

(No Model.)

3 Sheets—Sheet 1.

J. E. WELLS.
CASH REGISTER.

No. 466,280.

Patented Dec. 29, 1891.

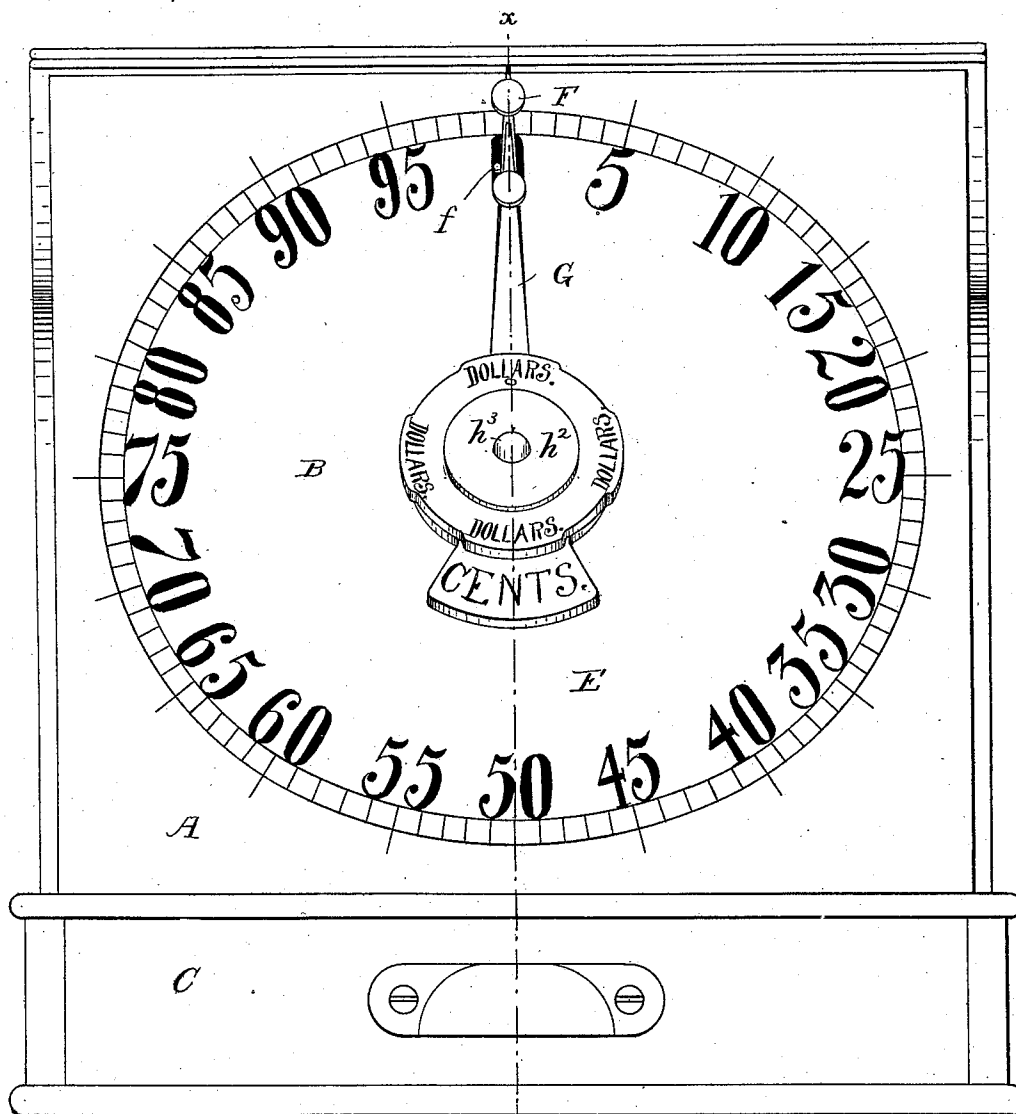
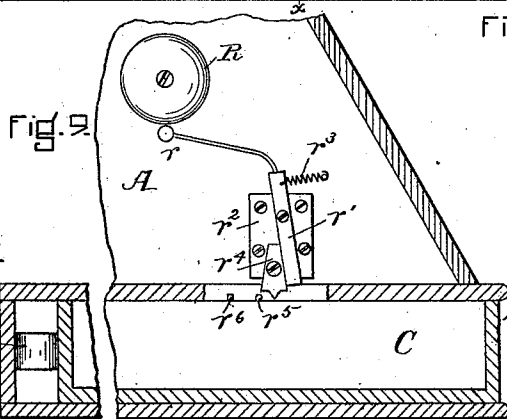


Fig. 1.



WITNESSES.

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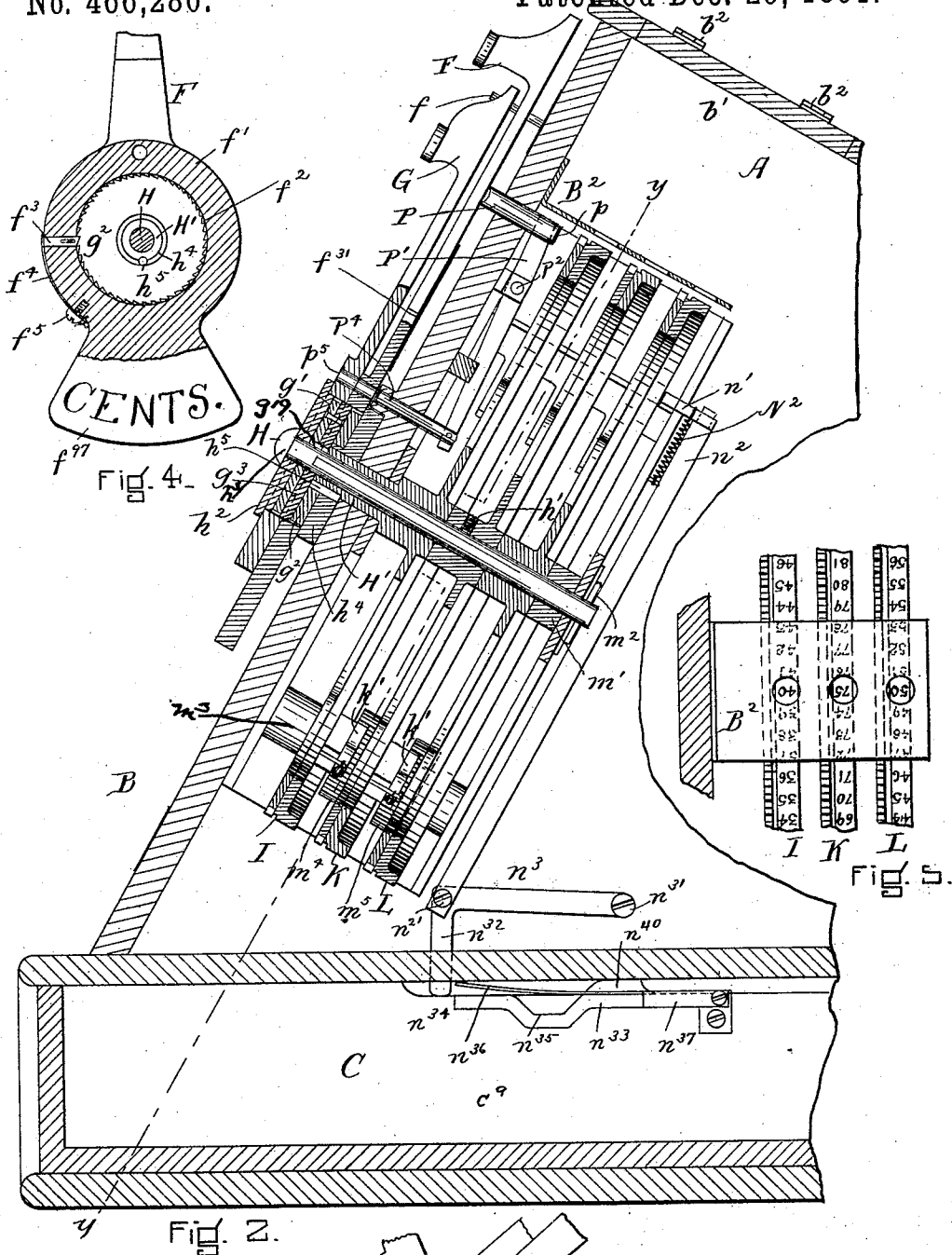
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WITNESSES.

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Fig. 6.

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(No Model.)

3 Sheets—Sheet 3.

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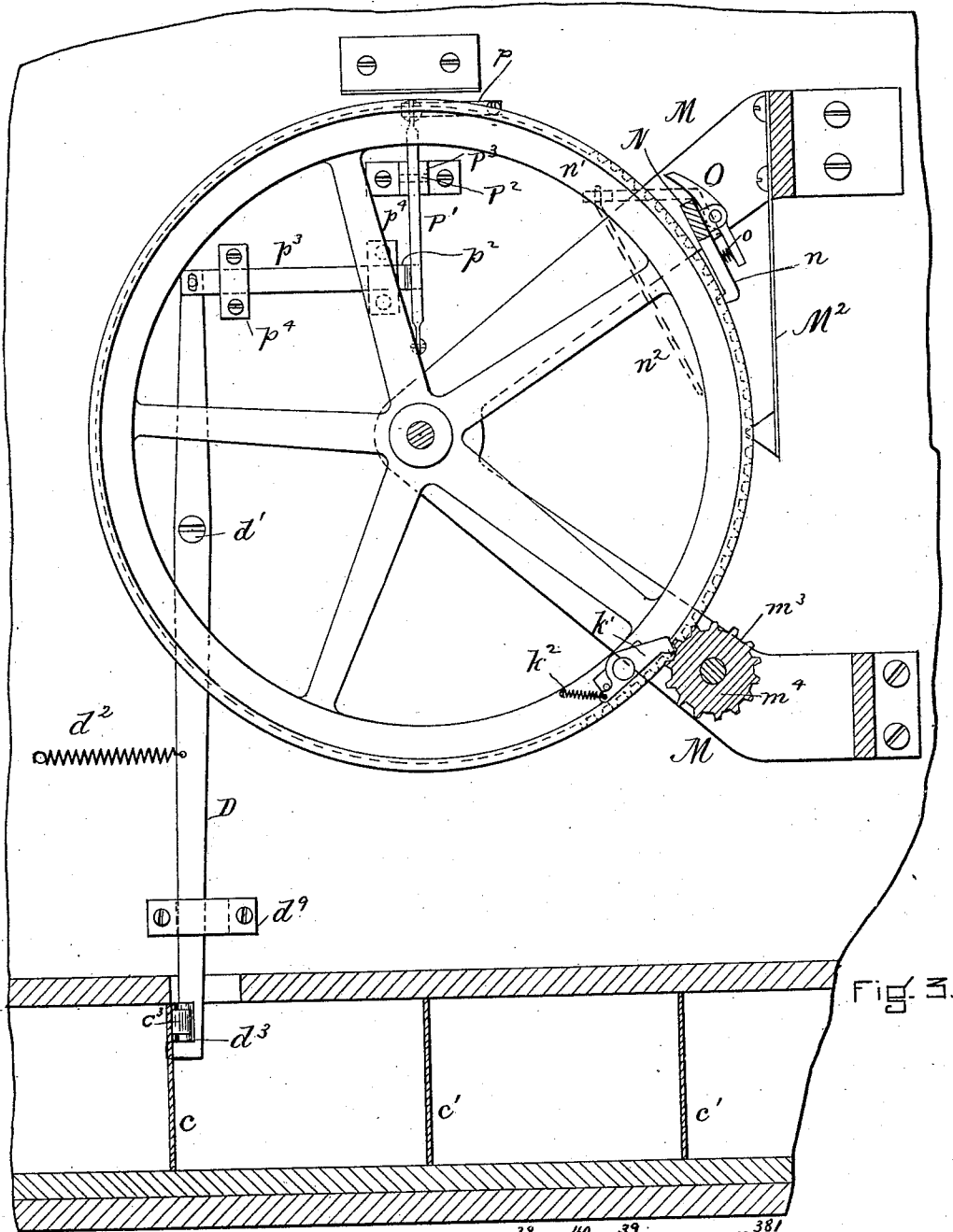


Fig. 3.

WITNESSES.
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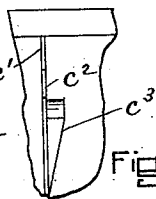


Fig. 8.

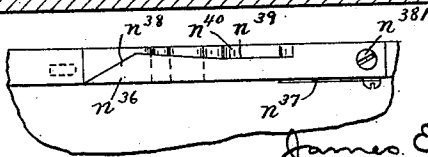


Fig. 7.

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UNITED STATES PATENT OFFICE.

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HENRY MILLAN AND FOREST W. BEAL, OF SAME PLACE.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 466,280, dated December 29, 1891.

Application filed April 24, 1891. Serial No. 390,281. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. WELLS, a citizen of the United States, formerly of Auburn, in the county of Cayuga and State of New York, but now a resident of Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Cash-Registers, of which the following is a specification.

The main objects of my invention are to provide a cash-register of simple, compact, and durable structure, from which shall be omitted the series of finger-keys and separate movable indicators, usually employed in certain types of cash-registers, and to provide one in which, in place of the arrangements comprising two or more dials and their respective indicating-pointers, which heretofore have been employed in the class of cash-registers, which may be designated "dial-registers," there will be employed but a single dial having thereon a single circle of graduations and having arranged in proper relation therewith concentrically-pivoted indicating-pointers having operative connections with registering devices.

My invention consists in certain new and useful features of construction and novel combinations of parts, and will first be described in connection with the accompanying drawings, and then be particularly pointed out in the claims at the close of this specification.

In the accompanying drawings, Figure 1 is a view in front elevation of a cash-register embodying my present invention. Fig. 2 is a view of the said cash-register in section on the line *x x* of Fig. 1, showing, however, in elevation certain details which are cut by said line of section. Fig. 3 is a view showing the cash-register in section on the line *y y* of Fig. 2, the view being taken from the rear in the said Fig. 2. Fig. 4 is a detail view, partly in section, showing one of the pointers, its spring-actuated pawl, the ratchet-wheel engaged by the said pawl, the hub on which said wheel is keyed, and the shaft passing through said hub. Fig. 5 is a detail view in plan, showing portions of the registering-wheels, and also the plate having perforations through which the graduations of the said wheels are to be

read. Fig. 6 is a detail view showing a portion of one of the registering-wheels and the pinion in engagement therewith. Fig. 7 is a view in plan of a portion of the side of the cash-drawer and certain devices applied thereto, which will be described hereinafter. Fig. 8 is a view of another portion of the cash-drawer, showing a part of the devices for locking the drawer in a closed position. Fig. 9 is a view in section showing, mainly, the bell, the devices for sounding the same, and the spring for projecting the drawer slightly open when the latter is unlocked.

In the drawings, A is the case of the cash-register, the same having the upper portion thereof provided with a front plate B, preferably disposed in an inclined position, to which the registering devices are applied, the front side of such plate having thereon the dial E, which, in connection with the movable pointers F G, serves to indicate the extent of each transaction.

C is the cash-drawer, and *c* is a spring, herein represented as a bent strip of spring material, placed between the rear end of the drawer and a portion of the case A and compressed by the drawer when the latter is pushed into its closed position. By its reaction this spring operates to push the drawer forward and partly open when the drawer is unlocked. In practice it will be arranged to thrust the drawer forward and open to a short distance—as, for example, just about one-half inch. One of the partitions *c'* of the cash-drawer is notched vertically near its front end at *c²*, as indicated in Fig. 8, and when the drawer is closed the lower end of a locking-lever D, pivoted at *d'* to the inner side of the front plate B, enters the notch *c²*, the said lower end of the lever D being drawn into the said notch by the action of a spiral spring *d²*, one end of which spring is connected to the face-plate B and the other to the lever D. An abutting piece *c³* is applied to the partition aforesaid at the side thereof adjacent to the notch *c²*, and the lever D has a roller *d³* mounted thereon, which contacts with the inclined side of the said abutting piece and rolls thereon as the drawer is being closed.

In order to provide for moving the lever D

to disengage its lower end from the notch c^2 and abutting piece c^3 , and thereby leave the drawer free to be thrust partly open by the spring c , I employ, in connection with the indicating and registering devices, other devices through which, when the pointers are in their normal position at zero, one of them may be caused to act upon the locking-lever D to move the latter and free the drawer, all as will appear hereinafter.

The dial E , upon the front side of the face-plate B , by preference, has thereon one hundred subdivisions or graduations arranged in a single circle, as indicated in Fig. 1, and the pointers F G are pivoted concentrically with the dial E and with each other, one of the said pointers, as F , being intended for a cents indicator or index, as is indicated by the marking thereon in Figs. 1 and 4, and the other, as G , being intended as the dollars indicator, as denoted by the marking thereon in Fig. 1. These pointers are represented in Figs. 1 and 2 in their normal position—that is, at zero—and resting against a fixed stop f in the shape of a pin entering the face-plate B . The pivotal portion or hub f' of each pointer F G is bored out, as at f^2 , Fig. 4, and through the wall of the said hub portion extends a pawl f^3 , pressed inward by a spring f^4 , secured by a screw f^5 to the outer side of the hub.

Within the hubs of the pointers F G are placed two ratchet-wheels g' g^2 and a disk g^3 , which is riveted or otherwise connected to one of the said ratchet-wheels and is of a diameter a little greater than that of the ratchet-wheels g' g^2 . This disk g^3 is placed between the two ratchet-wheels and lies partly within the hub of one pointer and partly within the hub of the other, and is intended to keep the interior portions of the hubs from coming into contact with the teeth of the ratchet-wheels. The ratchet-wheel g' is engaged by the spring-actuated pawl carried by the pointer G , and the ratchet-wheel g^2 is engaged by the spring-actuated pawl carried by the pointer F . Ratchet-wheel g' is connected by a pin or key g^{10} with a shaft H , and ratchet-wheel g^2 is connected by pin h^5 with a sleeve H' , surrounding the shaft H , and connected with or forming part of the hub of the registering-wheel I . Upon the shaft H are mounted the registering-wheels K and L , the former of which is connected with the shaft so as to turn therewith by some suitable means, as by a screw h' passing through its hub and engaging with the shaft, while the latter is free to rotate loosely around the shaft. A disk h^2 is applied to the shaft H between the head h^3 thereof and the ratchet-wheel g' , and has a portion thereof reduced in diameter to equal the diameter of the disk g^3 , the said reduced portion of the disk h^2 entering the hub of the pointer G and serving the same purpose as disk g^3 . The sleeve H' has applied to the exterior thereof a disk h^4 , upon an extension or hub of which is mounted the ratchet-wheel

g^2 , the said ratchet-wheel g^2 and disk h^4 being keyed to each other and to the sleeve H' by a pin h^5 . To the rear side of the face-plate B is affixed a frame M . The sleeve H' has its bearing in one side of this frame and in the face-plate, while the shaft H has its bearing in the other side of this frame. A washer m' is applied to the shaft H between the wheel L and the adjacent side of the frame M , while the pin m^2 , passed through a hole in the end of the shaft H , prevents the said shaft from being withdrawn until after the said pin m^2 has been removed. The said wheels I K L are graduated and marked or numbered on their peripheries, each one having preferably one hundred subdivisions or graduations and being correspondingly marked. On a rod m^3 , fixed in the frame M , are mounted to turn loosely a pinion m^4 , the teeth of which engage with teeth on the wheel K , and a second loose pinion m^5 , the teeth of which engage with those on the wheel L . On the wheel I is mounted a tooth extending into position to engage with the pinion m^4 in the rotation of the wheel I , the said tooth communicating a partial rotation to the pinion m^4 , and thereby serving to move forward the wheel K one step for each complete revolution of the wheel I . A tooth carried by the wheel K is adapted in like manner to engage with the pinion m^5 and move the wheel L . I have herein shown (see Fig. 3) the teeth k' , which are carried by the wheels I K , as being pivoted to the said wheels and acted upon by springs k^2 to hold them in position for engagement with the pinions m^4 m^5 . By thus connecting and applying the said teeth they are made yielding, and thereby, when in the rotation of the wheel I its tooth k' is brought into the relation to the pinion m^4 in which it is represented in Fig. 3, any movement which may be communicated to the wheel K through the movement of its pointer G around the dial will have no effect in disturbing the wheel I from its position, as otherwise might be the case in consequence of the pinion m^4 being rotated from the wheel K , and, by engagement with the tooth k' , shifting the wheel L . The yielding tooth is of particular importance when employed between the wheel I and the wheel K , because of the fact that an independent movement is given to the wheel K whenever the pointer G is moved around the dial, the said pointer G being operatively connected with the said wheel, as already described herein. I find it convenient to employ a yielding tooth upon the wheel K , also for engagement with the pinion m^5 , which serves as a part of the means of transmitting motion from the said wheel K to the wheel L , although it is to be observed that the said wheel L derives its movement only from the wheel K through the intermediary of the tooth carried by the said wheel K and the pinion m^5 . A rigid tooth may be employed on the wheel K in place of the yielding one, if desired. By way of insuring clear-

ness it is noted at this point that wheel I is rotated directly by means of pointer F and that the wheel K may be rotated directly from the pointer G, while at the same time each complete rotation of the wheel I also serves to move the wheel K forward a step. The wheel L, however, is rotated only from the wheel K, it being given a movement forward of one step at the completion of every revolution of the wheel K. Spring-pawls M² engage with the teeth of the wheels I K L to hold them from accidental rotation. Above the wheels I K L is a plate B², which is secured to the rear side of the face-plate B in position to extend over the said wheels, and this plate is perforated, as shown in Figs. 2 and 5, in order that the positions of the wheels I K L may be ascertained by reading the numerals that appear on the portions of the wheels which are visible through the perforations. A portion b' of the top side of the case A is hinged, as at b², so that it may be raised when it is desired to inspect the registering devices. This hinged portion will be kept locked ordinarily.

I prefer to hold the registering-wheels locked, so as to render them immovable when the drawer is completely closed, and also when it is either wholly or partially opened, except when the drawer is at one particular point in its opening movement and reaches this point in such opening movement. In the illustrated embodiment of my invention I have shown one construction and arrangement of devices by which I secure this result. Thus in the drawings I have shown a bar N pivoted in the sides of the frame M and provided with engaging fingers or lugs n, adapted to enter between the teeth of the wheels I K L, and while thus entered to serve positively to hold the said wheels from movement. An arm n' on the locking-bar N is engaged by the upper end of a rod n², the lower end of which is pivoted at n²¹ to an L-shaped arm n³, which is pivoted at n³¹ to the side of the case A, the said arm having a projecting part n³² resting on the upper edge of one side of the drawer. The said edge is recessed, as indicated in Fig. 2, and in a depressed portion of the recess is inserted a piece n³³, which piece is formed with a depression n³⁵, and has pivoted thereto at one end, as at n³⁵¹, one end of a spring-switch n³⁶, the free end of which is bent so as normally to incline or curve upwardly, as in Fig. 2, and the outer side of which is cut away at n³⁹ for the reception of an upwardly-extending portion n⁴⁰, on the piece n³³, the end of the switch n³⁶ at n³⁸ being cut away at angle. The switch swings horizontally on its pivot at n³⁸¹, and is pressed by its spring n³⁷ laterally into contact with the portion n³⁹, and thereby maintained in the position in which it is represented in Fig. 7.

The parts thus constructed and combined operate as follows: While the drawer remains

closed the portion n³² of the arm n³ rests on an elevated portion of the side c⁹, and thereby the locking-fingers n, Fig. 3, are held in engagement with the teeth of the wheels I K L. As the drawer is drawn outward to open the same the oblique face n³⁸ of the switch n³⁶ is drawn against the portion n³² of the arm n³, and the switch is thereby moved laterally in opposition to the pressure of the spring n³⁷. The drawer having been opened a short distance—say a little over half an inch—the arm n³ descends as its portion n³² slides down the inclined portion at one side of the depression n³⁵, the spring N², which is connected at one extremity to the arm n' of the locking-bar N and at the other extremity to the frame M, forcing down the said arm n³ and rocking the locking-bar N, so as to raise the fingers n out of engagement with the teeth of wheels I K L. At this moment the wheels are free to be turned for the purpose of registering. Now when the drawer is pulled out farther the portion n³² of the arm n³ rides up the inclined opposite side of the depression n³⁵, the fingers n thereby being forced again into locking engagement with the teeth of the wheels I K L. The switch n³⁶ is swung by its spring n³⁷ back into its normal position, as represented in Fig. 7, after the arm has passed, and when now the drawer is pushed to the arm rests on top of the said switch and is guided thereby across the depression n³⁵ and kept from descending into the said depression, the wheels in consequence being kept locked. For the purpose of preventing the wheels I K L from being moved rearwardly while the fingers n are out of engagement therewith, I employ pawls, such as O, which are pivoted between lugs on the locking-bar N and acted upon by springs o to throw their engaging ends toward the teeth of the wheels I K L, these pawls being depressed into position to engage with the teeth of the said wheels by the same movement which lifts the locking-fingers out of the said teeth.

It is necessary to provide for unlocking the cash-drawer when it is desired to deposit money therein, and I find it expedient to utilize one of the pointers and appropriate operative connections for the purpose of acting upon the locking-lever D in order to effect the unlocking aforesaid. To this end I place a push-pin P in a hole extending through the face-plate B, the said pin having its inner end forked and arranged to straddle the upper arm of a lever P', which is pivoted at P² between lugs P³, secured to the face-plate. A spring p acts to project the push-pin through the hole in the face-plate and to press the upper end of the lever P' toward the said plate. The lower arm of the said lever P' stands in proximity to the inclined end p² of a sliding bolt p³, which is held by plates p⁴ to the rear side of the face-plate and is jointed to the upper arm of the lever

D. When now the push-pin P is pushed rearwardly through the face-plate, the lever P' is rocked on its fulcrum and the lower arm of the said lever, acting against the inclined end of the bolt p^3 , moves the said bolt endwise, and thereby turns the lever D on its fulcrum sufficiently to move the extremity of the lower arm of the lever out of the notch c^2 in the partition c' of the cash-drawer and over to one side to escape the abutting piece c^3 . The lower arm of the lever D plays within a keeper d^p , secured to the rear side of the face-plate.

As a means of preventing the drawer from being unlocked and opened, except when the indicators or indexes F G stand at the zero-point on the dial, I employ a locking-pin P⁴, which passes through a hole in the face-plate B at a point adjacent to the hubs of the pointers F G, and is pivotally connected at its rear end to the lower arm of the lever P'. A hole p^5 is formed in the hub of each of the pointers F G, and these holes register with each other and with the hole in the face-plate for the bolt P⁴ only when both pointers are brought against the stop f . When the pointers are in any other position than both at the zero-point on the dial, the hub of either the lower pointer or the upper pointer will be struck by the pin P⁴ at one side of the hole p^5 therein, and consequently the lever P' will be prevented from being moved sufficiently to disengage the lever D from the partition c' of the drawer, except when both pointers are brought against stop f . In this position of the pointers they overlie the pin P, and hence, in order that the said bolt P may be depressed, it is necessary to bear upon the pointers and occasion a deflection of either both of them or the lower of them sufficient to effect the movement of the pin P. I prefer to make the lower pointer F flexible, so that it may be used as a means of acting upon the pin P. Where the said indicator is not in itself sufficiently flexible it may be composed of two parts united by a steel strip f^{31} .

The bell and sounding apparatus which I employ are represented in Fig. 9. R is the bell secured to one side of the case A. r is the hammer carried by a lever r' , pivoted to a plate r^2 , secured to the side of the case and drawn in a direction to carry the hammer against the bell by spring r^3 , one end of which is connected to the side of the case and the other to the upper arm of the lever r' . Adjacent to the lower arm of the lever r' a trip r^4 is pivoted to the plate r^2 , and by the spring r^3 the said lower arm of the lever r is pressed against the said trip, the said arm bearing against the trip on both sides of the fulcrum of the latter. The lower end of the trip extends into proximity to the drawer, on the side of which are secured projections or pins r^5 r^6 . In the outward movement of the drawer these projections or pins contact with the bell and cause the same to be sounded twice, and

similarly two strokes on the bell are produced during the inward movement of the drawer.

The register constructed and arranged as shown and described is simple and reliable in working. Its mode of operation is as follows: At the beginning the wheels I K L will be set so that zero on each appears through the corresponding perforation in the plate B² and the pointers F G will be turned until they are in vertical position and resting against the stop f . It being desired to register the amount of a sale and open the drawer for the purpose of depositing cash therein, the pointer is pressed upon so as to push in the push-pin P. This turns the lever P' upon its fulcrum, carrying the lower arm thereof against the bolt p^3 and moving the latter and the lever D in a manner to unlock the drawer, at the same time thrusting the locking-pin P⁴ through the holes p^5 in both indicators F and G in a manner to lock them from accidental or other movement at this time. The unlatching of the drawer leaves the same to be pushed forward slightly by the spring c , and the latter occasions a sufficient forward movement of the drawer to carry the depression n^{35} under the arm n^3 . This causes the wheels I K L, which up to this time have been held locked by the fingers n , to become unlocked by the lifting of the said fingers in consequence of the action of the spring N². The pressure on the pointer F is now relieved and the spring p acts upon the lever P' to withdraw the bolt P⁴ from the holes p^5 in the pointers F G, leaving the latter free to be moved for the purpose of registering the amount of the transaction. The pointers having been thus moved, the drawer is pulled completely open by hand, the cash is deposited and change made, if necessary, and the drawer is again closed. As hereinbefore indicated, by the continued forward movement of the drawer in opening the same the depression n^{35} is withdrawn from beneath the arm n^3 and the latter rides out upon the elevated portion of the side c^2 of the drawer to again lock the wheels I K L, so as to render impossible any further change in the position of the wheels. As before indicated, also during the closing movement of the drawer the wheels remain locked, owing to the presence of the switch n^{36} beneath the arm n^3 , so that no further change can be made in the position of the wheels until after the drawer has been completely closed, the indicators have been returned to the zero-point on the dial, and the pointer F has been pressed upon to effect an unlatching of the drawer and permit the spring c to carry the drawer forward to present depression n^{35} under the arm n^3 again. The bell arrangement described occasions a tap on the bell, resulting from the contact of the projection r^5 with the trip r^4 at just the moment when the arm n^3 drops into the depression n^{35} , and a second tap after the depression has been carried beyond

the portion n^{32} of the arm n^3 , the taps being repeated in the closing movement of the drawer.

By the single dial, with its graduations extending up to one hundred, and the two pointers F and G, I am enabled to register any transaction involving any amount from one cent to ninety-nine dollars and ninety-nine cents by one positioning of the indicators, and the use of the third wheel L enables me to register any aggregate amount up to nine thousand nine hundred and ninety-nine dollars and ninety-nine cents. Other wheels may be added to wheel L to carry up the addition as far as desired.

As a means of guarding against any falling back of the pointers after they have been turned around to the left-hand half of the dial, I may form them, as I have shown the pointer F formed, with a counterbalancing portion f^{97} .

I claim as my invention—

1. The combination, with a single graduated dial, wheels for registering values of different denominations, and transmitting devices for moving forward the second wheel one step for each revolution of the first wheel, of a shaft on which one of the said wheels is mounted and secured, the said shaft passing through the hub of the other wheel, ratchet-wheels mounted on said shaft and hub, respectively, pointers mounted concentrically with relation to said ratchet-wheels, and pawls carried by the said pointers and engaging the said ratchet-wheels, substantially as described.

2. The combination, with a single graduated dial, of pointers mounted concentrically with relation to said dial, pawls carried by the said pointers, two ratchet-wheels with which said pawls engage, a shaft on which one of said ratchet-wheels is fixed, a registering-wheel mounted on the said shaft, a hub surrounding the said shaft and having fixed thereto the second of said ratchet-wheels, a second registering-wheel carried by the said hub, a tooth pivoted to the registering-wheel last mentioned, a spring acting upon the said tooth, a pinion to be engaged by such tooth in the revolution of the registering-wheel by which it is carried, the said pinion being in gear with the registering-wheel carried by the shaft, all substantially as described.

3. The combination, with a pointer, a cash-drawer, a spring acting upon the cash-drawer in a manner to push it partly open, and a latch whereby the drawer is held locked normally, of a push-pin in a position to be covered by the pointer when the latter stands at zero, a lever with which said push-pin engages, and a bolt operated by said lever and engaging the latch, whereby when the pointer is at zero and is depressed the latch will be disengaged from the drawer to permit the latter to be pushed partly open by the spring, substantially as described.

4. The combination, with a pointer, of a

locking device operated by the pointer when the latter is pressed upon and engaging with the latter to hold it from movement until the pressure thereon is relieved, substantially as described.

5. The combination, with the pointers, of a push-pin, a lever, and a locking-pin for engagement with the said pointers to hold them from movement, the said push-pin being acted upon by one of the pointers when such pointer is pressed upon, substantially as described.

6. The combination, with the pointers, each having a hole therein, as described, of a locking-pin to enter the said holes, a lever, a push-pin which is acted upon by one of the pointers when such pointer is pressed upon, and a spring for retracting the locking-pin, substantially as described.

7. The combination, with the pointers, a locking-pin for engaging therewith, a cash-drawer, a latch engaging therewith, and a spring for projecting the drawer part way open when permitted to do so by the withdrawal of the latch, of a lever in operative connection with the said latch and locking-pin, and a push-pin to be depressed by one of the pointers when the said pointer is pressed upon, substantially as described.

8. The combination, with registering devices and a cash-drawer, of a lock for such registered devices normally in engagement with such devices, and devices intermediate the said lock and the drawer and operated by the drawer for causing the lock to engage the said registering devices and normally hold them from movement and release them only when the drawer is open to a given extent, substantially as described.

9. The combination, with registering-wheels, a lock to hold them from revolution and normally in engagement with such wheels, and a cash-drawer having a depression in one side thereof, of an arm connected with the lock and resting on the said side of the drawer, the depression being positioned to enable the arm to enter the same after the drawer has been partly opened, substantially as described.

10. The combination, with registering-wheels and a pivoted lock normally engaged therewith and holding them from revolution, of a cash-drawer having a depression in one side thereof, an arm in connection with the lock and resting on the drawer side, the depression being positioned to enable the arm to enter the same after the drawer has been partly opened, and a spring-actuated switch covering the said depression, substantially as described.

11. The combination, with registering-wheels, a lock to hold them from revolution and normally engaged therewith, a cash-drawer having a depression in one side thereof, and a spring to project such drawer open a short distance when allowed to act by the unlatching of the drawer, of an arm connected

with the lock resting on the said side of the drawer and entering the depression after the drawer has been projected open by the spring, substantially as described.

- 5 12. The combination, with the registering-wheels and a lock therefor, of pawls carried thereby to engage the wheels after the lock

has been disengaged therefrom and thereby hold the wheels from retrograde movement, substantially as described.

JAMES E. WELLS.

Witnesses:

HENRY MILLAN,
F. W. BEALE.