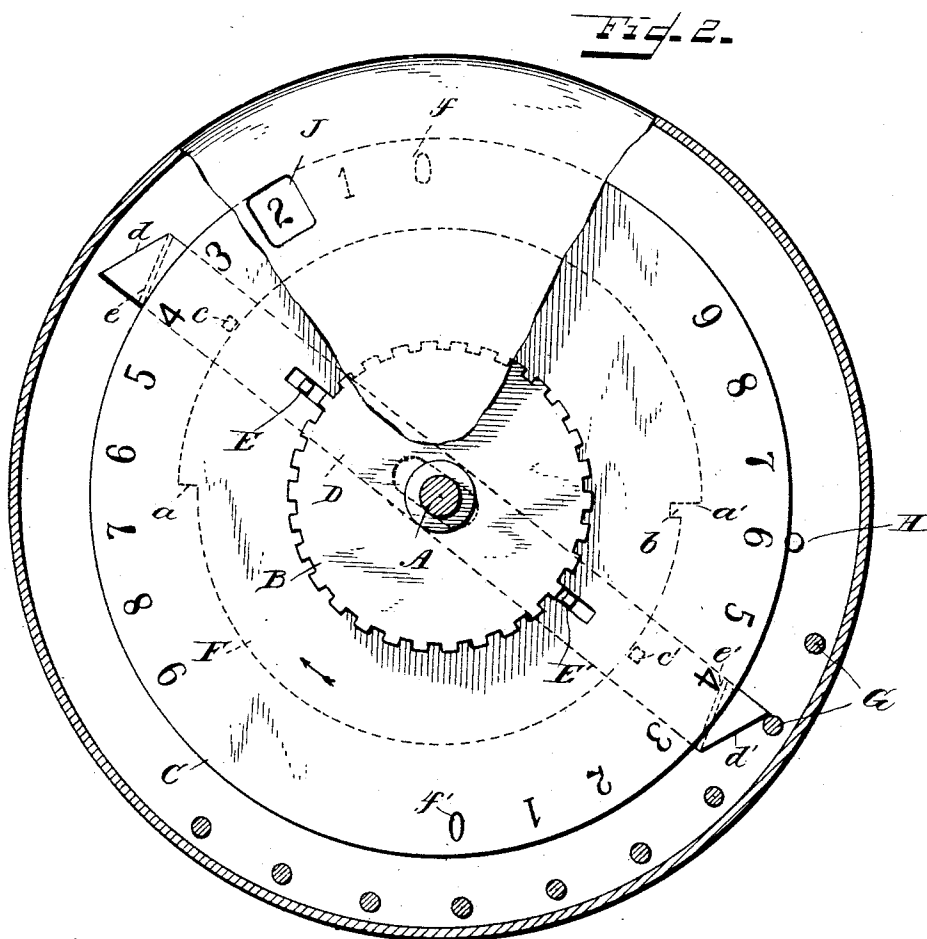
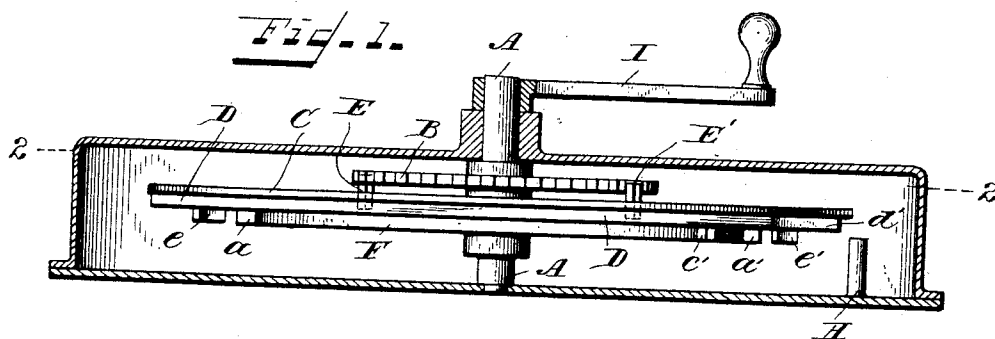
(No Model.)

3 Sheets—Sheet 1.

H. COOK.
CASH REGISTER AND INDICATOR.

No. 469,544.

Patented Feb. 23, 1892.



Witnesses.
J. Thomson Cross
E. H. Wockbee

Inventor:
Hugo Cook
by *Pick & Rector*
Attorneys.

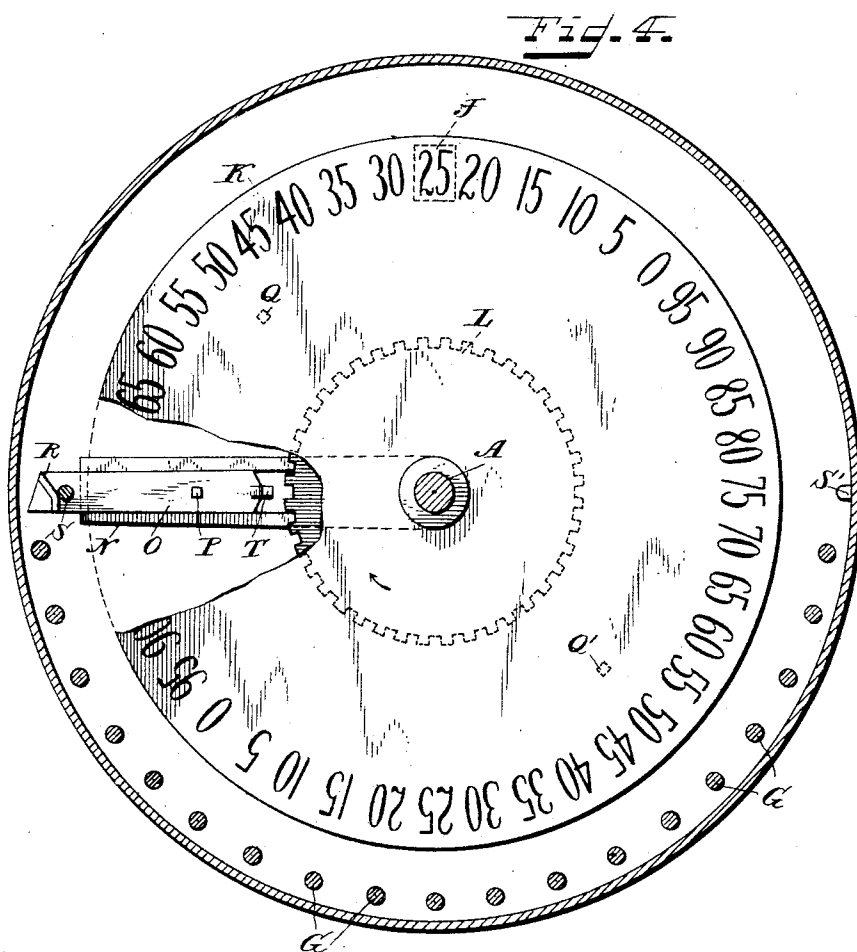
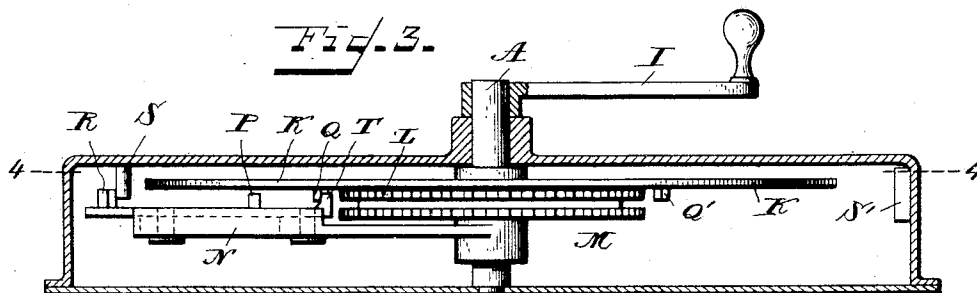
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3 Sheets—Sheet 2.

H. COOK.
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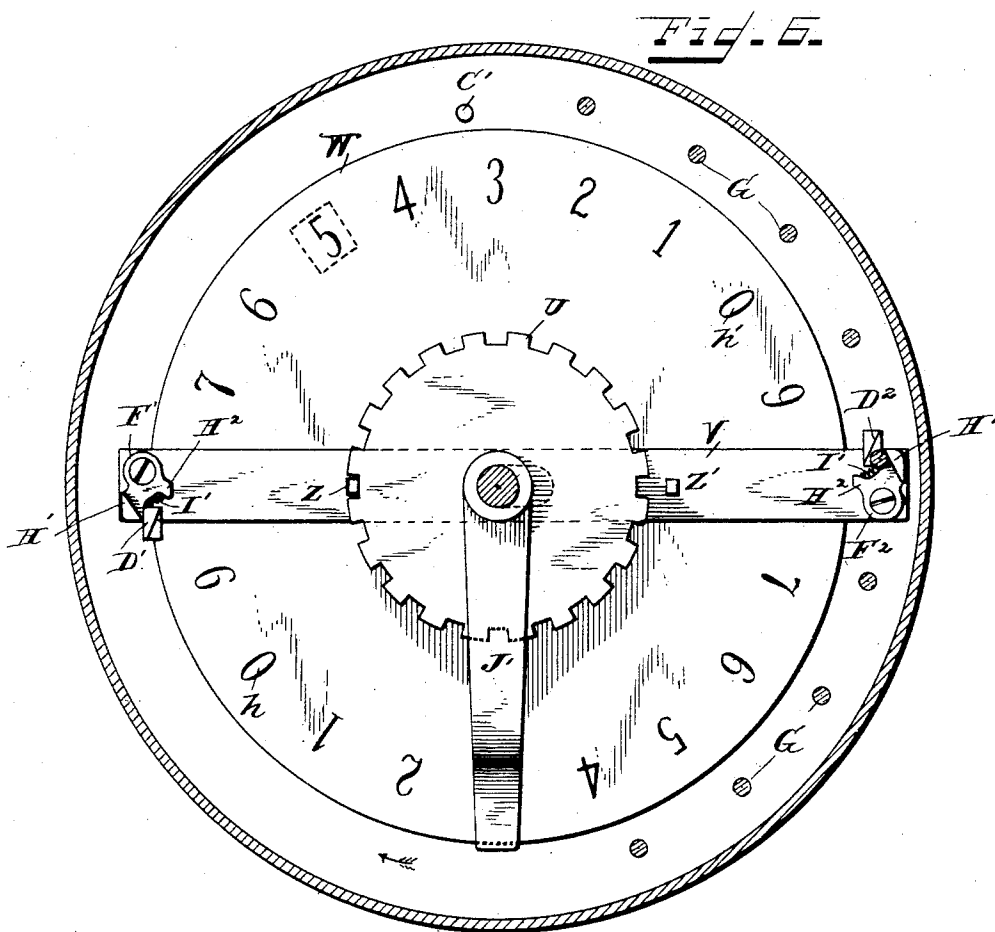
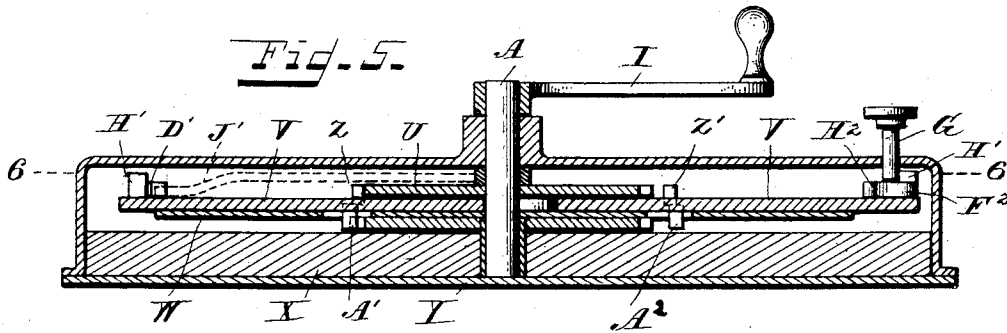
3 Sheets—Sheet 3.

H. COOK.

CASH REGISTER AND INDICATOR.

No. 469,544.

Patented Feb. 23, 1892.



Witnesses.

Thomson Cross.

E. H. Mockbee

Inventor.

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UNITED STATES PATENT OFFICE.

HUGO COOK, OF DAYTON, OHIO.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 469,544, dated February 23, 1892.

Application filed October 17, 1891. Serial No. 408,975. (No model.)

To all whom it may concern:

Be it known that I, HUGO COOK, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have
5 invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a description.

Heretofore in the machines of this character with which I am familiar the indicator
10 has always had a reciprocating movement, (either in a straight line or in the arc of a circle,) being moved in one direction from zero or normal position to make the indication, and then in the opposite direction back to
15 zero or normal position to destroy the indication. Likewise the registering-wheel, while revolving in one direction only, has been actuated by a device having a reciprocating movement, the wheel moving with the actuating
20 device in one direction, but remaining stationary while the actuating device moved in the opposite direction.

My present invention is believed to involve a radically new mode of operation in this class
25 of machines, first, by reason of the fact that the indicator does not have a reciprocating movement, but revolves in one direction, both to make the indication and to destroy it preparatory to the next indication, and, second,
30 by reason of the fact that the driver or actuating device for both the indicator and register is also revoluble and has no reciprocating movement.

My invention contemplates the employment
35 of the revoluble indicator and revoluble driver without the register, and likewise the revoluble register and revoluble driver without the indicator, as well as the employment of both the indicator and register with the
40 driver. The driver has a uniform stroke or limit of movement (preferably one complete revolution) at each operation of the machine, while the movements of the indicator and register vary according to the amounts to be
45 indicated and registered. A suitable latch or other connecting and disconnecting device is employed to connect the driver with and permit it to be disconnected from the indicator and register. Where both an indicator and
50 a register are employed in the machine a single latch may be made to co-operate with both the indicator and the register. In its co-oper-

ation with the register the latch is controlled and operated by a fixed stop or stops and a movable stop or series of stops, either to cause
55 the driver and register to be connected at a fixed point and disconnected at different points, or to be connected at different points and disconnected at a fixed point, as hereinafter explained. In its co-operation with the indicator
60 the latch may or may not be operated by both the fixed stop and the movable stops, depending upon the construction and arrangements of parts employed, for in some instances, as will
65 be explained, the fixed stop or stops may be dispensed with, so far as the co-operation of the latch with the indicator is concerned, and the latch be arranged to connect the driver and indicator independently of any stops and
70 the movable stop or stops be alone employed to disconnect them. Since the indicator and register are both revoluble, the primary device with which the latch connects the driver and to which the latter transmits power is also revoluble. In the machines illustrated
75 in the drawings it is a wheel mounted upon the same shaft as the revoluble driver. Such wheel may be itself the indicator or register or be simply the driving gear or wheel for an indicator and register.
80

In the simplest form of my invention the driver is connected by the latch directly with a wheel which is itself the indicator, and also with a wheel which is itself the primary registering-wheel, and I have so illustrated the
85 invention in the drawings; but in the full development of my invention in complete machines for the market it will often be desirable to employ the primary revoluble part of wheel, with which the driver is connected by
90 the latch, simply as the actuator for the indicator or register, which may be geared or connected with it directly or indirectly in any suitable manner.

I have devised several different forms of ap-
95 paratus all embodying the new mode of operation, and I have no doubt that I will be able to devise many other forms and that others will be able to do so when the mode of operation is explained to them by the following description of the invention.

Inasmuch as my invention is believed to be radically new in principle and mode of operation, it is not restricted in its broader scope

to any particular construction or arrangement of apparatus, but contemplates all forms of apparatus involving the new mode of operation, however widely they may differ in construction.

In the accompanying drawings I have illustrated only a few of the different forms of apparatus which I have already devised, having selected those which I believe will best facilitate an explanation of the invention.

Figure 1 is a side elevation of one form of apparatus with the casing in central section. Fig. 2 is a horizontal section of the same on the line 2 2 of Fig. 1 with a small portion of the top of the casing left to show the reading-opening. Fig. 3 is a central sectional view of a modified construction. Fig. 4 is a sectional plan view of the same on the line 4 4 of Fig. 3 with a portion of the indicator-wheel broken away to expose the latch-bar beneath. Fig. 5 is a side elevation of another modification with the casing in central section. Fig. 6 is a sectional plan view of the same on the line 6 6 of Fig. 5.

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

In the views shown in Figs. 1 and 2, A is a revoluble shaft or spindle suitably journaled in the casing. Loosely mounted upon this shaft, between collars fast thereon, is a wheel B, having a series of equidistant notches in its periphery, in this instance thirty. Beneath the wheel B, and also loosely mounted upon the shaft A, is a larger wheel C, which in this instance bears the indicating-numbers upon its upper face and constitutes the indicator. Immediately beneath the wheel C and revoluble with it is a latch-bar D. The hole at the middle of this bar, through which the shaft A passes, is elongated, as shown by dotted lines in Fig. 2, so that the bar is capable of slight reciprocating movement diametrically of the wheel C. Two lugs E E' upon the upper side of the bar, upon opposite sides of the shaft A, extend up through slots in the wheel C into position to alternately engage the notches in the wheel B.

Beneath the latch-bar D and fast upon the shaft A is a disk F, which in this instance constitutes what I call the "driver." A plan view of it is shown in dotted lines in Fig. 2, where it will be seen that the opposite halves of the disk are of unequal radius, each, however, being a true half-circle. This unequal size of the two halves of the disk forms two shoulders *a a'*, diametrically opposite each other on the periphery of the disk, and both facing in the same direction. A notch *b* is cut into the disk at the base of the shoulder *a'*. The latch-bar D has upon its under side, upon opposite sides of the central shaft A, two lugs *c c'*, which co-operate with the shoulder *a'* and notch *b* of the disk or driver F in a manner to be presently explained. The opposite ends *d d'* of the latch-bar D are beveled on substantially-parallel lines and co-op-

erate with a series of movable stops or keys G. Upon the under side of the bar D, one near each end, are two lugs or cam-surfaces *e e'*, which co-operate with a fixed stop or pin H in the manner hereinafter described.

A handle I, fast upon the upper end of the shaft A, may be used to turn the latter and with it the driver F, which is fast upon the shaft.

There are two series of indicating-numbers upon the upper face of the wheel C near its periphery, each set occupying one-third of the circle and separated, upon opposite sides of the wheel, by spaces, each equal to one-sixth of the circle. At some suitable point immediately above the rows of numbers the casing is provided with an opening, as at J, through which the numbers upon the wheel may be separately exposed.

The stops G consist of short pins arranged in suitable guides on the casing and bearing upon their upper ends push-buttons provided with numbers corresponding with the amounts to be indicated and registered. (See Fig. 5.) In Fig. 2 only cross-sections of the stems are shown to indicate the relative positions of the keys and facilitate an explanation of the operation of the parts. In normal position—that is, before they are pushed inward—the lower ends of these keys are above the horizontal plane of the latch-bar D; but when any key is pushed inward to its full limit its lower end is brought into the path of travel of the outer beveled ends of said bar.

Instead of a series of stops or keys G, mounted in guides and arranged to be pressed in and moved out, there might be simply a series of holes and a single pin which could be inserted in one hole or another, according to the amount to be indicated. This pin might be either wholly detached from the machine or be carried by the outer end of an arm hung upon the central shaft A and arranged to be swung over the row of holes, so that the pin could be pushed down into any one of them.

Such a movable pin in connection with a series of holes for its reception, being a familiar substitute in this art for a series of keys mounted in different positions corresponding to the holes, the operation of the machine under either arrangement will be readily understood.

In operating the machine to make an indication and registration the key corresponding to the amount of the sale is pushed inward and the handle I then given a complete revolution. The action of the several parts under such an operation may be now described in detail.

In the view shown in the drawings the driver F is in its normal position of rest and the figure 2 is exposed at the reading-opening in indication of the preceding sale. As the driver is now revolved in the direction of the arrow its shoulder *a'* comes in contact with the lug *c'* upon the bar D and the driver picks up the bar and indicator-wheel C (which

revolves with the bar) and carries them around with it, the bringing of the notch *b* in line with the lug *c'* permitting the bar to move slightly inward as its end *d'* clears the key against which it was resting. Just as the driver completes a half-revolution the zero at *f'* (I have indicated the zeros of the two sets of numbers as *f* and *f'*) is brought beneath the reading-opening *J*. The cam-lug *e* upon the under side of the bar *D*, near its end *d*, at this moment engages the stationary pin *H*. As the driver carries the bar on around the lug *e* rides over the pin *H* and the bar is forced to the right, (the elongated hole at the middle of the bar permitting such movement, as before explained,) and the lug *c'* on the bar is thereby drawn into the notch *b* in the driver. As the driver continues to revolve the bar *D* and the indicator-wheel *C* are moved forward with it, the zero *f* being carried beyond the reading-opening *J* and the numbers following it passing successively under the opening until the beveled end *d* of the bar, which is now traveling below the row of keys, strikes the key which has been pressed in, whereupon the bar is forced in the opposite direction to that in which it was drawn by the pin *H*, and the lug *c'* is carried out of the notch *b* in the driver and out of the path of the shoulder *a'*, and the lug *c* at the opposite side moved up against the periphery of the driver, (as the lug *c'* is against it in Fig. 2.) This positively arrests the bar *D*, for the end *d* of the bar cannot clear the operated key without the bar moving farther in the same direction, and this it cannot do because of the contact of the lug *c* with the periphery of the driver. The bar *D* and indicator-wheel *C* are thus arrested at the proper point for the number on the latter which corresponds to the value of the operated key to be exposed at the reading-opening, while the driver *F* moves on to normal position alone. Supposing the operated key to have been 5, the bar *D* will be left opposite the 5-key, just as it was left opposite the 2-key by the previous operation, and when the driver *F* is again revolved to make a new indication the shoulder *a'*, when it arrives opposite the 5-key, will engage the lug *c*, which now stands opposite the 5-key. The lug *c* can then move into the notch *b* as the end of the bar clears the key, and the bar and indicator-wheel will be picked up by the driver and carried around by it until the zero *f'* on the wheel is exposed at the reading-opening *J*, at which time the cam-lug *e'* on the bar *D* will engage the pin *H* and the bar will be forced to the right, in the manner before explained, drawing the lug *c* farther into the notch *b*. As the driver moves on in the last half of its revolution the indicator-wheel will be carried on around with it until the beveled end of *d'* of the bar *D*, which end is now traveling under the row of keys, strikes the key which has been pressed in, whereupon the lug *c* is disengaged from the notch *b* and shoulder *a'* of the driver, the indicator-wheel comes to rest

with the proper number under the reading-opening, and the driver goes on to normal position, all as in the operation first described and as will be readily understood. From the above description it will be seen that the indicator-wheel is always left with a number (in one or the other set) corresponding to the operated key exposed at the reading-opening; that at the next operation of the machine the driver, during the first half of its revolution, picks up the indicator-wheel and carries it with it until the zero of the other set of numbers is brought beneath the reading-opening, and that during the second half of the revolution of the driver the wheel is moved forward from this zero until the number corresponding to the operated key is brought beneath the reading-opening, whereupon the wheel becomes disconnected from the driver and stops and the driver goes on to normal position. Thus the driver makes a complete revolution at each operation, the first half of which revolution is utilized for turning the indicator-wheel to zero and the second half for turning it forward from zero to make the new indication.

So far I have described simply the indicating mechanism. I will now describe the registering mechanism shown in Figs. 1 and 2. In the construction there illustrated the wheel *B* may itself be the primary registering-wheel, or it may be simply a driving-gear for any suitable train of wheels. In the drawings I have shown it as the only registering-wheel, since this part of the machine may be sufficiently described without illustrating any other wheels for that purpose. The registering-wheel *B* is coupled to and uncoupled from the indicator-wheel *C* and bar *D* by the lugs *E* *E'*, which, as before stated, extend up through slots in the wheel *C* and alternately engage the notches in the periphery of the wheel *B*. In the position of the parts shown in Fig. 2 of the drawings it will be seen that both of the lugs are free from the wheel *B*, so that during the first half of the revolution of the driver, while it is picking up the indicator-wheel and turning it on to zero, the wheel *B* remains stationary. When, however, the driver has completed the first half of its revolution and brought the indicator-wheel *C* to zero, the movement of the bar *D* to the right as the cam *e* rides over the pin *H*, in the manner heretofore explained, will draw the lug *E'* into one of the notches in the wheel *B* and move the opposite lug *E* into the extreme outer end of its slot in the wheel *C*. From that point forward to the point at which the driver and indicator-wheel are disconnected by the beveled end *d* of the bar *D* striking the operated key, as before explained, the wheel *B* is turned with the driver and indicator-wheel. When the end of the bar *D* strikes said key and the bar is forced away from the key, carrying the lug *c'* out of the notch *b* and beyond the shoulder *a'*, as before explained, the lug *E'* is likewise

disengaged from the wheel B, and the latter is arrested with the indicator-wheel and bar D, and the driver goes on to normal position alone. This last movement of the bar D carries the lug E toward the wheel B again and brings it into the same position relatively to the periphery of said wheel that the lug E' occupies in Fig. 2 of the drawings. At the next operation of the machine the lugs E and E', being both free from the wheel B, the latter is not moved until after the driver has completed the first half of its revolution and brought the indicator-wheel to zero, whereupon the forcing of the bar D to the right by the passage of the cam *e'* over the pin H will draw the lug E into engagement with a notch in the wheel B, whereupon said wheel will move forward with the driver and indicator-wheel until the end *d'* of the bar D strikes the key, which has been pressed in, whereupon the driver will be disconnected from the bar D and the wheels B and C come to rest.

It will be understood from the above description of the parts that when the bar D is forced to the right by the pin H, just as the indicator-wheel is brought to zero, the lug E or E', which happens at that time to be upon the right side of the wheel B, is moved into the extreme outer end of its slot in the wheel C, while the lug which is at that time upon the left side of the wheel B is drawn into one of the notches of said wheel. When the driver is disconnected from the indicator and registering-wheel by the engagement of the bar D with the operated key, as before explained, the lug E or E', which has been engaged with a notch in the wheel B, is not only moved out of said notch, but also away from the periphery of the wheel to the position of the lug E in Fig. 2, the opposite lug being brought to the position of the lug E' in said figure, ready to engage a notch in the wheel B at the next operation of the machine. It will thus be seen that during the first half of its revolution the driver does not move the registering-wheel, but simply turns the indicator-wheel to zero, that when the indicator has been turned to zero the driver becomes locked to the registering-wheel and then turns it forward with the indicator-wheel until the proper number upon the latter is brought to the reading-opening, whereupon the driver is disconnected from both wheels. The registering-wheel therefore moves with the indicator-wheel during the entire indicating movement of the latter, and thereby registers the value of the operated key, while the indicator-wheel has an additional movement in being brought to zero, during which movement the registering-wheel remains at rest. It will also appear from the above description that the stationary pin H and cams *e* and *e'* serve no necessary purpose in connecting the driver with the indicator, for that is effected by the engagement of the shoulder *a'* with the lug *c'* or *c*, which stands in its path at the beginning of its movement. The sole

function of the pin H and cams *e* and *e'* is to force the bar D to the right when the driver has completed a half-revolution and brought the indicator to zero, and thereby draw the lug E or E' into the notch of the registering-wheel to connect the latter with the driver. In the absence of the registering-wheel, therefore, the fixed pin H, cams *e* and *e'*, and lugs E and E' might be dispensed with, the remaining parts, essential to the operation of the indicator, being simply the driver, the latch-bar having the lug *c c'* and beveled ends, the indicator-wheel turning with the latch-bar, and either the series of stops G or a single movable stop in the place of the series. Again, I have not shown any means for either positively retaining the operated key in its depressed position or for returning it to normal position when another key is operated; but such devices are so common in this art that it is not thought necessary to illustrate them in detail. A suitable and common method of accomplishing the desired result would be to surround each key with a coiled spring, tending to hold it in its outer position and to provide a spring-pressed detent-plate to co-operate with notches in the stems of the keys, the arrangement being such that when any key was pressed in it would be caught and held by the detent-plate until a second key was pressed in, whereupon the detent-plate would be moved by the second key and the first key be thereby released and then thrown out to normal position by its spring.

In Figs. 3 and 4 I have illustrated a different embodiment of my invention, in which the revoluble driver and indicator-wheel are connected at different points by means of the different stops or keys and are disconnected at a fixed point. In the construction there shown the general shape of the machine is the same as in Figs. 1 and 2, and the central revoluble shaft A and handle I are employed. Loosely mounted upon the shaft A is the indicator-wheel K. Fast upon the under side of the wheel K is a toothed wheel L, while loose upon the shaft A beneath the wheel L, separated from it in this instance by a spacing-disk, is a similar notched wheel M, whose notches coincide with those in the wheel L. Fast upon the shaft A, beneath the wheel M, is a radially-extending arm N, which carries upon its upper side in a suitable guideway a radially-sliding latch bar or plate O, and constitutes the driver of the machine in this instance. Upon the upper side of the latch-plate O, near its middle, is a lug or projection P, which co-operates with two lugs Q Q', secured upon the under side of the indicator-wheel K, and upon the upper side of the plate O at its outer end is a cam-lug R, which co-operates with a fixed cam or pin S, depending from the under side of the top of the casing, as seen in Fig. 3. The outer end of the latch-plate O is beveled off and co-operates with a pin or cam S', diametrically opposite the pin S, and with the series of movable

stops or keys G. At its inner end the plate O is provided with an upwardly-projecting lug or tooth T, which co-operates with both of the wheels L and M, all in the manner hereinafter explained.

In the construction shown in Figs. 3 and 4 nineteen keys are shown, and the indicator-wheel is provided with two series of nineteen numbers, each representing multiples of five from 5 to 95, with a zero between the 95 and 5.

As in the construction shown in Figs. 1 and 2, so in the construction shown in Figs. 3 and 4, a full operation of the machine consists in pressing in a key and turning the operating-handle one complete revolution. This will register the value of the key and leave a number upon the wheel K corresponding to such value exposed at the reading-opening at J.

In the position of the parts shown in Fig. 4 the operating-handle and driver are at rest, the latch-plate O has been slid to its outermost position, and its tooth T withdrawn from engagement with the wheels L and M by the cam-lug R, riding over the fixed cam S. The number 25 is exposed at the reading-opening in indication of the preceding sale. It will be seen that the lug Q on the indicator-wheel K lies directly in the path of travel of the lug P on the latch-plate O when the latter is in its outer position, as shown in Fig. 4. The result of this is that when the driver N is revolved by turning the handle I and shaft A the lug P will engage the lug Q and pick up the wheel K and carry it around with the driver. Just as the driver N completes the first half of its revolution and brings one of the zeros on the indicator-wheel beneath the reading-opening the outer beveled end of the latch-plate O strikes the stationary cam or pin S' and is driven slightly inward, far enough to carry its lug P out of line with the lug Q, with which it has been engaged, and to thereby disconnect the driver from the indicator-wheel K, but not far enough to engage the tooth T with the wheels L and M. As the driver is turned on in the second half of its revolution the wheel K remains stationary, with zero exposed at the reading-opening, until the outer end of the plate O, which is traveling beneath the row of keys G, strikes the key which has been pressed in, whereupon said plate is slid still farther inward and its tooth T enters two coincident notches in the wheels L and M. From that point on until it completes its revolution the driver carries with it both of the wheels L and M. From that point on until it completes its revolution the driver carries with it both of the wheels L and M and also the indicator-wheel K, which is fast to the wheel L. As the driver completes its revolution the cam-lug R on the plate O rides over the stationary pin S. The plate is slid to the left into its outermost position, withdrawing its tooth T from the wheels L and M, whereupon the latter come to rest with a number upon the wheel K corresponding to the value of the

operated key exposed at the reading-opening. Thus when the driver is connected with the wheels at any given key it will turn them just far enough before it is disconnected from them at the pin S to expose at the reading-opening a number corresponding to the value of the operated key and to add such value upon the registering-wheel. The outward movement of the plate O at the pin S again brings the lug P into line with the lugs Q and Q' on the indicator-wheel, ready to pick up the latter and carry it around to zero at the next operation of the machine. The wheel M in this case will be the registering-wheel or the driver for a train of registering-wheels, as desired. It will be understood from the above description that the tooth T of the latch-plate O engages the wheel M simultaneously with the wheel L and that the tooth is disengaged from both wheels at the same time. The wheel M thus turns with the wheels L and K while the latter are moving forward from zero to make the new indication, but remains stationary while the indicator-wheel is being turned to zero during the first half of the revolution of the driver.

As in the construction first described, Figs. 1 and 2, any suitable devices may be employed for temporarily holding the operated key in its inward position and for releasing it and restoring it to normal position when another key is pressed in. Likewise both in this and the first-described construction any suitable device may be employed to arrest the operating-handle and driver when they complete a revolution and arrive at normal position; but such devices are so common in this class of machines that it is unnecessary to illustrate or describe them.

In the construction shown in Figs. 3 and 4 it will be understood that the sole purpose of the lug P on the latch-plate O, the lugs Q Q' on the indicator-wheel K, and the fixed cam S' is to cause the driver to turn the indicator to zero during its first half of its revolution, and to leave it there until again connected with it by the operated key. In the absence of the indicator-wheel, therefore, these parts might be dispensed with, the only elements essential to the operation of the register being the driver N, latch-plate O, having the cam R, the fixed pin S, keys G, and wheel M. Under the operation of these last-named parts the driver would move forward from normal position alone until the outer end of the plate O engaged the operated key, whereupon the driver would become locked to the wheel M and turn it on with it until disconnected from it by the engagement of the lug R with the pin S.

In Figs. 5 and 6 is represented a third construction embodying my invention. There the same central shaft A and operating-handle I are employed. The upper toothed wheel U, loosely mounted upon the shaft A, is the registering-wheel or driver for a train of registering-wheels. Beneath this wheel is a

sliding latch-bar V, extending diametrically across the machine and having an elongated opening at its middle, through which the shaft A passes, which opening permits a longitudinal reciprocating movement of the bar. Beneath the bar V, the bar resting upon it in this instance, is the indicator-wheel W, loosely mounted upon the shaft A, while beneath the wheel W and fast upon the base X of the machine is a toothed locking-disk Y, Fig. 5, to be presently described. Upon the upperside of the bar V at opposite sides of the wheel U and adjacent to its periphery are two lugs Z Z', by which the bar is intermittently locked to the wheel U. Upon the under side of the bar V are two lugs A' A², which extend down through slots in the indicator-wheel W, so that while the bar V can have a reciprocating movement upon the wheel W the latter and the bar revolve together. The lugs A' A² may be either directly in line below the lugs Z Z' and integral with the latter, if desired, or may be out of line with them, as shown in the drawings, according as the diameter of the locking-disk Y is less than or the same as the diameter of the wheel U, as will be hereinafter explained. Secured upon the upper side of the bar V near its outer ends are two lugs D' D², whose inner faces are beveled or inclined upon substantially parallel lines. Adjacent to these lugs are pivoted two rocking plates F' and F². Each of these plates has upon its upper side a lug H', projecting above the body of the plate and above the upper surface of the adjacent lug D' or D². (See Fig. 5.) The inner faces of these lugs H' are beveled on lines intersecting the lines of the beveled faces of the lugs D' D², as shown. In the same horizontal plane as the beveled face of the adjacent lug D' or D² each of the plates F' F² is provided with an inwardly-projecting shoulder H². These shoulders H² and the beveled lugs D' D² co-operate with the driver, to be described, while the lugs H' co-operate with a fixed pin C' and the series of movable pins or keys G. Springs I', interposed between the lugs D' D² and the plates F' F², yieldingly hold the latter in the position shown in Fig. 6. The driver consists of a radial arm J', fast upon the shaft A, and having its outer end extended into position to engage and bear laterally against the beveled lugs D' D² and shoulder H². Under this construction of the machine, as well as in those previously described, a full operation consists in pressing in a key and giving the operating handle and driver a complete revolution. In the position of the parts shown in Fig. 6 the driver J' is in its normal positions of rest: The lug H' of the plate F² at the right-hand end of the bar V is engaged with the 5-key, and the number 5 upon the indicator-wheel W is exposed at the reading-opening in indication of the preceding sale. The lug Z is engaged with a notch in the wheel U, and the lug A' upon the under side of the bar V is engaged with a notch in the fixed locking-disk Y, Fig.

5, so that the indicator and registering wheels are positively locked from movement. It will be understood that when a second key is pressed in, preparatory to the next operation of the machine, the last-operated key, with which the lug H' on the plate F² is engaged, (in this instance the 5-key,) will be released and spring outward to normal position, out of the path of travel of the lug H', some suitable devices, such as I have before referred to, being employed to accomplish this result. When the handle I is then turned forward in the direction of the arrow, the outer end of the driver, when it reaches the lug D', as indicated by the dotted lines in Fig. 5, bears against the beveled face of the latter and forces the lug, and consequently the bar V, to the left until it passes the lug. This movement of the bar V to the left withdraws the lug Z from engagement with the wheel U, thereby disconnecting said wheel from the bar V and wheel W, and also withdraws the lug A' from engagement with the locking-disk Y, and thereby unlocks both wheels and the bar V, so that they are all free to move forward. As the driver now continues its revolution its outer end engages the shoulder H² of the plate F', and carries the bar V and indicator-wheel W forward with it, the registering-wheel U remaining stationary. When the lug H' of the plate F' reaches the fixed pin C', the indicator-wheel has been brought to zero, and the zero h is exposed at the reading-opening. At this point as the lug H' rides over the pin C' the pressure of the end of the driver against the shoulder H² prevents the plate F' from yielding on its pivot and holds it firmly in position with the point of the lug H' against the back of the fixed lug D'. The passage of the lug H' by the pin C' therefore draws the bar V toward that side of the machine, and pulls the lug Z' on said bar into a notch upon the opposite side of the wheel U, thereby coupling the registering-wheel to the bar V and indicator-wheel. The sliding movement of the bar, caused by the passage of the lug H' over the pin C', has not been sufficient, however, to engage the lug A² with a notch in the locking-disk Y, nor to withdraw the shoulder H² of the plate F' from engagement with the outer end of the driver, and as the latter moves on forward in the second half of its revolution the indicator and registering wheel are both carried with it, the numbers which follow the zero h upon the indicator-wheel passing successively under the reading-opening J. When the lug H' of the plate F' reaches the key which has been pressed in, its beveled face engages such key, and as the line of the keys is farther from the center of the machine than was the pin C' the bar V is forced still farther to the right as the lug rides over the key. This movement of the bar is sufficient to disengage the shoulder H² from the end of the driver before the lug H' quite clears the key, and also draws the lug Z' on the opposite side of

the wheel U farther into the notch in said wheel with which it was engaged as the lug H' passed the pin C', as before described, and brings the lug A² upon the under side of the bar V into one of the notches in the fixed locking-disk Y, thereby positively arresting and locking both the registering and indicator wheels, (with the proper number on the latter exposed at the reading-opening,) while the driver is freed from both and moves on to normal position alone.

At the next operation of the machine, when a new key is pressed in, the key with which the lug H' of the plate F' has just been engaged is released and springs out to normal position. When the operating handle and driver are then turned forward, the outer end of the driver first engages the beveled face of the lug H' on the plate F², which is now on the left side of the machine, and forces the bar V to the left, thereby withdrawing the lugs Z' and A² from engagement with the wheel U and locking-disk Y, respectively, and releasing both the indicator and the registering-wheel. The driver then engages the shoulder H² of the plate F² and picks up the indicator-wheel, carrying it on around with it until the zero h' is brought beneath the reading-opening, at which point in the operation the lug H' of plate F² engages the pin C' and draws the lug Z on the opposite side of the wheel U into a notch in said wheel. As the driver continues its movement the indicator and registering-wheel are both carried with it until the lug H' reaches the key which has been pressed in, whereupon the driver is disconnected from them and they are arrested and locked, all as before explained in connection with the first-described operation.

It will be understood from the above description that during the first half of its revolution the driver unlocks the registering-wheel and indicator and turns the latter to zero; that at the completion of this half of the revolution the registering-wheel is coupled to the indicator-wheel and driver, and during the second half of the revolution moves forward with them until the operated key is reached, whereupon the driver is disconnected from both wheels and moves on to normal position.

It will be understood that the sole purpose of the lugs Z and Z' upon the bar V and the fixed pin C' is to connect the driver with the registering-wheel U, and that in the absence of such wheel the lugs would be dispensed with; also, that the only purpose of the lugs A' and A² is to co-operate with the locking-disk Y. I have before stated that those lugs may either be in line with the lugs Z Z' above or may be out of line with them and farther away from the center of the machine. If they are in line, then the locking-disk Y will have to be of smaller diameter than the registering-wheel U, since the lugs Z and Z' are first to be engaged with the wheel U, while

the lugs A' A² remain disengaged from the disk Y, and they are to be drawn farther into the notches in the wheel U when the lugs A' A² are engaged with the disk Y, as before described.

Thus far I have not explained why the plates F' and F² are pivoted to the bar V instead of being rigidly secured thereon. The main purpose of this arrangement of the plates is to enable the lug H', which is caught on the operated key, to yield and slip by said key at the beginning of the next operation of the machine, in case the same key should be again operated. Thus in Fig. 6 the amount indicated is five, and the lug H' of the plate F² is caught upon the 5-key. Now if the next sale should be five, this same 5-key would have to be pressed in or allowed to remain in. In either event if the plate F² could not yield the lug H' would become locked against the key when the handle was started forward and the end of the driver J' brought against the beveled lug D' to press the bar V toward the left, as before described; but with the plates made yielding, as they are, when the end of the driver bears against the lug D' the bar V' can be moved to the left against the stress of the spring I' at the opposite end, and as the end of the driver passes the lug D' and comes in contact with the shoulder H², and begins to turn the bar V forward with it the lug H' of the plate F² slips off the 5-key and the spring I' restores the plate to normal position. Under the exact construction of the parts shown in Fig. 6 this yielding arrangement of the plates F' and F² serves, also, another purpose, and that is to enable the plate to yield and its lug H' to clear a newly-operated key at the beginning of the next operation of the machine in case such key should be of higher value than the last-operated one, and therefore stand in the path of the lug H' at the beginning of the forward movement of the bar V. Thus with the parts in the position shown in Fig. 6, if the next-operated key should be the 8-key, we will assume that the 5-key, with which the lug H' has just been engaged, will be released and spring out of the path of the lug; but when the bar V is forced to the left by the engagement of the driver with the beveled lug D' at the beginning of the forward movement of the driver the lug H' of the plate F² will be brought into line with the keys, and the lower end of the newly-operated 8-key will stand directly in its path. If the plate F² could not yield, the lug H' would become locked against such key, and the machine could not be further operated; but with the plate made yielding as it is the lug slips by the key and the spring I' then resets the plate. The last-described operation is, however, incidental to the particular construction and arrangement of the parts shown in Fig. 6, for the beveled lugs D' D² might be made of such shape that the engagement of the driver with one or the other of them at the

beginning of its forward movement would force the bar V far enough to the left to carry the lug H' at the opposite end of the bar entirely inside of the line of the keys, so that in the forward movement of the bar the outer side of the lug would clear the inner side of the newly-operated key.

As I have before stated, the wheels C, K, and W, which bear the indicating-numbers, may, instead of being themselves the indicators, be simply the actuators or driving-wheels for any suitable indicating mechanism, with which they may be geared or otherwise connected in any suitable manner; nor is it essential that the indicator with which these wheels may be connected as actuators should have two sets of indicating-numbers, as have the wheels shown in the drawings, for by gearing any one of these wheels to an indicator by a suitable train of speed-increasing gears the indicator need have but one set of indicating-numbers.

From the foregoing description it will be seen that under all the constructions illustrated the latch, in connecting the driver with and disconnecting it from the registering-wheel, co-operates with both the fixed stop or stops and the movable stop or stops; but that in connecting the driver with and disconnecting it from the indicator-wheel it co-operates with only the movable stop or stops, except in the construction shown in Figs. 3 and 4. It will thus be seen that in the combination of the indicator-wheel and driver my invention is not restricted to the employment of both a fixed stop or stops and a movable stop or stops, but contemplates the broad combination of the indicator revolving in one direction only, the revoluble driver also revolving in one direction only, and any suitable means for connecting and disconnecting them. It will also be seen that under all the constructions illustrated the revoluble part, with which the latch connects the driver, is in each case a wheel, whether the registering-wheel, the indicator-wheel, or a driving-wheel for one or the other be considered, so that where my claims refer to a wheel they are intended to include each and all of such revoluble devices connected with and disconnected from the driver.

It will be understood that in machines in which a type-wheel is employed to print the different amounts indicated it will be driven by the same wheel which here drives the indicator, and may be employed either in connection with or without the indicator and registering wheels.

From the foregoing description it will have been seen that in the constructions shown in Figs. 1 and 2 and 5 and 6 the driver is disconnected from the indicator and register at different points determined by the operated key, while in the construction shown in Figs. 3 and 4 it is connected to them at different points and disconnected from them at a fixed point. All of these constructions embody the

same general combination and mode of operation, and my broader claims are designed to cover all of them; but I also desire in this specification to claim more specifically the construction and mode of operation under which the driver is disconnected from the indicator and register at a fixed point.

In another pending application, Serial No. 418,252, filed January 16, 1892, I have specifically claimed the mode of operation in which the driver is disconnected from the indicator and register at different points.

Having thus fully described my invention, I claim—

1. The combination of a wheel revolving in one direction only, a driver therefor revolving on the same axis and in one direction only, and means for connecting and disconnecting them.

2. The combination of a wheel revolving in one direction only, a driver therefor revolving on the same axis and in one direction only, a latch for connecting them, and a stop co-operating with the latch to disconnect them.

3. The combination of a wheel revolving in one direction only, a driver therefor revolving on the same axis and in one direction only, a latch for connecting them, and a fixed stop and a movable stop co-operating with the latch.

4. The combination of an indicator revolving in one direction only and moving at each operation of the machine first to zero and thence to the new indication, a revoluble driver therefor, and means for connecting and disconnecting them.

5. The combination of an indicator revolving in one direction only and moving at each operation of the machine first to zero and thence to the new indication, a revoluble driver, a latch for connecting them, and a stop for disconnecting them.

6. The combination of a wheel revolving in one direction only, a driver therefor revolving in one direction only, a latch also revolving in one direction only for connecting the driver and wheel, and a stop for disconnecting them.

7. The combination of a wheel revolving in one direction only, a driver therefor revolving in one direction only, a latch also revolving in one direction only for connecting the driver and wheel, and a fixed stop and a movable stop co-operating with the latch.

8. The combination of an indicator-wheel revolving in one direction only, a registering-wheel, a revoluble driver, and means for connecting the driver with and disconnecting it from the indicator and registering wheels.

9. The combination of an indicator-wheel revolving in one direction only, a registering-wheel, a revoluble driver, a latch for connecting the driver with and disconnecting it from the indicator and registering wheels, and a fixed stop and a movable stop co-operating with the latch.

10. The combination of an indicator revolvy-

ing in one direction only, an independently-revoluble driver making a complete revolution at each operation, means for connecting the driver with the indicator during the first half of its revolution to cause it to pick up the indicator and turn it to zero, and means for disconnecting the driver from the indicator during the second half of its revolution.

11. The combination of an indicator revolving in one direction only, a registering-wheel, an independently-revoluble driver making a complete revolution at each operation, a latch for connecting the driver with the indicator during the first half of its revolution to cause it to pick up the indicator and turn it to zero, means co-operating with the latch to connect the driver with the registering-wheel after the driver has completed the first half of its revolution, and means co-operating with the latch to disconnect the driver from both the indicator and registering wheel.

12. The combination of a wheel revolving in one direction only, a revoluble driver therefor, a radially-sliding and revoluble latch-bar for connecting the driver and wheel, and a stop co-operating with the latch-bar to disconnect the driver and wheel.

13. The combination of a register-wheel, a revoluble driver therefor, a radially-sliding and revoluble latch-bar for connecting the driver and wheel, and a fixed stop and a movable stop co-operating with the latch-bar.

14. The combination of an indicator-wheel revolving in one direction only, a registering-wheel, an independently-revoluble driver, a radially-sliding and revoluble latch-bar for connecting the driver with the indicator and registering wheels, and a fixed stop and a series of movable stops co-operating with the latch-bar.

15. The combination of a notched wheel revolving in one direction only, a radially-sliding and revoluble latch-bar co-operating with the notches in said wheel, a driver for revolving the latch-bar, and a fixed stop and a series of movable stops co-operating with the latch-bar.

16. The combination of an indicator-wheel provided with two series of indicating-numbers and revolving in one direction only, a revoluble driver therefor, a latch for connecting the driver and indicator-wheel, and a stop co-operating with the latch to disconnect the driver and wheel.

17. The combination of an indicator-wheel provided with two series of indicating-numbers and revolving in one direction only, a revoluble driver therefor, a latch for connecting the driver and indicator-wheel, and a fixed stop and a series of movable stops co-operating with the latch.

18. The combination of an indicator-wheel provided with two series of indicating-numbers and revolving in one direction only, a registering-wheel, a revoluble driver, a latch for connecting the driver with the indicator and registering wheels, and a fixed stop and

a series of movable stops co-operating with the latch.

19. The combination of an indicator revolving in one direction only and moving at each operation of the machine first to zero and thence to the new indication, a driver therefor, a latch for connecting the driver and indicator, a series of movable stops or keys co-operating with the latch to connect the driver and indicator at different points, and a fixed stop co-operating with the latch to disconnect the driver and indicator at a fixed point.

20. The combination of an indicator revolving in one direction only, a registering-wheel independently revoluble in the same direction, a revoluble driver, a latch for connecting the driver with the indicator and registering wheel, a series of movable stops or keys co-operating with the latch to connect the driver with the indicator and registering wheel, and a fixed stop co-operating with the latch to disconnect it from them.

21. The combination of an indicator revolving in one direction only and moving at each operation of the machine first to zero and thence to the new indication, a driver therefor, a latch carried by the driver for connecting it to the indicator, a series of movable stops co-operating with the latch to connect the driver and indicator at different points, and a fixed stop co-operating with the latch to disconnect them at a fixed point.

22. The combination of a notched wheel revolving in one direction only, a driver revoluble in the same direction, a latch carried by the driver and co-operating with the notches in the wheel, and a series of movable stops, and a fixed stop co-operating with the latch to connect the driver with and disconnect it from the notched wheel.

23. The combination of an indicator revolving in one direction only, a notched wheel fast upon the indicator, a revoluble driver making a complete revolution at each operation, a radially-sliding latch-plate carried by the driver and co-operating with the notched wheel, two diametrically-opposite projections upon the indicator co-operating with the latch-plate to turn the indicator to zero, a fixed stop co-operating with the latch-plate at the completion of the first half of the revolution of the driver to disconnect the driver from the indicator-wheel after the latter has been turned to zero, a series of movable stops co-operating with the latch-plate during the second half of the revolution of the driver to connect the driver with the indicator-wheel, and a fixed stop co-operating with the latch-plate at the completion of the revolution of the driver to disconnect the driver from the indicator-wheel.

24. As a new element in a cash register and indicator, an indicator-wheel revolving in one direction only, both to make the indication and to destroy it preparatory to the next indication and moving at each operation of the machine first to zero and thence to the new indication, substantially as described.

25. The combination of the indicator-wheel K, revolving in one direction only, the notched wheel L, the independently-revoluble notched wheel M, the central revoluble shaft A, the driver N, fast thereon, the radially-sliding latch-plate O, provided with the lugs P and R and tooth T, the lugs Q Q' upon the wheel K, co-operating with the lug P on the latch-plate O, the fixed stop S, co-operating with the cam-lug R upon the latch-plate and the fixed stop S', and movable stops or keys G, co-operating with the beveled outer end of the latch-plate, substantially as described.

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Witnesses:

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