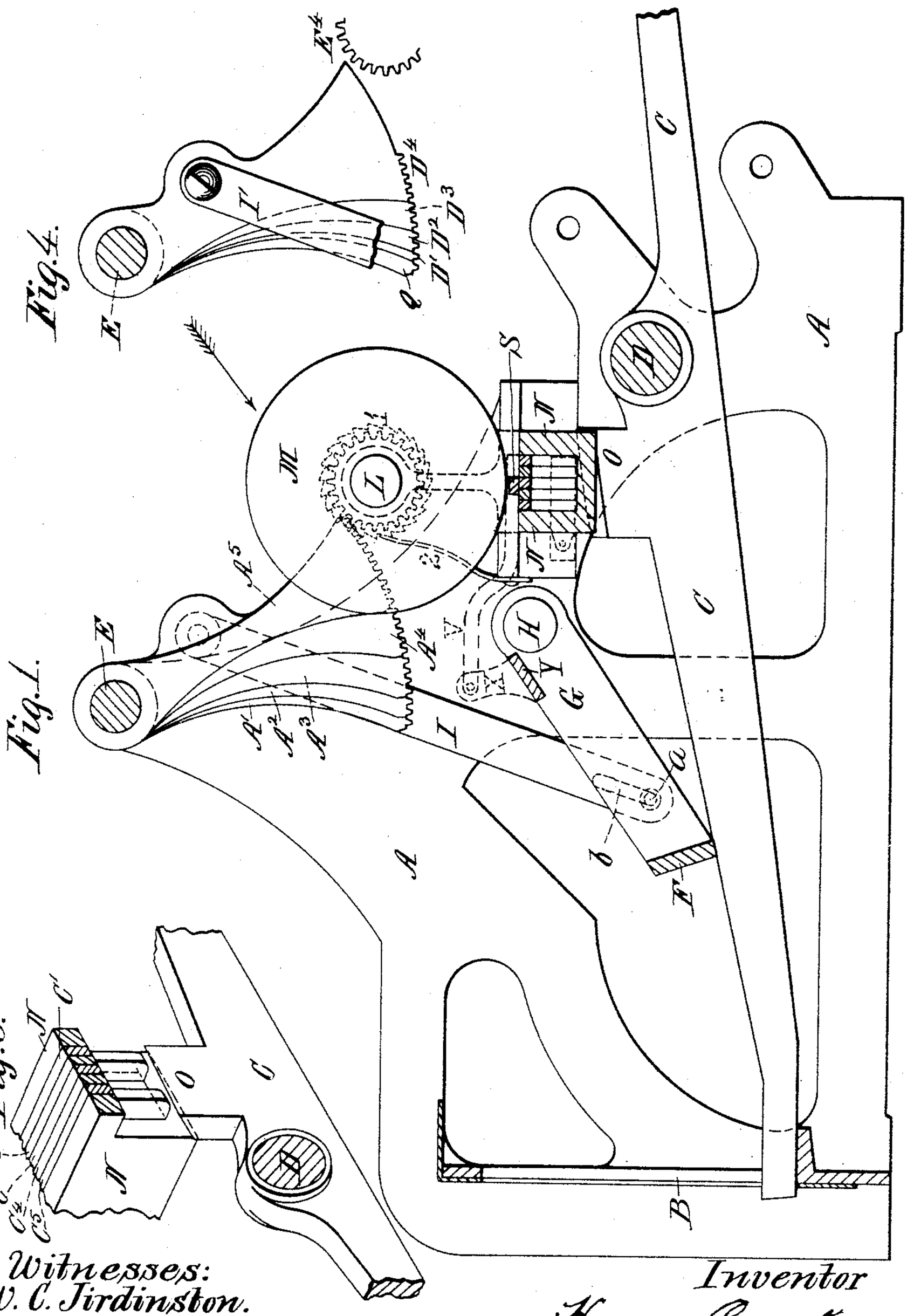
(No Model.) 2 Sheets—Sheet 1.

H. COOK.

CASH REGISTER.

No. 444,334. Patented Jan. 6, 1891.



Witnesses:
W. C. Jirdinston.
Charles Billon

Inventor
Hugo Cook
by Peck & Seton
his Attorneys.

(No Model.) 2 Sheets—Sheet 2.

H. COOK.

CASH REGISTER.

No. 444,334. Patented Jan. 6, 1891.

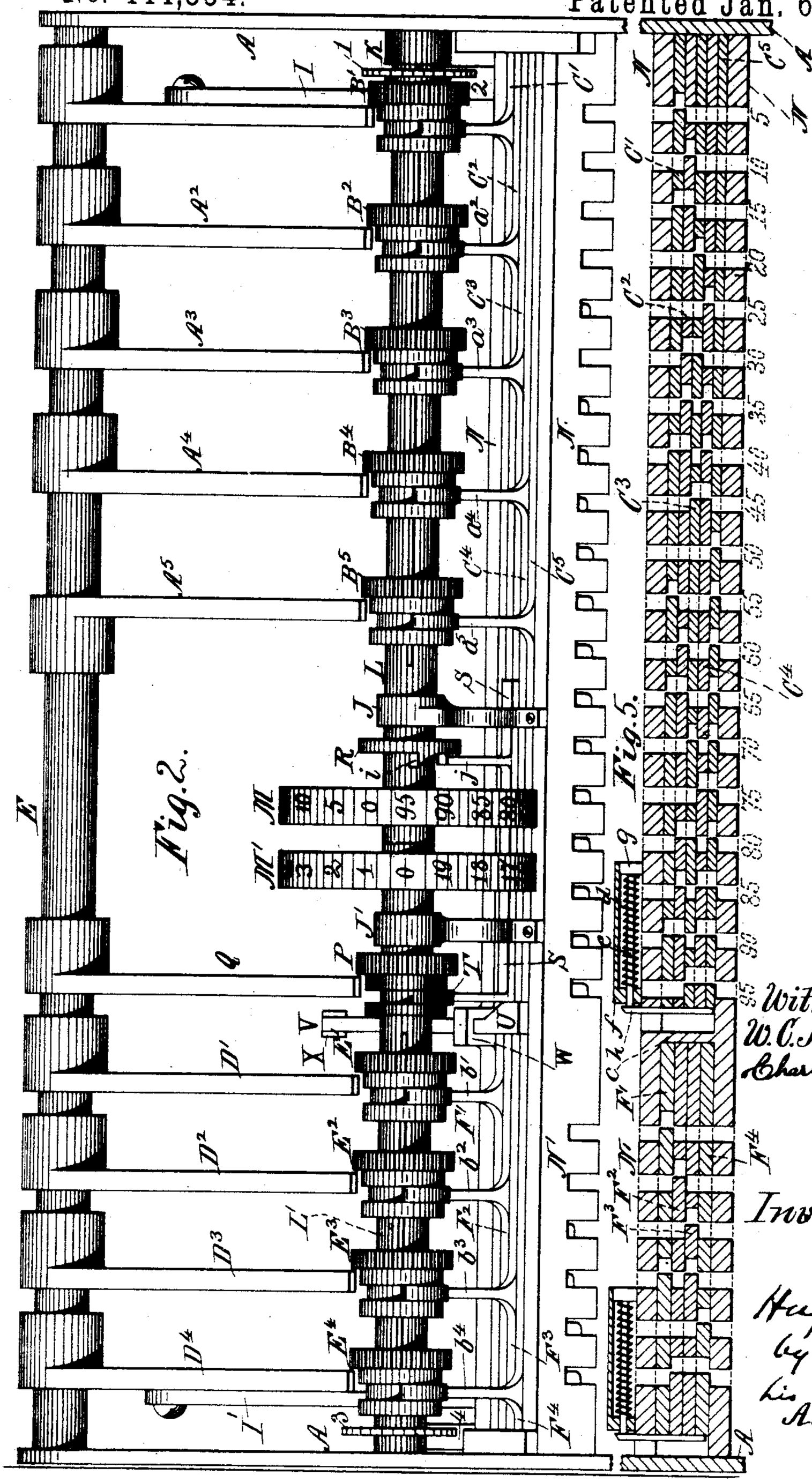


Fig. 2.

Fig. 5.

Witnesses:
W. C. Tirdinston
Charles Billon

Inventor

Hugo Cook
by Peck & Peck
his Attorneys

UNITED STATES PATENT OFFICE.

HUGO COOK, OF DAYTON, OHIO.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 444,334, dated January 6, 1891.

Application filed December 13, 1889. Serial No. 333,573. (No model.)

To all whom it may concern:

Be it known that I, HUGO COOK, 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 full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a sectional side elevation of so much of a cash-register as is necessary to illustrate my invention. Fig. 2 is a perspective front view of the same, looking in the direction of the arrow in Fig. 1. Fig. 3 is a detail of a portion of a key and the shifters upon which it acts. Fig. 4 is a detail side elevation of the segment-racks on the dollar side of the machine. Fig. 5 is a sectional plan view of the shifter-casing and its contained shifter-slides.

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

The operating parts of the machine are supported in a frame-work, which consists, chiefly, of two side frames A, which are connected and braced by suitable cross-rods and by a slotted guide-plate B, in which the rear ends of the keys play up and down.

The operating-keys C are pivoted on a shaft D, extending across the front of the machine and carried by the side frames A. The front ends of these keys project through the front of a case, (not shown,) in which the working parts of the machine are inclosed, and their outer ends are provided with finger-buttons (not shown) bearing numbers corresponding to the values to be registered, all of which is common in this class of machines and will be readily understood.

The machine illustrated in the drawings is provided with two distinct series of keys—one for cents and one for dollars—and for the sake of clearness I will first describe the mechanism which is actuated directly by the cent series of keys, and afterward that operated by the dollar series.

Extending across the top of the machine and journaled at its ends in the side frames A is a rock-shaft E. Tightly secured upon this rock-shaft are five pendent segment-racks A', A^2, A^3, A^4, and A^5. The first of these racks has only one tooth, the second two, the third four, the fourth five, and the fifth ten. These racks are so arranged upon the shaft E that none of their teeth are in transverse alignment with each other, but in side elevation form one continuous series of twenty-two equidistant teeth, as shown in Fig. 1, and in this series, counting from front to rear, the teeth of the rack A^5 constitute the first ten teeth, those of the rack A^4 the next five, those of the rack A^3 the next four, those of the rack A^2 the next two, and that of the rack A' the last or twenty-second tooth, all for a purpose to be hereinafter explained.

Extending across the entire series of keys is a bar F, which is hung by side arms G upon pivotal supports H on the side frames A, one at each side of the machine. This bar F rests on the tops of the keys, and with its side arms G is lifted by the operation of any key.

Projecting from the side of the arm G on the right-hand side of the machine is a pin *a*, which enters a slot *b* in the lower end of a link I, whose upper end is pivoted to a projection from the rock-shaft E, in this instance to the side of the segment-rack A', which is suitably shaped for the purpose. It results from this construction that when any key C is operated by depressing its front end and the bar F is thereby lifted the entire series of racks A', A^2, A^3, A^4, and A^5 will be vibrated upward and forward, and the adjustment of the parts is such that the full operation of the key will move them in such direction until the last tooth in the series (the one on the segment A') has passed beyond the transverse line of the position normally occupied by the first tooth of the rack A^5.

Journaled at one end in a supporting-standard J and at the other in ring K, projecting from the inner side of the right-hand side frame A, Fig. 2, is a shaft L, which extends across the front of the series of segment-racks A', A^2, A^3, A^4, and A^5. Feathered upon this shaft so as to slide freely thereon, but to turn with and be turned by the shaft, are a series of pinions B', B^2, B^3, B^4, and B^5, one for each of the segment-racks, and each provided with twenty teeth of a size and shape suitable to gear with the teeth of said racks.

Each of these pinions has secured to or made integral with it a hub b', b^2, b^3, b^4, and b^5, provided with a central groove, for a purpose to hereinafter explained. These pinions are normally held out of the path of the upward and forward travel of their respective racks; but when they are slid to the left on the shaft L they come into the path of travel of the racks and are engaged and turned by the latter, and thereby turn the shaft L.

It will be seen from the above construction and arrangement of the parts that if any one of the pinions B′, B², B³, B⁴, and B⁵ be slid on the shaft L into the path of travel of its corresponding rack A′, A², A³, A⁴, and A⁵ as the latter are being thrown upward and forward by the operation of a key C it will be turned as many teeth as there are teeth in its corresponding rack. Thus if the pinion B′ be slid to the left into the path of travel of the rack A′ as the latter is advancing it will be turned one tooth by the full forward movement of the rack. In the same manner the pinion B² will be turned two teeth by the rack A², the pinion B³ four teeth by its rack A³, and the pinions B⁴ and B⁵ five and ten teeth, respectively, by their racks A⁴ and A⁵, the shaft L in each instance being turned the same distance the pinion is. It will also be seen that from the arrangement of the racks in the order shown in Fig. 1 and with their teeth forming one continuous series if any two or more of the pinions B′, B², B³, B⁴, and B⁵ are simultaneously shifted into the path of travel of their respective racks the rack having the largest number of teeth will first engage and turn its shifted pinion and the shaft L a distance corresponding to the number of teeth in the rack, whereupon the rack having the next highest number of teeth will come into engagement with its shifted pinion and turn the latter and the shaft L a farther distance corresponding to the number of teeth in the rack, and so on, the shaft L being turned altogether a distance corresponding to the aggregate number of teeth in the racks which engage the shifted pinions. Thus if the pinions B′ and B² be shifted the shaft L will be turned a distance corresponding to three teeth of the pinions or three-twentieths of a revolution. If the pinions B′ and B⁵ be shifted, the shaft L will be turned eleven-twentieths of a revolution; or, if the pinions B³, B⁴, and B⁵ be the shifted ones the shaft L will be turned nineteen-twentieths of a revolution, so that by shifting the proper pinions into the path of travel of their racks the shaft L may be turned any degree from one-twentieth of a revolution by the rack and pinion A′ B′ to nineteen-twentieths of a revolution by the racks and pinions A³ A⁴ A⁵ and B³, B⁴, and B⁵, or even to greater distance by a shifting of all the pinions into line with their respective racks. A ratchet 1 and pawl 2 near the outer end of the shaft L prevent the latter turning in the reverse direction. Secured upon the shaft L, in this instance near its left-hand end, is a registering-wheel M, whose periphery is divided into twenty equidistant spaces bearing numbers from 0 to 95, inclusive. This wheel is turned one number by each twentieth of a revolution given the shaft L by the pinions B′, B², B³, B⁴, and B⁵ and racks A′, A², A³, A⁴, and A⁵.

There are nineteen keys C in the cent series on the left side of the machine representing multiples of five from five to ninety-five, inclusive, the five-cent key being on the extreme right, and the keys increasing in value by five in regular order from right to left, the last key on the left of the series being the ninety-five-cent key.

Inasmuch as the operation of any key throws all of the racks A′, A², A³, A⁴, and A⁵ forward and upward through the medium of the vibrating frame F G and link I, it will be understood that if the proper pinions be moved in line with their respective racks at the beginning of the operation of a key the shaft L will be turned thereby a distance sufficient to register the exact value of the key. Thus if the pinion B′ be shifted in line with the rack A′ at the beginning of the operation of the five-cent key the full operation of the key will cause the rack to turn the pinion one tooth, and thereby turn the shaft L one-twentieth of a revolution and the registering-wheel M one number to register five cents. In the same manner the shifting of each of the pinions B², B³, B⁴, and B⁵ at the beginning of the operation the ten, twenty, twenty-five, and fifty cent keys, respectively, will cause the values of those keys to be registered on the wheel M. The keys just mentioned are the only ones whose values, under the construction and arrangement illustrated in the drawings, can be registered by shifting a single pinion; but the value of each of the others may be registered by simultaneously shifting two or more pinions at the beginning of the operation of the key, as will be hereinafter more fully explained. It is therefore necessary that means be provided for shifting the proper pinions into line with their respective racks at the beginning of the operation of each of the several keys. This shifting of the pinions may be accomplished in various ways, and my invention is not limited to any particular means for doing it.

In the accompanying drawings I have illustrated one form of mechanism or devices for the purpose, which may be thus described.

Extending across the machine above the keys in rear of their pivotal shaft D and immediately below the shaft L and pinions B′, B², B³, B⁴, and B⁵, and supported at each end by the side frames A, is a box or casing. This box is divided into two compartments N N′ by a partition at *c*, or there may be two separate boxes N N′; but as only the right-hand compartment or box N has to do with the cent series of keys and the mechanism thus far described the left-hand compartment or box N′ will not be considered in the descrip-

tion which immediately follows. The box N is open at its top, and there are a series of equidistant vertical slots cut through its bottom and extending upward half-way or more through the body of the box. There is one of these slots for and in line with each of the keys C of the cent series.

Extending lengthwise of and snugly fitting within the box N are five shifter-slides C′, C², C³, C⁴, and C⁵. These slides are of somewhat less length than the interior of the box N and are normally held pressed toward the right by the force of a spiral spring *d*, which is coiled around a rod *e*, inclosed in a casing *f*, secured upon the rear side of the box N near its left-hand end. One end of the spring *d* bears against the end of the casing *f* and the other against a nut or enlarged head *g* on the end of the rod *e*. The opposite end of the rod *e* without the casing carries a laterally-projecting arm *h*, which extends through a slot in the rear side of the box N and bears against the ends of the shifter-slides C′, C², C³, C⁴, and C⁵, acting by the force of the spring *d* to yieldingly hold the slides pressed to the right, but permitting them to be moved a limited distance to the left against the resistance of the spring. Each of the shifters C′, C², C³, C⁴, and C⁵ has projecting from its upper edge a yoke *a*′, *a*², *a*³, *a*⁴, and *a*⁵, each engaging and fitting in the groove in the hub of one of the pinions B′, B², B³, B⁴, and B⁵. In the present instance the yoke *a*′ of the shifter C′ engages the hub *b*′ of the pinion B′, the yoke *a*² the hub *b*² of the pinion B², and the yokes *a*³, *a*⁴, and *a*⁵ the hubs *b*³, *b*⁴, and *b*⁵ of the pinions B³, B⁴, and B⁵, respectively. It results from this construction and arrangement of the parts that whenever any one of the slides C′, C², C³, C⁴, and C⁵ is moved to the left its corresponding pinion is moved into line with its rack, so that if at the beginning of the operation of any key the proper slides are shifted to the left and held there against the force of the spring *d* during the further operation of the key the shaft L and wheel M will be turned through the medium of the racks A′, A², A³, A⁴, and A⁵ and the shifted pinions to register the value of such key. This shifting of the proper slides at the beginning of the operation of the respective keys may be accomplished by any suitable means, the devices which I have illustrated for that purpose being as follows:

Each of the slides C′, C², C³, C⁴, and C⁵ has a series of vertical slots cut into it from the under side, one slot for and adjacent to each of the slots in the box N. Some of these slots in each slide are exactly coincident with the corresponding slots in the box N, while others are not, but have one of their side walls projecting into the slot in the box, for a purpose hereinafter explained. This arrangement will be clearly seen in Fig. 5, which is a sectional plan view of the box N and its contained slides, the section being taken on a plane extending through the box and slides just at the top of the slots.

Extending upward from the top of each of the keys C, just in rear of their pivotal shaft D, is a projection O, having a beveled upper left side which forms a wedge of the projection. (See Fig. 3.) These projections are immediately beneath the slots in the box N, and whenever the front end of a key is depressed and its rear end thereby lifted its wedge enters the slot immediately above it in the box N. It results from this that if the left side wall of a slot in any one of the slides is projecting into the slot in the box N, which the wedge projection on the operated key enters, the slide will be forced to the left against the pressure of the spring *d* and will carry its yoke *a*′, *a*², *a*³, *a*⁴, or *a*⁵ with it, and thereby shift the pinion whose hub the yoke engages into line with its corresponding rack, and as the operation of the key continues and the racks are thrown forward the rack corresponding to the shifted pinion will engage and turn it as many teeth as there are teeth in the rack.

In Fig. 5 the numbers immediately below the slots in the box N indicate the values of the keys which are beneath the respective slots. It will be seen that the slot of the five-cent key has projecting into it the left wall of a slot in the slide C′, the ten-cent slot the wall of a slot in the slide C², and the twenty, twenty-five, and fifty cent slots the walls of slots in the slides C³, C⁴, and C⁵, respectively. Upon the operation of the five-cent key its wedge O enters the five-cent slot and forces the slide C′ to the left, thereby shifting the pinion B′ into line with the rack A′, by which it is turned one tooth. The shaft L and wheel M are thereby turned one-twentieth of a revolution and five cents registered on said wheel. In the same manner the operation of the ten-cent key forces the slide C² to the left and shifts the pinion B² into line with the rack A², which has two teeth, and causes the shaft L and wheel M to be turned two-twentieths of a revolution and ten cents to be registered. The operation of the twenty, twenty-five, and fifty cent keys causes the slides C³, C⁴, and C⁵ to be forced to the left and the pinions B³, B⁴, and B⁵ to be shifted into line with the racks A³, A⁴, and A⁵ and twenty, twenty-five, and fifty cents to be registered on the wheel M, as will be readily understood.

Under the construction illustrated in the drawings the above are the only keys whose values can be registered by shifting a single slide and pinion. The values of the others are registered by causing two or more of the pinions to be simultaneously shifted into line with their respective racks at the beginning of the operation of the key, and this is done by causing the left slot-walls of two or more of the slides to project into each of the slots in the box N which correspond to these keys, so that the wedge on the key will shift two or

more of the slides and pinions. Thus the fifteen-cent key will shift slides C′ and C^2 and pinions B′ and B^2, the thirty-cent key slides C^2 and C^3 and pinions B^2 and B^3, and so on up to the ninety-cent key, which shifts slides C′, C^2, C^4, and C^5, and the ninety-five-cent key, which shifts slides C^3, C^4, and C^5 and their corresponding pinions, all as clearly shown in Figs. 2 and 5. As has been before explained, where two or more pinions are simultaneously shifted into line with their respective racks they are not engaged and turned by their racks simultaneously, but successively, the rack having the highest number of teeth engaging and turning its pinion first, then the rack having the next highest number of teeth engaging and turning its pinion, the shaft L being independently turned by each rack and pinion and turned altogether a distance corresponding to the aggregate number of teeth in all the racks which engage the shifted pinions. It will thus be seen that owing to the co-operation of each shifter C′, C^2, &c., with several of the keys I am able to connect a single key with two or more of the hubs b', b^2, &c., of the pinions B′, B^2, &c., so that upon operating any one of the nineteen keys of the series just the proper pinions will be shifted to cause the value of that key to be registered. This connection of single keys of the series with two or more of the shifting-pinions by means of the movable bars or shifters C′, C^2, &c., so combined with the keys that two or more of them are moved by the operation of a single key and the others allowed to remain stationary, forms a novel and valuable feature of my invention, and its use is not restricted to the machine which I have illustrated in the drawings. This connection of single keys of a series with two or more movable devices, such as the hubs b', b^2, &c., of the pinions, by means of shifters such as C′, C^2, &c., each co-operating with two or more keys of the series, may be advantageously employed in the other machines where it is desired to effect such connections and combinations.

It is necessary that upon the operation of a key the proper pinion or pinions should be shifted before the racks A′, A^2, A^3, A^4, and A^5 are thrown forward to engage them. This I accomplish under the construction illustrated in the drawings by the slot-and-pin connection *a b* between the link I and the arm G of the vibrating bar F, which permits the operated key to be moved far enough for its wedge O to enter its slot in the box N and shift the proper slides and pinions before the link I begins to move the racks A′, A^2, A^3, A^4, and A^5 forward.

The above constitutes the registering mechanism for the cent series of keys. A similar mechanism is provided for the dollar series on the left-hand side of the machine.

Tightly secured upon the rock-shaft E are four segment-racks D′, D^2, D^3, and D^4, similar to the racks A′, A^2, A^3, A^4, and A^5. The first of these has one tooth, the second two teeth, the third three teeth, and the fourth five teeth, and they are arranged in corresponding order to the racks A′, A^2, A^3, A^4 and A^5, the one having five teeth being located in advance and followed by the ones having three, two, and one, respectively, as shown by the detail side elevation of them in Fig. 4.

A link I′, corresponding to the link I, is connected at its lower end by slot-and-pin connection to the side arm G of the vibrating bar F on the left-hand side of the machine, and at its upper end is pivoted to the rack D^4, as shown in Fig. 4, so that upon operating any key of the dollar series all the racks D′, D^2, D^3, and D^4 are thrown upward and forward.

Journaled at one end in the left-hand side frame A of the machine and at the other in a supporting-standard on the box N is a horizontal shaft L′, whose right end abuts against the end of the shaft L. Feathered on this shaft so as to turn with it, but free to slide longitudinally on it, are a series of pinions E′, E^2, E^3, and E^4, each having twenty teeth of a size and shape suitable to gear with the teeth of the racks D′, D^2, D^3, and D^4. Each of these pinions has secured to or made integral with it a hub having a central groove. These hubs are engaged by a series of yokes b', b^2, b^3, and b^4, projecting from the upper sides of four shifting-slides F′, F^2, F^3, and F^4, contained in the box N′, and having slots in their lower sides similar to those in the slides C′, C^2, C^3, C^4, and C^5. The slides F′, F^2, F^3, and F^4 are normally held pressed to the right by a spring and associate devices similar to the spring *d*, &c., for the cent series of keys, as seen in Fig. 5. The keys of the dollar series are six in number. Five of them represent multiples of one from one to five, and the sixth one represents ten dollars. These keys are each provided with a wedge projection corresponding to the wedges O on the keys of the cent series, and act upon the slides F′, F^2, F^3, and F^4, through the slots in the box N′, to shift the pinions E′, E^2, E^3, and E^4 in the manner explained with reference to the cent keys.

On the right-hand end of the shaft L′, adjacent to the cent-registering wheel M, is a dollar-registering wheel M′, whose periphery is divided into twenty equidistant spaces and bears a series of numbers in multiples of 1 from 0 to 19. When any key of the dollar series is operated, the proper one of the slides F′, F^2, F^3, and F^4 is forced to the left to shift the corresponding pinion into line with its rack, and the latter turns the pinion and shaft L′ a sufficient distance to register the value of the operated key on the wheel M′. A ratchet 3 and pawl 4 at the outer end of the shaft L′ prevent it turning in the reverse direction.

For the purpose of transferring the amounts registered by the revolutions of the wheel M to the wheel M′, I provide the following devices: Feathered upon the shaft L′, so as to slide freely

thereon, but to turn with it, is a pinion P, having a grooved hub similar to the pinions B′, E′, &c. Tightly secured upon the rock-shaft E is a fifth segment-rack Q, having a single tooth arranged in rear of the transverse line of the teeth on the racks D′, D², D³, and D⁴, as shown in Fig. 4. The pinion P is normally out of the path of travel of the rack Q, but may be moved into it, as hereinafter explained. Secured upon the shaft L at any convenient point—in this instance at the right of and adjacent to the wheel M—is a collar or disk R, having a lateral cam projection *i*, arranged to ride against the upper projecting arm *j* of a shifter-bar S as the shaft L is revolved by the racks A′, A², A³, A⁴, and A⁵ and pinions B′, B², B³, B⁴, and B⁵. This shifter-bar extends under the wheels M M′, and is carried in guides cut in the lower sides of the supports J J′. Its left-hand end supports a yoke T, which engages the groove in the hub of the pinion P. When the cam projection *i* on the collar R strikes the upper projecting arm *j* of the bar S, it shifts the bar to the left, and thereby moves the pinion P into line with the rack Q. The collar R is secured upon the shaft L in such relation to the wheel M that the cam projection *i* strikes the projection *j* just before the wheel M completes its revolution and brings its zero to the reading-point. As the cam projection *i* passes the projection *j* the bar S is forced to the left and shifts the pinion P into line with the rack Q, by which it is engaged just at the completion of the stroke of the operated key and turned one tooth, thereby turning the shaft L′ one-twentieth of a revolution and adding one dollar to the registry on the wheel M′. As the tooth on the rack Q is located in rear of the transverse line of the rearmost tooth on any of the other racks in either series, the registering operation of the keys is always completed before the transfer takes place, so that the proper transfer and proper registry are always made even if a dollar and a cent key be operated simultaneously. The bar S and pinion P remain shifted to the left until the operated key begins its return-stroke, whereupon a cam U on the forward end of a sliding bar V, which has been moved forward during the operation of the key, as hereinafter explained, strikes the end of the bar S in the rearward movement of the bar V and moves the bar S and pinion P back to the position shown in Fig. 2. This sliding bar V is guided in a guide W on the upper rear side of the shifter-casing N, and its rear end is pivoted to an arm X, (dotted lines, Fig. 1,) projecting from the upper side of a bar Y, which connects the two side arms G of the vibrating frame near the pivotal points H of said arms. It results from this construction that whenever any key is operated and the vibrating frame is lifted the bar V is thrown forward so that the cam U is moved out of the way of the bar S, and when the key is reset the bar V is pulled rearward and the cam U restores the bar S to normal position if it has been shifted to the left during the operation of the key, as will be readily understood.

The two registering-wheels M M′ may actuate and transfer their registry to any suitable supplemental registering mechanism to increase the capacity of the machine indefinitely.

My invention is not limited to the details of construction or particular arrangement of the parts illustrated in the accompanying drawings; but in its principal feature it contemplates, broadly, the combination of a series of racks arranged in the order described—that is, with the one having the highest number of teeth in advance, followed in regular decreasing order by those having the lower number of teeth, the whole being arranged to form one continuous series of teeth—and a series of pinions co-operating with said racks, in the manner and for the purpose described. So, also, in the case of the shifters C′, C², &c., I have stated that they may be combined with the operating-keys in any suitable way to cause two or more of them to be moved by a single key while the others remain stationary, so that this feature of my invention contemplates, broadly, the combination of the series of shifters with the operating-keys in such manner that the operation of a single key may move two or more of said shifters and allow the others to remain stationary.

Having thus fully described my invention, I claim—

1. In a registering-machine, the combination of a series of racks arranged in the order described—that is, with the one having the highest number of teeth in advance, followed in regular decreasing order by those having the lower numbers of teeth, the whole being arranged to form one continuous series of teeth, and a series of co-operating pinions movable into and out of the path of the racks.

2. In a registering-machine, the combination of a series of racks arranged in the order described—that is, with the one having the highest number of teeth in advance, followed in regular decreasing order by those having the lower numbers of teeth, the whole being arranged to form one continuous series of teeth, a revoluble registering-shaft, and a series of pinions feathered thereon and movable into and out of the path of the racks.

3. In a registering-machine, the combination of the series of racks A′ A² A³ A⁴ A⁵, arranged in the order described, the registering-shaft L, the series of pinions B′ B² B³ B⁴ B⁵, feathered thereon and co-operating with the racks A′ A² A³ A⁴ A⁵, and the keys C, operatively connected with the racks and pinions to vibrate the former and shift the latter, for the purpose specified.

4. In a registering-machine, the combination of the operating-keys C, the vibrating bar F, the rock-shaft E, connected with and rocked by the vibration of the bar F, the series of segment-racks A′ A² A³ A⁴ A⁵, secured

upon the rock-shaft and arranged in the order described, the registering-shaft L, the series of pinions B′ B^2 B^3 B^4 B^5, feathered thereon, and the series of shifters C′ C^2 C^3 C^4 C^5, actuated by the keys C and co-operating with the pinions B′ B^2 B^3 B^4 B^5, for the purpose specified.

5. In a registering-machine, the combination of the registering-shaft L, cam projection *i*, carried thereby, shifter-bar S, shaft L′, pinion P, and rack Q, the parts co-operating with each other substantially in the manner and for the purpose described.

6. In a registering-machine, the combination of the registering-shaft L, the cam projection *i*, carried thereby, the shifter-bar S, having the projection *j* and yoke T, the shaft L′, the pinion P, loose thereon, the rack Q, and the registering-wheels M M′, substantially as and for the purpose described.

7. In a registering-machine, the combination of a series of movable shifters and a series of operating-keys, each of which co-operates with two or more of said shifters, but not with the others, whereby the movement of one key may be transmitted through said shifters to two or more movable parts of the machine and the movement of another operating-key may be transmitted through them to other movable parts of the machine, substantially as and for the purpose described.

8. In a registering-machine, the combination of a shaft, a series of parts mounted thereon and movable longitudinally thereof, and a series of operating-keys, each connected with two or more of such parts to move them longitudinally of said shaft, substantially as described.

9. In a registering-machine, the combination of the movable shaft L, the hubs *b′* b^2, &c., sliding thereon and turning therewith, and a series of operating-keys, each connected with two or more of the hubs, substantially as and for the purpose described.

10. In a registering-machine, the combination of the laterally-movable hubs *b′* b^2, &c., the shifters C′ C^2, &c., each connected with one of said hubs, and a series of operating-keys, each of which co-operates with two or more of said shifters, but not with the others, substantially as and for the purpose described.

11. In a registering-machine, the combination of the revoluble shaft L, the hubs *b′* b^2, &c., sliding thereon and turning with it, the shifters C′ C^2, &c., each connected with one of said hubs, and a series of operating-keys, each co-operating with two or more of said shifters, but not with the others, substantially as and for the purpose described.

12. In a registering-machine, the combination of the slotted shifters C′ C^2, &c., with the operating-keys provided with the wedge projections O, arranged to enter the slots in the shifters, each wedge being arranged to co-operate with two or more shifters, but not with the others, substantially as and for the purpose described.

13. In a registering-machine, the combination of the shaft L, laterally-movable hubs *b′* b^2, &c., thereon, the slotted shifters C′ C^2, &c, each connected with one of the said hubs, and the operating-keys, each provided with a wedge projection O, arranged to co-operate with the shifters, substantially as and for the purpose described.

14. In a registering-machine, the combination of the revoluble shaft L, the hubs *b′* b^2, &c., sliding thereon and turning therewith, the slide-box N, having the slides C′ C^2, &c., contained therein, each connected with one of the hubs *b′* b^2, &c., and the operating-keys C, each having a wedge O adapted to enter a slot in the box N when the key is operated, substantially as and for the purpose described.

HUGO COOK.

Witnesses:
JNO. H. PATTERSON,
WILLIAM B. SULLIVAN.