

3 SHEETS—SHEET 1.



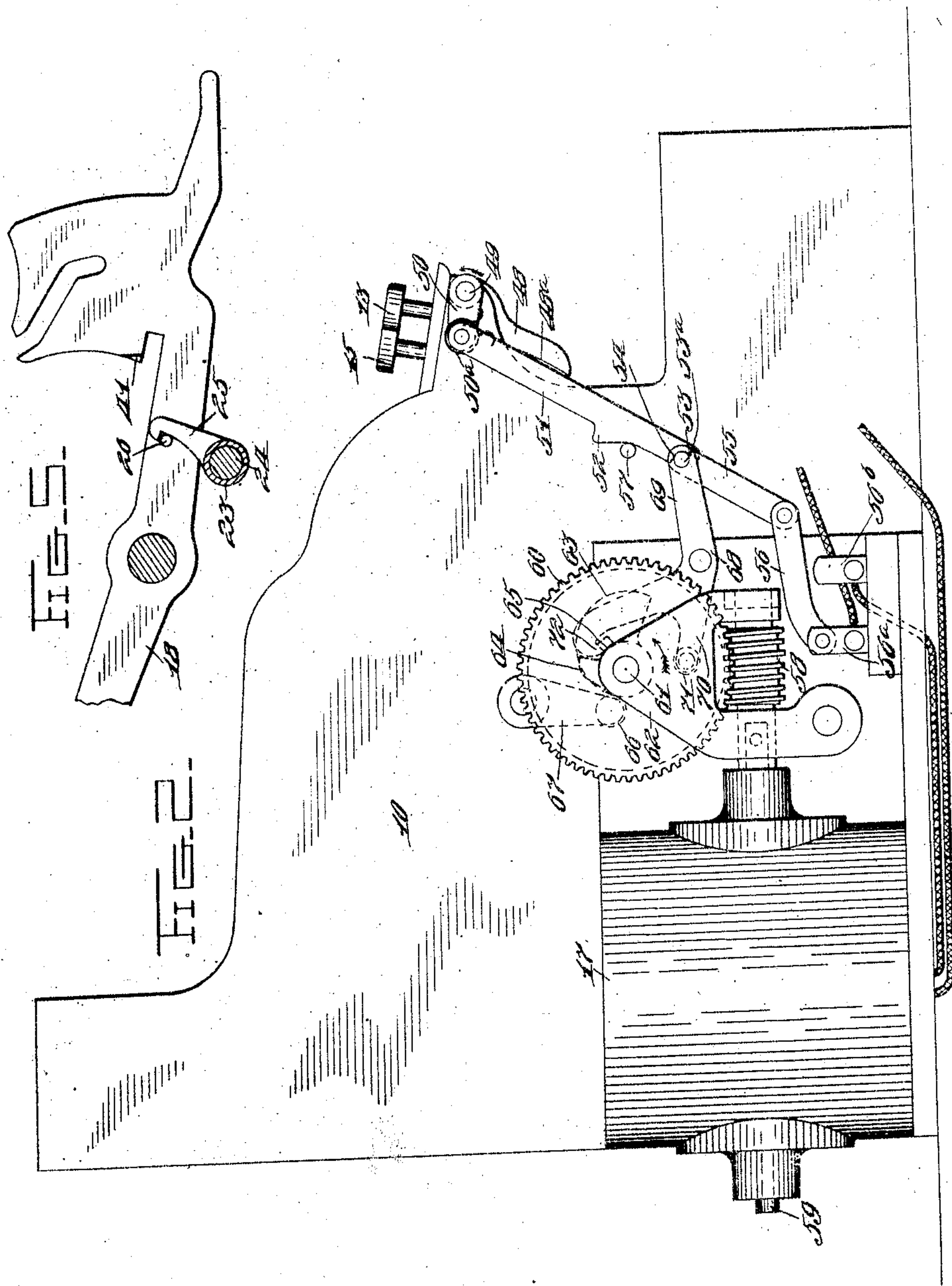
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948,368.

T. CARNEY.
CASH REGISTER.
APPLICATION FILED DEC. 22, 1902.

Patented Feb. 8, 1910.
3 SHEETS—SHEET 2.



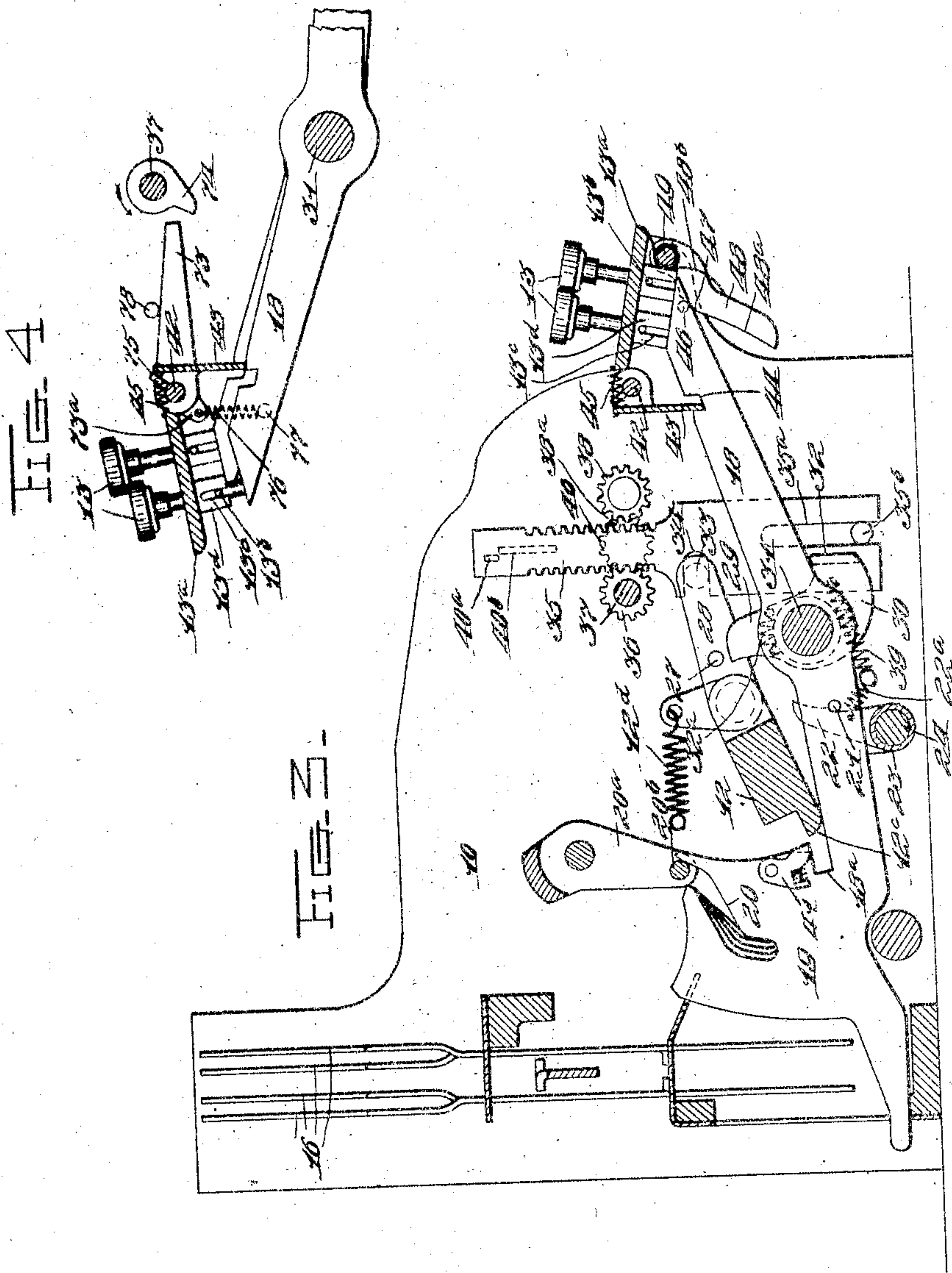
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Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS CARNEY, OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

CASH-REGISTER.

948,368.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed December 22, 1902. Serial No. 136,165.

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 certain new and useful Improvements in Cash-Registers, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in cash registers and has more particular relation to improvements in electrically operated machines.

The object of the invention is to provide a cash register with an improved electrical mechanism, for automatically effecting its operation, after certain elements have been properly set for such operation.

The invention consists of certain novel constructions, combination and arrangements of parts, all of which will be hereinafter more particularly set forth and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 represents a top plan view of the machine embodying my invention, with the cabinet removed. Fig. 2 represents an end elevation of the same, the cash drawer being omitted. Fig. 3 represents a vertical, transverse section through the machine, on the line 3-3 of Fig. 1; the cash drawer being omitted. Fig. 4 represents a detail side elevation of the key levers and their detent; one of the said levers being in a depressed position. Fig. 5 represents a detail side elevation, partly broken away, of one of the clerks' keys and its lock.

In the aforesaid drawings, 10 represents the frame of the machine, 11 the register or counter, 12 the key coupler, 13 the amount keys, 14 the clerks' keys, 15 the special keys, 16 the tablet indicators and 17 the electric motor.

Described in general terms, the machine comprises a series of amount key levers which are coupled by an initial movement to a common operating member. An electric motor is suitably connected with this member, and is provided with a switch, which is operated to break the circuit, by means which connect it with the common operating member. The clerks' keys which operate the switch, to complete the circuit, remain locked until one of the amount keys, or one of the special keys is operated.

The amount keys 13, comprise suitably numbered heads and shanks, which latter are mounted in a supporting and guiding plate 13^a of the main frame. The key shanks are provided with laterally projecting pins 13^b, which operate in slots 13^c of sleeves 13^d, formed on the under side of the plate 13^a. This slot and pin construction prevents the keys from turning in the plate 13^a.

The key levers 18 are journaled upon a transverse shaft 31, so that their forward ends normally project under the lower ends of the key shanks, as shown in dotted lines in Fig. 1. When a key is depressed, the forward end of its respective key lever is correspondingly depressed, and its rear end elevated to effect the coupling with the pivoted key coupler 12.

As a number of the parts shown in the present application are substantially the same in construction, as the parts shown and described in the patent to Carney #583,888, said patent may be referred to for a more detailed description of said parts.

The aforesaid key coupling bar 12 is journaled in the frame of the machine by trunnions 12^a and 12^b, and is arranged to cooperate with notches 18^a formed in their respective key levers, to couple the levers for simultaneous operation. In order, however, that the keys may be operated successively, to couple them to the coupling bar, each of the same is provided with a pivoted, spring pressed pawl 41. When one of the amount or special keys is depressed, it imparts a slight upward movement to the key coupler. This movement is sufficient to cause the coupler to pass under the lower end of the pawl 41. This action prevents the return of the lever, independently of the coupler. After the coupler has been so raised, the operation of the second key lever will cause its pawl 41 to engage the key coupler, as said lever rises, and thus force the pawl backward against the tension of its spring, so that, when it passes above the coupler flange 12^c, it will again spring forward over the same and become coupled thereto.

The key coupler is limited in its initial movement by a stop nose 29, formed on a pivoted yoke 32, so as to normally project into the path of a pin 27, carried by an arm 28, integral with the key coupler. This yoke 32 projects under all of the clerks' key levers

18 and is held in its normal position by a coiled spring 32^a which connects it with the stationary shaft 31 as shown in dotted line in Fig. 3. When one of the clerks' key le-
 5 vers is depressed the frame 32 is rocked and the nose 29 is moved out of the path of the pin 27, to permit the coupler to be operated.

The keys of this machine, as is usual in cash registers, are divided into a series of
 10 banks, and each of these banks is provided with one of a series of detent plates 43. These plates are pivotally mounted upon a rock shaft 42, and each of the same is held in its normal position by a coil spring 45,
 15 which connects it with the stationary plate 13^a. (See Fig. 1.) The lower edges of the plates 43 project into notches 44 formed in the key levers. When a key lever is given its initial movement its respective detent 43,
 20 will be rocked slightly forward, by the rear wall of the notch 44, until the lever passes free of the detent, when the latter will assume its normal position, and lock the key lever in its depressed position, by passing
 25 over the same as shown in Fig. 4. One of the detents 43 is provided, as before stated, for each bank of keys; but as the special keys 15 must be operated independently of the regular keys, they are each provided
 30 with an independent detent, as clearly shown in Fig. 1.

The detents are rocked forward, to permit the operated key levers to return to their normal positions, by a series of pins 75, fast
 35 on the shaft 42, and arranged to engage the upper edges of the plates 43, as plainly shown in Fig. 4. The shaft is rocked near the end of the operation of the machine, by an arm 73 which is fast thereto, and which
 40 is engaged and operated by a cam 74, fast on a transverse rotation shaft 37. This shaft is given one rotation during each operation of the machine as hereinafter described. The lever 73 is held in its normal position
 45 against the stop pin 78 by a coil spring 76 which connects an arm 73^a thereof with a pin 77 on the main frame (see Fig. 4).

As it is desirable to prevent the operation of any one of the clerks' keys until after one
 50 of the amount keys, or one of the special keys has been operated, each of the clerks' key levers is provided with a stop pin 26 best shown in Fig. 5. These pins are normally engaged by hook arms 25, mounted on
 55 a sleeve 23 fast to a transverse rock shaft 24. This shaft also carries a series of cam arms 22, which project upward in proximity to each of the amount keys and special keys. These cam arms engage pins 21, projecting
 60 from the amount and special key levers so as to be rocked thereby.

It will be seen from the above that, when one of the amount or special key levers is
 65 operated, the shaft 24 will be rocked rearward and thus disengage arms 25, from pins

26, to release all of the clerks' keys. The latching arms and cam arms are returned to their normal positions by a suitable coil spring 22^a which connects one of said arms with the main frame.

Each of the key levers 18, except those of the special keys 15, is formed with a cam slot 20. These slots of each bank are of graduated formation relative to a bar 20^b of the registering frame 20^a with which they
 75 coöperate, as shown in Fig. 3.

The pivoted, registering frames 20^a, carry suitable rack segments and are mounted above the respective key banks. Each of these frames is provided with a cross bar 20^b
 80 which when a key lever is operated, is engaged by the walls of the cam slot of said key and the frame 20^a, thus rocked to a greater or less degree, according to the value of the key operated.

The operating rack segments carried by the registering frames coöperate with the pinions of the counter wheels, to impart movement thereto, in a manner well known in the art, and described in the aforesaid
 90 patent.

The tablet indicators 16 are mounted to coöperate with the rear ends of the key levers substantially as described in the said
 95 patent.

The oscillatory movement of the key coupler 12, is converted into rotary movement of the shaft 37 by means of a rack bar 35. This bar is formed with a horizontal slot 34, into which projects a pin 33 mounted
 100 on the arm 28. By this means, the bar 35 is raised and lowered with the key coupler. At its lower end, the bar is formed with a vertical slot 35^a, through which projects a guiding and fulcrum pin 35^b mounted on
 105 the main frame. The opposite edges of the upper portion of the bar are formed with rack teeth which are adapted to alternately engage and operate pinions 36 and 38. These pinions are connected, at one side of the rack
 110 bar, by an intermediate pinion 40 whereby the pinion 36 is continuously rotated in the same direction, even though the pinion 38 travels in an opposite direction when rotated. The rack bar is held to its work by
 115 a lug 40^a which plays on one or the other side of a stationary, vertical flange 40^b formed on the main frame. A spring 39 is connected to the lower end of the plate 35, and is so arranged, that it exerts its tension
 120 alternately above and below the pin 35^b as the bar is reciprocated. This construction results in the rack bar being shifted from one pinion to the other, as the lug 40^a passes free of flange 40^b upon the completion of the
 125 opposite strokes of the rack bar.

The devices above described, are substantially identical with the devices in Patent No. 764,559, granted July 12, 1904, to Thomas Carney, with the exception that the
 130

keys and key levers are separate as shown in the aforesaid patent.

After the amount keys and special keys have been coupled to the key coupler, it is necessary to oscillate the latter, in order to complete the operation of the machine. To effect this result, the depression of one of the clerks' keys establishes an electric circuit through the motor 17, which is geared to the key coupler, as hereinafter described.

To accomplish the closing of the electric circuit, each clerk's key lever is provided with a pin 46, which engages one of a series of cam arms 48 to rock the shaft 49 upon which the said arms are mounted. Each of the cam arms is formed with a cam edge 47 and a concentric edge 48^a, whereby, when a key lever is operated, the arm 48 will move only when the pin 46 is engaging the edge 47. During the time that the pin is passing over the edge 48^a, the arm 48 remains stationary for a purpose hereinafter described. The spring 48^b wound about the shaft 49 is connected with the main frame, and to one of the arms 48 so as to normally hold the arms 48 in the position shown in Fig. 3. The left end of the shaft 49 is provided with a crank 50 to which is pivotally connected a pendent link 51 having a cam nose 52 and a notched end 53. The spring 50^a is wound about the pivot of the link 51, and bears with its respective ends against the link and the arm 50. The office of this spring is to hold the link 51 against a stationary top pin 57. The lower, notched end 53 of the link 51 engages a pin 53^a which connects a pivoted bell crank lever 68, and a link 55. The link 55 is in its turn connected with a switch lever 56 which is pivoted to one of the circuit terminals 56^a of the switch. The contact terminal 56^b of the switch, is of the usual split spring construction, and is arranged to receive the contact lever 56 when the latter is depressed, and thus complete the circuit.

When one of the clerks' keys is given its initial movement its particular arm 48 is rocked forward and the shaft 49 rocked. This action forces the link 51 downward and as before described, closes the circuit through the motor which operates the machine, as described. As the key lever continues its downward movement, the pin 46, simply plays along the edge 48^a, of the arm 48 and thus holds the link 51 depressed, until the key lever is subsequently released, by the rocking of its detent 43. The first downward movement of the link 51 forces the arm 56 to engage the contact terminal 56^b. As the link 51 continues its downward movement, the cam 52, engages the pin 57 and moves the link out of engagement with the pin 53^a. This leaves the link 55 free to rise and break the circuit, before the link 51 is allowed to return to its normal position. This construction prevents any manipula-

tion of the machine, such as an attempt to depress the link 51, the second time, during the same operation of the machine, and also permits the necessary sequence of operation.

One of the projecting trunnion ends of the key coupler is provided with a crank arm 67 carrying an anti friction roller 66. This roller is engaged by cam 63, mounted upon a short rotation shaft 61, which latter is journaled in the main frame, and in an auxiliary frame 62. The shaft 61 carries a worm wheel 60 which meshes with a worm 58, fast to the armature shaft 59 of the motor. The shaft 61 also carries a stop lug 65 and a cam 64. The bell crank 68 is formed with an auxiliary arm 70 carrying a roller 71, and is also formed with a hook 72. This hook is adapted to normally project into the path of the lug 65, to arrest the mechanism in its normal position. When the link 51 is depressed, the hook 72 is moved out of the path of the lug 65, thus leaving the shaft 61 free to be rotated. This same movement of the bell crank brings the roller 71 into the path of the cam 64 whereby, when the operation is about half completed, with the key coupler raised, the lever 68 will be rocked to draw the contact lever 56 out of connection with the contact 56^b, and break the circuit. The momentum of the armature, however, is sufficient to carry the parts forward, after the circuit is broken, until the lug 65 contacts with the hook 72, when the parts are all arrested. The key coupler and key levers are returned to normal position by gravity or if desired, suitable springs 12^a may be employed to assist in the return movement.

The motor employed in this machine may be of any suitable construction and operation, and, as such construction forms no part of the present invention it is not thought necessary to describe it.

The operation of the machine is as follows: If a sale of \$5.50 is made by clerk A, the amount keys are first pressed and then the clerk's key A. The depression of the amount keys causes their respective key levers to become coupled to the key coupler. When the clerk's key is depressed, its particular key lever becomes coupled to the key coupler and the circuit is closed by the depression of the contact lever 56. This operation also releases the machine by moving the hook nose 72 out of the path of the lug 65. The operation of the motor then causes the worm 58 to rotate the worm wheel 60, and thus elevate the coupler by means of the cam 63 connected to said worm wheel. After the coupler has been fully elevated, the cam 63 passes free of the roller 66 and thus leaves the coupler free to descend by gravity. At the same time the circuit is broken, but the momentum of the different parts carries the worm wheel 60 forward until it is ar-

rested in its normal position by the lug 65 coming into contact with the hook 72.

By means of the peculiar worm and worm gear connection it is practicable to employ
5 a high speed motor and at the same time only operate the machine with a medium speed and not fast enough to rack or jerk the parts during the operation. By this rapid movement of the motor and relatively
10 slow movement of the machine the motor may run with the speed necessary for its most efficient operation.

With this improved machine the key action is very light as only enough power is
15 required to depress the respective key levers and couple them to the coupler. The operation of this machine is very light when compared to the usual key machines in which the full stroke of the key lever is accomplished by hand, or the key is set and the
20 machine subsequently operated by hand.

While the form of mechanism herein shown and described is admirably adapted to fulfil the objects primarily stated, it is to
25 be understood that it is not intended to confine the invention to the one form of embodiment herein disclosed, for it is susceptible of embodiment in various forms, all coming within the scope of the claims which
30 follow.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a cash register, the combination with
35 a series of key levers, of a series of amount keys, a common operating frame for the key levers, a counter and connections coöperating with the key levers, a series of special keys, an electric motor for actuating the
40 operating frame, and means controlled by the special keys for establishing the circuit through the motor.

2. In a cash register, the combination with
45 a series of amount keys, of a series of special keys, an operating mechanism, a counter co-operating therewith, an electric motor connected to the operating mechanism, means controlled by any one of the special keys for establishing the circuit through the motor
50 and means connected to the operating mechanism for breaking the circuit.

3. In a cash register, the combination with
55 a series of amount keys, of a series of special keys, an operating mechanism, a counter co-operating therewith, an electric motor connected to the operating mechanism, means controlled by the special keys for establishing the circuit through the motor, and means for preventing the operation of the special
60 keys until after an amount key is operated.

4. In a cash register, the combination with
a series of amount key levers, of a series of special key levers, a common operating member, a counter and connections coöperating

with the amount key levers, an electric motor 65 connected to the common operating member, means controlled by the special key levers for establishing the circuit through the motor and means for preventing the operation of the special key levers until an amount key 70 lever has been operated.

5. In a cash register, the combination with an operating mechanism, of an electric motor connected thereto, a circuit closer, a series of keys, a detent for the keys connected to the operating mechanism and means 75 operated by the keys for actuating the circuit closer and constructed to automatically disengage therefrom to permit the circuit closer to be returned to normal position before the keys are released. 80

6. In a cash register, the combination with a series of amount key levers, of a series of special key levers, a key coupler common to the key levers, an electric motor connected 85 to the key coupler, a circuit closer operated by the special key levers, a lock for the special key levers controlled by the amount key levers and a lock for the key coupler controlled by the special key levers and an 90 accounting device controlled by the key levers.

7. In a cash register, the combination with a series of setting elements, of a common operating member for said elements, a 95 counter and connections coöperating with said elements, a series of special setting elements, an electric motor for actuating the operating member, means controlled by the special setting elements for establishing the 100 circuit through the motor, and means for automatically disabling the effectiveness of any operated special element on the circuit establishing means.

8. In a cash register, the combination with 105 a series of setting elements, of an operating mechanism, a counter and connections co-operating with the operating mechanism, a series of special setting elements, an electric motor for actuating the operating mechanism, means controlled by the special setting 110 elements for establishing the circuit through the motor, and means for automatically disabling the effectiveness of any operated special element on the circuit establishing 115 means.

9. In a machine of the character described, the combination with a series of setting elements, of a common operating member for said elements, accounting devices co- 120 operating with said elements, a series of special setting elements, an electric driving device for actuating the operating member, and means controlled by the special setting elements for establishing the circuit through 125 the electric driving device on the initial movement of any one of said special setting elements, with provisions permitting the

continued and final movement of the special setting elements independently of further movement of the circuit establishing means.

10. In a cash register, the combination with an operating mechanism and means normally locking same, of a series of value keys, a series of special keys, means normally locking the special keys until a value key is operated, means controlled by the special keys for unlocking the operating mechanism, and means controlled by the operating mechanism for returning the locking means therefor to normal position.

11. In a cash register, the combination with an operating mechanism, of an electric driving device for same, value and special keys, means locking the special keys but disabled by the operation of a value key, and circuit closing means for the driving device, controlled by the special keys.

12. In a cash register, the combination with an operating mechanism, of an electric motor connected thereto, a circuit closer and series of keys, a detent for the keys connect-

ed to the operating mechanism, and mechanical means operated by the keys for actuating the circuit closer and constructed to automatically disengage therefrom to permit the circuit closer to return to normal position before the keys are released.

13. In a machine of the class described, the combination with an operating mechanism, of a series of setting elements having initial and final movement, a driving device for said operating mechanism, electrical devices controlling the operation of said driving device, and circuit closing means for said electrical devices operated by the initial movement of said setting elements, the construction being such that said elements retain the circuit closing means in operated position.

In testimony whereof I affix my signature, in the presence of two witnesses.

THOMAS CARNEY.

Witnesses:

G. C. EDGETER,
CHAS. R. GILLIES.

Corrections in Letters Patent No. 948,368.

It is hereby certified that in Letters Patent No. 948,368, granted February 8, 1910, upon the application of Thomas Carney, of Dayton, Ohio, for an improvement in "Cash-Registers," errors appear in the printed specification requiring correction as follows: Page 3, line 2, after the word "patent," the abbreviation and figures No. 583,888 should be inserted; page 4, after line 30, the following paragraph should be inserted:

This case includes claims to the motor and its controlling connections as used to actuate a cash register or the like machine. It will be clear, however, that the driving device may be used in many other relations and that it includes novel features in and of itself and without reference to the particular machine driven. In view of this a divisions application, Serial No. 438,808 was filed on June 16, 1908, and in that divisional application claim is made to the driving device itself; and that the said Letters Patent should be read with these corrections therein, that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of March, A. D., 1910.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.