

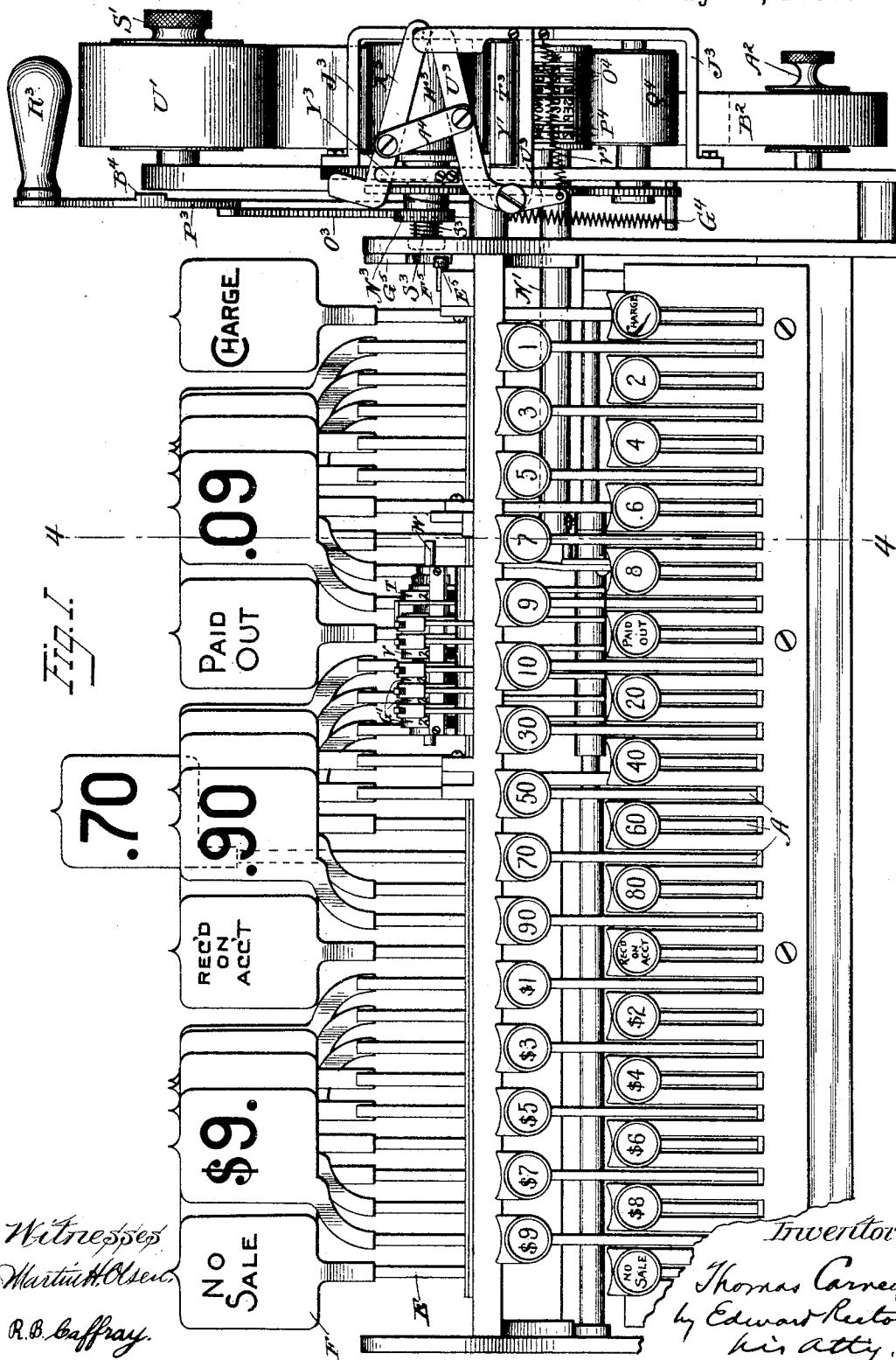
(No Model.)

7 Sheets—Sheet 1.

T. CARNEY.
CASH REGISTER.

No. 497,861.

Patented May 23, 1893.



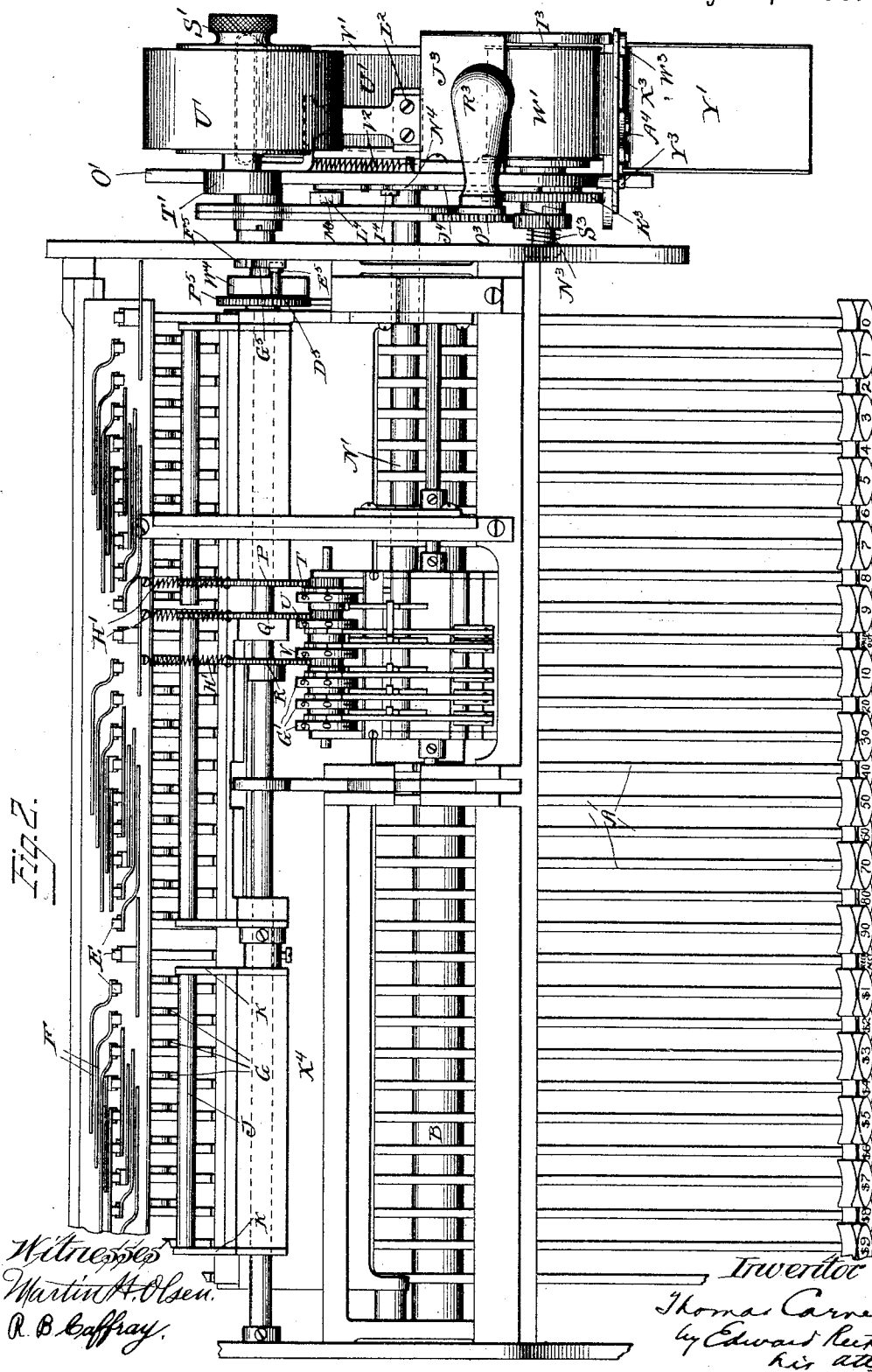
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7 Sheets—Sheet 2.

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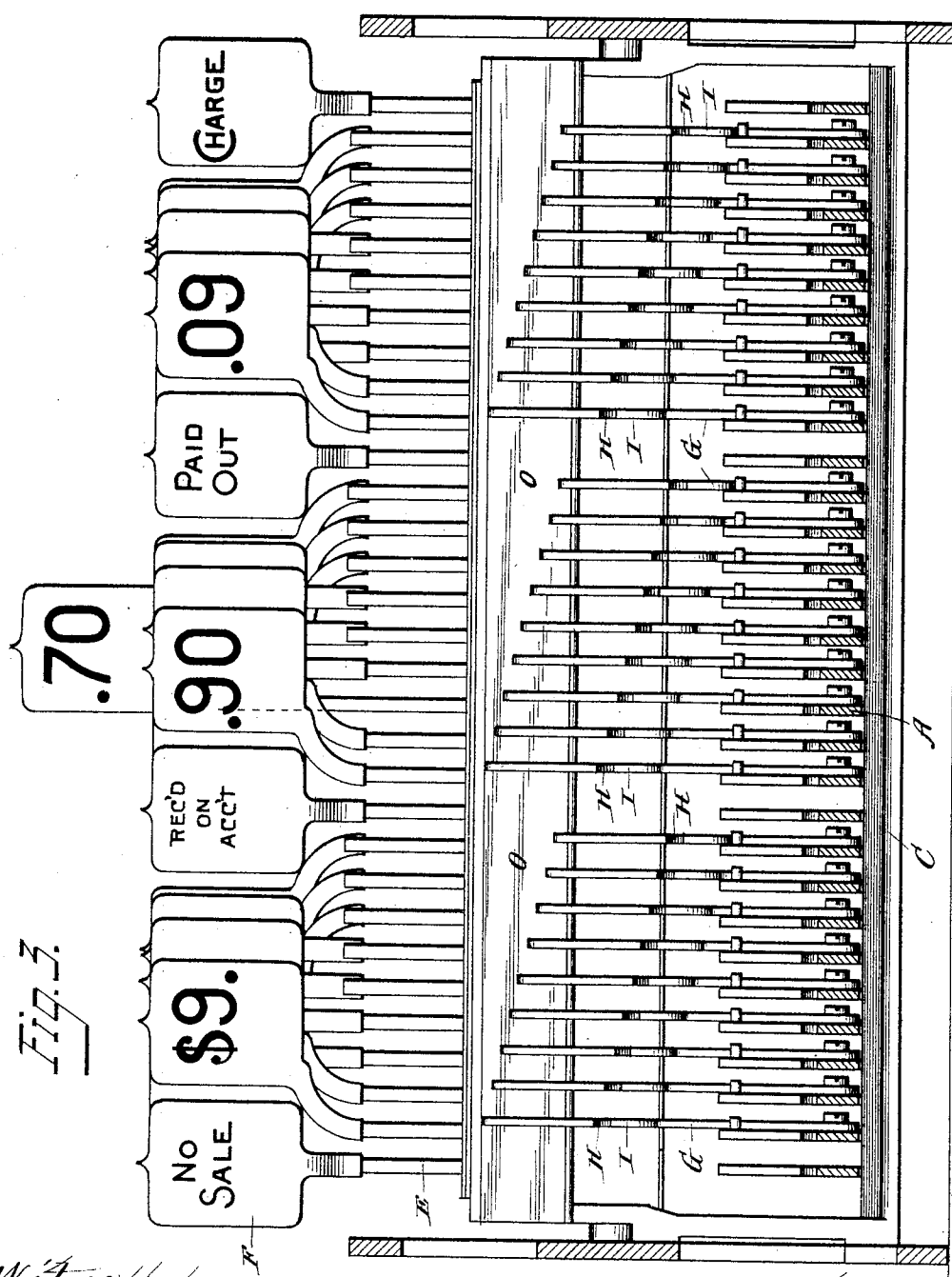
(No Model.)

7 Sheets—Sheet 3.

T. CARNEY.
CASH REGISTER.

No. 497,861.

Patented May 23, 1893.



Witnessed
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R. B. Caffray

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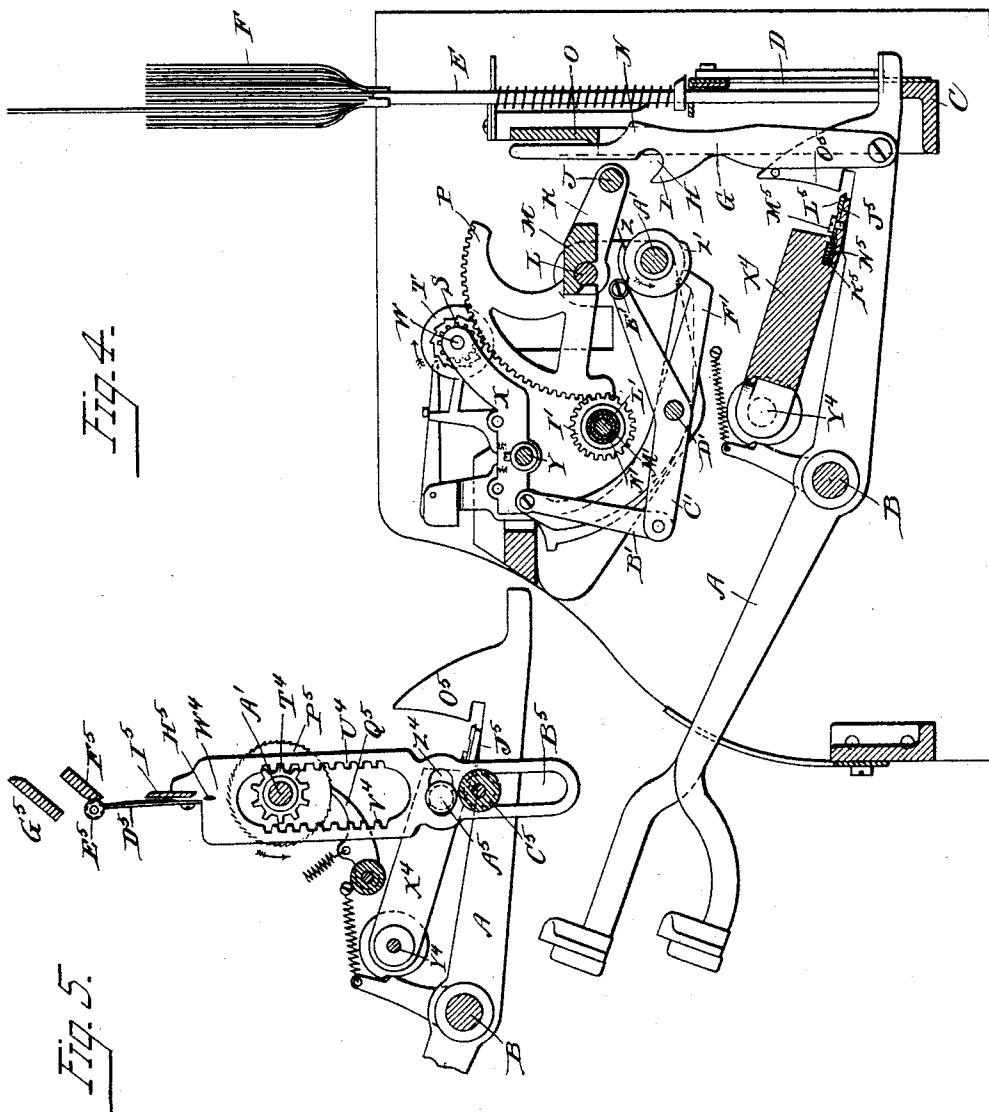
(No Model.)

7 Sheets—Sheet 4.

T. CARNEY.
CASH REGISTER.

No. 497,861.

Patented May 23, 1893.



Witnesses
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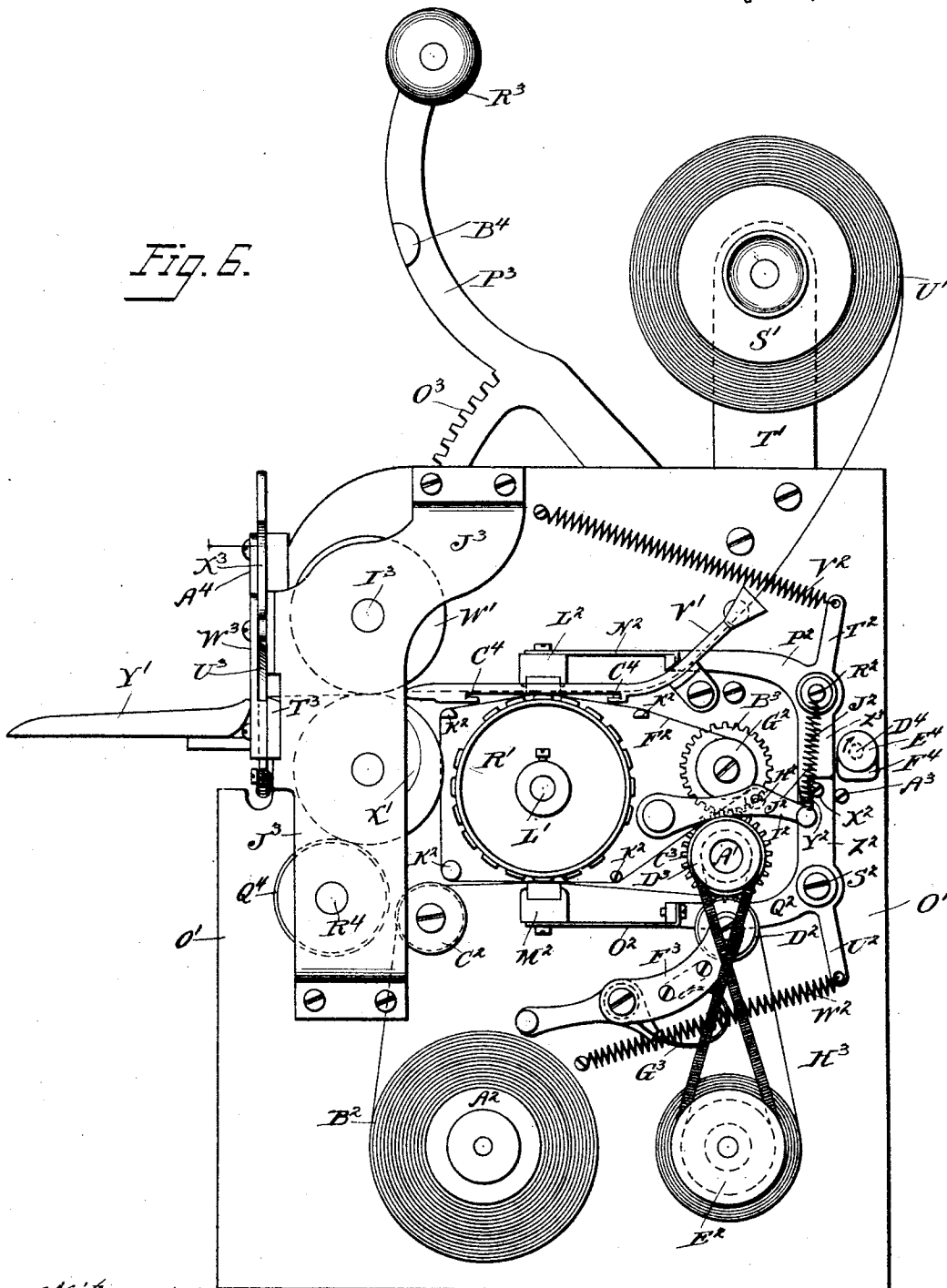
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CASH REGISTER.

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Fig. 6.



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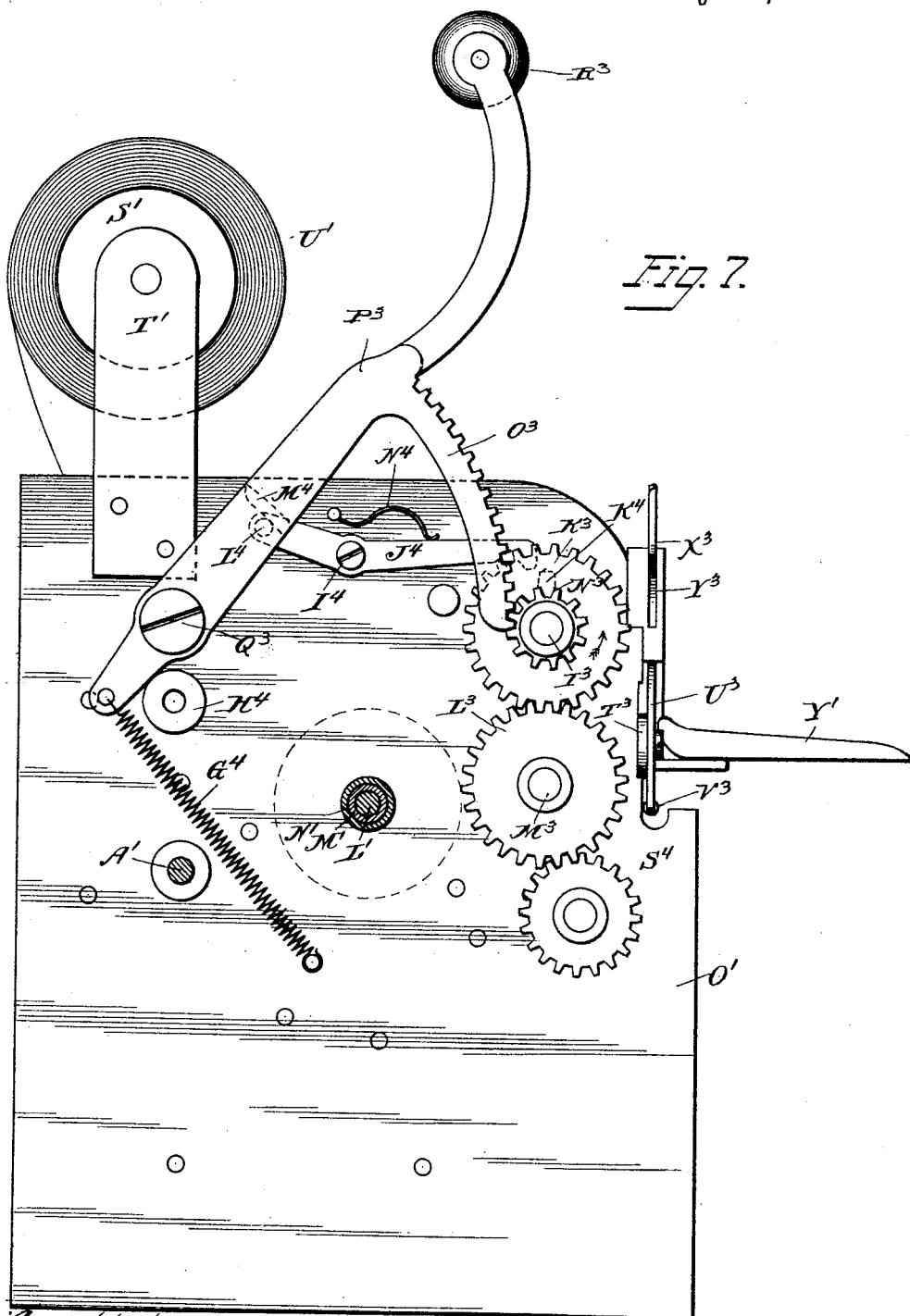
(No Model.)

7 Sheets—Sheet 6.

T. CARNEY.
CASH REGISTER.

No. 497,861.

Patented May 23, 1893.



Witnesses
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(No Model.)

7 Sheets—Sheet 7.

T. CARNEY.
CASH REGISTER.

No. 497,861.

Patented May 23, 1893.

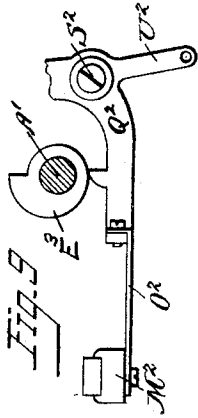


Fig. 9.

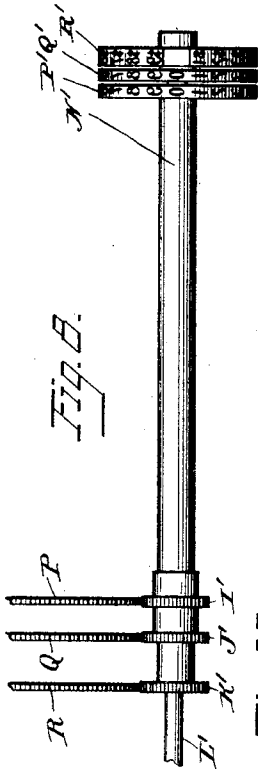
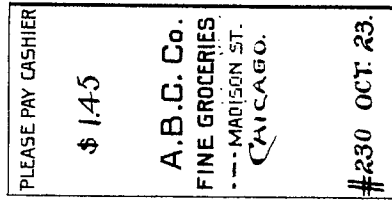


Fig. 8.

Fig. 11.

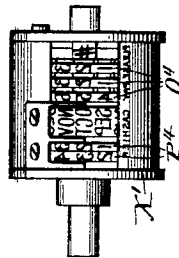


Fig. 12.

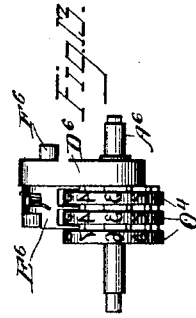
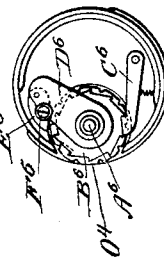


Fig. 14.

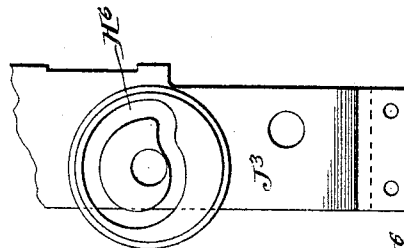
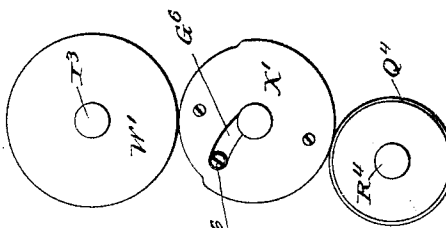
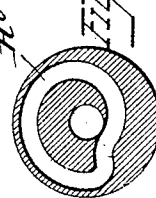


Fig. 15.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS CARNEY, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 497,861, dated May 23, 1893.

Application filed March 1, 1893. Serial No. 464,233. (No model.)

To all whom it may concern:

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

My invention consists chiefly in the application of a ticket and record-printing attachment to the machine shown and described in my pending application, Serial No. 455,932, filed December 21, 1892; and its novelty consists in the new combinations, arrangements and constructions of parts hereinafter set forth and particularly pointed out in the claims.

In the accompanying drawings Figure 1 represents a front elevation of my machine, removed from its casing, and showing the check printing attachment at its right hand end; Fig. 2 a top plan view of the machine; Fig. 3 a transverse vertical section of the machine showing the three sets of graduated lifters; Fig. 4 a vertical section of the machine approximately on the line 4—4 of Fig. 1; Fig. 5 a detail view of the devices for converting the reciprocating movements of the keys into rotary movement in a shaft; Fig. 6 an enlarged side elevation of the printing attachment at the right hand end of the machine; Fig. 7 a corresponding view of the opposite side of the printing attachment, being a vertical section of the machine between the right hand side of the frame and the printing attachment; Fig. 8 a detail view showing the three actuating segments and the shafts and sleeves geared thereto and carrying the type wheels; Fig. 9 an enlarged detail view of one of the platens, its supporting lever and actuating cam; Fig. 10 an end elevation of the type cylinder and impression and inking rollers; Fig. 11 a side elevation of the type cylinder, showing the consecutive-numbering and dating wheels therein; Fig. 12 an end view of the type cylinder with the head thereof removed; Fig. 13 a detail view of the consecutive-numbering wheels and their actuating pawl; Fig. 14 a detail elevation of the inner face of the supporting plate or bracket in

which the outer journals of the type cylinder and rollers have their bearings, showing the cam-groove which actuates the pawl-carrier; Fig. 15 a detail vertical section showing said cam groove, from the opposite side, facing the type cylinder and rollers; and Fig. 16 a face view of one of the printed tickets.

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

Inasmuch as all of the novel features of the machine, excepting the printing attachment, are covered by my aforesaid pending application, I will describe the construction and mode of operation of its various parts only so far as may be necessary to a clear understanding of the subject matter of the present application.

The operating keys of the machine are preferably divided into two or more sets, each representing multiples of one from 1 to 9 inclusive. In this instance there are three such sets of keys, the first on the right representing units of cents, the next tens of cents and the third units of dollars, Fig. 1. The machine is also provided with four special keys, one at each end and the other two separating the three sets of keys, but these special keys have nothing to do with my present invention. The keys consist of levers A fulcrumed on a horizontal shaft B in the lower forward part of the machine, and resting at their rear ends upon a cross piece C of the framework in the lower ends of vertical slots in the usual guide plate D. Above the ends of the keys are the vertically guided rods E carrying the usual indicating tablets F corresponding with the respective keys.

Pivoted to the side of each key, (excepting the special keys,) near its rear end, is a lifter plate G adapted to co-operate with the registering frame corresponding to the set of keys to which said key belongs. These lifter plates are provided upon their forward sides with recesses or notches H and forwardly projecting lifting fingers I which co-operate with the rear cross rods J of the registering frame. Each of said frames, Fig. 2 consists of the rod J, side arms K hung upon a shaft L, and a front cross bar M connecting the side arms and constituting with said arms and the rod J a rigid frame free to oscillate

upon the shaft L. The lifter plates G are provided upon their rear sides with shoulders N adapted to co-operate with the lower rounded edge of the cross piece O of the framework. When the front end of a key lever is depressed and its rear end and plate G lifted the shoulder N upon the rear side of said plate will strike the lower edge of the cross piece O just as the notch H in the front side of the lifter comes opposite the rod J of the registering frame, and the engagement of the shoulder N with the cross piece O will throw the plate N forward and cause its notch H to embrace the rod J. During the further upward movement of the plate the rod J will be carried with it and the frame oscillated, the rear side of the plate G being so shaped that it will co-operate with the cross piece O to hold the plate and bar J of the registering frame coupled together, so that it is impossible for the registering frame to be thrown ahead of the plate or to be moved any farther than the plate itself is moved by the operated key. Upon the release and return of the key toward normal position the plate G is free to move rearward again as soon as its shoulder N clears the cross piece O, and be thereby disengaged from the registering frame.

The notches H and lifting fingers I upon the forward sides of the plates G in each set are arranged in graduated order, as seen in Fig. 3, the distance between the notches and fingers and the rod of the registering frame increasing in distance from left to right, the adjustment being such that the extreme left hand or 9 key in the set will engage and begin to move the registering frame when the key has been moved one unit of distance, while the plate of the next or 8 key will not engage the registering frame until the key has moved two units of distance, and so, to the key at the extreme right hand end of the set, whose plate G will not engage the registering frame until the key has moved through nine-tenths of its stroke, so that only one-tenth of the movement of said key will be transmitted to the registering frame. In this manner the registering frames are given different degrees of movement by the operations of different keys, proportionate to the values of said keys.

As seen in Fig. 2 there are three registering frames such as the one above described, one above each set of nine keys and co-operating with the lifter plates G thereof. The first and second frames from the right are loosely hung upon the shaft L, but the left hand frame is fast upon the shaft, the latter being mounted to oscillate in bearings upon the opposite side frames of the machine. The three registering frames have secured to and oscillating with them the three gear-toothed segments P Q R, the segment P being secured to the extreme left hand end of the cross bar M of the right hand frame, the segment Q to the extreme right hand end of the cross bar

M of the middle frame, while the segment R is fast upon the shaft L which oscillates with the third or left hand frame. These three segments co-operate with pinions S fast upon the sides of registering wheels T U V mounted upon the shaft W carried in a frame X supported and capable of slight rocking movement upon a shaft Y. This frame X is given its rocking movements by cams Z Z' fast upon a rotary shaft A', and intermediate connections between said cams and the frame, Fig. 4. The forward end of the frame X is connected by a link B' with the front end of a lever C' hung upon a shaft D' and carrying at its rear end a friction roller E' co-operating with the cam Z', while also hung upon the shaft D' is a lever F' whose rear end co-operates with the cam Z and whose upwardly curved forward end bears against the under side of or is connected to the frame X. In the normal position of the parts shown in Fig. 4 the rear end of the frame X is tilted upward and the pinions S are disengaged from the segments P Q R. At the first forward movement of the shaft A', however, the cam Z' will be carried from under the roller E' upon the rear end of the lever C' and the cam Z will ride over the rear end of the lever F' and depress the latter, throwing up its forward end and thereby tilting the rear end of the frame X downward and throwing the pinions S into engagement with the segments. The shaft A' is given its rotary movement by the operations of the keys, by means hereinafter described, being given the first half of a revolution by the downward stroke of an operated key and the second half by the return stroke of the key. At the beginning of the downward stroke of a key, therefore, the pinions S of the registering wheels are thrown into engagement with the segments, so that the movement imparted to any registering frame and segment by the lifter plate G of the operated key (or the movements imparted to two or more of the registering frames and segments by the operated keys in several sets) will be transmitted to the respective registering wheel or wheels. Just at the end of the downward stroke of the operated key or keys, or at the very beginning of the return upward stroke thereof, the cam Z will clear the rear end of the lever F' and the cam Z' will again come under the roller E' on the rear end of the lever C', thereby lifting the rear end of said lever and depressing its front end and tilting the rear end of the frame X upward and disengaging the pinions from the segments, so that during the return of the latter to normal position they will be disconnected from the registering wheels and the latter will remain stationary.

Besides the three wheels T U V upon the shaft W, there are in this instance three additional registering wheels G', Fig. 2, the wheels T U V representing respectively units of cents, tens of cents and units of dollars and the three wheels G' representing tens, hun-

dreds and thousands of dollars, respectively. Suitable transfer devices, which have been fully described in my former application, are interposed between the several registering wheels, by which at each complete revolution of any wheel a unit is transferred to the next higher wheel in the series.

The registering frames and segments are yieldingly held in normal position by suitable springs, in this instance by coiled springs H' connected to the rear ends of the segments and to one of the cross plates of the framework.

The three segments P Q R are in constant mesh at their lower ends with three pinions I' J' K', Fig. 8, which are secured respectively upon an oscillatory shaft L' and two concentric sleeves M' N' loose upon said shaft. The shaft L' is journaled at its left hand end in a suitable bracket upon the framework, and at its right hand end projects with the sleeves M' N' through the side frame of the machine and through the main plate O' of the printing attachment. At the right of the latter, upon the extreme right hand ends of the shaft and sleeves, are secured three type wheels P' Q' R', the wheel P' being fast upon the end of the sleeve N', the wheel Q' upon the end of the sleeve M' and the wheel R' upon the end of the shaft. The wheel P' thus oscillates with the segment P which is actuated by the right hand set of keys representing units of cents; the wheel Q' with the middle segment Q, which is actuated by the keys of the middle set, representing tens of cents; and the wheel R' by the segment R which is actuated by the keys of the left hand set, representing units of dollars.

Each of the wheels P' Q' R' is provided with two diametrically opposite series of type numbers, each representing units from 1 to 9 inclusive. The wheels P' Q' are also provided with two diametrically opposite zero types, separating the two series of numbers thereon, while the wheel R' has two diametrically opposite blank spaces separating its two series of numbers. The wheel R' is wider than the other wheels and is provided with a dollar mark type beside each of its numbers. When the parts are in normal position the zero types upon each of the wheels P' Q' and the blank spaces upon the wheel R' stand in vertical line, at the printing points immediately above and below said wheels. When any key is operated the oscillation of the segment actuated by said key will, during the downward stroke of the key, turn the corresponding type wheel until the two type numbers respectively representing the value of such key are brought to the two printing points, and if two or more keys in several sets be simultaneously operated the several corresponding type wheels will be turned to bring to the printing points the type numbers representing the values of the keys. Just at the end of the downward strokes of the keys, suitable spring-actuated impression platens, here-

inafter described, will be thrown against the types at the printing points, to print their numbers upon paper strips or tickets inserted between the platens and type wheels.

As seen in Fig. 6 there is wound upon a reel S' mounted upon a standard T' of the framework a supply of paper strip U', which in this instance constitutes the check or ticket strip. From the reel S' this strip is led downward and forward through a guide way V', across the types of the three type wheels, thence between two feed rollers W' X', thence past a cutting mechanism to a shelf or tray Y' projecting forward therefrom. Also wound upon a reel A² at the lower end of the machine is a paper strip B² which in this instance constitutes the record strip. From the reel A² this strip is led upward over a roller C², thence to the right beneath the type wheels and around a roller D², and thence downward around a storage reel E².

An endless inking ribbon F² is passed around a roller G², between said roller and a second roller H² carried by an arm I² and pulled by a spring J² against the roller G², and thence over guides K² and around the type wheels, between the latter and the paper strips U' B².

The two impression platens L² M² which co-operate with the type wheels at opposite sides thereof are secured by spring arms N² O² to three-armed levers P² Q² pivotally-mounted at R² S² upon studs projecting from the frame plate O'. Connected to the arms T² U² of the levers P² Q² are coiled springs V² W² which yieldingly hold the levers in normal position. When the levers are moved out of normal position and the platens L² M² carried away from the type wheels these springs are put under tension, and when the levers are released the springs throw them back to normal position and cause the platens to strike the type wheels a quick, sharp blow. The two levers P² Q² are connected by a pin X² and projection Y² upon their vertical arms Z² Z³, so that when the lever Q² is moved out of normal position the lever P² will be moved with it, while the lever P² may be moved independently of the lever Q². A pin A³ projecting from the frame plate holds the levers P² Q² in normal position against the stress of the springs V² W². In this position the platens L² M² do not press against the type wheels, though they rest very near them. When the platens are retracted against the stress of the springs V² W² and then released and thrown back to normal position the spring arms N² O² permit them to strike the type wheels and then cause them to assume their normal position.

The roller G² above described has fast upon it a gear-wheel B³ which meshes with a gear-wheel C³ fast upon a roller D³ fast upon the same rotary shaft A' which carries the cams Z Z', Fig. 4, and which is given a complete revolution at each operation of the machine.

The roller D³ is provided with a cam E³, Fig. 9, which co-operates with a projection upon

the upper edge of the horizontal arm of the lever Q^2 . At each operation of the machine and complete revolution of the roller D^3 the cam E^3 will depress the lever Q^2 and retract the platen M^2 , and, by the connection of the lever Q^2 with the lever P^2 , also retract the platen L^2 , and when the cam clears the projection on the lever Q^2 the springs $V^2 W^2$ will throw the platens against the type wheels and effect the printing upon the strips U' and B^2 .

It will be seen that the revolution of the roller G^2 , will cause the inking ribbon F^2 to be advanced at each operation of the machine and present fresh surfaces at the printing points. It will also be seen that the movement imparted to the roller D^3 by the roller G^2 through their intermeshing gears will cause the record strip B^2 to be advanced at each operation of the machine, the roller D^2 over which said strip passes being carried by an arm F^3 and pressed by a spring G^3 against the roller D^3 . A yielding band H^3 passed around the roller D^3 and fitting in a groove therein, and also around the storage reel E^2 and fitting in a groove therein, causes the roller E^2 to be turned at each operation of the machine far enough to wind up the portion of the paper strip advanced to it by the rollers $D^2 D^3$.

From the foregoing description it will be understood that at each operation of the machine the type wheels will be turned to bring the proper numbers to the printing points during the downward strokes of the keys and the platens will be retracted against the stress of the springs, and at the end of the downward strokes of the keys they will be released and thrown against the type wheels by the springs, to print the numbers upon the two paper strips, and that the inking ribbon and record strip will be advanced at each operation, the former to bring fresh inking surfaces to the printing points, and the latter to bring a blank space to the lower printing point to receive the next record.

For the purpose of advancing the check strip U' and cutting the printed checks therefrom the following mechanism is provided: As stated above the check strip is led from the upper printing point between feed-rollers $W' X'$. The roller X' is in fact a type cylinder and the roller W' an impression roller co-operating therewith, but for the purpose of the present description they may be assumed to be simply feed rollers for advancing the paper strip. The roller W' is fast upon a shaft I^3 journaled at its right hand end in a bracket plate J^3 secured to the main frame plate O' , and projecting at its left hand end through and beyond said frame plate and having fast upon it a gear wheel K^3 , Fig. 7, which meshes with a second gear wheel L^3 fast upon a shaft M^3 corresponding to the shaft I^3 and upon which the lower roller X' is fastened. The shaft I^3 has loosely mounted upon it at the left of the gear wheel K^3 a pinion N^3 , Figs. 1, 2 and 7, which meshes with

a segmental rack O^3 carried by an operating lever or handle P^3 fulcrumed upon the frame plate at Q^3 and provided with a grasping knob R^3 at its upper end. A coiled spring G^4 connected to the lever P^3 at its lower end yieldingly holds it in its upper normal position against a stop H^4 upon the frame plate. There is a suitable clutch interposed between the pinion N^3 and gear wheel K^3 , consisting of one or more clutch teeth, Fig. 2, and there is confined between the left hand side of the pinion N^3 and a collar fast upon the end of the shaft I^3 a coiled spring S^3 surrounding the shaft and pressing the pinion toward the wheel K^3 . Owing to this clutch connection between the pinion and wheel, when the operating lever P^3 is depressed and the pinion N^3 turned in the direction of the arrow (Fig. 7) by the rack O^3 the gear K^3 will be carried with it and the rollers $W' X'$ will be turned to advance the paper strip. During the return upward stroke of the operating lever and backward movement of the pinion the latter will turn independently of the gear-wheel K^3 and the rollers $W' X'$ remain stationary. The diameter of the pinion N^3 and the length of the rack O^3 and stroke of the operating lever are such that a full downward and forward stroke of the lever will cause the rollers $W' X'$ to be turned one complete revolution to feed forward a length of paper strip equal to the circumference of said rollers.

Pivoted to the frame plate O' at I^4 (Fig. 7) is a lever J^4 whose front end is adapted to co-operate with a stop lug or projection K^4 upon the right hand side or hub of the gear wheel K^3 (dotted lines Fig. 7) and whose rear end has projecting from its side a stud L^4 which co-operates with a plate M^4 upon the side of the lever P^3 . A spring N^4 bearing against the upper side of the lever J^4 tends to press its forward end downward, but when the operating lever P^3 is in normal position the engagement of the plate M^4 with the stud L^4 holds the rear end of the lever depressed and its front end elevated, against the pressure of the spring N^4 . When the lever P^3 is thrown forward and downward to feed out a check the plate M^4 is carried from over the stud L^4 and the spring N^4 throws the front end of the lever J^4 downward into the path of the projection K^4 on the gear wheel, where it remains until the lever P^3 is returned to normal position and the plate M^4 engaged with the stud L^4 again. There is thus provided a positive stop for the gear wheel K^3 and the feed rollers at the end of the forward and downward stroke of the operating lever, so that it is impossible for the feed rollers to be turned too far by any quick or violent manipulation of the lever.

Any suitable ratchet and pawl arresting device may be applied to the lever P^3 to compel a full stroke thereof in each direction, but as there are so many well known forms of devices for this purpose it is not thought

necessary to illustrate and describe any one in detail.

Extending transversely across the path of the paper strip, in front of the rollers $W'X'$, is a knife bar T^3 secured at its right hand end to the front edge of the bracket plate J^3 and near its left hand edge to the edge of the front plate O' , and projecting a short distance to the left of the latter, Fig. 1. Pivoted to the extreme left hand end of this knife bar T^3 is a lever U^3 having connected to its lower depending end a coiled spring V^3 which tends to hold it in the normal position shown. The lower edge of the upper transverse arm of this lever is beveled off (Fig. 6) and constitutes a shearing knife adapted to co-operate with the fixed knife bar T^3 . Its extreme right hand end is confined and has vertical play in a guide way formed by the forward edge of the plate J^3 and a plate W^3 is secured thereto. Pivoted in the extreme upper end of this guide way is the right hand end of a second lever X^3 extending to the left transversely above the knife or lever U^3 and fitting at its right hand end in a vertical guide way Y^3 , Figs. 1 and 7. The levers U^3 X^3 are connected by a link A^4 , Fig. 1, pivoted at its lower end to the lever U^3 near the middle of the latter and at its upper end to the lever X^3 toward the left hand end of the latter. The left hand end of the lever X^3 is upturned and arranged to co-operate with a plate B^4 secured upon the lever P^3 . When the lever P^3 is depressed to its limit of stroke the plate B^4 carries the left hand end of the lever X^3 downward, thereby forcing downward the knife lever U^3 and causing the lower edge of the latter to shear off the paper strip against the fixed knife-bar T^3 . In this manner and by the means described, at each operation of the machine, after the operating keys have been depressed and released and the amount of the sale indicated and registered, and printed upon both the record strip B^2 and the check strip U' , and the forward and downward stroke given the lever P^3 will cause the printed check to be fed forward by the rollers $W'X'$ and severed from the strip and delivered upon the tray Y' .

The roller X' , which, as before stated, is a type cylinder, may contain the type for any matter which it is desired to print upon the checks. In the present instance, as seen in Fig. 11, it contains a set of consecutive numbering wheels O^4 , a set of dating wheels P^4 , and adjacent thereto an electro-type bearing the words "Please pay cashier." Upon the opposite side of the cylinder may be an electrotype of any other usual matter, such as the name and address and business of the proprietor. The dating wheels are set by hand, as is usual, while the consecutive numbering wheels are actuated automatically by the revolutions of the cylinder, in the manner and by the means hereinafter described. An inking roller Q^4 journaled below the type cylinder bears against the latter and serves to ink

the type. The shaft R^4 of this inking roller extends through the frame plate O' and at the left thereof, Fig. 7, has fast upon it a pinion S^4 meshing with the gear wheel L^3 before described.

The means for automatically actuating the consecutive-numbering wheels O^4 by the revolutions of the type cylinder X' is shown in Figs. 10 to 14. The wheels are eccentrically mounted in the cylinder upon a shaft A^6 , Fig. 12. Each wheel is provided with a ratchet B^6 , with which engage the usual retaining pawls C^6 . Loosely hung upon the shaft A^6 beside the wheels O^4 is an arm or pawl-carrier D^6 carrying a triple-toothed pawl E^6 , Fig. 13, whose teeth respectively engage the ratchets of the three wheels O^4 and operate in the usual manner to turn the primary wheel one number at each reciprocation of the pawl carrier, the second wheel one number at each complete revolution of the primary, and the third wheel one number at each complete revolution of the second.

The pawl-carrier D^6 is provided with a laterally projecting stud F^6 , preferably surrounded by an anti-friction collar or sleeve, and extending through a slot G^6 in the head of the cylinder and into a cam groove H^6 formed in the inner face of the frame plate or supporting bracket J^3 .

From the foregoing description and reference to the drawings it will be seen that at each complete revolution of the cylinder X' the travel of the stud F^6 in the cam groove H^6 will reciprocate the pawl carrier D^6 back and forth and cause the pawl E^6 to turn the primary wheel O^4 one number.

I am aware that type-cylinders containing sets of dating wheels and automatically actuated consecutive-numbering wheels arranged similarly to those shown and described have been heretofore employed in machines of this character; and I am also aware that in some instances the pawl-carrier has been actuated positively by a stud traveling in a fixed cam groove, and the novelty of this feature of my invention consists in dispensing with said separate link and arranging the cam groove to co-operate with a stud located upon the pawl carrier itself.

The heads of the cylinder X' are provided with peripheral flanges which co-operate with the impression roller W' to advance the check strip. For the purpose of temporarily arresting the strip during a portion of the revolution of the cylinder, as when the knife is in the act of severing the printed ticket from the strip, the flanges upon the cylinder are cut away for a space, as shown, so that during the passage of this portion of the cylinder opposite the impression roller the strip will remain stationary.

The inking roller is arranged in such relation to the type cylinder that it will bear upon and ink the numbering and dating wheels and the electrotypes, as they pass it, but will not bear against the surface of the cylinder itself.

At the left of the printing line of the numbering wheels there may be secured to the head of the cylinder a type character such as #, Fig. 11. In this instance a check such as shown in Fig. 16 is printed and delivered from the machine at each operation.

If, after a check has been issued and delivered to a customer, an additional purchase is made by him, the end of the check may be inserted between the upper platen L^2 and the type wheels (a guide way C^4 in the under side of the check-strip chute or guide-way V' (Fig. 6) being provided for that purpose) and the proper keys operated to indicate and register the amount of the sale and print it upon the check. The amount will also be printed upon the record-strip B^2 at the lower printing point, so that a record of both the original and second purchases will be preserved. In such case the lever P^3 will of course not be operated, since no new check is to be issued from the machine.

When it is desired, as is often the case in some lines of business, to use the machine with the record-printing attachment, but without the check-printing attachment, the check strip U' may be simply withdrawn from the guide way V' , and reinserted in the same and passed between the feed rollers when it is desired to renew the issuing of checks; but as a more convenient means of throwing the check-printing attachment out of operation and into operation at will, and for the purpose also of preventing the useless striking of the platen L^2 against the type wheels and consequent wear of the inking ribbon, I have provided at the rear of the levers which carry the platens a stub shaft D^4 journaled in the frame plate O' and having a thumb piece E^4 secured to its outer end, by which it may be turned. This shaft has fast upon it a cam F^4 in line with the vertical arm Z^3 of the lever P^2 which carries the upper platen L^2 . By turning this shaft a quarter of a revolution in the direction of the arrow the cam F^4 will throw the arm Z^3 of the lever P^2 forward and lift the platen L^2 away from the type wheels and maintain it out of operation until the cam is restored to normal position. It will be seen that, owing to the character of the connection between the two levers P^2 Q^2 , (by the pin X^2 and projection Y^2), this throwing of the lever P^2 out of operation will have no effect on the lever Q^2 , so that the platen M^2 will continue to print the amount of each sale upon the record-strip B^2 .

The devices for rotating the shaft A' which carries the cams Z Z' , Fig. 4, and the roller G^2 and gear B^3 , Fig. 6, are illustrated in Fig. 5, and may be described as follows, being the same mechanism shown for this purpose in my aforesaid pending application: The shaft A' has fast upon it just within the side frame of the machine a pinion T^4 with which co-operate two reciprocating racks U^4 V^4 formed upon a plate W^4 carried by the usual vibrating frame X^4 , Fig. 4, which is pivoted by its

side arms to the framework at Y^4 and rests at its rear edge upon the upper sides of the key levers near their rear ends. The plate W^4 is provided with a horizontal slot Z^4 through which passes a stud or screw A^5 entering the end of the frame X^4 , so that while the plate W^4 is lifted by the frame X^4 it is capable of slight oscillatory movement. The lower end of the plate W^4 is provided with a vertical slot B^5 which embraces a stud C^5 upon the side frame of the machine by which the plate W^4 is guided in its vertical movements. At its upper end the plate W^4 has secured to it a vertically extending spring arm D^5 which carries at its upper end a friction roller E^5 which co-operates with two inclined lugs F^5 G^5 formed upon the inner face of the side frame of the machine. The plate W^4 is also provided with a projection H^5 which co-operates with a guide rib I^5 formed upon the inner face of the side frame.

Under the above construction and arrangement of the parts the operation is as follows: In normal position the engagement of the roller E^5 on the spring arm D^5 with the lug F^5 holds the plate W^4 in its forward position, with the rack U^4 engaged with the pinion T^4 . When the front end of any key lever is depressed and the vibrating frame X^4 and plate W^4 thereby lifted the rack U^4 turns the pinion T^4 and shaft A' in the direction of the arrow, the projection H^5 upon the plate W^4 traveling up the forward side of the guide rib I^5 . When the roller E^5 upon the spring arm D^5 comes in contact with the lug G^5 and is forced rearward as it travels upward against the rear inclined side of said lug it tends to throw the plate W^4 rearward, but the engagement of the projection H^5 with the guide rib I^5 prevents movement of the plate W^4 in this direction until said projection clears the upper end of the rib, whereupon the spring arm D^5 , which has been put under tension by the engagement of the roller E^5 with the lug G^5 , will throw the plate W^4 rearward and engage the rack V^4 with the pinion T^4 . During the return movement of the parts the rack V^4 , in its downward movement, will continue to turn the pinion T^4 in the same direction in which it has been turned by the upward movement of the rack U^4 , and complete its revolution. The projection H^5 upon the plate W^4 travels downward upon the rear side of the guide rib I^5 . When the roller E^5 upon the spring arm D^5 engages the lug F^5 in its downward movement it tends to throw the plate W^4 forward again, but the engagement of the projection H^5 with the rear side of the guide rib I^5 prevents such movement of the plate W^4 until the projection has cleared the lower end of the rib, whereupon the plate W^4 is thrown forward again to normal position and the rack V^4 disengaged from the pinion and the rack U^4 re-engaged with it. It is obvious that many of the well known mechanisms for converting reciprocating into rotary motion in machines of this kind may be substituted for that above described.

Under the construction of the machines so far described it would be necessary, in indicating, registering and printing amounts requiring the operation of keys in two or more sets, to depress all of the keys to their full limit of stroke at exactly the same time, since the printing is effected at the end of the downward stroke of the operated keys, and if several keys were depressed at approximately, but not exactly, the same time, the platens would be released and thrown against the type wheels as soon as the downward stroke of any one of the keys was completed, and if any of the other keys were only partially depressed at such moment their corresponding type wheels would not be set with the proper numbers at the printing point, and an incorrect amount would be printed. Many machines of this class are provided with devices for coupling together displaced keys, so that if several keys are started together they are compelled to complete their movement together. In such machines the liability of printing incorrect amounts in the manner above indicated is not present. In my machine I have provided mechanism not only for coupling together simultaneously displaced keys, as has been common in machines of this class for a number of years, but for coupling successively displaced keys to a movable bar or frame common to all of the keys, so that where it is desired to indicate, register and print amounts requiring the operation of keys in different sets, the several keys may be successively slightly depressed and then the operation completed by fully depressing the last one, all with one hand. The devices I employ for this purpose have been illustrated and described at length in my former application and form the subject matter of claims therein. It will be sufficient in the present case to explain that the vibrating frame X^4 is provided with a rearwardly projecting flange J^5 and with a longitudinal slot K^5 , Fig. 4. Resting upon this flange J^5 are three sliding plates L^5 , one overlying each set of keys. These plates are secured to the flange by screws M^5 passing through slots in the plates, so that the plates are capable of being pressed forward into the slot K^5 , and the latter contains coiled springs N^5 bearing against the forward edges of the plates and yieldingly holding them in their normal position. The key levers A are provided with the usual slotted lugs or hooks O^5 adapted to co-operate with the plates L^5 and flange J^5 . Whenever the front end of a key lever is slightly depressed its slotted lug O^5 will hook over the flange J^5 and plate L^5 as the rear end of the key and flange J^5 and plate L^5 move upward, and the key thereby become attached to the vibrating frame X^4 . Now, by means of a ratchet P^5 fast upon the shaft A' and engaged by a pawl Q^5 , Fig. 5, the frame X^4 is obliged to make a complete movement in each direction when once displaced from normal position as is common in machines of this class, so

that when the frame X^4 is slightly lifted, as above described, it cannot return to normal position until it has made a full upward stroke. When therefore a key has been slightly displaced from normal position and attached to the vibrating frame in the manner above described, and is then released, it will be held in such slightly displaced position. The rear edges of the plates L^5 overlying the keys of the other sets will, owing to the slightly elevated position of the vibrating frame X^4 , rest just above and in the path of the points of the hooks O^5 of the keys in said sets, so that when any key in one of such sets is depressed the point of its hook O^5 in rising will force the corresponding plate L^5 slightly forward against the pressure of the springs N^5 , until the point of the hook clears the plate, whereupon the latter will be thrown rearward again and catch under the hook, and the second key thus become attached to the vibrating frame. A key in the third set may be attached to it in the same way, and then the operation of all three of the keys, and the registration, indication and printing of their combined values, be effected by fully depressing any one of the displaced keys.

While, as stated at the beginning of the specification, my present invention consists chiefly in the application of a printing attachment to the machine shown and described in my prior application, yet the application of my novel printing attachment to such machine results in the production of combinations and modes of operation which are broadly new and in no way depend upon the particular construction of such machine. In this respect, therefore, my present invention may be said to consist in the production of a new machine, as a whole, having a new mode of operation and accomplishing new results, or old results in a manner in which they have not heretofore been accomplished. For instance, so far as I am aware I am the first in the art to produce a machine of this general character in which the values of one or more operated keys may be printed upon a paper strip, and in which said paper strip may then be advanced and the printed check or ticket severed therefrom and delivered from the machine by the operation of a lever or other suitable hand-operated device; and this, whether the operation of such hand-device simply advances the paper strip and cuts off the check, or also actuates printing mechanism which will consecutively number and date the check and print upon it such matter as desired, in the manner I have shown and described. In the broad combination, therefore, of the operating keys, the type-carriers, the platen actuated by the keys and co-operating with the type-carriers, the feed rollers for advancing the paper strip, the knife for cutting it into separate checks or tickets, and the means for actuating the feed rollers and knife, the particular character of the mechanism intermediate the keys and type-

carriers for setting the latter is immaterial, and either that which has been shown and described, and whose novel construction forms the subject matter of claims in this and my former application, or some other known or suitable form, may be employed for that purpose. So, too, I believe I am the first in the art to produce a machine of this character in which the values of the operated keys may, by the simple operation of such keys, be simultaneously printed upon a record-strip carried within the machine and upon a check-strip led from a suitable supply reel between the platen and type-carriers, and in which the check-strip may then be advanced and severed into separate checks by the operation of a suitable handled device, so that by the operation of the proper keys and such device the values of the keys may be printed upon the record-strip and preserved within the machine, and also upon a check or ticket cut from a check-strip and delivered from the machine. Again, I believe myself to be the first in the art to produce a machine of this character having a series of operating keys divided into separate sets and in which two or more keys in different sets may be successively started and then the operation of all of them completed, and the printing of their combined values upon one or more paper strips effected, by completing the operation of any one or another of the several keys so started. My invention, therefore, in these respects consists, not in the novel construction or arrangement of parts, but in the broad combinations of elements set forth, any one or more of which elements may be assumed to be old. The scope of my invention in these features is restricted only by the terms of my respective claims in which it is expressed.

Having thus fully described my invention, I claim—

1. The combination of a series of keys representing different values, a movable frame actuated thereby and given different degrees of movement proportionate to the values of the respective keys, means for automatically coupling the keys to the frame at the beginning of its movement to prevent overthrow of the latter, a type-carrier geared to the frame and bearing a series of type numbers representing the values of the respective keys, and a platen co-operating with said type-carrier, substantially as described.

2. The combination of a series of operating keys representing different values, a movable frame, a series of lifters interposed between the keys and frame for giving the latter different degrees of movement proportionate to the values of the respective keys, means for coupling the lifter of each operated key to the movable frame at the beginning of movement of the latter, to prevent overthrow of the frame, a type-carrier geared to the frame and bearing a series of type numbers representing the values of the respective keys, and a

platen co-operating with the type carrier, substantially as described.

3. The combination of a series of operating keys representing different values, a movable frame, a series of graduated lifters pivoted to the operating keys and interposed between them and the movable frame, for giving the latter different degrees of movement proportionate to the values of the operated keys, means for coupling the lifter of each operated key to the frame at the beginning of movement of the latter, to prevent overthrow of the frame, a type-carrier geared to said frame, and a platen co-operating with the type-carrier, substantially as described.

4. The combination of a series of keys representing different values, an oscillatory frame actuated thereby and given different degrees of movement by different keys proportionate to the values thereof, a gear-toothed segment carried by the frame, a registering wheel intermittently geared to said segment, to be moved by it in one direction but not in the other, a type-carrier geared to said segment and bearing a series of type numbers representing the values of the respective keys, and a platen co-operating with the type-carrier, substantially as described.

5. The combination of a series of operating keys representing different values, a type-carrier bearing a series of numbers representing the values of the respective keys, means intermediate the keys and type-carrier for moving the latter at the operation of any key to bring to the printing point the type number representing the value of such key, a platen actuated by the keys and co-operating with the type carrier, a pair of feed rollers for moving a paper strip between the type-carrier and platen, a knife for cutting said strip into separate checks or tickets, and means, as a lever or handle, for actuating the feed rollers and knife, whereby upon operating a given key its value will be printed upon said paper strip and upon then operating said handle or lever the paper strip will be advanced and the printed check or ticket severed therefrom, substantially as described.

6. The combination of a series of operating keys representing different values, a type-wheel bearing two diametrically opposite series of type numbers, each representing the values of the respective keys, means intermediate the keys and type-wheel for turning the latter at the operation of a given key to bring to the printing points the two type numbers representing the value of such key, two platens actuated by the keys and co-operating with the opposite series of type numbers, a record-strip led between one of the platens and the type-wheel, a pair of feed rollers for moving a check-strip between the opposite platen and type-wheel, a knife for cutting the check-strip into separate checks or tickets, and means for actuating the feed rollers and knife, whereby upon operating a

key its value may be printed upon both the record-strip and a check-strip, and upon then actuating the feed rollers and knife the check-strip may be advanced and the printed check-strip severed therefrom, substantially as described.

7. The combination of a series of operating keys representing different values, a movable frame actuated thereby and given different degrees of movement by the different keys proportionate to the values thereof, means for coupling the operated keys to said frame at the beginning of movement of the latter, to prevent overthrow of the frame, a type-carrier geared to said frame and bearing a series of type numbers representing the values of the respective keys, a platen actuated by the keys and co-operating with the type-carrier, a pair of feed rollers for moving the paper strip between the platen and type-carrier, a knife for cutting said strip into separate checks, and means for actuating the feed rollers and knife, substantially as and for the purpose described.

8. The combination of a series of operating keys representing different values, a movable frame actuated thereby and given different degrees of movement by the different keys proportionate to the values thereof, a type-wheel geared to said frame and provided with two diametrically opposite series of type numbers, each representing the values of the respective keys, two platens actuated by the keys and co-operating with the opposite series of type numbers, a record strip carried upon supply and storage reels and led between one platen and the type-wheel, a pair of feed rollers for moving a check strip between the opposite platen and the type-wheel, a knife for cutting said check-strip into separate checks, and means for actuating the feed rollers and knife, substantially as and for the purpose described.

9. The combination of a series of operating keys representing different values, a type-carrier bearing a series of type-numbers representing corresponding values, means intermediate the keys and type-carrier for moving the latter at the operation of a given key to bring to the printing point the type-number representing the value of such key, a platen actuated by the keys and co-operating with the type-carrier, a rotary type cylinder, types carried thereby, an inking roller and an impression roller co-operating with the type-cylinder, said type-cylinder and impression roller operating as feed-rollers to advance the check-strip led between the platen and type-carrier, and an operating handle for actuating the impression-roller and type-cylinder, whereby upon operating any key in the series its value will be printed upon the check-strip, and upon then operating the handle the check-strip will be advanced and the printed check delivered from the machine, substantially as described.

10. The combination of a series of operating keys representing different values, a type-carrier bearing a series of type-numbers repre-

sented corresponding values, means intermediate the keys and type-carrier for moving the latter at the operation of a given key to bring to the printing point the type-number representing the value of such key, a platen actuated by the keys and co-operating with the type-carrier, a rotary type-cylinder containing a set of consecutive-numbering type-wheels actuated automatically by the revolutions of the cylinder, and containing also a set of dating type wheels, an inking-roller and an impression-roller co-operating with the type cylinder, the impression-roller and type-cylinder operating as feed-rollers to advance a check-strip led between the platen and type-carrier, and an operating handle for actuating the impression-roller and type-carrier, whereby upon operating any key in the series its value will be printed upon the check-strip, and upon then operating the handle the check-strip will be advanced and the check numbered and dated and delivered from the machine, substantially as described.

11. The combination of a series of operating keys representing different values, a type-carrier bearing a series of type numbers representing corresponding values, means intermediate the keys and type-carrier for moving the latter at the operation of a given key to bring to the printing point the type number representing the value of such key, a platen actuated by the keys and co-operating with the type-carrier, a rotary type-cylinder, a set of consecutive-numbering type-wheels mounted therein and actuated automatically by the revolutions of the cylinder, an inking roller and an impression roller co-operating with the type-cylinder, said type-cylinder and impression roller operating as feed rollers to advance a check-strip led between the platen and type carrier, a knife for severing said check strip, and means, as an operating handle or lever, for actuating the knife and the impression roller and type-cylinder, whereby upon operating any key in the series its value will be printed upon the check-strip, and upon then operating the lever or handle the check-strip will be advanced, the consecutive number of the printed ticket printed thereon, and the ticket severed from the strip, substantially as described.

12. The combination of a series of operating keys representing different values, a type-carrier bearing a series of type numbers representing corresponding values, means intermediate the keys and type-carrier for moving the latter at the operation of a key to bring to the printing point the type number representing the value of such key, a platen actuated by the keys and co-operating with the type-carrier, a type-cylinder containing a set of consecutive numbering type wheels actuated automatically by the revolutions of the cylinder, and containing also a set of dating type-wheels, and bearing type matter upon its surface, an inking roller and an impression roller co-operating with the type-cyl-

inder, the impression roller and type-cylinder operating as feed rollers to advance a paper strip led between the platen and type-carrier, a knife for severing said check-strip and means for actuating the knife and the impression roller and type-cylinder, substantially as and for the purpose described.

13. The combination of a series of operating keys representing different values, a type-wheel provided with two diametrically opposite series of type numbers, each representing the values of the respective keys, means intermediate the keys and type-wheel for turning the latter at the operation of a key to bring to the printing points the two numbers respectively representing the value of such key, two platens actuated by the keys and co-operating with the opposite series of type numbers, a record-strip carried upon supply and storage reels and led between one platen and the type-wheel, a type-cylinder containing a set of consecutive-numbering type-wheels actuated automatically by the revolutions of the type-cylinder, and containing also a set of dating type-wheels, an inking roller and an impression roller co-operating with the type-cylinder, the impression roller and type-cylinder operating as feed rollers to advance a check strip led between the platen and type-wheel opposite the record strip, a knife for cutting the check-strip into separate tickets, and means for actuating the knife and the impression roller and type-cylinder, substantially as and for the purpose described.

14. The combination of a series of operating keys divided into separate sets, the different keys in each set representing different values, a series of type-carriers, one for each set of keys, and bearing a series of type numbers representing the values of the respective keys in such set, means intermediate each set of keys and its corresponding type-carrier for moving the latter at the operation of any key in the set to bring to the printing point the type number representing the value of such operated key, a platen co-operating with the type-carriers, a movable bar or frame common to all of the keys of the several sets, and means for coupling displaced keys in different sets to said movable bar or frame, whereby upon starting two or more keys in different sets they become coupled to said movable bar or frame, so that the operation of all of them and the printing of their combined values may be effected by giving a full movement to any one or another of them, substantially as described.

15. The combination of a series of operating keys divided into separate sets, the different keys in each set representing different values, a series of type-carriers, one corresponding to each set of keys and bearing a series of type numbers representing the values of the keys in such set, means intermediate each set of keys and its corresponding type-carrier for moving the latter at the operation of any key

in the set to bring to the printing point the type-number representing the value of such operated key a platen co-operating with the type-carriers, a movable bar or frame common to all of the keys of the several sets, and means for coupling to said bar keys in different sets successively displaced from normal position, whereby two or more keys in different sets may be successively started and coupled to said movable bar or frame and the operation of all of them then completed and the printing of their combined values effected by completing the movement of any one of them, substantially as described.

16. The combination of a series of operating keys divided into separate sets, the different keys in each set representing different values, a series of type-carriers, one corresponding to each set of keys and bearing a series of type numbers representing the values of the keys in such set, means intermediate each set of keys and its corresponding type-carrier for moving the latter at the operation of any key in the set to bring to the printing point the type-number representing the value of such operated key, a platen co-operating with the type-carriers, a movable bar or frame common to all of the keys of the several sets, means for successively coupling displaced keys in different sets to said movable bar or frame and an arresting device applied to said frame to prevent the return of the same to normal position, after being displaced therefrom, until given its full movement in one direction, substantially as and for the purpose described.

17. The combination of a series of operating keys divided into sets, different keys in each set representing different values, a series of type-wheels, one corresponding to each of the sets of keys and bearing upon its periphery two diametrically opposite series of type numbers each representing the values of the respective keys in such set, means intermediate such set of keys and its corresponding type-carrier for moving the latter at the operation of any key in the set to bring to the printing point the type-number representing the value of such operated key, two platens co-operating with the opposite series of type-numbers and adapted to print corresponding amounts upon a record strip and a check strip passed between the platens and type wheels upon opposite sides of the latter, a movable bar or frame common to the keys of the several sets, and means for coupling to said bar keys successively started in the different sets, substantially as and for the purpose described.

18. The combination of a series of operating keys representing different values, a type wheel bearing two diametrically opposite series of type numbers each representing the values of the respective keys, means intermediate the keys and type-wheel for moving the latter at the operation of a key to bring to the printing points two type numbers representing the value of such key, two platens actu-

ated by the keys and co-operating with the type-wheel and adapted to print corresponding amounts upon a record-strip and a check or check-strip passed between the platens and type-wheel on opposite sides of the latter, and means for temporarily throwing one of said platens out of operation at will, whereby the printing at one side of the type-wheel may be temporarily discontinued without affecting that at the opposite side thereof, substantially as described.

19. The combination of a series of operating keys representing different values, a type-wheel bearing two diametrically opposite series of type numbers each representing the values of the respective keys, means intermediate the keys and type wheel for moving the latter at the operation of a key to bring to the printing points the two type numbers representing the value of such key, two spring actuated platens co-operating with the type-wheel and adapted to print corresponding amounts upon a record-strip and a check or check-strip passed between the platens and type-wheel at opposite sides of the latter, means actuated by the keys for retracting the platens and putting their springs under tension during the down stroke of the operated key and releasing them at the end of such stroke, and a cam co-operating with the check-printing platen for temporarily throwing the latter out of operation at will, substantially as and for the purpose described.

20. The combination of the operating keys, the lifters G actuated thereby, the cam plate O and the three oscillating frames co-operating with the lifters, the segments P Q R carried by the respective frames, the shaft L' and sleeves M' N' loose thereon, the pinions I' J' K' fast upon the shaft and sleeves and meshing with the segments P Q R, the type wheels P' Q' R' fast upon the opposite ends of the sleeves and shaft, and a platen actuated by the keys and co-operating with the type wheels, substantially as described.

21. The combination of the operating keys, the lifters G actuated thereby, the cam plate O and the three oscillating frames co-operating with the lifters, the segments P Q R carried by said frames, the registering wheels T U V mounted in the rocking frame X and provided with pinions S, means actuated by the operating keys for rocking the frame X to throw the pinions S into and out of mesh with the segments P Q R at the opposite ends of the strokes of the latter, the shaft L' and sleeves M' N' loose thereon, the pinions I' J' K' fast upon the shaft and sleeves and meshing with the respective segments, the type wheels P' Q' R' fast upon the outer ends of

the shaft and sleeves, and a platen actuated by the keys and co-operating with the type wheels, substantially as described.

22. The combination of the type cylinder X', the impression roller W' and inking roller Q⁴ co-operating therewith and geared to it, the pinion N³ loose upon the shaft of the roller W', a clutch between said pinion and shaft, the reciprocating lever P³ provided with the rack O³ meshing with the pinion N³, the fixed knife bar T³, the hinged knife bar U³ co-operating therewith, the lever X³ actuated by the lever P³, and the link A⁴ connecting the lever X³ with the knife bar U³, substantially as described.

23. The combination of the operating keys A, the type-wheels P' Q' R', means intermediate the keys and type-wheels for setting the latter, a platen actuated by the keys and co-operating with the type wheels, a reel S' for holding a roll of paper strip, the guide-way V' for directing the paper strip from the supply roll across the type-wheels, the rotary type-cylinder X' containing a set of consecutive-numbering wheels and a set of dating wheels, the impression roller W' and inking roller Q⁴ co-operating with the type-cylinder and geared thereto, the pinion N³ loose upon the shaft of the roller W', a clutch between said pinion and shaft, the lever P³ provided with the rack O³ meshing with the pinion N³, the fixed knife bar T³, and the hinged knife bar U³ co-operating therewith and actuated by the lever P³, substantially as described.

24. The combination of the roller W', the pinion N³ loose upon the shaft thereof, a clutch between the pinion and shaft, the reciprocating operating lever P³ provided with the rack O³ meshing with the pinion N³, and the lever J⁴ co-operating at one end with a projection, as K⁴, upon the shaft of the roller W', and at its opposite end with the lever P³, substantially as and for the purpose described.

25. The combination of the operating keys, A, the type-wheels, means intermediate the keys and type-wheels for setting the latter, the two spring-actuated bell-crank levers P² Q², connected as by the pin X² and projection Y², and carrying the platens L² M² co-operating with the opposite series of type numbers upon the wheels, means actuated by the keys for retracting said levers and platens against the resistance of their springs, and the cam F⁴ co-operating with the lever P² for temporarily holding the platen L² out of operation when desired, substantially as described,

THOMAS CARNEY.

Witnesses:

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