

W. H. MUZZY.

ELECTRICAL CASH REGISTER WITH DISTANT INDICATION.

APPLICATION FILED DEC. 26, 1903.

996,786.

Patented July 4, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

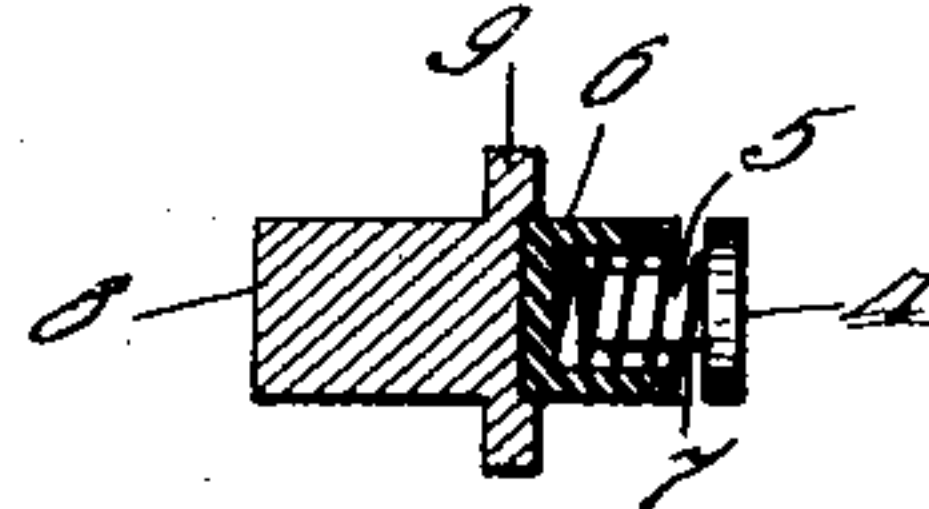
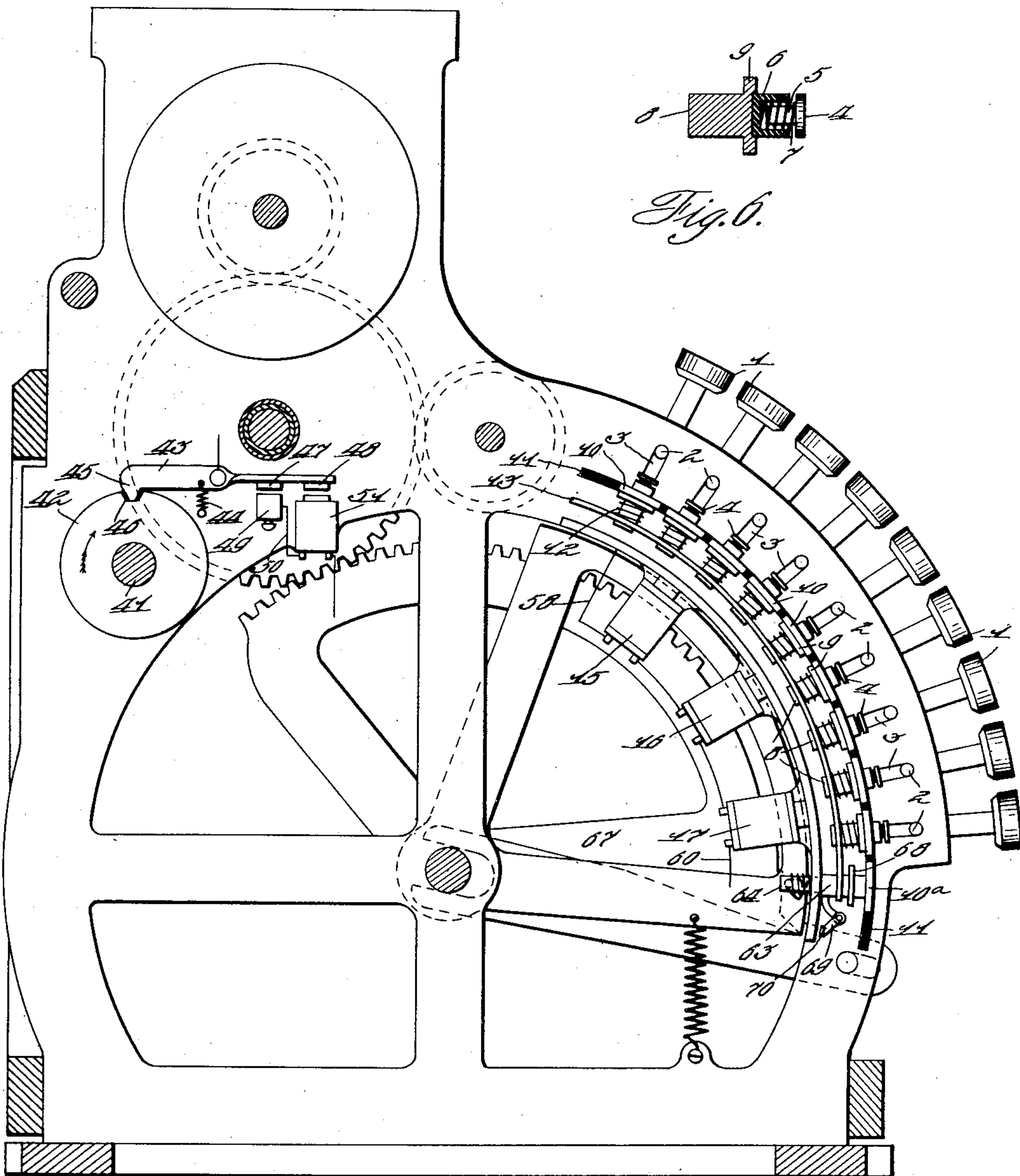
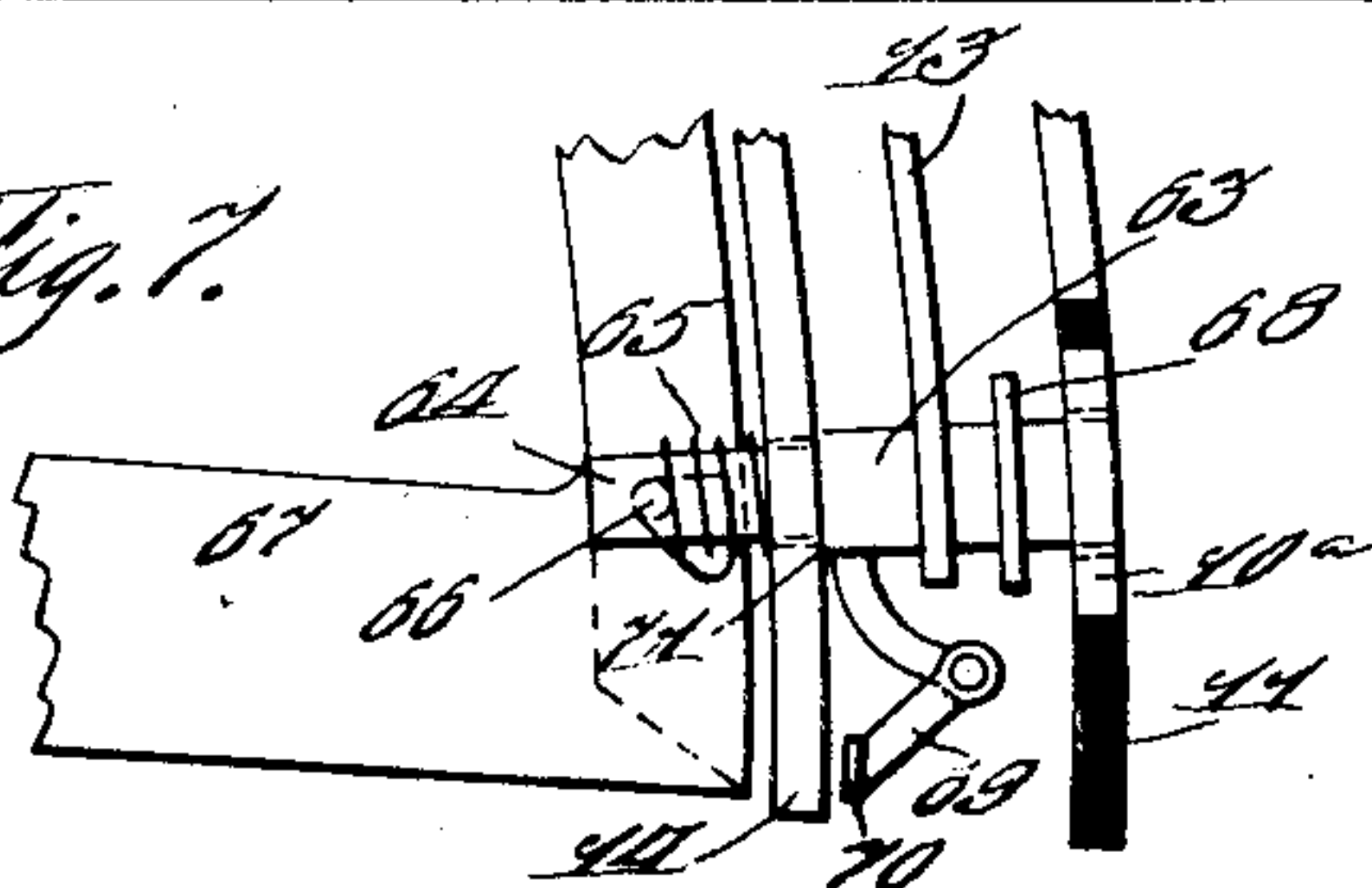


Fig. 6.

Fig. 7.



Witnesses
W. M. Clarity
John Hungary

Inventor

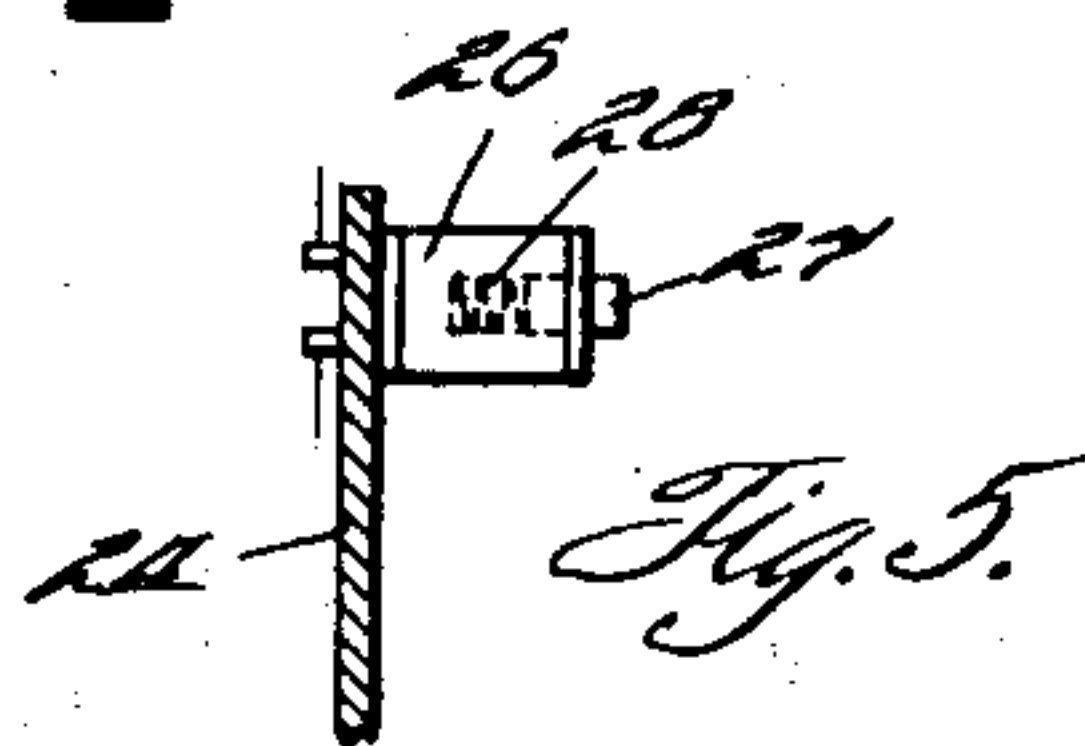
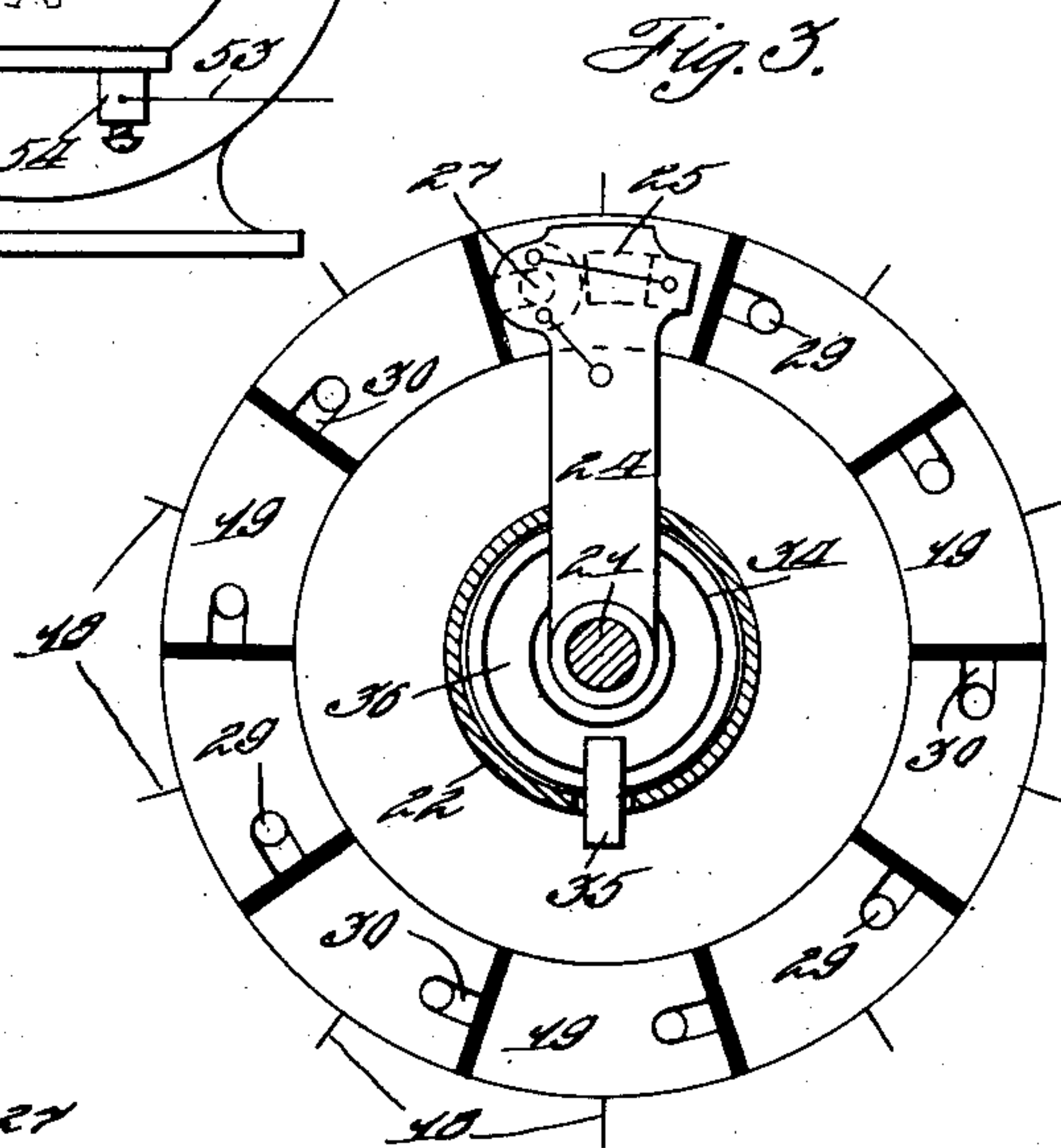
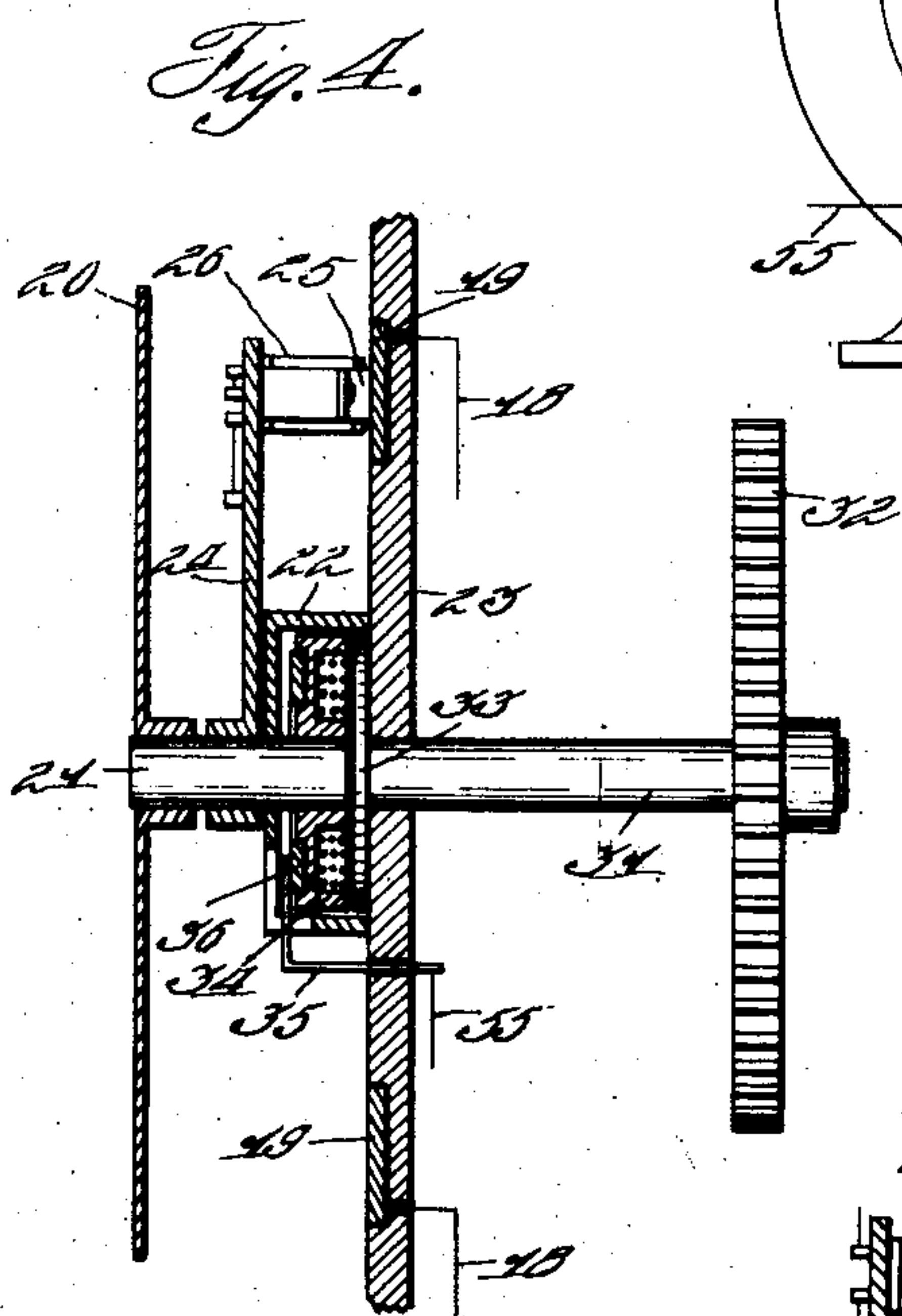
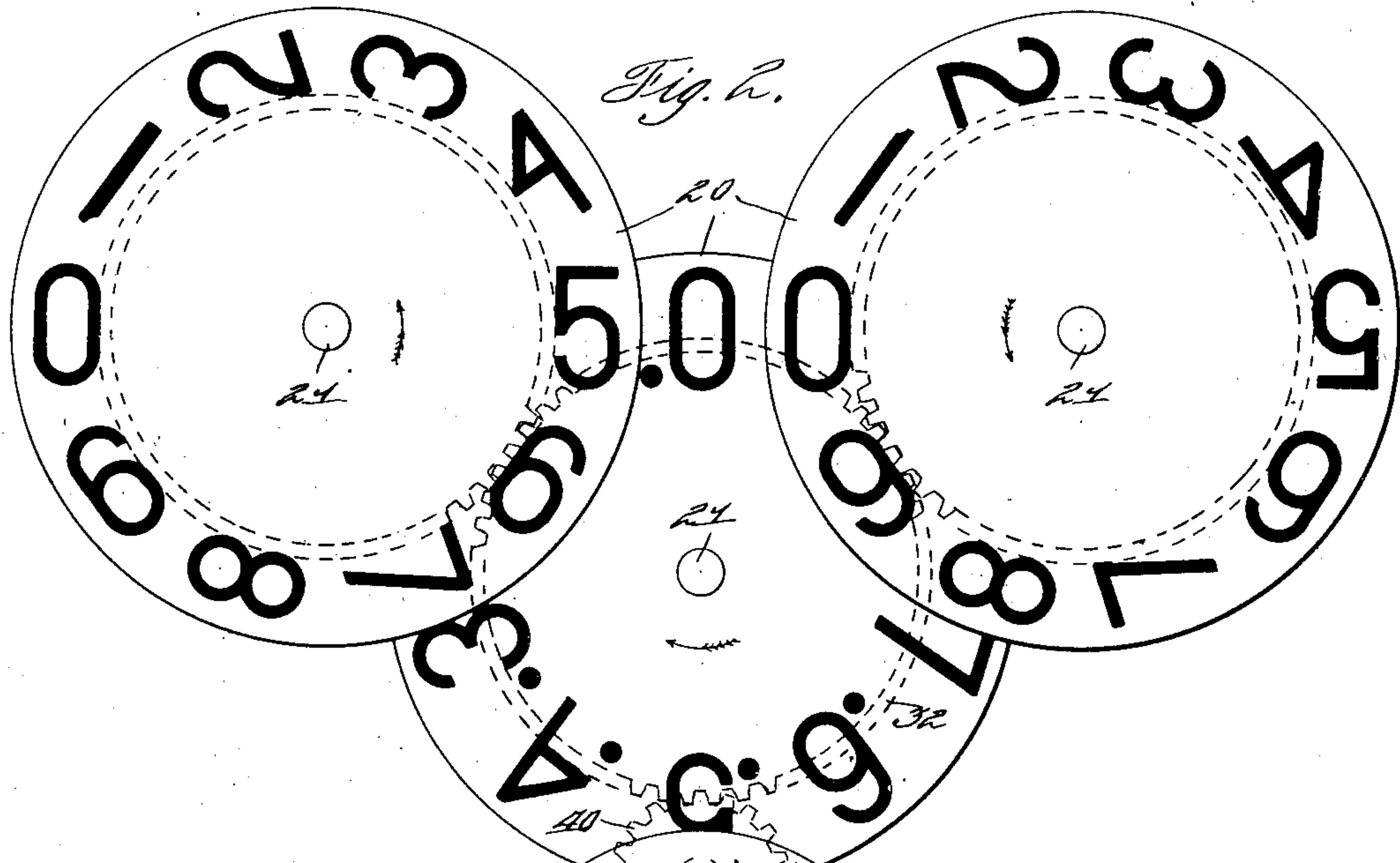
W. H. Muzzy

W. H. MUZZY.
ELECTRICAL CASH REGISTER WITH DISTANT INDICATION.
APPLICATION FILED DEC. 26, 1903.

996,786.

Patented July 4, 1911.

3 SHEETS-SHEET 2.



Witnesses
W. M. McCarthy
John J. Langway

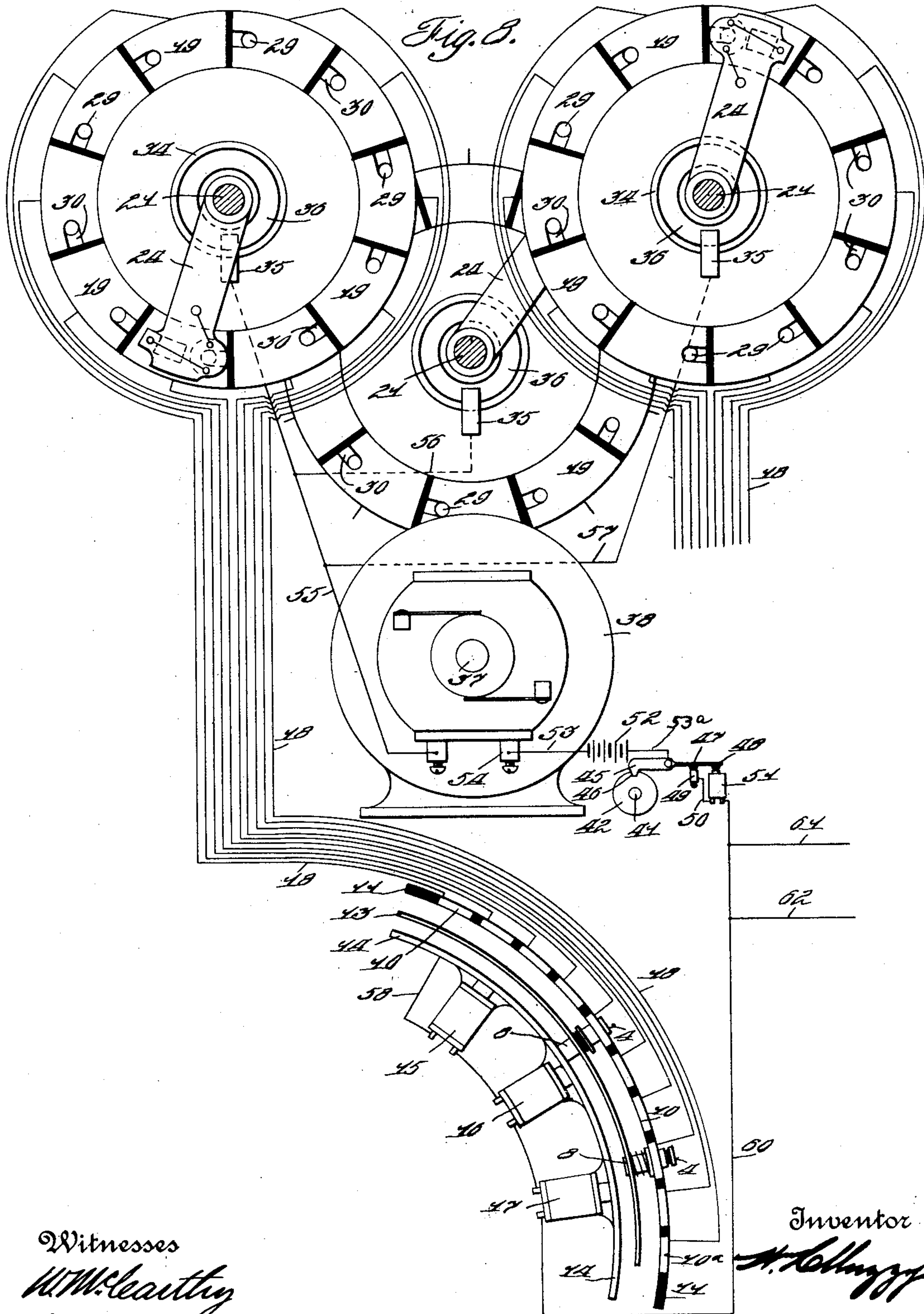
Inventor
W. H. Muzzy

W. H. MUZZY.
ELECTRICAL CASH REGISTER WITH DISTANT INDICATION.
APPLICATION FILED DEC. 26, 1903.

996,786.

Patented July 4, 1911.

3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

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

ELECTRICAL CASH-REGISTER WITH DISTANT INDICATION.

996,786.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed December 26, 1903. Serial No. 186,741.

To all whom it may concern:

Be it known that I, WILLIAM H. MUZZY, 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 Electrical Cash-Registers with Distant Indication, of which I declare the following to be a full, clear, and exact description.

10 This invention relates to improvements in cash registers and has more particular relation to improvements in indicating devices for the same located at a distance from the machine or register proper.

15 The object of the invention is to provide improved mechanism for indicating at a distance, at one or several points, the amounts of the transactions which are registered indicated or recorded at the main station
20 where the cash register is located.

A further object is to apply an improved form of distant indication to the type of machine known as a "two-motion" machine, in which keys are first set and the machine
25 proper subsequently operated by a lever, handle, or its equivalent means.

The invention consists of certain novel constructions, combinations and arrangements of parts, all of which will be herein-
30 after more particularly set forth and claimed.

In the accompanying drawings forming part of this specification: Figure 1 represents a transverse vertical section through a machine of the type shown in the patent to Cleal and Reinhard, No. 580,378, dated April 13, 1897, with my improvements applied thereto. Fig. 2 represents a front elevation of one of the groups of indicators and
40 its actuating motor. Fig. 3 represents a detail front elevation of one of the contact rings or groups of segments. Fig. 4 represents a detail vertical section through one of the indicators, its operating clutch and connections. Fig. 5 represents a detail side elevation of one of the solenoid latches. Fig. 6 represents a detail vertical section through one of the contact pieces operated by the keys. Fig. 7 represents a detail side elevation of one of the zero contact devices; and
50 Fig. 8 represents a diagrammatic view of the wiring of one group of indicators.

As a number of the parts shown in the present drawings are fully described and shown in the patent to H. S. Tittle, No. 55 709,806, granted September 23, 1902, I will not give a full description of such parts in the present case but will refer to said patent for any detail description desired.

In the aforesaid patent but a single indicator wheel is shown while in my present invention each of the groups of indicating devices comprise three indicators, arranged to be actuated by a single motor. The indicators are connected up to the motors
60 through the medium of suitable magnetic clutches and the indicators are arrested in their movements by the breaking of the circuits through the magnetic clutches whereby the indicators are disconnected from the
70 motor.

In the following specification I will describe the machine as provided with a single group of indicators but it will be understood that as many groups as desired may be provided and made to indicate in different
75 rooms or parts of a single room by properly connecting the circuit wires.

The type of machine shown in Fig. 1 is fully described and illustrated in the aforesaid patent to Cleal and Reinhard and it will therefore not be necessary to describe this machine in detail in this application except in so far as the construction of the machine comes into intimate relation with the
80 devices comprising the present invention. The setting keys 1 are arranged in banks as described in the aforesaid patent; each bank containing 9 keys numbered from "1" to "9" and the banks represent units-of-cents, 90 tens-of-cents and units-of-dollars. It will of course be understood that this capacity can readily be increased and the number of indicators correspondingly increased without departing from the spirit of this invention. I
95 have simply selected a three bank machine for the sake of illustration of my improvements. The keys 1 operate in connection with the regular registering, indicating and recording devices substantially as shown and
100 described in the aforesaid patent. The shank of each of these keys is provided with a laterally projecting pin 2 which operates through a radial slot 3 formed in a portion

of the main frame of the machine. When one of the keys is depressed its pin 2 contacts with the head 4 of a small spring plunger 5 which is mounted in a fiber cup 6 and is normally forced outward by a coil spring 7 also mounted in said cup and engaging the head 4, as clearly shown in Fig. 6. The cup 6 is mounted in a slidable contact piece 8 provided with an annular flange 9 which is normally forced into contact with a contact plate 10 mounted in a fiber segment 11 which is secured to the frame of the machine. The slide 8 is mounted in an apertured metallic plate 13 and is normally forced into engagement with its contact piece 10 by a light coil spring 12 interposed between the plate 13 and the flange 9. A soft iron contact plate 14 is mounted below the slides or plungers 8 so that when one of the same is depressed it will contact with said plate. It will of course be understood that when any one of the keys 1 is depressed it is latched in its depressed position by the regular detent described in the aforesaid patent and is held in this position until the machine is subsequently operated. The office of the spring plunger 4 is to compel the proper contact between the plunger or slide 8 and the plate 14 and to take up any inequalities due to difference in the play of the keys 1. When a key is depressed it will be seen that the plunger 8 is moved out of contact with its contact plate 10 and brought into contact with the plate 14.

When the key is so depressed, and the machine subsequently operated, a circuit is established through three magnets 15, 16 and 17, the cores of which are secured to the plate 14 as more clearly shown in Fig. 8.

By the above described devices the energizing of the magnets 15, 16 and 17 transforms the soft iron plate 14 into a magnet of sufficient strength to hold the depressed plungers 8 in their depressed positions irrespective of the movements of the keys and thus holds the circuit closed until the same is finally broken at the indicators, as hereinafter described.

By reference to Fig. 8 it will be seen that each of the contact pieces 10 is connected by a suitable wire 18 with one of a series of contact plates or segments 19 arranged in a circle and suitably insulated one from the other. Each of the indicator disks 20 is provided with ten numerals from "0" to "9." By reference to Fig. 4 it will be seen that each of these indicators 20 is fast to a short shaft 21 suitably mounted in a frame 22 which is secured to a stationary board 23. The shaft 21 carries a rigid arm 24. This arm in turn carries a spring contact clip or spring 25 suitably insulated therefrom and arranged to engage the contact segments 19 successively as the arm 24 rotates with the indicator. This arm 24 further carries a

small solenoid magnet 26 included in the circuit through said arm and the clip 25 and provided with a small solenoid core 27 normally forced outward by a coil spring 28 behind it. When the magnet 26 is energized, the core 27 is drawn inward, and the circuit through the magnet is broken, the spring 28 forces the core 27 far enough outward to cause it to engage the surface of the segments 19. Each of these segments is provided with a locking aperture 29 and a shallow guiding channel 30. By this construction when one of the cores or plungers 27 is released it passes into the channel 30 and finally into one of the recesses 29 to lock the arm 24 in its adjusted position and also prevents any overthrow of the same. When the magnet 26 is again energized the plunger 27 is drawn out of the aperture 29 and the arm 24 with the indicator left free to move forward again. The shaft 21 receives its primary movement from a shaft 31 carrying a gear 32 and provided with an iron clutch disk 33. This disk 33 operates in proximity to a magnetic clutch member 34 which is fast to the shaft 21. A brush 35 mounted in the plate 23 engages a contact ring 36 mounted on the clutch member 34. By reference to Fig. 2 it will be seen that all of the gears 32 of the three indicators intermesh so as to move in unison and that the central gear is connected to the armature shaft 37 of the motor 38 by two intermediate pinions 39 and 40.

As before stated the present invention is an improvement on the patent to Tittle and in this patent the indicators, as in the present case, are arrested by the contact spring 25 reaching a segment which is "dead" or out of circuit. It becomes necessary in applying my improvements to the type of machine shown to prevent the operation of the indicators immediately upon the depression of the keys and to defer such operation until the crank handle or lever of the machine is operated. For this purpose the rotation shaft 41 of the machine is provided with a notched disk 42. A pivoted lever 43 is mounted upon the main frame and is drawn downward by a coil spring 44 whereby a nose 45 formed on its rear end is drawn into the notch 46 of the disk 42. The lever 43 is provided with a contact piece 47 and an armature plate 48. When the shaft 41 is rotated the rear end of the lever 43 is cammed upward by the wall of the notch 46 thus bringing the contact piece 47 into contact with a stationary contact piece 49. This latter contact piece is connected by a wire 50 to a stationary magnet 51 the core of which is located under the armature plate 48. The magnet 51 and the lever 43 are included in the circuit as plainly shown in Fig. 8. By means of this construction the operating handle or lever of the machine might

be moved with great rapidity but the contacts 47 and 49 will remain together as long as the magnet 51 remains energized even though the notch 46 has been moved under the nose 45 and it is only after the indicators have become fully set and the circuit broken that the lever 43 is allowed to resume its normal position shown in Fig. 1.

By reference to Fig. 8 I will trace out the connections for the left-hand indicator which is shown as fully wired to its respective bank of contact pieces on the register. Starting with the battery or source of electrical energy 52 the current passes through the wire 53 to one of the binding posts 54 of the motor, thence through the motor and by wire 55 to the brush 35 of the left-hand indicator; suitable branch wires 56 and 57 passing from the wire 55 to the brushes of the companion indicators. The current passes through the brush 35, to the ring 36, thence through the bobbin of the clutch, to the shaft 21, thence through the arm 24 and magnet 26 to the spring contact piece 25, thence from the successive contact plates 19 to the contact plates 10 by wires 18, thence through all of the plungers 8 which remain undepressed, to the plate 13, thence through the depressed plunger 8, to the plate 14, thence by wire 58 through the bobbins 15, 16 and 17, thence by wire 60 to the magnet 51; suitable branch wires 61 and 62 connecting wires 60 to the bobbins 15, 16 and 17 of the remaining banks of keys; from the magnet 51 by wire 50 to the contact 49, through contact 47 to lever 43, and thence by wire 53^a back to the battery thus completing the circuit. When the arm 24 reaches the segment 19, connected to the plate 10 of the plunger 8, which is depressed, the circuit is broken through the magnet 26 and the clutch 34 of that particular indicator with the result that the clutch ceases to act to force the arm 24 forward and the plunger 27 comes into play to lock the arm 24 against further movement. The shaft 31 of the arresting indicator may continue its movement and in fact does so if the remaining indicators require a further movement.

In a machine of the type described in this application it is necessary, when a key is operated in one of the amount banks only, to bring the indicators pertaining to the remaining banks to indicate zero, and to accomplish this result I provide each of the banks of keys with a tenth plunger 63 corresponding to the regular plungers 8 except that it is not operated by a key. This plunger is provided with a stem or shank 64, more clearly shown in Fig. 7, and which passes loosely through an aperture in the plate 14. A coil spring 65 surrounds the stem 64 and engages a transverse pin 66 mounted in the stem to normally force the stem inward and bring the plunger 63 into contact with the

plate 14. In this normal position, which is shown in Figs. 1 and 7, the plunger 63 is establishing a contact in a manner similar to one of the plungers 8 when the latter is depressed. As this plunger 63 controls the circuit through one of the segments 19 the indicators would be arrested at zero when the plungers 63 are in this normal position. When any one of the keys in the bank is operated, however, the detent 67 is elevated in a manner well known in the art and the movement of this detent is utilized to force the plungers 63 outward and bring its contact flange 68 into contact with its contact plate 10^a. This prevents the indicator being arrested when its arm 24 reaches the segment 19 which is connected to the plate 10^a, as the plunger 63 when in this position corresponds to the position of one of the plungers 8 when its respective key is not depressed. As a rapid operation of the machine might release the regular key detent and thus release the plunger 63 before the operation of the indicator was completed I provide means for holding the plunger 63 in its outward position irrespective of the movement of the key detent 67. This means comprises a pivoted bell crank 69, one end of which bears against the plunger 63. This bell crank is provided with an armature 70. Whenever the plunger 63 is forced outward the bell crank 69 is free to pass under a shoulder 71 formed on the plunger and does so pass when the plate 14 becomes energized to draw the armature 70 downward against it. The bell crank 69 then acts to hold the plunger 63 in its outward position irrespective of the movement of the key detent 67.

It will be seen from the foregoing description that the setting of the indicators is predetermined by the operation of the keys 1 and the subsequent operation of the machine proper but that independent of this predetermination the indicators are set correctly notwithstanding the keys may have been returned to their normal positions and the machine proper may have finally completed its operation. The controlling parts are only finally returned to their normal positions when the indicators have reached the proper positions to break the circuits. By this means the setting of the indicators is free from any possibility of fraudulent manipulation attempted by a violent operation of the machine.

Although I have shown series of keys arranged in banks for controlling the respective contact pieces on the machine, it will be understood that I can arrange to have single movable elements which may be moved to different adjusted positions for different amounts in the several banks without departing from the spirit of this invention.

No registering or recording mechanism is shown in this application but such mechanism is shown in the patent to Cleal and

Reinhard referred to and would in practice be found in any embodiment of this invention. In fact any type of accounting mechanism, by which term is included what is
 5 known in the art as indicating, registering and recording mechanism, may be adapted to utilize the present invention.

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

1. In a machine of the class described, the combination with an operating mechanism, of a series of setting elements for different denominations, a series of indicators, actuating means for said indicators, means for holding the indicators in set positions while the setting elements return to normal positions and electrical controlling means intermediate the setting elements, the indicators,
 15 and the operating mechanism, whereby the indicators corresponding to the denominations in which no setting elements are operated, are simultaneously actuated to be brought to zero indicating positions when
 20 the operating mechanism is actuated.

2. In a cash register, the combination with an operating mechanism, of a series of setting elements arranged in banks, a series of indicators corresponding to said banks, means for holding the indicators in set positions while the setting elements return to normal positions, electrical controlling contacts intermediate these setting elements and the indicators, an independent automatic
 25 zero contact, and a contact controlled by the operating mechanism, whereby the indicators corresponding to the banks in which no setting elements are operated will be simultaneously actuated to be brought to zero
 30 indicating positions when said mechanism is operated.

3. In a cash register, the combination with a series of setting elements, of a series of indicators, means for holding the indicators in set positions while the setting elements return to their normal positions, controlling contact plates for the indicators, contact pieces controlled by the setting elements and connected to the contact plates, a movable
 45 contact piece moving with each indicator, and a positive stop device for said movable contact piece.

4. In a cash register, the combination with a series of setting elements, of a series of contact pieces controlled thereby, a series of indicators controlled by the contact pieces, devices for breaking the circuit when the indicators have become set, and a magnetic holding device for the contact pieces included in the circuit.
 50

5. In a cash register, the combination with a series of setting elements, of an operating mechanism, a series of indicators, electrical connections controlled by the indicators,
 55 electrically operating means intermediate the

setting elements and the indicators, and a switch controlled by the operating mechanism for making and breaking the electrical connections with the indicators and the electrical operating means. 70

6. In a cash register, the combination with a series of setting keys, of a series of contact pieces actuated thereby, a series of indicators, electrical operating devices intermediate the indicators and the contact pieces,
 75 an operating mechanism coöperating with the keys, and a switch controlled by the operating mechanism for connecting and disconnecting the electrical operating devices with the contact pieces. 80

7. In a cash register, the combination with a series of keys, of an operating mechanism, a series of indicators, contact pieces controlled by the keys, electrical means intermediate the contact pieces and the indicators,
 85 a switch controlled by the operating mechanism, and magnetic means for holding the switch to its circuit independent of the operating mechanism.

8. In a cash register, the combination with a series of setting keys, of contact pieces controlled thereby, a series of indicators, a series of contact pieces for the indicators, movable contact arms coöperating with the indicator contact pieces, electrical connections intermediate the key contact pieces and the indicator contact pieces, and a magnetically controlled switch actuated by the operating mechanism. 90

9. In a cash register, the combination with an operating mechanism, of a series of keys arranged in banks, a series of indicators, electrical connections intermediate the keys and the respective indicators, for controlling the movements of the latter, means for holding the indicators set while the keys return to normal position, an auxiliary electrical connection between each bank of keys and the indicator, electrical connections with the operating mechanism, and means whereby
 100 the auxiliary connections in the respective banks will be changed when the keys in the corresponding banks are operated. 110

10. In a cash register, the combination with a series of keys arranged in banks and numbered from 1 to 9 in each bank, a series of contact pieces, one for each key, an auxiliary contact piece in each bank, means for actuating the auxiliary contact piece when any other contact piece is actuated, a series of indicators, and electrical connections between the indicators and the contact pieces. 115

11. In a cash register, the combination with setting elements arranged in banks, of a series of indicators, a single driving motor for the indicators, individual clutches between the motor and the respective indicators, means for controlling the clutches according to the operation of the setting elements in the respective banks and electrical
 120 125 130

connections for automatically continuing the motor in circuit until all the indicators have been set.

12. In a cash register, the combination with a series of keys arranged in banks, of a series of indicators, electrical connections between the keys and the indicators, a single driving motor for the indicators, and magnetic clutches between the motor and the respective indicators controlled by the electrical connections of their respective banks whereby the motor is continued automatically in circuit until all the indicators are set.

13. In a cash register, the combination with suitable contact closing devices, of a series of indicators located at a distance therefrom, means for breaking the circuit when the indicators reach the desired set positions, a single motor for actuating the indicators, clutches intermediate the motor and the indicators, means for throwing out a particular clutch when a certain indicator has reached its set position so that the motor may continue to actuate the remaining indicators and electrical connections whereby the motor is continued automatically in circuit until all the indicators are set.

14. In a cash register, the combination with suitable setting devices, of a series of indicators located at a distance therefrom, electrical connections between the indicators and the setting devices, means for breaking the circuit when an indicator reaches its set position, and a magnetically controlled stop device for positively arresting an indicator when its circuit is broken.

15. In a cash register, the combination with a series of setting devices, of a series of contact pieces controlled thereby, a magnetic detent for said contact pieces, and an operating mechanism controlling said magnetic detent.

16. In a cash register, the combination with a series of setting elements, of a series of contact pieces, a detent for the contact pieces, an operating mechanism controlling the detent, and a magnetic switch also controlling the detent independently of the movement of the operating mechanism.

17. In a cash register, the combination with a suitable setting mechanism, of an indicator, electric controlling devices intermediate the setting mechanism and the indicator for arresting the indicator by the breaking of the circuit, and a magnetically controlled stop device for the indicator interposed in the circuit.

18. In a cash register, the combination with a series of setting keys, of a detent for the same, electrically controlled indicators, and a contact controlled by the key detent for arresting the indicators at zero.

19. In a cash register, the combination with a series of keys, of a series of indica-

tors, electrical connections between the keys and the indicators, and normally broken electrical connections for arresting the indicators at zero arranged to be established by the actuation of the keys.

20. In a cash register, the combination with a series of keys arranged in banks, of contact pieces for the respective keys, magnetic detents for the contact pieces, an operating mechanism, a switch controlled thereby, magnetic devices also controlling the switch, a series of indicators, a motor for driving the indicators, and means for breaking the circuits to arrest the indicators in the desired positions.

21. In a cash register, the combination with a series of setting elements, of a series of indicators, electric devices for actuating the indicators, means controlled by the setting devices for closing the circuits of the electric devices, and means for preventing the breaking of these circuits until the indicators are properly set.

22. In a cash register, the combination with a series of keys, of a movable member operated by any of said keys, electrically controlled indicators, and a contact controlled by the common key member for arresting the indicators at zero.

23. In a cash register, the combination with a series of keys arranged in banks, of a series of indicators, electrical connections including magnetic clutches between the keys and indicators and constructed to arrest the indicators by the breaking of the circuit, and a single driving motor for the indicators, whereby the motor is continued automatically in circuit until the circuits through all the indicators are broken.

24. A cash register, having setting devices and an operating mechanism, a series of indicators, circuit controllers movable with said indicators, a common operating means for said indicators, electrical circuits including said indicator operating means, said circuit controllers and movable parts of the cash register, and means for changing the electrical condition of said circuits on an operation of the register operating means.

25. In a cash register, the combination with a series of movable contact devices, of a magnetic detent for holding any of said devices in moved position, and operating devices for magnetizing said magnetic detent.

26. In a cash register, the combination with an operating mechanism, of circuit controlling devices which control different circuits for different amounts and independent means for making and breaking said circuits actuated by the operating mechanism, a series of accounting devices, circuit controllers movable with said accounting devices and magnetic stop devices for the account devices included in the said circuits.

27. In a cash register, the combination

with a series of setting elements of a series of accounting devices, electric devices for actuating said accounting devices, means controlled by the setting elements for closing the
5 circuits of the electric devices, and means for preventing the breaking of these circuits until the accounting devices are properly set.

28. In a cash register, the combination
10 with an operating mechanism, of setting devices, accounting devices, electrically operated controlling means between the setting devices and the accounting devices, and a switch actuated by the operating mechanism
15 for making and breaking the electrical connections with the accounting devices.

29. In a cash register, the combination with a series of keys arranged in banks, of a series of accounting devices, electrical con-
20 nections including magnetic clutches between the keys and the accounting devices and constructed to arrest the latter by the breaking of the circuits, and a single driving motor for the accounting devices, with con-
25 nections whereby the motor is continued automatically in circuit until the circuits through all the accounting devices are broken.

30. In a cash register, having setting de-
30 vices and an operating mechanism, a series of accounting devices, circuit controllers movable with said accounting devices, a common operating means for said devices, electrical circuits for said common operat-
35 ing means, said circuit controllers and movable parts of the cash register, and means for changing the electrical condition of said circuits on an operation of the register operating means.

40 31. In an accounting machine, the combination with a series of setting elements, of a series of accounting devices controlled thereby, a motor for actuating said devices, a switch for closing the circuit to the motor,
45 a magnet included in the circuit and controlling this switch and an auxiliary switch actuated by the motor and also included in the circuit.

50 32. In an accounting machine, the combination with a series of setting elements, of a series of accounting devices controlled thereby, an electric motor for driving the accounting devices, a switch included in the motor circuit, an electromagnet also in-
55 cluded in the circuit for holding the switch in its operated position, and an independent switch included in the circuit and operated by the motor.

60 33. In an accounting machine, the combination with a series of setting elements, of an accounting mechanism, electric devices for actuating the accounting mechanism, means for closing the circuit of the electric devices, and means for preventing the break-
65 ing of this circuit until the electric devices

have fully operated the accounting mechanism.

34. In a cash register, the combination with setting devices, of an operating mechanism, accounting devices, contacts controlled
70 by the setting devices, electrical connections intermediate the contacts and the accounting devices, a switch controlled by the operating mechanism, and magnetic means for holding the switch in circuit independent of
75 the operating mechanism.

35. In a cash register, the combination with accounting devices, of an electrically controlled setting mechanism, a switching device, manually operated means for con-
80 trolling the switch, and an electrically controlled device for also controlling the switch and included in the electrical connections.

36. In a cash register, the combination
85 with a setting mechanism, of a series of contact pieces controlled thereby, a series of indicators, electric operating devices intermediate the indicators and contact pieces, an operating mechanism cooperating with the
90 setting mechanism, and a switch controlled by the operating mechanism, for connecting and disconnecting the electric operating devices with the contact pieces.

37. In a cash register, the combination
95 with a setting mechanism, of accounting devices, electrical connections including movable contacts, and magnetic detents included in the electrical connections for retaining the contacts in position.
100

38. In a cash register, the combination with a setting mechanism, of movable contact pieces controlled thereby, a magnetic detent for holding any of said contact pieces
105 in moved position, and means for magnetizing said magnetic detent.

39. In a cash register, the combination of a series of setting keys, and a movable member common to the same, electrically con-
110 trolled accounting devices, and a contact controlled by the movable member for arresting the accounting devices at zero.

40. In a cash register, the combination with a setting mechanism, of an accounting mechanism having a plurality of movable
115 elements, a common driving motor for all of said elements, and electrical connections for continuing the motor in circuit as long as any one of the elements is to be operated.

41. In a cash register, the combination
120 with a setting mechanism, of an accounting mechanism including a plurality of movable elements, a motor driving said movable elements, and connections whereby the motor is continued in operation until the last element has been actuated.

42. In a registering mechanism, the combination with a plurality of indicating mechanisms, of a motor common to the said
125 mechanisms for driving same, devices for

connecting each indicator separately to the motor, contact devices controlling said connecting devices and a circuit for said motor including said contact devices.

43. In a registering mechanism, means for producing differential motion comprising, an element adapted to have a differential motion, a motor mechanism for driving same, means for connecting said element to said motor mechanism, a magnet controlled stop device for said differential element, and a circuit for said motor controlling said connecting means and said stop device.

44. In a registering mechanism, means for producing differential motion comprising, an element adapted to be given a differential motion, mechanism for driving same, means for connecting said element to said mechanism, a stop device movable with said element and means for simultaneously operating said stop device and connecting means.

45. The combination with a series of movable contacts, of a differentially movable element, means independent of the contacts for establishing an electrical circuit between the contacts and the movable element, and means controlled by said element for breaking the circuit.

46. In a cash register, the combination with an operating mechanism, of a detent, contact devices movable into engagement with said detent, a digit carrier controlled by said contacts, means controlled by the operating mechanism for energizing the detent to hold said contact devices in engagement, therewith, and means controlled by the digit carrier for deenergizing the detent.

47. The combination with a sending machine, of a receiving machine, a motor for the latter, a single circuit for the motor including switches at both the sending and receiving machines, the receiving machine switch being actuated to control the sending machine switch.

48. The combination with a sending machine, of a receiving machine, a motor for the latter, a single circuit for the motor including magnetic devices at the sending machine for holding the circuit closed, means for closing the circuit at the sending machine, and means at the receiving machine for breaking the circuit connections to disable the magnetic devices of the circuit.

49. In a cash register, the combination with a plurality of differentially movable elements each capable of independent movement, of a single driving device therefor, means for determining the extent of movement imparted to said elements by the driving device, sets of contact plates over which said elements move, means for energizing said plates, and means controlled by the determining means for deenergizing one plate of each set so as to arrest said movable elements.

50. In an indicating mechanism, the combination with a plurality of indicators, of electrical means for operating same to display different numerals, manipulative devices divided into groups for controlling said indicators to display any desired numerals and spring actuated contacts for controlling indicators corresponding to groups in which no manipulative devices are operated.

51. In an indicating mechanism, the combination with an indicator constructed to display the digits, of contacts for controlling the display of the digits from one to nine inclusive, manipulative devices for closing said contacts, and a spring actuated contact for controlling the display of the zero digit when none of the manipulative devices are operated.

52. In a cash register, the combination with driving member, of a driven member constructed to be moved variable distances from normal position by the driving member, electrical means for determining the extent of movement of the driven member, and automatically operating means for arresting the driven member at normal position when the determining means is not operated.

53. In a machine of the class described, the combination with a cash register having determining keys and an operating mechanism, of a distant and structurally separate indicating mechanism consisting of a plurality of differentially movable indicators, actuators for the indicators, normally disestablished frictional driving connections between the indicators and the actuators therefor, means, controlled by the keys and the operating mechanism, for establishing the connections between the actuators and indicators, and means for disestablishing the connections and positively arresting the indicators.

54. In a machine of the class described, the combination with a cash register having determining keys and an operating mechanism, of a distant and structurally separate indicating mechanism consisting of a plurality of differentially movable indicators, actuators for moving the indicators distances determined by the keys, normally disestablished frictional driving connections between the indicators and the actuators therefor, means, controlled by the keys and the operating mechanism, for establishing the connections between the actuators and the indicators, and means, connected to the indicators, for disestablishing the connections and positively arresting the indicators.

55. In a machine of the class described, the combination with a cash register having determining keys and an operating mechanism, of a distant and structurally separate indicating mechanism consisting of a plu-

5 rality of differentially movable indicators, electrically operated actuators for moving the indicators distances determined by the keys, normally deenergized magnetic clutches between the indicators and actuators, circuits for the clutches, controlled by the keys and the operating mechanism, and means, movable with the indicators, for breaking

the circuits and positively arresting the indicators.

10

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

WILLIAM H. MUZZY.

Witnesses:

WM. O. HENDERSON,
JOHN J. UNGVIERY.