

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Automatic Amusement Machine

I, ALFRED JAMES LITOLFF CROMPTON, a British subject, of 1 Viking Court, Cliftonville Avenue, Cliftonville, Margate, Kent, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to amusement machines of the kind which may be found in fun fairs, amusement arcades or clubs and, more particularly, to an automatic amusement machine usable by a single player.

The invention consists of an automatic amusement machine comprising at least one coin slot, a substantially vertical panel down which coins inserted in the slot may fall, a number of openings in the panel, a plurality of springy pins projecting from the panel adapted to deflect coins falling down the surface of the panel, and electrical control circuitry arranged to pay out predetermined numbers of coins as winnings when coins enter predetermined single openings or combinations of openings in the panel.

The openings are preferably arranged in row and column order. In one embodiment there are three openings in each row, there being four rows one above the other, the individual openings being arranged vertically above or below those of the next row, so that there are three columns. In another embodiment there are four openings in each row, there being four rows one above the other, the individual openings being arranged vertically above or below those of the next row, so that there are four columns.

There may be a moving deflector member upon which coins inserted in a slot are arranged to fall so that the coins are deflected in different directions, depending upon the position of the member when struck by a coin. Alternatively there may be a number

of coin receivers equal to the number of openings in the uppermost row, a chute running downwardly from each coin receiver, there there being one coin receiver above each of the openings in the uppermost row, and a springy pin beneath each chute to deflect coins passing through the receiver.

Two preferred embodiments of the invention will now be described, by way of example, with reference to the drawings accompanying Provisional specification No. 50,759/64, (Serial No. 1,068,859) referred to herein as Figures 1 to 6, and the accompanying drawings, referred to herein as Figures 7 to 10.

In the drawings:—

Figure 1 is an elevation of the vertical panel of an amusement machine according to the invention with a transparent front panel, which normally covers the vertical panel, largely cut away;

Figure 2 is a circuit diagram of the relays associated with the individual openings of the panel of Figure 1;

Figure 3 shows the circuitry for energizing a relay controlling a motor;

Figure 4 is a diagram of circuitry which controls the payment of coins to winning players;

Figure 5 is a circuit diagram showing how indicator lamps are controlled by the relays;

Figure 6 is a diagram of the mains supply circuitry.

Figure 7 is an elevation of the upper part of the vertical panel of a further embodiment of an amusement machine according to the invention, with a transparent front panel which normally covers the vertical panel, largely cut away;

Figure 8 is a circuit diagram of the relays associated with the individual openings of the panel of Figure 7;

Figure 9 shows the circuit for energizing

a relay controlling a motor; and

Figure 10 is a diagram of circuitry which controls the payment of coins to winning users of the machine.

5 Referring first to Figure 1, there is shown a vertical panel 11 which, in a complete amusement machine, would be enclosed in a cabinet having a large opening containing a panel 12 made of glass or of a synthetic
10 transparent plastics material such as that known by the Registered Trade Mark PER-SPEX. The panel 11 may be made of thick plywood or other rigid material, and it has
15 fixed to its two sides strips 13 which serve to maintain a predetermined space between the front surface of the panel 11 and the rear surface of the transparent panel 12.

Near the upper edge of the panel 11, a deflector member 14 is carried on a spindle
20 which passes through the panel and is connected to a geared motor unit arranged to rotate the member 14 at a low speed, for example, 10 r.p.m. The deflector member 14 is provided with three peaked portions
25 15 which are joined by curved flanks so that coins delivered downwardly from a slot (not shown) in the cabinet of the machine in the direction of the arrow 16 strike the deflector member 14 and are deflected in any direc-
30 tion, dependent upon the instantaneous position of the member 14 when struck by a coin. Users of the machine are prevented from seeing the position of the member 14 because the upper portion 17 of the panel 12 has an
35 opaque coating at its rear so that only the portion below the line 18 is visible to the user. The upper portion 17 may have an ornamental design upon it.

At various positions in the panel 11, pins
40 made of a springy material, for example, spring steel or stainless steel rod, project outwardly from the surface. Each of these pins is firmly set in a block (not shown)
45 which is secured to the rear of the panel 11 and the pin passes through a clearance hole in the panel which is substantially larger than the pin diameter so that the end of the pin projects by about one eighth or three six-
50 teenths of an inch beyond the front surface of the panel. Due to the length of the pin which passes through the thickness of the panel 11, and which is unsupported, these pins are very springy. A coin deflected from the deflector member 14 to the right on the
55 drawing may strike either one of the pins 19 or 20, which emerge through clearance holes, respectively 21 and 22, and may then be further deflected, depending upon the angle at which they strike the pins 19 and
60 20. However, the deflector member 14 may be in such a position as to allow the coin to pass between the member 14 and the pin 19 or it may be in such a position that the coin strikes the inner edge 23 of the right-
65 hand strip 13. Equivalent conditions obtain

if the coin is deflected to the left by the member 14 since there are two further pins in positions equivalent to the pins 19 and 20 on the left-hand side of the panel.

Passing right through the panel 11 is a
70 series of openings arranged in row and column order, there being four rows, respectively A, B, C and D, each row containing three openings which are vertically above or below
75 those of the adjacent row. Thus the upper row consists of openings A1 (not shown) A2 and A3, the second row consists of openings B1, B2 and B3, and so on. The openings A1, B1, C1 and D1 are arranged vertically
80 above or below one another to form a column and the other openings are similarly arranged. The openings are all of the same shape as, for example, the opening A2, which has a circular portion 24 and a rectangular
85 portion 25 cut out at the lower end. A metal chute (not shown) which is set on a steep slope leads downwardly from the bottom of the rectangular portion of each opening at the rear of the panel. Each of the openings
90 has two of the springy pins set close to it, for example, the two pins 26 and 27 adjacent the opening C1. These may be set on a radius struck from the centre of the curved portion of the opening and on lines radiating
95 from the centre of this curve at an angle of about 45° to the vertical. Above the row C of openings is a line of four pins 28, 29, 30 and 31, and above the row of four pins are two further pins 32 and 33 which are near
100 the two strips 13 and serve to deflect coins which strike them towards the centre of the panel 11. Each of the rows A, B, C and D is provided with springy pins in positions equivalent to those of the pins 26 to 33. The exact positioning of the pins may be varied,
105 and preferably they are so arranged that over a long period, during which the law of averages will operate, only about 5% of the coins which fall on to the deflector member 14 are able to escape from the bottom of the panel
110 without entering one of the openings.

The front transparent panel 12 is provided with a series of rings 34, each of which contains a coloured pictorial device or design
115 in the space 35 inside the ring, and these devices serve to conceal the openings from the user of the machine but, apart from these obscurations, the user is able to watch the progress of the coin he has inserted all the way down the panel 11.
120

Coins passing down the panel 11 are likely to fall into any of the openings and, assuming that the machine is arranged to accept pennies then, according to a preferred embodiment, it is arranged that a penny entering the
125 opening A1 will cause the machine to pay out two pennies in the form of winnings. Pennies entering the openings A2 and A3 are lost.

Assuming that the coins inserted by a 130

player pass the first row A of openings, then if two coins inserted by the player enter the openings B1 and B2, in either order, the machine will automatically pay out four pennies as winnings. If, however, a coin enters each of the openings B1, B2 and B3 then the machine will pay six pennies as winnings, but only provided that the first or second of the three coins enters the opening B3.

Pennies passing the first and second row may fall into openings in the third row C. If two pennies enter the openings C1 and C2, in either order, the machine will automatically pay six pennies in winnings but if a coin enters each of the openings C1, C2 and C3 the machine will pay eight pennies in winnings provided that the first or second of the three coins enters the opening C3.

The arrangement with regard to the openings in the row D is similar to that described with respect to rows B and C except that the winnings are higher in amount. Thus two coins entered in the openings D1 and D2 will cause the machine to pay out eight pennies, whereas if three coins are entered in the openings D1, D2 and D3, the machine will pay twelve pennies provided that the first or second of the coins enters the opening D3.

The machine is also arranged so that when a coin enters any one of the openings an indicator lamp is illuminated, and this lamp may conveniently be placed behind the panel 11 so that the illumination shows through the respective device in the space 35 in front of the opening. The machine is further arranged so that as soon as a winning opening or combination is achieved all lights are extinguished and the machine is re-set to the starting condition. The circuitry by which all this is achieved will now be described.

Each of the twelve openings in the panel 11 has a relay associated with it. In Figure 2 only the microswitches and relays of the first four openings are shown in detail and the presence of the others is indicated. In addition there is a microswitch for each opening. The chute previously referred to, sloping downwardly from the rear of the opening, has a slot cut in it and an operating arm from the respective microswitch projects through this slot so that a penny sliding down the chute momentarily closes the microswitch. In the case of the opening A1 (which is obscured by the device on the front panel 12) the microswitch SW1 is momentarily closed. Current flows from the +24 volt line of Figure 2, through a closed contact D1, through SW1 and through the winding RA1 of the relay. The relay operates and a holding contact RA1.1 is closed, so that the relay remains in the operated condition.

Operation of the relay RA1 also closes a contact RA1.2 (Figure 3) which is fed from

the +24 volt line and is in series with a motor relay winding RM. This relay is momentarily energized and operates. Operation of the relay RM closes a holding contact RM.1 and current now flows from the +24 volt line of the circuitry of Figure 3 through a closed contact D2 and the holding contact RM.1 to hold the relay RM in the operated condition. The relay RM is provided with a further contact (not shown) which is in the control circuit of a motor (not shown) which operates at the supply voltage. This motor is provided with a reduction gear and rotates a drum controller which is not shown, but which may conveniently be of the kind described and shown in the specification of my British patent No. 796,371.

In its initial position the two drum contacts D1 and D2 are closed, as shown in Figures 2 and 3 respectively, but seven other contacts D3 to D9 (shown in Figure 4) are open. When the drum motor is set in motion and the drum begins to rotate, it momentarily closes contact D3 once. Since contact RA1.3 is closed, current passes from the +24 volts line in Figure 4, through D3 and RA1.3 to the solenoid 36 to actuate a coin dispenser which is not shown, but may conveniently be of the type described and shown in the specification of my British patent No. 967,344. The coin dispenser is arranged to dispense two coins at each actuation and will thus, in the embodiment being described, deliver two pennies as windings to the user. After closing the contact D3 once, the drum momentarily closes the contact D4 twice, the contact D5 once, the contact D6 three times, the contact D7 once, the contact D8 four times, and the contact D9 twice. As will be shown later these pulses provide for the payment of any sum required as winnings. Having completed its cycle, the controller then momentarily opens contacts D1 and D2. This releases the relay RA1 and extinguishes the lamp so that the machine is returned to its starting condition.

The momentary opening of contact D2 de-energizes the motor relay RM which returns to its unoperated condition and thereby stops the motor.

Assume now that coins inserted by a player all pass the openings in the row A and the first coin lodges in the opening B1. This will operate the microswitch SW4 of Figure 2, so that current will flow from the +24 volts line in that Figure through contact D1, switch SW4 and relay coil RB1, and cause that relay to operate. Operation of relay RB1 closes contact RB1.1 to hold the relay operated. Operation of relay RB1 closes contact RB1.2 in Figure 3 but this has no immediate effect. It also closes contact RB1.3 in Figure 4 and this also has no immediate effect. It further closes contact RB1.4, which

is not specifically shown in Figure 5, and this contact causes the respective lamp 37 to be illuminated. Assuming that the next coin enters the opening B2 then the effect is momentarily to close a microswitch SW5, which is not specifically shown in Figure 2, and this momentarily energizes the winding of a relay RB2, also not specifically shown in Figure 2. A contact RB2.1 is closed to hold the relay operated and causes contacts RB2.2 of Figure 3, RB2.3 of Figure 4 and RB2.4 (present in Figure 5 but not specifically shown) to be closed. The respective lamp 37 (not shown) in Figure 5 is illuminated. The closure of contact RB2.2 completes a circuit in Figure 3 through RB1.2 (previously closed) and RB2.2 through the relay winding RM to energize the motor relay RM, which is then held in the operated condition by contact RM.1. When the drum controller, started by closure of contact RB2.3, begins to operate, it first closes contact D3 momentarily, but this has no effect since contact RA1.3 is open. It next closes contact D4 momentarily twice and at each closure of this contact current passes from the +24 volt line of Figure 4 through contact D4, through contacts RB1.3 and RB2.3 and the solenoid 36, so that the coin dispenser is actuated twice in order to pay out four pennies to the winner.

Still considering the operation of the machine when coins fall into openings of row B, assume now that the first coin falls into opening B1. This causes relay RB1 to operate, as already described, with the consequences previously noted. However, assume that the second coin falls into opening B3. This causes momentary closure of the microswitch SW6 (present but not specifically shown in Figure 2) so that the relay RB3 (present but not shown) is closed and held by its holding contact of Figure 2. Operation of relay RB3 has no effect in Figure 3, but in Figure 4 contact RB3.2 is closed while, in Figure 5, contact RB3.3 (present but not specifically shown) is closed to light the respective lamp 37.

Assume now that the third coin enters opening B2. This causes the operation of switch SW5 (present but not specifically shown in Figure 2) and operation of relay RB2, as previously described. In Figure 3, the closure of contact RB2.2 causes the relay RM to be operated to start the drum motor. During its rotation the drum motor first momentarily closes contact D3 and this has no effect since contact RA1.3 is open. The drum next closes contact D4 momentarily twice. Since both contacts RB1.3 and RB2.3 are closed, two pulses are passed through the coin dispenser solenoid 36 and the coin dispenser is actuated twice to dispense four pennies in winnings. The drum next closes contact D5 momentarily once

and since contact RB3.2 is closed a pulse passes from the +24 volt line of Figure 4 through contact D5 through contacts RB3.2, RB1.3 and RB2.3 in that order to the dispenser solenoid 36, so that a further two pennies are dispensed, making the player's winnings sixpence in all.

A consideration of the circuitry will show that if the first penny had fallen into the opening B2 and the third penny had fallen into the opening B1, the second penny falling through the opening B3, the effect would be precisely the same. It would also be the same if the first penny were to fall through the opening B3 and the second and third pennies were to fall through the openings B1 and B2 in either order, that is to say, the machine will deliver six pennies as winnings in return for pennies in each of the openings B1, B2 and B3 provided only that the first or the second coin falls into opening B3. If the first two coins fall into openings B1 and B2 in either order, the machine operates on those two alone and pays four pennies in winnings.

It will also be evident from a consideration of the circuitry that if pennies fall into openings in the row C or the row D while a correct combination is being made in the row B, the pennies falling into the openings of the row C or the row D will be lost unless they form a winning combination before that in the row B is completed, since opening of the contact D1 at the end of the machine's pay cycle cancels all the stored-up relay settings corresponding to coins in other openings. Similarly, if one coin had fallen through opening B1 and another coin had fallen through opening B3 and the third coin were to fall through opening A1, the machine would automatically pay two pennies in respect of the opening A1 and cancel the previous entries in the openings B1 and B3.

Figure 6 shows the power circuitry for the machine and is quite conventional, consisting of a socket or terminal block 38 having three connections, the outer ones of which are for the line and neutral conductors and the centre one for an earth conductor. A transformer 39 has a primary winding suitable for the supply mains and two secondary windings, one of which is connected to a full-wave rectifier 40 to provide a rectified supply at 24 volts and the other of which is wound to provide 12 volts a.c., which is used for lighting the lamps 37.

It will, of course, be appreciated that various lamps and signs operated at mains voltage may also be provided on the machine to attract prospective players, if desired.

It will be evident from a consideration of the fore-going description that numerous modifications may be made in the embodi-

ment described, in that the openings need not necessarily be in row and column formation, the positions of the spring pins may be changed, the deflector number 14 may
5 be of different form provided that it is movable, and the winning combinations may be selected in a different manner.

The embodiment of the amusement machine shown in Figures 7 to 10 is a modification of that just described, in that the moving deflector member is omitted and there is a plurality of coin receivers placed at different positions along the upper edge of the panel. There are no "losing" openings,
15 and openings which have been "primed" by a coin falling into them are not cancelled when the machine pays out in respect of a winning combination but are left in the "primed" state, so that the player, or another player, retains the benefit of them.
20

The vertical panel 11 shown in Figure 7 is in many respects similar to the vertical panel disclosed in Figure 1 and contains a number of openings arranged in row and column
25 order, there being four rows, but each row containing four openings instead of three. Only the upper part of the panel is shown in Figure 7, the upper row of openings consisting of an opening A1 (not shown) and
30 openings A2, A3 and A4, the second row containing openings B1, B2, B3 and B4, while the third and fourth rows (not shown) contain openings which will be referred to as C1, C2, C3 and C4, and D1, D2, D3 and D4.

In the complete amusement machine, the panel 11 is enclosed in a cabinet having a large opening containing a front panel 12 made of glass or of a synthetic transparent
35 plastics material and it has fixed to its two sides the strips 13 which serve to maintain a predetermined spacing between the front surface of the panel 11 and the rear surface of the transparent panel 12.
40

The moving deflector member 14 shown in Figure 1 is omitted, but the machine is provided with four coin receivers, respectively 41, 42, 43 and 44, the receivers being respectively vertically above the openings A1, A2, A3 and A4. The coin receiver 41 has
50 a solid back and a circular opening 45 defined by a forwardly projecting rim, the opening 45 being of the correct size to receive a particular coin, such as a penny piece. The coin receiver has inwardly projecting
55 lips 46 and 47 below the circular opening 45 which define a chute and which project inwardly for a sufficient distance to prevent a penny inserted in the opening 45 and falling downwardly therefrom from disengaging
60 itself from the coin chute. The lower portion of each chute is formed with a slot 48 through which projects a strip of metal 49

having an oblique edge and supported on a small spindle at the rear of the coin receiver. If a penny piece is inserted in the circular
65 opening of the coin receiver it will fall downwardly and deflect the strip of metal 49 as it passes, due to its own weight, being retained in the chute by the inwardly projecting lips. If, however, a smaller coin, such
70 as a halfpenny piece, is inserted in the coin receiver it is not engaged by the lips 46 and 47 and in falling downwardly it is deflected to a sufficient extent by the metal strip 49 to be thrown forwardly and into a shallow
75 tray 50 which may, if desired, be so formed as to allow the incorrect coin to be ejected from the machine into a receptacle from which the user may recover it. The coin receivers 42, 43 and 44 are identical with
80 the receiver 41.

Penny pieces inserted in the coin receivers pass behind the tray 50 and fall on to a springy deflector pin, the pin below the receiver 41 not being shown, the pins below
85 the receivers 42, 43 and 44 being identified by reference numbers 51, 52 and 53 respectively. Apart from these extra deflector pins and the fact that additional pins are provided in respect of the fourth opening in each row
90 of the panel 11, the general arrangement of the pins is as described in relation to Figure 1. The openings themselves are also of the same shape, each consisting of a circular portion 24 and a rectangular portion 25 cut
95 out at the lower end. The front transparent panel 12 is provided with a series of rings 34 each covering one of the openings and containing a coloured pictorial device or design in the space 35 inside the ring.
100

The arrangement for the payment of winnings is somewhat different from that described in relation to Figure 1 in that there are no "losing" openings, and all coins fall-
105 ing into the openings eventually form winning combinations, except in those cases where one opening has already been "primed" by the passage of a coin, and a second coin falls into it before the winning
110 combination has been completed.

The arrangement of the modified machine now being described is that if coins fall into openings A1, A2 and A3, the machine will pay a predetermined amount, while if coins
115 fall into all the four openings A1, A2, A3 and A4, the machine will pay a larger amount, provided that a coin has fallen into the opening A4 before the three openings A1, A2 and A3 have all received a coin.
120

Precisely the same conditions apply to row B, row C and row D and a particular scale of winnings, for which the circuitry of Figures 2, 3 and 4 has been designed, is as follows:
125

	For coins in A1, A2, A3 ...	winnings	4d.
	" " " A1, A2, A3 and A4	"	6d.
	" " " B1, B2 and B3 ...	"	4d.
	" " " B1, B2, B3 and B4	"	8d.
5	" " " C1, C2 and C3 ...	"	6d.
	" " " C1, C2, C3 and C4	"	10d.
	" " " D1, D2 and D3 ...	"	8d.
	" " " D1, D2, D3 and D4	"	1/-.

Figure 8 shows the circuitry associated with the machine illustrated in Figure 7. There is a relay associated with each opening. The relays associated with the openings A1 to A4 are respectively labelled RA1, RA2, RA3 and RA4. Only the first of the relays associated with the row B is shown, being that associated with opening B1 and labelled RB1. The remainder of the circuitry associated with the row B of openings, and rows C and D, is not shown, since it would only involve unnecessary repetition in Figure 8. In series with the relay RA1 is a switch SW1 which is a microswitch having an operating pin projecting through the sloping chute associated with the opening A1 and which is closed momentarily by a coin which has entered the opening A1 and slides down the respective chute. In parallel with the switch SW1 is a normally open relay contact RA1.1. In the same way, RA2 is associated with a switch SW2 and a normally open relay contact RA2.1, the relay RA3 is associated with a switch SW3 and a normally open relay contact RA3.1, and the relay RA4 is associated with a switch SW4 and a normally open relay contact RA4.1. All the microswitches and relay contacts so far referred to are connected to the +24V terminal of a d.c. electric supply, while the free ends of the relay windings RA1 to RA4 are connected together, the junction being connected to one side of a normally closed relay contact RA1.2, to one side of a normally closed relay contact RA2.2, to one side of a normally closed relay contact RA3.2, and to one side of a normally closed drum contact D1 (which is actuated by a drum controller similar to that described in relation to Figure 1). The other sides of the contacts RA1.2, RA2.2, RA3.2 and D1 are connected to the negative terminal of the power supply marked OV in Figure 8. The normally closed contacts could, of course, be connected on the positive side of the relays instead of the negative side as shown.

Figure 9 shows the circuitry for controlling the motor relay RM which drives the drum controller through a reduction gear. The +24V terminal of the power supply is connected through a series circuit consisting of normally open contacts RA1.3, RA2.3 and RA3.3 to one end of the winding of the relay RM. The +24V terminal is also connected to a second series circuit consisting of normally open relay contacts RB1.3,

RB2.3 and RB3.3 also connected to the said one end of the winding RM, and third and fourth series circuits are similarly connected, the third series circuit consisting of normally open relay contacts RC1.3, RC2.3 and RC3.3 and the fourth series circuit consisting of normally open relay contacts RD1.3, RD2.3 and RD3.3. There is a further circuit between the +24V supply terminal and the said one end of winding RM consisting of a normally closed drum contact D2 and a normally open holding contact RM1 associated with the relay RM.

The pay circuit associated with the modified machine is shown in Figure 10. The +24V supply terminal is connected to one side of each of the normally open drum contacts D3 to D10. The other side of contact D3 is connected through normally open relay contacts RA1.4, RA2.4 and RA3.4 to one side of the pay solenoid 36, the other side of which is connected to the OV power supply terminal. The pay solenoid 36 is the winding of an electromagnetic actuator which actuates the mechanism of the coin dispenser which, in the present instance, is arranged to dispense two penny pieces at each actuation. The other side of contact D4 is connected through a normally open relay contact RA4.2 to the said other side of contact D3. The other side of contact D5 is connected through normally open relay contacts RB1.4, RB2.4 and RB3.4 in series to the said one side of solenoid 36 and the other side of contact D6 is connected through a normally open relay contact RB4.2 to the other side of contact D4.

Circuitry similar to that described in relation to contacts D3, D4 and D5, D6 is associated with contacts D7 and D8, the normally open relay contacts being RC1.4, RC2.4, RC3.4 and RC4.2, and with contacts D9 and D10, the normally open relay contacts being RD1.4, RD2.4, RD3.4 and RD4.2, the rows of contacts being in all cases connected to the said one side of the pay solenoid 36.

A series of lamp circuits is also provided as described in relation to Figure 1 but is not illustrated or described in this embodiment since it functions in precisely the same way.

The operation of the machine is as follows. If a coin inserted through any of the coin receivers 41 to 44 enters the opening A1 it momentarily closes switch SW1 as it slides down the chute at the rear of the opening. This energizes and operates relay RA1 so that holding contact RA1.1 is closed and the relay is held in the operated condition. Relay contact RA1.2 in Figure 8 is opened but the relay circuit is maintained through closed contacts RA2.2, RA3.2 and D1. Operation of relay RA1 also closes contact RA1.3 of Figure 9 and contact RA1.4 of 130

Figure 10, and it further closes the appropriate contact (not shown) to illuminate a lamp behind opening A1. When a coin falls into the opening A2 the switch SW2 is momentarily closed so that relay RA2 operates and closes contact RA2.1 whereby the relay is held in the operated condition. Relay contact RA2.2 of Figure 8 is opened but the relay circuit is maintained through contacts RA3.2 and D1. Contact RA2.3 of Figure 8 and RA2.4 of Figure 10 are also closed in addition to the respective lamp contact (not shown). When a coin falls into opening A3, switch SW3 is momentarily closed, and relay RA3 operates to close contact RA3.1 by which the relay is maintained in the operated condition. Contact RA3.2 is opened but the relay circuit is maintained through contact D1. Contact RA3.3 of Figure 9 is closed, and this establishes a circuit from the +24V terminal through contacts RA1.3, RA2.3 and RA3.3 to relay winding RM and thence to the OV terminal. Relay RM operates and closes holding contact RM1. Another contact (not shown) on relay RM starts the drum motor. Operation of relay RA3 also closes contact RA3.4 of Figure 10 and the associated lamp contact. During its rotation the drum controller momentarily closes contact D3 twice and since relay contacts RA1.4, RA2.4 and RA3.4 are closed, the pay solenoid 36 is energized twice, the coin dispenser is actuated twice and, since it is arranged to dispense two pennies at each actuation, it dispenses a total of four penny pieces in winnings. In its further progress the drum controller closes contact D4 once, contact D5 twice, contact D6 twice, contact D7 three times, contact D8 twice, contact D9 four times and contact D10 twice, but these have no effect, since the respective relay contacts in series with them are open. At the end of its cycle the controller momentarily opens contact D1. Since the parallel contacts RA1.2, RA2.2 and RA3.2 (Figures 2) are already open, the opening of contact D1 de-energizes the relays RA1 to 4 and these release. The drum controller at the same time momentarily opens three other contacts (not shown) D11, D12 and D13, which will be referred to later, and it finally opens contact D2 momentarily so that the circuit through the relay winding RM is broken (since contacts RA1.3, RA2.3 and RA3.3 are already open) so that relay RM releases and contact RM1 opens. This switches off the motor, but the opening of contact D2 was only momentary, so that by the time the motor stops this contact is again closed. If one of the pennies inserted in the machine had fallen into opening A4 before each of the openings A1, A2 and A3 had received a coin, relay RA4 would have been energized and held by its holding contact so that re-

lay contact RA4.2 (Figure 10) would have been closed and the respective lamp behind opening A4 would have been illuminated. In such a case, when the drum controller operates, it momentarily closes contact D3 twice, as previously stated, in order to cause the dispenser to dispense four pennies, and when it subsequently closes contact D4 once the circuit to the pay solenoid 36 is energized a third time, due to the closed condition of contact RA4.2, and accordingly the machine pays six pennies.

Referring to Figure 8, the wiring of three sets of normally closed contacts and a normally closed drum contact equivalent to RA1.2, RA2.3 and RA3.2 and D1 is repeated for row B, the drum contact (not shown) being D11, previously referred to. Similar wiring arrangements are provided for the relays associated with row C of the openings, the drum contact in this case being D12, and a similar arrangement is also provided for the relays associated with the openings of row D, the drum contact in that case being D13.

Assume now that successive pennies fall into openings A1 and A3 so that relays RA1 and RA3 are closed. Contacts RA1.2 and RA3.2 are consequently open but relay RA2 remains un-energized and contact RA2.2 remains closed. Assume now that subsequent pennies miss the first row and that three pennies lodge respectively in the openings B1, B2 and B3 so that the three relays concerned RB1 (shown in Figure 8) and RC2 and RC3 (not shown) are operated and held as described previously. Contacts RB1.3, RB2.3 and RB3.3 (Figure 9) are closed so that relay RM is operated and the drum motor is started. The drum momentarily closes contact D3 twice but since contact RA2.4 is open this has no effect, neither does the single momentary closure of D4. The controller next closes contact D5 twice, as described above, and this applies two impulses to the pay solenoid 36 since contacts RB1.4, RC2.4, RB3.4 are all closed. The subsequent closure for the predetermined numbers of times of contacts D6, D7, D8, D9 and D10 has no effect because relay contacts in series with them are open. When the controller subsequently opens contact D1 momentarily this also has no effect since it will be recalled that opening A2 had not received a coin so that relay RA2 is unoperated, so that contact RA2.2 remains closed. However, all three normally closed contacts associated with the relays RB are open so that when contact D11 is opened by the drum controller these relays release. The same condition as in the case of relays RA applies to the other rows C and D of openings, that is to say, any openings which have been "primed" by receiving a coin remain in the "primed" condition even when the

machine pays out on a winning row. The priming of the openings of the winning row is, of course, cancelled, but the player does not lose the "credit" earned by the priming of other openings in respect of which the machine has paid out no winnings. The player sees that this is so since the lamps at the winning openings are extinguished while those at the other "primed" openings remain alight. This forms a great attraction to players, especially as, when one player leaves the machine, he will almost certainly leave several of the openings "primed" and the next player will receive the benefit of the coins already inserted.

WHAT I CLAIM IS:—

1. An automatic amusement machine comprising at least one coin slot, a substantially vertical panel down which coins inserted in the slot may fall, a number of openings in the panel, a plurality of springy pins projecting from the panel adapted to deflect coins falling down the surface of the panel, and electrical control circuitry arranged to pay out predetermined numbers of coins as winnings when coins enter predetermined single openings or combinations of openings in the panel.

2. A machine as claimed in claim 1 in which the openings are arranged in row and column order.

3. A machine as claimed in claim 2 in which there are three openings in each row and four rows one above the other, the openings in each row being arranged vertically above or below those in the next row so as to form three columns.

4. A machine as claimed in claim 2 in which there are four openings in each row and four rows one above the other, the openings in each row being vertically above those in the next row so as to form four columns.

5. A machine as claimed in any one of claims 2 to 4 comprising a moving deflector member upon which coins inserted in a slot are arranged to fall, so that the coins are deflected in different directions depending upon the position of the member when struck by a coin.

6. A machine as claimed in any one of claims 2 to 4 comprising a number of coin receivers equal to the number of openings in the uppermost row, there being one coin re-

ceiver above each of these openings, a chute running downwardly from each coin receiver, and a springy pin beneath each chute to deflect coins passing through the chute.

7. A machine as claimed in any preceding claim in which certain of the openings are losing openings, a coin which falls into a losing opening being lost to the player.

8. A machine as claimed in any preceding claim comprising a steeply sloping chute behind each winning opening down which coins entering the winning opening slide, a switch having an operating arm projecting through each chute which is deflected when a coin slides down the chute, and a relay which is operated when the switch is actuated by a coin, the relay contacts being connected singly or in chosen combinations so that when a singly connected relay is operated or all the relays of a chosen combination are operated a pay coin dispensing means is actuated to dispense a predetermined number of coins as winnings to the player.

9. A machine as claimed in claim 8 comprising a drum controller driven by a motor which is switched on when a singly connected relay is operated or a chosen combination of relays is operated, the drum controller closing a series of contacts in sequence, and an electromagnetically actuated coin dispenser energized by the contacts of the drum controller.

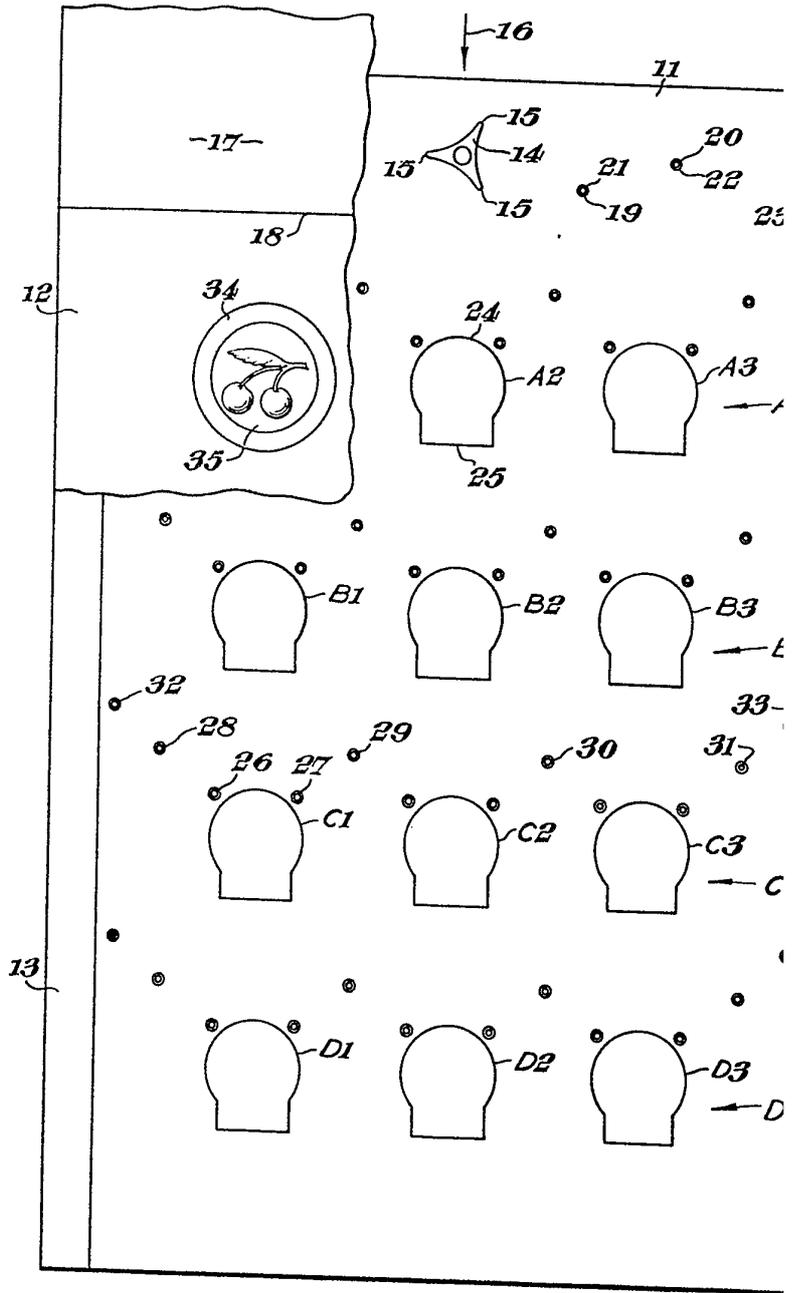
10. A machine as claimed in claim 8 or 9 comprising an indicator lamp associated with each opening which is illuminated when the associated relay is operated.

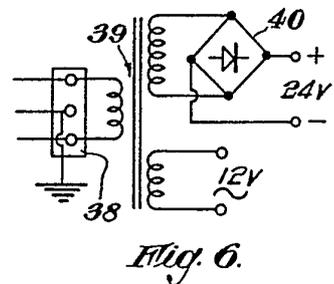
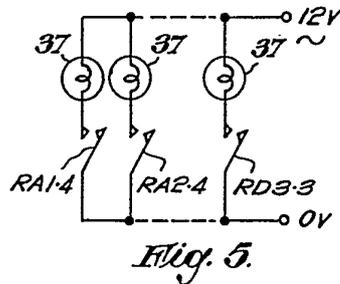
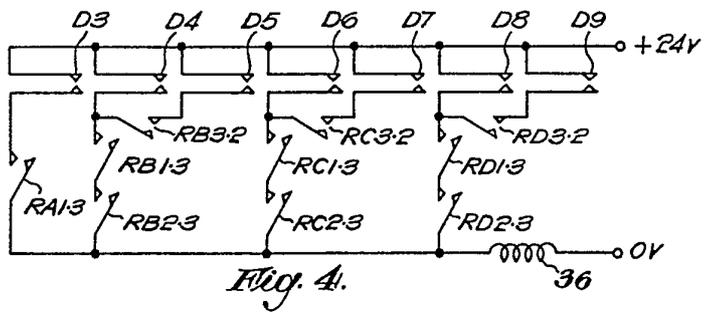
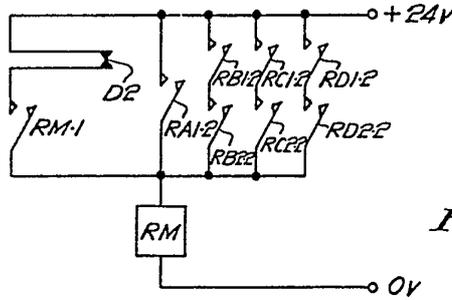
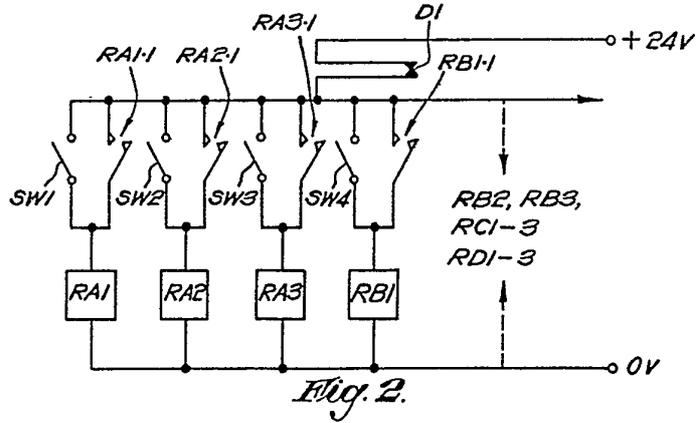
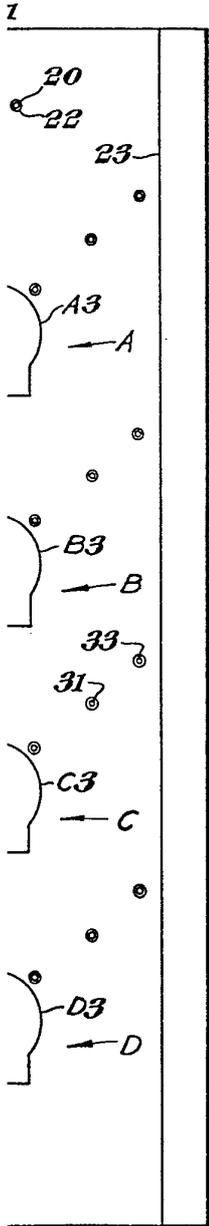
11. A machine as claimed in any preceding claim comprising a cover in front of the panel which is transparent except for pictorial devices which conceal the openings.

12. An automatic amusement machine arranged and adapted to operate substantially as herein described, with reference to and as illustrated in the drawings accompanying Provisional specification No. 50,759/64 or in the accompanying drawings.

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Fig. 1.





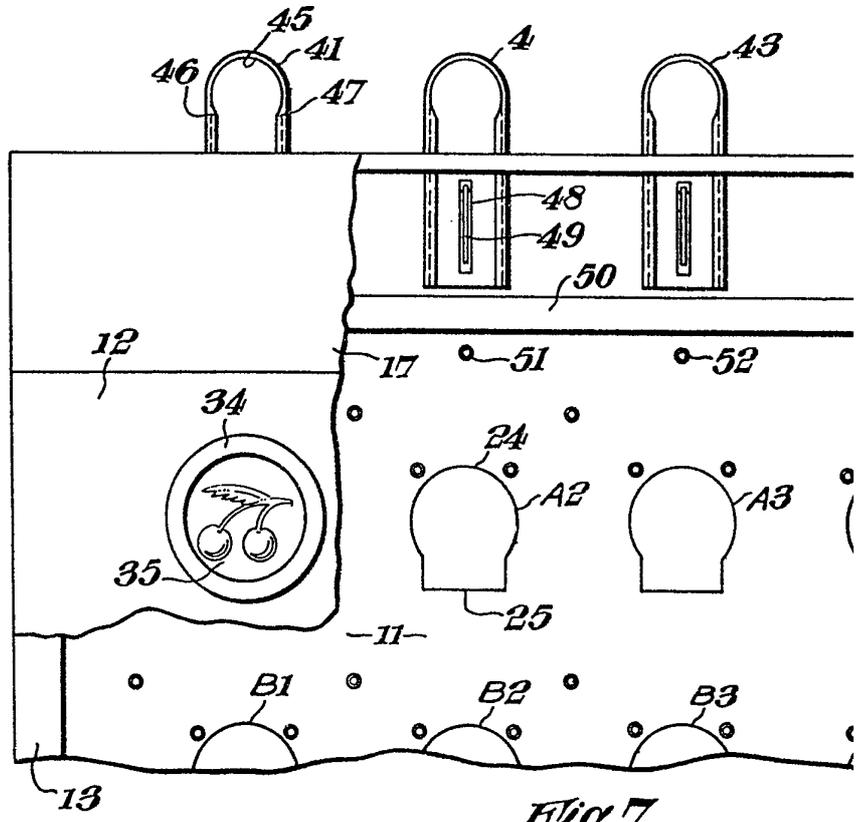


Fig. 7.

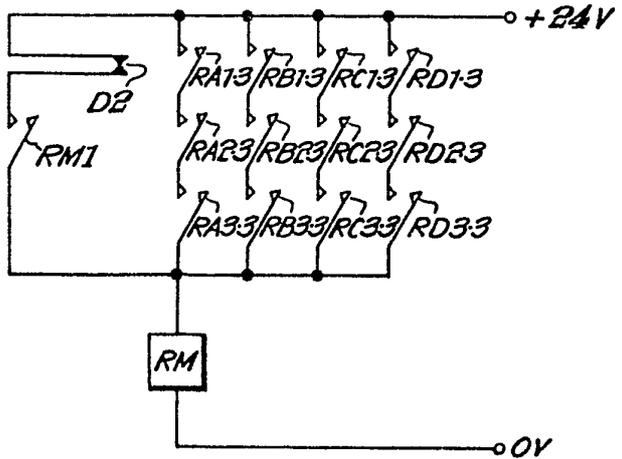


Fig. 9.

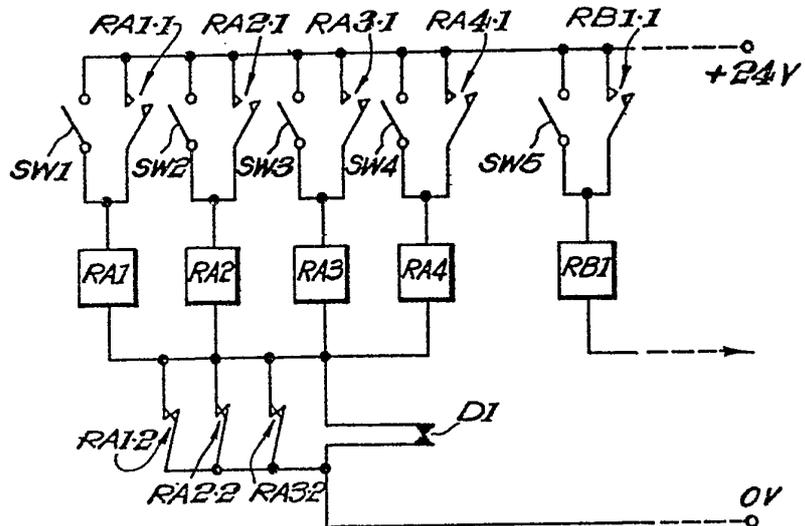
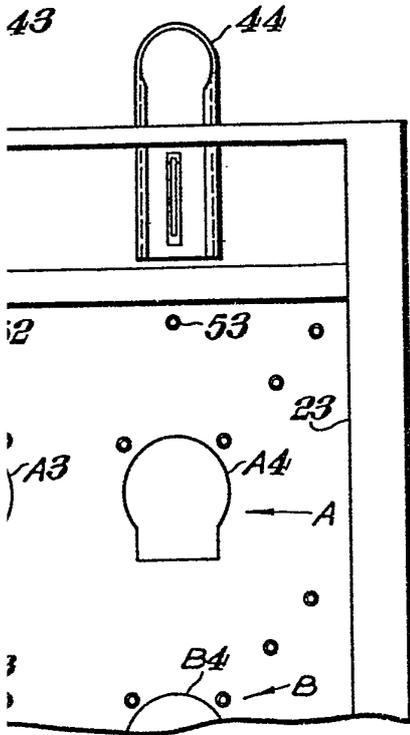


Fig. 8.

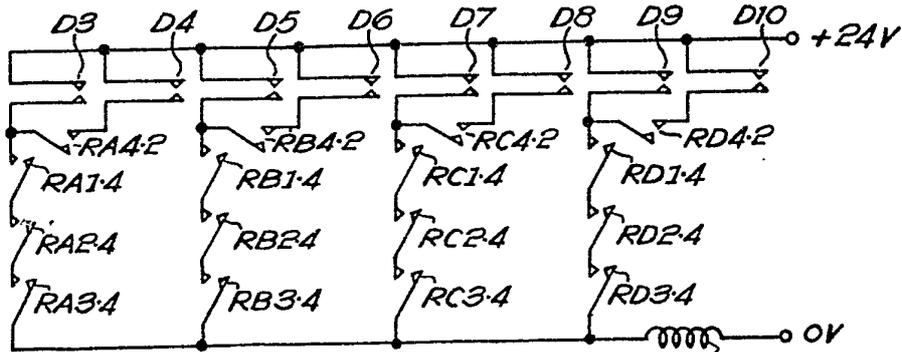


Fig. 10.

