(No Model.) 4 Sheets—Sheet 1.

H. G. O'NEILL.

CASH REGISTER AND INDICATOR.

No. 480,125. Patented Aug. 2, 1892.

Fig. 1.

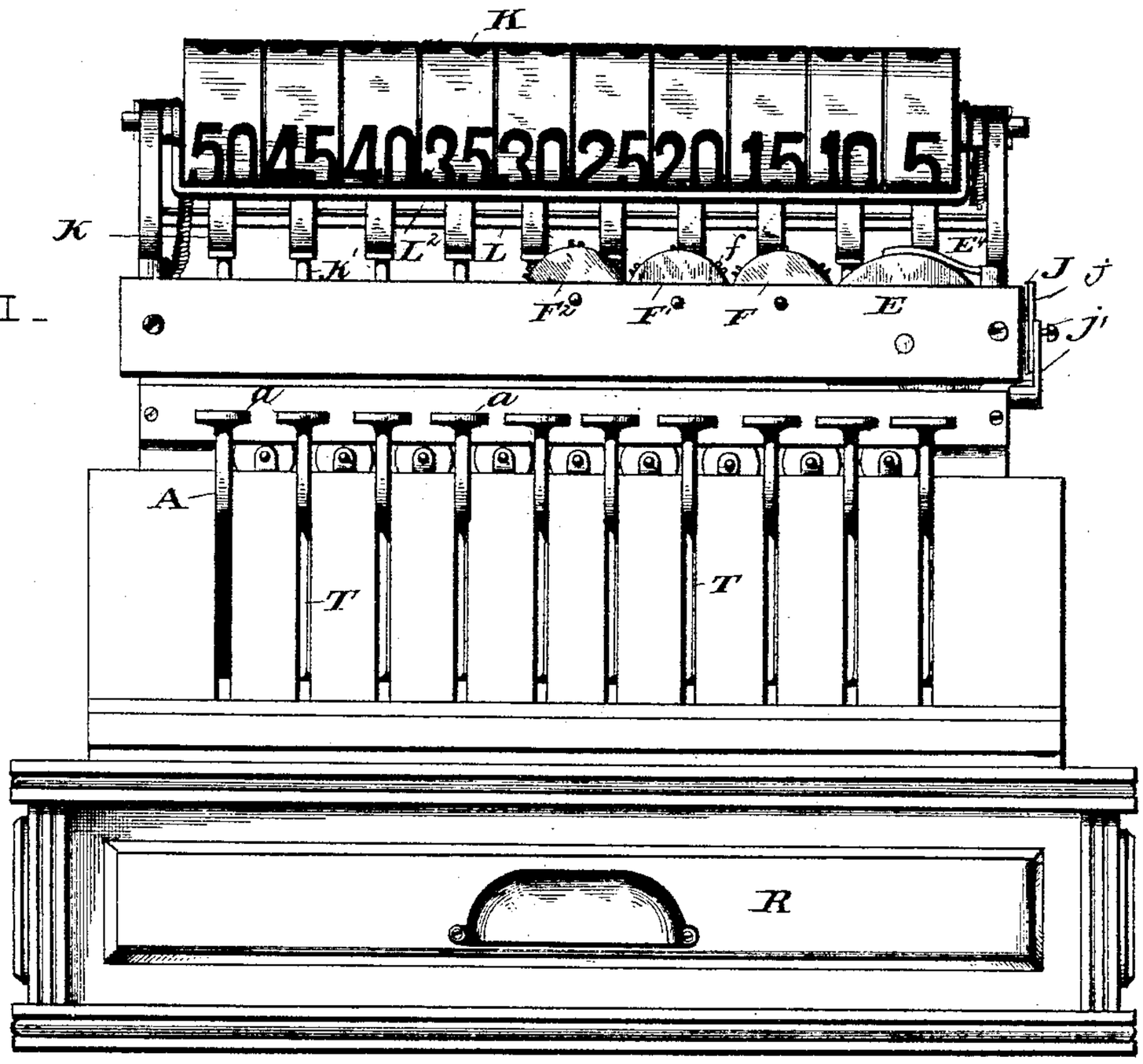


Fig. 10.

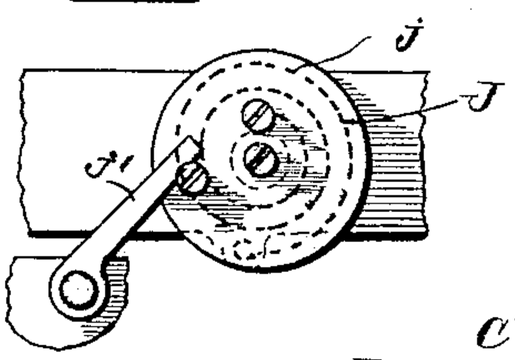


Fig. 2.

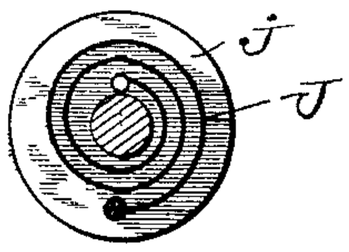
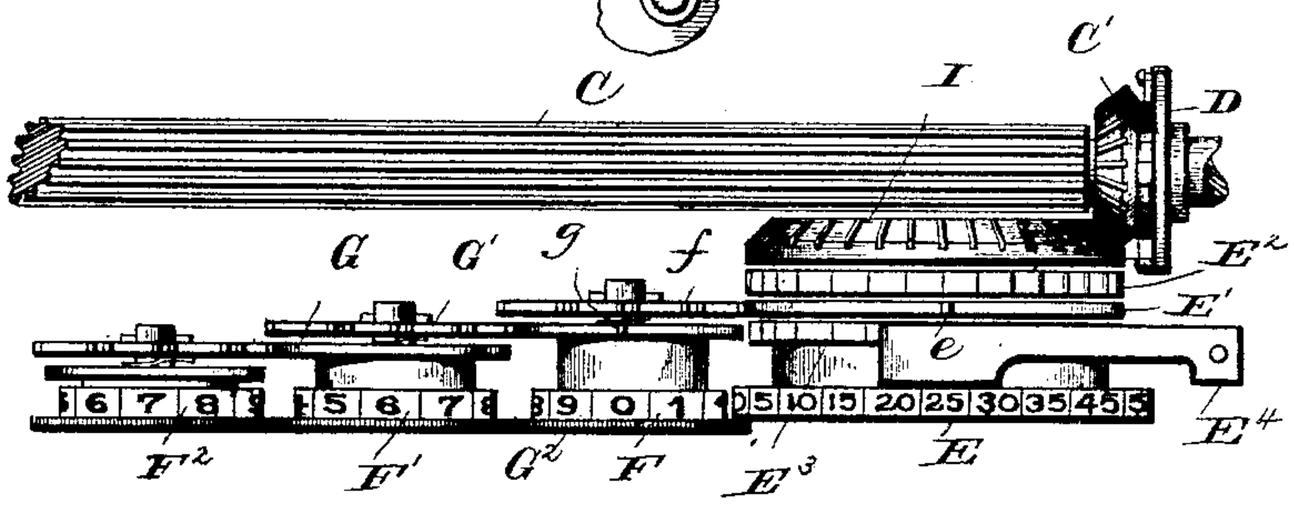


Fig. 8.



Witnesses
Paul W. Stevens.
Philip L. Masi.

Inventor
Henry G. O'Neill,
By his Attorney
E. W. Anderson.

(No Model.)

4 Sheets—Sheet 2.

H. G. O'NEILL.

CASH REGISTER AND INDICATOR.

No. 480,125. Patented Aug. 2, 1892.

Fig. 3.

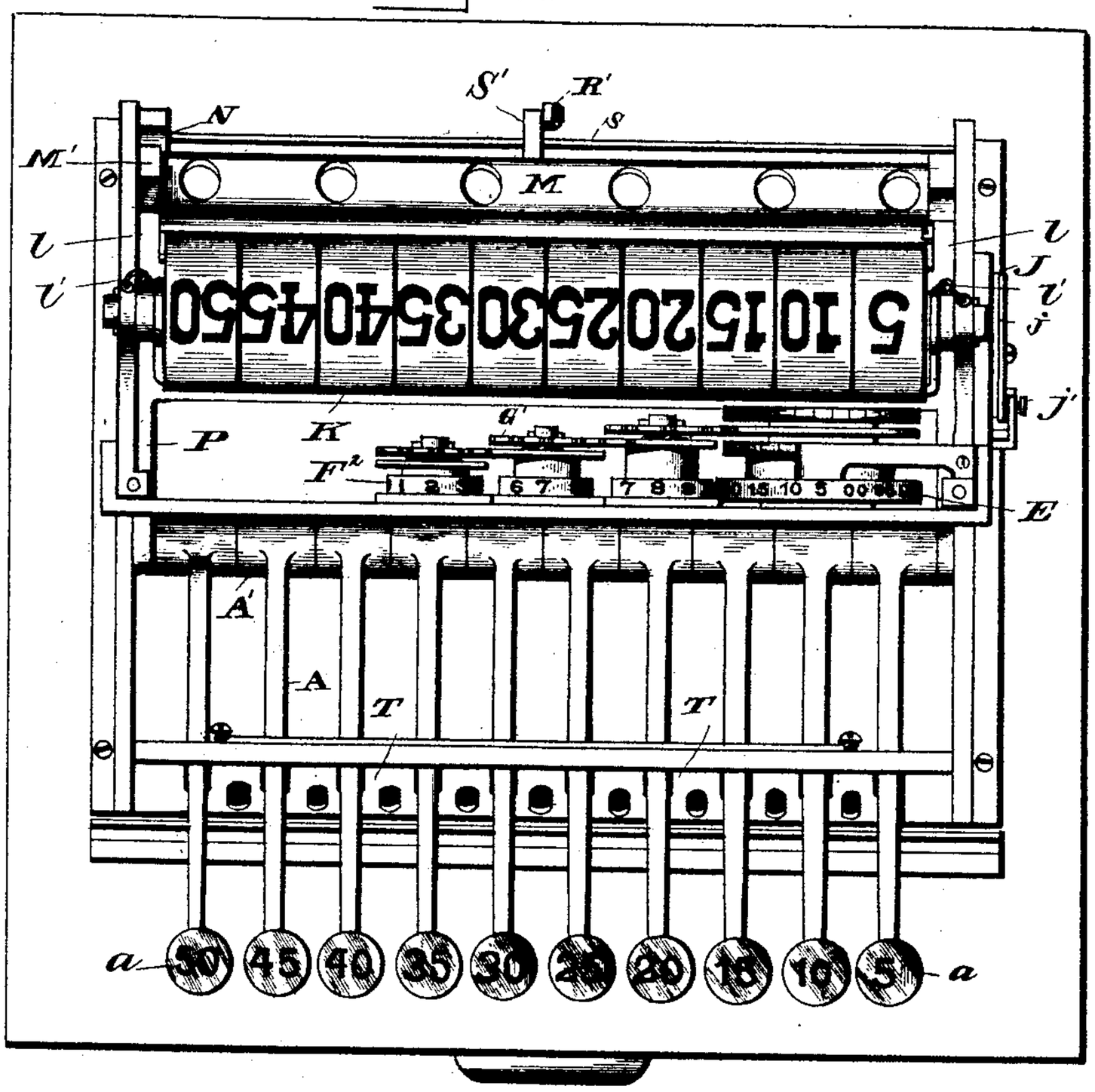
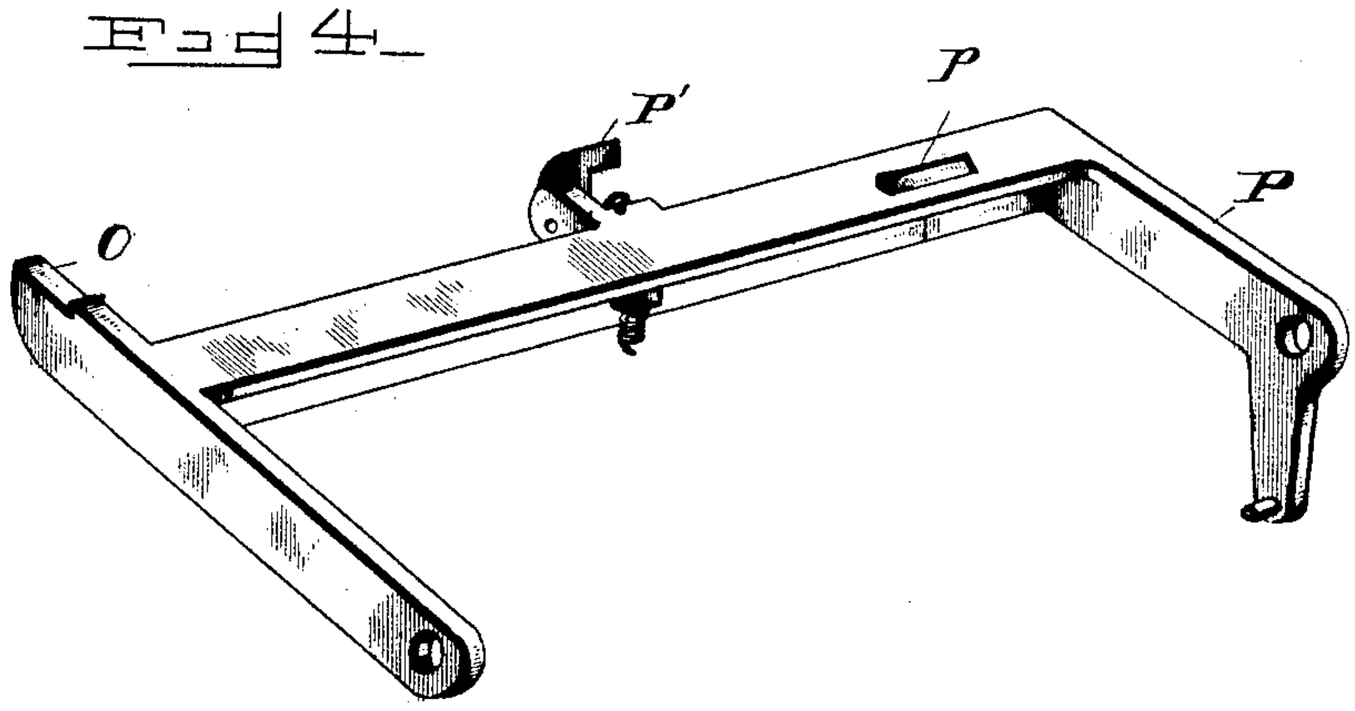


Fig. 4.



Witnesses
Paul W. Stevens
Philip C. Masi.

Inventor
Henry G. O'Neill
By his Attorney
E. W. Anderson

(No Model.)

4 Sheets—Sheet 3.

H. G. O'NEILL.

CASH REGISTER AND INDICATOR.

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Fig 5.

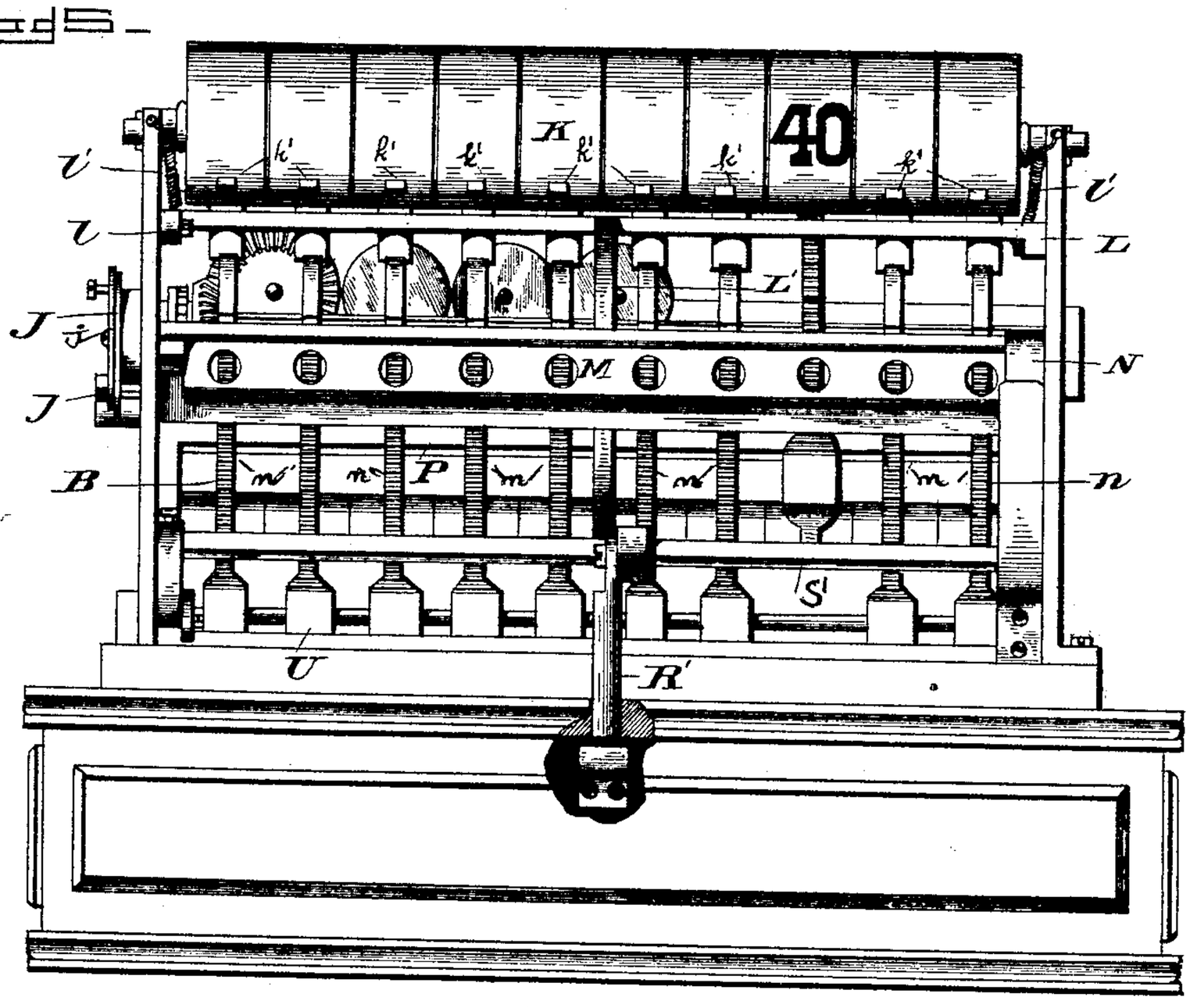
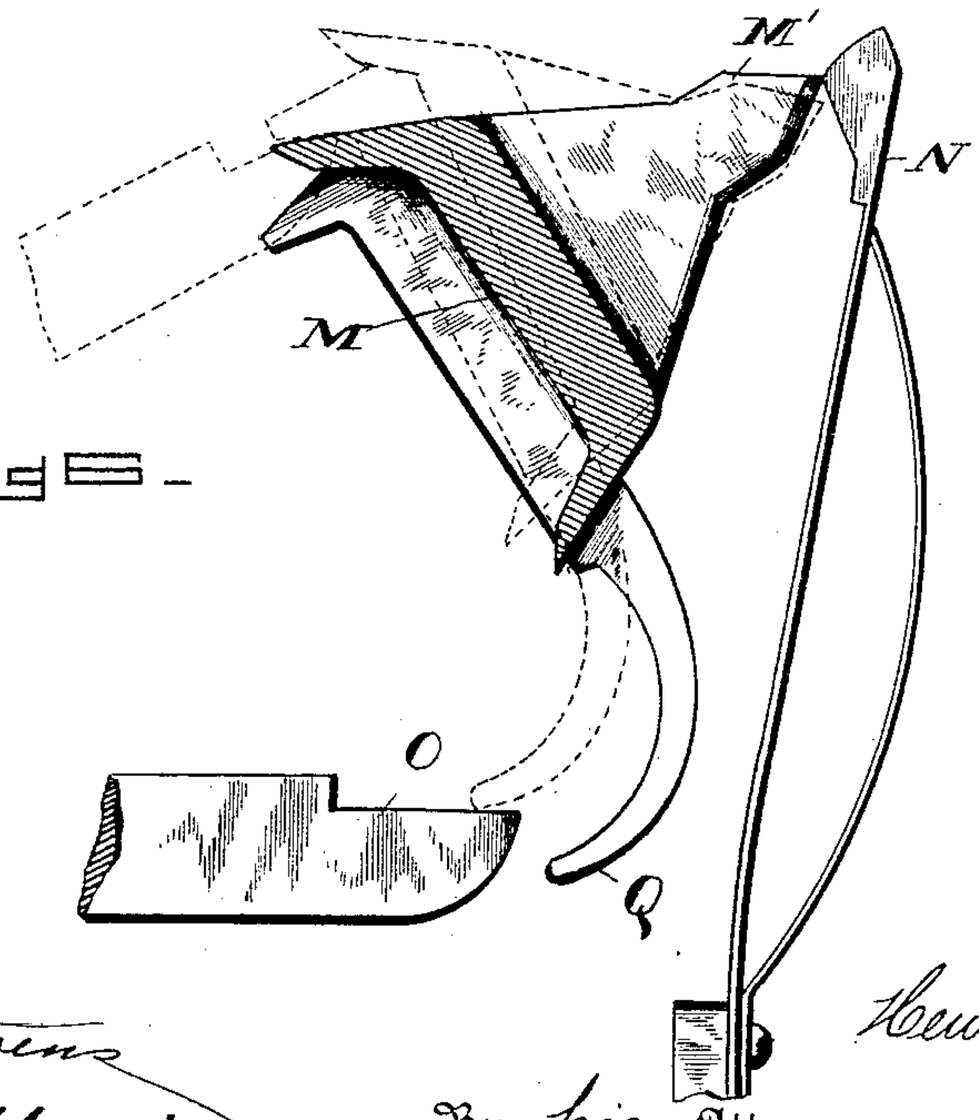


Fig 6.



Witnesses
Paul W. Stevens
Philip C. Masi.

Inventor
Henry G. O'Neill
By his Attorney
E. W. Anderson.

(No Model.) 4 Sheets—Sheet 4.

H. G. O'NEILL.

CASH REGISTER AND INDICATOR.

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FIG. 1.

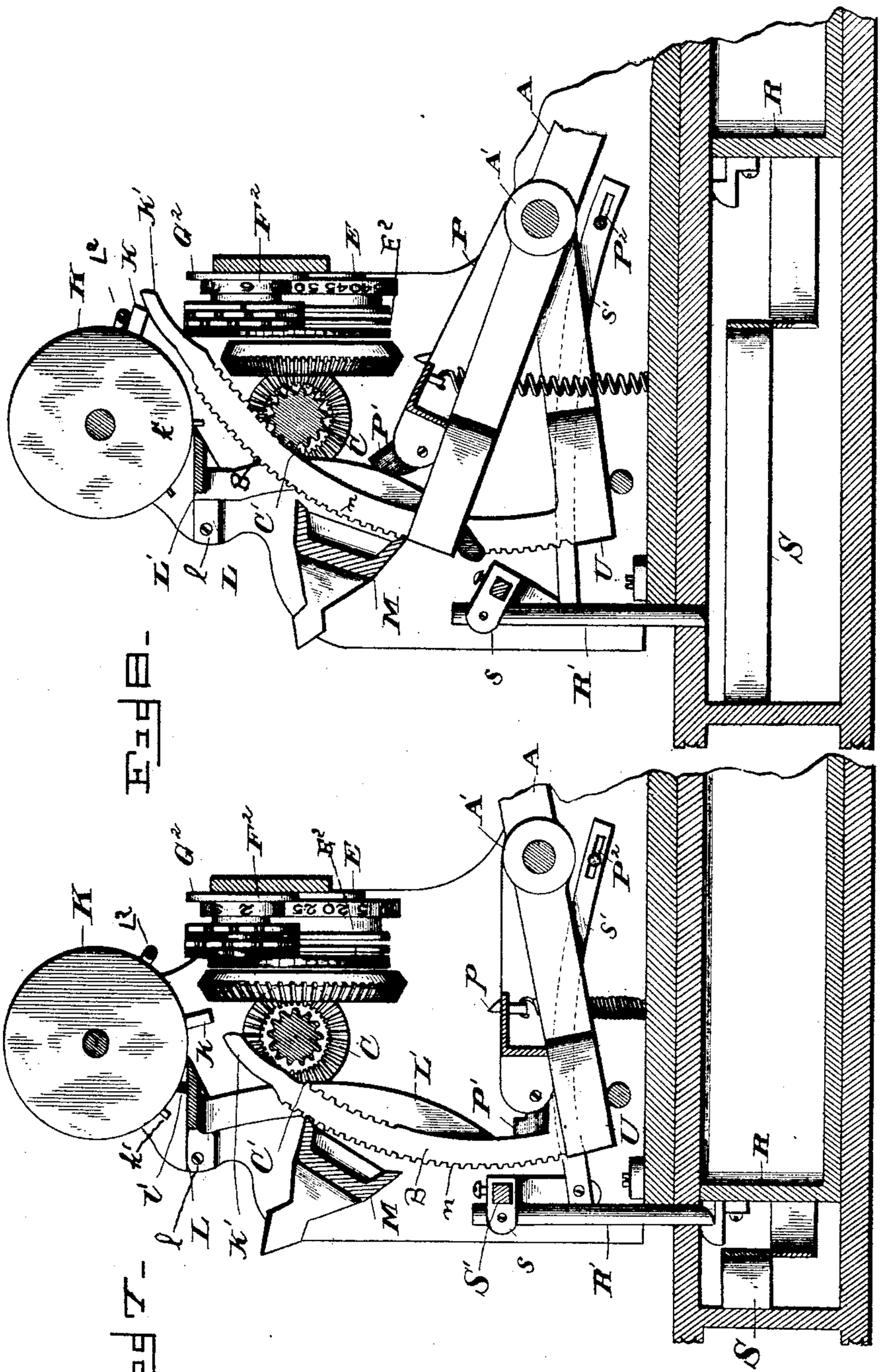

FIG. 2.

Witnesses
Paul W. Stevens
Philip C. Masi.

Inventor
Henry G. O'Neill
By his Attorney
E. W. Anderson

UNITED STATES PATENT OFFICE.

HENRY GIBSON O'NEILL, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO THE STANDARD REGISTER COMPANY, OF BOSTON, MASSACHUSETTS.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 480,125, dated August 2, 1892.

Application filed November 20, 1891. Serial No. 412,574. (No model.)

To all whom it may concern:

Be it known that I, HENRY GIBSON O'NEILL, a citizen of Great Britain, and a resident of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Cash-Registers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a front elevation. Fig. 2 is a detail plan view of the adding mechanism and fluted roll. Fig. 3 is a plan view. Fig. 4 is a detail perspective view of bail-bar. Fig. 5 is a rear elevation. Fig. 6 is a detail view of bar M and its tripping mechanism. Fig. 7 is a vertical section on line *x x*. Fig. 8 is a similar view with one of the keys depressed. Figs. 9 and 10 are detail views showing the spring and stop for the corrugated-shaft.

This invention has relation to that class of devices known as "cash-registers," the object being to provide a machine of greatly-simplified construction which may be operated to indicate the amount of each sale and at the same time add the same to the sum of the previous transactions; and it consists in the novel construction and combination of parts, as hereinafter described, and pointed out in the claims.

In the accompanying drawings the letter A designates a series of key-levers pivoted upon a common shaft A′ and provided each with a finger-piece or key *a*. These finger-pieces or keys in the construction illustrated are marked from "5," in multiples of five, to "50," (shown in Fig. 3), although it is obvious that other systems of numbering may be employed, as desired. The opposite extremity of each key-lever is provided with an arc-shaped ratchet-arm B, having on its inner edge teeth, the number of which is governed by the value of the key, two teeth being shown on the arm of the five-cent-key lever, three on the arm of the ten-cent-key lever, and so on.

Above the key-levers and in proper relation to the arc-shaped toothed arms thereof is located a transverse fluted roll, toothed cylinder, or corrugated shaft C, which turns in bearings at its ends and is common to all said key-levers. At one extremity said shaft carries loosely thereon a toothed beveled wheel C′, (best shown in Fig. 2), having a ratchet-and-pawl connection D with the shaft, in order that the latter may turn freely in either direction while operating the adding mechanism, now to be described, in one direction only. Near said fluted shaft and arranged in approximately parallel position therewith is the series of aligned adding-wheels, (shown in Fig. 2 in detail,) loosely carried on short shafts or axle-studs of the frame. The first wheel E of the series is marked around its periphery with the numbers "05" to "95" and "00," in multiples of five. Connected to and moving with wheel E is a disk E′, from the peripheral edge of which projects a tooth or spur *e*, so located that it will come into engagement with a tooth *f* of the second wheel F to effect the carrying when the wheel E has completed one revolution. Moving with said wheel and disk are also the ratchet-wheels E^2 and E^3, the wheel E^3 being engaged by a pawl E^4 to prevent the adding-wheel E from turning backwardly. The ratchet E^2, as more fully hereinafter described, is engaged by a projection *p* of a bail-bar P when a key is depressed the length of its stroke to prevent the adding-wheel being carried by its momentum beyond the point denoted by the value of the key struck. The inner end of said wheel has also a bevel-gear I in engagement with the wheel C′ of the fluted shaft. The remaining wheels F F′ F^2 of the adding series are each of less diameter than the wheel E, with which they are aligned, and are numbered on their peripheries from "0" to "9," inclusive. Each of said wheels is provided with a disk G, having a spur or projection *g* on its periphery so located as to come into engagement with the toothed disk G′ of the succeeding wheel to effect the proper carrying after each adding-wheel has completed its revolution. Said wheels are also provided with the milled disks G^2, by means of which they may be turned by hand for reduction to "0."

It will be understood from the above that when any key is depressed its arc-ratchet extension will turn the fluted roll or shaft through an arc corresponding to the number of teeth thereon and the value of the key, and through the bevel-gear will operate the wheel E to register the proper amount and effect the addition to the sum of the previous transactions. As the key returns to its position the pawl-and-ratchet device D on the fluted roll is disengaged from the wheel C′ thereon, permitting the shaft to turn backward to its original position without operating the adding mechanism, and to insure such return to the proper position and to guard the movement thereof the spring J is provided and the stop j', which consists of a disk j on the end of the shaft, having a lug or projection thereon, which when the shaft comes to its normal position is stopped by contact with the arm j', secured to the frame. The spring is connected to the disk and to the frame.

K, Figs. 1, 3, 5, 7, and 8, are the indicator-disks, which are preferably arranged in a parallel series at the upper rear portion of the frame above and at the rear of the adding-wheels. Each of these disks has a depending projection K, which is adapted to be engaged by an extension K′ of the arc ratchet of the respective key-lever when the latter is operated, turning said disk into position for the numeral thereon corresponding to the value of its key to appear at the sight-slots of the casing. Said disks are usually marked or numbered at diametrically-opposite points, so that the numbers may be seen from both front and rear.

P designates a pivoted bail-bar (best shown in Fig. 4) common to all the key-levers and resting thereon near their inner or rear ends in such a position that when any lever is operated by the depression of its key said bar will be elevated thereby.

L, Figs. 1, 5, 7, and 8, represents a stop-bar extending in proximity to the lower rear portions of the indicator-disks and pivotally connected at its ends to the frame by the arms l. Depending from this bar is a curved or cam arm L′, which when a key-lever is operated is engaged by a lug or arm P′ on the bail-bar P, causing said bar L to be withdrawn slightly from its position in proximity to the indicator-disks, in which latter position it is normally held by the springs l'. When, therefore, one of the indicator-disks is turned by the operation of the key-lever to its indicative position, a stop or projection k' thereon is brought into engagement with this bar, which prevents the said disk from returning to its original position until a subsequent lever is operated to withdraw said bar and permit said disk to fall. Said disk may be returned by gravity, aided by the spring-actuated bail-bar L^2, which extends along the entire series of disks and resting on the projection k of any disk when in its indicative position. As before stated, when the bar P is elevated its projection p comes into engagement with the ratchet E^2 of the first adding-wheel just as the latter has been operated its proper distance in order to prevent its being carried too far by its momentum.

To insure each key being depressed the full length of its stroke, I provide the device now to be described.

M, Figs. 5, 6, 7, and 8, designates a plate-like bar having loose bearings at its ends and extending along the rear portions of the arc ratchet-arms of the key-levers, said bar being common to the series. This bar is provided with a sharp upper edge, which is normally held against the ratchet-arms by means of a spring-pressed pawl N, which normally bears against a beveled lug or projection M′ on said bar. The rear edge of each ratchet-arm is provided with a series of transverse teeth or corrugations n, and when any key-lever is operated these teeth are engaged by the bar M and the key is prevented from returning. When, however, the key-lever has completed its entire stroke, a lug or projection O on the bail-bar P comes into engagement with a projection O′ on the bar M, turning the upper edge thereof out of engagement with the ratchet-arm of the key. As it is turned into this position the head of the pawl N passes over the point of the tooth or projection M′, and the bar M is locked in this position thereby. The key-lever is now free to return; but as it approaches the limit of its return movement the projection O of the bail-bar comes into contact with a depending curved or cam arm Q of the bar M, which will actuate the latter to release the pawl N, the upper edge of said bar again coming into contact with the ratchet-arms. By this arrangement any danger of mistake is avoided, as each key-lever must be operated its full stroke, and therefore registers its full value before it can be returned.

In the lower portion of the casing below the operating mechanism is the cash-drawer R, Figs. 1, 5, 7, and 8, normally locked in said casing by the vertical bolt R′ and arranged to be automatically thrown out when released by springs S. To operate this bolt, I provide the longitudinal rock bar or shaft S′, to a lug s of which the lock-bolt is loosely connected. The bar S′ extends along the lower rear portion of the machine and near one end carries a depending arm S^2, to which is connected one end of a link s', the other end having a loose slotted engagement with an arm P^2 on one of the pivoted arms of the bar P. When, therefore, any lever is operated, the rock-bar is operated to withdraw the bolt from engagement with the lock of the drawer, the latter being thrown outwardly by the springs.

To prevent more than one key from being depressed at a time, I provide a series of vertical slides T, Fig. 1, between which the key-levers respectively pass, and so arranged that the depression of any one of said levers will throw said slides into such position that no other lever can be operated—that is to say,

that below the reduced portions *t* at their upper ends, between which the levers rest when in normal position, the space occupied by the series of slides is equal to the entire interval between the side bars of the frame, less the width of one key-lever, so that when any lever is depressed between its adjacent slides the other slides of the series are crowded into close contact with each other.

The operating mechanism is inclosed in a frame in the usual manner, through which the key extremities of the levers project, and provided with sight-slots, through which the numbers on the indicator-disks are visible when in indicative position. The inner ends of the key-levers are preferably enlarged or weighted, as shown at U, to insure their return after operation, which is also effected by the bar P, resting thereon, said bar being provided with retracting-springs.

Having described this invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cash-register or accounting-machine, the combination, with a series of key-levers and their ratchet-arms, of a series of adding-wheels having gearing and carrying devices, a transverse fluted shaft engaging said arc ratchets when operated and common to all said key-levers, a toothed wheel loosely journaled at the end of said fluted shaft, a ratchet-and-pawl connection between said toothed wheel and shaft, the spring and stop for said shaft, and the stop device operated by the operation of any key-lever to prevent the adding mechanism being carried beyond the proper point by its momentum, substantially as specified.

2. In a cash-register or accounting-machine, the combination, with the series of aligned adding-wheels, their gearing and carrying devices, and their operating mechanism, of the bar resting on the key-levers and operated by any one of said levers, said bar having a projection adapted to engage the gear of the adding mechanism when any lever reaches the limit of its stroke, and projections for releasing the indicators and for operating devices to permit the return of the keys upon the completion of their stroke, substantially as specified.

3. The combination, with a series of key-levers having the arc ratchets or racks arranged to actuate the adding mechanism and the pivoted bail-bar resting on said levers and operated by any one thereof, of the device for insuring the complete stroke of each key, said device comprising a loosely-journaled plate-like bar having one of its edges normally held in contact with the arc ratchet-arms of the keys and designed to engage with any one of said arms upon the depression of its key, the devices operated by said bail-bar for releasing said plate-like bar when the stroke is completed, and a lug or projection on said bail for acting upon the plate-like bar to throw it back into engagement when the key has returned to its normal position, substantially as specified.

4. The combination, with the series of key-levers and the adding and indicating mechanism operated thereby, of the pivoted bail-bar resting on said levers and common to and actuated by all the series, and devices connected with and operated by said bar for insuring each key its full stroke, for returning the indicator-disks to their normal positions, and for operating the lock of the cash-drawer, substantially as specified.

5. In a cash-register, the combination, with the series of key-levers, the adding and indicating mechanism operated thereby, and means for preventing more than one key from being operated at a time, of the bar P, common to said series of levers and resting thereon, the stop-bar normally in engagement with teeth on the ratchet-arms of said key-levers, means whereby an engagement is effected with said stop-bar by the bar P when any key-lever approaches the limit of its stroke to release said bar from engagement with said lever, the holding-pawl for said bar, and means operated by the bar P for releasing said pawl and retracting the stop-bar when the lever returns to its normal position, substantially as specified.

6. The combination, with the series of key-levers and the bar P, common thereto and resting thereon, said bar having a projection designed to serve as a stop for the adding mechanism and having devices for releasing the indicators and the key-levers, of the cash-drawer, its lock and bolt, the rock-shaft to which said bolt is loosely connected, and a connection between said shaft and an arm of the bar P, whereby when the latter is operated by any key-lever said bolt is withdrawn from the lock, substantially as specified.

7. The combination, with the series of key-levers, the adding and indicating mechanism operated thereby, and the bar P, resting on said levers at the rear of their pivotal points, of the pivoted stop-bar parallel with and in close proximity with said indicator-disks and engaged by a projection on any one of said disks when the disk is operated to hold it in indicative position, and a connection between said stop-bar and the bar P, whereby the former is withdrawn from engagement with said projection to allow said disk to return to its normal position when a subsequent key is struck, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY GIBSON O'NEILL.

Witnesses:

FRANK Q. BROWN,

LOUIS E. LOVEJOY.