(No Model.) 4 Sheets—Sheet 1.

L. M. MILLS.

CASH INDICATOR AND RECORDER.

No. 434,799. Patented Aug. 19, 1890.

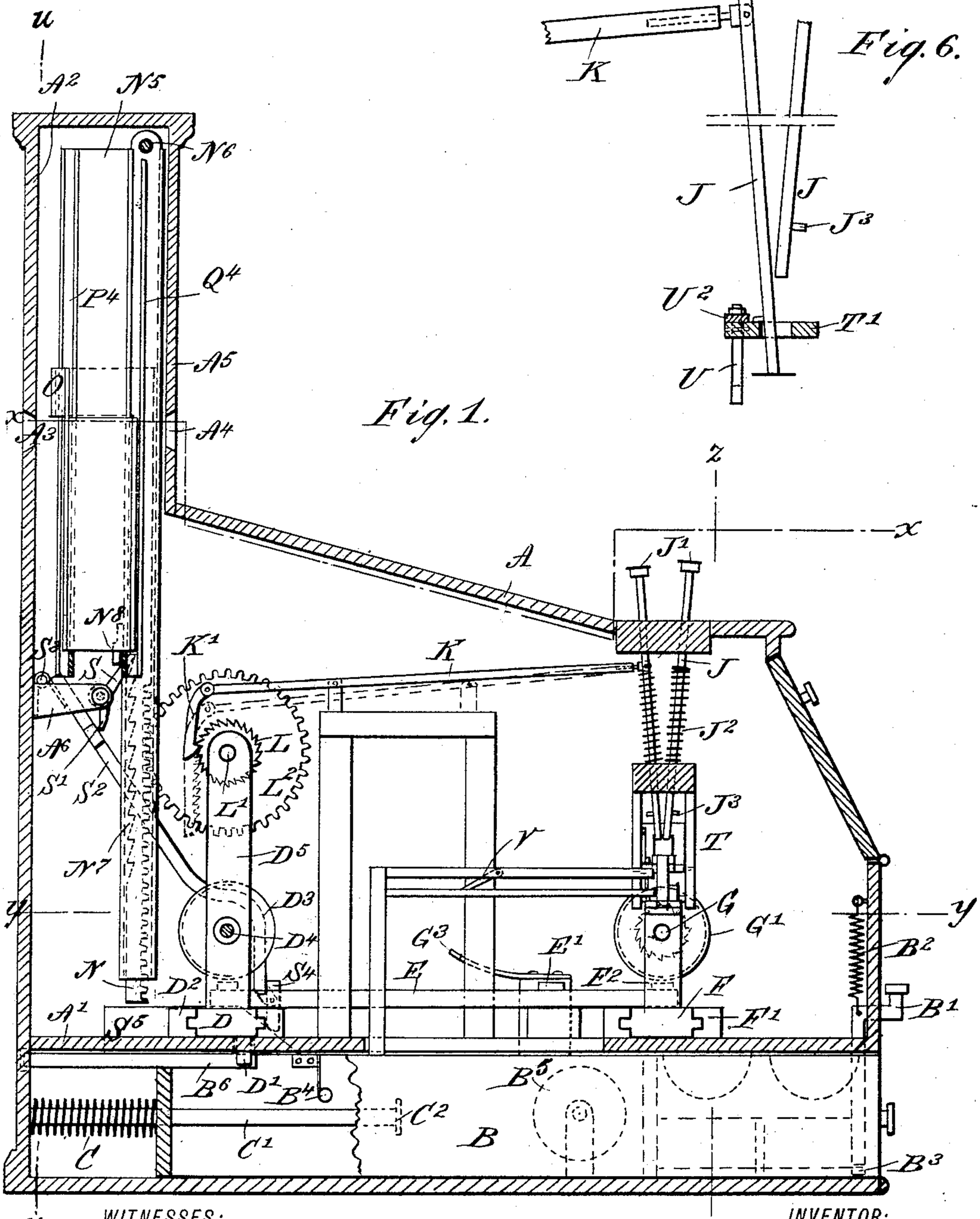


Fig. 1.

Fig. 6.

WITNESSES:

Donn Twitchell

C. Sedgwick

INVENTOR:

L. M. Mills

BY

Munn & Co.

ATTORNEYS.

4 Sheets—Sheet 2.

(No Model.)

L. M. MILLS.

CASH INDICATOR AND RECORDER.

No. 434,799. Patented Aug. 19, 1890.

Fig. 2.

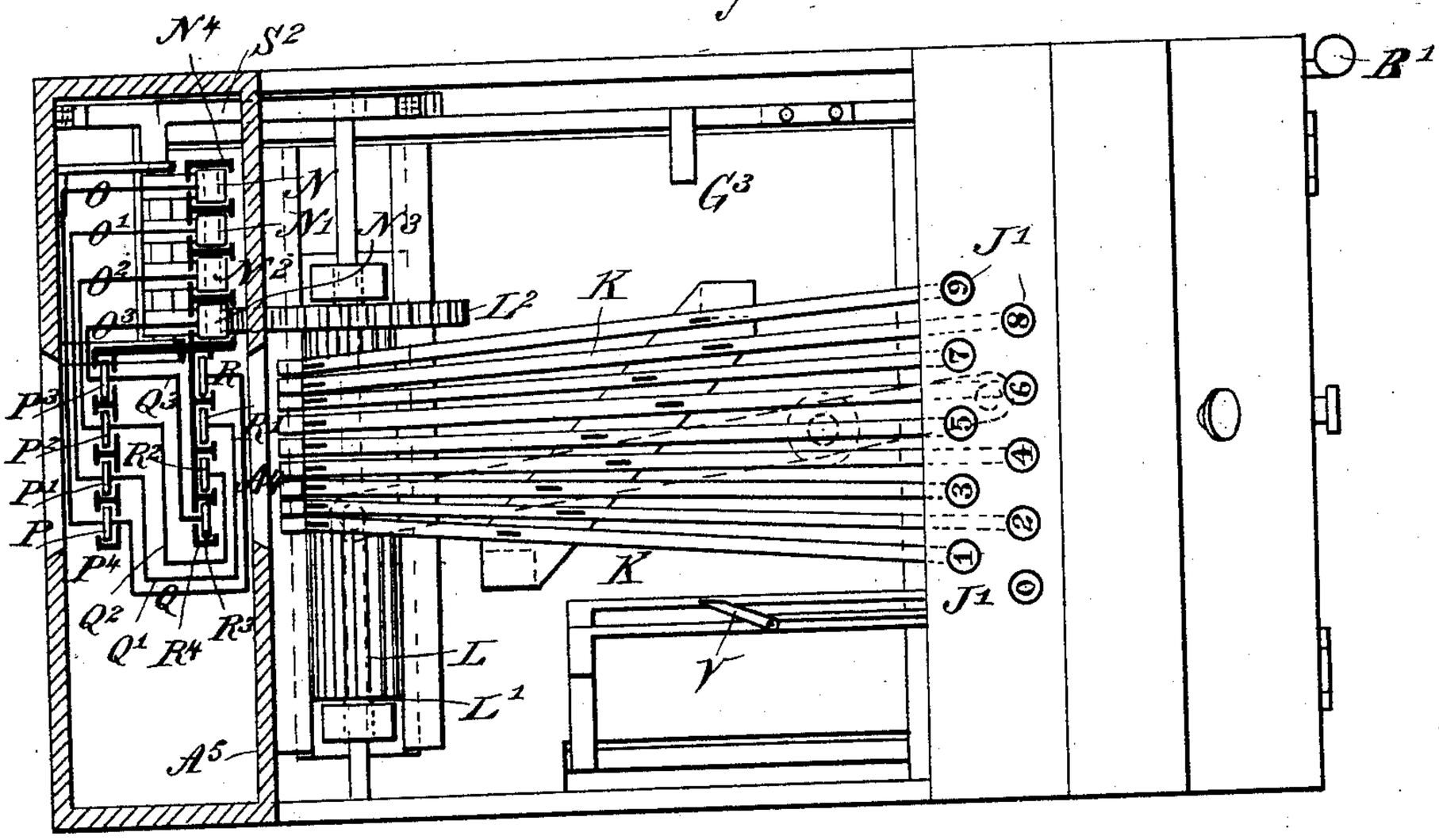
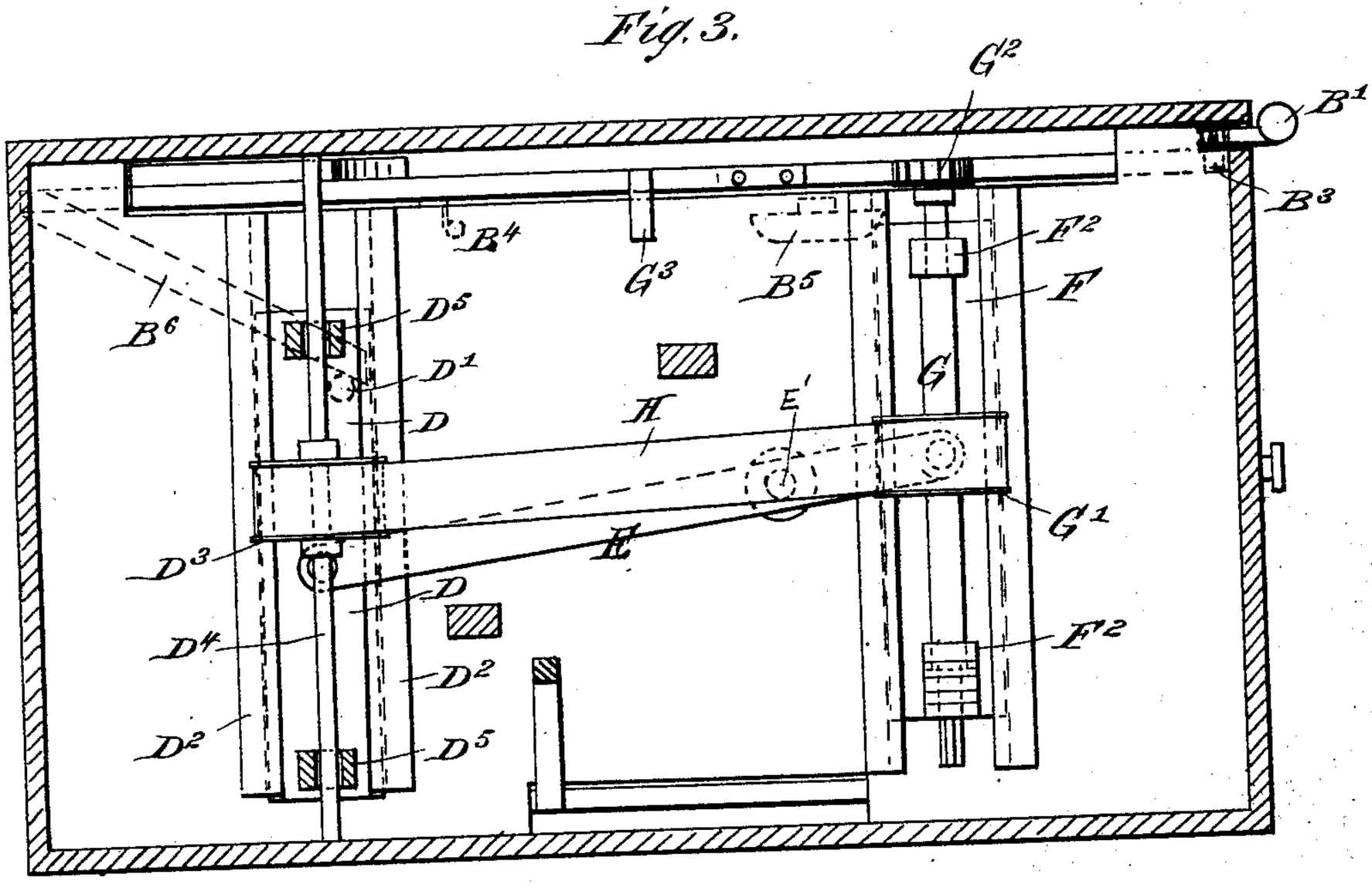


Fig. 3.



WITNESSES:

Louis Switchell

C. Sedgwick

INVENTOR:

L. M. Mills

BY Munn & Co

ATTORNEYS.

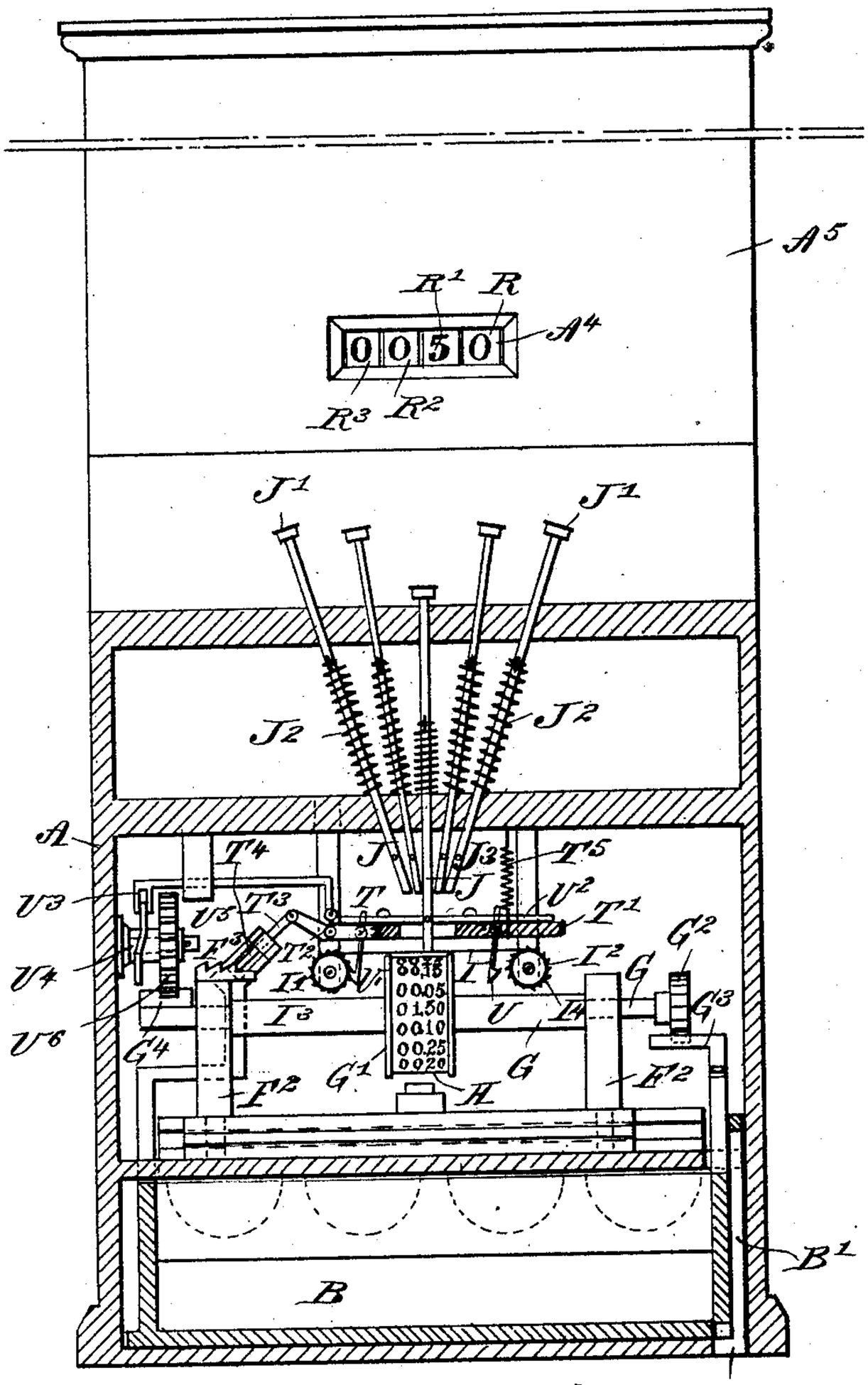
(No Model.) 4 Sheets—Sheet 3.

L. M. MILLS.

CASH INDICATOR AND RECORDER.

No. 434,799. Patented Aug. 19, 1890.

Fig. 4.



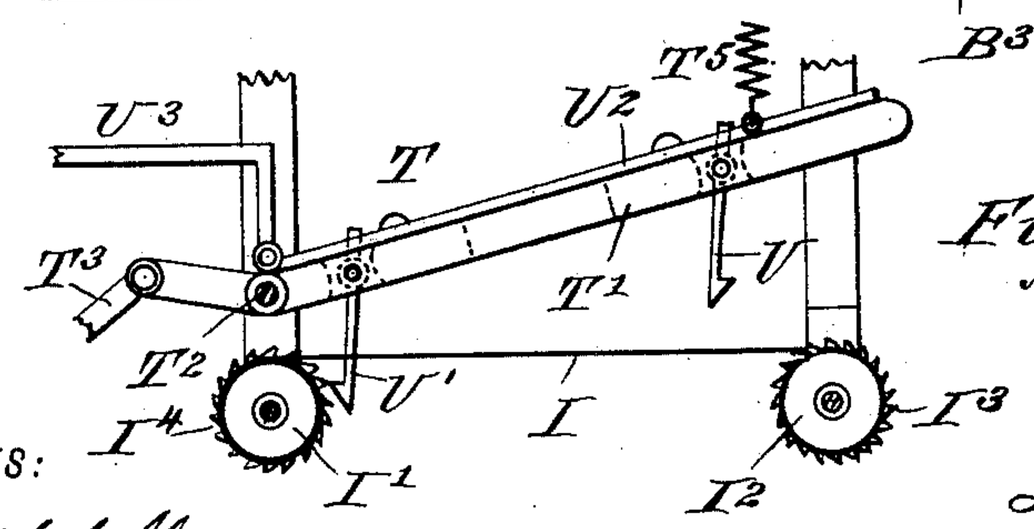


Fig. 5.

WITNESSES:

Donn Switchell

C. Sedgwick

INVENTOR:

L. M. Mills

BY

Munn & Co.

ATTORNEYS.

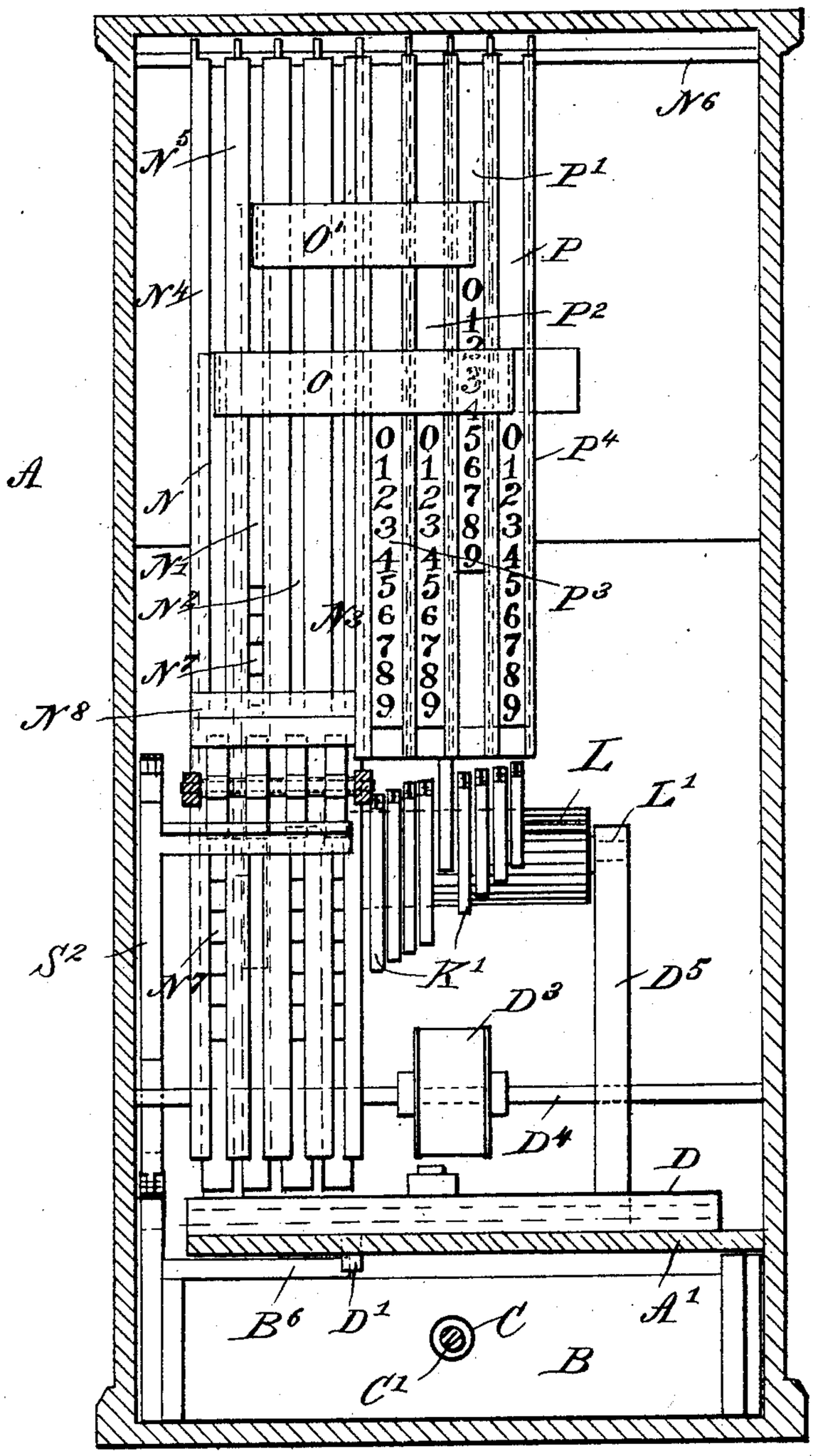
(No Model.) 4 Sheets—Sheet 4.

L. M. MILLS.

CASH INDICATOR AND RECORDER.

No. 434,799. Patented Aug. 19, 1890.

Fig. 7.



WITNESSES:

Thos. Fairchild

E. Sedgwick

INVENTOR:

L. M. Mills

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

LLOYD M. MILLS, OF GRAND RAPIDS, MICHIGAN.

CASH INDICATOR AND RECORDER.

SPECIFICATION forming part of Letters Patent No. 434,799, dated August 19, 1890.

Application filed July 17, 1889. Serial No. 317,813. (No model.)

To all whom it may concern:

Be it known that I, LLOYD M. MILLS, of Grand Rapids, in the county of Kent and State of Michigan, have invented a new and Improved Cash Recorder and Indicator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved cash recorder and indicator which automatically and accurately prints or stamps numerals corresponding to keys attached upon a tape in proper position directly over or below each other in due numerical order to form a column of figures the sum of which can be readily totalized.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional plan view of the same on the line *x x* of Fig. 1. Fig. 3 is a sectional plan view of the same on the line *y y* of Fig. 1. Fig. 4 is a sectional end elevation of the same on the line *z z* of Fig. 1. Fig. 5 is an enlarged end elevation of the printing mechanism. Fig. 6 is an enlarged sectional side elevation of the keys and their connections, and Fig. 7 is a sectional end view of the improvement on the line *u u* of Fig. 1.

The improved cash recorder and indicator is provided with a suitably-constructed casing A, in the bottom of which is mounted to slide a money-drawer B, adapted to be locked in a closed position by a locking-bolt B′, connected with a spring B^2 and provided with an arm B^3, engaging a corresponding notch in the bottom of the drawer B, so as to lock the latter in place until the bolt B′ is pressed downward against the tension of the spring B^2.

The drawer B is first opened when the bolt B′ is pressed by a spring C, coiled on a fixed rod C′, secured in the end of the casing A and passing through the end of the drawer B, as is plainly shown in Fig. 1. The spring C is coiled on the said rod C′ between the end of the casing A and the end of the drawer B, as shown in Fig. 1. A collar C^2 on the outer end of the rod C′ limits the outward movement of the drawer B.

In one side of the drawer B is secured a striker B^4, adapted to sound a bell B^5, held stationary in the casing A. On one side and on the end of the drawer is secured a horizontal bar B^6, placed in an inclined position, as is plainly shown in Fig. 3, and adapted to engage on the return movement of the drawer B a pin D′, projecting from the under side of a slide D, mounted to slide transversely in suitable guideways D^2, secured on the horizontal partition A′, held in the casing A directly above the drawer B. The slide D is pivotally connected with one end of a lever E, fulcrumed at E′ on the top of the partition A′, and pivotally connected at its other end with a second slide F, mounted to slide transversely in suitable guideways F′, secured to the partition A′ in the front of the casing A.

On the slide F are erected a number of standards F^2, in which is mounted to turn and to slide transversely a shaft G, carrying a pulley G′, over which passes a tape H of any desired material, and on which the numerals representing the amount of cash received are printed. The tape H also passes over a pulley D^3, secured on a shaft D^4, mounted loosely in suitable bearings formed in the standards D^5, secured on the slide D, previously mentioned. Over the tape H on the top of the pulley G′ is held an ink-ribbon I, extending transversely and wound on the rollers I′ and I^2, mounted to turn in suitable bearings held in the casing A.

On the top of the ink-ribbon I is adapted to press a series of type-bars J, preferably arranged in two rows and radially, so that when pressed their types press onto the same spot. The type-bars J extend through the top of the casing A, and each is provided with a finger-piece J′, marked with a numeral. A spring J^2 is coiled on each of the type-bars and serves to hold the same in an uppermost position—that is, with its type out of contact with the ink-ribbon I. Usually ten type-bars J are employed, the finger-pieces J′ being provided with the numerals from 0 to 9, as is plainly shown in Fig. 2.

Each of the type-bars, except the one having the numeral 0, is pivotally connected with

a lever K, extending longitudinally and fulcrumed on a suitable frame-work in the casing A. On the outer end of each lever is held a toothed pawl K′, all adapted to engage a ratchet-wheel L, secured on a shaft L′, mounted to turn in suitable bearings formed in the standards D^5, secured on the slide D. The throw of the several levers K and the number of teeth on their respective pawls K′ depends on the type-bar J, with which it is connected. For instance, the throw of the lever K, connected with the type-bar carrying the numeral 1, is very short, and the pawl K′ is provided with only one tooth, so that when the said type-bar carrying the numeral 1 is pressed the ratchet-wheel L and its shaft L′ are turned for a short distance. The type-bar J, carrying the numeral 9, when pressed gives a long throw to its lever K, and the respective pawl K′ on the said lever is provided with a number of teeth, so that the ratchet-wheel L and its shaft L′ are turned quite a distance.

On the shaft L′ is secured a gear-wheel L^2, adapted to engage the rack-bars N, N′, N^2, and N^3, mounted to slide in suitable guideways formed in a frame N^4, pivoted at N^6 in the top of the casing A. (See Figs. 1 and 7.) The gear-wheel L^2, secured on the shaft L′, moves with the latter when the slide D shifts, so that the gear-wheel L^2 can be brought in mesh with any one of the four rack-bars N, N′, N^2, and N^3. The latter are connected by bands O, O′, O^2, and O^3, respectively, with the numeral-slides P, P′, P^2, and P^3, mounted to slide vertically in suitable guideways P^4, formed in the frame N^5. Each of the numeral-slides P, P′, P^2, and P^3 is provided with the numerals 0 to 9, placed successively one above the other and adapted to appear one at a time on each slide in an aperture A^3, formed in the back A^2 of the casing A. When one of the rack-bars N, N′, N^2, or N^3 is moved up or down by the gear-wheel L^2, the position of the corresponding numeral-slide P, P′, P^2, or P^3 is changed and a different numeral appears in the opening A^3.

The numeral-slides P, P′, P^2, and P^3 are rigidly connected by bands Q, Q′, Q^2, and Q^3 with a second set of numeral-slides R, R′, R^2, and R^3, respectively, mounted to slide in suitable guideways R^4, formed in the frame N^5. The numeral-slides R R′ R^2 R^3 are provided with numerals similarly to the slides P, P′, P^2, and P^3, the numerals being arranged to appear one at a time on each slide in an opening A^4, formed in the vertical front A^5 of the casing A. The numerals on the two sets of slides P and R are so arranged that the same numeral appears in both openings A^4 and A^3, consequently indicating the same amount in both openings A^3 and A^4.

Each of the rack-bars N, N′, N^2, and N^3 is provided on its back with teeth N^7, adapted to be engaged by a pawl S, fulcrumed on a suitable bracket secured in the back A^2 of the casing A and provided with a downwardly-extending lug S′, adapted to be engaged by a lever S^2, fulcrumed at S^3 to the back A^2 of the casing A on one side thereof, as is plainly shown in Figs. 1 and 2. The lever S^2 extends downward and carries on its lower end a pawl S^4, mounted to swing in one direction only and adapted to travel on an incline S^5, formed on the top of one side of the drawer B. When the latter is pulled outward, the incline S^5 engages the pawl S^4, so that the latter swings the lever S^2 upward, whereby the lugs S′ of the several pawls S are engaged and cause said pawls S to disengage from the teeth N^7 of the several rack-bars N. The latter are then moved downward into their normal position, carrying the sets of numeral-slides P and R downward into the same position, so that the numerals 0 appear in the apertures A^3 and A^4.

As previously mentioned, the shaft G is mounted to turn and to slide, and is provided for this purpose with a gear-wheel G^2, adapted to be engaged by a tooth G^3, projecting from one side of the drawer B and moving with the latter, so that when the drawer is open the tooth engages the gear-wheel G^2 and turns the same a short distance. The mechanism T for changing the position of the shaft G transversely is actuated by the type-bars J, each of the latter being provided for this purpose with a pin J^3, adapted to press on a lever T′, fulcrumed at T^2 to a fixed standard in the casing A. One outer end of each lever T′ is pivotally connected with a pawl T^3, held to slide in a bearing T^4, secured on a bracket projecting from one side of the drawer B. The pawl T^3 is adapted to engage ratchet-teeth F^3, formed on one of the standards F^2, carrying the shaft G. The teeth F^3 are arranged transversely, and the action of the pawl causes the standard F^2 and the slide F, carrying both standards F^2, to move transversely in the guideways F′, so that the shaft G, with the pulley G′ and the tape H, is shifted, for the purpose hereinafter described.

A spring T^5 is connected by one end to the lever T′ and fastened by its other end to a fixed part of the casing A, as is plainly shown in Fig. 4. The spring T^5 serves to hold the lever T′ in a normal inclined position, as is shown in Fig. 5, when the respective type-bar J does not press the lever T′ downward by means of its pin J^3.

On top of the lever T′ is mounted to slide transversely the arm U^2, adapted to engage pawls U and U′, pivoted on the lever T′ and engaging ratchet-wheels I^3 and I^4, secured on the rollers I′ and I^2, carrying the ink-ribbon I. One of the pawls U or U′ is disengaged from its ratchet-wheel at a time, so that the ink-ribbon is moved in one direction until unwound from the respective roller I′ or I^2. The pawls U and U′ are then shifted, so that the other pawl engages its respective ratchet-wheel I^4 or I^3, whereby the ink-ribbon will be moved in the opposite direction and wound upon the roller from which it was previously unwound. The arm U^2 is provided on one

outer end with an arm U^3, engaged by a cam U^4, secured on the hub of a gear-wheel U^6, mounted to turn on a stud U^5, secured in one side of the casing A. The gear-wheel U^6 is engaged by a tooth G^4, held on the shaft G, so that the latter in making one revolution turns the gear-wheel U^6 the distance of one tooth, and by a certain number of revolutions of the said shaft G, the gear-wheel U^6 makes a complete revolution, and by its cam U^4 shifts the arm U^2, whereby the latter changes the position of the pawls U and U′, as above described.

A pawl V is held in an inclined position on suitable standards secured to one side of the drawer B, said pawl V being adapted to disengage the pawl T^3 from the teeth F^3 when the drawer is moved inward, so that the shaft G can return to its former position.

The operation is as follows: When the drawer B is closed, as shown in Fig. 1, the type-bars J are in their uppermost position, and the shaft G is in its extreme position to the right, so that if a type-bar J is pressed the type can strike near the left edge of the tape H on the pulley G′. When the operator now desires to deposit money in the drawer B, he presses on the locking-bolt B′, so that the lower end B^3 disengages the corresponding notch in the drawer B and the latter is forced open by the action of the spring C. The drawer B in moving outward sounds, by means of the striker B^4, the bell B^5. At the same time the tooth G^3 passes over the under sides of the teeth of the ratchet-wheel G^2 without turning the latter, and the pawl V passes the pawl T^3 without disturbing the same, said pawl T^3 then engaging the outermost left-hand tooth of the teeth F^3. The outward movement of the drawer B causes the incline S^5 to move the lever S^2, so that the several pawls S are disengaged from the teeth N^7 in the rack-bars N, N′, N^2, and N^3. At the same time the pawls S strike against an offset N^8 on the frame N^5, so that the latter swings outward toward the back A^2 of the casing A. This outward movement of the frame N^5 disengages the respective rack-bar N, N′, N^2, or N^3 from the gear-wheel L^2, so that the several rack-bars and sets of numeral-slides move downward into their normal position, displaying four 0's in each of the apertures A^3 and A^4. When a sale has been made and the operator receives, say, fifty cents, he deposits the money in the open drawer B and then first presses the bar J, marked with the numeral 0, so that the said bar moves downward and its type passes over the ink-ribbon I and prints the numeral 0 on the left edge of the tape H directly above the pulley G′. The downward movement of the type-bar J causes a downward swinging of the lever T′ by the pin J^3 of the said type-bar engaging the said lever T′. The moment the operator releases the pressure on the said type-bar bearing the numeral 0 the spring J^2 of the type-bar forces the latter into its uppermost position, and at the same time the spring T^5 moves the lever T′ into its upwardly-inclined position, (shown in Fig. 5,) whereby the pawl T^3 presses against the left one of the teeth F^3 on the standard F^2, so that the latter, with the slide F, the shaft G, and the pulley G′, is moved to the left. The movement of the slide F to the left causes a movement of the slide D to the right, on account of the lever E connecting the two slides with each other. The operator then again presses the same type-bar J, carrying the numeral 0, and the above-described operation is repeated—that is, a second 0 is printed alongside the first 0 on the tape H, and the latter, with its pulley G′, is again shifted to the left and a similar movement takes place with the slides D and F, so that the gear-wheel L^2, carried by the standards D^5 on the slide D, is moved to the rack-bar N′. The operator now presses the type-bar J, having the numeral 5, so that the number 5 is printed alongside the second numeral 0 on the tape H. The downward movement of the type-bar J, carrying the numeral 5, causes its lever K to swing upward at its outer end, so that the pawl K′ on the said lever K engages the ratchet-wheel L and turns the same, whereby the gear-wheel L^2, meshing into the rack-bar N′, moves the latter upward such a distance that the corresponding numeral-slides P′ and R′ display the numeral 5 in the apertures A^3 and A^4. It is understood that the other slides R^2 and R^3 and P^2 and P^3 still display the numerals 0 in the said apertures A^3 and A^4 as the rack-bars N^2 and N^3 were not disturbed by pressing the type-bar J, carrying the numeral 0. When the operator releases the type-bar J, carrying the numeral 0, the above-described operation in regard to the shifting of the shaft G, the pulley G′, the slides F and D, and the gear-wheel L^2 is repeated, so that the said gear-wheel L^2 moves in contact with the teeth of the rack-bar N. The operator now presses the type-bar J, carrying the numeral 0, so that another 0 is printed alongside the numeral 5 on the tape H in the manner previously described. When the operator releases the pressure on the said type-bar J, carrying the numeral 0, no movement of the ratchet L, the shaft L′, and the gear-wheel L^2 takes place, as the said type-bar J, carrying the numeral 0, is not connected with the same. It is understood that the pawls S hold the rack-bars N, N′, N^2, and N^3 in position if raised by the gear-wheel L^2, as previously described. The operator now closes the drawer B, and in the openings A^3 and A^4 is displayed the amount recorded—that is, fifty cents—as is plainly shown in Fig. 4. The inward movement of the drawer B causes the projection G^3 to turn the ratchet-wheel G^2 a short distance, so that the row of numerals printed, as above described, on the tape H moves from under the lower ends of the type-bars J, thus presenting a blank space on the tape H under the type-bars. The inward movement of

the drawer B also causes a return motion of the slide D to its normal position by means of the incline B^6, secured on the drawer B, moving against the pin D′, secured on the under side of the slide D, and shifted to the right during the operation previously described. The return movement of the slide D causes a return movement of the slide F, so that the pulley G′, carrying the tape H, is again in its normal position—that is, with its left edge directly under the type-bars—it being understood that a movement of the slide F is made as the pawl T^3 is disengaged from the tooth F^3 by the pawl V. When the drawer B moves inward, the spring C is again compressed, and the pawl S^4 on the lever S^2 moves back into a vertical position, sliding over the incline S^5, to assume the position shown in Fig. 1. The lever S^2 also moves again into contact with the lugs S′ of the pawls S, so as to be ready to move the pawls S out of contact with the several rack-bars N, N′, N^2, and N^3, as previously described. When the drawer B is moved to its innermost position, the bolt B′ engages, by means of its arm B^3, the notch in the bottom of the drawer, so as to lock the latter in place. When another sale has been made, the operator again opens the drawer B, as previously described, and the above-described operation is repeated.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a cash recorder and indicator, the combination, with a series of radially-arranged type-bars mounted to slide, of a tape adapted to be printed on by the said type-bars and an indicator actuated by the said type-bars so as to display the amount printed on the said tape, substantially as shown and described.

2. In a cash-recorder, the combination, with a casing and a drawer mounted to slide therein, of a series of radially-arranged type-bars mounted to slide in the said casing and a tape adapted to be printed on by the said type-bars and set in proper place to receive the printing by the movement of the said drawer, substantially as shown and described.

3. In a cash-recorder, the combination, with a casing and a drawer mounted to slide therein, of a series of radially-arranged type-bars mounted to slide in the said casing, a tape adapted to be printed on by the said type-bars and set in proper place to receive the printing by the movement of the said drawer, and an indicator actuated by the said type-bars and the said drawer, substantially as shown and described.

4. In a cash register and indicator, the combination, with type-bars and a tape adapted to be printed on by the said bars, of a series of racks, numeral-slides connected to the racks, a gear-wheel adapted to mesh with the racks, means for throwing the gear-wheel in and out of gear with the racks, and mechanism for operating the gear-wheel from the type-bars, substantially as described.

5. In a cash recorder and indicator, the combination, with indicator-slides and means for operating the said slides, of a drawer and mechanism between the drawer and slides to release the slides from their operating mechanism and allow them to return to their normal positions, substantially as described.

6. In a cash recorder and indicator, the combination, with a printing mechanism, numeral-slides, and means for operating the slides from the printing mechanism, of tape-carrying pulleys, a drawer, and mechanism for operating the pulleys from the drawer and for releasing the numeral-slides to allow them to return to their normal positions, substantially as herein shown and described.

7. In a cash recorder and indicator, the combination, with a series of numeral-slides, type-bars, and mechanism for operating the numeral-slides from the type-bars, of a shaft having a rotary and endwise movement, tape-carrying pulley mounted on the shaft, a drawer, and mechanism for rotating the shaft and moving it endwise from the drawer, substantially as herein shown and described.

8. In a cash recorder and indicator, the combination, with a series of numeral-slides, of two slides, a pivoted bar connecting the said slides, a gear-wheel carried by one of the slides for operating the numeral-slides, tape-pulleys, one mounted on each of the said slides, a drawer, and means for operating the said sildes from the drawer, substantially as herein shown and described.

9. In a cash-recorder, the combination, with a series of racks and numeral-slides connected to the racks, of a slide, standards secured to the slide, a gear-wheel mounted in the standards and adapted to mesh with the said racks, and a drawer adapted to engage the slide, substantially as herein shown and described.

10. In a cash recorder and indicator, the combination, with a series of rack-bars having teeth on their rear sides and numeral-slides connected to the racks, of a slide, standards secured to the slide, a gear-wheel mounted in the standards and adapted to engage the racks, a pawl for engaging the teeth on the rear of the racks, a pivoted bar adapted to engage the pawl, and a drawer with which the free end of the pivoted bar engages, substantially as described.

11. In a cash recorder and indicator, the combination, with a casing having an opening in its front and rear, of a series of racks, two sets of numeral-slides connected to the racks, a gear-wheel adapted to mesh with the racks, a printing mechanism, and mechanism for operating the gear-wheel from the printing mechanism, substantially as and for the purpose set forth.

12. In a cash recorder and indicator, the combination, with type-bars, of levers connected with the said type-bars, pawls held on the said levers, a ratchet-wheel adapted to be engaged by the said pawls, a gear-wheel turning with the said ratchet-wheel, and rack-bars

adapted to be engaged by the said gear-wheel, substantially as shown and described.

13. In a cash recorder and indicator, the combination, with type-bars, of levers connected with the said type-bars, pawls held on the said levers, a ratchet-wheel adapted to be engaged by the said pawls, a gear-wheel turning with the said ratchet-wheel, rack-bars adapted to be engaged by the said gear-wheel, and numeral-slides rigidly connected with the said rack-bars, substantially as shown and described.

14. In a cash recorder and indicator, the combination, with type-bars, of levers connected with the said type-bars, pawls held on the said levers, a ratchet-wheel adapted to be engaged by the said pawls, a gear-wheel turning with the said ratchet-wheel, rack-bars adapted to be engaged by the said gear-wheel, numeral-slides rigidly connected with the said rack-bars, and a frame provided with guideways for the said rack-bars and slides, substantially as shown and described.

15. In a cash recorder and indicator, the combination, with type-bars, of levers connected with the said type-bars, pawls held on the said levers, a ratchet-wheel adapted to be engaged by the said pawls, a gear-wheel turning with the said ratchet-wheel, rack-bars adapted to be engaged by the said gear-wheel, numeral-slides rigidly connected with the said rack-bars, a frame provided with guideways for the said rack-bars and slides, and pawls for locking the said rack-bars in place, and also adapted to move the said guide-frame, substantially as shown and described.

16. In a cash recorder and indicator, the combination, with type-bars, of levers connected with the said type-bars, pawls held on the said levers, a ratchet-wheel adapted to be engaged by the said pawls, a gear-wheel turning with the said ratchet-wheel, rack-bars adapted to be engaged by the said gear-wheel, numeral-slides rigidly connected with the said rack-bars, a frame provided with guideways for the said rack-bars and slides, pawls for locking the said rack-bars in place and also adapted to move the said guide-frame, and means, substantially as described, for operating the said pawls, as set forth.

LLOYD M. MILLS.

Witnesses:
A. T. B. PALMER,
C. H. ADAMS.