(No Model.) 4 Sheets—Sheet 1.

C. W. WEISS.

CHECK PRINTING AND ADDING MACHINE.

No. 458,203. Patented Aug. 25. 1891.

Fig. 2.

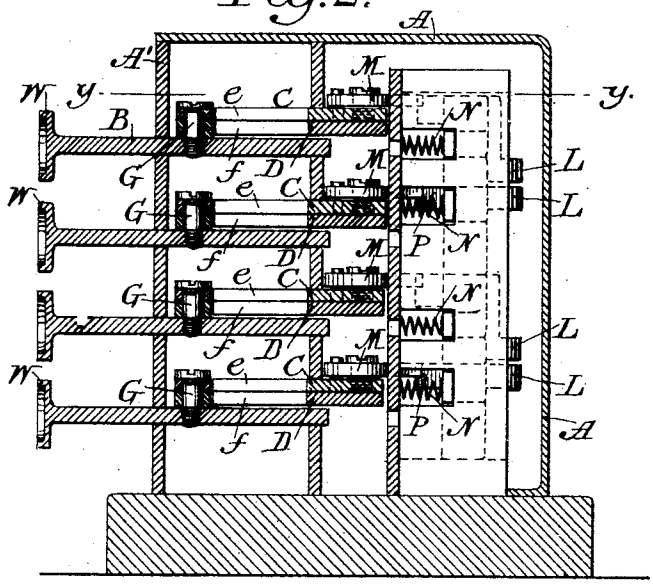
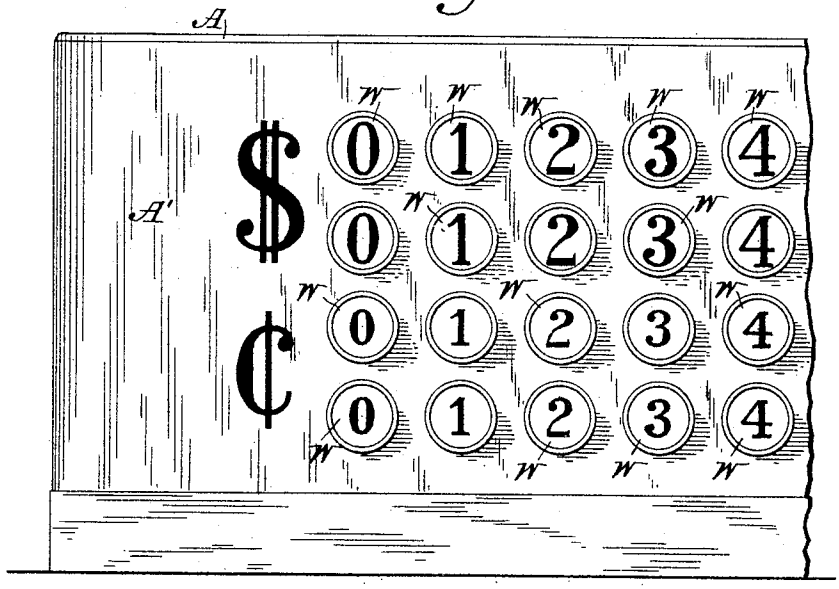


Fig. 1.



Attest:
A. N. Jesbera.
A. Widdes

Inventor:
Carl W. Weiss
By David A. Burr
Atty.

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

(No Model.) 4 Sheets—Sheet 2.

C. W. WEISS.

CHECK PRINTING AND ADDING MACHINE.

No. 458,203. Patented Aug. 25, 1891.

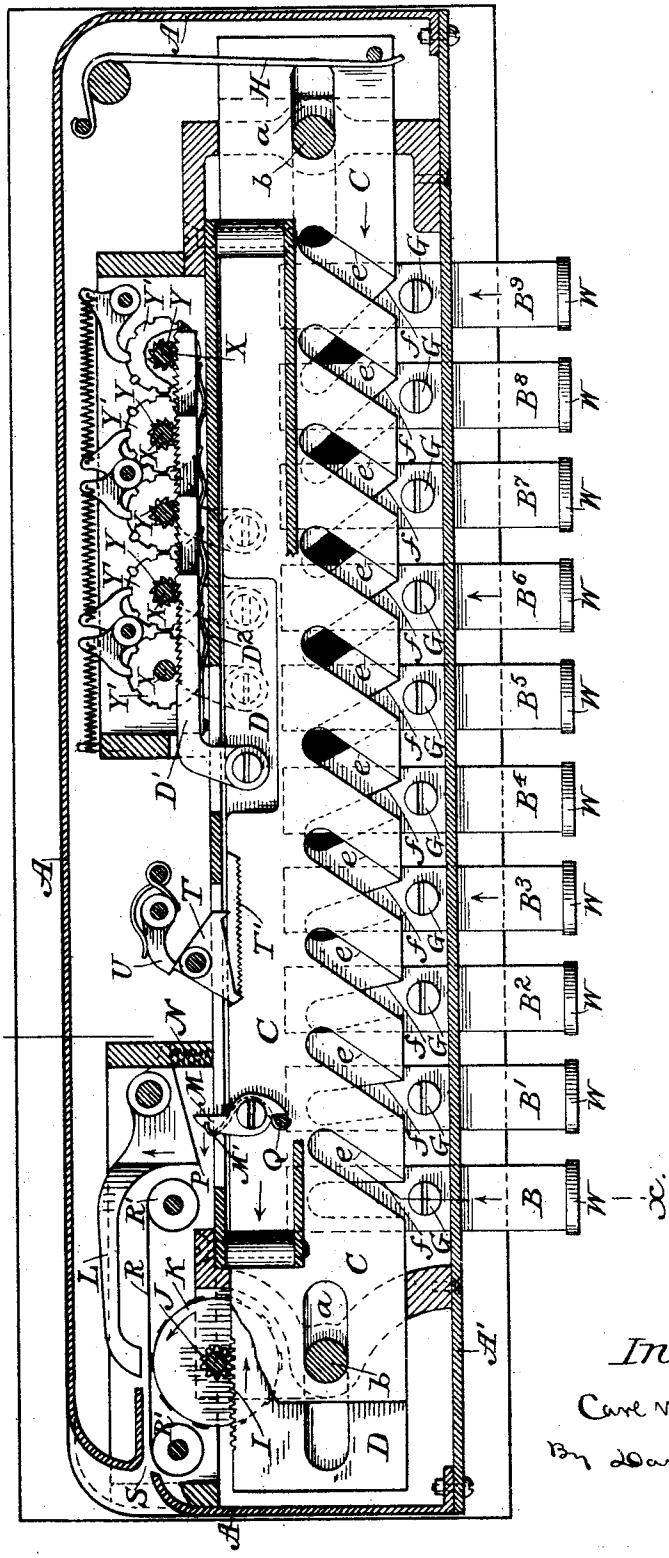


Fig. 3.

Attest:
A. N. Jeshera.
A. Chidder.

Inventor:
Carl W. Weiss
By David A. Burr
Atty.

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

(No Model.) 4 Sheets—Sheet 3.

C. W. WEISS.

CHECK PRINTING AND ADDING MACHINE.

No. 458,203. Patented Aug. 25, 1891.

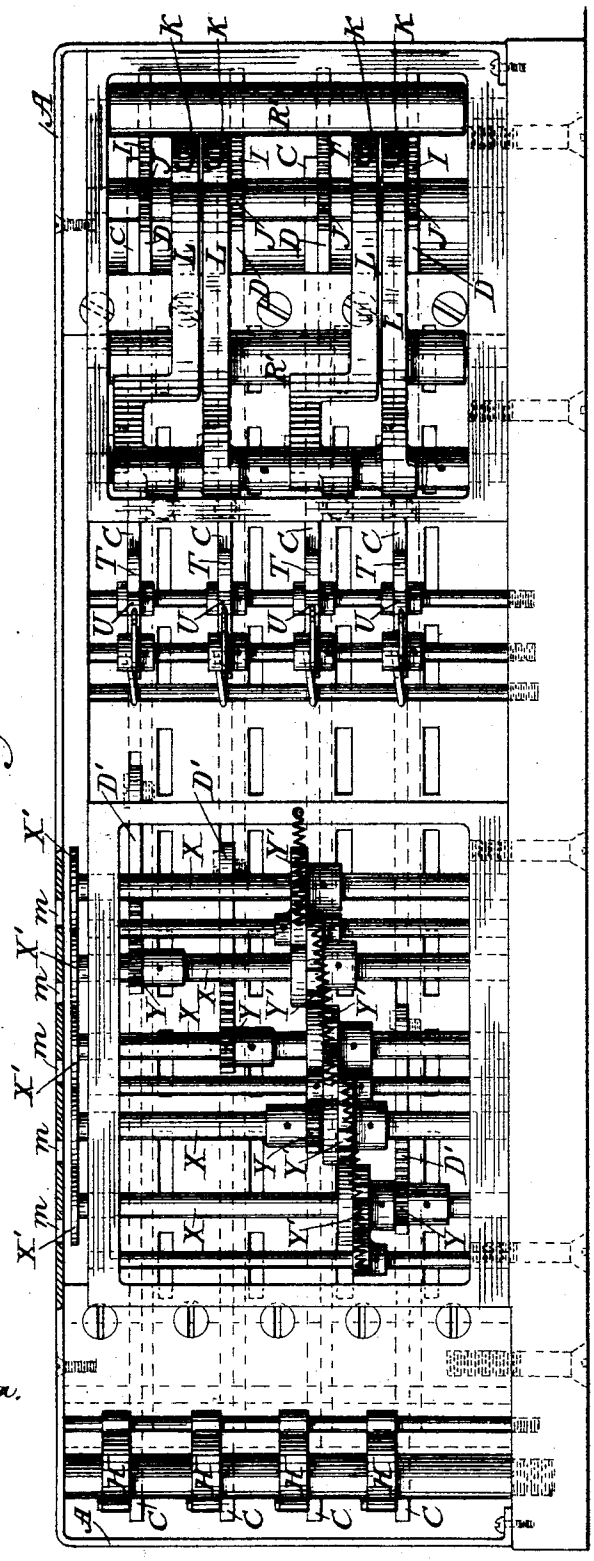


Fig. 4.

Attest:
A. A. Jesbra.
A. Hidder.

Inventor:
Carl W. Weiss
By David A. Burr
Atty.

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

(No Model.) 4 Sheets—Sheet 4.

C. W. WEISS.

CHECK PRINTING AND ADDING MACHINE.

No. 458,203. Patented Aug. 25, 1891.

Fig. 6.

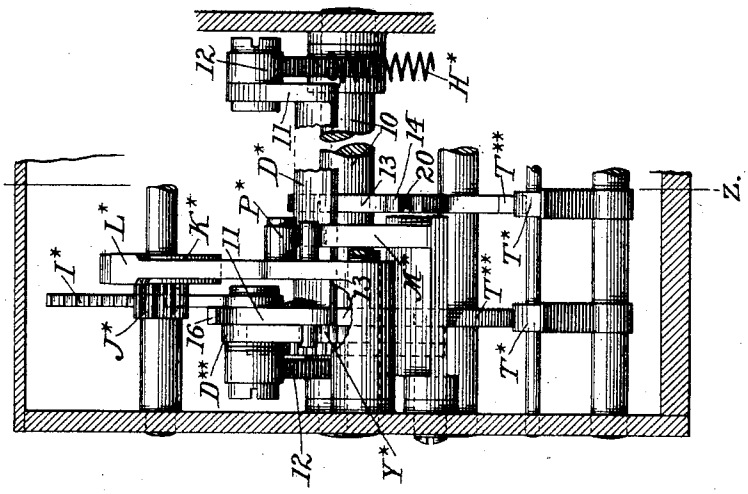
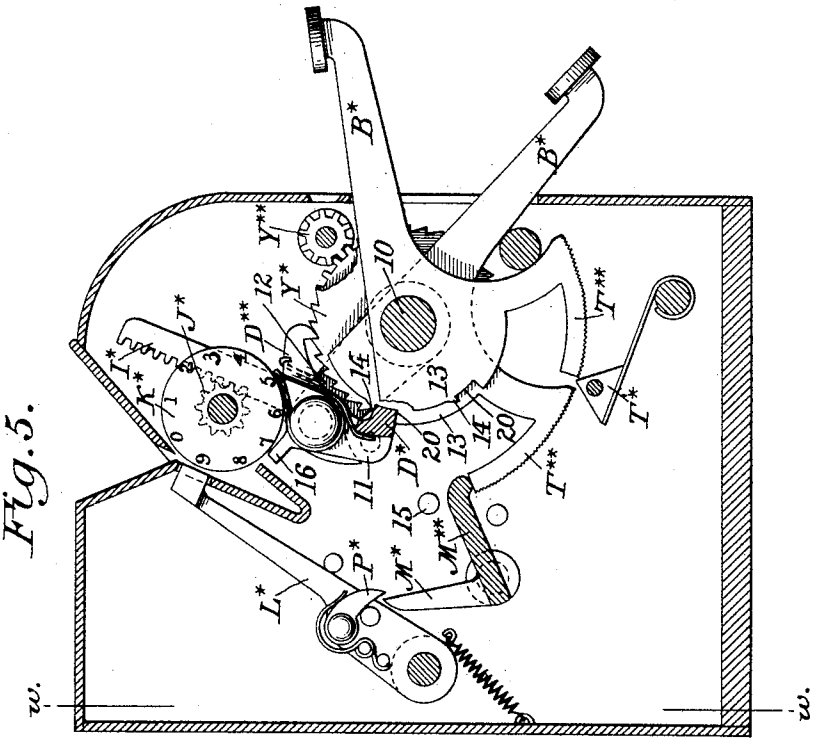


Fig. 5.



Attest:
A. St. Jeshora.
A. Fidder.

Inventor:
Carl W. Weiss
By David A. Burr
Atty.

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

UNITED STATES PATENT OFFICE.

CARL W. WEISS, OF BROOKLYN, ASSIGNOR TO THE KRUSE CASH REGISTER COMPANY, OF NEW YORK, N. Y.

CHECK-PRINTING AND ADDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,203, dated August 25, 1891.

Application filed April 30, 1891. Serial No. 391,076. (No model.)

To all whom it may concern:

Be it known that I, CARL W. WEISS, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Check-Printing and Adding Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, making a part of this specification.

My invention relates to key-operated machines for printing checks and adding and indicating the total sum of the checks issued.

It has for its object to produce a simple machine at low cost in which the type for printing shall be adjusted and the adding mechanism and printing mechanism operated by a single movement of any one of its keys; and it consists in the combination and arrangement of mechanism substantially as is hereinafter described and claimed, whereby the object is attained.

In the accompanying drawings, Figure 1 is a front elevation of a portion of my improved check-printing and adding machine; Fig. 2, an irregular vertical cross-section in line *x x* of Fig. 3; Fig. 3, a horizontal section in line *y y* of Fig. 2; Fig. 4, a rear elevation of the machine with the back plate of its casing removed and its upper plate cut partly in section; Fig. 5, a sectional view showing a modification of my invention, the section being in a vertical plane transversly to the length of the key-shaft in line *z z* of Fig. 6; and Fig. 6 a longitudinal section in line *w w* of Fig. 5.

Similar letters and numerals indicate like parts in all of the figures.

A represents the frame-work and case of the machine.

B B′ B^2 B^3, &c., Figs. 2 to 4, are flat bars or keys arranged to slide horizontally in parallel rows at the front of the machine, being made to extend outward at the front through its face-plate A′. Each horizontal row embraces ten keys, which are severally designated, the first by a cipher and the remainder by the digital numbers in consecutive order. The lower row is thus made to represent values by units of cents, the second in tens, the third units of dollars, and the fourth or upper row as tens of dollars. The inner ends of the keys in each row pass under two parallel bars C D, superimposed one above the other at a right angle with the keys, and which are mounted in suitable ways to slide longitudinally, each independently of the other. The two bars are of such length as to be intersected by all the keys in the row. A series of slots *e e*, corresponding in number with the keys, are cut in the uppermost slide-bar C for each row, to extend inwardly from its front edge, and these slots are all equally inclined in the one direction at an angle of thirty degrees, more or less. The underlying slide-bar D for each row is likewise formed with series of slots *f f*, corresponding in number with the keys, and which extend inwardly from its front edge; but these slots *f f* are, with the single exception of the slot for the cipher-key, which is not inclined but is cut at a right angle with the length of the slide-bar, severally inclined in an opposite direction from those *e e*, formed in the upper bar C, and are severally inclined at a different angle, the pitch being made to increase in regular progression from the slot next the cipher-key to that of highest denomination. Each key-bar is fitted with a pin G, adapted to project upward, so as to enter and slide within the corresponding slots in the two slide-bars overlying the key-bar, and as the key-bar is forced inward by pressure upon the head or button W at its outer end the pin, acting as a wedge against the inclined edges of the slots, will operate to move the slotted bars laterally lengthwise in opposite directions a distance proportionate to the degree of inclination of the respective slots, the return of the bars to their first or normal position when the pressure upon the keys ceases being effected automatically by means of suitable springs H H. (See Fig. 3.) Since the slots *e e* in the upper bar C are all inclined to the same degree and in the same direction it follows that the inward movement of each of the keys will move the bar in the one direction and to the same extent; but as the slots *f f* in the lower bar D differ in their inclination the extent of its movement under the action of a key will depend upon the pitch or degree of the inclination of the slot entered by the key. The distance to which the lower slide-bar D is moved by the key by reason of the inclina-

tion of the slot therein, which is opposite the unit-key B′ in each series, constitutes a unit by which the inclination of each of the remaining slots in the same bar is governed, so that the distance to which the bar will be moved by the second key shall be twice that of the unit-key and the distance to which it will be moved by the third key three times that of the unit-key, and so on. The lower bar D is geared by means of a rack I on its rear edge, at one end thereof, (see Fig. 3,) to a pinion J on the side of the type-wheel K, bearing type corresponding in character and numbers with the denominations of the one series of the keys actuating the bar, the adjustment of the gear being such as that the cipher on on the type-wheel shall be normally at line of print. The movement of the unit-key B′ will then operate to move the type-wheel K far enough to bring the type 1 to said line of print, and of the second key B^2 the type 2 to line of print, &c. A spring-actuated hammer L is pivoted in position to drop under the action of a spring connected therewith upon the type at line of print after being lifted away therefrom, and it is thus lifted at each movement of a key by means of the lifting-toe M, pivoted upon the upper slide-bar C, to project beyond its edge and engage an inclined edge on the arm of the hammer. As the bar moves forward the toe M will gradually retract the hammer from the periphery of the type-wheel against the stress of a spring N, which controls the hammer, until just as the bar is about to complete its stroke the toe reaches a point at which the edge of the hammer is cut away or the hammer bent to form a sharp re-entrant angle P, which will permit the hammer to drop inward, under the action of its spring N, against the type-wheel, the spring being so adjusted as to permit a slight recoil of the hammer and its disengagement from the face of the type when at rest. The pivoted lifting-toe M is prevented by means of a pin Q, engaging its heel, from yielding when carried into contact with the inclined edge of the hammer in making a forward movement, but is free to yield in the opposite direction upon the return movement of the slide-bar, its normal position being enforced by means of a spring M′. (See dotted lines, Fig. 3.) An inking-ribbon R is carried in the customary manner over the face of the type between two winding-spools R′ R′, and a suitable opening S is formed in the end of the casing of the instrument to permit of the insertion of a check for imprint upon the periphery of the type-wheel K. A reverse movement of the upper slide-bar C, after it has commenced its stroke in either direction, is prevented in the usual manner until the stroke is completed by means of a double-toothed dog T, pivoted to engage with one or the other of its teeth a rack T′ on the edge of the slide-bar, the dog being held in engagement with the teeth by means of a spring-actuated detent U, engaging an angle on the outer edge of the dog. When the bar is about to complete its stroke, the free tooth on the dog T will strike the end of the rack T′, and thereby trip the dog, so as to cause said free tooth to drop into engagement with the rack and liberate the opposite tooth therefrom. The spring actuating the detent U yields sufficiently to allow the angle on the outer edge of the dog to shift its position under the detent. The lower differential slide-bar D of each set of keys is not only geared to the printing-wheel K, but is also geared to a pinion Y, actuating an indicating and adding wheel Y′ by means of a pivoted rack-bar D′, which is held lightly in engagement with the pinion by a spring D^2. The teeth of the rack-bar D′ are so inclined that they will engage the pinion Y only as the slide-bar D moves forward under the operation of pressure upon a key, but will ride freely over the teeth of the pinion during the return of the bar to its first or normal position. Hence the unit-wheel of the adding-train will be moved by the movement of each key a distance proportionate to the length of movement of the slide-bar D, which in turn will be determined, in manner as described, by the denomination of the particular key pressed inward, the cipher-key producing no movement, the next key of lower denomination moving it the unit distance, that of the next key in order twice the unit distance, &c. The shaft X of each unit-wheel is extended to the top of the casing and fitted immediately under its covering-plate with a disk or dial X′, (see Fig. 4,) bearing numerals corresponding with the digits on the keys of the series with which it is connected, and the covering-plate is provided with sight-apertures *m m*, through which the numerals corresponding with the keys last played are brought singly into view. The unit-wheels are geared together in the customary manner known to the art to constitute an adding-train, a complete revolution of the unit-wheel for the first series of keys and their slide-bars operating to move the unit-wheel connected with the second series of keys, and so on. The movement of the slide-bars may be steadied by means of longitudinal slots *a* in their ends and fixed guide-pins *b* entering said slots.

In the operation of the machine constructed, as described, with sliding key-operated bars, when it is desired to obtain a check for one cent a blank check-strip is inserted through the opening S in the end of the casing and the key B′ in the lower or unit row representing cents is pushed inward. This movement will cause the lower slide-bar D to slide longitudinally in its bearings toward the right, and thereby operate to turn by the gearing of its rack I with the pinion J the type-wheel K one step, so as to bring the figure 1 to line of print, and by means of the gearing of its pivoted rack-bar D′ with the pinion of the adding-wheel cause said wheel to move one step. The movement of the key will also cause simultaneously with its movement of

the lower slide-bar D a movement of the upper slide-bar C in the opposite direction far enough to carry the toe M on the edge thereof into engagement with the hammer L to lift and release it, so that it shall produce in connection with the inking-ribbon an impression from the type on the type-wheel at line of print upon the interposed check. So soon as the pressure upon the key is released the action of the spring will automatically return the several moving parts to their first or normal position in readiness for the operation of another key. After the movement of a key has begun the action of the dog T and its detent U upon the rack T′ on the slide-bar C will prevent a reverse movement of the key until its full stroke is completed, the printing of the check effected, the value of the printed check added upon the adding-train to that of the checks previously issued, and the sum total indicated.

As a modification of my invention I contemplate the use of pivoted oscillating bars and segments as substitutes for sliding bars to actuate the adding, registering, and printing mechanism by the single movement of any one of the keys, and Figs. 5 and 6 illustrate my invention in this form. In these figures I have shown only a portion of a complete machine, though sufficient to illustrate my invention fully. It will be understood that there are as many series of keys as there are denominations to be registered—as for cents up to ten, dimes up to one dollar, and dollars from one to ten—and that the several keys of each series represent the several digital values of the respective denomination. In said figures, 10 represents a fixed shaft serving as a pivotal axis for a series of keys B*, and D* represents a bar carried parallel with the shaft upon arms 11 11, pivoted between the ends of radial arms 12 12, which are themselves pivoted loosely upon the shaft 10 at each end thereof, the arms 11 11 being thus left free to swing at a right angle with the radial arms. 13 13 are segmental disks formed integral with each key B* to project from the shaft on the side thereof opposite the outer arm of the key, the periphery of each segment being concentric with the axis of the shaft. The bar D* rests upon the peripheries of the segments, each of which is provided with a single peripheral notch 20, cut deep enough to engage and hold the bar, the portion of the segment in front of the notch being, however, cut away to the depth of the notch upon an arc concentric with the axis of the shaft, leaving but a slight offset 14 at the front of the notch, sufficient to hold the bar when the segment is moving backward and yet allow it to be readily disengaged at the proper moment when moving in said direction. The bar is disengaged from the notch in each segment so as to allow the segment to continue its backward movement independently thereof by means of a fixed pin 15, projecting from the casing in position to engage an offset 16, extending radially from one of the swinging arms 11 over its pivotal connection. The notches in the several key-segments are disposed differentially relatively to each other and to the fixed pin 15, each at a distance from the pin which, when the several keys are at rest in their first or normal position, is proportional to the relative denomination or value of the key with respect to the remaining keys. Thus the distance of the notch on the segment for the one-cent or unit key is so located as that it will be the farthest removed from the fixed pin 15 when the key is at rest, and hence will not engage the bar D* until the first or downward stroke of the key is nearly completed, and will consequently produce but a comparatively short movement of the bar D*. This movement of the bar, produced by the unit-key, serves as the unit of distance by which to determine the movements of the bar when actuated by each of the remaining keys, the notch on the segment of the five-cent key being brought into engagement with the bar at a point which will cause it to carry the bar five times as far as will the unit-key, and so on, the nine-cent key being made to engage the bar at the beginning of its stroke, so as to carry the bar with it the full distance or nine times as far as the unit-key. After the bar has been moved forward the full distance allowed by the first or downward stroke of either key it is retracted and brought back automatically to its first position by means of a suitable spring H*, and in its return movement is disengaged from each segment to allow the latter to complete its full return movement by being tripped through contact with the stop-pin 15 in manner as described. A reverse movement of either key and of the bar D* in either direction until its full stroke in that direction is completed is prevented by a spring-detent T*, engaging a serrated segment T**, carried by each key, as shown in Fig. 5. The differential movements of the bar D* are made to actuate the type-wheel K* of the printing mechanism by means of a rack-bar I*, which engages a pinion J* upon the axis of the type-wheel, whereby the movement of the bar D* under the action of the unit-key will move the wheel one step and bring the unit-type 1 thereon to line of print. The movement of the two-cent key will carry the type 2 to line of print, &c. During the forward movement of the bar D* a pawl D**, pivoted upon the same axis as said bar and at one end thereof, is carried forward freely over a toothed wheel Y*; but upon the return movement of the bar the pawl engaging the teeth of the wheel will cause it to move a distance corresponding with that over which the bar travels. This toothed wheel Y* is geared to an adding-train, so that the value or denomination of each key played is registered and added upon the return stroke of the key. In the movement of each key the curved segmental finger T**, made to project from the key-seg-

ment in an arc concentric therewith, as shown in Fig. 5, is brought to bear against a rocking plate M**, from whose axis extends a toe M*, so that said toe shall be swung thereby into contact with the projecting end of a latch P*, pivoted to the arm of a spring-actuated hammer L*, which is made to drop, when free, against the type on the type-wheel K* at line of print. As the toe M* bears against the latch during the movement of the key, it will retract the hammer from the type until, as the movement is nearly completed, the toe passes beyond the end of the latch and allows the hammer to drop and produce an imprint from the type. The free return of the toe to its first position without moving the hammer is permitted by the tripping of the latch P*. Thus by the downward movement of any one of the keys the type-wheel is turned to carry to line of print the type appropriate to the key, and an imprint therefrom upon a check inserted over the type is produced by the action of the hammer at the close of the movement, while during the return of the key to its original or first position after its release the adding mechanism is actuated by the pawl D** to register the value of the key.

I claim as my invention—

1. The combination, in a check-printing and registering machine, of a type-wheel, an adding mechanism, an actuating device operating simultaneously both the type-wheel and adding mechanism, a printing mechanism, a separate actuating device operating the same, and a series of independent keys severally operating at each complete movement thereof both of said actuating devices, whereby the type-wheel and adding mechanism are severally adjusted and the printing mechanism operated all at a single stroke of any one of the keys, substantially in the manner and for the purpose herein set forth.

2. The combination, in a check-printing and registering machine, of a type-wheel, an adding mechanism, a series of independent keys having the same uniform movement, a device operated by said keys to adjust simultaneously both the type-wheel and adding mechanism and the extent of whose movement under the action of each key is determined by the relative position of said key, and a printing mechanism operated by the movement of the key which adjusts the type-wheel, substantially in the manner and for the purpose herein set forth.

3. The combination, in a check-machine, of a longitudinally-moving slide-bar having slots differentially inclined in the same direction, a series of separate keys moving transversely to the length of the bar and severally engaging the differential slots, and a type-wheel geared to the sliding bar and bearing characters corresponding with those designating the several keys, a hammer to co-operate with said type-wheel, and means to actuate said hammer, substantially in the manner and for the purpose herein set forth.

4. The combination, in a check-machine, of a slide-bar having slots differentially inclined in the same direction, a series of separate keys moving transversely to the length of the slide-bar and severally engaging the differential slots, a type-wheel geared to the sliding bar and bearing characters corresponding with those designating the several keys, an adding mechanism, and a device gearing the adding mechanism to the slide-bar while it makes its forward movement but freed therefrom upon its return movement, substantially in the manner and for the purpose herein set forth.

5. The combination, in a check-machine, of a slide-bar having slots differentially inclined in the same direction, a superimposed slide-bar having slots inclined all at the same angle in a direction opposed to the inclination of the slots in the underlying slide-bar, the slots in the two bars being brought normally in register at their outer ends, a series of separate keys corresponding in number with the slots in either bar moving transversely to the length of the bars and severally engaging each its corresponding slot in each of the two bars, a type-wheel geared to the differentially-slotted bar, a hammer swinging to and from the type-wheel and having an inclined edge, a spring carrying said hammer toward the type-wheel, and a toe upon the upper slide-bar made to engage the inclined edge of the hammer to lift it until the stroke of the bar is nearly completed, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL W. WEISS.

Witnesses:
A. N. JESBERA,
A. WIDDER.