

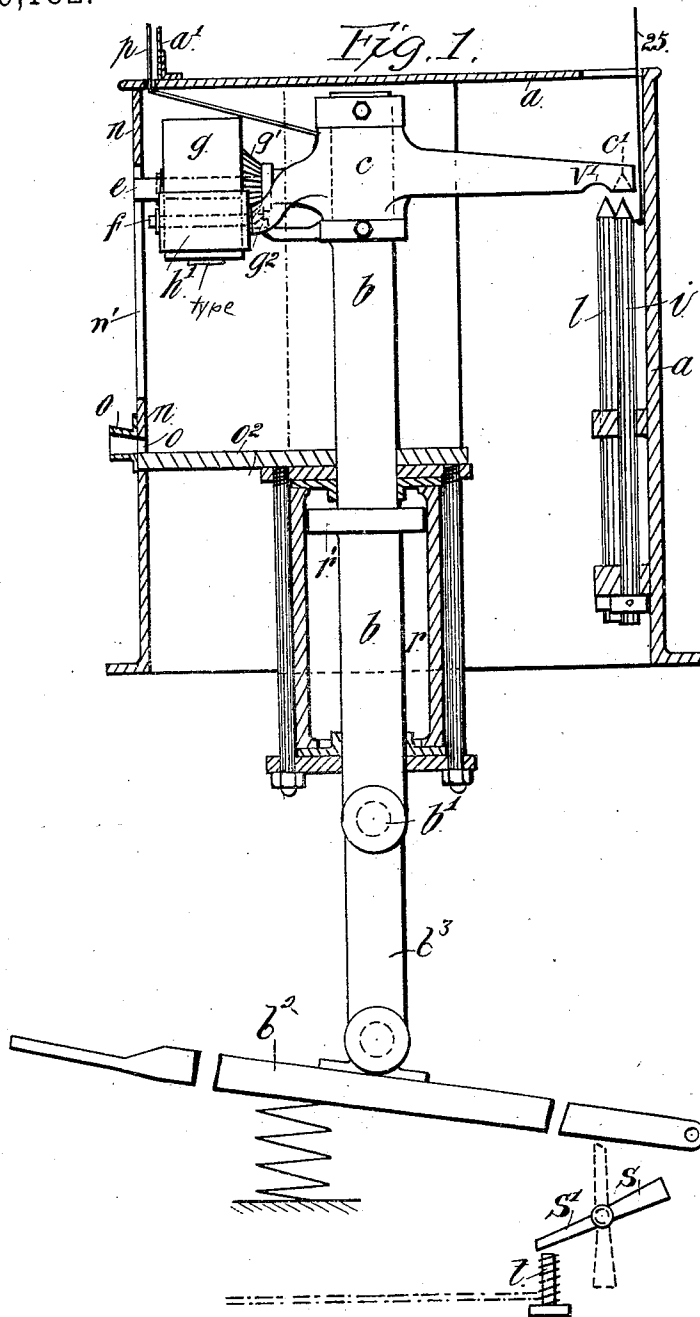
(No Model.)

6 Sheets—Sheet 1.

R. M. MACDONALD.  
TICKET PRINTING AND REGISTERING DEVICE.

No. 559,182.

Patented Apr. 28, 1896.



Witnesses  
H. van Oldenmeel  
E. H. Sturtevant

Inventor  
Ranald Macintosh Macdonald  
by *[Signature]*  
Attorneys

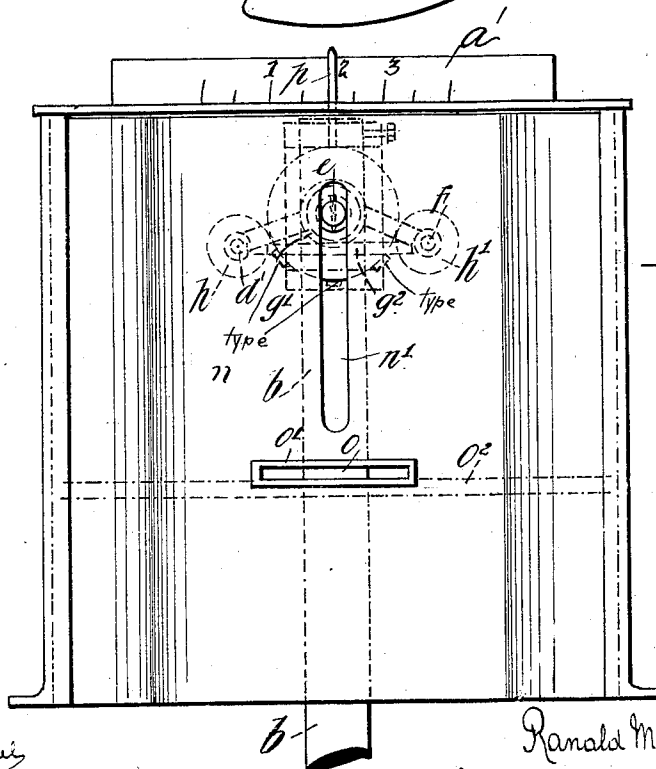
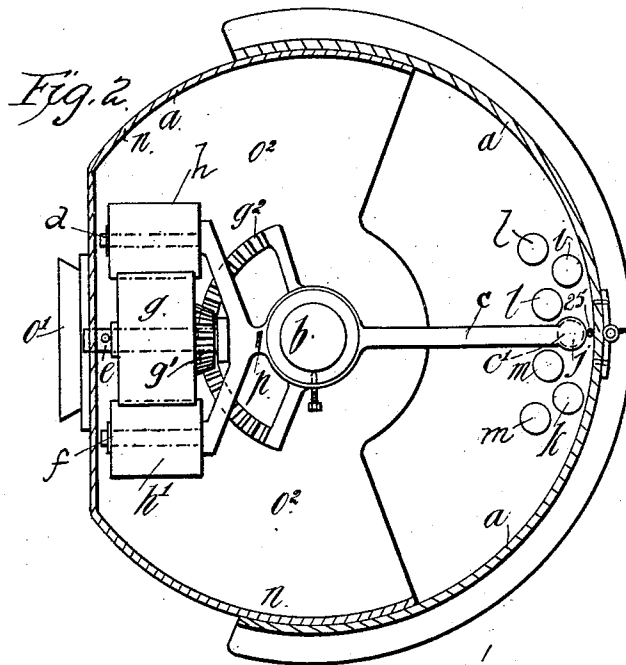
(No Model.)

6 Sheets—Sheet 2.

R. M. MACDONALD.  
TICKET PRINTING AND REGISTERING DEVICE.

No. 559,182.

Patented Apr. 28, 1896.



Witnesses  
H. van Dusen  
E. H. Stewart

Inventor  
Ranald Macintosh Macdonald  
by *[Signature]*  
Attorneys

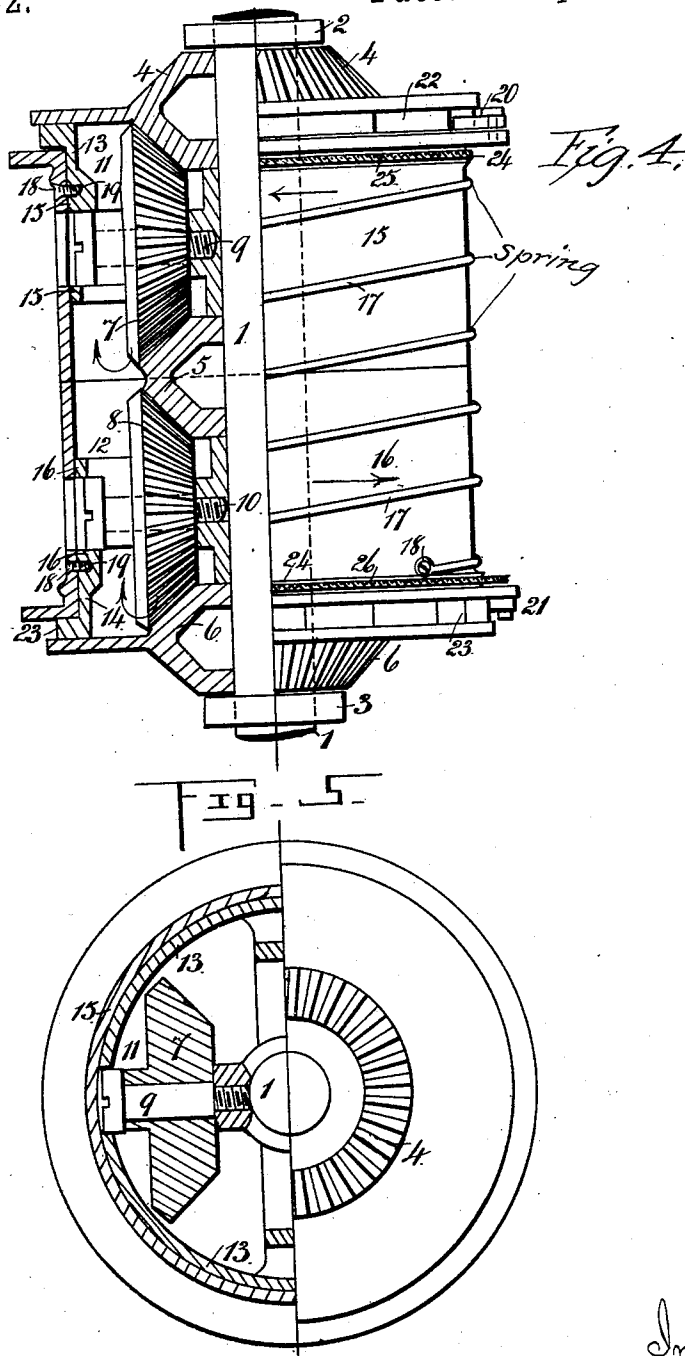
(No Model.)

6 Sheets—Sheet 3.

R. M. MACDONALD.  
TICKET PRINTING AND REGISTERING DEVICE.

No. 559,182.

Patented Apr. 28, 1896.



Witnesses  
H. van Oldenmeel  
E. H. Sturtevant.

Inventor  
Ranald Macintosh Macdonald  
by *Ranald Macintosh Macdonald*  
Attorneys

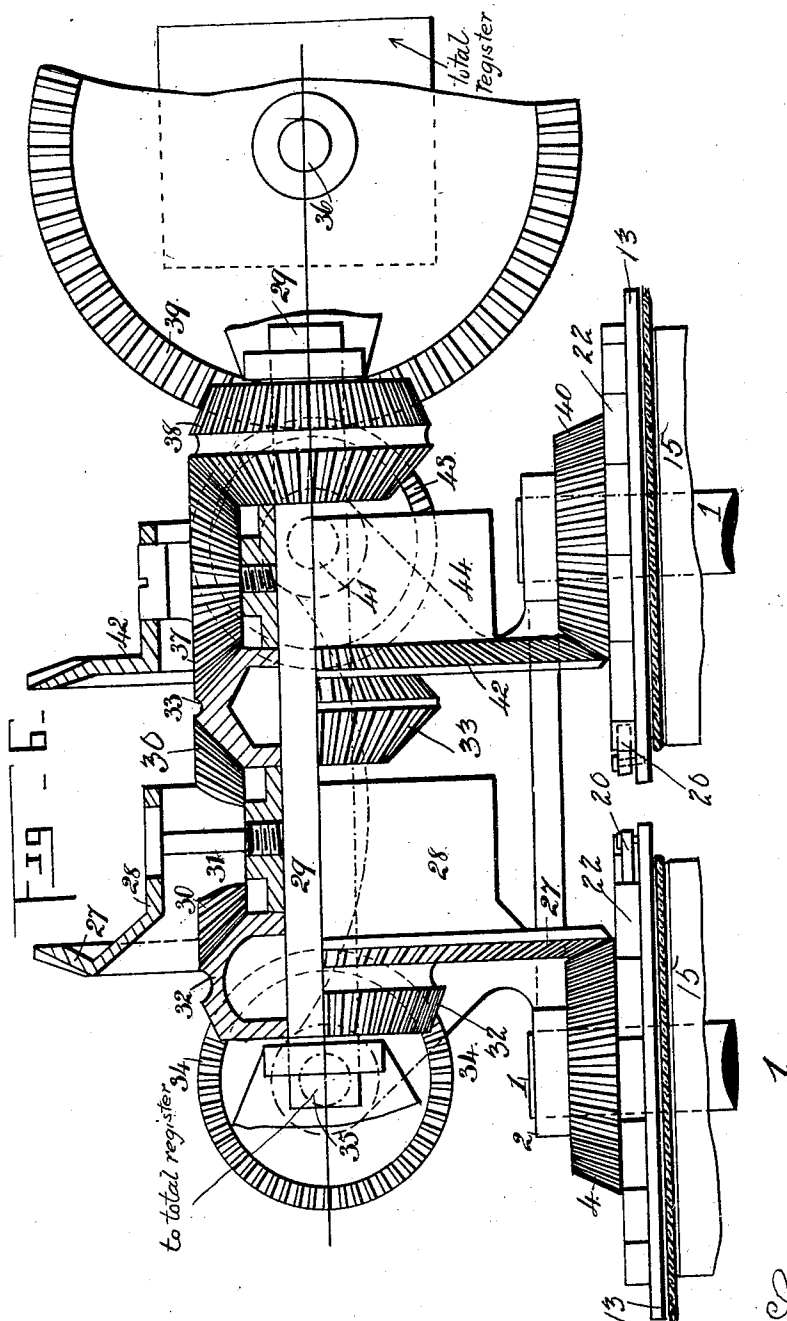
(No Model.)

6 Sheets—Sheet 4.

R. M. MACDONALD.  
TICKET PRINTING AND REGISTERING DEVICE.

No. 559,182.

Patented Apr. 28, 1896.



Witnesses  
H. van Olden  
& H. L. Sturtevant

Inventor  
Donald Macintosh Macdonald  
by *[Signature]*  
Attorneys

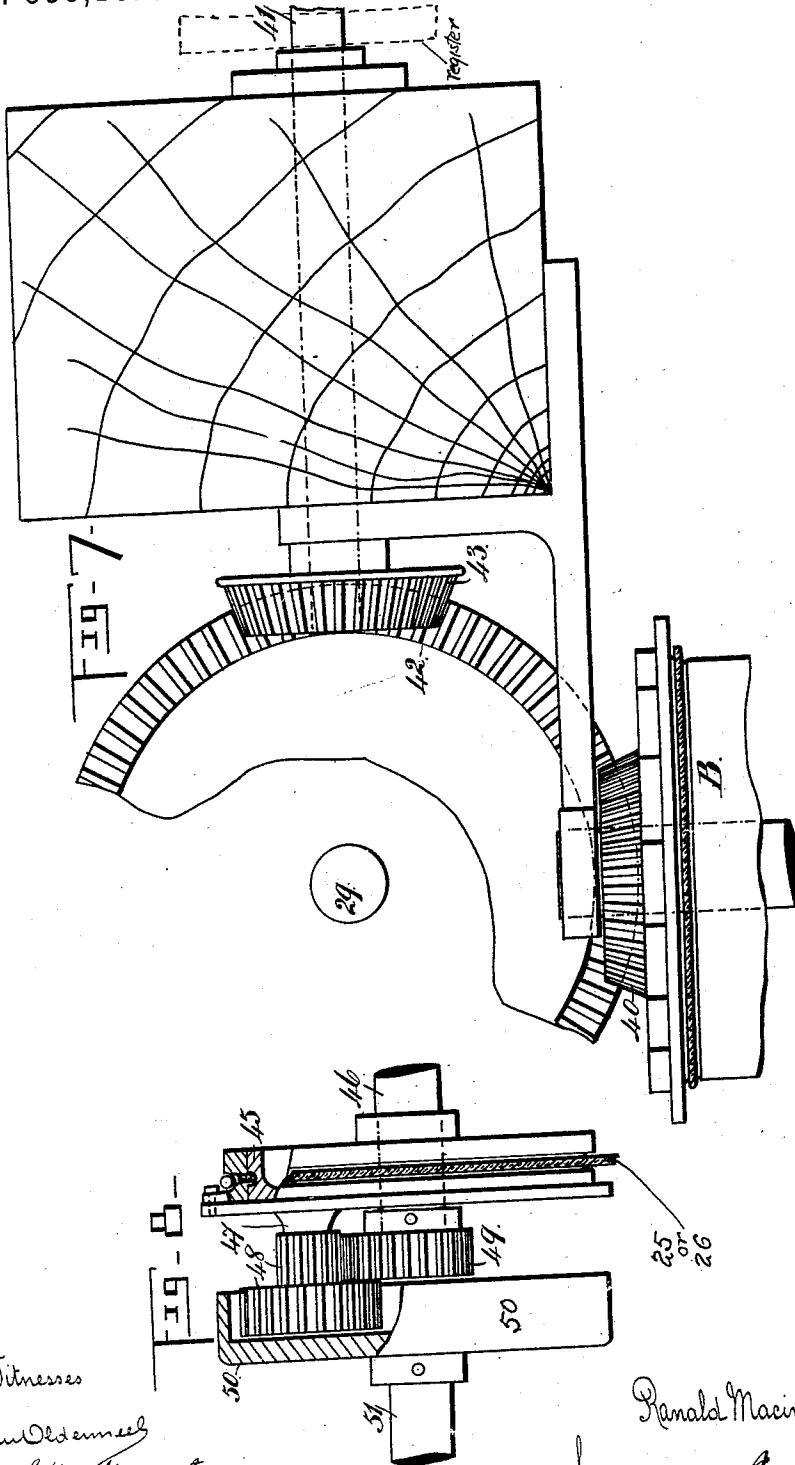
(No Model.)

6 Sheets—Sheet 5.

R. M. MACDONALD.  
TICKET PRINTING AND REGISTERING DEVICE.

No. 559,182.

Patented Apr. 28, 1896.



Witnesses  
H. van Oudenweel  
E. H. Sturtevant

Inventor  
Renaud Macintosh Macdonald  
Attorneys

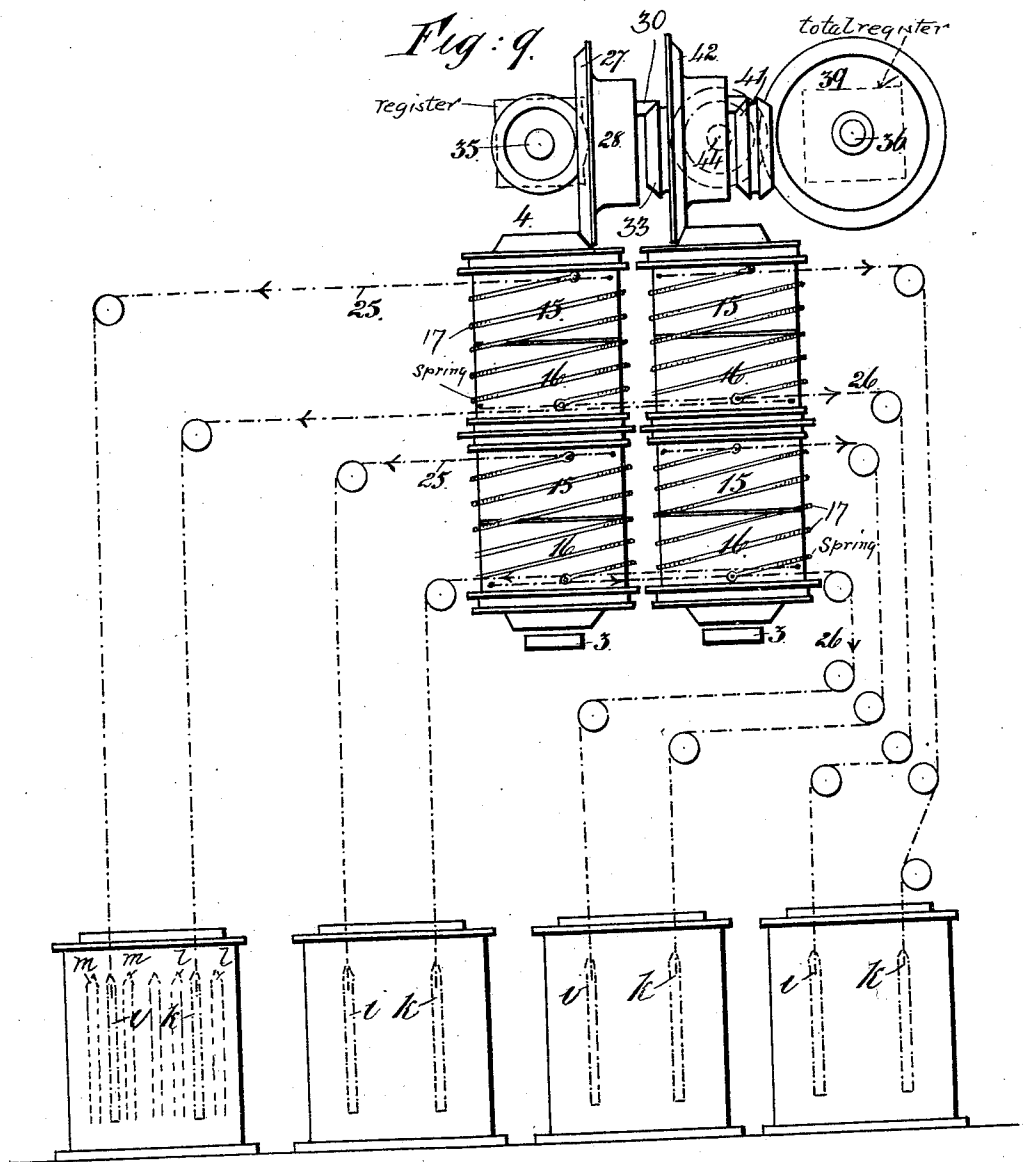
(No Model.)

6 Sheets—Sheet 6.

R. M. MACDONALD.  
TICKET PRINTING AND REGISTERING DEVICE.

No. 559,182.

Patented Apr. 28, 1896.



*Witnesses.*

*Herrie Hampton Raymond.*  
*Samuel Puring.*

*Inventor*

*Russell Macintosh Macdonald*

# UNITED STATES PATENT OFFICE.

RANALD MACINTOSH MACDONALD, OF CHRISTCHURCH, NEW ZEALAND.

## TICKET PRINTING AND REGISTERING DEVICE.

SPECIFICATION forming part of Letters Patent No. 559,182, dated April 28, 1896.

Application filed March 28, 1895. Serial No. 543,540. (No model.)

*To all whom it may concern:*

Be it known that I, RANALD MACINTOSH MACDONALD, a citizen of the Colony of New Zealand, residing at 71 Cathedral Square, Christchurch, in the Provincial District of Canterbury, New Zealand, have invented a new and useful Ticket Printing and Registering Device, of which the following is a specification.

My invention relates to means whereby a plurality of transactions involving the exchange of tickets, checks, or bills of purchase for money and taking place at different counters or in different booths may be recorded on dials, there being a separate dial for each attendant or official and a dial common to them all upon which the total number of transactions may be recorded. Such machines may be used in large mercantile houses, at fairs, or like places.

My invention provides improvements in such machines in which the exact amount printed upon a ticket may be registered at the same moment when the printing operation takes place, and any or all of the officials may indicate upon the same dial at the same instant, while fraud is prevented on the part of the public or of the officials in charge of the machine.

In practice I provide a printing or impressing apparatus for each operator capable of printing upon a ticket-receipt the memoranda of the transaction at that particular counter or booth. The operation of printing a ticket actuates mechanism similar to what is known to engineers as "differential gear," through the medium of which the indications are made by any ordinary counting-gear and upon ordinary indicating-dials. The employment of differential gear enables operations upon the same dial to be conducted simultaneously by a number of officials. I also provide means for instantaneously arresting the action of the machine from any distance.

Referring to the accompanying drawings, Figure 1 is a sectional elevation, Fig. 2 a sectional plan, and Fig. 3 a front elevation, of my apparatus for stamping tickets and thereby actuating the registering mechanism. Fig. 4 is a side elevation, partly in section, of a portion of my improved mechanism for actuating the registering-gear. Fig. 5 is a plan

thereof, partly in section. Fig. 6 is a front elevation, partly in section, illustrating the mechanism employed for actuating the grand-total register; and Fig. 7 is an end elevation thereof, the supporting-beam being shown in section. Fig. 8 is a view of similar apparatus to that shown in Fig. 4, but illustrating the use of spur instead of bevel gearing therein. Fig. 9 is a diagrammatic view illustrating the manner in which the parts are connected up.

The same letters and numerals of reference indicate the same parts in all the figures.

A ticket-stamping apparatus similar to that illustrated in Figs. 1, 2, and 3 is furnished to each of the attendants at the various booths or stands. It consists of a cylindrical chamber *a*, in the center of which is mounted the vertically-sliding spindle *b*, which can be operated by an ordinary treadle-lever *b*<sup>2</sup>, a connecting-rod *b*<sup>3</sup> leading from the treadle-lever being connected to the spindle *b* by a pin through the eye *b*<sup>1</sup>. The spindle *b* carries upon its upper end the arm *c*, which is free to rotate upon it and is provided at one end with three pins *d e f*. Upon the center pin *e* is pivoted a printing or impressing roller *g*, which is caused to rotate by a pinion *g*<sup>1</sup>, attached to it, which gears into a toothed quadrant *g*<sup>2</sup>, rigidly fixed upon the spindle *b*. The roller *g* is provided upon its periphery with suitable rubber or other type or means for perforating or printing any desired matter. When type is used, it is inked by the inking-rollers *h* and *h*<sup>1</sup>, (see Figs. 1, 2, and 3,) which are mounted, respectively, on the pins *d* and *f* which bear against it. The opposite end of the arm has a conical recess *c*<sup>1</sup>, which engages over the conical point of one of a number of actuating-pintles, such as *i j k*, which are free to slide vertically and one of which is provided for each transaction or article of sale. A separate cord, such as 25 or 26, is attached to each of these pintles and is used to actuate totaling and registering mechanism, as hereinafter described.

Fixed pintles, such as *l* and *m*, are placed one between each two of the pintles referred to and serve as a guide to insure the end of the arm *c* engaging upon one of the actuating-pintles in its downward descent, the under side of the arm being formed into a V or knife-edge *V* for the same purpose.

A semicircular carriage or frame *n*, which is free to rotate for a portion of a rotation, is arranged within the casing *a*, which casing is cut away, as seen in Fig. 2. This frame is provided with a slot *o*, (see Fig. 1,) having a mouthpiece *o'*, in which may be inserted the ticket-receipt which it is desired to print or impress.

The vertical spindle *b*, when moved down by the treadle-lever before referred to, brings the printing-roller *g* down upon the table *o*<sup>3</sup>, and it is evident that the particular type or perforating apparatus which comes into contact with the ticket which rests upon the table is regulated by the position of the pinion *g'* on the tooth-quadrant *g*<sup>2</sup>, so that it is only necessary to rotate the frame *n*, and with it the arm *c*, in order to cause the printing-roller to rotate and bring the desired type into operative position. The arm *c* is caused to rotate with the carriage *n* by the pin *e*, which projects through the roller *g* into the carriage *n*, in which is a vertical slot *n'* to permit of the downward travel of the pin *e* when the spindle *b* is operated.

In order to show when the carriage *n* is in the desired position, an indicating-pointer *p* is attached to the arm *c*, and projecting upward through the top of the casing *a* indicates upon a semicircular scale *a'*, which bears similar names or numbers to those on the printing-roller. When the end of the arm *c* is in position to print the number or name of a transaction or article of sale, the opposite end thereof is ready to engage upon the point of the pintle, to which is attached the cord 25 or 26, which actuates the registering mechanism for the particular transaction or article of sale, and when the arm *c* is caused to descend it forces down that pintle, thus pulling the cord and actuating the mechanism, a dash-pot *r* being placed around the spindle *b*, which is provided with a piston *r'* for the purpose of preventing injury to the mechanism from rough usage.

Figs. 4 and 5 illustrate my transmitting apparatus, in which differential gear is used to convey the operations of two officials simultaneously or separately to the registering-dial of the same transaction or article of sale. The spindle 1 (see Figs. 4, 5, and 6) is rigidly secured in the brackets 2 3 and has mounted upon it the double bevel-wheels 4 5, consisting of two wheels formed integral, which are free to turn upon the spindle 1, and the double bevel-wheel 6, which is secured thereon by any convenient means. The pinions 7 and 8 connect the wheels 4 5 and 5 6, respectively. These pinions 7 and 8 are carried by the pins 9 10 within the recesses 11 and 12, formed in the drums 13 14, which are free to rotate upon the spindle 1. External drums 15 and 16 encircle each of the drums 13 14, a single spring 17, coiled round and secured to both of them, serving to maintain them in their relative positions. The pins 18, engaging in the grooves 19, serve to prevent the drums 15 16 moving

endwise. The drums 15 16 are provided with pawls 20 21, which severally engage with ratchet-teeth 22 and 23, formed on a flange on the drums 13 and 14. The grooves 24, formed in the periphery of one end of each of the drums 15 16, receive the cords 25 and 26, which are carried round in opposite directions and connected to the drums 15 and 16, respectively, at one end and being carried over suitable guide-pulleys are severally attached at the other to an actuating-pintle in the ticket-stamping apparatus of each of the operators. (See Fig. 9.) The double bevel-wheel 4 communicates motion to the apparatus now to be described.

Referring to Figs. 6 and 7, which illustrate the apparatus for communicating the motion of the gear just described to the registering-dials, 13 13 represent the upper ends of two of the drums hereinbefore described for operating the mechanism of the registering-dials of two separate transactions, and also the mechanism of the grand-total register. The bevel-wheel 4 referred to gears into a bevel-wheel 27, formed upon the drum 28, rotating upon the fixed spindle 29. This drum is recessed to receive a pinion 30, which is rotatable upon a pin 31 and gears into both the double bevel-wheels 32 and 33, the double bevel-wheel 32 communicating its motion to another bevel-wheel 34, secured upon the spindle 35, which is connected at its other end by suitable gearing to any suitable individual register for registering the amount of rotation of the shaft 35.

The pinion 33 is for the purpose of communicating motion from the apparatus 13 to the total-registering spindle 36 through the gear described and the pinion 37 and bevel-wheels 38 and 39, the spindle 36 actuating a suitable total-register, as indicated conventionally by dotted lines.

The bevel-wheel 40 fulfills the same office as the bevel-wheel 4 in communicating the operations of two or more officials to the registering-spindle 41 of another competitor. It does this through the bevel-wheel 42 upon the drum which gears into the bevel-wheel 43 upon the spindle 41. The drum 44 is similar to the drum 28 before described and carries the pinion 37, which conveys the motion of both bevel-wheels 4 and 40 to the total-register gear on shaft 36.

It will thus be observed that the amount of rotation of shaft 35 is registered upon its individual register and the movement of rotation of shaft 44 is registered upon its individual register, while the sum of the rotations, and consequently the grand total of all the transactions of all the different ticket-printing devices, is registered upon the total-register connected with the shaft 36.

In practice it may be advisable to duplicate the pinions 7, 8, 30, and 37, placing one opposite the other in the drums 13 and 14 and 28 and 44, so as to balance the mechanism. It will be evident to all persons skilled in



mechanics that it is only necessary to reproduce the parts of the apparatus shown in order to enable any number of officials to operate upon the registering-dials of any number of distinct transactions. It will also be evident that many parts of the apparatus might be substituted for their mechanical equivalents. For instance, an apparatus in which spur-wheels are employed instead of bevel-gearing is illustrated in Fig. 8, which I will now proceed to describe.

A drum 45, rotating upon the shaft 46 by means of an external oscillating drum, as in the apparatus previously described, carries an arm 47, which has mounted upon it the double spur-wheel 48, which meshes with the spur-wheel 49 and also with the internal teeth of a wheel 50, which is fixed on the shaft 51. One of these apparatuses is required for each person registering on a dial, the operation being similar to that of the gear illustrated in Figs. 4 and 5.

When it is desired by the proprietors or others using the machine to make it impossible to issue tickets or receipts or engage in any further transactions after the business is closed for the time being, an electric apparatus for locking the treadle is used, consisting of a lever S, placed in position, as shown in Fig. 1. The end S' of such lever being slightly the lighter is held down by an electromagnet *t*, having wires connected with and leading to any desired place. When the circuit is broken, the end S' is released and rises sufficiently to prevent the treadles being depressed. The machine is thereby effectually locked, preventing further issue of tickets.

In operation, when one of the officials in charge of a machine receives the price of an article or of a ticket, he inserts the receipt or ticket in the slot *o* in the carriage or frame *n*, which may then be rotated by hand until the impressing or printing roller *g* has come into a position to print the number or name of the article or transaction on the ticket. This will also bring the opposite end of the lever *c* immediately over the pintle having a cord attached to it, which leads to the indicating mechanism of that article or transaction. By pressing the treadle the arm *c*, and with it the printing-roller *g*, is brought down and the desired name or number is printed or impressed upon the ticket, while the end of the arm *c* engages with and depresses a pintle, thus pulling a cord, as hereinbefore described. Upon the official releasing the treadle the spindle *b* is raised by a spring or counterbalance-weight, thus lifting the printing-roller *g* from the ticket. The opposite end of the lever is also lifted from the pintle with which it is in contact, thus slackening the cord and allowing the drum around which it is wound to return to its normal position by the action of the coiled wire spring.

It will be seen that separate or simultaneous operations may be performed by two operators, for if the drum 16, Fig. 4, be ro-

tated in the direction of the arrow it will communicate its motion through the ratchet-teeth and pawl to the pinion 8, which is caused to rotate through being in gear with the fixed wheel 6, the motion being transferred through the double bevel-wheel 5 to the pinion 7, and thence to the double bevel-wheel 4, which will rotate in an opposite direction to the drum 16. If the drum 15 be rotated in the direction of the arrow while the drum 16 is stationary, then the double wheel 5 takes the place of the fixed wheel 6 in the operation just described. The pinion 7 is thus caused to rotate in the direction of the arrow, such rotation being communicated to the double wheel 4, while if the drum 15 be rotated simultaneously but in an opposite direction to the drum 16 the pinion 7 will convey the motion of the drum to the double wheel 4; but as the double wheel 5 is rotating in an opposite direction the rotation of the pinion 7 will be augmented by an amount equal to the rotation of the double wheel 5 and will convey the aggregate motion due to the rotation of both drums 15 and 16 to the double wheel 4, and so on to the registering and totaling gear, as hereinbefore described. The same description applies to the operation of the total-registering apparatus, and it is evident that the totalizing-spindle 36, actuating the total-registering mechanism, may be rotated by the gear A or the gear B alternately, or both together, through the mechanism described and illustrated.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a ticket printing and registering apparatus, the combination with the vertically-moving printing-roller means for rotating said roller to print different characters, the arm connected to said roller and moving therewith, the vertically-moving pintles moved by said arm, and a registering device and connections thereto from the said pintles, substantially as described.

2. In combination the casing having a ticket-opening, the vertically-moving spindle carried by said casing, the vibrating arm mounted upon said spindle, the printing-roller journaled on said arm, a stationary quadrant geared to said roller to turn the same as the arm vibrates, the series of pintles the registering device connected with said pintles, said pintles being moved by said vibrating arm, and means for reciprocating the spindle, substantially as described.

3. In combination, the casing, the framing *n*, arranged to vibrate therein and having a ticket-opening, the vertical spindle mounted in the casing, the vibrating arm journaled on said spindle, the printing-roller journaled on the forward end of said arm, the extreme end of said arm engaging a slot in the framing, a quadrant stationary on the spindle a gear on the roller meshing with said quadrant, means for reciprocating the spindle, a series of pintles engaged by said vibrating arm, a

registering device and connections therefrom to said pintles, substantially as described.

4. In combination, the casing, the framing rotatably mounted therein, and having a ticket-opening, the spindle with means for moving it vertically in the casing, the arm journaled upon the upper end of said spindle and having its forward end engaging a vertical slot in the framing, the printing-roller journaled on said arm, the stationary segment carried on the spindle a gear on the printing-roller meshing with said segments, the rear end of said arm having a conical recess, the pointed sliding pintles the registering device connected with said pintles, and the guide-pins for guiding the recessed end of the arm upon the points of the pintles, substantially as described.

5. In combination, the casing, the vertical shaft with means for reciprocating it, the vibrating arm mounted on said shaft, the printing-roller journaled on the arm, the stationary quadrant engaging the printing-roller for rotating it as the arm vibrates, and the pointer carried by said arm extending through a slot in the casing, substantially as described.

6. In combination with a number of ticket-printing devices, a corresponding number of drums journaled upon the shaft springs for placing tension upon said drums, cords connecting said drums with the ticket-printing devices and operated thereby to rotate adjacent drums in opposite directions, a gear-

wheel carried by each drum, a stationary gear engaging therewith, movable gears operated by the gears on the drums, a registering device, and connections therefrom to said gears, substantially as described.

7. In combination with a number of printing devices a corresponding number of drums journaled upon a supporting-shaft springs for placing tension on said drums, cords connecting said drums with the respective printing devices and arranged to rotate said drums, bevel-gears carried by the drums meshing with an intermediate gear, bevel-gears connected with the supporting-shaft and meshing with the gears of the drums, a register and connections therefrom to said supporting-shaft, substantially as described.

8. In combination with a series of ticket-printing devices, a plurality of drums arranged to be rotated thereby, rotary shafts, with means for imparting the individual or collective movement of the drums to said shafts, an individual register for each shaft, connections from each register to its respective shaft, a total-register and gear connections for transferring thereto the total amount of movement of said shafts, substantially as described.

RANALD MACINTOSH MACDONALD.

Witnesses:

HENRIE HAMPTON RAYWARD,  
SAMUEL CUMING.