

(No Model.)

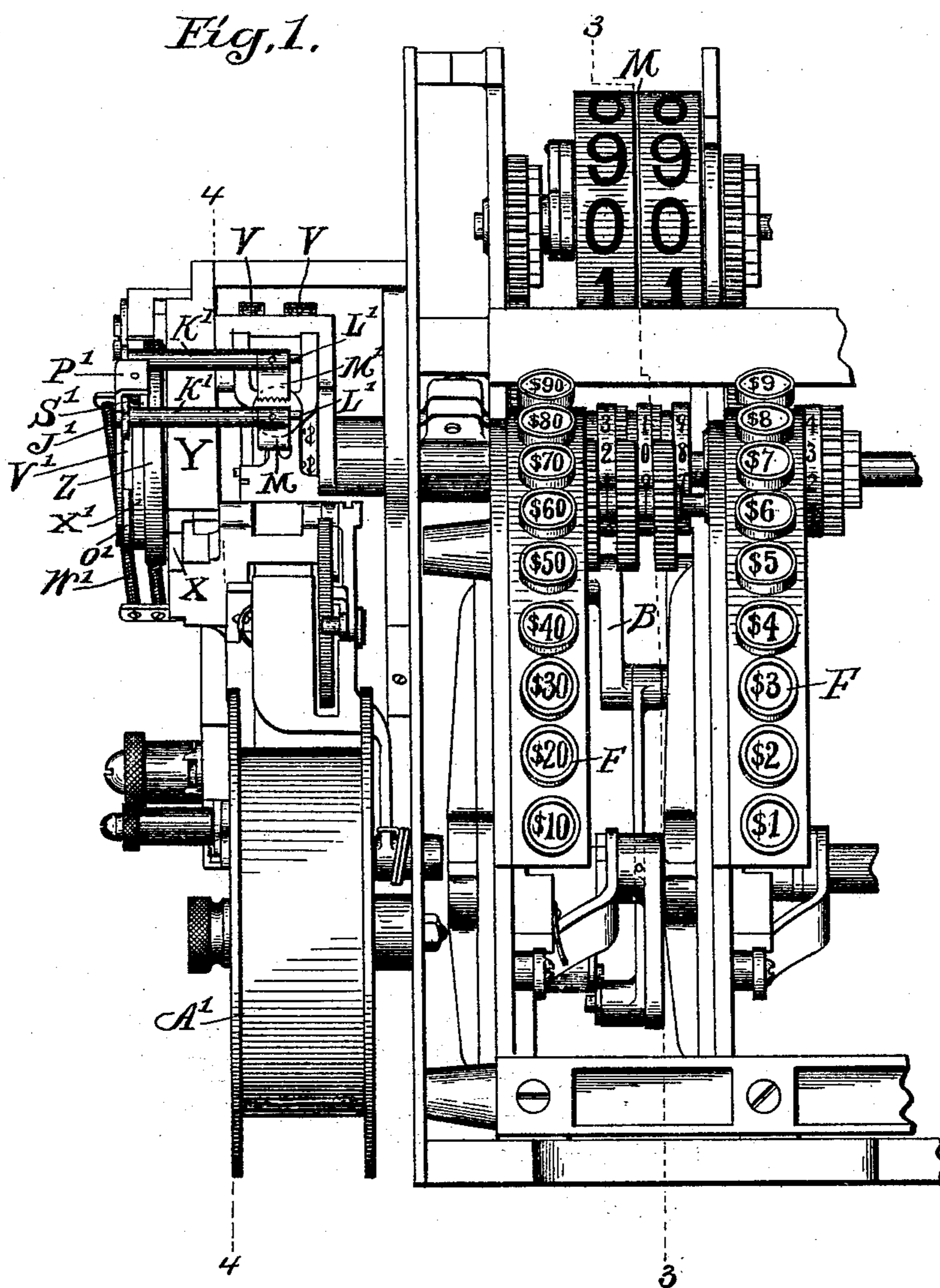
4 Sheets—Sheet 1.

G. W. GROVE.

CHECK EJECTOR FOR CHECK PRINTING CASH REGISTERS.

No. 509,660.

Patented Nov. 28, 1893.



Witnesses,
J. H. Brainard,
R. B. Caffray.

Inventor.
George W. Grave
by Edward Rector
his atty

(No Model.)

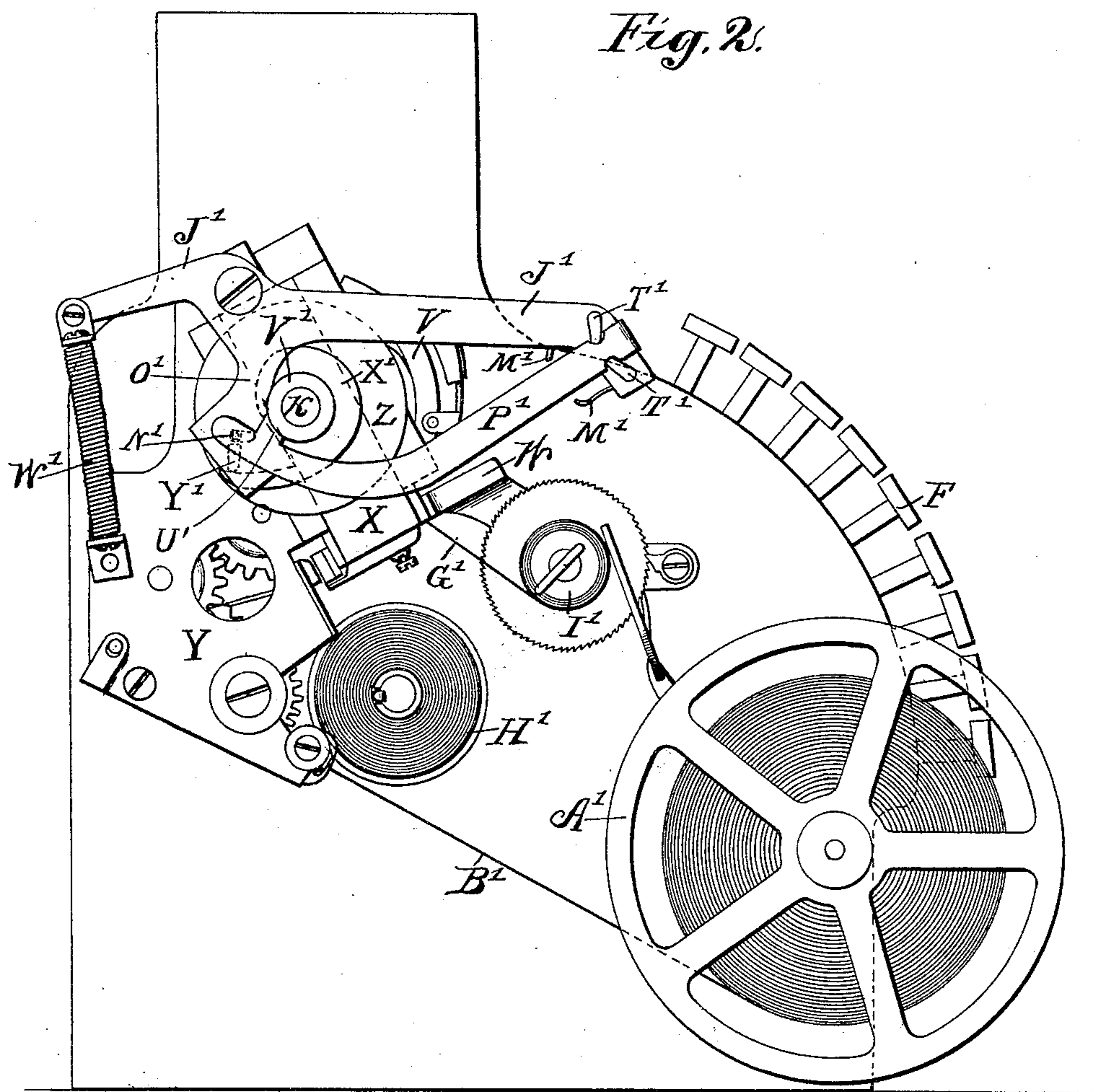
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(No Model.)

4 Sheets—Sheet 3.

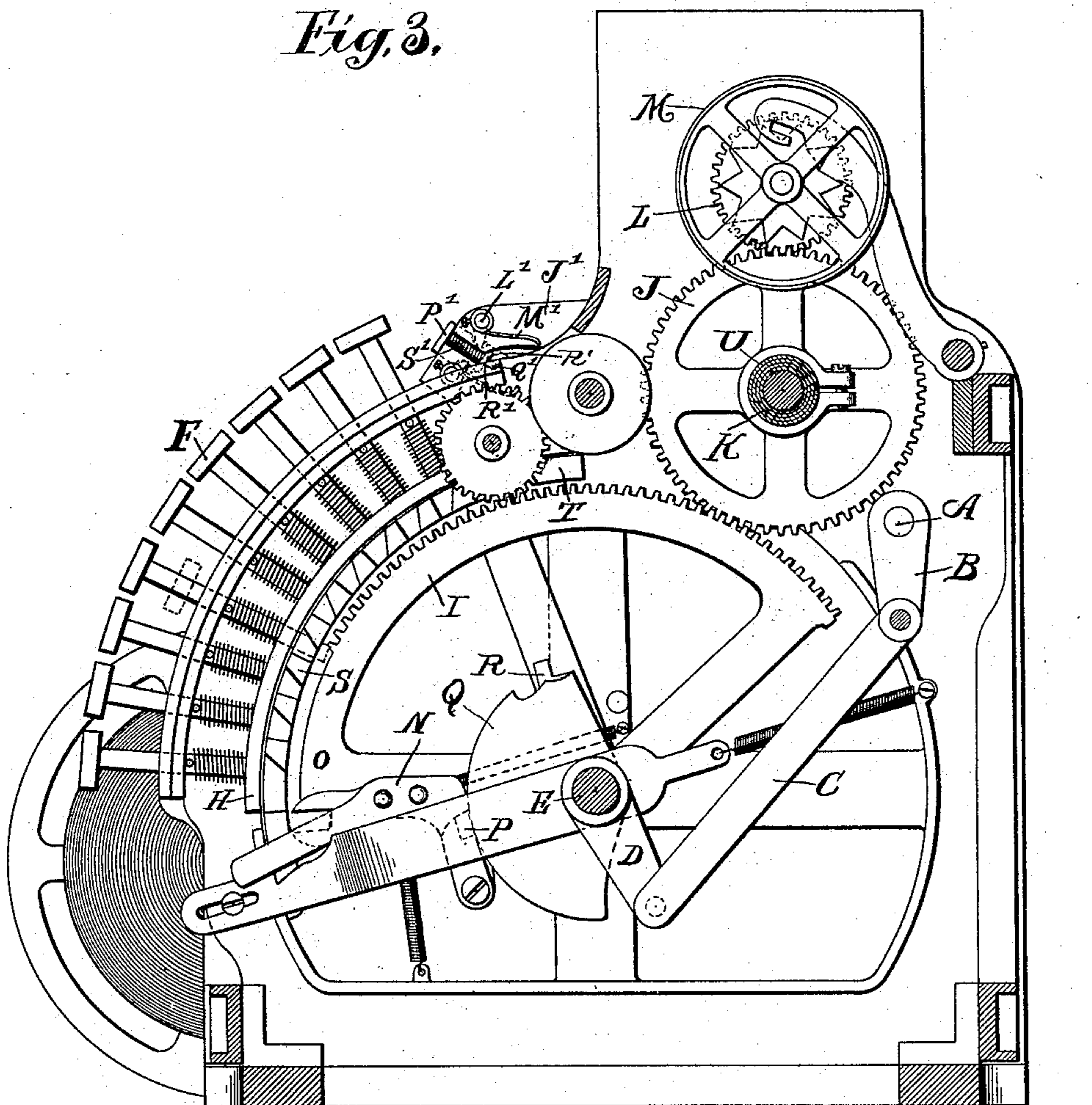
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Fig. 3.



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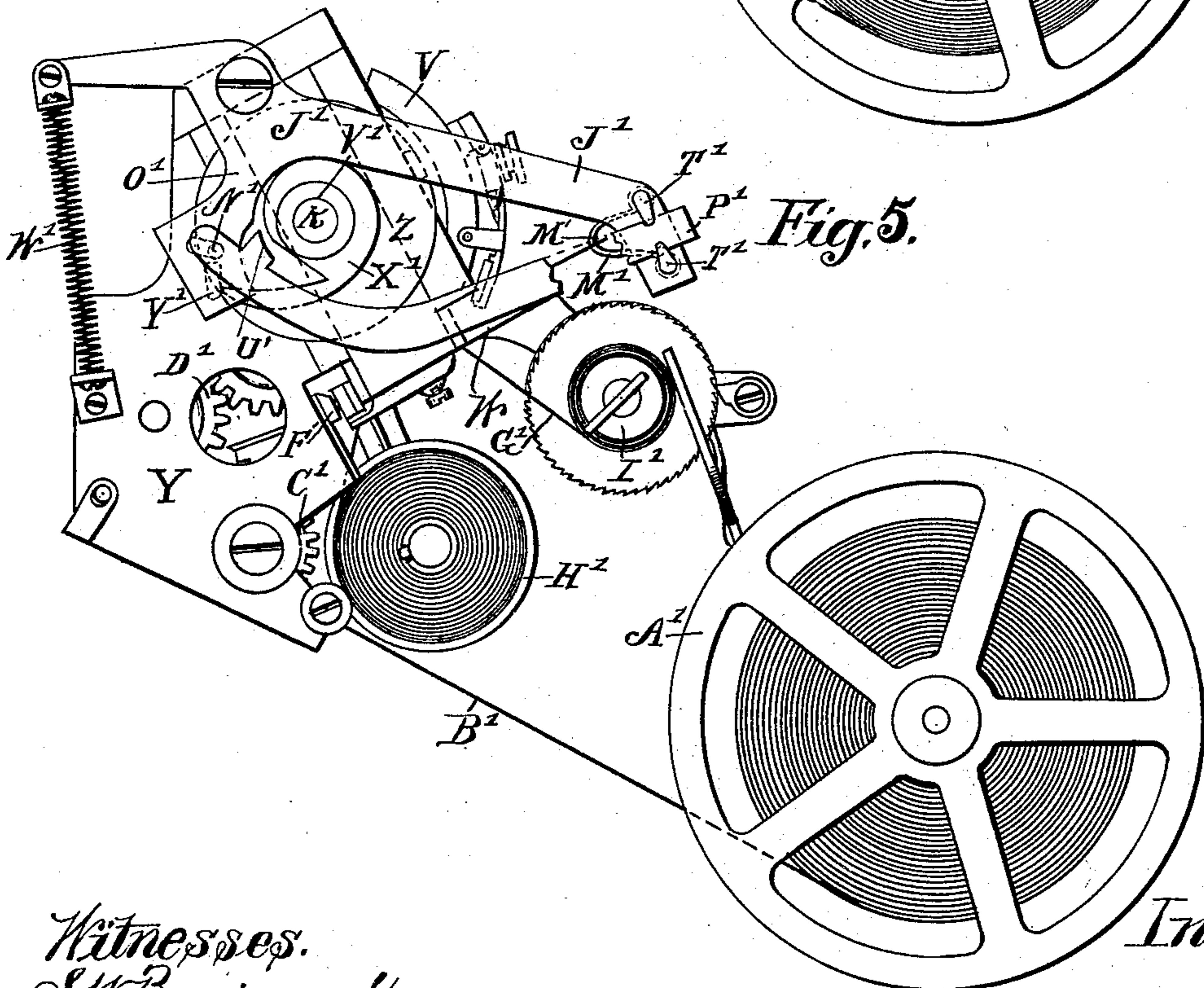
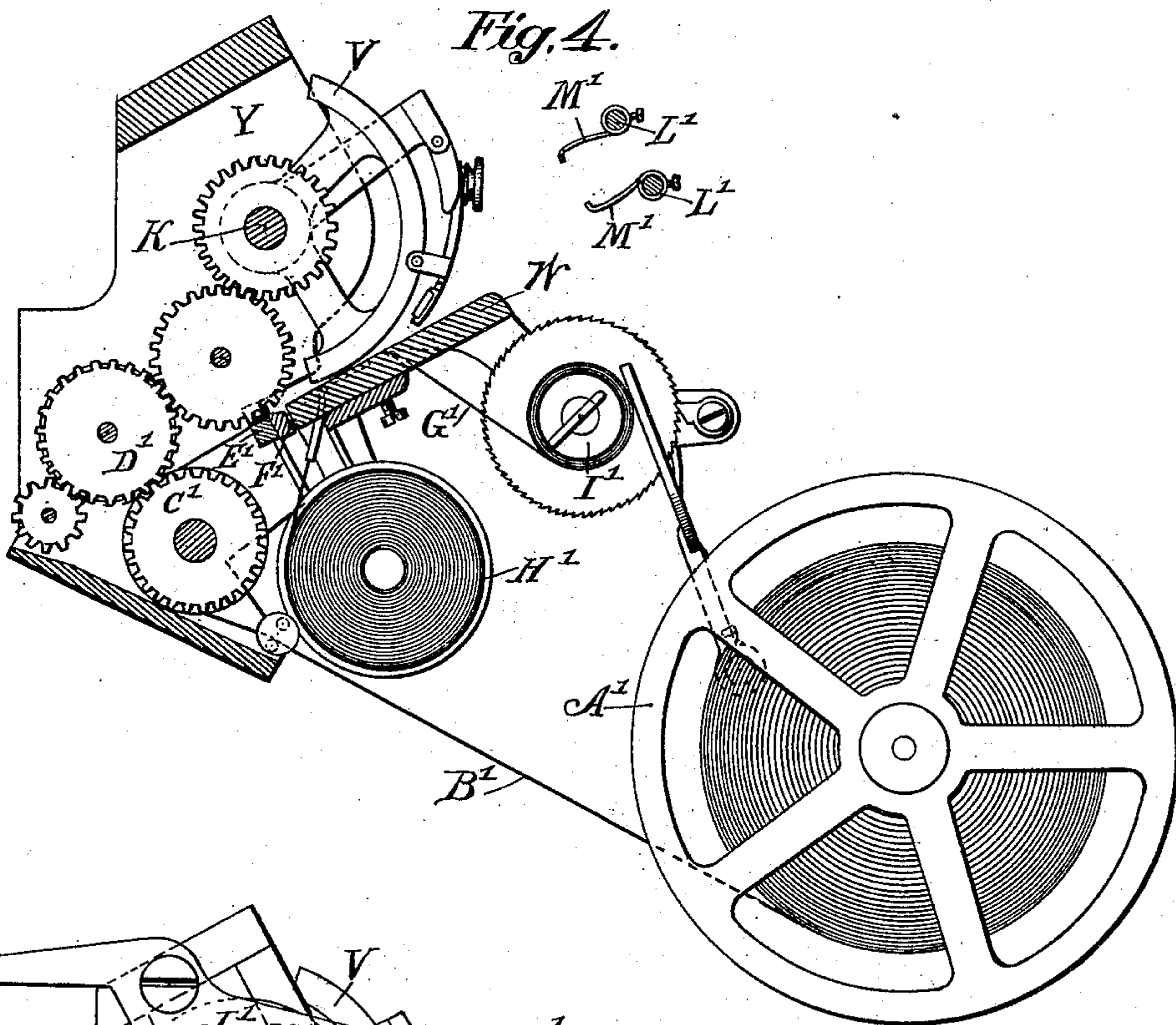
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UNITED STATES PATENT OFFICE.

GEORGE W. GROVE, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CHECK-EJECTOR FOR CHECK-PRINTING CASH-REGISTERS.

SPECIFICATION forming part of Letters Patent No. 509,660, dated November 28, 1893.

Application filed July 15, 1893. Serial No. 480,634. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. GROVE, 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 relates to that class of cash registers which contain a printing attachment for printing the different amounts upon paper checks or tickets, a supply of which is preferably carried in the form of a paper strip wound upon a reel, a given length of the strip being fed out and cut off at each operation of the machine, to form a detached check.

It relates more particularly to machines of the character shown and described in Letters Patent of the United States No. 464,294, of December 1, 1891, and No. 483,511, of September 27, 1892, granted to Hugo Cook; and it consists in the combination of a check-ejector with the printing attachment, by which after a check has been printed and severed from the paper strip it is automatically ejected or delivered from the machine.

In the accompanying drawings Figure 1 is a front elevation of the left hand end of the mechanism of a machine such as those above referred to, with its casing removed; Fig. 2 an end elevation of the left hand end of the same; Fig. 3 a vertical section approximately on the line 3—3 of Fig. 1; Fig. 4 a vertical section approximately on the line 4—4 of Fig. 1; and Fig. 5 a detail elevation of the left hand end of the machine, showing the check-ejector in position for gripping the printed check.

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

The machine illustrated in the drawings is of that class in which are employed a driving mechanism having a uniform movement at each operation of the machine, a latch or coupling device for intermittently connecting such driving mechanism with the indicating, registering or printing mechanism, and a series of keys co-operating with the latch or coupling device for determining the point of connection or disconnection of the driving

mechanism with the other mechanisms and consequently controlling the extent of movement to be imparted to the latter mechanisms. Such machines usually contain four sets or banks of keys, having nine keys in each set, the keys in each set representing the nine digits or multiples thereof in ten, and designating respectively units of cents, tens of cents, units of dollars and tens of dollars. The machines shown in the drawings employ four such sets of keys, but inasmuch as only the left hand end of the machine is illustrated only two sets of keys are shown, these sets representing respectively units and tens of dollars.

The driving shaft of the machine is a revoluble shaft A having interposed in it a crank B, Figs. 1 and 3, to which is connected the upper rear end of a link C whose lower forward end is pivoted to an arm D fast upon a central rock-shaft E. The shaft A is given a complete revolution at each operation of the machine by a handle or suitable connections at its right hand end, not shown, and the shaft E thereby oscillated forward and backward a definite distance.

The numbered keys F are mounted radially to the shaft E in segmental guide plates G H and are surrounded between said plates by coiled springs which bear at their inner ends against the plate H and at their outer ends against pins passed through the stems of the keys, and thereby press the keys outward and yieldingly hold them in normal position.

Loosely mounted upon the rock-shaft E, one approximately in line with each set of keys, are four gear-toothed sectors I which mesh with gear wheels J loosely mounted upon a shaft K, while the wheels J mesh with smaller gears L fast upon the sides of the numbered indicator wheels M. Pivoted to the side of each sector I at its lower forward end is a latch plate N provided with an open mouth O at its outer end and a recess P upon its rear side. Fast upon the rock-shaft E are four cam plates Q, one beside each sector I, and each cam plate has fast upon its side at its upper end a coupling lug R adapted to co-operate with the recess P in the pivoted latch N. Each of the keys F is provided near its inner end with a notch, which, when the

key is pressed inward, is adapted to be engaged by a beveled detent S upon the side of a sliding detent-plate T and held in its inner position against the stress of its spring. The other details of construction and the exact mode of operation of these coupling or connecting devices between the rock-shaft E and sectors I are fully described in Patent No. 464,294 heretofore referred to, so that a detailed explanation of them is thought unnecessary here. It will suffice to say that if one of the keys F be pressed inward and caught and held by the detent plate T, and the driving shaft A be then given a complete revolution, the coupling lug R at the end of the forward oscillation of the rock-shaft E will engage the recess P in the latter plate N and thereby couple the shaft E to the sector I, so that during the backward oscillation of said shaft the sector I will be carried with it until the outer end of the latch plate N engages the inner end of the key which has been pressed inward, whereupon the mouth O of the latch plate will embrace the end of the key, the latch plate rock upon its pivot until its recess P is disengaged from the lug R and the sector I be arrested, while the shaft E, plate Q and lug R will move on backward to normal position alone. When the sectors I stand in the position shown in Fig. 3 the indicator wheels M and the type wheels or carriers hereinafter referred to stand at zero or initial position, and the adjustment of the parts is such that when the sector I in its backward movement is arrested by the inner end of any operated key the numbers upon the indicator and type wheels which correspond to the value of such key will have been brought to the indicating and printing points respectively and the registering mechanism will have been actuated to add the value of such key to the amount theretofore registered.

The four gear wheels J which mesh with the sectors I are secured upon concentric sleeves U which are loosely mounted upon the shaft K, while secured upon the extreme left hand end of said sleeves are four segmental type-carriers V, Figs. 1 and 4, as fully explained in Letters Patent No. 483,511 heretofore referred to. Co-operating with the type-carriers V is a reciprocating impression plate or platen W which is carried by a plate X adapted to reciprocate in a guide way in a frame-plate Y which incloses and supports the printing mechanism. The plate X is reciprocated, to carry the platen W against and away from the type-carriers, by a cam upon the inner face of a disk Z which is fast upon the outer end of the shaft K, and which has been fully described in the patent last above referred to and need not be explained in detail here.

Carried in a supply roll upon a reel A' is the paper check-strip B', which is led upward and rearward between a pair of feed-rollers C' D' and thence forward between the type-

carriers V and platen W. Between the feed-rollers and platen the paper strip is led through a slot in a cross bar E', Fig. 4, and the plate W carries at its rear edge a shearing bar F' which co-operates with the front side of the slotted bar E' to shear off the check each time the platen W is lifted against the type-carrier to effect the printing.

The record-strip G' is carried in a supply roll upon a reel H' mounted upon a support depending from the plate W and is led thence upward through an aperture in said plate, thenceforward, and thence downward through a second aperture and around a storage reel I', the latter being actuated by the reciprocations of the plate W, to advance the record-strip, in the manner explained in the patent above referred to.

From the foregoing description it will be understood that whenever a key in one or more of the sets is pressed in and the driving shaft given a complete revolution the indicator wheels will be turned until the numbers representing the values of such keys are brought to the indicating point and the type-carrier will be adjusted to bring the corresponding type numbers to the printing point, and the platen will then be lifted against the carriers to print the amount upon the paper check-strip, the latter being simultaneously severed to form a detached check. At the end of the operation of the machine, therefore, the printed check would be left lying upon the platen plate W and would have to be removed therefrom by hand. If not removed then at the next operation of the machine it was liable to slip backward or otherwise become displaced and clog up the machine and interfere with the printing of the next check.

It is the object of my invention to provide automatic means for ejecting the printed check or delivering it from the printing point at the end of each operation of the machine. The means which I have provided in the present instance consist of a gripping device which takes hold of the check while it is being printed and at the end of the operation moves it forward from the printing point. This device may now be described as follows: Pivoted to the outer side of the frame plate Y near its upper end, Fig. 2, is a lever J' which has secured to the right hand side of its forward end two tubular bearings K', Fig. 1, projecting to the right in front of the type-carriers V and having journaled in them rock-shafts L' which have fast upon their extreme right hand ends serrated gripping fingers or jaws M'. Connected at its rear end by a slot and pin at N' to a downwardly projecting arm O' of the lever J', Figs. 2 and 5, is an arm or link P' whose extreme forward end is bent to the right at right angles and overlaps the end of the lever J', Figs. 1 and 3. This bent forward end of the arm P' has secured to it a pin Q' projecting rearwardly in line with the arm, Fig. 3, and pass-

ing loosely through an aperture in a small plate R' projecting to the right from and rigid upon the lever J'. A spring S' coiled around the pin Q' and confined between the plate R' and bent end of the arm P' constantly presses the latter forward. The rock-shafts L' project at their left hand ends through apertures in the lever J' and have fast upon them short arms T', Figs. 2 and 5, whose inner ends fit in notches in the opposite edges of the arm P'. It results from this that if the arm P' be moved forward the shafts L' will be rocked and the serrated ends of the fingers M' thrown together to grip anything inserted between them. It also results from the employment of the spring S' above described that the arm P' is constantly tending to move forward and throw the gripping fingers together. It is normally held from forward movement by the engagement of a bearing U' upon its rear end with the hub V' of the disk Z which is fast upon the shaft K as before explained. The lever J' is yieldingly held in normal position with its arm O' bearing against the same hub V' by springs W' connected to its rear end. Fast upon the side of the disk Z is a snail cam X' which is adapted to co-operate in the revolutions of the shaft K and disk Z with a lug Y' and also with the pin N' which is fast upon the rear end of the arm P' and projects through the slot in the arm O'. At each operation of the machine the cam X' will, during the latter half of the revolution of the shaft K, engage both the lug Y' and pin N' and press both the arm O' and arm P' rearward and throw the front ends of the lever J' and arm P' downward, causing the open fingers or gripping jaws M' to embrace (but not grip) the forward end of the check which is being printed and whose front end extends forward of the plate W. During this movement of the parts the pin N' is in the rear end of its slot in the arm O' of the lever J', and the arm P' is held in this position relatively to the lever J', against the stress of the spring Q' tending to throw it forward, by the engagement of the cam with the pin N'. Shortly before the end of the operation the tail of the cam will clear the pin N' and release the arm P', whereupon the spring Q' will throw it forward and rock the shafts L' and cause the fingers M' to grip the projecting front end of the ticket, as seen in Fig. 5; and just after this has been done the tail of the cam will clear the lug Y' upon the arm O' of the lever J' and release the latter, whereupon its springs W' will throw it back to normal position, causing its front end to move upward quickly and carry the printed check with it, and when the bearing U' of the arm P' engages the hub V' of the disk Z and is arrested thereby the further forward movement of the front end of the lever J' to the position shown in Fig. 2 will cause the shaft L' to be rocked back to normal position and the gripping jaws thrown open to release the ejected check.

From the foregoing description it will be understood that just at the end of each operation of the machine the gripping fingers will be moved to position to catch hold of the projecting forward end of the printed check and then quickly returned to their normal forward position and thrown open, to carry forward and release the check.

So far as I am aware I am the first in the art to combine an automatic check-ejecting device of any sort with a cash register and indicator employing a check printing mechanism. My invention therefore is not restricted in its broader scope to the details of construction and arrangement which have been illustrated and described, but contemplates broadly the combinations and modes of operation set forth in my respective claims.

Having thus fully described my invention, I claim—

1. In a cash register, the combination of a series of keys representing different values, a type-carrier adapted to print said values, a platen co-operating with the carrier, means for moving a paper-strip past the printing point, means for severing it into detached checks, and an ejector for automatically ejecting the printed check, substantially as described.

2. In a cash register, the combination, with a check-printing mechanism, of an ejector consisting of a reciprocating gripping device, a spring operating to yieldingly hold said device in and return it to normal position, and a rotary cam operating to move said device against the stress of its spring to position to grip the check, and to release it after the check has been printed and permit its spring to restore it to normal position and eject the printed check from the machine, substantially as described.

3. In a cash register, the combination, with a check-printing mechanism, of an ejector consisting of a pair of vibrating gripping fingers or jaws, a spring operating to yieldingly hold said jaws in and return them to normal position, and a rotary cam operating to move said jaws to position to clutch the check and to release them and permit the spring to throw them back to normal position and eject the printed check, substantially as described.

4. In a cash register, the combination with the driving mechanism, a type-carrier, means for intermittently connecting the driving mechanism and type-carrier, a series of keys of different values for determining the degree of movement imparted by the driving mechanism to the type-carrier, and an impression platen co-operating with the carrier, of an ejector actuated by the driving mechanism and operating to automatically eject the printed check, substantially as described.

5. In a cash register, the combination, with the driving mechanism, a type-carrier, means for intermittently connecting the driving mechanism and type-carrier, a series of keys

of different values for determining the degree of movement imparted by the driving mechanism to the type-carrier, an impression platen co-operating with the type-carrier, means for moving the paper check-strip between the type-carrier and platen, and means for cutting the strip into separate checks, of an ejector consisting of a gripping device actuated by the driving mechanism and adapted to automatically grip the printed check and eject it from the machine, substantially as described.

6. In a cash register, the combination, with the driving mechanism, a type-carrier, means for intermittently connecting the driving mechanism and type-carrier, a series of keys of different values for determining the degree of movement imparted by the driving mechanism to the type-carrier, an impression platen co-operating with the type-carrier, means for moving a paper check-strip between the type-carrier and platen, and means for cutting the strip into separate checks, of an ejector for automatically ejecting the printed check, and a rotary cam for actuating the ejector, substantially as described.

7. In a cash register, the combination, with the driving mechanism, a type-carrier, means for intermittently connecting the driving mechanism and type-carrier, a series of keys

of different values for determining the degree of movement imparted by the driving mechanism to the type-carrier, an impression platen co-operating with the type-carrier, means for moving a paper check-strip between the type-carrier and platen, and means for cutting the strip into separate checks, of an ejector consisting of a reciprocating gripping device, a spring for yieldingly holding said device in and returning it to normal position, and a rotary cam operating to move said device into position to clutch a check while the latter is being printed and to release it after the check has been printed and permit the spring to throw it back to normal position and eject the printed check from the machine, substantially as described.

8. In a cash register, the combination, with the check-printing mechanism, of the pivoted lever J', the rock-shafts L' carried thereby and having secured to them the gripping jaws M', the spring-pressed arm P' connected with and adapted to rock the shafts L', and the rotary cam X' co-operating with the arm P' and lever J', substantially as described.

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Witnesses:

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JOSEPH P. CLEAL.