April 29, 1952 A. M. GORDON 2,594,422

FARE REGISTER HAVING PHOTOELECTRIC FARE SENSING MECHANISM

Filed March 23, 1949 5 Sheets-Sheet 1

Fig. 1.

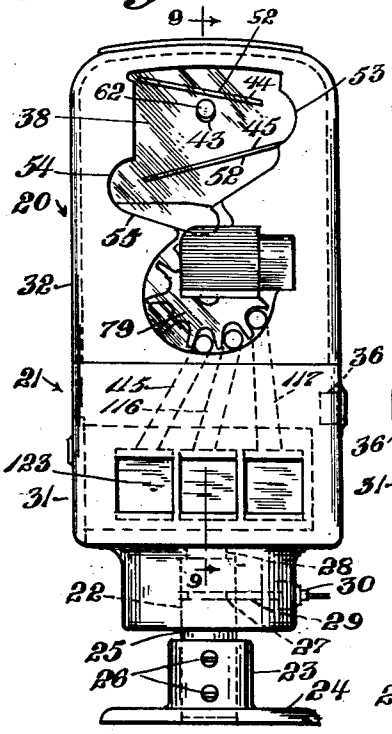


Fig. 2.

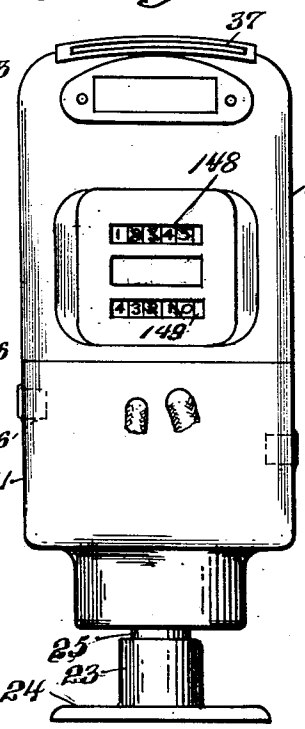


Fig. 3.

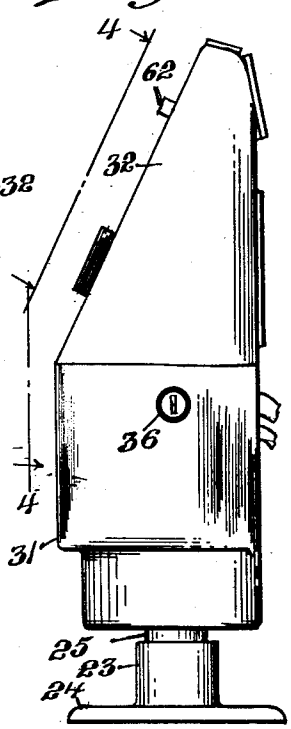
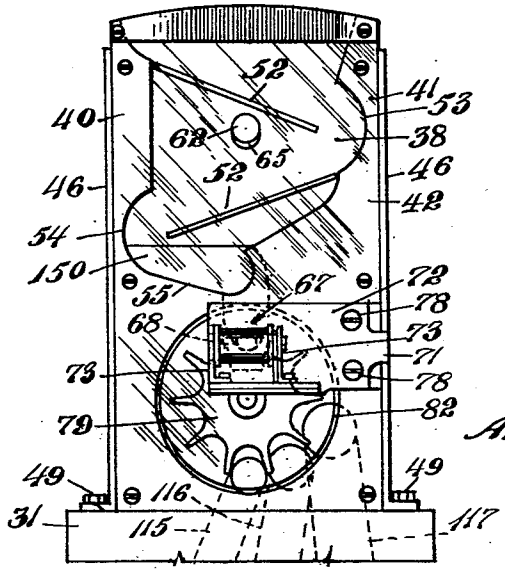


Fig. 4.



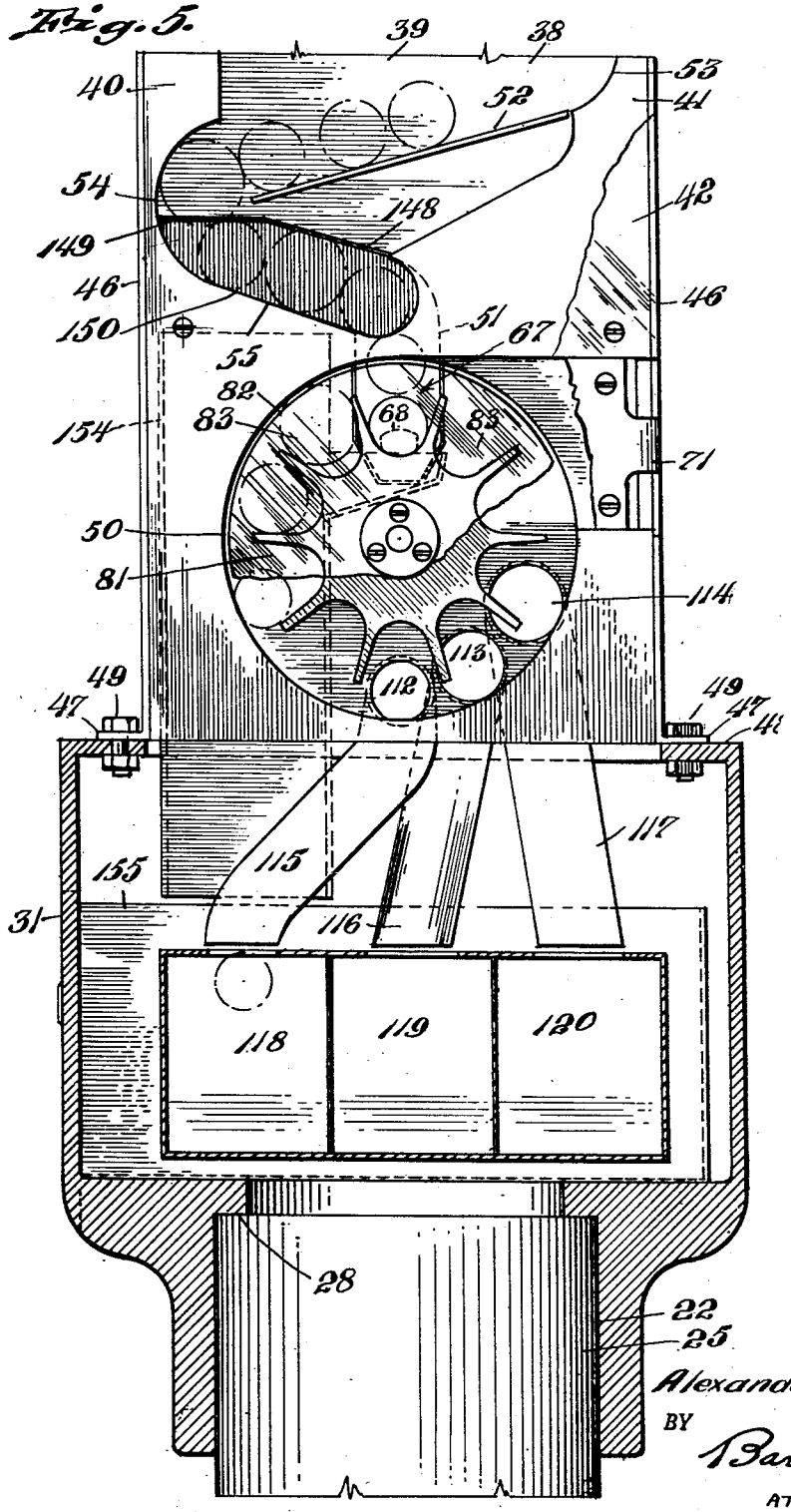
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FARE REGISTER HAVING PHOTOELECTRIC FARE SENSING MECHANISM

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Fig. 5.



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Fig. 6.

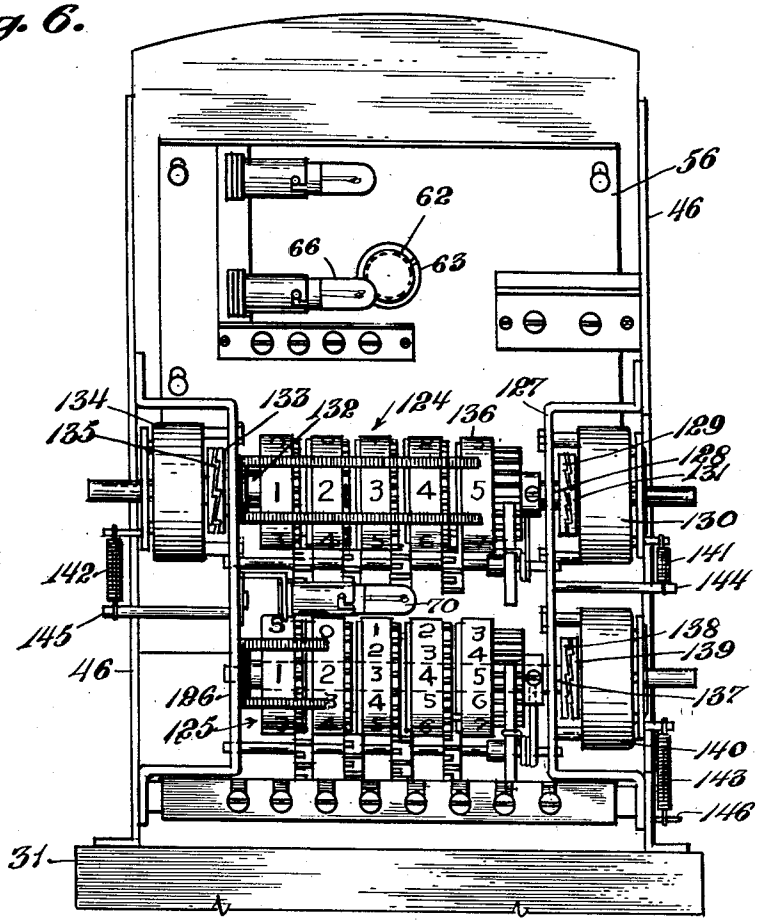


Fig. 7.

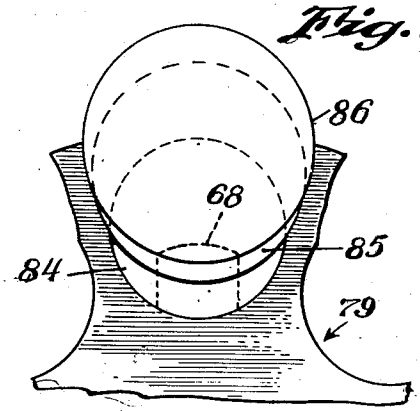
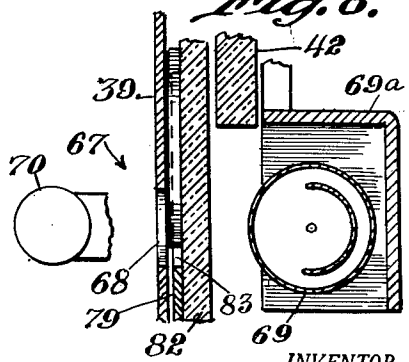


Fig. 8.



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Fig. 9.

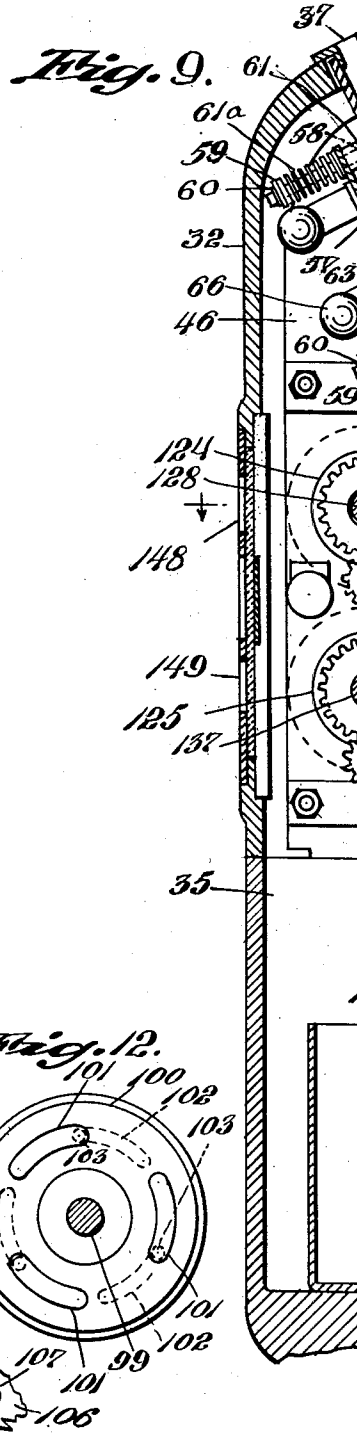


Fig. 10.

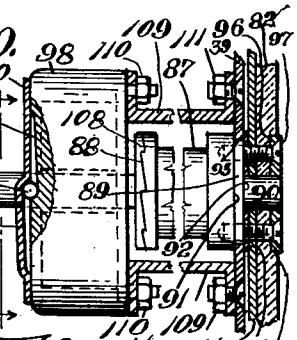


Fig. 11

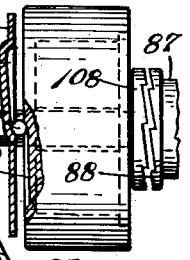


Fig. 12.

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FARE REGISTER HAVING PHOTOELECTRIC FARE SENSING MECHANISM

Filed March 23, 1949 5 Sheets-Sheet 5

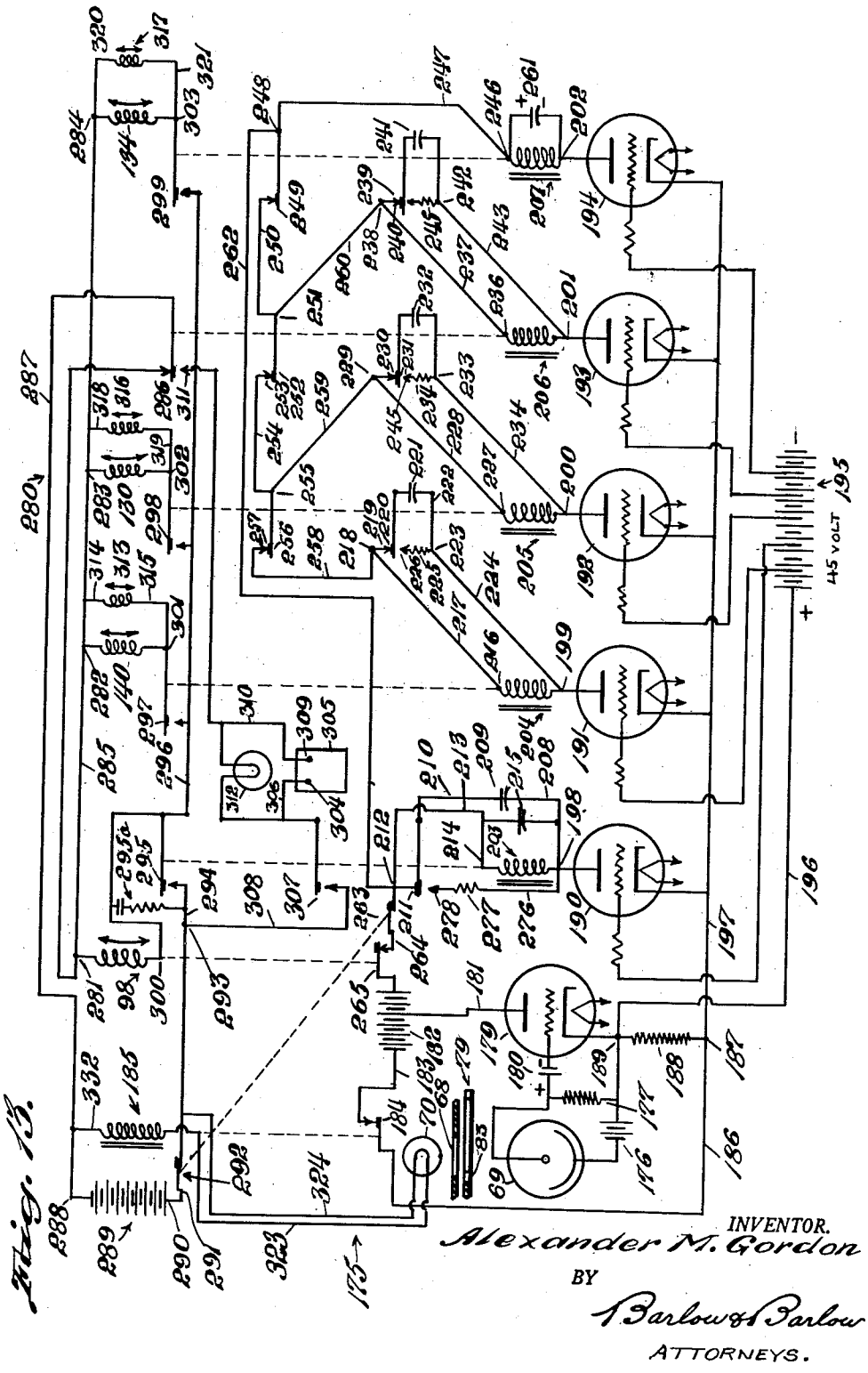


Fig. 11.

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Patented Apr. 29, 1952

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UNITED STATES PATENT OFFICE

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FARE REGISTER HAVING PHOTOELECTRIC FARE SENSING MECHANISM

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Application March 23, 1949, Serial No. 83,066

4 Claims. (Cl. 235—32)

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This invention relates to a machine for the collection and registering of fares on cars, busses and other vehicles.

Machines for collecting fares on public transportation vehicles are usually of a construction such as to register and totalize the coins or tokens deposited therein. It is usual to provide mechanical means for accomplishing the desired functions of the machine. Usually such mechanical means are very intricate in operation and must be of a high excellence of precision, thus costly to manufacture.

The general object of the invention is to provide a machine so constructed that a plurality of coins and the like deposited therein will be separated, identified, registered, totalized and sorted as to kind by mechanical means electrically controlled.

Another object of this invention is to provide a fare collecting machine of such a construction that a multiple coin fare may be simultaneously deposited in the machine.

Another object of the invention is to provide a machine for collecting fares of such a construction that a multiple coin fare simultaneously deposited therein will be separated and moved by gravity one by one to a station to be identified and registered.

Another object of this invention is to provide a machine for collecting fares of such a construction that each coin after being identified and registered will be positively moved to be sorted as to kind and value.

Another object of this invention is to provide a machine for collecting fares of such a construction that a mutilated coin deposited therein will be intercepted and passed out of the path of movement of the coins which are next in line.

Another object of this invention is to provide a machine for collecting fares so constructed that a selective audibly distinguishable tone will be sounded for each different coin or token registered.

Another object of this invention is to provide in a fare-collecting machine means for scavenging deformed coins and foreign objects that would normally jam the machine.

Another object of this invention is to provide a fare collecting machine of such a construction that a complete fare, which may consist of a plurality of coins or tokens, will be held spaced from each other for inspection.

Another object of the invention is to provide an electrical circuit which may be applied to control the moving mechanism in a fare collecting machine.

Another object of the invention is to provide a photocell in a fare register for identifying the coins of a multiple fare.

Another object of the invention is to provide

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the moving mechanism in a fare collecting machine with an electrical circuit control so constituted as to cause a delayed action to be had to allow certain branches of the circuit to become stabilized.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is an elevational view of a fare collecting machine embodying my invention;

Fig. 2 is a similar view showing the opposite side of the machine;

Fig. 3 is a side elevational view of the machine;

Fig. 4 is an elevational view of a fragmental portion of the machine looking in the direction of the arrows in line 4—4 of Fig. 3;

Fig. 5 is a view similar to that shown in Fig. 4 but on an enlarged scale;

Fig. 6 is an elevational view of a fragmental portion of the machine showing the counters and totalizer mechanism;

Fig. 7 is a view of a construction detail showing the relative position of coins with reference to a scanning opening;

Fig. 8 is a sectional view showing a coin in position to be identified;

Fig. 9 is a sectional view taken substantially along line 9—9 of Fig. 1 on an enlarged scale;

Fig. 10 is a side elevational view of a solenoid showing the manner of attaching the same to a moving element of the machine;

Fig. 11 is a view of the solenoid in a different position than that shown in Fig. 10;

Fig. 12 is an end view of the solenoid looking in the direction of the arrows on line 12—12 of Fig. 10; and

Fig. 13 illustrates diagrammatically an electrical circuit for controlling the various mechanical functions of the machine.

In proceeding with the invention as applied to a multiple three coin fare register, I provide for each coin deposited into the machine to be passed between a photocell and the rays of its exciter lamp in a manner so as to control the amount of light falling on the photocell. To this end, the rays of the exciter lamp are made to pass through a restricted opening and the coins are passed before the opening by means of a carriage or rotor. The rotor has pockets which are provided with the walls designed in such a manner that each coin carried thereby will be held so as to block a portion of the exciter lamp rays passing through the opening, thereby varying the photocell conduction. In the present instance the pockets are so designed that a dime will block all the light passing through the opening; a nickel about one-third and a token according to its particular diameter. The amount of current flow-

ing through the photocell is amplified by appropriate devices and through proper circuits is employed to operate and control the various motions of the machine whereby the multiple fare may be registered and sorted.

Referring to the drawings for a more detailed description of the invention, 20 designates generally a machine for collecting fares and comprises a body designated generally 21 which is provided with a mounting opening 22 at the lower end thereof. The body 21 is mounted upon a pedestal 23 having a base 24 from which there rises a column 25 that is adjustably secured in position, such as by means of screws 26. The column 25 is provided with an annular recess 27 and is received in the opening 22 to engage with a shoulder 28 formed at the upper end of the opening 22. A lock plunger 29 which is manipulated by a lock device 30, the mechanism of which is not shown but which may be of any approved manufacture, extends into the recess 27 so as to prevent relative axial movements between the body 21 and the column 25 but to permit turning of the body on the column when desired.

The body 21 is made in two sections, a lower hollow section 31 and an upper cover section 32 which is removably secured to the lower section 31 by means of dowels 33 that project from the cover 32 and are received in openings 34 in the side walls 35 of the lower section 31 (see Fig. 9). The cover 32 may be locked in position if desired by means of a lock mechanism indicated generally 36 (Fig. 1), the mechanism of which is not illustrated.

The cover 32 is provided with a coin slot 37 at the upper edge thereof through which a multiple coin or token fare to be collected may be simultaneously deposited to fall into a coin receiving and separating chamber 38, having a rear wall 39, side walls 40, 41 (Fig. 5) and a front transparent wall 42 (Fig. 9). The walls 39 and 42 extend generally parallel to each other and are inclined at an angle approximately 25° from the vertical. The rear wall 39 has a central opening 43 and elongated openings 44, which extend at a slight angle from the horizontal (see Figs. 1, 9). For convenience in manufacture these several walls are formed by separated plates which are secured to each other in any appropriate manner and are supported in position by side frames 46 which rise from the section 31 and are provided with foot portions 47 which rest on the upper edge 48 of the section 31 (see Fig. 5). Bolt and nut fastenings 49 secure the side frames in position on the section 31. The walls of the chamber 38 are extended to form a second chamber 50 which is positioned immediately beneath the chamber 38. A restricted opening 51 extends between the lower portion of the chamber 38 and the upper portion of the chamber 50 for the passage of coins or tokens from the chamber 38 into the chamber 50.

When a multiple coin or token fare is deposited into the chamber 38 the several coins or tokens are separated and peel off through gravity and arrive at the opening 51 one at a time. This is accomplished by means of interceptors 52, which in the instant disclosure are in the form of metal strips which extend through the openings 44 in the rear wall 39 to adjacent the front wall 42. The interceptors 52 are inclined from the horizontal and provide tracks on which the coins will roll edgewise in a downward direction. At the lower end extremity of each interceptor the side walls 40—41 are recessed as at 53, 54, providing a surface for guiding the coins from the upper interceptor 52 onto the lower interceptor 52 (Fig. 9). The side wall portion 55 adjacent the recess 54 is inclined downwardly towards the opening 51 providing a track for the coins to roll to the opening 51. The interceptors 52 (Fig. 9) are secured to a plate 56 such as being welded thereto as at 57. The plate 56 is yieldingly supported in spaced relation with the rear wall 39 by means of pins 58 which project from the rear wall 39 through and beyond the plate 56. The free ends of the pins are provided with abutments 59 retained on the pins by means of ring fastenings 60. Spacing collars 61 encircle the pins between the rear wall 39 and the plate 56. Compression springs 61*a* encircle the pins between the plate 56 and the abutments 59 to yieldingly hold the plate against the collars 61. A central transparent elongated button 62 is secured to the plate 56, such as by means of a ring fastening 63. The button extends from the plate 56 through the opening 43 in the rear wall 39 and through a similar aligned opening 65 in the transparent front wall 42. Should it so happen that a coin or coins become wedged between the front and rear wall 39, 42, the button may be pushed to move the interceptors back and forth to loosen such jammed coins. A lamp 66 may be positioned at the lower edge of the button to illuminate the same.

In order that a token or coins be gauged or identified to be properly registered, an identification station, designated generally 67 (see Figs. 4, 5, 8 and 9) is provided, and comprises providing the rear wall 39 of chamber 50 with a scanning aperture 68 at a location directly beneath the opening 51. A photocell 69 is mounted to be in position directly in front of the aperture 68 and is properly shielded by a closure 69*a*. An excitor lamp 70 is mounted at the opposite side of the aperture 68 in such a manner that the rays thereof will project through the aperture onto the photocell. The photocell 69 and lamp 70 are mounted in position by means of a bracket 71 (Fig. 9) which is substantially U-shape providing an arm 72 which carries contacts 73 properly apertured to receive the end portions of the photocell and insulated from the arm 72 by insulation 74. The other arm 75 extends on the opposite side of the wall 39 and carries a socket 76 for receiving the lamp 70 and an insulated contact carrying bar 77. The bracket 71 is secured in place, such as by means of screws 78 (Fig. 4). A rotor 79 having a central mounting opening 80 is provided with a plurality of similar recesses 81 opening into the peripheral edge of the rotor.

A transparent disk 82 of a diameter substantially that of the rotor is positioned to engage the rotor and forms with the walls of the recesses 81 coin receiving pockets 83 which may be moved into register with the scanning aperture 68. The bottom edge of each pocket 83 when in register with the scanning aperture 68 is directly in line with the lower edge thereof (see Fig. 7). The walls of the pockets are so shaped that different size coins and the like lodging therein will block a portion of the light passing through the aperture 68 in accordance with the diameter of the coin lodged in the pocket 83 in register with the scanning aperture.

By way of example (see Fig. 7) a dime, indicated 84, will block substantially all light passing through the aperture 68, a nickel, indicated 85,

about one-third, and a token fare 66 according to the particular diameter thereof.

The rotor 79 is fixed to a rotatable cylindrical support 87 (see Figs. 9, 10). The support is provided at one end extremity thereof with radially extending ratchet-like teeth 88. The other end of the support 87 is reduced in diameter in step formation providing a neck portion 89, a spindle 90, and shoulders 91, 92. The neck portion 89 is journalled in a bearing opening 93 in the rear wall 39 with the shoulder 91 abutting against the stock about the bearing opening 93 on the rear side of the wall 39. The neck 89 is of a length slightly greater than the thickness of the rear wall 39. A spacing and retaining collar 94 encircles the spindle 90 and extends about the edges of the opening 93 on the front side of the rear wall 39. The spindle extends through the opening 80 (Fig. 9) in the rotor 79 and through a similar aligned opening in the transparent disk 82 which is provided with an annular recess 95 (Fig. 10) in which is positioned a reinforced disk 96. Screws 97 extend through the disk 96, the rotor 79, the collar 94, and threadingly engage the support 87. Thus the support 87 is rotatably mounted by the rear wall 39 and the rotor 79 fastened thereto so as to move therewith.

The support 87 may be moved to index a pocket in register with the scanning aperture 68 in any suitable manner. In the instant disclosure, a solenoid 98 is provided. The solenoid 98 is of a construction whereby the linear movement of the core 99 thereof is transferred to rotary motion. This is accomplished by means of a cam disk 100 which is made fast to the core 99 (see Figs. 10, 11). The disk 100 is provided with a plurality of equally spaced recesses 101 with inclined bottom walls. Similarly spaced recesses 102 are provided on the adjacent side of the solenoid in alignment circumferentially with the recesses 101 but with the bottom walls thereof inclined in the opposite direction. A spherical member 103 is positioned to engage the walls of a recess 101 in the disk and the walls of an adjacent recess 102 in the solenoid body. Upon the solenoid 98 being activated the pull of the core 99 will cause the disk 100 to ride on the spherical member 103 in a helical fashion, thereby partially turning the core 99 about its axis. The core 99 is moved in the opposite direction by means of a yielding force which may take the form of a pull spring 104 (see Fig. 12), one end of which is anchored to a pin 105 projecting from the disk 100 and the other end anchored to a suitable support 106 by means of a screw 107.

The opposite end of the core 99 extends beyond the end of the solenoid body and is provided with a ratchet wheel 108 which engages with the teeth 88 on the member 87, whereupon axial and rotary movement of the core 99 will move the wheel 108 in engagement with the teeth 87 and turn or index the rotor 79. The solenoid is attached to the wall 39 by means of brackets 109 fixed to the solenoid 98 such as by screw and nut fastening 110 and to the wall 39 by a similar fastening 111.

Coins deposited in the chamber 38 will, as previously described, arrive at the opening 51 one at a time and drop into an empty pocket 83 in register with the scanning aperture 68 to be gauged or identified by the photocell 69 which controls an electric circuit which operates the various motions of the machine. As the rotor is indexed the coins in the pockets will be carried by the rotor to pass by a plurality of screening openings 112, 113, and 114 which extend through the wall 39 of the chamber 50. These openings are arranged in a progressive order with the smaller of the openings positioned to be first in line to be passed by a coin in a pocket 83. The diameter of the openings are such that the smaller opening 112 will permit a dime but not a larger coin to fall therethrough and the opening 113 a nickel but not a larger coin. Each opening is provided with a conduit 115, 116, 117 respectively, which extends to a separate compartment 118, 119, and 120 respectively in the lower section 31 of the machine. Each compartment is provided with a swinging closure 121 hingedly secured in place as at 122 to be swung inwardly whereby coins guided into the compartments may be taken from the compartments through an opening 123 in the section 31 opposite each closure 121.

Each coin or token gauged is registered. To this end a mechanical operable counter, which in the present disclosure is a well-known five digit rotary counter 124, is provided for the coins and a similar counter 125 is provided for the tokens. The counter 124 is mounted between brackets 126, 127 with the shaft 128 thereof journaled in suitable openings in the brackets. One end of the shaft 128 is provided with a ratchet wheel 129. A solenoid 130 which is identical in construction to the indexing solenoid 98 above described is mounted by the bracket 127 with the ratchet wheel 131 thereof in line to be moved into engagement with the ratchet wheel 129 to index the counter for each nickel gauged.

In the present instance, the other end 132 of the shaft 128 is provided with a similar ratchet wheel 133 which is engaged and turned by a similar solenoid 134 having a ratchet wheel 135 movable into engagement with the wheel 133. The solenoid 134 is provided with sufficient movement to index the first digit wheel 136 two divisions, thus providing for indexing of dimes.

The counter 125 for the tokens is also mounted between the brackets 126, 127 and the shaft 137 thereof is also provided with a ratchet wheel 138 which is engaged and turned by the ratchet wheel 139 on the solenoid 140 which is also similar in construction to those above described. Each solenoid is biased to the inactive position by means of pull springs 141, 142, and 143 attached at one end to the solenoid 130, 134, and 140 respectively. The other ends of the springs are attached to the brackets 126, 127 by means of pins 144, 145, and 146 projecting therefrom. The side of the section 32, as seen in Fig. 2, is provided with a window 148 through which the counter 124 may be viewed and a window 149 through which the counter 125 may be viewed.

A mutilated coin may be deposited in the machine and in order to prevent such a coin, or other foreign articles, from jamming the machine, a scavenger plate 150 is provided (see Figs. 5 and 9). The plate 150 is located in the plane of the wall 39 and is attached to the plate 56 in spaced relation therewith to move therewith by means of a spacing collar 151 and a screw 152. When a mutilated coin or other foreign article is deposited in the machine the operator will see the same through the opening 153 in the cover, whereupon the button 62 may be pushed to permit the mutilated coin or foreign articles to drop into a chute or conduit 154 leading to a drawer 155 in the lower section 31 of the machine.

The electric circuit for operating the fare collecting machine above described is indicated generally 175 (see Figure 13). The photo-cell 69 pro-

vides a signal of a predetermined constant fixed value for each coin passed between it and its exciter lamp 70. The signal is passed on to vacuum tubes, there being a tube or triode section thereof for each coin to be registered, which amplifies the signal and by means of a relay, causes it to actuate a specific solenoid, which in turn operates the particular counter to register the value of the coin gaged.

A coin lodging into the rotor pocket 63 in the manner previously described interrupts some or all of the light from the exciter lamp 70 falling on the cathode of the cell 69. This reduces the flow of current in the closed circuit comprising the cell 69, potential source 176 and photo-cell load resistor 177. The reduced flow of current reduces the voltage across the load resistor 177, which is shunted across the anode of the cell 69 and the positive of the potential 176 and reduces the negative voltage applied to the grid of the photo-cell amplifier tube 179. The grid of tube 179 is connected to the negative of potential 180, the positive of which potential is connected to the anode of the photo-cell 69. The plate of tube 179 through lead 181 is connected to the positive of potential 182, the negative of which potential is connected through lead 183, contacts 184 of relay 185, lead 186 to junction point 187, thence through resistor 188 and junction point 189 to the cathode of tube 179. The potential 180 places a bias on the grid of tube 179 so that under static conditions, as when there is no coin in front of the scanning aperture 68, the tube 179 will not pass any current. Thus there is no drain through tube 179 from the potential 182.

The voltage appearing across resistor 188 is applied in a positive direction to the grids of amplifier tubes 190, 191, 192, 193, and 194 through the potentials 195, the positives of which potentials connect through lead 196 to junction point 189. The potentials 195 comprise a "C" battery providing taps at various points to provide different fixed values of negative bias voltage to each of the grids of the amplifiers 190 to 194 respectively. Thus, the amplified voltage across resistor 188 is applied in series with fixed negative bias voltages to the grids of tubes 190 to 194. The voltage across resistor 188 opposes the fixed bias voltages on the tube grids. The fixed bias voltages on these tubes are sufficient to keep them cut off or beyond, such that a signal voltage made by a coin or token interrupting the least light falling on the photo-cell 69 will produce a signal voltage only sufficient to overcome the negative bias voltage of tubes 190, 191 whereupon these two tubes will be conductive of current to operate the relays associated therewith, there being a relay for each amplifier tube. A coin of smaller diameter (a nickel) will interrupt more light falling on photo-cell 69 and produce a signal of greater value than a token which signal will overcome the bias voltage of tubes 190, 191, and 192 and place these three tubes 190, 191, and 192 in current conductive condition. A penny or cent being of a smaller diameter than a nickel will interupt a greater amount of light falling on the photo-cell so as to produce a signal voltage of greater value so as to overcome the bias voltage of tubes 190, 191, 192, and 193 so as to place these four tubes in current conductive condition. The signal voltage made by a dime, the smallest of the coins, will be of the greatest value and overcome the negative bias of all the amplifier tubes 190 to 194 respectively so that all the tubes will conduct current therethrough. For simplicity, the connections from a power source for heating the filaments of the amplifier tubes have not been shown.

The cathodes of amplifiers 190 to 194 respectively are connected through a common lead 197 to junction point 187. The plates of tubes 190 to 194 are connected to the terminals 198 to 202 inclusive to the relays 203 to 207 respectively. The terminal 198 is connected through a lead 208, capacitor 209, lead 210, normally closed contacts 211, thence through junction point 212, lead 213 to terminal 214 of relay 203. A capacitor 215 is shunted across the terminals 198 and 214 of relay 203. The terminal 198 is also connected through a lead 276, resistor 277 to normally open contact 278.

The terminal 216 of relay 204 is connected through lead 217, junction point 218 to normally closed contacts 219, 220 of relay 205, thence through relay holding capacitor 221, lead 222, junction point 223 and lead 224 to terminal 199 Terminal 199 is connected through lead 224, junction point 223 and resistor 225 to normally open contact 226 of relay 205. Terminal 227 of relay 205 is similarly connected through lead 228, junction point 229 to closed contacts 230, 231 of relay 206, thence through relay holding capacitor 232, junction point 233 and lead 234 to terminal 200 of relay 205. Terminal 200 is connected through lead 234, junction point 233, resistor 234 to contact 235 of relay 206. Terminal 236 of relay 206 is also similarly connected through lead 237, junction point 238 to normally closed contacts 239, 240 of relay 207, thence through capacitor 241, junction point 242 and lead 243 to terminal 201. Terminal 201 is connected through lead 243, junction 242, resistor 244 to contact 245.

The terminal 246 of relay 207 is connected through lead 247 to a tie point 248, normally closed contacts 249, 250 of relay 207, thence to a tie point 251, closed contacts 252, 253 of relay 206, lead 254 to a tie point 255, closed contacts 256, 257 of relay 205 and lead 258 to junction 218. A lead 259 extends from tie point 255 to junction 229 and a similar lead 260 extends from tie point 251 to junction 238. A capacitor 261 is shunted across terminal 202 and 246 of relay 207. A lead 262 extends from junction point 248 to junction point 212, thence through contacts of switch 263, lead 264, and contacts of switch 265 to the positive of potential 182.

The index and counter solenoids 93, 140, 130, and 134 of the apparatus are placed in a branch circuit designated generally 280 with the terminals 281, 282, 283, and 284 thereof, respectively, connected to a common lead 285 extending to the normally closed contacts 286, through lead 287 to the terminal 288 of a potential source 289. The other terminal 290 of the potential 289 extends through lead 291 to the contacts of switch 292, thence through junction 293, lead 294 through normally open contacts 295 of relay 203 to common lead 296 connecting to normally open contacts 297, 298, and 299, of relays 204, 205, and 207, respectively. The terminals 300, 301, 302, and 303 of solenoids 93, 140, 130, and 134, respectively, are connected to the contacts 295, 297, 298, and 299 of relays 203, 204, 205, and 207, respectively. A capacitor and resistor designated generally as 295A are shunted across contacts 295 to suppress the sparking of the same.

The terminal 304 of a buzzer 305 is connected through lead 306, normally open contacts 307, lead 308 to junction 293. The terminal 309 is connected through lead 310 to normally open

contact 311 of relay 206. An indicator lamp 312 is shunted across the terminals 304 and 305 of buzzer 305.

A solenoid operated sounding device 313 is connected in shunt with the solenoid 140 through leads 314, 315. Similar sounding devices 316 and 317 are similarly connected to the solenoids 130, 134 through leads 318, 319, and 320, 321, respectively, whereuon the energizing of a counter solenoid will similarly energize the sounding device associated therewith.

Relay 185 is connected through lead 322 to terminal 288 and through lead 323 to exciter lamp 70, thence through lead 324 to switch 292, thus placing the relay 185 in series with the exciter lamp, upon failure of which the relay 185 will become de-energized to open contacts 184 and disconnect plate voltage to all tubes.

The index solenoid 98 is mechanically linked to switch 265 by means of a cam 279 which is fixed to rotate with the shaft 99 of the solenoid 98 (see Figures 9 and 10).

Fixed bias voltages provided by potential source 195 on tubes 190, 191, 192, 193 and 194 are sufficient to keep them at cut off or beyond. These tubes conduct enough to operate the relays 203, 204, 205, 206, and 207, respectively, only when the voltage across resistor 188 is sufficient to cancel the bias voltage. Tubes 190 and 191 require at least the signal produced by a token to operate their respective relays. They will, however, also operate for all smaller coins and to prevent misregistration the contacts 256, 257 of relay 205, contacts 252, 253 of relay 206, contacts 244 of relay 207 are interconnected so as to provide an interlock system. For example, the signal produced by a nickel will operate in turn relay 204 and 205, but as soon as relay 205 operates, normally closed contacts 256, 257 open, disconnecting the plate supply voltage from potential source 182 to tube 191, causing relay 204 to be de-energized and the contacts 297 to return to their normally open position before relay 203 operates after an interval by reason of the capacitor 209 connected in shunt across its coil. When relay 203 operates after the delay period, contacts 295 close, causing index solenoid 98, nickel solenoid 130, and nickel bell solenoid 316 to be energized and operated simultaneously, effecting registration of the nickel and indexing of rotor in position to receive another coin.

Energizing of solenoid 98 will open the switch 265 which is normally closed. With the switch 265 open, no conduction of current will be had through tube 179 and solenoid 98 will operate to index rotor 79 and then mechanically return to initial position and close switch 265 to again place tube 179 in current conducting condition. Also upon the opening of switch 265 relays 203 to 207, inclusive, will be disconnected from source 182; however, the charged capacitor 232 will discharge through closed contacts 230, 231 and lead 228 to coil of relay 205 to hold the same energized to operate, as above stated, simultaneously with the index solenoid 93.

Upon energizing of the relays 205, 206, and 207, the contacts 225, 245, and 249 will close and provide paths for the discharge of the capacitors 221, 232, and 241, through resistors 225, 234, and 245.

The buzzer 305 and lamp 312 are provided as a means for indicating to the operator the depositing of a penny into the machine, and this operates in a manner similar to that described above for the nickel through the tube 193 and its relay 206. The signal produced by the penny will energize the relay 206 to open contacts 286 and close contacts 311, thereby connecting one side of bell and buzzer to potential 289. Upon the operation of relay 203, contacts 307 will close, energizing the buzzer 305 and lamp 312 through potential 289, the index solenoid being prevented from operating through the now open contact 286. Also upon the operation of relay 203, contacts 278 will be closed, providing a path for the discharge of capacitor 209 through the resistor 277. Upon the de-energizing of relay 203, the contact 278 will be open through mechanical means, not shown, placing the capacitor discharge circuit again into condition to provide the delay action for the relay 203.

The entire circuit is opened by manually operated switches 292 and 263 which are mechanically linked together.

I claim:

1. A fare registering machine comprising a casing, means in said casing operable for registering a multiple fare deposited therein, an electric circuit for controlling said means, said casing having an aperture therein, a photocell in said circuit positioned on one side of said aperture, an exciter lamp positioned on the other side of said aperture whereby the rays of said exciter lamp will pass through said aperture and fall on said photocell, a carrier for moving a fare in register with said aperture comprising a plate having generally V-shape notches in its edge providing pockets for receiving and supporting a fare at varying distances in said V pockets in accordance with the diameter thereof to vary the effective light transmitting area of said aperture according to the size of the fare in register therewith to said photocell, a plurality of electronic valves responsive to various degrees of conduction of said photocell, each valve operating a counting solenoid.

2. In a machine as set forth in claim 1 wherein said carrier is a rotor having a plurality of equally spaced coin receiving pockets opening in the periphery thereof.

3. In a machine as set forth in claim 2 wherein said rotor is indexed by means of a solenoid, said solenoid being responsive to the operation of a counting solenoid.

4 A fare registering machine comprising a casing having a multiple fare receiving chamber therein, a gauging station to gauge individual parts of the fare according to the diameter thereof, said station comprising a well having an aperture therein, a photocell positioned on one side of said aperture, an exciter lamp positioned on the other side of said aperture, a carrier for moving individual parts of the fare between the rays of the lamp and the photocell, said carrier comprising a plate having a plurality of V-shape notches therein providing pockets for receiving a fare, said pocket edges being uniformly angled to hold specific diameter fares at the same relative position in each pocket, said fare partially blocking the rays of the lamp falling on the photocell in accord with its diameter to vary the effective light transmitting area of said aperture according to the fare in register therewith, and means for registering the individual parts comprising a plurality of solenoids responsive to degrees of conduction of said photocell, each solenoid operating a registering counter.

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