

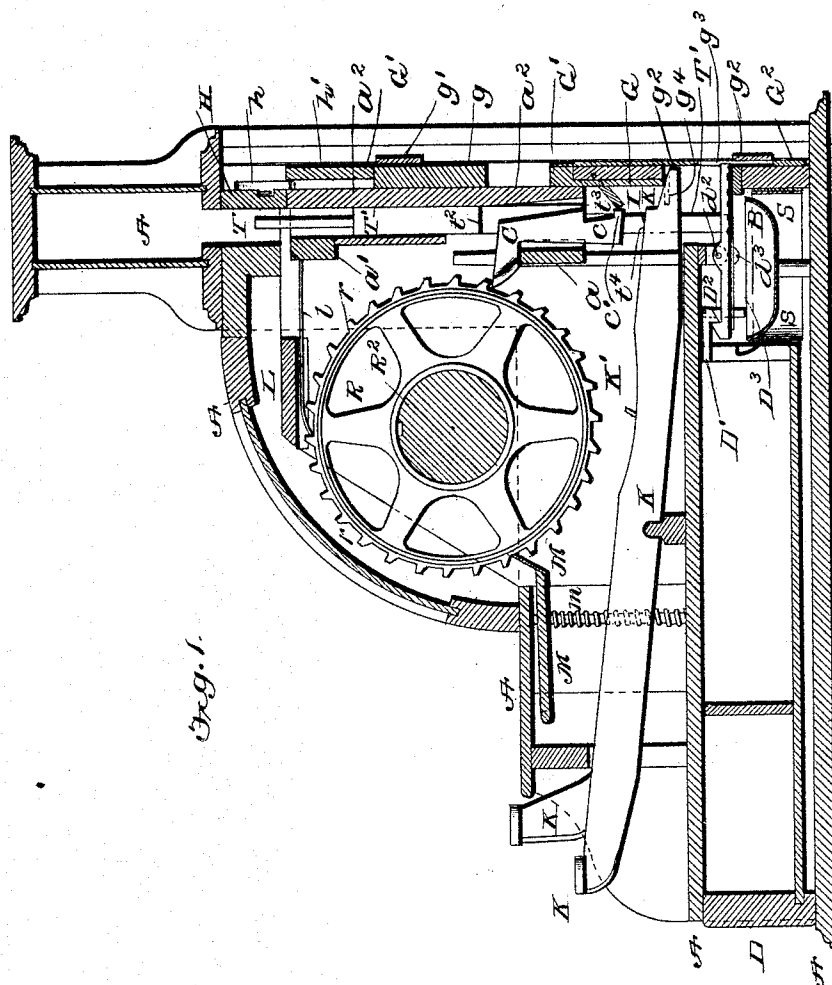
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6 Sheets—Sheet 1.

M. N. LOVELL.
CASH REGISTER AND INDICATOR.

No. 489,383.

Patented Jan. 3, 1893.



Witnesses

John Emile
Franklin Moore

M. N. Lovell, ^{Inventor}
per
Hallock and Halleck
Attorneys

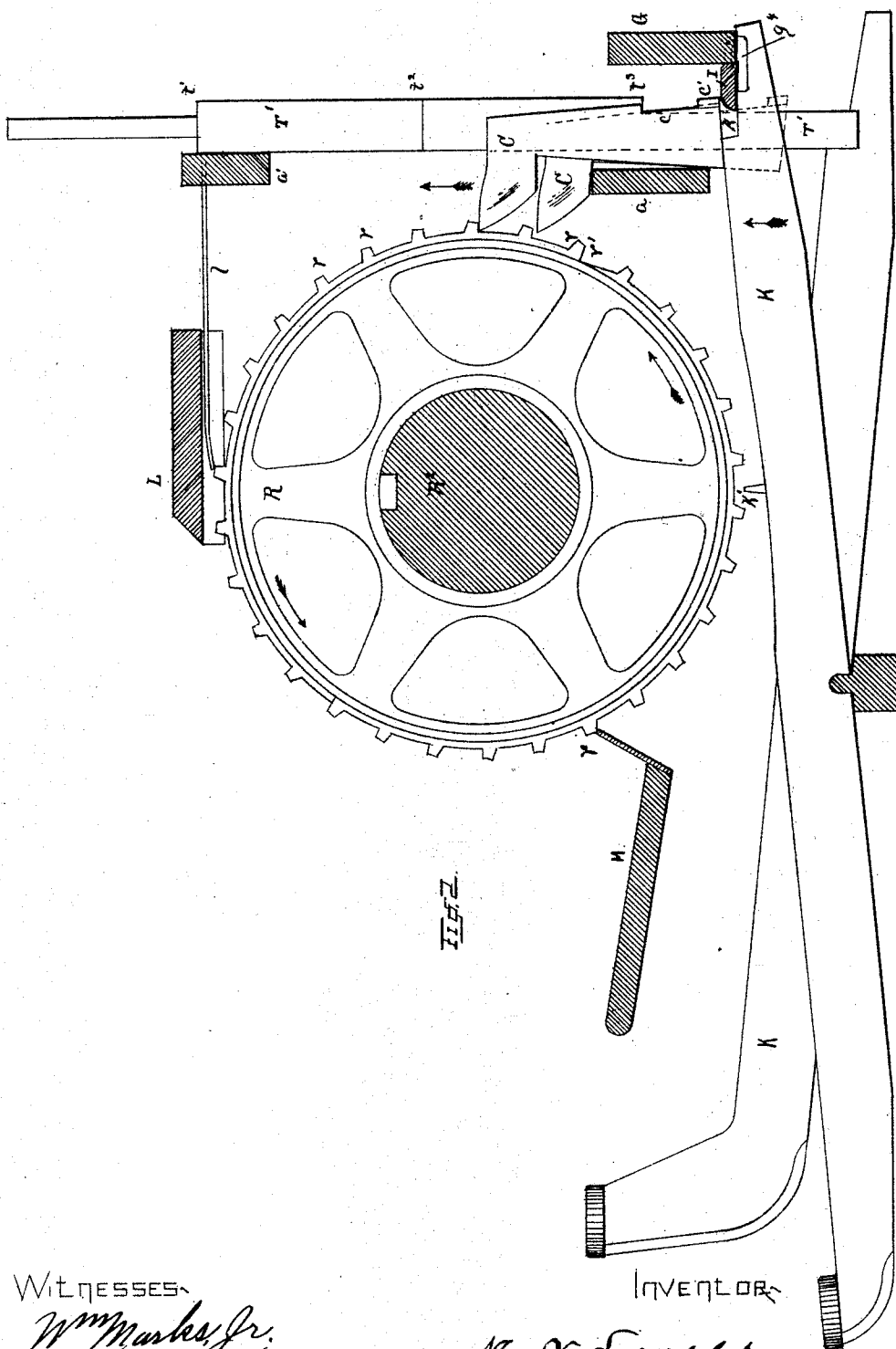
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Witnesses-

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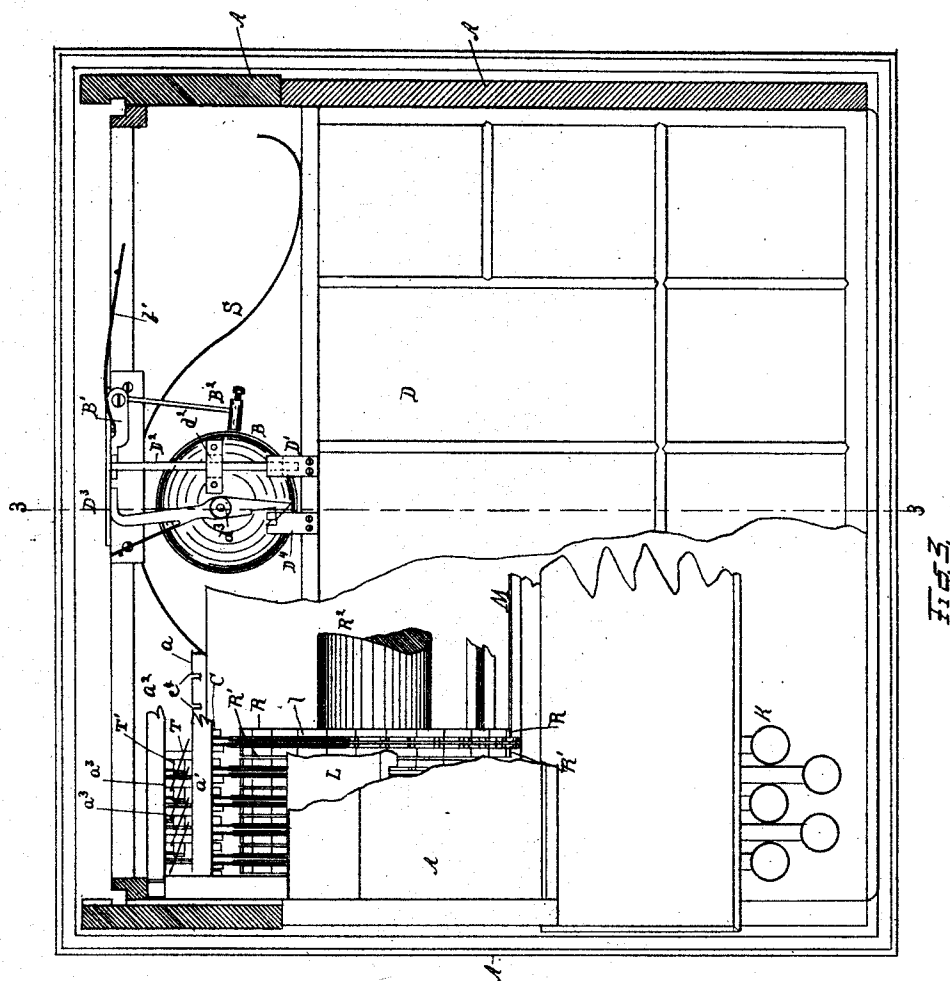
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(No Model.)

6 Sheets—Sheet 4.

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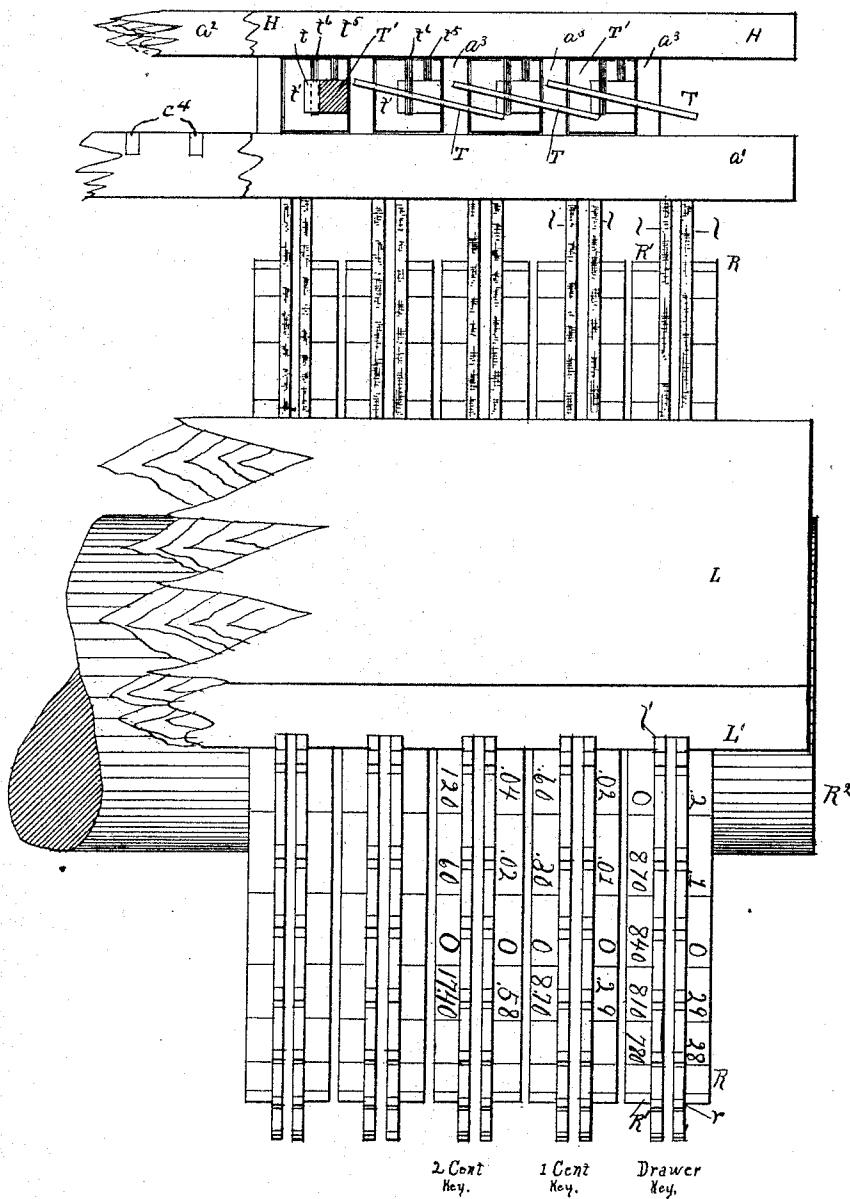


Fig. 4.

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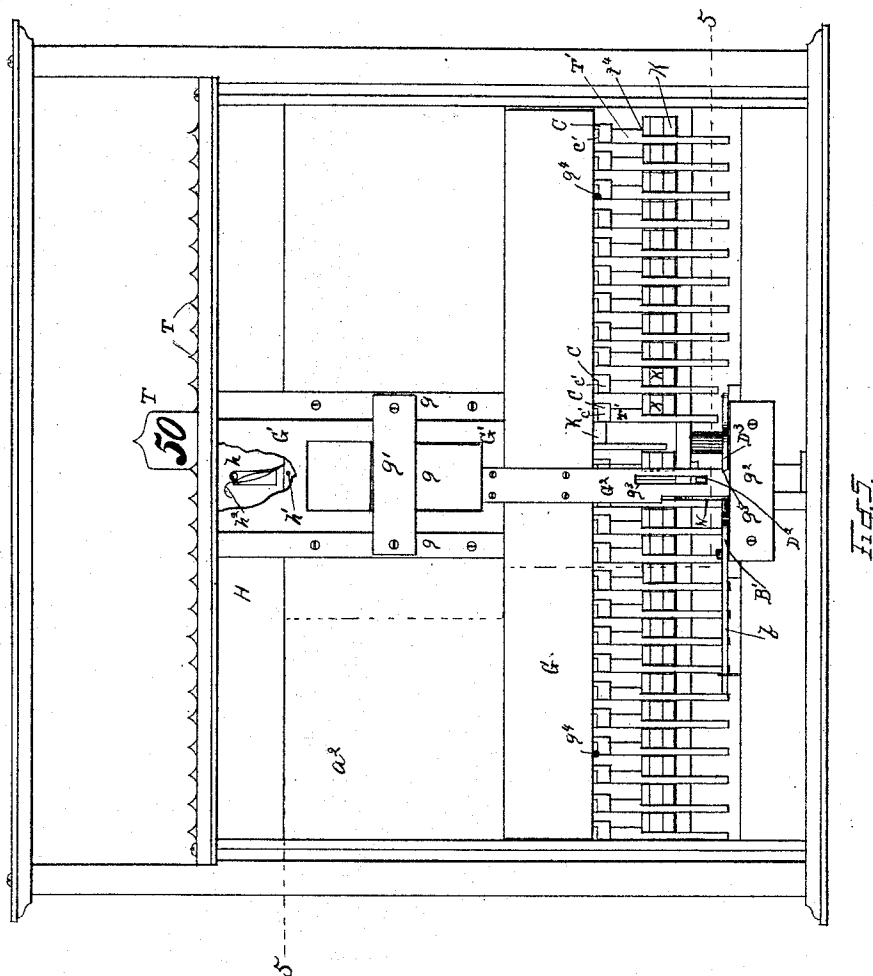
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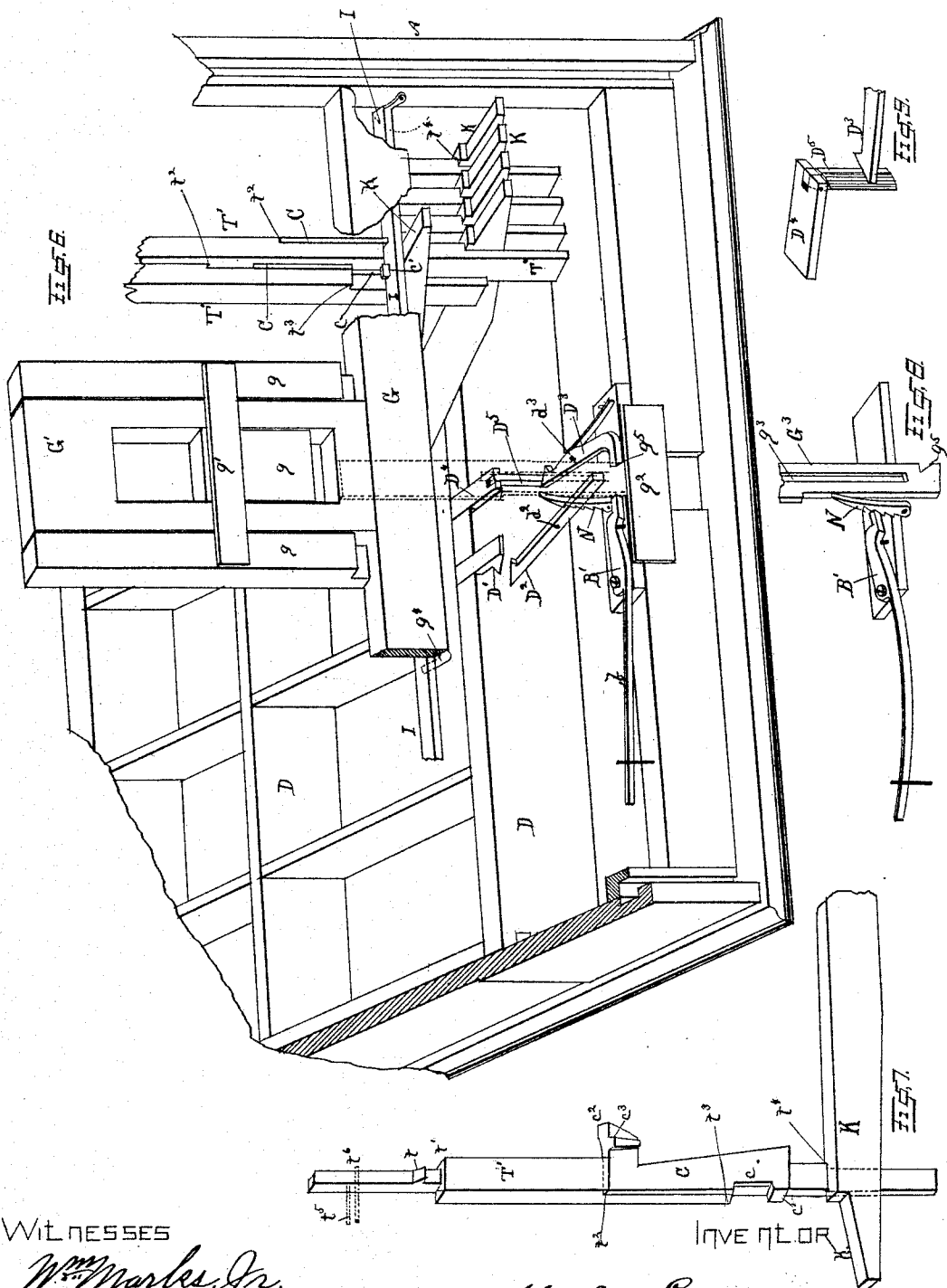
(No Model.)

6 Sheets—Sheet 6.

M. N. LOVELL.
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No. 489,383.

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WITNESSES

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UNITED STATES PATENT OFFICE.

MELVIN N. LOVELL, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE LOVELL MANUFACTURING COMPANY, LIMITED, OF SAME PLACE.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 489,383, dated January 3, 1893.

Application filed June 15, 1892. Serial No. 436,825. (No model.)

To all whom it may concern:

Be it known that I, MELVIN N. LOVELL, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Cash Registers and Indicators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to cash registering and indicating machines, and consists in certain improvements in the construction of the same, as will be hereinafter fully set forth and pointed out in the claims.

My present invention relates chiefly to that type or style of cash register and indicator shown and described in an application for a patent now pending in the Patent Office, filed by me October 9, 1890, Serial No. 367,406; and while my present improvements may, many of them, be used on many of the various types of machines for like purpose now in common use, it may, nevertheless, be said to be an improvement upon the class or type of machine shown and described in said application Serial No. 367,406.

The accompanying drawings illustrate my invention as follows:

Figure 1 is a transverse vertical section through the middle of the machine on a line at right angles to the key-board, said line being indicated by the dotted line 3—3 in Fig. 3. Fig. 2 is a like view to Fig. 1, with many important parts left out and the scale enlarged, and a changed position of parts is shown to illustrate the action of the mechanism. Fig. 3 is a horizontal section taken on the ledged plane indicated by the dotted line 5—5 in Fig. 5. Fig. 4 is a plan view of a few of the registering wheels and indicating tablets drawn at about the size I prefer to make the said parts. Fig. 5 is an elevation of the rear of the machine with the rear case removed. Fig. 6 is a rear perspective view, partly in section and with only certain parts represented. Fig. 7 is a perspective view of a tablet-rod, a dog which acts upon the register wheels and the rear end of a key. Figs.

8 and 9 are perspective views of details for the purpose of illustrating the action, and will be explained fully hereinafter in place.

A, marks the case; D, the drawer; T, the indicating tablets; T' the tablet rods; R and R' the register wheels; C, the dogs which move the register wheels; K, the keys or key-levers; B, the bell; B² the bell hammer; and S, the drawer spring.

Other letters designating other parts will be referred to in proper place.

Each key K, controls the movement of two register wheels R, R', which are journaled on the shaft R². These wheels are each provided with thirty teeth and one of the wheels, R, is moved one notch or tooth at each movement of its actuating key while the other wheel, R', is moved one notch or tooth at every thirtieth movement of said key, or at each complete revolution of the wheel R. Therefore I call the wheels R, the primary wheels and the wheels R' the secondary wheels.

There may be as many keys and sets of wheels as desired. I have used twenty-six keys, as follows: one cent, two cent, three cent, four cent, five cent, ten cent, fifteen cent, twenty cent, twenty-five cent, thirty cent, thirty-five cent, forty cent, forty-five cent, fifty cent, fifty-five cent, sixty cent, seventy cent, eighty cent, ninety cent, one dollar, two dollar, three dollar, four dollar, five dollar and ten dollar, and a drawer key, that is, a key for opening the drawer when it is not desired to register or indicate any amount. Each of these keys not only operate a pair of register wheels R R', but also operate a tablet when any of them are depressed and these tablets are each marked to correspond with the denomination of the key by which they are operated. The drawer key having as its designating sign a cypher. The object in having register wheels in connection with the drawer key is to show the number of times the drawer has been opened for extra purposes.

By noting Fig. 4 it will be seen how the register wheels are marked. The primary wheel of the one-cent key is marked 0, .01, .02, .03, &c. and the secondary wheel .30, .60, .90, &c. The primary wheel of the two-cent key is

marked 0, .02, .04, .06, .08, &c and the secondary wheel is marked .60, 1.20, 1.80, &c. Above the wheels is a board L with grooves l' which receive the vertical flanges of each pair of wheels, and the edge L' of this board is the reading line; that is to say, the numerals on the wheels that are to be observed in order to ascertain the amounts registered by each wheel are those in proximity to the edge L' of the board L. Hence when the machine is to be set for commencing work the 0 sign on each wheel should be brought into position at the edge of the board L. After the machine has been used for a time, say one day, and it is desired to find the total amount registered by the wheels it can be ascertained by adding up all the amounts displayed on all the wheels (except the drawer wheel) along the full length of the reading line.

The arrangement and general method of operation of the register wheels just described is the same as in my said former application. In this instance the wheels are made of cast metal in place of wood and the teeth r are formed in the vertical flanges in place of being laterally extending pins. In the present instance, as in the former, the register wheels are held against untimely movement by spring catches or pawls l at the upper side and a catch-pin k' on the key. In addition to these stop devices I now provide a pawl-plate M, which is reacted by springs m at each end thereof. This plate can be seen in Figs. 1, 2 3. It extends the whole length of the machine in front of the wheels, and when in normal position is in engagement with all the wheels and holds them uniformly in position. But whenever any wheel is operated this plate is depressed until the acting tooth slips off of it, when it is reacted by the springs m . In Fig. 2 the parts are shown with one key nearly depressed to its limit, but not quite. The pawl plate M is shown as just about being disengaged by the acting tooth r , and the spring catch l , is shown as nearly off of a tooth. When the key is depressed a little further the spring catch l will drop in back of the tooth on which it is shown as resting and the spring plate M will slip off the tooth r and fly up against the next tooth and its spring action will hold the wheel R against its stops l and k' , and with its number spaces in line with all like spaces on the other wheels. This spring pawl plate acting when in normal position upon all the wheels prevents any wheel being moved out of place by frictional contact with an adjoining wheel, and it returns any register wheel to place that may be partially actuated. It will be seen in Fig. 2 that the teeth r of the wheels have their outer faces slanted back so that the pawl-plate M will be free to react as soon as it has passed from the front face of the tooth. This prevents the pawl-plate being carried past the next following tooth under any conditions of rapid action.

The wheels R and R' are moved by the ac-

tion of the dogs C and the dogs are moved by the direct action of the keys which also move the tablet rods. The form of the dogs is best shown in Figs. 1, 2 and 7. They have two acting faces c^2 and c^3 , one of which, c^2 , acts upon the teeth of the primary wheel R, and the other, c^3 , acts upon the teeth of the secondary wheel. The face c^3 stands back of the face c^2 and can only act upon the secondary wheel when the face c^2 falls into the deep notch r' in the primary wheel. There is but one of these deep notches r' in each primary wheel and hence the secondary wheel is only moved once during each revolution of the primary wheel. Each dog has a notch c on its rear side near the bottom, and also a lug c^2 below the notch which extends at right angles from the dog and across the tablet rod with which the dog is consorted. This construction is best seen in Fig. 7. The dogs when in normal position hang on the frame piece a , as seen in Figs. 1 and 2, which is grooved to receive them as shown in Figs. 3 and 4 at the upper left hand corner thereof, said grooves being marked c^4 .

Each tablet-rod is guided in a channel-way formed by the frame pieces a , a' , a^2 and the vertical strips a^3 (see Figs. 1, 3 and 4) and each dog lies within this channel-way by the side of the tablet-rod which is cut away below the shoulder t^2 to admit it so that the dog and the tablet-rod stand side by side. On the lower end of each tablet-rod is a shoulder t^1 against which the key K contacts; above this is the shoulder t^2 which rests on the dog when the parts are at normal, as seen in Fig. 7 most clearly. When the key is depressed the tablet-rod is lifted, the shoulder t^2 leaving the dog, and the tablet-rod alone is moved until the key contacts with the lower end of the dog, then the dog is carried with the rod but by contact with the key. The rods are limited in their upward movement by a stop pin t^5 which contacts with the shoulder t^1 on the rod, and they are held up by a spring catch t^6 which passes and gets below the catch t on the rod. The keys are limited by the outer ends contacting with the frame base A (see Fig. 1) but they are not held depressed by any device. The dogs are held up by means to be hereinafter explained. The object in having the tablet-rods move through a greater space than the dogs is that only a limited degree of movement of the dogs is required to move the register wheels one notch or tooth, while in order to display a tablet of sufficient size to make the indication clear it must move much farther than it is necessary to move the dog. In my application above referred to this extra movement of the rod was provided for, but in that case the dog was carried by the rod, while in this case the dog and rod are each carried independently by the key and each has separate means for holding it up and releasing it.

As stated above, the rods are held up by the spring catches t^6 engaging with the catch lugs

t. These spring catches t^6 are all supported by a sliding bar H, and when this bar is moved longitudinally any supported tablet-rod is released. The arrangement is such that the bar H is moved longitudinally whenever a key is depressed, hence the last indicated amount is continued until the next amount is to be indicated. Thus, if the last sale was five cents, the five cent tablet will remain displayed until the next sale is to be indicated, and if that is ten cents, then the ten-cent tablet will be displayed and the five-cent tablet will simultaneously disappear, for the movement which brings up the ten cent tablet moves the bar H and releases the five-cent tablet.

The means for moving the bar H, are connected with and operated by the means which engages and disengages the dogs and will be explained in connection therewith, as follows:

At the rear of the machine is a gate, G, which extends across the whole length of the machine and when in its normal position, lies directly over the extreme ends k of the keys K. This is shown in Figs. 1, 2, 5 and 6. In Figs. 1 and 6 it will be seen that this gate G, is T-formed; that is, it has an upward extension G' at its middle which is notched and fits in guide-blocks g and is held in place by a cross-piece g' . Whenever any key is depressed this gate is raised. At the upper end of the part G' on the inside thereof is a pin h' , which, when the gate goes up, contacts with a cam h on the bar H, and moves that bar longitudinally. As soon as the pin passes the cam the bar reacts by the action of a spring not shown, which it carries. This reaction takes place before the gate has reached its upward limit and, hence, before the tablet rod, carried by the key which moves the gate also, has reached its upward limit, and, consequently, the tablet-rod that was last raised is released by the longitudinal movement of the bar H, while the gate is being raised, and is reacted into position to allow the proper spring catch t^6 , to act to engage the tablet rod which is being carried up with the gate before the gate reaches its upward limit of movement. When the gate descends the pin h' passes down on the opposite side of the cam h from that against which it acted when going up, and the cam is pivoted and held in normal position by a spring h^2 (see Fig. 5) which spring is overcome when the cam is pushed back by the pin h' when the gate is going down. Immediately in front of the gate G, is a parallel bar I which is hung, by arms extending from its ends, on pivots on the frame posts, as clearly shown in Fig. 6. This bar is seen in its normal position in Fig. 1, in cross section, and in its active position in Figs. 2 and 6. When the gate G is elevated to its upper limit, as shown in Figs. 2 and 6, the bar I, which I call a dog-bar, is engaged by hooks g^4 , on the gate and held in a horizontal position and when in that position it sets under the lower end of the dog

that is elevated and thus holds it up and it sets into the notches c in all the other dogs and holds them against being moved. Hence, while the gate G, is in an elevated position, it is impossible to operate any of the other dogs or move any of the keys operatively. The gate G has a bar G^2 extending down from it near its middle and near its lower end is a notch g^5 which is engaged by a catch-lever D^3 when the gate reaches its upward limit, and the gate will be held up by this catch device until it is released, and this will occur when the drawer is closed.

All the various parts of the machine, except the last tablet displayed and its rod, are at normal when the drawer is closed. When a key is depressed to its limit the drawer is released and thrown open by a spring S. Then those parts which have just been operated may be said to be in action and while they are thus no other keys and consorted parts can be actively operated until the drawer is closed, which will bring all the parts just in action to normal, except the tablet and its rod. In Fig. 1 the parts are shown at normal, that is, as they are when the drawer is closed. It will be seen that a catch D' on the back of the drawer is in engagement with a catch-bar or trigger D^2 which is pivoted at d^2 to a lug on the frame work. The rear end of the trigger D^2 extends through a slot g^3 in the bar G^2 that is connected with the gate G. When the gate G is raised to its limit the trigger is struck by the bottom of the slot g^3 and lifted up and this disengages the catch and allows the drawer to open by the action of the spring S. On the back of the drawer there is a lug D^4 in which is pivoted a finger D^5 which has a rounded side (see Fig. 9). Back of this device is the catch lever D^3 above referred to, which engages the notch g^5 in the gate-bar G^2 and holds the gate up. This lever is pivoted at d^3 on the frame work. When the drawer is closed the finger D^5 pushes the lever D^3 to one side and thereby releases its engagement with the bar G^2 and thus allows the parts to return to normal. The finger D^5 when the drawer is closed, falls into a notch in the lever D^3 , and when the drawer is opened it turns on its pivot on the lug D^4 and thus escapes the lever D^3 and is again ready for action upon that lever, as seen in Figs. 6 and 9.

On the side of the bar G^2 is a pivoted notched cam N, which, as the gate is moving up with the bell-lever B' and pushes it back, but before the gate G reaches its upper limit the cam N passes the lever B' and allows it to react by its spring b , and the bell is sounded. The cam N is pivoted so as to escape the lever B' when the gate is descending. A spring, not shown, holds the cam N in normal position. The cam N is notched on its acting face and the lever B' has its contacting face pointed so as to engage said notches. The object of this is to hold the gate G against reaction at all points in its upward movement until the lever B' passes below the cam N and

then the lever D³ engages the bar G² and holds the gate up as above stated.

In Fig. 8 the cam N is shown engaging the lever B' as the gate is partially elevated, and in Fig. 6 the cam N is shown as having passed over the lever B' and released it.

It is not necessary that there be more than one or two notches in the cam N, and these should be at its lower end so as to lock the gate against reaction as soon as the dog-bar I has been lifted into a horizontal position, where it locks all the dogs, except the moving dog, against movement, and it locks the moving dog against reaction. But I have shown the cam N, as having many notches and when so made the gate can not be reacted after it has been moved a little way up, but if the operator discovers that he is operating a wrong key he can change to the proper key any time before the dog bar I, has been brought into active position. If the cam N, has only one or two notches at its lower end in proper relative position to hold the gate against reaction after the dog-bar had been brought into action, then in case the operator found it necessary to correct his action before he had gone too far he could do so, but the gate G, would be lowered with the abandoned key and then moved up again with the newly used key. Hence all that is effected by the surplus number of notches in the cam N, is to prevent the gate from moving back if a change of keys is desired, and this is of no great moment.

As soon as a key has been used and the gate is up and the dogs are locked, that key, as well as all the others, is free. The keys are at no time locked, but the dogs are locked, and hence the keys become inoperative to the extent that they can not move the registering mechanism until the drawer is closed and the parts are brought back to normal.

What I claim as new is:

1. In a machine of the class herein named, the combination of a series of key-levers, a series of dogs coinciding in number with the series of key-levers, each dog being moved to action by one of said keys, a series of register wheels coinciding in number with said series of key-levers and dogs, each register wheel being moved by one of said dogs, a series of stop-devices for stopping each of said register-wheels and a single spring actuated pawl-plate M, extending in front of and acting upon all of said register wheels to hold them in alignment.

2. In a machine of the class herein named, the combination of a series of key-levers, a series of dogs coinciding in number with said series of key-levers, each dog being moved to action by one of said keys, a series of register-wheels having their teeth in a vertical flange formed on the side of said wheel, each of said wheels being moved by one of said dogs acting upon said teeth, a series of stop devices for stopping said wheels, a reading bar extending along the top of said wheels

and having grooves which embrace the vertical flanges of said wheels, and a single pawl-plate which acts upon all of said wheels and holds them in alignment so that the matter to be read will be in line along the edge of said reading-bar.

3. In a machine of the class herein named, the combination of a series of key levers, a series of dogs coinciding in number with said series of key-levers, each dog being moved by one of said keys, a series of registers coinciding in number with said series of keys and dogs, each register being moved by one of said dogs, and a single swinging dog-bar I which swings from a vertical to a horizontal position when brought into action and is moved to action by the operation of any one of said keys and when in action retains the acting dog in active position and holds the other dogs against action by any of the other keys.

4. In a machine of the class herein named, the combination of a series of key-levers, a series of dogs coinciding in number with said key-levers, each dog being moved by one of said key-levers, a series of registers coinciding in number with said series of keys and dogs, each register being moved by one of said dogs, a single gate movable by each of said key-levers and a single dog-bar moved to action by said gate and when in action retains the acting dog in active position and holds the other dogs against action by any of the other keys.

5. In a machine of the class herein named, the combination of a series of keys, a series of registers, a series of dogs each of which is moved by one of said keys and in turn moves one of said registers, a drawer which is moved outwardly by a spring and held in by a catch, a gate that is moved by the action of any of said keys and when elevated releases said drawer catch and allows the drawer to open, a catch for holding said gate in elevation, a dog-bar which locks the non-acting dogs against action and the acting dog against reaction when the gate is held in elevation, and a releasing device on the drawer which releases the gate-holding catch when the drawer is closed.

6. In a machine of the class herein named, the combination of a series of key-levers, a series of indicators marked to coincide with the marks on the key-levers, and movable into action by said key-levers, and out of action by gravity, a series of registering devices, one for each key-lever, a series of dogs, one for each of said registering devices, for moving the same one notch or space for each movement of its key-lever, said dogs being moved into action by contact with a key-lever and out of action by gravity, and a single dog-bar which is moved into action through the action of any of said keys and when in active position holds the acting dog in active position and the inactive dogs against operation.

7. In a machine of the class herein named, the combination of a series of key-levers, an

indicating device and a register-actuating dog contacting with and moved to action by each of said keys, a vertically sliding gate moved by any of said keys by contacting therewith, a dog-bar for holding the inactive dogs against operation and the acting dog in acting position that is moved into action by said gate, a catch device for holding the drawer shut that is moved into disengagement by the upward movement of said gate, a bell-hammer that is actuated to sound the bell by the upward movement of said gate, a catch device for holding said gate in elevation, and thereby holding said dog-bar in action, and a releasing device on the drawer that disengages said gate-supporting catch when the drawer is closed.

8. In a machine of the class herein named, the combination of a series of key-levers, a series of registers, a series of indicators and a series of dogs that are moved by said keys, in conjunction with said indicators and actuate their said registers, said dogs having notches *c* and lugs *c'* below said notches, and a single dog-bar extending across the machine, in proximity to the notched and lugged portion of said dogs and in operative connection with each of said key-levers in a manner substantially as described whereby when the said bar is actuated by the movement of any key it will take position below the lug on the dog carried by said key and within the notches of all the other dogs and thereby hold the acting dog in action and the inactive dogs against operation.

9. In a machine of the class herein named, the combination of a series of key-levers, a series of registers, a series of indicators and a series of dogs for moving said registers that

are moved by said keys and in conjunction with said indicators, said dogs having notches *c*, and lugs *c'* below said notches, a single dog-bar that extends across the machine in proximity to the notched and lugged part of said dogs and when in active position lies below the lug of the dog which is in action and within the notches of the dogs that are not in action, and a single vertically acting gate *G*, that is moved by the action of any of said key-levers and when in action holds the said dog-bar in action.

10. In a machine of the class herein named, the combination of a series of key-levers, a series of registers, a series of indicators and a series of dogs for moving said registers that are moved by said keys and in conjunction with said indicators, said dogs having notches *c* and lugs *c'* below said notches, a single dog-bar that extends across the machine in proximity to the notched and lugged part of said dogs and when in active position lies below the lug of the dog which is in action and within the notches of the dogs that are not in action, a single vertically acting gate *G*, that is moved by the action of any of said key-levers and when in action holds the said dog-bar in action, a catch device for holding the spring-actuated drawer shut that is released by said gate when moved into action, a catch for holding said gate in action and a releasing device on the drawer that releases the gate-holding catch when the drawer is shut.

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

MELVIN N. LOVELL.

Witnesses:

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H. J. CURTZE.