

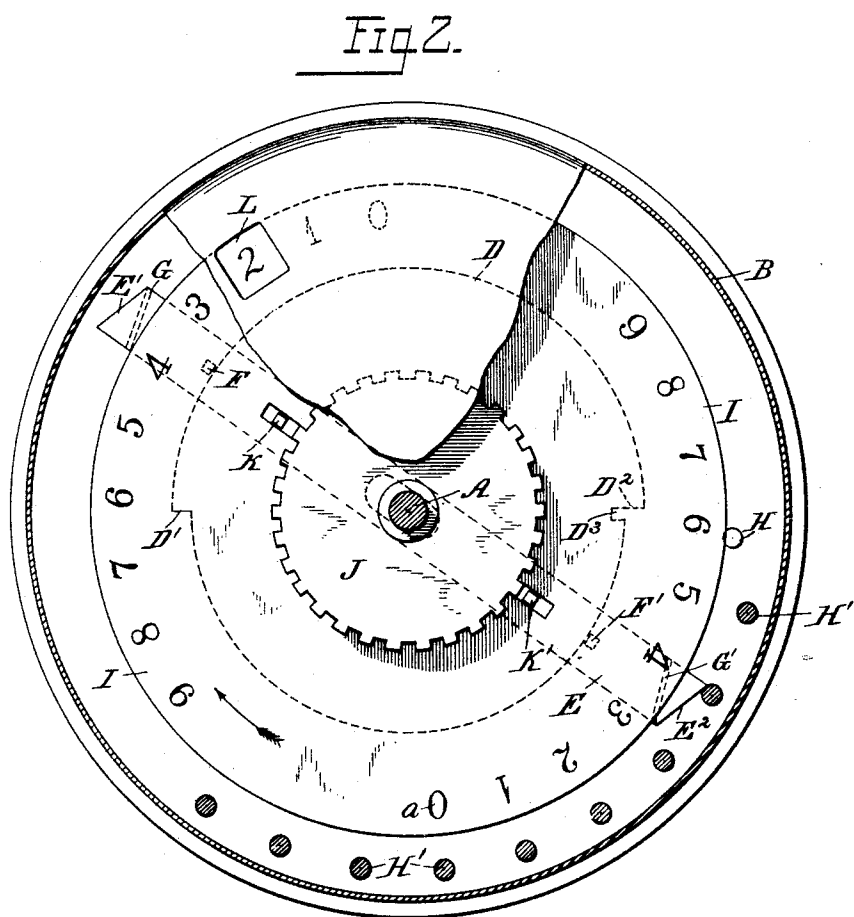
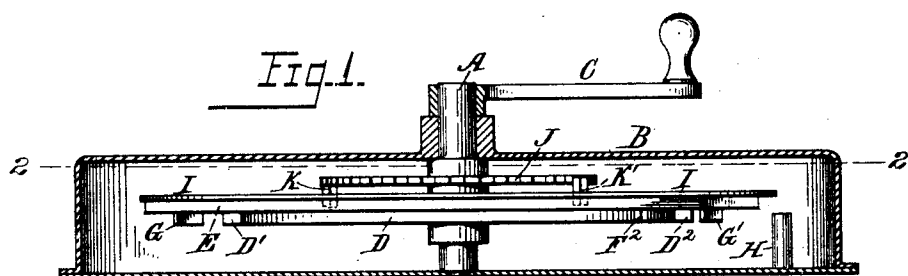
(No Model.)

4 Sheets—Sheet 1.

H. COOK.
CASH REGISTER AND INDICATOR.

No. 469,545.

Patented Feb. 23, 1892.



Witnesses:
W. C. Jirdinston.

E. W. Goodinghaus

Inventor:

Hugo Cook
by Peck & Rector
his Attorneys.

H. COOK.
CASH REGISTER AND INDICATOR.

No. 469,545.

Patented Feb. 23, 1892.

Fig. 3.

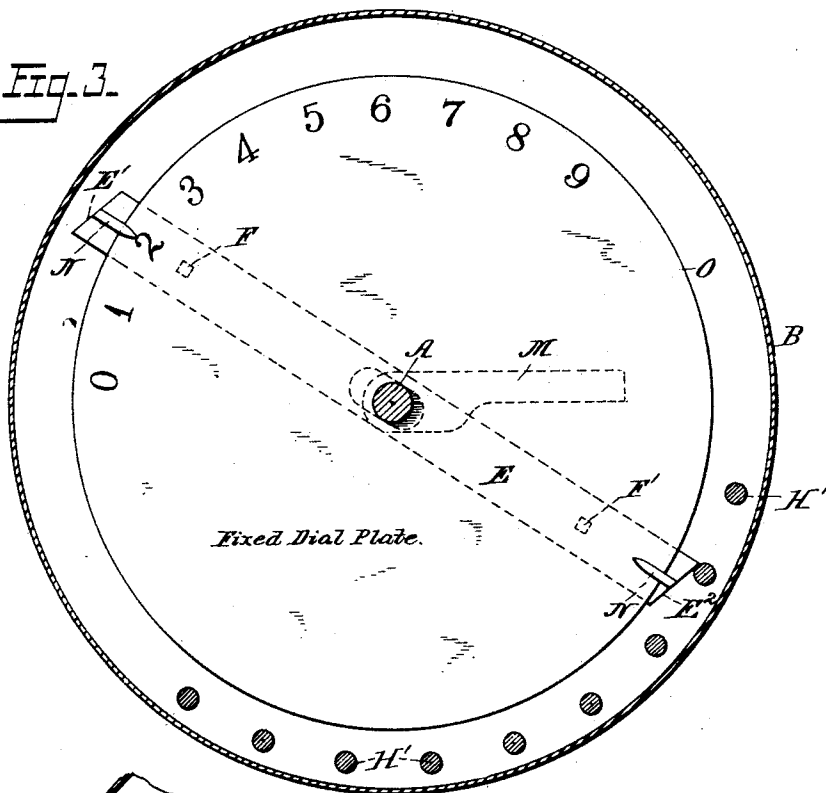
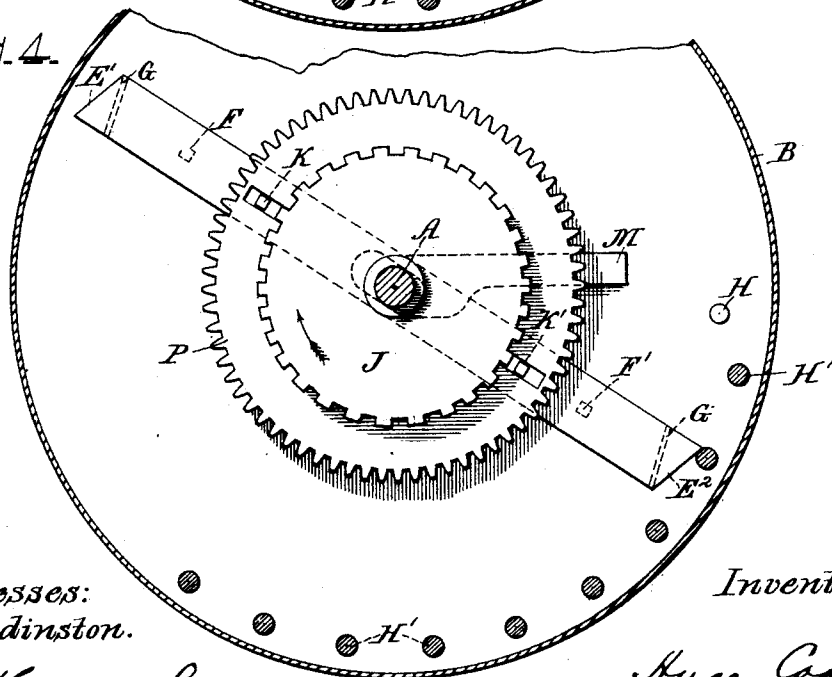


Fig. 4.



Witnesses:
W. C. Jirdin, Jr.

Edw. Hardinghaus

Inventor:

Hugo Cook
by *Peck & Reiter*
his Attorneys

H. COOK.
CASH REGISTER AND INDICATOR.

No. 469,545.

Patented Feb. 23, 1892.

Fig. 5.

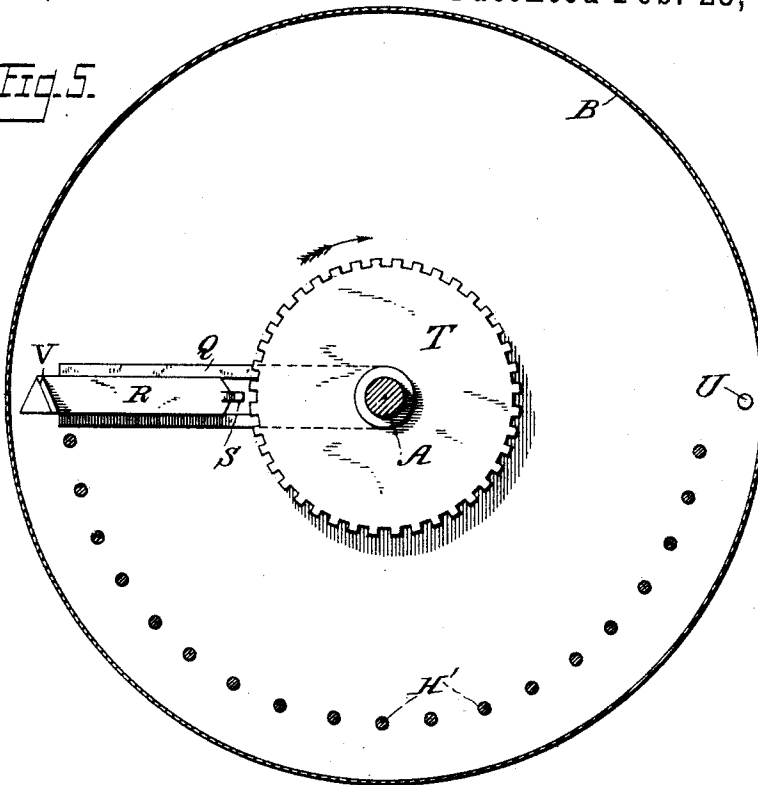
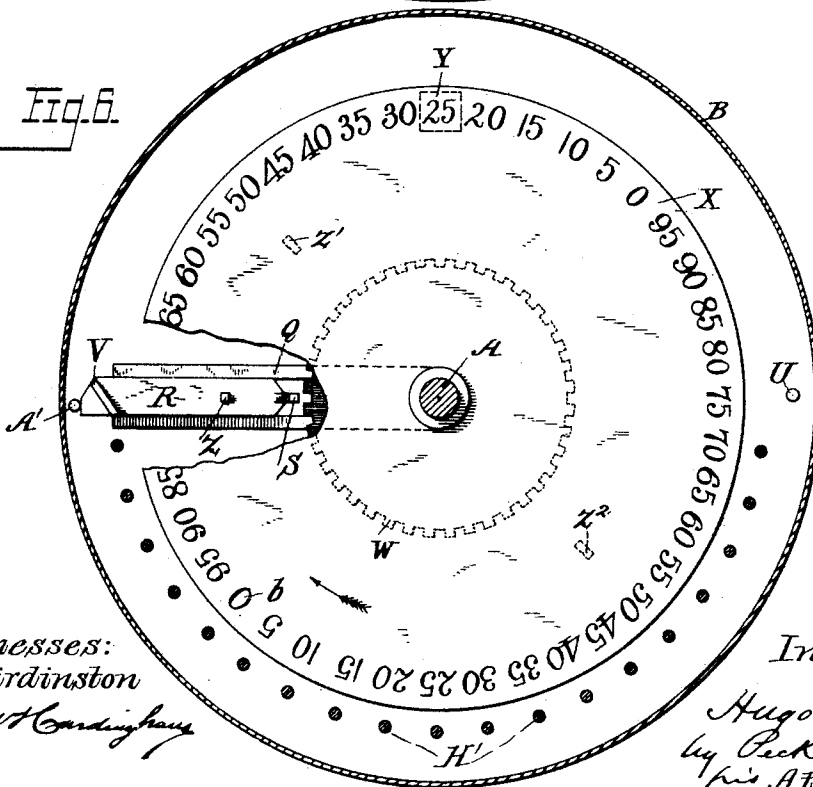


Fig. 6.



Witnesses:
W.C. Jirdiniston
E.W. Hardinghaus

Inventor:
Hugo Cook
by Peck & Rosta
his Attorneys.

(No Model.)

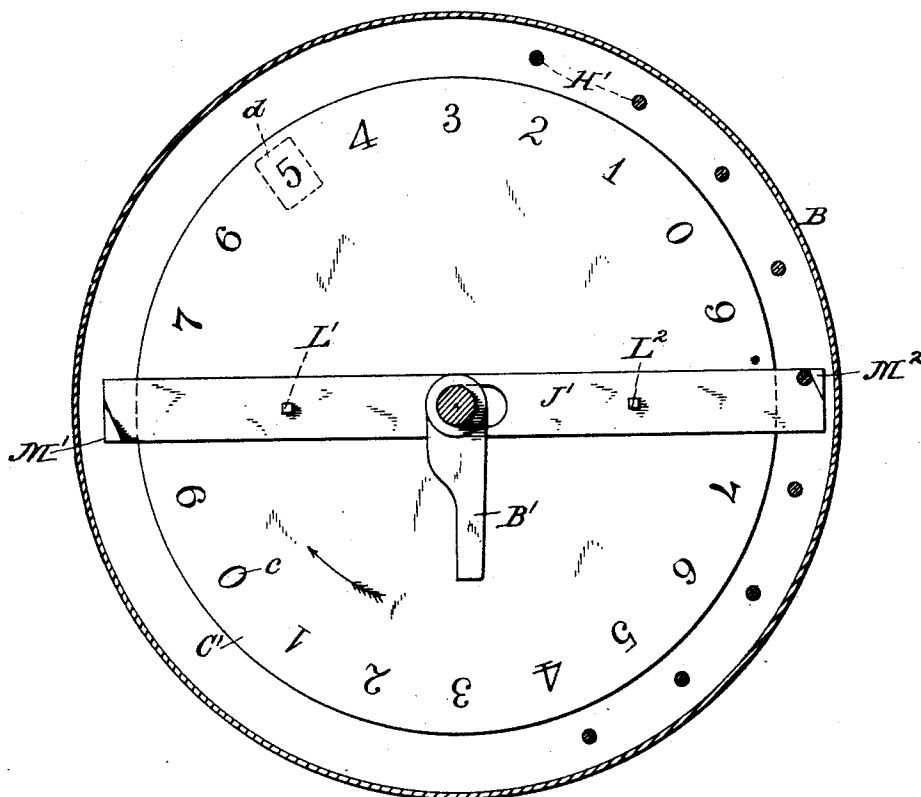
4 Sheets—Sheet 4.

H. COOK.
CASH REGISTER AND INDICATOR.

No. 469,545.

Patented Feb. 23, 1892.

Fig. 7.



Witnesses:
W. C. Firdinston.

E. W. Gaudinghaus

Inventor:

Hugo Cook
by Beck & Reiter
his Attorneys.

UNITED STATES PATENT OFFICE.

HUGO COOK, OF DAYTON, OHIO.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 469,545, dated February 23, 1892.

Application filed January 16, 1892. Serial No. 418,252. (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, reference being had to the accompanying drawings, forming part of this specification.

10 My invention does not relate to the form or arrangement or details of construction of the various parts composing such machines, but to a new mode of operation and a new mechanical movement applicable thereto, as will
15 be hereinafter set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, with the casing in central section, of one form of cash register and indicator embodying my invention; Fig. 2, a plan
20 view of a horizontal section on the line 2 2 of Fig. 1, with a section of the top of the casing remaining to show the reading-opening; and Figs. 3, 4, 5, 6, and 7, horizontal sectional views
25 of different constructions, showing various modifications of my invention to be hereinafter described in detail.

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

30 The foundation of my invention consists in a driving device which revolves in one direction only, combined with another independently-revoluble part which also revolves in one direction only, with means for connecting
35 the two to cause the driver to carry the other part with it and means for disconnecting them at different points to cause the driver to release the other part and move on alone, the result being that while the driver is given a
40 uniform movement at each operation of the machine the other revoluble part will be moved by it a greater or less distance, depending upon the points of connection and disconnection of the two. Now the revoluble part
45 to which I refer may be either a registering-wheel or wheel for driving a register, an indicator or wheel for driving an indicator, or it may not be a wheel at all, but simply a device for connecting the driver to the indicator
50 or registering-wheel or for transmitting the movements of the driver to some other mov-

able part, or may itself constitute the indicator, all as will be hereinafter explained.

In the construction shown in Figs. 1 and 2, A is a revoluble shaft journaled in the top and
55 bottom of the casing B and having secured to it a handle C. Fast upon this shaft, within the casing, is a disk D, a top plan view of which is shown in dotted lines in Fig. 2. This disk turns with the shaft A and handle C and
60 constitutes what I term the "driver." Its two halves are of unequal diameters, so that shoulders D' D² are formed on its opposite sides, both facing in the same direction. The shoulder D' serves no purpose; but the shoulder D²
65 forms an operative part of the driver, as will be hereinafter explained. At the base of the shoulder D² a notch D³ is cut in the periphery of the disk.

Next above the driver D, Fig. 1, is a bar E, 70 extending diametrically across the machine and having its opposite ends E' and E² beveled on substantially parallel lines. This bar is mounted at its middle on the shaft A by an elongated slot, through which the shaft
75 passes, which slot admits of a longitudinal reciprocating movement of the bar, as well as its revoluble movement on the shaft A.

Upon the under side of the bar E, at diametrically-opposite sides of the disk D, are
80 two lugs F and F', which co-operate with the shoulder D² and notch D³ in the disk D in the manner to be described. Also formed or secured upon the under side of the bar E, near
85 its opposite ends, are two beveled or inclined lugs or cams G and G', the planes of whose operating-faces intersect the planes of the beveled ends of the bar. These lugs co-operate with a fixed pin or cam H, projecting upward from the bottom of the casing, Fig. 1.
90 The beveled ends of the bar E co-operate with a series of movable stops, cams, or keys H', mounted in the top of the casing. These keys are not shown in Fig. 1, since in that view the near half of the casing in which they are
95 mounted is removed; but their position is shown in the plan view in Fig. 2. They are mounted in guides and arranged to be pushed in and moved out in the usual manner. When
100 in their outer position, their lower ends are above the horizontal plane of the bar E; but when any one of them is pushed in its lower

end projects through such plane, as will be readily understood.

Next above the bar E, Fig. 1, is a large wheel I, loosely mounted on the shaft A and constituting under the construction shown in Figs. 1 and 2 the indicator. It has two series of indicating-numbers arranged near its periphery, each series occupying one-third of the circle in which they are located. Next above the wheel I, Fig. 1, and separated from it in this instance by a collar on the shaft A is a notched wheel J, which constitutes the registering-wheel or driving-gear therefor. Upon the upper side of the bar E are two lugs K and K', which project up through slots in the wheel I on the opposite sides of the wheel J and co-operate with the notches in the latter. It results from this that, while the bar E is free to reciprocate diametrically of the wheel I, the two revolve together. A reading-opening L in the top of the casing permits the exposure of the indicating-numbers on the wheel I.

The keys H', beginning with the one on the right in Fig. 2, represent, successively, 1, 2, 3, &c., up to 9. In the position of the parts shown in Fig. 2 the beveled end E² of the bar E is arrested at the second key, and the number "2" on the wheel I is exposed at the reading-opening L in indication of the last operation of the machine.

A full operation of the machine consists in pushing in one of the keys H' so that its lower end intersects the plane of the bar E and then giving the handle C one complete revolution. The action of the various parts under this operation will be as follows: As the driver D moves forward with the handle C and shaft A its shoulder D² will engage the lug F' on the under side of the bar E and will pick up the bar and the wheel I (which moves with the bar) and carry them forward with it. When the driver D has made one-half of a revolution and the shoulder D² has been brought to a position diametrically opposite that in which it is shown in Fig. 2, the zero on the wheel I at a will have been brought under the reading-opening L and will stand exposed to view. At this point the inclined lug G upon the under side of the bar E (at the upper left-hand end of the bar in the position of the parts shown in Fig. 2) will ride over the outer side of the fixed pin H at the right-hand side of the machine and force the bar E to the right. This will draw the lug F' into the notch D³ at the base of the shoulder D² and will also draw the lug K' into one of the notches in the wheel J and thereby lock the driver and wheel I to the wheel J. From this point forward all three will move together until the end E' of the bar E strikes the lower end of that key H' which has been pushed in, whereupon as the beveled end of the bar rides over the key the bar will be forced toward the opposite side of the machine far enough to carry the lug F' out of the notch D³ in the driver and beyond the shoulder D² thereof

and also to carry the lug K' out of the notch in the wheel J, so that the driver is disengaged from everything and moves on to normal position alone, while the bar D and registering and indicator wheel come to rest with the number on the latter which corresponds to the operated key exposed at the reading-opening.

It will be noticed that the lugs F and F' fit closely against the periphery of the driver, so that the bar E is held from any reciprocating movement, except when one of said lugs is in or opposite the notch D³ at the base of the shoulder D². It results from this that when the end of the bar strikes the key which has been pressed in and is thereby forced toward the opposite side of the machine the lug F on the end of the bar adjacent to the key is moved up against the near edge of the driver D into the position of the lug F' in Fig. 2. The lug F reaches this position just before the beveled end of the bar quite clears the key, and as the engagement of the lug with the periphery of the driver prevents any further movement of the bar in the direction which its contact with the key has forced it the bar is positively arrested by the key.

At the next operation of the machine when the shoulder D² of the driver engages the lug the bar is free to move forward, because the notch D³ is brought opposite the lug at the same instant that the shoulder engages it, so that as the driver bears against the bar to carry it forward the lug can enter the notch far enough to permit the end of the bar to clear the key. This would be the operation if the same key were successively operated or allowed to remain in. In machines of this character, however, the keys are generally so combined with resetting-springs and detent plates or catches that when one key is pressed in any other key which has been previously pressed in and detained will be released and thrown out to normal position. If, therefore, a different key is pressed in at the next operation of the machine, the one already in the 2-key, for instance, will be released and thrown outward, so that, so far as this key is concerned, the bar E would be perfectly free to move forward when the shoulder D² engaged its lug even in the absence of the notch D³; but if the newly-operated key should happen to be one of higher value than the one last operated it would stand in the path of the bar E, and the latter would become locked upon it but for the notch D³, which will permit the bar E to be moved away from the newly-operated key as its end rides over the key.

While it is more convenient to have a separate key H' for each amount to be indicated and registered, it will be understood that the general mode of operation of the machine would be the same if there were simply nine holes and a single movable pin, which could be inserted in one hole or another, as desired. Such a pin might be carried on the outer end of an arm hung to the shaft A and arranged

to swing back and forth over the row of holes, as will be readily understood.

In the construction thus far described the sole purpose of the lugs K and K', stationary pin H, and beveled lugs G and G' is to co-operate with the notched wheel J, so that in the absence of such wheel all those parts might be dispensed with. So far as the operation of the indicator-wheel is concerned the only parts necessary are the driver, the bar D, provided with the lugs F and F', (or equivalents therefor,) and the keys H'.

From the construction thus far described it will be seen that the main purpose of making the driver D in the form of a disk is to lock the bar E from reciprocating movement, except when permitted by the notch D³, and that the principal operative part of the driver is simply the shoulder D². In Fig. 3, therefore, I have illustrated a driver M, consisting simply of an arm fast upon the shaft A and combined with the bar E and keys H', these being the only parts necessary to the operation of an indicator. Under this construction when the driver moves forward its outer end will engage the lug F' and pick up the bar E and carry it on around with it until the beveled end E' of the bar strikes the key which has been pushed in, whereupon the bar will be forced toward the opposite side of the machine and the lug F' be carried outward beyond the end of the driver M, thereby disconnecting the driver from the bar, the latter coming to rest at the point determined by the operated key and the driver going on to normal position.

In Fig. 3 I have not shown either an indicator-wheel or a registering-wheel, but have shown how the bar E may itself be made to constitute the indicator. As there shown, it is provided upon its upper side, near each end, with a pointer N, arranged to travel over the periphery of a fixed plate or dial O, provided with a series of indicating numbers. In the drawings the end E² of the bar E is shown arrested on the second key and the pointer N at the opposite end of the bar stands over the figure "2" on the dial. At the next operation of the machine if the 5-key be pressed in the end E' of the bar E will be caught on the fifth key and the pointer N on the end E² of the bar will come to rest over the figure "5" on the dial, as will be readily understood. If desired, a second series of numbers might be placed on the plate O diametrically opposite those shown, so that the pointers N N would simultaneously point to corresponding figures in the two opposite series of numbers.

In Fig. 4 I have shown a driver similar in form to that in Fig. 3 combined with the bar E and registering-wheel J. Instead of an indicator-wheel, such as I, or a fixed dial, such as O, I have here shown simply a gear-wheel P, from which may be driven an indicator of any suitable form and arrangement. Under this construction when the driver M moves forward its outer end engages the lug F' on the bar

E and picks up the bar and carries it and the gear P on around with it, the wheel J remaining stationary. Just as the driver completes one-half of its revolution and reaches a position diametrically opposite that shown in Fig. 4 and the indicator driven by the gear P has been brought to zero the beveled lug G on the under side of the bar E rides over the outer side of the fixed pin H and forces the bar E to the right, and thereby draws the lug K' into one of the notches in the wheel J. From this point forward the registering-wheel is carried with the bar E and driver until the beveled end E' of the bar E engages the operated key, whereupon the bar E is forced toward the opposite side of the machine and the lug F' carried beyond the end of the driver and the lug K' moved out of the notch in the wheel, so that the bar and wheels P and J come to rest, while the driver is released and moves on to normal position alone.

In building machines for the market I prefer to connect the gear P by a suitable speed-increasing train of gears with an indicator-wheel provided with only one series of numbers, so that the figures may be made larger than where two series of numbers are employed.

In Fig. 5 I have shown another embodiment of my invention involving the same general combination and mode of operation under a somewhat different construction and arrangement of the parts. In this case the driver consists of a radial arm Q, fast on the central shaft A and carrying in a guideway upon its upper side a sliding latch bar or plate R. This plate is provided at its inner end with a tooth S, which co-operates with a notched wheel T, loosely mounted on the shaft A. This wheel is the registering-wheel or the driving-gear therefor. The outer end of the plate R is beveled and co-operates with a fixed cam U at the right-hand side of the machine. Upon the upper side of the plate R, near its outer end, is a lug V, having its inner face beveled or inclined to co-operate with the series of keys H', of which there are nineteen shown in this instance, representing multiples of five from 5 to 95.

A full operation of the machine consists in pushing in one of the keys H' to bring its lower end into the horizontal plane of the lug N on the bar or plate R and then giving the shaft A a complete revolution by means of the operating-handle. (Not shown.) When the driver Q has moved one-half of a revolution, the outer beveled end of the plate R engages the fixed cam U, and as it rides over said cam the plate R is forced inward and its tooth S engaged with a notch in the wheel T. This couples the driver to the registering-wheel, and they move forward together from this point until the lug V on the plate R engages the lower end of the key which has been pressed in. As the lug rides over the outer side of the key, the plate R is forced outward and its tooth withdrawn from the

notch in the wheel T, thereby uncoupling the driver and wheel, whereupon the latter comes to rest and the driver returns to normal position alone. It will thus be seen that the driver carries the registering-wheel with it from the point at which they are coupled together by the operation of the cam U until they are uncoupled by the action of the operated key, and thus the value of such key is registered at each operation of the machine.

While in the construction shown the driver is not coupled to the registering-wheel T until the driver has made half a revolution, in order that the first half of its revolution may be utilized in turning the indicator to zero, where an indicator is employed, as will be presently explained, yet so far as the registering-wheel alone is concerned the cam U might be located at a point diametrically opposite that which it occupies in Fig. 5, so that it would force the tooth of the latch-plate R into engagement with the wheel T when the driver comes to normal position instead of at the end of the first half of its revolution. In such case the driver would carry the wheel forward with it from the beginning of its movement until disconnected from it by the operated key and would be again connected with it at the completion of its revolution, as will be readily understood. Under such an arrangement there could be enough keys to completely fill the circle in which they are located, excepting the one place opposite the cam U, or, instead, the series of keys shown could be located on the opposite side of the machine, so that they would co-operate with the latch during the first half of the revolution of the driver, while it would travel free of any keys during the second half of its revolution.

In Fig. 6 I have shown how an indicator-wheel may be operated with a driver and latch-plate such as shown in Fig. 5. In Fig. 6 a wheel W, similar to the wheel T in Fig. 5, is loosely mounted on the shaft A above the wheel T, the two being separated by a collar on the shaft A. The wheel W has fast upon its upper side the large indicating-wheel X, bearing upon its face, near its periphery, two series of indicating-numbers, each representing multiples of five from 5 to 95 and separated by zero or blank spaces at diametrically-opposite points on the wheel. These indicating-numbers are adapted to be exposed to view singly at a reading-opening in the top of the casing, (indicated by the dotted lines at Y.) Upon the under side of the wheel X, upon opposite sides of its center, are two lugs Z' and Z², which co-operate with a lug Z upon the upper surface of the latch-plate R. At the left-hand side of the machine, diametrically opposite the fixed cam U, is a second fixed cam or pin A', also co-operating with the beveled outer end of the plate R. When the driver Q is in its normal position of rest, as shown in Fig. 6, the outer end of the plate R bears against the cam A' and the plate is held

in such position that the lug Z' upon the under side of the wheel X stands in the path of travel of the lug Z on the plate R.

The operation of the parts is as follows: As the driver moves forward at the beginning of the operation the lug Z on the plate R engages the lug Z' on wheel X and picks up said wheel and carries it on around with the driver. Assuming that the last operation of the machine has left the number "25" on the wheel X exposed at the reading-opening Y, as shown in Fig. 6, the numbers to the left of "25" will now pass successively under said opening until the zero at b is brought under it. At this point in the operation the driver will have completed one-half of a revolution and the outer beveled end of the plate R will engage the fixed cam U and the plate will be forced inward and its tooth S be engaged with one of the notches in the wheel W and with a coincident notch in the registering-wheel T immediately below it. (Not shown in Fig. 6.) As the driver moves on in the second half of its revolution the indicator-wheel X, and the registering-wheel T as well, will be carried with it until the operated key is reached. This key having been pressed in, its lower end will stand in the path of travel of the lug V on the plate R, and as this lug rides over the outer side of the key the plate R will be forced outward and its tooth S disengaged from the wheels T and W, which will thereupon come to rest with the number on the indicator-wheel X corresponding to the operated key exposed at the reading-opening Y. This outward movement of the plate R will have carried the lug Z outward beyond the lug Z' on the wheel X, so that the lug Z will now stand outside of the circle in which the two lugs Z' and Z² are located; but as the driver comes to normal position the outer beveled end of the plate R will engage the fixed cam A' and the plate will be moved slightly inward to bring the lug Z into line with the lugs Z' and Z² ready to engage the latter at the next forward movement of the driver.

In Fig. 7 I have shown still another construction in which the indicator-wheel is operated in a similar manner to that in Figs. 1 to 4. The driver consists of an arm B', fast on the shaft A. The indicator-wheel C' is loosely mounted on this shaft. A bar J', provided at its middle with an elongated slot, through which the shaft A passes, is capable of reciprocating diametrically of the indicator-wheel, but turns with it, as does the bar E in Figs. 1 to 4. Upon the upper face of the bar J' are two lugs L' and L², which co-operate with the end of the driver B'. At the opposite ends of the bar J' are two lugs M' and M², having beveled inner faces to co-operate with the lower ends of the keys H'.

The operation of the parts is as follows: As shown in the drawings, the lug M² at the right-hand end of the bar is caught on the fifth key and the figure "5" on the wheel C' is exposed at the reading-opening, (indicated by

the dotted lines at *d*.) As the driver B' moves forward from the position shown in the drawings its outer end engages the lug L' on the bar J' and picks up said bar and the wheel C' and carries them around with it, the lug M² at the opposite end of the bar slipping over the key upon which it had been caught. When the driver completes one-half of a revolution and reaches a position diametrically opposite that occupied by it in Fig. 7, the zero on the wheel C' at *c* will have been brought under the reading-opening at *d*. As the driver moves on in the second half of its revolution the figures following the zero *c* on the wheel C' will pass successively under the reading-opening until the lug M' on the bar J' engages the lower end of the key which has been pressed in. As this lug rides over the outer side of the key the bar J' will be forced to the right and the lug L', with which the driver B' has been engaged, will be carried outward beyond the end of the driver, which, being thus freed from the bar J' and wheel C', will move on to normal position alone, while the bar and wheel will be arrested at the operated key, with the number on the wheel which corresponds to such key exposed at the reading-opening.

It will of course be understood that gear-wheels might be substituted for the indicator-wheels X and C' in Figs. 6 and 7 (just as a gear-wheel is substituted in Fig. 4 for the indicator-wheels in Figs. 1 and 2) and indicators of any desired form and location be driven from such gears by means of suitable interposed gearing. It will also be understood that the zeros both upon the indicator-wheels and upon the fixed dial simply indicate initial positions of the indicator, from which the forward movement to the new indication begins, so that where I speak of the indicator being "turned to zero" I simply mean that it is moved to initial position. It is not necessary that any zero should be actually placed upon the indicator-wheel or dial.

From the foregoing description it will be seen that in each of the constructions illustrated, in which an indicator is shown the first half of the revolution of the driver is utilized to turn the indicator to zero and that from this point forward the driver carries the indicator with it until the operated key is reached, whereupon the driver is disconnected from it and moves on to normal position alone, the indicator coming to rest with its number corresponding to the operated key exposed to view or with its pointer standing at such number on a stationary dial. It will also be seen that where a registering-wheel has been illustrated the driver has been coupled to such wheel at the end of the first half of its revolution and has been disconnected from it at various points in the second half of its revolution, such points being determined by the operated keys.

In another pending application, Serial No. 408,975, filed October 17, 1891, I have illus-

trated and described a number of different constructions, in all of which a driver revolving in one direction only is combined with an indicator or registering wheel, or both, also revolving in one direction only, with means for connecting said driver with and disconnecting it from said wheel or wheels, and have claimed said general combination and mode of operation broadly. In some of the constructions illustrated and described in said application the driver was disconnected from the indicator and registering wheel at different points in the second half of its revolution, the point being determined by the operated key, and in another it was coupled to said wheels at different points in the second half of its revolution and disconnected from them at a fixed point for the same purpose. While claiming, broadly, in said application the general combination above referred to, covering both of the modes of operation just described, I also claimed more specifically the combination and mode of operation under which the driver was coupled to the indicator and register at different points and disconnected from them at a fixed point. Inasmuch as I did not and could not also specifically claim in that application the combination and mode of operation under which the driver was disconnected from the indicator or registering wheel at different points, it is the purpose of my present application to cover specifically such combination and mode of operation. While, therefore, my present application is subordinate to the broader claims of my aforesaid pending application and my present claims are restricted to one of the two defined modes of operation described in said application, yet they are not intended to be restricted to any particular construction and arrangement of the parts, but are designed to cover, broadly, the combination and modes of operation which they set forth. Where the term "indicator" is used in my claims, it is intended to be broad enough to cover a construction in which a pointer moves over a stationary dial, as in Fig. 3 of the drawings, or in which a gear-wheel is employed to drive an indicator, as in Fig. 4 of the drawings, as well as where an indicator-wheel, such as that in Figs. 1, 2, 6, and 7, is employed. So where the word "indicator-wheel" is used in my claims it is intended to be broad enough to include both a wheel having the indicating-numbers directly upon it and a wheel employed simply to drive the indicator. Where the word "registering-wheel" is employed, it is intended to include a gear-wheel which simply drives the register, which may be directly or indirectly geared to it, and where the word "wheel" is employed without qualifying description it is intended to cover both the indicator and registering wheels or driving-wheels therefor.

Having thus fully described my invention, I claim—

1. The combination of an indicator revolving in one direction only, a revoluble driver for the indicator, making a complete revolution at each operation of the machine and
 5 operating to pick up the indicator during the first half of its revolution and carry it to zero or initial position, and means for disconnecting the driver and indicator at different points during the second half of the revolution of
 10 the driver, substantially as described.
2. The combination of an indicator revolving in one direction only, a register, a revoluble driver making a complete revolution at each operation of the machine and operating
 15 to pick up the indicator during the first half of its revolution and carry it to zero or initial position, means for connecting the driver and register at the end of the first half of the revolution of the driver, and means for disconnecting the driver from both the indicator
 20 and register at different points during the second half of the revolution of the driver, substantially as described.
3. The combination of a wheel revolving in
 25 one direction only, a driver therefor revolving on the same axis and in one direction only and making a complete revolution at each operation of the machine, means for connecting the driver with the wheel at the end of the
 30 first half of the revolution of the driver, and means for disconnecting it from the wheel at different points during the second half of its revolution, substantially as described.
4. The combination of a wheel revolving in
 35 one direction only, a driver therefor revolving on the same axis and in one direction only, a latch for connecting them, and a movable stop or series of stops co-operating with the latch to disconnect them at different points, sub-
 40 stantially as described.
5. 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, a cam co-operating with the latch at the
 45 end of the first half of the revolution of the driver to connect the driver and wheel, and a movable stop or series of stops co-operating with the latch during the second half of the revolution of the driver to disconnect the
 50 driver and wheel at different points, substantially as described.
6. The combination of a wheel revolving in one direction only, a driver therefor revolving in one direction only, a latch also revolving
 55 in one direction only for connecting the driver and wheel, and a movable stop or series of stops co-operating with the latch to disconnect the driver and wheel at different points, substantially as described.
- 60 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, a cam co-operating with the latch to connect the driver and wheel at
 65 a fixed point, and a movable stop or series of stops co-operating with the latch to disconnect the driver and wheel at different points, substantially as described.
8. The combination of a wheel revolving in one direction only, a revoluble driver there-
 70 for, a radially-sliding and revoluble latch-bar for connecting the driver and wheel, and means for disconnecting the driver and wheel at different points, substantially as described.
9. The combination of a wheel revolving in
 75 one direction only, a revoluble driver therefor, a radially-sliding and revoluble latch-bar, a cam co-operating with the latch-bar at the end of the first half of the revolution of the driver to connect the driver and wheel, and
 80 a movable stop or series of stops co-operating with the latch-bar during the second half of the revolution of the driver to disconnect the driver and wheel at different points, substantially as described.
- 85 10. The combination of the revoluble driver, the radially-sliding and revoluble bar provided with the two lugs co-operating with the driver, and the series of stops co-operating with the bar to disconnect it from the driver
 90 at different points, substantially as described.
11. The combination of the revoluble driver, the radially-sliding and revoluble bar provided with the two lugs co-operating with the driver, the wheel revolving with the bar, and
 95 the series of stops co-operating with the bar to disconnect it from the driver at different points, substantially as described.
12. The combination of the revoluble driver, the radially-sliding and revoluble bar pro-
 100 vided with the two lugs F and F', co-operating with the driver and also with the two cams G and G' and the two lugs K and K', the wheel revolving with the bar and the notched wheel revolving independently of the bar, the
 105 cam H, co-operating with the cams G and G' on the bar to engage one of the lugs K K' with the notched wheel, and the series of stops H', co-operating with the bar to disconnect it from the driver at different points, substantially as
 110 described.
13. The combination of the shaft revolving in one direction only, the driver fast thereon, the wheel loose thereon and revolving in one
 115 direction only, an interposed latch for connecting the driver and wheel, and a series of stops co-operating with the latch to disconnect the driver and wheel at different points, substantially as described.
14. The combination of the shaft revolving
 120 in one direction only, the driver fast thereon, the wheel loose thereon and independently revoluble in the same direction, a latch interposed between the driver and wheel, a cam co-operating with the latch to connect the
 125 driver and wheel, and a movable stop or series of stops co-operating with the latch to disconnect the driver and wheel at different points, substantially as described.
15. The combination of the driver revol-
 130 ving in one direction only, a gear-wheel revolving in the same direction, an interposed latch

also revolving in the same direction for connecting the driver and gear-wheel, and means co-operating with the latch to disconnect the driver and wheel at different points, substantially as described.

16. The combination of the driver revolving in one direction only, the gear-wheel revolving in the same direction, the radially-sliding latch-bar also revolving in the same direction for connecting the gear-wheel to the driver, and means co-operating with the latch-bar to disconnect the driver and gear-wheel at different points, substantially as described.

17. The combination of the shaft revolving in one direction only, the driver fast thereon, the gear-wheel loose thereon and revolving in the same direction, the radially-sliding latch-bar also revolving in the same direction for connecting the driver and gear-wheel, and the series of stops co-operating with the latch-bar to disconnect the driver and gear-wheel at different points, substantially as described.

18. The combination of the shaft revolving in one direction only, the driver fast thereon, the registering-wheel loose thereon, the radially-sliding and revoluble latch-bar, a cam

co-operating with the latch-bar to connect the driver and registering-wheel at the end of the first half of the revolution of the driver, and the series of stops co-operating with the latch-bar during the second half of the revolution of the driver to disconnect the driver and wheel at different points, substantially as described.

19. The combination of the shaft revolving in one direction only, the driver fast thereon, the indicator and registering wheels loose thereon, the radially-sliding latch-bar co-operating with the driver and revolving with the indicator-wheel, a cam co-operating with the latch-bar at the end of the first half of the revolution of the driver to connect the driver and registering-wheel, and the series of stops co-operating with the latch-bar during the second half of the revolution of the driver to disconnect the driver from both wheels, substantially as described.

HUGO COOK.

Witnesses:

EDWARD RECTOR,
J. THOMSON CROSS.