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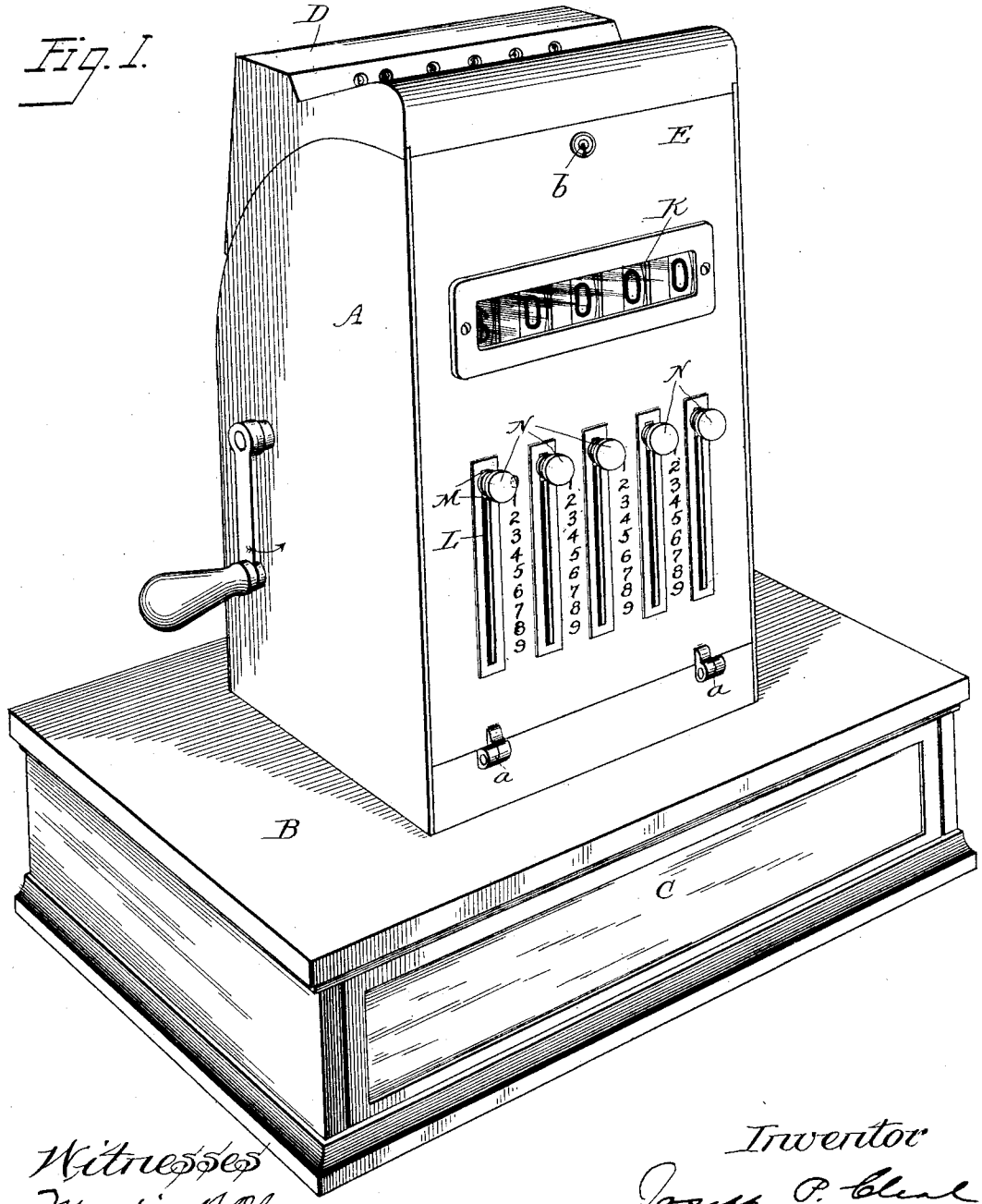
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CASH REGISTER.

No. 589,246. Patented Aug. 31, 1897.

Fig. 1.



Witnesses:
Martin A. Olsen.
Leonora Wiseman.

Inventor:
Joseph P. Cleal
by Edward Rector
his attorney

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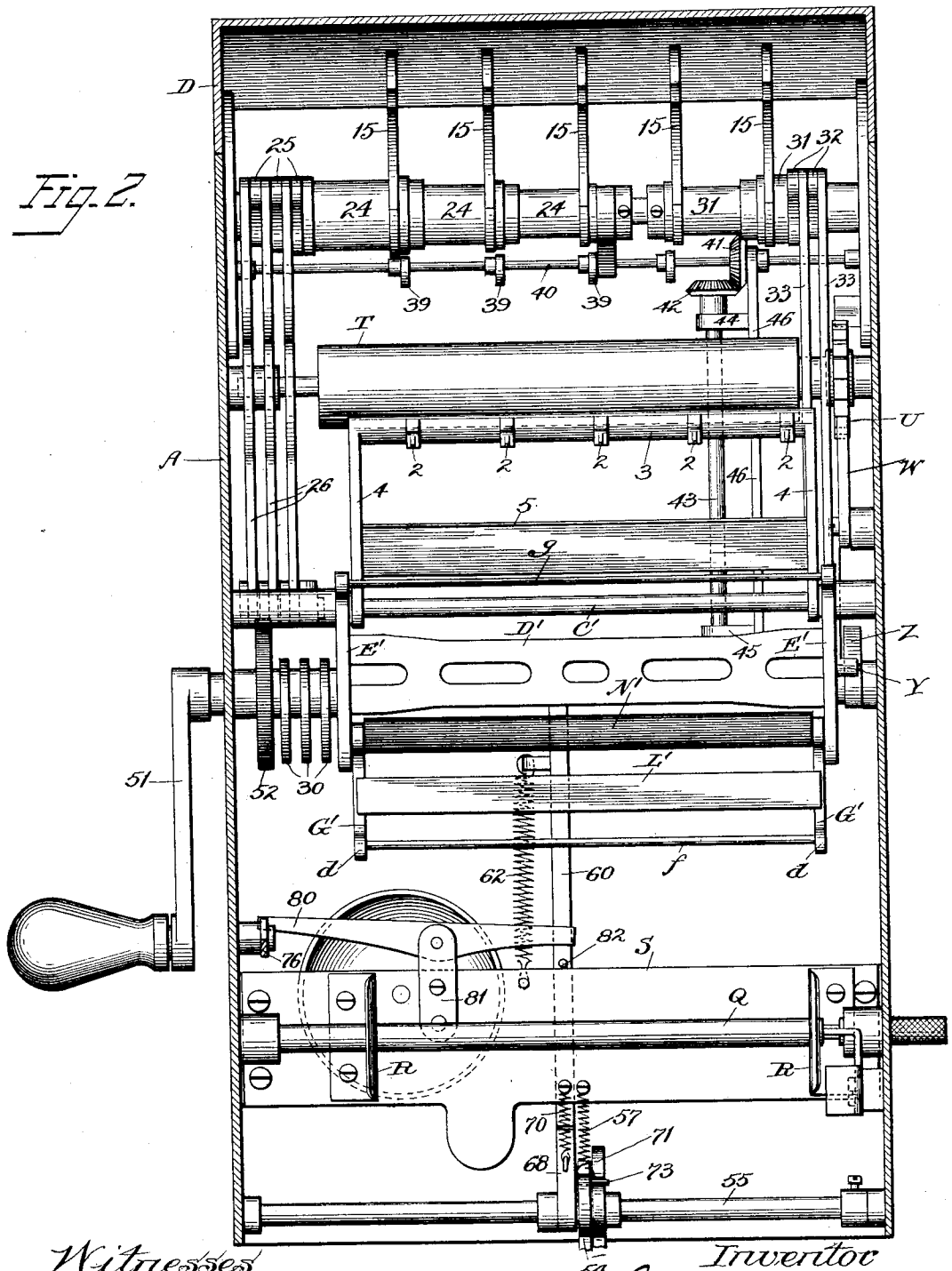
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Fig. 2.



Witnesses
Martin A. Olsen.
Leonard Wiseman.

Inventor
Joseph P. Cleal
by Edward Rector
his atty

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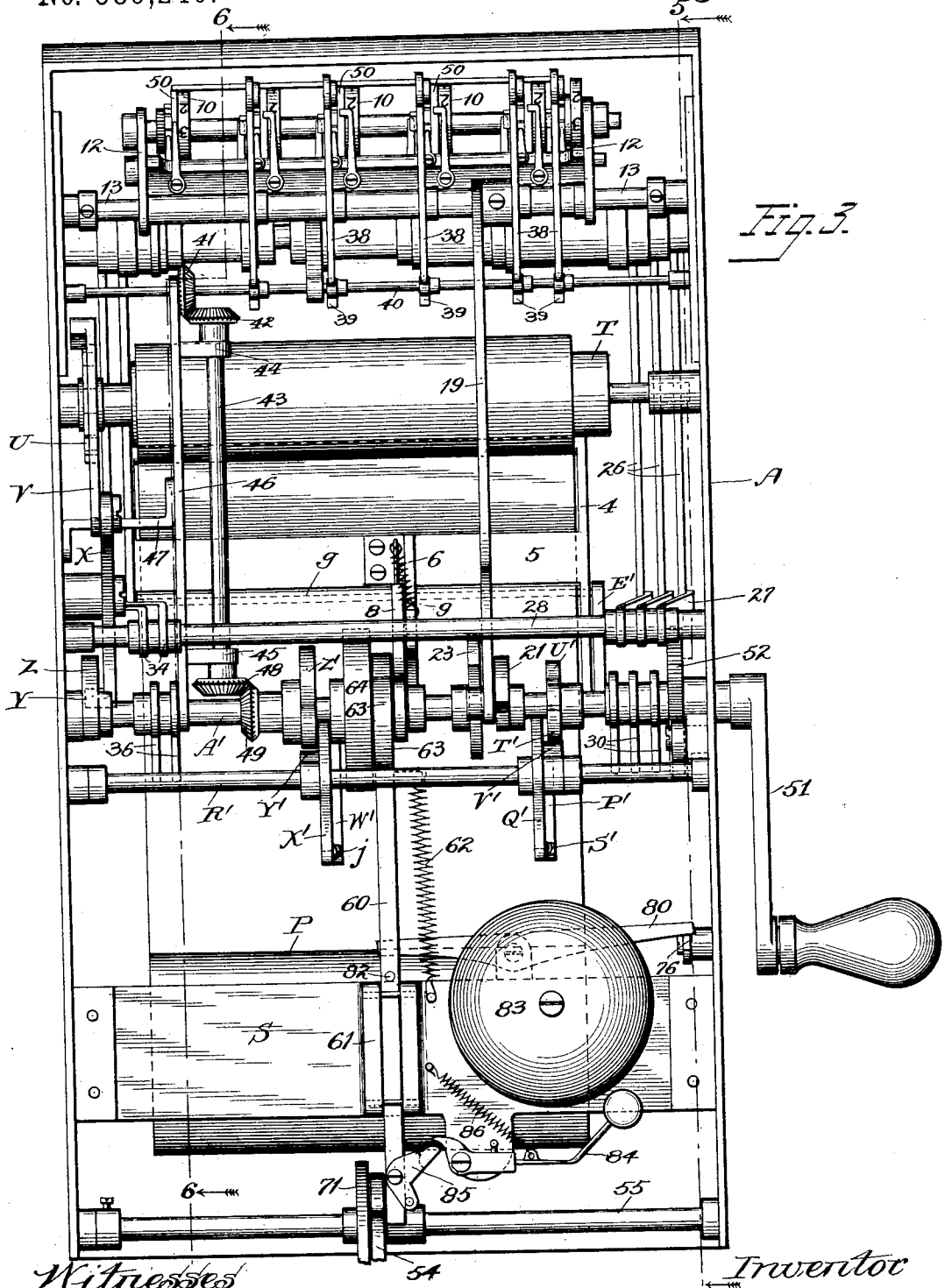


Fig. 3.

Witnesses
Martin H. Olsen.
Leonora Wiseman

Inventor
Joseph P. Cleal
by Edward Reiter
his Atty

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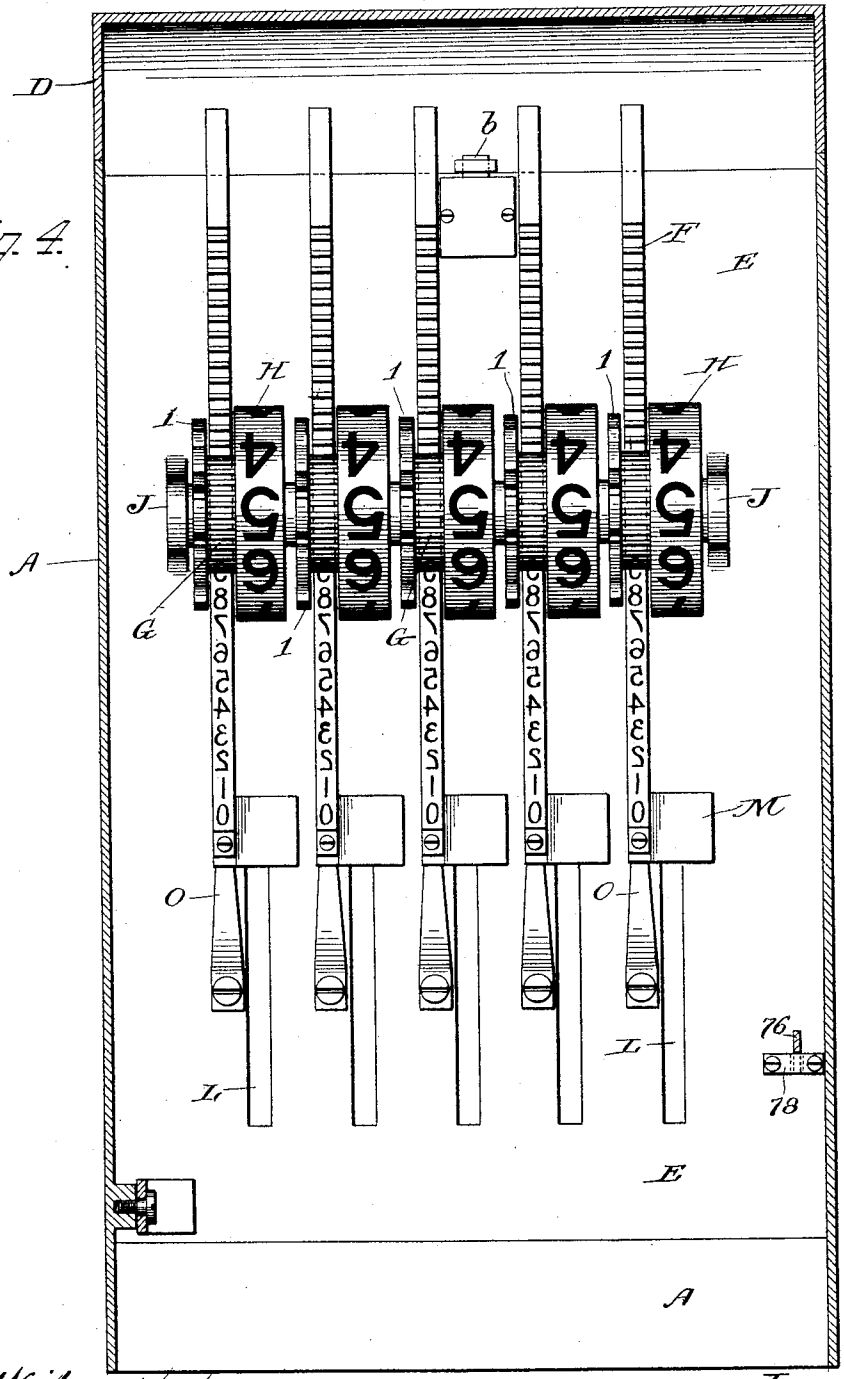
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Fig. 4.



Witnesses
Martin H. Olsen.
Leonora Wiseman.

Inventor
Joseph P. Cleal
by Edward Rector
his atty

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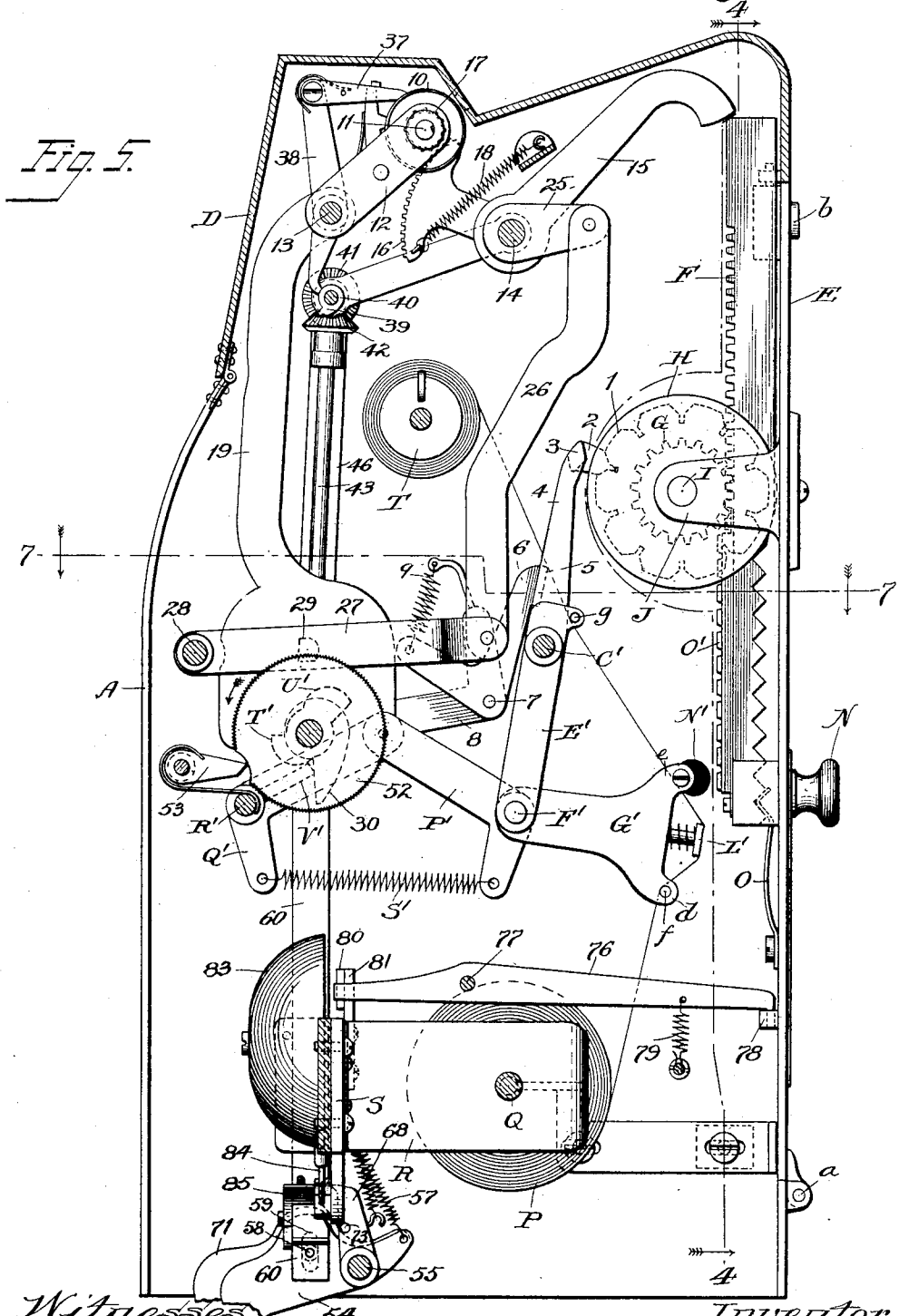
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Fig. 5.



Witnesses
Martin A. Olsen.
Leonora Niemann.

Inventor
Joseph P. Cleal
by Edward Rector
his Atty

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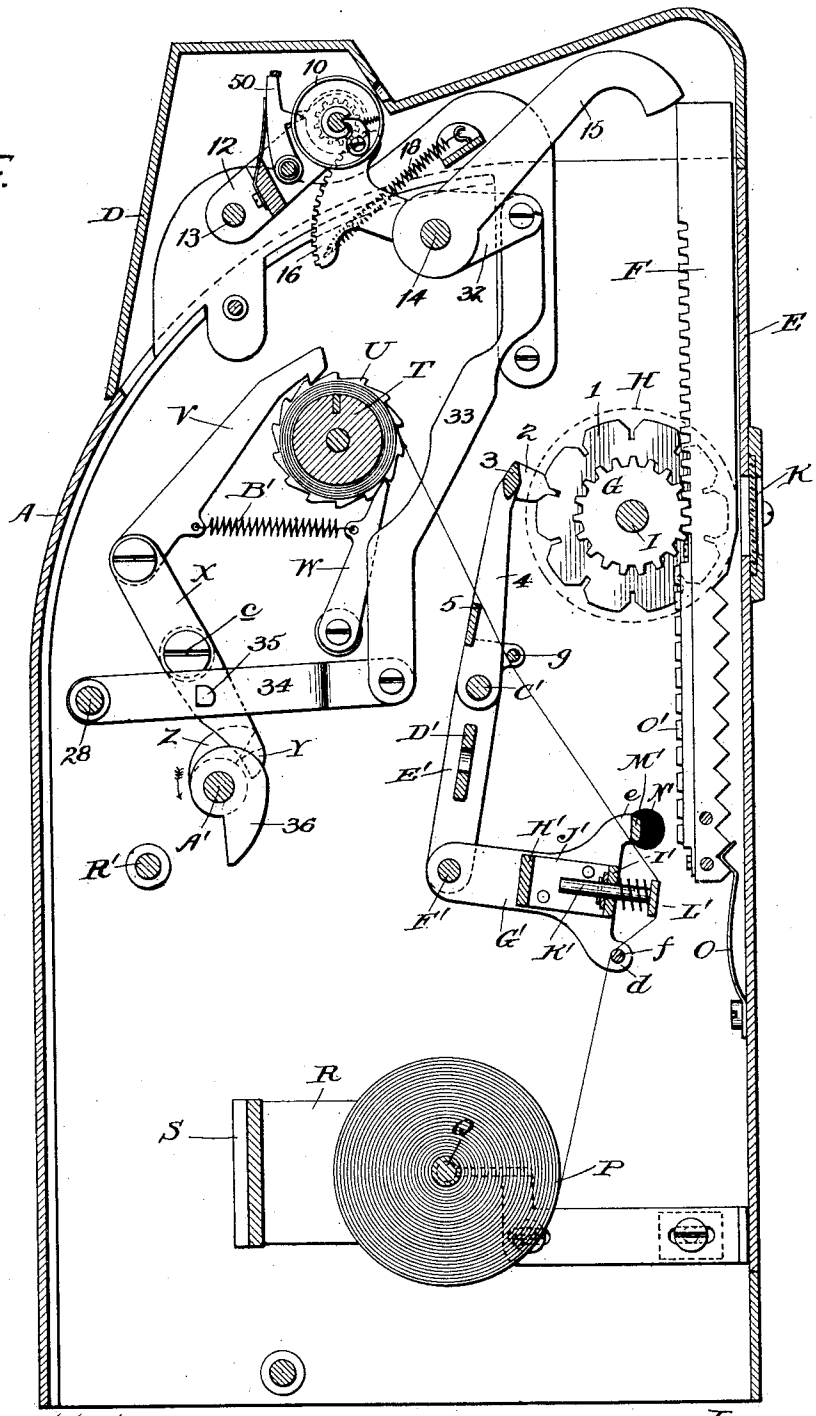
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CASH REGISTER.

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Fig. 6.



Witnesses
Martin W. Olsen.
Leonora Wiseman.

Inventor
Joseph P. Cleal
by Edward Rector
his atty

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Fig. 7.

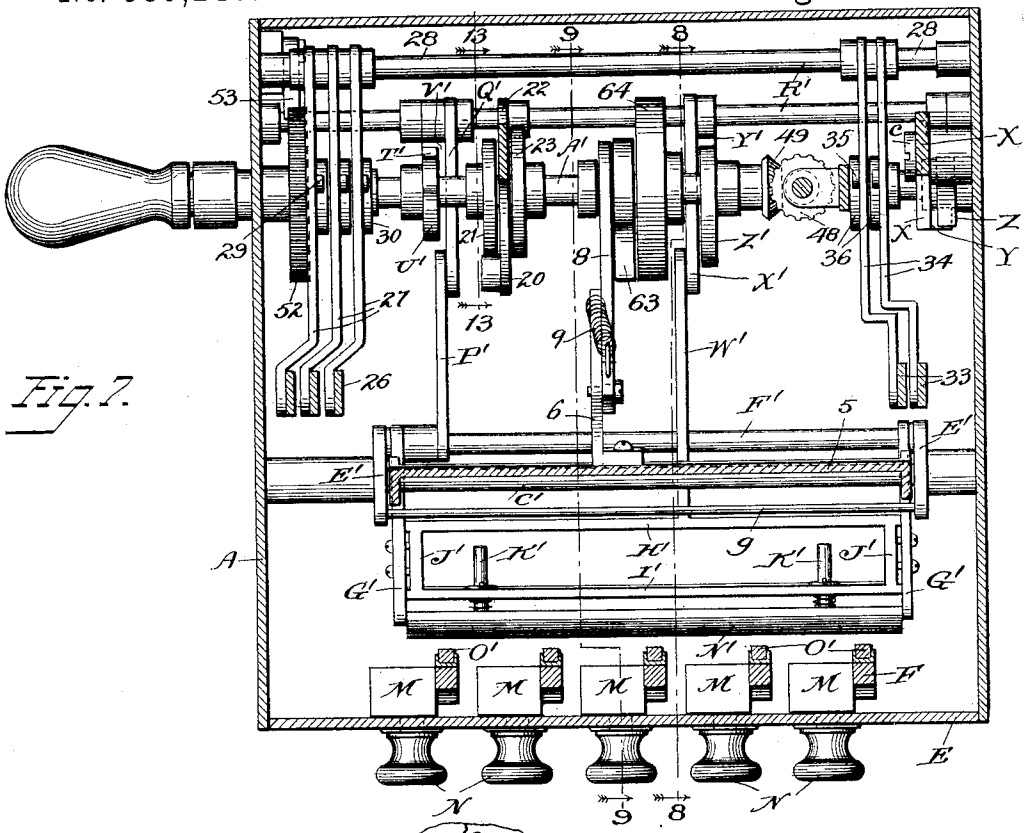
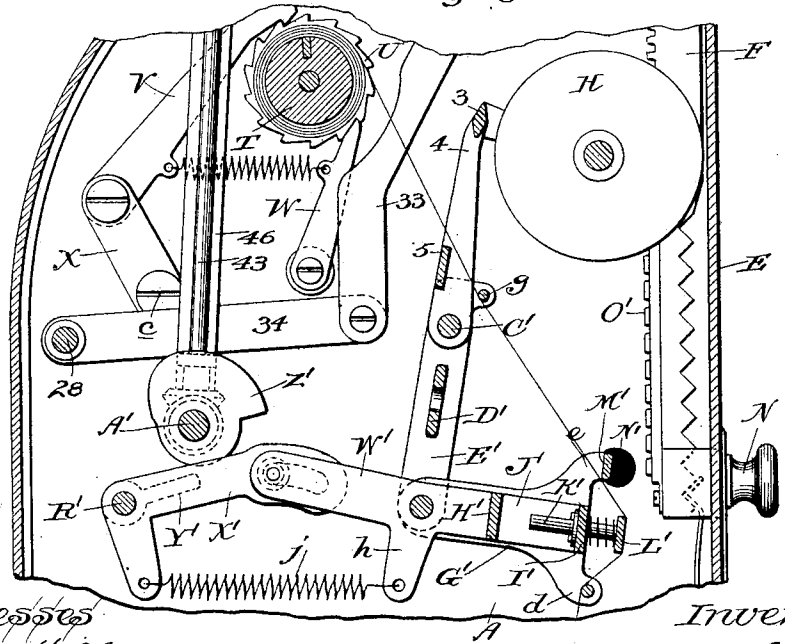


Fig. 8.



Witnesses
Martin A. Olsen.
Leonora Wiseman

Inventor
Joseph P. Cleal
by Edward Rector
Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

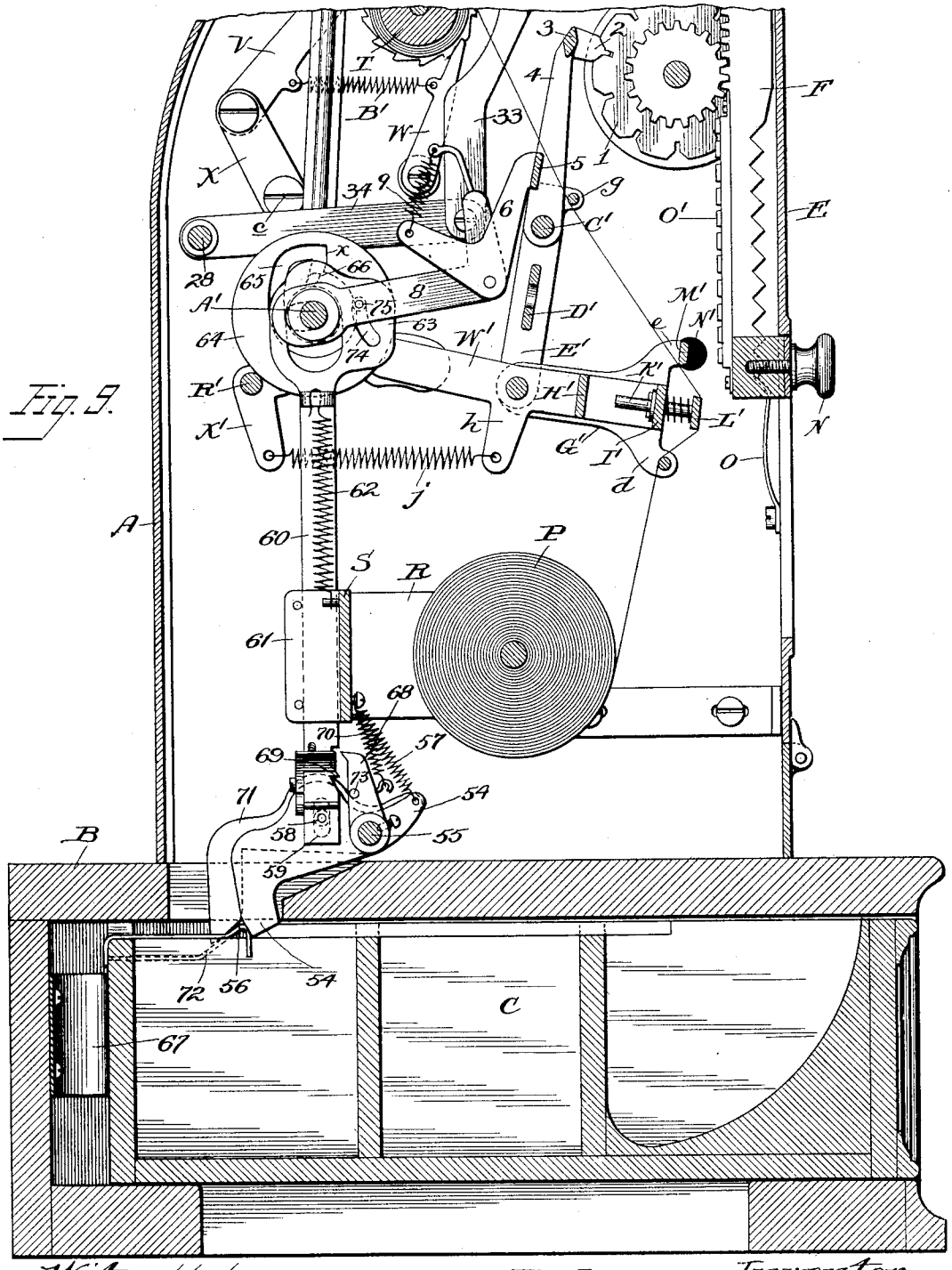
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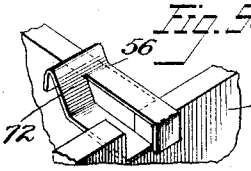
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Fig. 9.



Witnesses
Martin A. Olsen.
Leonora Niemann

Fig. 9a.



Inventor
Joseph P. Cleal
by Edward Rector
Atty

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CASH REGISTER.

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Fig. 10.

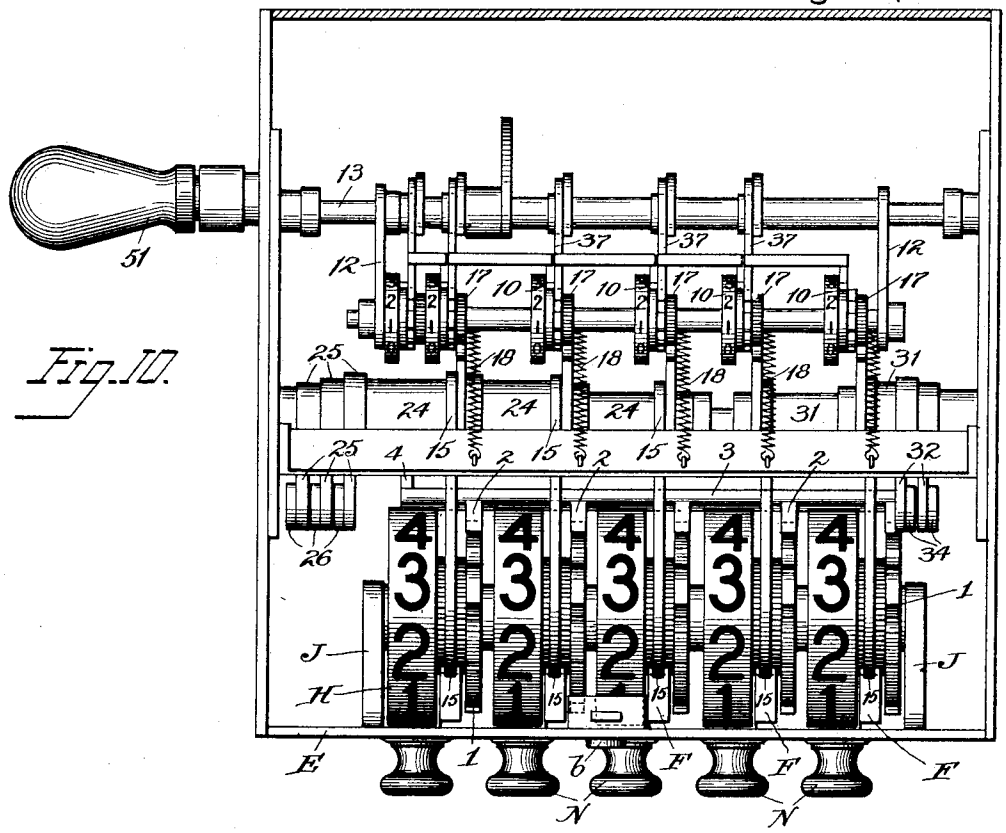


Fig. 11.

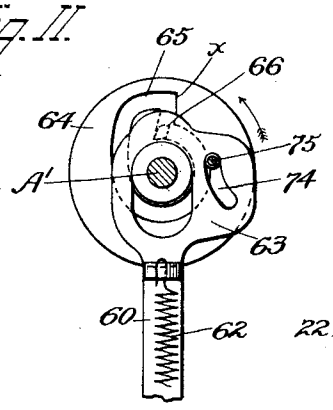


Fig. 12.

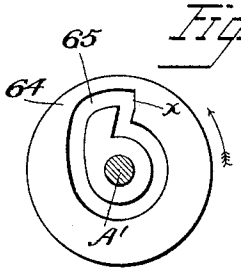
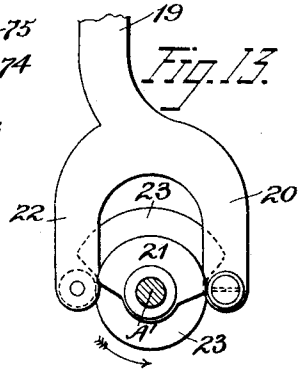


Fig. 13.



Witnesses
Martin A. Olsen.
Leonora Wiseman.

Inventor
Joseph P. Cleal
by Edward Rector
his atty

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UNITED STATES PATENT OFFICE.

JOSEPH P. CLEAL, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 589,246, dated August 31, 1897.

Application filed March 23, 1896. Renewed July 1, 1897. Serial No. 643,141. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. CLEAL, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash-Registers, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its object the production of a cheap and simple machine for indicating and recording upon a paper strip and also, preferably, adding upon a set of registering-wheels the amounts of the various transactions in connection with which the machine is used; and it consists in certain new combinations and arrangements of parts and certain new modes of operation, all of which will be hereinafter more fully explained, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of the complete machine, including the base or drawer-compartment, upon which the working mechanism rests. In the remaining views the base or drawer-compartment is omitted, excepting in Fig. 9, and the views are enlarged, and Fig. 2 is a front elevation of the machine, with the casing in section; Fig. 3, a rear elevation with the rear wall of the casing removed; Fig. 4, a vertical section approximately on the line 4 4 of Fig. 5, showing an inside face view of the hinged front wall of the casing and the parts carried thereby; Fig. 5, a vertical section approximately on the line 5 5 of Fig. 3; Fig. 6, a vertical section approximately on the line 6 6 of Fig. 3; Fig. 7, a horizontal section approximately on the line 7 7 of Fig. 5; Fig. 8, a detail vertical section on the line 8 8 of Fig. 7; Fig. 9, a vertical section of the entire machine, excepting the extreme top, approximately on the line 9 9 of Fig. 7; Fig. 9^a, a perspective detail of the portion of the cash-drawer which coöperates with the drawer-latch and trip-lever; Fig. 10, a top plan view with the top of the casing cut away or removed; Figs. 11 and 12, details of the cam which operates the drawer-lock and gong-sounding mechanism, and Fig. 13 a detail of the cams which rock the registering-wheel frame.

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

The principal working parts of the machine are inclosed within and supported by a casing A, which rests upon the usual box B, which contains the money-drawer C and which constitutes the base of the machine. The body of the casing A is approximately square in cross-section, Fig. 7, and is composed of four vertical plates or walls and a hinged top D. The front wall E is hinged at its lower edge at *a a*, so that it may be swung outward and downward to give access to the interior of the machine, and when closed is secured by a lock *b* at its upper edge, Figs. 1, 4, and 5.

Mounted to slide vertically upon the inner face of the wall E are a series of bars F, whose upper halves have racks formed upon them, which racks mesh, respectively, with pinions G, fast upon the hubs of a series of indicator-wheels H, one for each rack-bar, which are mounted upon a horizontal shaft I, supported at its opposite ends in arms or brackets J, secured upon the inner face of the hinged wall E and projecting inwardly therefrom. The wall E is provided with a transverse window or sight-opening K opposite the indicator-wheels H, through which opening a single number upon each wheel may be exposed at one time.

In the lower part of the hinged wall E, beneath the several indicator-wheels, are a series of vertical slots L, in which fit the suitably-shaped forward sides of blocks M, into which are screwed the stems of the operating knobs or buttons N, Figs. 1, 4, 5, 6, 7, 8, 9, and 10. The main bodies of the blocks M are upon the inner side of the wall E, only their reduced forward sides or the lugs thereon projecting through the slots L, and the lower ends of the bars F are secured to the sides of the respective blocks M. The provision of the blocks M is simply a means for guiding the lower ends of the bars F and attaching the operating-knobs to them, and it will be understood that the slots L might in some cases be arranged in ver-

tical line with the bars and the stems of the operating-knobs pass through them and be directly screwed into or otherwise secured to the bars.

For the purpose of yieldingly holding the bars F in the several positions to which they may be moved by the operating-knobs there are provided friction-springs O, fastened at their lower ends of the wall E and curved outwardly at their upper ends and shaped to coöperate with notches formed upon the outer sides or edges of the bars, as shown in Figs. 5 and 6. These notches in the bars F correspond to the exact indicating and printing positions of the bars, hereinafter described, so that when the spring O is engaged with any given notch of its bar the latter is in proper position to indicate and print some given number. The springs and coöperating notches on the bars therefore serve not only to yieldingly hold the bars in the different positions to which they may be moved, but serve as well to adjust them and cause them to always come to rest when released in proper indicating positions.

In the present instance there are five of the bars F, indicating-wheels, and operating-knobs, and at the right of each of the slots L there is placed upon the front face of the wall E of the casing, Fig. 1, an index consisting of a vertical row of numbers, representing a cipher and the nine digits in regular order. Each of the indicator-wheels H likewise bears upon its periphery a corresponding series of nine indicating-numbers and a cipher, and the adjustment of the parts is such that when any one of the operating-knobs N is moved vertically until it stands opposite any given number the indicator-wheel, which is geared to its bar F, will be turned to present the corresponding number at the window K. The left-hand one of the operating-knobs N and its coöperating indicating devices are used to represent units of cents, the second tens of cents, the third units of dollars, the fourth tens of dollars, and the fifth hundreds of dollars, so that by means of the five knobs and their coöperating devices any amount from one cent to nine hundred and ninety-nine dollars and ninety-nine cents may be indicated at the window K by moving the several knobs to the proper positions for that purpose.

The foregoing constitutes the indicating mechanism of the machine, and I will next describe the recording or printing mechanism by which the various values indicated at the different operations of the machine are separately printed upon a paper strip, and an individual record of each transaction thereby preserved.

The paper strip referred to is carried in a supply-roll P, mounted upon a spindle Q, Figs. 2, 5, 6, and 9, supported at its opposite ends in bearings upon the side walls of the casing and passing through openings in flat springs R R, which are secured at their rear ends to a cross-bar or plate S, supported by the side walls of the casing and project forwardly therefrom and fit against the opposite ends of the roll P, bearing against the same with sufficient pressure to preserve a proper tension upon the strip. The paper strip is led from the roll P upward by an indirect course, hereinafter described, to a storage spool or reel T, mounted in the upper middle portion of the casing and provided upon one end with a ratchet U, Figs. 2, 6, and 8, with which cooperates an actuating-pawl V to intermittently advance the record-strip and a holding-pawl W to prevent backward movement of the storage-reel. The actuating-pawl V is pivoted at its lower end to the upper end of a lever X, which is pivoted at *c* to a stud projecting inward from the side plate of the casing. The lever X has formed upon its lower end a lateral projection or lug Y, Figs. 3, 6, and 7, which stands in the path of a cam Z upon a rotary shaft A′, so that at each revolution of said shaft the lever X is vibrated and the pawl V caused to turn the ratchet U and advance the record-strip. A coiled spring B′, connecting the pawls V and W, holds them in engagement with the ratchet U and also serves to reset the pawl V and lever X after the latter has been actuated by the cam upon the shaft A′ in the manner described.

Hung upon a rod C′, extending transversely across the machine and supported at its opposite ends in bearings upon the side walls of the casing, Figs. 2, 5, and 6, is a pendent swinging frame composed of two side arms E′, rigidly connected by a cross-bar D′, and a rod F″, connecting the lower ends of the arms E′. Hung in the lower end of this swinging frame upon the rod F″ is a second frame composed of two opposite side plates G′, which are hung at their left-hand or rear ends upon the rod F″ and extend forwardly to the right therefrom in approximately horizontal position and have their front ends widened and shaped to form ears *d e*. The two side or end plates G′ of this frame are rigidly connected by an interposed transverse frame consisting of two cross-bars H′ I′ and end plates J′, formed integral with the bars and secured to the opposite end plates G′ of the swinging frame, Fig. 7. Mounted in the cross-bar, near its opposite ends, are two short rods or pins K′, adapted to slide back and forth through the holes provided for them in the bar I′ and having fast upon their front ends a transverse platen-bar L′. Coiled springs surrounding the rods K′ between the platen-bar L′ and the cross-bar I′ serve to press the platen-bar toward the right in Figs. 5, 6, and 9, while its movement in that direction is limited by pins passed through the rods K′ at the left of the bar I′.

Supported between the upper forward corners of ears *e* of the two side plates G′ is a transverse bar M′, carrying the inking-pad N′. This inking-pad and the platen L′ are adapted to coöperate with types O′, formed

upon or secured to the rear faces of the lower ends of the bars F, beneath the racks upon the latter. When the bars F are in their uppermost positions, as shown in the drawings, the lowermost ones of said types stand opposite the inking-pad N′ in what may be termed the "horizontal" printing-line, and when the bars are moved downward greater or less distances their different types will be brought to such line.

It will be seen that if the swinging frame which is hung upon the rod C′ be swung forward with the frame G′ in the position shown in Figs. 5 and 6 the inking-pad N′ will contact with and ink the types which are standing at the printing-line, and that if the parts are then swung rearward again and the front end of the frame G′ lifted until the platen L′ is brought opposite the printing-line and the parts are then swung forward to the right again the platen L′ will contact with the types at the printing-line and print the number represented by such types upon any paper strip which may be interposed between the platen and types. By the means to be described the parts are given these several movements at each operation of the machine and the paper strip is led from the roll P upward over the cross-rod *f*, supported at its opposite ends in the ears *d* of the plates G′, thence forward and upward across the platen L′, thence rearward and upward beneath a rod *g*, supported at its opposite ends in the upper ends of the arms E′, (which project a short distance above the rod C′ upon which they are hung,) and thence upward and rearward around the storage-reel T.

At each operation of the machine the movement of the parts above described causes the inking-pad N′ to be first thrown forward to the right against the types at the printing-line to ink them and to then be withdrawn and the platen L′ thrown against such types, carrying the paper strip with it and pressing it against the types and causing the figures represented by them to be printed upon it, after which the pawl V, heretofore described, is actuated to turn the storage-reel T and draw forward a portion of the record-strip sufficient to carry the printed line away from the platen. The types O′ upon the bars F of course correspond to the indicating-numbers upon the wheels H and are so arranged that when a given number upon any wheel is exposed to view at the window in the casing the corresponding type-number upon the vertical bar geared to such wheel will stand at the printing-line, so that the amount indicated at each operation of the machine will be also printed upon the paper strip.

I will now describe the means employed for effecting the inking and printing or impressing movements above described.

Loosely hung upon the rod F′, Figs. 5 and 7, is a bent lever or bell-crank P′, whose upper rear end is pivoted to the upper forward end of a similar lever Q′, loosely mounted upon a fixed rod R′, supported at its opposite ends in the side walls of the casing. A coiled spring S′ connects the lower ends of the two levers P′ Q′ and yieldingly holds them in the position shown in Fig. 5. The two connected upper ends or arms of these levers form a toggle, by depressing and straightening which the rod F′ and parts moving with it may be forced forward to the right to carry the inking-pad N′ against the types when the parts are in one position and to carry the platen against the types when the parts are in another position, as heretofore explained. Fast upon the rotary shaft A′, heretofore referred to, are two cams T′ U′, Figs. 2 and 7, which coöperate with a lug or projection V′ upon the side of the upper arm of the lever Q′ to depress the same twice in succession at each revolution of the shaft A′ and to consequently straighten the toggle and force the rod F′ and parts carried by it to the right twice in succession at each operation of the machine. At the first movement of the parts under the action of the cam T′, the frame G′ being in the position shown in Fig. 5, the inking-pad N′ will contact with the types and ink them, whereupon as the cam T′ clears the projection V′ the springs S′ will return the parts to normal position. Then before the cam U′ comes into contact with the projection V′ to again force the parts to the right the frame G′ is lifted, by the means to be now described, until the platen L′ is brought opposite the printing-line, so that when the cam U′ acts the platen will be forced against the types to effect the printing. As seen in Figs. 7, 8, and 9, the rear cross-bar H′ of the rigid frame, which is secured to and carried by the swinging frame or plates G′, has extending rearwardly from it an arm W′, through which passes the rod F′, thus constituting the arm a lever with the rod F′ as its fulcrum, so that by depressing the rear end of this arm or lever the forward side of the swinging frame G′ and the platen L′ may be lifted, and vice versa. The rear end of the lever W′ is connected by a slot-and-pin connection with the front end of a bell-crank lever X′, Fig. 8, which is mounted at its rear end or elbow upon the rod R′, heretofore described. This lever X′ has formed upon one side of it a lug Y′, which stands beneath and in the path of a cam Z′, fast upon the rotary shaft A′, heretofore described, Figs. 7 and 8. The lever W′ has an arm *h* extending downwardly from its fulcrum and connected by a coiled spring *j* with the lower arm of the bell-crank X′, which spring serves to yieldingly hold the two levers in and return them to their normal position. (Shown in Figs. 8 and 9.) The result of this arrangement of parts is that at each revolution of the shaft A′ the cam Z′ will depress the lever X′ and thereby depress the rear end of the lever W′ and throw the platen L′ upward to position opposite the printing-line. The adjustment of the parts is such that this operation takes place between the action of the

cams T' and U', heretofore described, and the cam Z' holds the parts in such position as it rides over the projection Y' of the lever X' while the cam U' is acting to force the platen against the types, after which the cam Z' clears the projection Y' and the spring *j* returns the levers W' X' and platen L' to normal position. In this manner and by these means at each operation of the machine the types which have been brought to the printing-line by the setting of the indicator-wheels in the manner heretofore described are first inked and then the paper strip is forced against them to effect the printing of their numbers upon it.

For the purpose of locking the indicator-wheels and type-bars in position after they have been set and while the printing and other operations hereinafter described are being effected each indicator-wheel H has fast upon its hub a notched disk 1, with which coöperates a pointed locking-tooth 2, formed upon and projecting forwardly (to the right in Figs. 5, 6, and 9) from a transverse bar 3, which is formed integral with and carried by the upper ends of a pair of arms 4 4, which are loosely mounted at their lower ends upon the rod C' and are also connected a short distance above said rod by an integral cross-bar 5, Fig. 2. When the swinging frame formed of these side arms and cross-bars is swung to the right, its teeth 2 engage the notches in the disk 1 and lock the indicator-wheels and type-bars in fixed position. When the frame is swung rearward to the left, the teeth 2 are disengaged from the disk 1 and the bars are free to be slid upward and downward to set the indicator-wheels and types as desired. Rigidly secured to the rear side of the cross-bar 5 of this swinging frame is the upper forward end of a bent arm or lever 6, to whose lower end or elbow is pivoted at 7 the front end or elbow of a somewhat similar arm or lever 8, whose rear end is provided with an enlarged opening loosely fitting over the shaft A', Fig. 9. The upper front end of this arm or lever 8 and the upper rear end of the arm 6 are connected by a coiled spring 9, whose action tends to throw the upper side of the swinging frame 3 4 5 to the right and maintain the locking-teeth 2 in engagement with the notched disks 1 of the indicator-wheels and also presses the rear end of the arm 8 downward. A cam upon the shaft A', which will be hereinafter more fully described, at each operation of the machine forces the arm 8 slightly to the right, thus carrying the lower end of the arm 6 in that direction and rocking the swinging frame rearward and disengaging the teeth 2 from the notched disks of the indicator-wheels. This occurs just at the end of the operation of the machine, and at the very beginning of the next operation the cam releases the arm 8 and the spring 9 throws the locking-teeth 2 into reëngagement with the notched disks, so that during substantially the entire operation of the machine after the indicators and type-bars have been set they are locked from movement.

Having now described the indicating and printing and locking mechanisms, I will next describe the registering mechanism.

The registering-wheels 10, Figs. 1, 5, 6, and 10, are loosely mounted upon a shaft 11, carried in the upper forward ends of the side arms 12 of a swinging frame secured at its lower side to a rock-shaft 13, journaled at its opposite ends in bearings on the side walls of the casing, Fig. 3.

Loosely hung upon a fixed rod 14, extending transversely across the middle of the machine, near its upper end, and secured to the opposite walls of the casing, are a series of levers 15, whose upper forward curved ends rest upon the upper ends of the vertical rack-bars F and whose rear ends are provided with curved racks or segments 16, adapted to coöperate with pinions 17 upon the sides or hubs of the respective registering-wheels 10.

There is a lever 15 and segment 16 for each of the rack-bars F and a registering-wheel to coöperate with each segment. Coiled springs 18, connected to the respective segments 16, yieldingly hold the levers 15 in normal position and cause their upper forward ends to bear upon the upper ends of the bars F. When the frame 12, which carries the registering-wheels, is in its normal position, as shown in Figs. 5 and 6, the pinions 17 are out of mesh with the segments 16, so that the front ends of the levers 15 may rise and fall with the bars F as the latter are moved vertically to set the indicator-wheels and types without affecting the registering-wheels. Fast upon the rock-shaft 13, which carries the frame 12, is a depending arm 19, Figs. 3 and 5, whose lower end is forked and projects downward upon opposite sides of the rotary shaft A', Figs. 7 and 13. The forward fork 20 is provided with a lateral projection or stud, (covered by an antifriction-roller,) which stands in the path of a cam 21, fast upon the shaft A', Figs. 3 and 7, while the rear fork 22 is provided with a similar projection, which stands in the path of a second cam 23, fast upon the shaft A'. The shapes and positions of the cams 21 and 23 are such that at the beginning of the rotation of the shaft A' at each operation of the machine the cam 23 will engage the projection upon the fork 22 of the arm 19 and swing the lower end of said arm slightly rearward, thereby rocking the shaft 13 and throwing the pinions of the registering-wheels into mesh with the segments 16 of the levers 15, while as the shaft approaches the completion of a half-revolution the cam 23 will clear the projection on the fork 22 and the cam 21 will contact with the projection on the fork 20 and swing the lower end of the arm 19 forward again and disengage the pinions from the segments. The operating-surface of the cam 21 is of sufficient length to maintain the parts in this position until after the shaft A' completes its revolution, Fig. 13,

so that at the end of the operation of the machine the parts are held in the position shown in Fig. 5, with the registering-wheels disengaged from the segments, while at the beginning of forward movement from such position the cam 21 clears the projection on the fork 20 and the cam 23 comes into operation, as before explained. Now it will be understood that when any one of the bars F is slid downward from its uppermost position (shown in Figs. 5 and 6) for the purpose of setting its indicator-wheel and type, the upper forward end of the lever 15, resting upon such arm, will follow it downward under the influence of the spring 18, the result of which is that the setting of any one of the bars F serves also to set the corresponding segment 16. If then the pinion of the registering-wheel corresponding to such set segment be engaged with it and the segment be then moved downward to normal position by lifting the front end of its lever 15 while the pinion remains in engagement with it, it will be seen that the registering-wheel will be turned a distance proportionate to the upward movement given the front end of its lever 15. The adjustment of the parts is such that when any given bar F is slid downward to its limit of movement to thereby turn its indicator-wheel nine-tenths of a revolution and bring the number "9" into view at the window in the casing the segment 16, corresponding to such bar, will be moved by its spring 18 a distance just sufficient to have turned its coöperating registering-wheel 10 nine-tenths of a revolution had the pinion of such wheel been in mesh with the segment during the movement of the latter.

The pinions of the registering-wheels are not in mesh with the segments during the setting of the bars F and indicator-wheels, so that, like said bars and wheels, they are simply "set" by such movements of the bars and wheels; but by means to be described all of the displaced segments are returned to their upper or normal position (shown in Figs. 5 and 6) at each operation of the machine and during the time the pinions of the registering-wheels are in mesh with them, and after they have been returned to such position the pinions are again thrown out of mesh, so that when the segments are released and moved backward to their several set positions by the springs 18 they will be out of mesh with the pinions of the registering-wheels and the latter will remain in the positions to which they have been moved by the segments.

It follows from the foregoing that whenever the bars F are moved downward from their uppermost positions to set their indicator-wheels and types the corresponding segments are likewise set and that in their return movement to their normal or upper position the segments actuate the registering-wheels to add upon them the amounts indicated by the indicator-wheels.

The means for moving the segment-levers 15 to their extreme upper position at each operation of the machine will be now described.

Referring to Fig. 2, it will be seen that the three levers 15 at the left are fast upon the right-hand ends of three concentric hubs or sleeves 24, while fast upon the left-hand ends of said sleeves are three forwardly-projecting arms 25, Figs. 2, 5, and 10. To the front ends of these arms 25 are pivoted the upper ends of links 26, whose lower ends are pivoted to the front ends of levers 27, Figs. 5 and 7, hung at their rear ends upon a rod 28, extending across the rear side of the machine. As seen in Fig. 7, each of the levers 27 is provided with a lateral projection or stud 29, standing in the path of a cam 30 upon the rotary shaft A'. The two right-hand levers 15 in Fig. 2 are fastened upon the left-hand ends of two concentric sleeves or hubs 31, to whose right-hand ends are secured forwardly-projecting arms 32, connected by links 33 to the front ends of levers 34, Figs. 6 and 10, also hung at their rear ends upon the shaft 28 and provided with lateral projections 35, standing in the path of cams 36 upon the shaft A'.

By the means above described the cams upon the shaft A' at each operation of the machine lift the levers 15 to their extreme upper positions. (Shown in Figs. 5 and 6.) This lifting movement takes place immediately after the cam 23, heretofore described, has thrown the lower end of the arm 19 rearward and thereby rocked the shaft and engaged the pinions of the registering-wheels with segments 16, so that during this upward movement of the levers 15 and downward movement of the segments from the several positions to which they have been moved by the springs 18 at the setting of the indicator-wheels the registering-wheels are geared to the segments and the movements of the latter are transmitted to the wheels. Shortly after the cam 23 has cleared the projection upon the rear fork 22 of the arm 19 and the cam 21 has engaged the projection upon the front fork 20 of said arm and thrown it forward and disengaged the pinions from the segments the cams 30 and 36 will clear the projections upon the levers 27 and 34, so that said levers will be unsupported, whereupon the springs 18, connected to the segments, will immediately lift the several segments and lower the links and levers until the forward ends of the levers 15 contact with and are arrested by the upper ends of the several bars F.

It will be understood from the foregoing that the levers 15 corresponding to any of the bars F which are in their uppermost positions and are not moved therefrom will not be affected by the operation of the machine, but will remain at rest, while the levers corresponding to such bars as are not in uppermost position will be moved from their several lower positions to their uppermost positions, and that during such movement their segments will be in mesh with the pinions of the registering-wheels and their movements

be thereby transmitted to said wheels, after which the segments and pinions will be disengaged and the levers be allowed to return independently to the several positions from which they were moved.

The transfers between the several registering-wheels are effected by suitable transfer-pawls 37, Fig. 5, carried by the upper ends of levers 38, loosely fulcrumed on the rock-shaft 13, the levers 38 being actuated by cams 39, fast upon a rotary shaft 40, Figs. 3 and 5, journaled at its opposite ends in bearings upon the side walls of the casing and having fast upon it a beveled gear 41, meshing with a similar gear 42, fast upon the upper end of a vertical shaft 43, journaled in brackets 44 45, projecting from a vertical bar 46, Fig. 3, suitably supported by the shafts 40 and A′ and by a bracket 47, secured to the side wall of the casing. At its lower end the shaft 43 has fast upon it a beveled gear 48, meshing with a similar gear 49, fast upon the shaft A′, heretofore described, so that at each revolution of the shaft A′ the shaft 40 and the cams 39 are given a revolution to actuate the pawl-levers 38. The pawls 37 coöperate with the usual latches 50, Figs. 3, 5, and 6, which normally support the pawls in inoperative position, but which are tripped by the complete revolutions of the respective wheels to permit the pawls to drop into operative position and to actuate the several wheels when they are thrown forward by the cams 39 to effect the transfers in the usual well-known manner.

The rotary movement of the shaft A′, heretofore referred to, is effected by means of a handle 51, secured upon its left-hand end, which projects outside the casing, Fig. 2, and to prevent backward movement of the handle after it has been turned from normal position the shaft A′ has fast upon it a toothed disk 52, Figs. 2 and 5, with which coöperates a spring-pressed pawl 53. At one point in its periphery this disk is cut away or left with a smooth surface to permit slight freedom of movement in either direction when the operating-handle is in approximately normal position, the pawl 53 at such time engaging this cut-away or smooth surface, as seen in Fig. 5.

The money-drawer C is locked when in closed position by a latch-lever 54, mounted on a transverse rod 55, supported at its opposite ends in the side plates of the casing just above the base of the machine. The rear end of this latch-lever extends downward through an opening in the top B of the drawer-compartment, Fig. 9, and when the drawer is closed catches in front of an upwardly-bent shoulder of a plate 56, secured to one of the division-walls of the drawer. A coiled spring 57, connected at its lower end to the front end of the lever 54 and at its upper end to the fixed cross-bar S, yieldingly holds the lever 54 in position to engage the plate 56 on the drawer. The lever 54 has in it a slot 59, in which fits a pin 58, projecting laterally from the lower end of a vertically-movable bar 60, mounted in guides 61 upon the rear face of the cross-bar S, Fig. 3, and pulled downwardly by a coiled spring 62, connected at its upper end to the bar 60 and at its lower end to the bar S. The bar 60 has secured to or formed integral with its upper end a plate 63, provided with a vertical slot embracing the rotary shaft A′ and fitting snugly a collar upon said shaft, by which means the upper end of the bar 60 is guided in its vertical movement. The vertical movements of the bar are effected by means of a cam-disk 64, fast upon the shaft A′ beside the plate 63 of the bar 60. This disk 64 is provided with a cam-groove 65, Figs. 11 and 12, in which fits a lug 66, projecting from the side of the plate 63. The shape of the cam-groove 65 is such that as the shaft A′ and disk 64 approach the end of a revolution at the completion of an operation of the machine the bar 60 will be lifted and the latch-lever 54 disengaged from the plate 56 upon the drawer, releasing the latter and permitting the spring 67 behind it to throw it open. At the end of the revolution of the disk 64 the lug enters the vertical portion of the cam-groove 65 in Figs. 11 and 12, so that the bar 60 is released and, but for the means hereinafter described, would immediately drop back to its lower position under the influence of the spring 62. It is prevented from immediate return to such position by a latch 68, which is also mounted on the rod 55, Fig. 9, and whose upper rear end is adapted when the bar 60 is raised and the drawer released and thrown open to engage a notch or shoulder 69 upon the forward side of the bar 60. A coiled spring 70, connected to the latch 68, presses its upper end rearward for this purpose, but when the drawer is in closed position the latch is held out of engagement or contact with the bar 60 by means of a lever 71, which is fulcrumed on the rod 55 beside the latch-lever 54 and whose rear end extends downward through the opening in the base-board B and coöperates with an incline 72 upon the upper edge of one of the partitions of the drawer, Figs. 9 and 9ª. The upwardly and rearwardly curved edge of this lever 71, adjacent its fulcrum 55, coöperates with a pin 73, projecting laterally from the latch 68. When the drawer is in closed position and the incline 72 has ridden under the lower rear end of the lever 71 and supports it in its highest position, the contact of the aforesaid edge of the lever with the pin 73 holds the latch in the normal position shown in the drawings against the stress of the spring 70, but when the drawer C is released and thrown open the rear end of the lever 71 is free to drop slightly, which releases the latch 68 and permits its spring 70 to throw its upper end rearward to engage the shoulder 69 upon the bar 60. The engagement of the latch 68 with this shoulder 69 supports the bar 60 in elevated position so long as the money-drawer C remains

open, but when the drawer is closed the lever 71 is again lifted to normal position, throwing the latch 68 forward and releasing the bar 60, which thereupon immediately drops back to the position shown in the drawings.

It will be understood that during the time the bar 60 is supported in its upper position, while the drawer remains open, the lug 66 on the plate 63 of said bar stands immediately in the path of the shoulder *x* of the cam-groove 65 in the disk 64, Figs. 11 and 12, so that during such time the disk 64 and consequently the shaft A′ and operating-handle of the machine are locked from movement. When the drawer is closed and the bar 60 released and dropped back to normal position, the lug 66 drops below the shoulder *x* of the cam-groove to the position shown in Figs. 11 and 12, thereby unlocking the machine ready for the succeeding operation. In this manner and by this means the machine becomes locked at the end of each operation and cannot be operated until the money-drawer is again closed. The plate 63 on the upper end of the bar 60 is also provided with a cam-slot 74, in which fits a pin 75, projecting from the side of the lever 8, heretofore described, Figs. 7 and 9. It will be remembered that this lever 8 is pivotally connected to the bent arm or lever 6, whose upper end is rigidly secured to the cross-bar 5 of the locking-frame, which coöperates with the indicator-wheels, and that it was stated that at each operation of the machine the lever 8 was thrown slightly forward by the action of a cam upon the shaft A′ to thereby rock the locking-frame slightly rearward and disengage its locking-teeth 2 from the disks 1 of the indicator-wheels. When the cam-disk 64 lifts the bar 60 and plate 63 in the manner described, the cam-slot 74 in the plate 63, operating on the pin 75 of the lever 8, will force the latter slightly forward and thereby unlock the indicator-wheels, and inasmuch as the bar 60 and plate 63 remain in elevated position so long as the money-drawer is open it follows that the indicator-wheels will likewise remain unlocked until the drawer is closed. The money-drawer is thus brought into coöperation with the indicator-wheels in such a way as to necessitate the setting of those wheels during the time the money-drawer remains open.

There is also provided a locking device for the hinged front wall E of the casing, which prevents such wall being swung open and access to the interior of the machine obtained except when the money-drawer C is open. To this end there is provided a lever 76, Fig. 5, which is fulcrumed on a rod 77 and whose forward end is bent downwardly and provided with a hook adapted to coöperate with a catch 78 upon the inner face of the front wall or door E of the casing. A spring 79, connected to the lever 76, pulls its front end downward and yieldingly holds it in position to coöperate with the catch 78.

The rear end of the lever 76 underlies the left-hand end of a lever 80, Fig. 2, which is pivoted to a plate 81, secured to and projecting upward from the cross-bar S, and whose right-hand end stands in the path of a pin 82 upon the vertically-movable bar 60, heretofore described. Whenever said bar is lifted at the end of a revolution of the operating-handle, in the manner before explained, the pin 82 will contact with and lift the right-hand end of the lever 80, thereby depressing its opposite end and the rear end of the lever 76 and lifting the forward end of the latter lever, Fig. 5, and disengaging it from the catch 78. The front wall E of the casing is then free to be swung outward whenever released from its lock *b*, and inasmuch as the bar 60 remains in elevated position so long as the money-drawer is open it follows that the lever 76 will likewise remain out of operative position until the drawer is closed, and thus the wall E of the casing is free to be unlocked at *b* and swung open at any time before the money-drawer is closed. When the money-drawer is closed, (the hinged wall E having been previously swung inward to closed position,) the locking-lever 76 will be released by the dropping of the bar 60 in the manner described and its spring 79 will reëngage its front end with the catch 78 to relock the wall E.

The machine is provided with a gong 83, Fig. 3, which is sounded at each operation of the machine by a striker 84, operated by a trip or trigger 85, pivoted to the rear edge of the bar 60, near its lower end, the striker being retracted from the gong by the trip 85 during the upward movement of the bar 60 and thrown against the gong by the action of a spring 86 when the trip clears the end of the striker-arm.

From the foregoing description it will be understood that when the parts are in normal position and the money-drawer closed the indicator-wheels and their setting devices are locked from movement. The first step at any given operation of the machine, therefore, consists in giving the operating-handle 51 a complete revolution, which has the effect of releasing the drawer and permitting the spring to throw it open and of unlocking the indicator-wheels and their setting devices. At the time of such revolution of the handle the handle becomes locked in the manner before explained and cannot be turned farther without first closing the money-drawer. The revolution of the handle causes the segment-levers to be moved forward to their limit of movement and then permitted to come back to their several set positions, thereby effecting a registration of the amount represented by the indicators in the position occupied by them at the beginning of the operation. The inking-pad and impression-platen are also actuated by this revolution of the handle to print upon the paper strip the same amount as that registered and indicated.

The next step in the operation of the ma-

chine consists in setting the indicators to indicate the amount of the new transactions and then closing the money-drawer, whereupon the indicators and their setting devices become locked in their new positions and remain so locked until the handle, which has been released by the closing of the drawer in the manner heretofore explained, is given another revolution to register and print the amount of the new indication. The amount which is indicated at any given operation of the machine is therefore not registered and printed until the next succeeding operation of the machine, but inasmuch as the indicators become locked in their set positions by the closing of the money-drawer at the end of each operation and can only be released and moved to any other position by first giving the operating-handle a revolution and thereby registering and printing the amount indicated, it follows that the registration and printing at each operation of the amount indicated by the preceding operation is assured.

Having thus fully described my invention, I claim—

1. The combination of the reciprocating bars provided with the racks and the series of types, the indicator-wheels geared to the bars, a movable frame carrying an inking-pad and an impression-platen, and means for moving said frame toward the types twice in succession at each operation and shifting it between said movements, to first press the inking-pad against the types and then press the impression-platen against them, substantially as described.

2. The combination of the reciprocating bars provided with the series of types, a swinging frame, a second frame pivoted in the swinging frame and carrying an inking-pad and an impression-platen, means for moving the swinging frame toward the types twice in succession at each operation, and means for moving the second frame on its pivot between such movements of the swinging frame, to cause the inking-pad to be pressed against the types at the first movement of the swinging frame and the impression-platen at the second movement thereof, substantially as described.

3. The combination of the reciprocating bars provided with the series of types, a swinging frame, a second frame pivoted in the swinging frame and carrying an inking-pad and an impression-platen, two rotary cams coöperating with the swinging frame to move the same toward the types twice in succession at each operation, and a third cam cooperating with the pivoted frame to move the same upon its pivot between the movements of the swinging frame, to cause the inking-pad to coöperate with the types at the first movement of the swinging frame, and the impression-platen at the second, substantially as described.

4. The combination of the vertically-reciprocating bars F provided with the types O′, the indicator-wheels H geared to said bars, the swinging frame E′ hung upon the rod C′, the frame G′ pivoted at its rear end in the lower end of the frame E′ and carrying at its forward end the inking-pad N′ and impression-platen L′, the rotary cams T′ U′ and means intermediate the same and the swinging frame E′ for moving the latter and the frame G′ toward the types twice in succession at each complete revolution of said cams, and the cam Z′ and means intermediate the same and the frame G′ for moving the latter upon its pivot, between the movements of the swinging frame E′, substantially as described.

5. The combination of the vertically-reciprocating bars F provided with the types O′, the swinging frame E′ hung upon the rod C′, the frame G′ pivoted at its rear end in the lower end of the frame E′ and carrying at its forward end the inking-pad B′ and impression-platen L′, the toggle-levers P′ Q′ intermediate the frame E′ and rod R′, the rotary cams T′ U′ coöperating with the lever Q′ to straighten the toggle twice in succession at each revolution of said cams, the spring S′ for returning them to normal position, the lever X′ coöperating with the arm W′ projecting from the pivoted frame G′, the cam Z′ cooperating with the lever X′, and the spring *j* for resetting the parts, substantially as described.

6. The combination of the reciprocating bars F provided with the types O′, the indicator-wheels H geared to said bars, the movable frame carrying the inking-pad and impression-platen, the rotary cams and intermediate devices for operating said frame, the storage-reel T upon which the record-strip is wound after being led from the supply-roll across the impression-platen, the actuating-pawl coöperating with the storage-reel T, and the rotary cam coöperating with said pawl to turn the ratchet and reel and advance the paper strip at each operation, substantially as described.

7. The combination of the reciprocating bars, the segment-levers coöperating therewith, the registering-wheels coöperating with the segments and moved in one direction by them, and means for returning all of the displaced segments to a given position at each operation of the machine, substantially as described.

8. The combination of the reciprocating bars movable to different positions to register different amounts, the segment-levers cooperating therewith, the registering-wheels mounted in a movable frame and provided with pinions coöperating with the segments, means for moving said frame to throw the pinions into and out of mesh with the segments, and means for returning all of the displaced levers to a given position at each operation of the machine, substantially as described.

9. The combination of the reciprocating bars, the spring-pressed levers bearing at one

end against said bars and provided with the segments at their opposite ends, the registering-wheels mounted in a pivoted frame and provided with pinions to coöperate with the segments, and rotary cams coöperating with said pivoted frame and with the segment-levers to throw the pinions into and out of mesh with the segments, and to move the displaced levers in one direction to a given position, at each operation of the machine, substantially as described.

10. The combination of the reciprocating bars, the indicator-wheels geared thereto, the segment-levers coöperating with the bars, the registering-wheels coöperating with the segments and moved by them in one direction, and means for returning the levers to a given position at each operation of the machine, substantially as described.

11. The combination of the reciprocating bars, the indicator-wheels geared thereto, the spring-pressed levers bearing at one end against said bars and provided with the segments at their opposite ends, the registering-wheels mounted in a pivoted frame and provided with pinions adapted to coöperate with the segments, and rotary cams and connections for moving the pivoted frame to throw the pinions into and out of mesh with the segments and for restoring the displaced levers to a given position, at each operation of the machine, substantially as described.

12. The combination of the reciprocating bars provided with the series of types, means for inking said types and pressing the paper strip against them, the spring-pressed segment-levers bearing at one end against said bars and provided at their opposite ends with the segments, the registering-wheels coöperating with the segments and moved in one direction by them, and means for restoring the displaced levers to a given position at each operation of the machine, substantially as described.

13. The combination of the reciprocating bars, provided with the series of types, the indicator-wheels geared to said bars, means for inking the types and pressing the paper strip against them, the spring-pressed segment-levers coöperating with the bars, the registering-wheels coöperating with the segments and moved in one direction by them, and means for restoring the displaced levers to a given position at each operation of the machine, substantially as described.

14. The combination, with the money-drawer and its latch, of a rotary disk provided with a cam-groove having an offset or shoulder, a reciprocating bar having a projection fitting in said groove and coöperating with the drawer-latch to release the drawer when the bar is moved by the cam, a latch for holding the bar in moved position, with its projection in the path of the shoulder in the cam-groove, to lock the disk from further movement, and a trip for said latch operated by the closing of the money-drawer, to release the bar and permit its projection to move out of the path of said shoulder, substantially as described.

15. The combination, with the money-drawer C and its latch-lever 54, of the rotary disk 64 provided with the cam-groove 65 having the offset or shoulder x, the reciprocating bar 60 coöperating at its lower end with the latch-lever 54 and provided at its upper end with the projection 66 fitting in the cam-groove 65, the latch 68 coöperating with the bar 60, and a trip-lever 71 coöperating with the money-drawer C and with the latch 68, substantially as described.

16. The combination of the rotary disk 64 having the cam-groove 65, the reciprocating bar 60 having the projection 66 fitting in said groove, the gong 83, the gong-striker 84, the spring 86, and the trip 85 carried by the bar 60 and coöperating with the striker 84, substantially as described.

17. The combination of the reciprocating bars, the indicator-wheels geared thereto and provided with the notched locking-disks, the swinging locking-frame provided with the locking teeth or projections coöperating with the notches in said disks, the money-drawer and its latch, releasing means for disengaging the latch from the drawer, and means intermediate the locking-frame and such releasing means for disengaging the locking-frame from the disks of the register-wheels when the drawer-latch is disengaged from the drawer to release the latter, substantially as described.

18. The combination of the reciprocating bars F, the indicator-wheels H geared to said bars and provided with the notched locking-disks 1, the swinging locking-frame coöperating with said disks, the money-drawer C, the latch 54 therefor, the rotary disk 64 having the cam-groove 65, the reciprocating bar 60 coöperating at its lower end with the latch 54 and provided at its upper end with the plate 63 having the projection 66 fitting in the cam-groove 65, means intermediate the plate 63 and the locking-frame for causing the latter to be disengaged from the indicator-wheels by the movement of the plate 63 in one direction and to become reëngaged with them at the movement of said plate in the opposite direction, the latch 68 coöperating with the bar 60, and the trip-lever 71 intermediate said latch and the money-drawer C, substantially as described.

19. The combination of the casing A having the hinged wall or door E, the locking-lever 76 coöperating with the catch 78 on said door, the reciprocating bar 60 having the projection 82, the lever 80 coöperating with said projection and with the lever 76, the rotary disk 64 having the cam-groove 65 in which fits the projection 66 on the bar 60, the money-drawer C, the latch-lever 54 coöperating therewith and with the lower end of the bar 60, the latch 68 coöperating with the bar 60, and the trip-lever 71 intermediate the drawer C and latch 68, whereby upon the release and open-

ing of the drawer the locking-lever 76 is disengaged from the catch upon the door E, and whereby upon the closing of the drawer C said lever is reëngaged with the catch, substantially as described.

20. The combination of the casing A having the hinged wall or door E provided with the window K, the reciprocating bars F mounted upon the inner face of said wall or door and having the racks and types, the indicator-wheels H also supported upon the inner face of said door opposite the window K and geared to the bars F, the knobs N connected to the bars F through the vertical slots in the wall E, and means for inking the types and pressing the paper strip against them, substantially as described.

21. The combination of the casing A having the hinged wall or door E having the window K, the reciprocating bars F mounted upon the inner face of said wall or door and provided with the types O′ and the series of notches, the springs O secured to said wall or door and coöperating with the notches, the indicator-wheels H supported upon the inner face of said wall or door opposite the window K and geared to the bars F, the operating-knobs N connected to the bars F through the vertical slots L, and the inking and impressing devices coöperating with the types upon the bars, substantially as described.

JOSEPH P. CLEAL.

Witnesses:
PEARL N. SIGLER,
ALVAN MACAULEY.