No. 789,558. PATENTED MAY 9, 1905.

W. H. MUZZY.

CASH REGISTER.

APPLICATION FILED APR. 22, 1904.

3 SHEETS—SHEET 1.

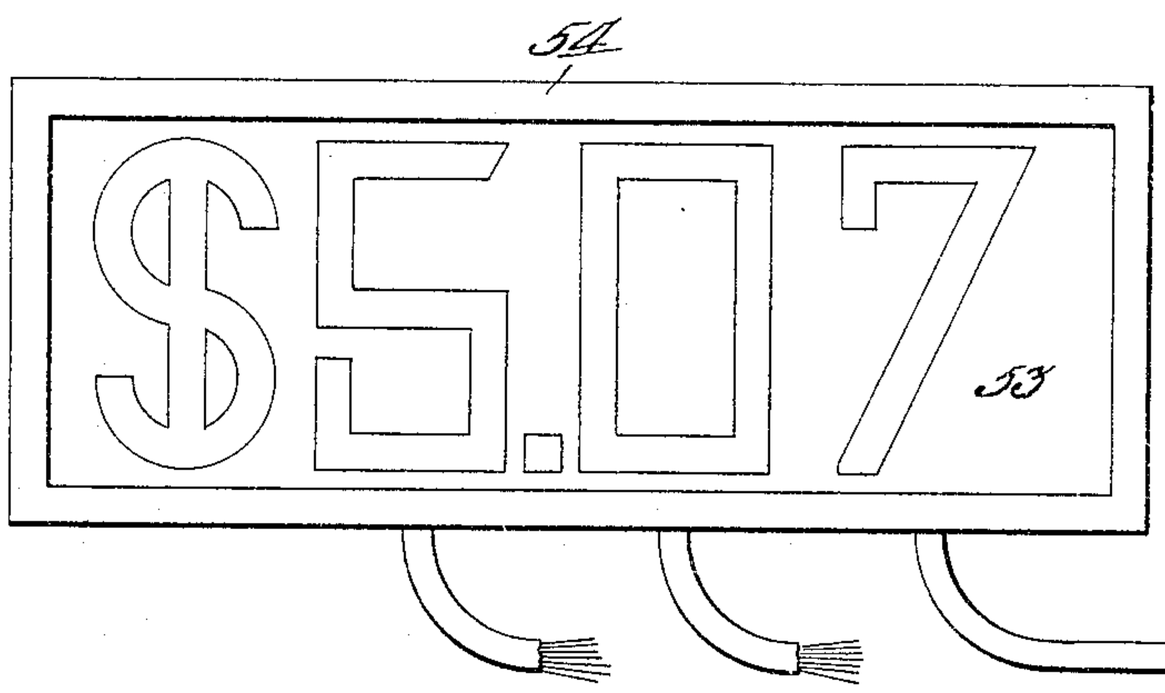

Fig. 3.

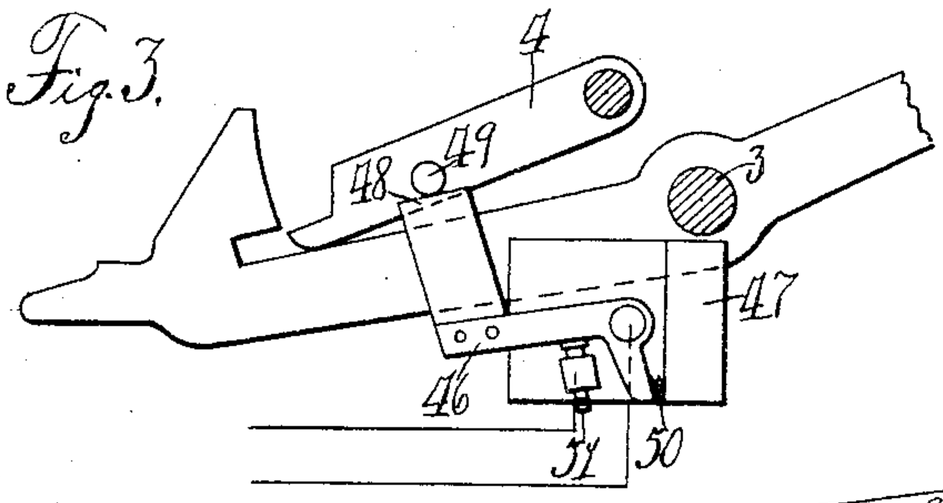

Fig. 1.

Witnesses

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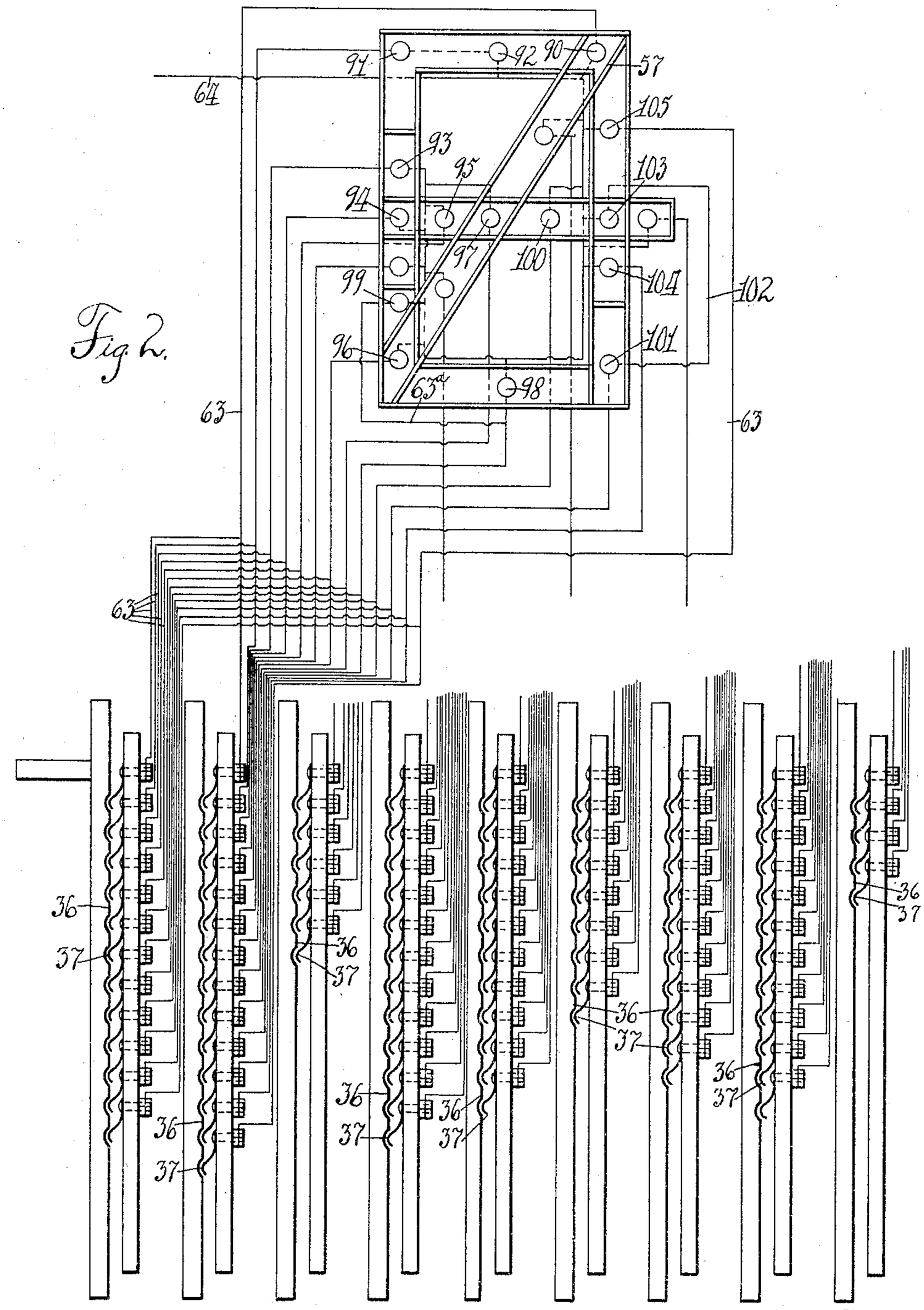
3 SHEETS—SHEET 2.

Fig 2.



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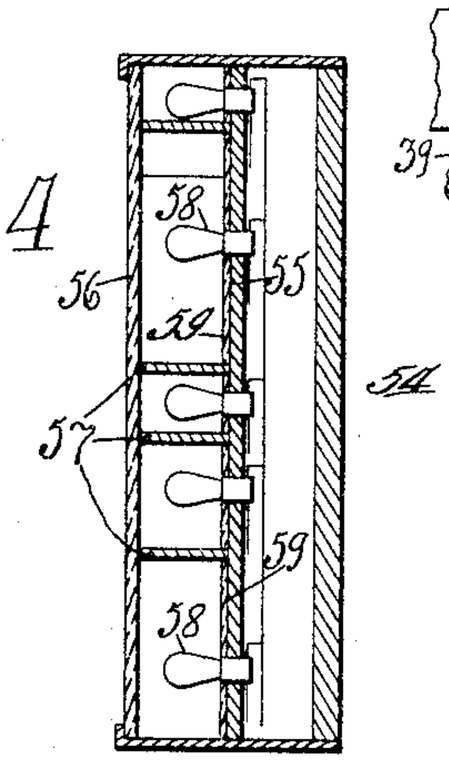
3 SHEETS—SHEET 3.

Fig. 4



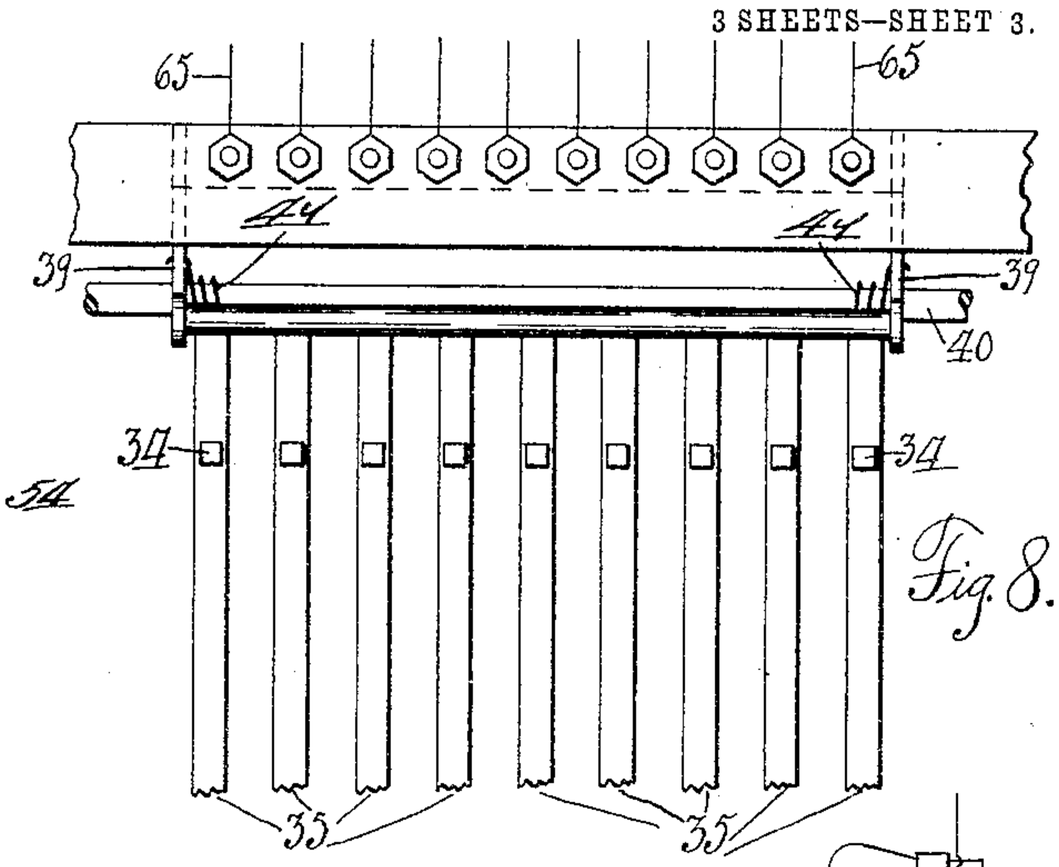


Fig. 8.

Fig. 7.

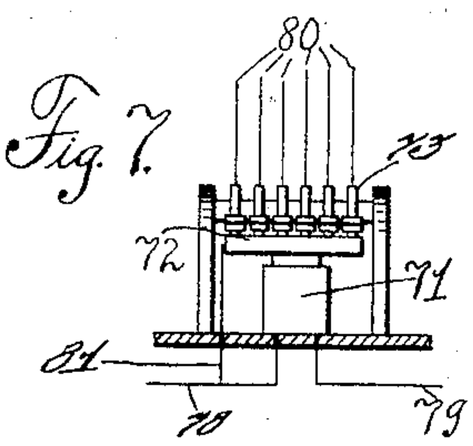
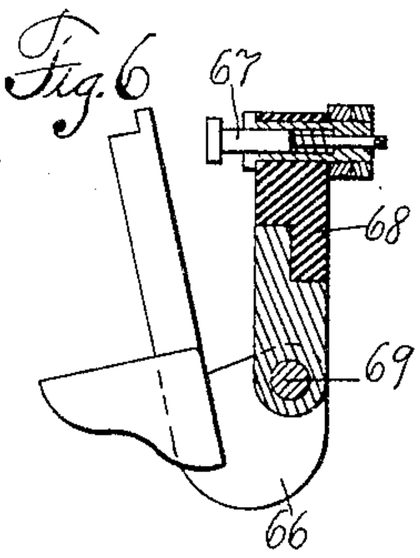


Fig. 6



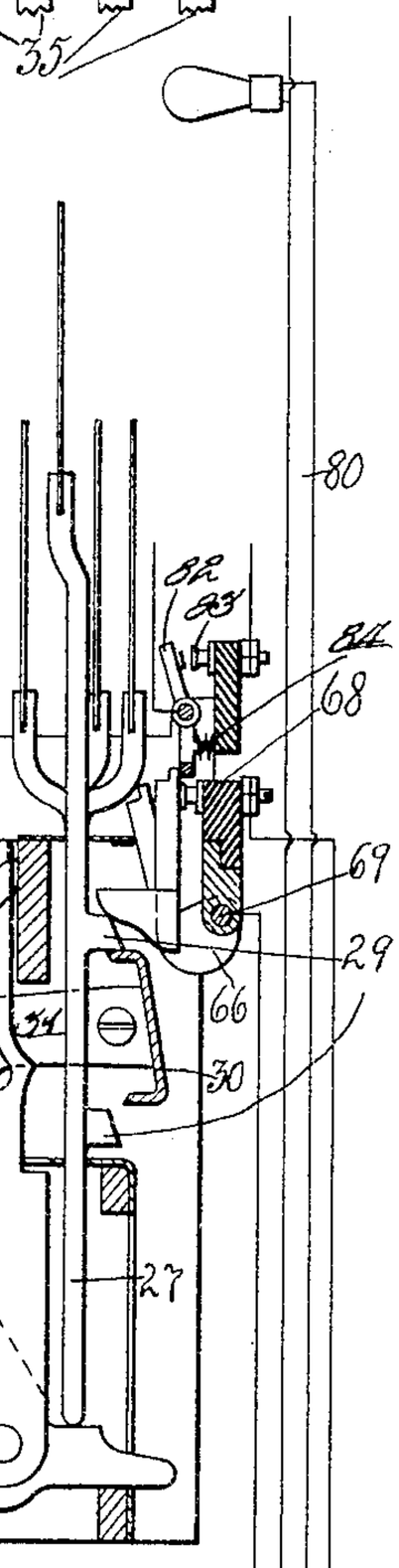
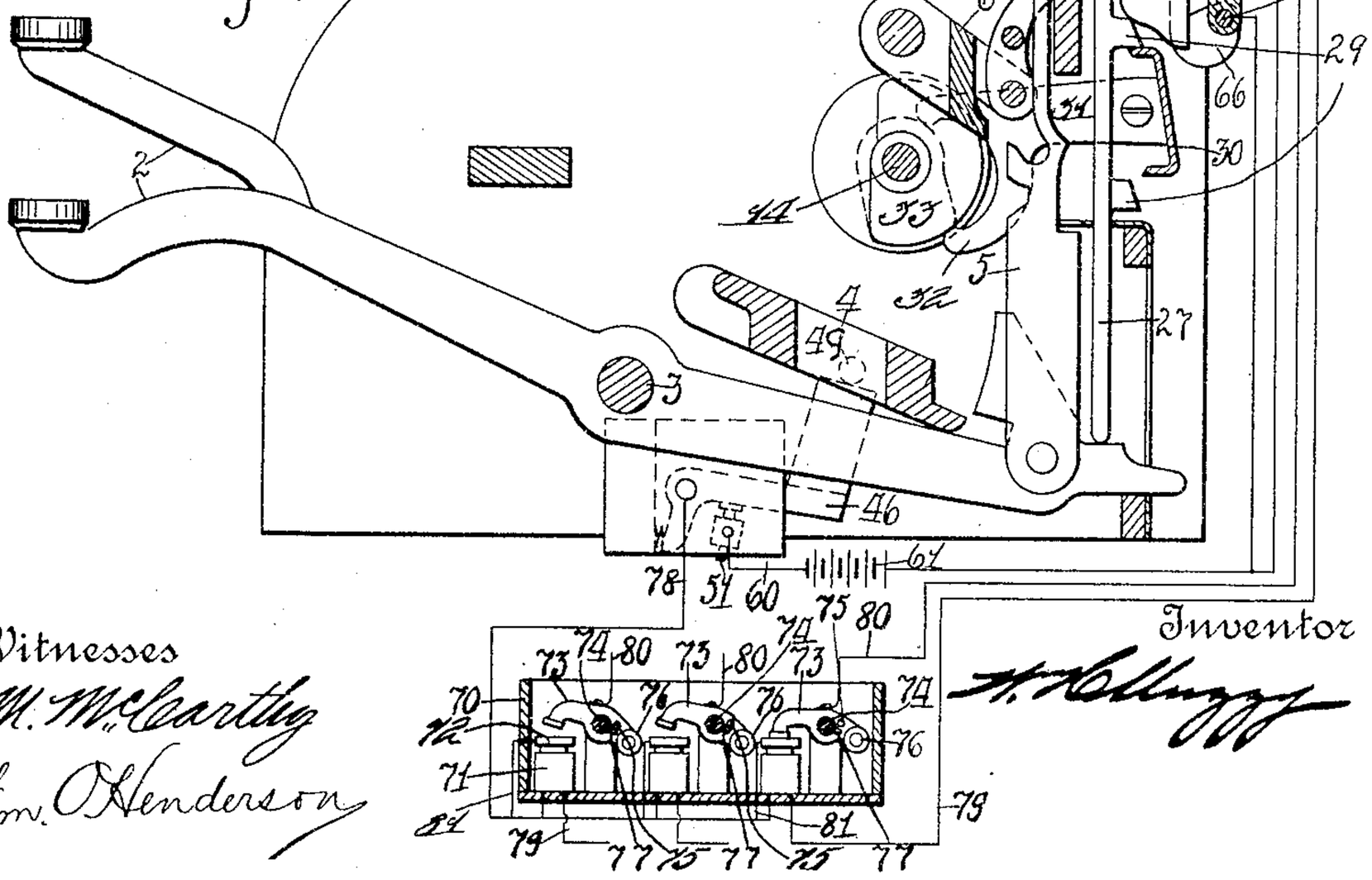


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM H. MUZZY, OF DAYTON, OHIO, ASSIGNOR TO NATIONAL CASH REGISTER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 789,558, dated May 9, 1905.

Application filed April 22, 1904. Serial No. 204,353.

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 Cash-Registers, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in indicating devices for cash-registers.

One of the several objects of the invention is to provide improved means for indicating the amount at a distance from the machine or cash-register.

A further object of the invention is to provide an improved indicator for cash-registers whereby a commercial form of indication may be secured without any moving parts in the indicator proper.

With these and incidental objects in view the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and preferred forms of embodiment of which are hereinafter specifically described with reference to the drawings which accompany and form part of this specification.

Of said drawings, Figure 1 represents a transverse vertical section through a machine of the type shown in patent to Thomas Carney, No. 497,860, dated May 23, 1893, with the present improvements applied thereto, the cabinet and cash-drawer being omitted. Fig. 2 represents a diagrammatic view of one of a series of commutators or switches, two of the elements only being connected to their respective lamps to avoid confusion. Fig. 3 represents a detail side elevation of the main switch operated by the key-coupler. Fig. 4 represents a detail vertical section through one of the indicator-frames. Fig. 5 represents a vertical section through the type of machine mentioned with a modified form of the invention applied thereto, a diagram of the electrical connections being also included in this figure. Fig. 6 represents a detail side elevation, partly in section, of one of the key-switches employed in this form of the invention. Fig. 7 represents a detail front elevation of one of the magnetic commutators shown in the modification illustrated in Fig. 4, and Fig. 8 represents a detail front elevation of one of the yoke-frames and its connections for controlling the zero-indicators.

As a large number of the parts shown in connection with the present invention are fully illustrated and described in the aforesaid patent to Carney, I will refer to this patent for such detail descriptions of such parts as are not hereinafter given. Described in general terms, however, the machine may be said to comprise a number of key-levers 2, mounted loosely upon a transverse shaft 3 and coöperating with a pivoted key-coupler 4. Each of these keys 2 carries a graduated operating-standard 5. The standards of each bank coöperate with one of a series of pivoted registering-frames 6 to oscillate said frame to a greater or less extent, according to the value of the key operated. Each of the frames 6 carries a segmental operating-rack 7, these racks being located in such positions as to be engaged by pinions 8, mounted upon counter-wheels 9, which in turn are mounted upon a counter-shaft 10. This shaft is journaled in a counter-frame 11. The frame 11 is rocked back and forth to move the pinions into and out of mesh with the segments 7 by cams 12 and 13, mounted upon a rotation-shaft 14 of the machine and coacting with rollers mounted upon the ends of throwing-arms 15 and 16 for the counter-frame.

Mounted to slide vertically in the rear of the machine are a number of indicator standards or stems 27, which rest with their lower ends upon the rear ends of the key-levers 2. Each of these standards is provided at its upper end with an indicating-tablet 28. Each of said standards is also provided with a latching-nose 29, said nose being adapted to coöperate with a pivoted supporting-frame 30. This frame is actuated to drop the elevated indicators upon the initial movements of the keys by an arm 31, connected to said frame and bifurcated at its inner end, as at 32, to straddle the rotation-shaft 14. This shaft is provided with an operating-cam 33, which is con-

structed to rock the arm 31 at the proper period in the movement of the machine. When any one of the indicator-standards 27 is elevated, its projection 29 engages one of a series of arms 34, projecting from one of a series of vertically-movable commutator-rods 35. Each of these rods is formed with a number of spaced projections 36, which are arranged to simultaneously contact with a series of contact-springs 37, mounted upon a stationary insulating-plate 38. By reference to Fig. 1 it will be seen that when one of the indicators is elevated and the commutator-rod 35 pertaining thereto correspondingly elevated all of the springs 37 will contact with the projections 36. When an indicator is released and permitted to resume its normal position, all of the projections 36 of the commutator-rod 35 pertaining to that particular indicator are moved out of contact with the springs 37. When an elevated indicator is so released and allowed to descend, the corresponding rod 35 is forced downward by a pivoted yoke-frame 39, which extends over the upper ends of all of the rods 35 pertaining to that particular bank of keys, there being one of the frames 39 for each of said banks of keys. The frames 39 are pivotally mounted upon a transverse rod 40 and are normally forced downward at their forward ends by springs 41, which surround the shaft 40 and bear with their opposite ends against the frames 39 and a portion of the main frame. Each of the frames 39 is further provided with a transverse bar 42, carrying a number of contact projections 43, which are arranged to engage a corresponding number of spring-pressed contact-plungers 44, which are mounted in an insulating cross-bar 45. The contacts 43 and 44 are arranged to control the zero-indicators, and it will be seen that when a key in any particular bank has been operated the contacts 43 and 44 will be separated, whereas should no key be operated in a particular bank these contacts will remain together and will result in a zero indication in a manner to be presently described. The contacts 43 and 44 are provided for the units and tens of cents banks only.

In order to prevent any sparking between the contacts 36 and 37 and 43 and 44, a main switch is employed similar to that shown, described, and claimed in the copending application of W. F. Schweiger, Serial No. 194,384, filed February 19, 1904. These switches comprise a bell-crank lever 46, mounted upon an insulating block or plate 47 and provided with an insulating operating-plate 48, which is arranged to be engaged and actuated by a stud 49, projecting laterally from the key-coupler. A coil-spring 50 is interposed between one arm of the lever 46 and the block 47 to force the rear end of said lever 46 upward when it is relieved of the pressure of the stud 49, all of which is clearly shown in Fig. 3. When the lever 46 is held in its lower position, (shown in Figs. 1 and 3,) it contacts with a spring-pressed contact-plunger 51, mounted upon the plate 47. The operation of the switch-lever 46 is such that the circuit is broken by this switch before it is broken at any of the contacts 36 and 37 or 43 and 44.

The special indicator 53 (shown in Fig. 1) comprises a rectangular frame or box 54, Fig. 4, provided with an interior false back 55 and a semi-opaque front plate 56. This latter plate is preferably a frosted or ground glass plate. The frame 54 is formed with a series of partition-walls 57, which extend from the false back 55 to the plate 56 and form a series of light boxes or compartments, as best shown in Figs. 2 and 4. The arrangement of these boxes or compartments is such that when certain of the same are illuminated the light will be reflected upon the plate 56 in the form of any numeral from "0" to "9." The incandescent electric lights 58 are mounted in the false back 55, so as to project into the respective compartments formed by the walls 57. Suitable mirrors or reflectors 59 are placed against the front of the false back 55 to throw the light forward through the plate 56, if so desired. The ends of the lamps 58 may be frosted or painted to prevent the light shining directly from the glowing carbon through the plate 56. By this means the light is evenly diffused and is not brighter at one point than at another.

The wiring from the machine to the lamps 58 is as follows: A wire 60 passes from one pole of the battery or generator 61 to the contact-plunger 51. The circuit from thence is through the lever 46, through a wire 62, to the rod 40 and the frame 39. As this frame always rests upon the elevated commutator-rod 35, it will complete the electric circuit to said rod. The circuit passes from said rod through all of the contact-springs 37 and by individual lamp-wires 63 to each of the lamps 58, or, if desired, any particular group of lamps may be controlled by any one of the wires 63. Each of the lamps or each series or group of lamps is connected to a common return-wire 64, as best shown in Fig. 2. This return-wire 64, as shown in Fig. 1, is connected to the opposite pole of the battery or generator 61 and the circuit thus completed. When no rod 35 is elevated in any particular bank, the circuit will pass from the rod 40 through the contacts 42 and 44 and by individual circuit-wires 65 to the lamp-wires 63, to which they are connected. It will of course be understood that the lamps controlled by any particular rod 35 or the contacts 43 and 44 are so disposed in the frame 57 as to give the proper configuration and indicate a numeral corresponding to the key operated. The wiring for only one of the boxes 57 has been shown in the drawings; but it will be readily understood that any desired number of these boxes may be arranged side by side, according to the capacity of the ma-

chine with which they are to be used. This arrangement will permit of what is known in the art as a "commercial form of indication," in which the indicating-numerals stand side by side in the same manner as they would appear if written. This form of indication is illustrated in Fig. 1, which shows the indication for a machine having three banks of keys. It will be understood that the wires leading to the different lamps, as shown in Fig. 2, are not multiplied for the different keys of a particular bank; but the individual wires leading to the different combination-commutators are simply branches of the lamp-wires 63. This has been clearly shown in regard to two keys in the left-hand portion of Fig. 2, the remaining connections having been omitted to avoid confusion.

As above stated, the connections for only two of the commutators have been shown in Fig. 2 of the drawings. The extreme left-hand commutator, as shown, is provided with twelve contact-points, which are arranged to contact with twelve corresponding contact-springs. This particular commutator is arranged to close the circuits for the proper lamps to indicate the figure "9." The circuit from the upper contact-spring is through its respective wires 63 to the lamp 90 and from this lamp to the common return-wire 64. The circuit from the second contact-spring from the top is through its wires 63 to the lamps 91 and 92 and thence to the main circuit-wire 64. The circuit from the third contact-spring is through its wires 63 to the lamp 93 and from thence to the main return-wire 64. The circuit from the fourth contact-spring is through its wires 63 to the lamp 94 and thence to the return-wire 64. The circuit from the fifth contact-spring is through its wires 63 to the lamp 95 and thence to the return-wire 64. The circuit from the sixth contact-spring is through its wires 63 to the lamp 96 and thence to the return-wire 64. The circuit from the seventh contact-spring is through its wires 63 to the lamp 97 and thence to the return-wire 64. The circuit from the eighth contact-spring is through the wires 63 to the lamp 98 and thence to the return-wire 64, a branch wire 63[a] passing to the lamp 99 and thence to the main return-wire 64. The circuit from the ninth contact-spring is through the wires 63 to the lamp 100 and thence to the return-wire 64. The circuit from the tenth contact-spring is through its wires 63 to the lamp 101 and thence through wire 102 to lamp 103 and thence to the main return-wire. The circuit from the eleventh contact-spring is through its wires 63 to the lamp 104 and thence to the main return-wire, while the circuit from the twelfth contact-spring is through its wires 63 to the lamp 105 and thence to the main return-wire.

It will of course be understood that the connections above described are duplicated for each one of the boxes 57 employed, excepting, of course, the main circuit-wire 64, which wire is common to the main circuits of the machine and any number of boxes 57. The dollar-sign and the period of the special indicator may be painted upon the glass 57, or these characters may be illuminated by constantly-burning lamps arranged in suitable compartments similar to the numeral-compartments above described.

In the modified form of the invention shown in Figs. 5, 6, and 7 each of the projections 29 of the indicator-standards is arranged to contact with and operate a pivoted contact-piece 66 to force the same into engagement with the spring-pressed contact-plunger 67, mounted in an insulating-plate 68. All of the levers 66 are mounted upon a common pivot-rod 69. Located in proximity to the machine is the switch-box 70, in which are arranged a number of groups of magnetic contact devices, there being one group for each key. Each of the groups comprises a magnet 71, the core of which is provided at its upper end with an enlarged head or bar 72. When this magnet is energized, the magnetic influence of the head 72 will draw downward a series of pivoted contact-pieces 73, mounted upon an insulating-rod 74 and normally held out of contact with the bar 72 by weights 76, attached to their rear ends. The movements of the contact-pieces are limited by pins 75, which contact with pins 77, projecting from the shaft 74. It will be seen from the above that when a magnet 71 is energized all of the contact-pieces 73 are brought into contact with the plate 72 in the same manner that all of the springs 37 are brought into contact with the rods 35 when said rods are operated. In this modified form of the invention a main circuit-wire 78 passes from the contact-lever 46 to all of the bobbins 71, as shown in Fig. 5, said bobbins being connected in parallel. Individual wires 79 connect the bobbins 71 independently to the respective contact-plungers 67. By this means when the contact is closed at the plunger 67 one of the bobbins 71 is energized and its particular series of contact-pieces 73 are drawn downward into contact with the plate 72. Each of the contact-pieces 73 is connected by a wire 80 to its particular lamp-circuit. One of these lamp-circuits is shown in Fig. 5. The plates 72 are connected by wires 81 with the main wire 78. By this means when any one of the magnets 71 is energized by its particular circuit being closed all of the circuits pertaining to that particular key are in turn closed and the indicators illuminated to display the character or figure corresponding to the key operated. Located above each bank of keys in this modified form of my invention is a pivoted frame 82. This frame is normally rocked forward to contact with a spring-pressed contact-plunger 83 by means of a coil-spring 84, interposed between it and the main frame. The contact-plunger 83 and

in said compartments, a series of commutators controlled by the keys for governing the lights to effect the indication of different amounts, and a special commutator which is normally active to cause the zero indication and is thrown out of active position by the operation of another commutator in its respective bank.

12. In a cash-register, the combination with a series of controlling-keys, a series of commutators governed by said keys, an indicator divided into compartments for indicating different numerals within the same area, lights in said compartments, means connecting the lights and commutators, and a special normally active commutator connected to the lights for forming the zero indication, and means for rendering the special commutator inactive when a key is operated.

13. In a cash-register, the combination with a series of keys, indicators operated by the keys, a series of notched commutator-bars cooperating with the indicators, a series of independent contact-pieces coöperating with the bars, an indicator divided into compartments for indicating different numerals within the same area, lights in said compartments, and means for controlling the lights from the independent contact-pieces.

14. In a cash-register, the combination with a series of controlling-keys, indicators governed by said keys, a series of notched commutator-bars controlled by the indicators, a common commutator-frame controlled by the commutator-bars, an indicator divided into compartments for indicating different numerals within the same area, lights within the compartments, and means for controlling the lights from the commutator-bars and the commutator-frame.

15. In a cash-register, the combination with a series of controlling-keys, a series of tablet-indicators, a series of commutator-bars actuated by the tablet-indicators, a commutator-frame common to and operated by a certain number of commutator-bars, an indicator comprising a series of independent compartments for indicating different numerals within the same area, lights in said compartments, and means for controlling the lights from the commutator-bars and the commutator-frame.

16. In a cash-register, the combination with an operating mechanism, of a series of keys, a special indicator comprising a series of independent compartments having lights whereby different numerals may be indicated within the same area, switches controlled by the keys for governing the lights, and a main switch operated by any one of the keys.

17. In a cash-register, the combination with an operating mechanism, of a series of keys, an indicator comprising a series of independent compartments having lights therein whereby different numerals may be indicated within the same area, switches controlled by said keys for governing said lights, zero-switches which are brought into operation automatically, and a main switch controlled by any of the keys.

18. In a cash-register, the combination with an operating mechanism, of a series of keys, an indicator divided into compartments for indicating different numbers within the same area, commutators controlled by the respective keys, lights in the compartments controlled by the commutators, and a zero-commutator controlled by the first-mentioned commutators.

19. In a cash-register, the combination with an operating mechanism, of a series of keys, an indicator divided into compartments for indicating different numerals within the same area, lights in said compartments, independent commutators for the respective keys controlling said lights, and a zero-commutator controlled by the independent commutators.

20. In a cash-register, the combination with an operating mechanism, of a series of keys, an indicator divided into compartments for indicating different numerals within the same area, lights in the different compartments, a series of independent commutators controlled by said keys and connected to said lights, a special zero-commutator controlled by the first-mentioned commutators, and a main switch controlled by all of the keys.

21. In a cash-register, the combination with a series of keys, of indicators divided into compartments for indicating different numerals and a zero within the same area, and means controlled by the keys for bringing a certain fixed combination of compartments into action for each key operated, and means for bringing the zero series of compartments into action when no key pertaining to a certain series of compartments is operated.

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

WILLIAM H. MUZZY.

Witnesses:
W. M. McCARTHY,
WM. O. HENDERSON.