April 1, 1941. J. C. K. SWAN ET AL 2,237,122

GAME OR AMUSEMENT APPARATUS

Filed March 13, 1939 3 Sheets-Sheet 1

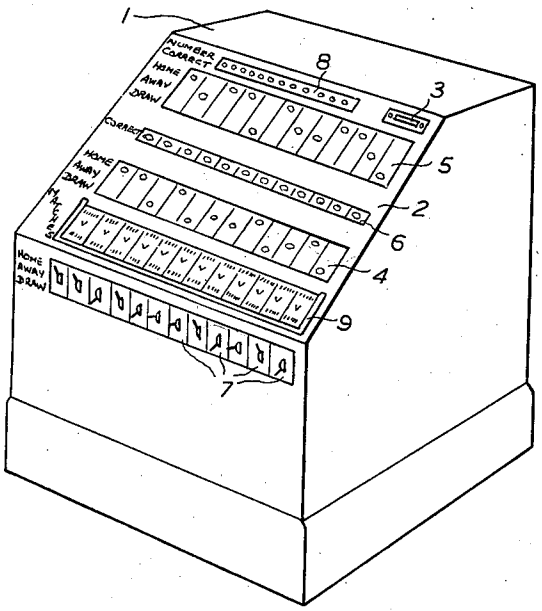
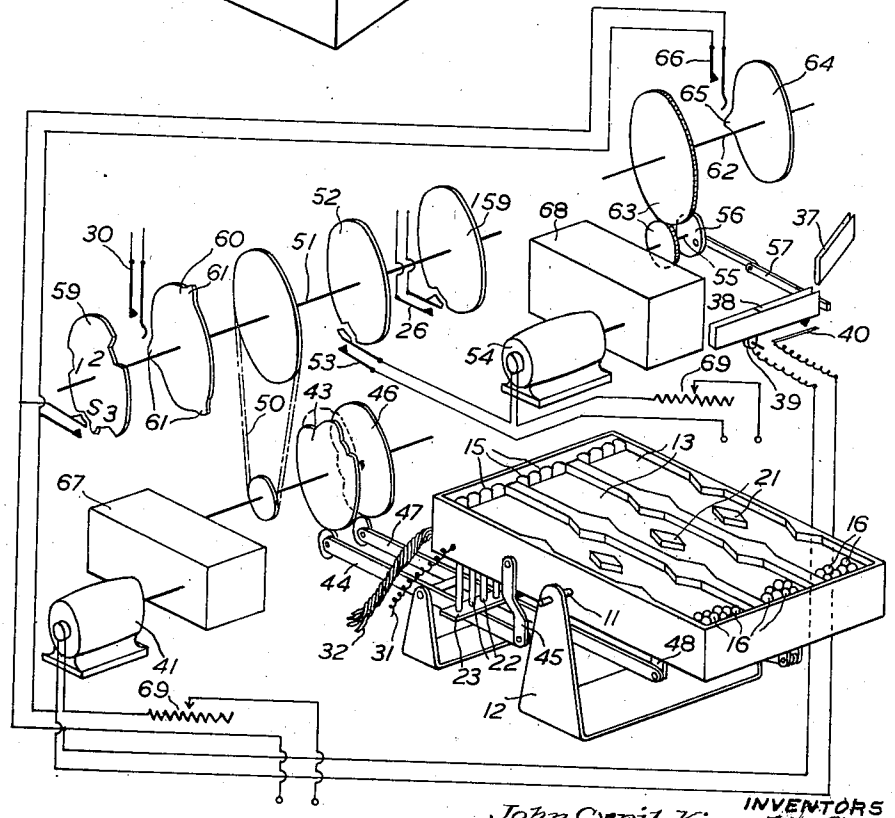


FIG. 1

FIG. 2



INVENTORS
John Cyril Kingsley Swan
and Hector Buchanan Roy, deceased,
By Constance Matilda Roy, Executrix.
BY
Munn, Anderson & Liddy
ATTORNEYS

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Filed March 13, 1939 3 Sheets-Sheet 2

FIG. 3

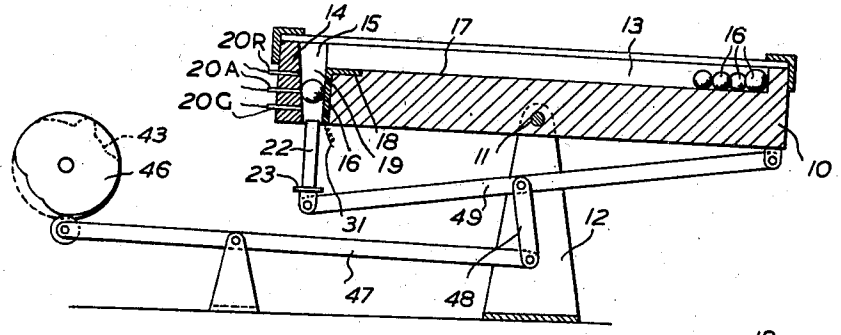


FIG. 4

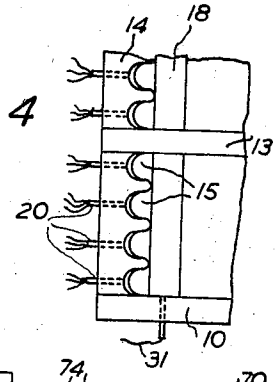


FIG. 6

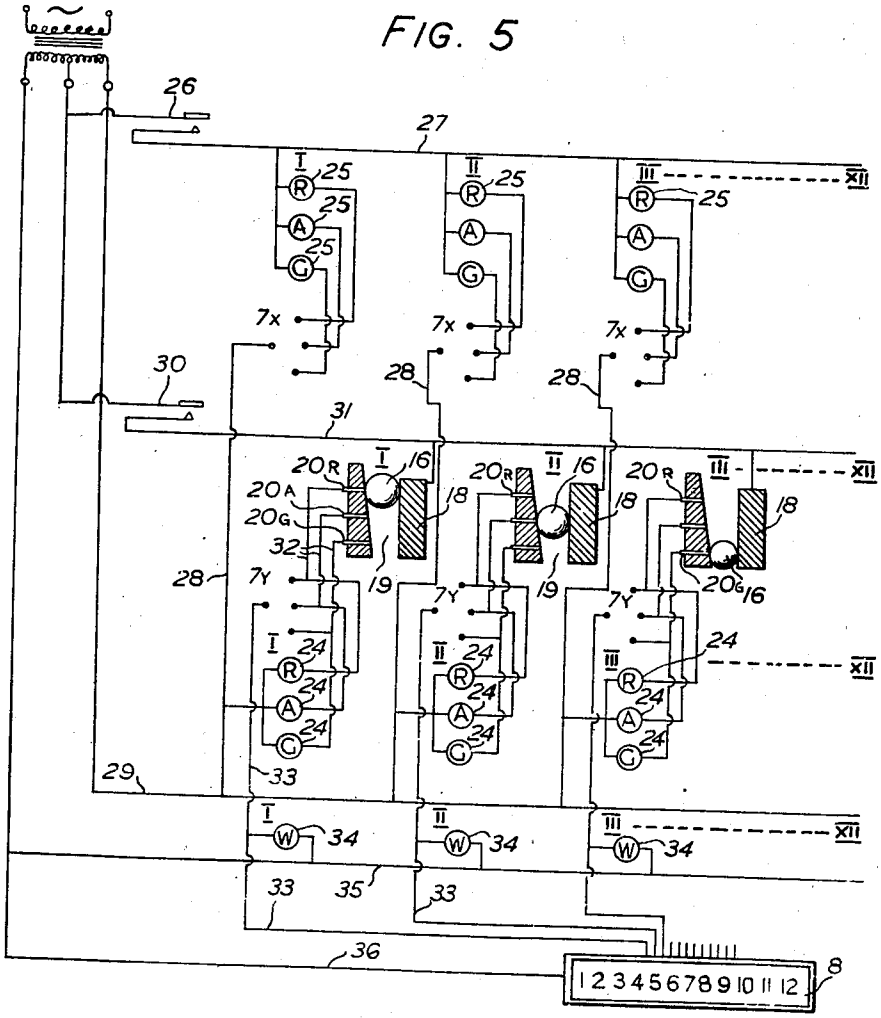
INVENTORS
John Cyril Kingsley Swan
and Hector Buchanan Roy, deceased,
By Constance Matilda Roy, Executrix.
BY Munn, Anderson & Liddy
ATTORNEYS

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Filed March 13, 1939 3 Sheets-Sheet 3

FIG. 5



INVENTORS
John Cyril Kingsley Swan
and Hector Buchanan Roy, Deceased,
By Constance Matilda Roy, Executrix.
BY Munn, Anderson & Liddy
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,237,122

GAME OR AMUSEMENT APPARATUS

John Cyril Kingsley Swan, Hove, England, and Hector Buchanan Roy, deceased, late of Hove, England, by Constance Matilda Roy, executrix, Hove, England

Application March 13, 1939, Serial No. 261,620
In Great Britain March 21, 1938

8 Claims. (Cl. 273—138)

This invention relates to game or amusement apparatus of an automatic or semi-automatic character, and broadly comprises a mechanism which when put into operation gives in association with each of a number of events an indication of which of a number of possible results (generally the same number for each event) has been chosen at random by selecting means included in the mechanism.

The mechanism comprises a plurality of means, each adapted when engaged by a ball to initiate actuation of one of a number of devices (e. g. lamps or other indicators), said means being arranged in a plurality of groups, means for distributing a plurality of balls, one and only one to each of said groups, to co-operate with one of the means in each group selected at random by the corresponding ball and to provide for the actuation of one of said devices, whereby a selected number of the devices, one for each group, may be actuated.

A plurality of sockets for the reception of the balls provides for the grouping of the means with which the balls co-operate to bring about the selective actuation of the plurality of devices, either by the provision of a number of means in each socket, or by a grouping of sockets each containing one such means.

According to one form of mechanism, elongated sockets are used, the width of each socket varying progressively along its length, and balls of different sizes are used with the sockets, so that the differently sized balls are restrained at different points in the length of the sockets, the means adapted to be controlled by the introduction of the balls being disposed at each such point in each socket.

According to the second form of mechanism, the sockets are arranged in groups with each of which a ball is associated, there being in each socket a single means adapted to be controlled by the introduction of the ball, so that the random distribution of the ball to one of the sockets in the group provides for the actuation of the device controlled by the means in the socket receiving the ball.

A selection being made by the distribution of the balls to the sockets, a corresponding selection can be made among the plurality of devices associated with the sockets, and indicating or other means is included in the mechanism to make known the results of the selection. Thus, for example, lamps or other indicators may be arranged in sets, one only of each set being selected by the balls entering the sockets.

Such an arrangement used as the basis of an amusement or game apparatus may have a plurality of ball-and-socket means each representing a football or other match, each such means serving to show the winning of the match by the "Home" team or by the "Away" team or a "Draw." Thus, each of the devices controlled by the balls entering the sockets may be in the form of a lamp or indicator illuminated or rendered visible to show which of the three results is obtained by the mechanism for any one match, all the devices showing the results for all the matches covered by the mechanism. Such a showing of the result of distributing the plurality of balls to the sockets may arise simply from the act of introducing balls into the sockets.

A further feature of the invention, however, resides in the provision of means under the control of the player to enable him to make any desired selection among a plurality of devices equal in number to the plurality of devices associated with the sockets, the mechanism then either enabling him to make comparison between his selection and the automatic selection effected by the introduction of the balls, or rendering the result visible only where any of his selections agrees with the selection made by the ball-and-socket mechanism. Means may be provided for allotting to the player an indication of the correctness of his selection, for example by the employment of a totalisator and/or by the issuing of a card or other token showing the number of correct selections.

The mechanism may be coin- or token-operated, electric motor or other means producing a cycle of operations in which balls are distributed at random to the sockets, the indication of the selection is rendered visible or otherwise made known to the player, and the balls are removed from the sockets in readiness for further distribution.

Means may also be provided to enable the player to have the benefit of more than one cycle of operations for each release of the freeing mechanism.

The balls may operate the plurality of devices electrically, for example by the sockets having pairs of electric contacts adapted to be connected by the introduction of a ball of conducting material. The operation may, however, be pneumatic, for example by having an aperture at a point at which a ball rests in the socket, so that one of a plurality of tubes may be closed by a ball to permit a vacuum to set up in the tube and

provide for selective pneumatic operation of the device connected to that tube.

The invention will now be described in greater detail with reference to the accompanying drawings, in which

Fig. 1 is a perspective view of a cabinet housing mechanism adapted to be used in conjunction with selector switches operable by a player, the view showing the positions at which lights appear to indicate the results selected by the player and by the mechanism;

Fig. 2 is a diagrammatic perspective view of the ball-and-socket mechanism and its operating mechanism;

Fig. 3 is a part-sectional elevation of the ball-and-socket mechanism;

Fig. 4 is a plan view of part of Fig. 3;

Fig. 5 is a wiring diagram showing the operation of the indicator lights by the selector switches and ball-and-socket mechanism; and

Fig. 6 is a wiring diagram of a modified form of ball-and-socket mechanism.

Referring to Fig. 1, a cabinet **1** is provided with an inclined front **2** in which is provided a coin-slot **3**, three ground glass panels **4**, **5**, **6** behind which lights are positioned to show respectively (*a*) the selection of results obtained by the player by the operation of the 12 3-pole, 2-way switches **7**, (*b*) the selection of the results obtained by the mechanism itself, and (*c*) the agreement between the two sets of results. A panel **8** serves to show numerically the number of correct results. A frame **9** receives a card, preferably removable, bearing an indication of twelve events, the three possible results of each of which are to be "forecasted".

Within the casing is the ball-and-socket mechanism shown in Figs. 2, 3 and 4. This comprises an elongated tray **10** (hereinafter called a "rocker") mounted so as to rock about pivots **11** in brackets **12**. The rocker is divided lengthwise into three compartments **13** and the left-hand end of each compartment terminates in an insulating block **14** formed with four serrations **15** into each of which may enter one of a plurality of balls **16** contained in the rocker when that end of the rocker is depressed. The serrations are formed by four tapered grooves closed below the surface **17** of the rocker **10** by a metal plate **18** so as to form sockets **19**. At points in the length of each socket **19** at which the widths of the socket are ¼-inch, 15/64-inch and 7/32-inch respectively are electric contacts **20R**, **20A**, **20G**. The balls **16** in the rocker have diameters equal to the dimensions just mentioned, there being as many balls in excess of four (say 12) as will ensure that by rocking the rocker each socket may be made to receive a ball. The numbers of each size of ball may be equal or unequal, as will be explained more fully later. The plate **18** provides a common return for each of the three circuits that may be completed by balls of the three different sizes entering the sockets.

With the rocker **10** tipped so that the left-hand end is raised, the balls **16** lie at the right-hand end of the rocker. The tipping of the rocker in the other direction causes the balls to run down the rocker so that one ball enters each serration **15**, a thoroughly random distribution preferably being effected by the provision of the obstructions **21** along the sides and in the centres of the rockers. The gaps left by the obstructions should not be so narrow as to allow any "bridging" by the balls.

Passing through the sockets **19** in each compartment are four ejector plungers **22** carried by a common bar **23**, the plungers lying—at the time the balls enter the serrations **15**—with their tops just below the tops of the sockets **19** so that the four balls in the serrations slightly enter the sockets. With the rocker tilted in the reverse direction, the other balls are removed from the vicinity of the serrations and the twelve plungers are then depressed in the sockets to allow the twelve balls to fall into the sockets and rest at levels corresponding to their diameters. In order to ensure that no serration is without a ball, the rocker is tilted a second time while the plungers remain raised, by means to be described later.

The three contacts **20** in each socket are connected to three electric lamps **24R**, **24A**, **24G** of three different colours, e. g. red, yellow and green, there being altogether twelve sets of such lamps. Three sets I, II, III are shown in Fig. 5. The lamps **24** lie in sets of three alongside the card in the frame **9** bearing the names of the teams of twelve football or other matches, the lighting of a red, yellow, or green lamp indicating respectively a "Home" win, an "Away" win, or a "Draw".

As previously mentioned, the switches **7** are of the 3-pole type, and, the switches being located opposite the 12 matches shown in the frame **9**, an indication at the left hand end of the set of switches shows the player that the top, middle and bottom positions of the switch levers enable him to select "Home", "Away" and "Draw" results respectively. The switches are also arranged for 2-way working to control the circuits of the lights displayed at the panel **4** to enable agreement between results in panels **4** and **5** to be shown in panel **6**. The two halves **7X**, **7Y** of the switches are shown separately in Fig. 5 for convenience. It will be understood, however, that when the switch-half **7X** is set to close the uppermost of its three circuits, the half **7Y** also closes the uppermost of its own three circuits. Switch-half **7X** controls three lights **25R**, **25A**, **25G** disposed one above the other behind the panel **4**. Upon the insertion of a coin in the slot **3** the switch **26** is closed by means to be described later, to permit any of the lights **25** in the sets I . . . XII to be switched on by operation of the switch-half **7X**. The sets of lights are supplied from a common lead **27**, the leads **28** connecting the switch-halves **7X** to a common return lead **29**. The lead **28** of a set is also connected to the three lamps **24** of the same set, the lamps **24** being disposed one above the other behind the panel **5**. With all the switches **7** set in any desired order by the player, 12 of the lights **25** indicate on the panel **4** the results of this selection.

In the meantime the rocker **10** has distributed 12 balls **16** at random into the 12 sockets **19** and the switch **30** is now closed (by means to be described later) to connect each of the plates **18** forming one side of each socket by a common lead **31**. Wherever a ball **16** makes a connection between a plate **18** and one of the contacts **20R**, **20A**, **20G**, a corresponding lamp **24R**, **24A**, **24G** is connected in the circuit by one of the leads **32**. The closure of the switch **30** after distribution of the balls **16** to the sockets **19** thus lights **12** of the lamps **24** behind the panel **5**. The leads **32** from the contacts **20** are also connected to the switch-half **7Y**, the other side of which is connected by lead **33** to a lamp **34**, the 12 lamps **34** being connected to a common lead **35**.

If the switch-halves 7X, 7Y of one switch 7 have been set to close say the uppermost of each of their three circuits, and the largest size of ball enters the corresponding socket 19, not only does the ball permit the uppermost lamp 24 to be lit, but also completes the uppermost circuit of the switch-half 7Y to light the corresponding lamp 34. If, however, a ball of either of the other two sizes has entered the socket 19, the lead 32 connected by the ball is not connected to the circuit selected in the switch-half 7Y, and the corresponding lamp 34 is not lit. It follows then that upon closure of the switch 30, not only are 12 of the lamps 24 lit behind the panel 5, but also such of the lamps 34 behind the panel 6 as indicate correspondence between the players' selection among the lamps 25 and the selection among the lamps 24 obtained by the operation of the rocker 10. The leads 33 of the switch-halves 7Y lead to a counter behind panel 8, the counter being of any suitable type, to close the circuit of a lamp behind a numeral corresponding to the total number of correct results, as indicated by the lights 34. 36 is the return lead for the counter.

Fig. 5 shows the sets I to XII of the sockets 19 connected respectively to the corresponding sets I to XII of the lamps 25 controlled by the switches 7. In order, however, to prevent any possible predisposition to the attaining of a preponderance of any particular set of results by the rocker 10, for example by balls of one size tending more frequently than the other sizes to enter the sockets, the connections between the sockets and the circuits controlled by the switches 7 need not be I to I, II to II etc., but may be arranged irregularly. Similarly, although in each compartment 13 on the rocker there may be say four balls of each of the three different sizes, different numbers of balls may be used, e. g. 5, 4, 3; and, moreover, where one compartment 13 may have a larger number of one size of ball, another of the compartments may have a smaller number of that size of ball.

Provision is made for three cycles of operation at each insertion of a coin, an interval being arranged before each showing of the selection made by the rocker during which the player can make his own selection, and the lamps 34 and the panel 8 showing towards the end of each cycle the extent to which the player's selection agrees with that obtained by the rocker. The mechanism for this 3-cycle operation is shown diagrammatically in Fig. 2.

A coin inserted in the slot 3 falls down the chute 37 on to the beam 38 and causes the beam to rock on its pivot 39, thus closing the switch 40 in the circuit of the motor 41 and setting the camshaft 42 in motion. A cam 43 provides for the tilting of the rocker 10 through the lever 44 and link 45, and a second cam 46 moves the plungers 22 in the sockets 19 through the lever 47, link 48, and lever 49.

The shaft 42 drives through gearing 50 a shaft 51, which makes one revolution while the shaft 42 makes three. The cam 52 on the shaft 51 closes the switch 53 in the circuit of a timing motor 54 driving a shaft 55, a crank disc 56 on which serves to withdraw a bar 57 and permit the coin to roll from the tilted beam 38. The switch 40 thus opens, but the circuit of the rocker motor 41 has in the meantime also been closed by the switch 58 controlled by the cam 59.

The cam 59 contains four notches, marked "1," "2," "3" and "S." Before the insertion of a coin, the whole of the mechanism occupies the positions shown in Fig. 2, and the notch "S" in the cam 59 lies opposite the switch 58. As soon as the cam rotates, the motor 41 is kept in rotation, and this rotation continues until the notch "1" reaches the switch 58. During this period the cams 43, 46 have completed a revolution to operate the rocker 10 and plungers 22.

Again, as soon as the shaft 51 rotates, the cam 159 closes the switch 26 for the lamps 24 controlled through the switches 7 by the player, the switch remaining closed during the whole revolution of the shaft 51.

A further cam 60 on shaft 51 has three equally spaced projections 61 that serve to close the switch 30 (controlling the lamps 25) three times in one revolution of the shaft.

The shaft 55 driven by the timing motor 54 rotates a shaft 62 through reduction gearing 63. A cam 64 on the shaft 62 has a single projection 65 to close a switch 66 once in each revolution. The switch 66 is connected in the circuit of the rocker motor 41.

The motors 41, 54 drive their shafts and cams through gear boxes 67, 68 at a slow speed. Allowing 5 minutes for the three cycles, the timing motor 54 rotates the cam 64 once in about 1⅔ minutes. During this period, the shaft 42 makes one rotation and the shaft 51 makes ⅓ revolution, the timing of these two shafts being, however, under the control of the motor 54. The speeds of the motors may be adjusted by the rheostats 69.

To return to the cycle that had been started by the passing of the notch "S" in the cam 59 away from the switch 58, the closing of the switch 26 by the cam 59 permits the lamps 25 to show the selection made by the player operating the switches 7. During the interval thus provided, the cam 46 lifts the plungers 22 to eject the 12 balls 16 remaining in the sockets 19 from the previous operation of the machine. The balls roll to the right-hand end of the rocker 10. The ejectors remain with their ends slightly below the mouths of the sockets. The cam 43 then lowers the left-hand end of the rocker, and the balls run down the tilted compartments 13, being mixed by the constructions 21. A ball enters each of the serrations 15 and drops slightly into the sockets 19 to rest on top of the plungers 22. In order to guard against the possibility of a socket not receiving a ball, the rocker is again tilted to the right and back to the left, one of the remaining balls then entering any vacant socket. The plungers 22 are then lowered by the cam 46 to permit the balls in the sockets to drop until they rest against contacts 20 at depths appropriate to their different diameters.

When the balls have dropped, the cam 60 brings one of its projections 61 into engagement with the switch 30 to complete the circuits through the 12 lamps 24 selected by the rocker and through any lamps 34 showing agreement between the lamps 24, 25, as already described. While the switch 30 is closed, the notch "1" in the cam 59 allows the switch 58 to open and the rocker motor 41 stops, the switch 30 remaining closed so that the lamps 24, 25, 34 continue to be seen through the panels 4, 5, 6.

Control of the timing is maintained by the motor 54, and at the end of 1⅔ minutes, the cam 64 closes the switch 66 to restart the rocker motor 41. The switch 30 opens to extinguish the 12 lamps 24 and to make the contacts 20 in the sockets 19 "dead." The notch "1" moves

away from the switch **58** to keep closed the circuit of the motor **41** after the switch **66** has reopened. The player again adjusts the switches **7** and the ejecting and rocking operations and the showing of results by the lamps **24** and **34** continue as in the first cycle. The second cycle ends by the notch "2" in the cam **59** allowing the switch **58** to open. The third cycle similarly ends with the switch **58** opened by the notch "3." At this point, the switch **30** remains closed by one of the projections **61** on the cam **60** and the cam **59** still keeps closed the circuit of the lamps **25**. To switch off these circuits, the projection **65** on the cam **64** driven by the timing motor **54** closes the switch **66** for the third time, and the rocking motor rotates to permit the cam **159** to open the switch **26** and the cam **52** to stop the timing motor by opening the switch **53**. The switch **58** is then opened by the notch "S" and the rocker motor **41** also comes to rest, the projection **65** on the cam **64** having, by the time the timing motor stopped, opened the switch **66**. The bar **57** rests across the beam **38** in readiness to retain the next inserted coin.

Fig. 6 shows a rocker **70** formed with three compartments **71** in each of which are three sockets **72**, one of which receives a ball **73** contained in the compartment by the tilting of the rocker. The sides of the socket have contacts **74** that are connected when a ball **73** enters the socket. In each compartment three of the contacts **74** are connected to a common lead **75** from a switch **130**. The other three contacts **74** are connected to three lamps **76R**, **76A** and **76G** disposed behind the panel **5**. Return leads **77** are connected to each set of a three lamps and also to the switch-half **7***x* of 3-way 2-pole selection.

The switch-half **7***x* is connected to a set of three lamps **78R**, **78A**, **78G**, the return lead of the three sets of lamps **78** and return lead of **79** running to the switch **126**. The other switch-half **7***y* is connected by three leads **80** to the lamps **76** and to a light **81** and counter **82**. Upon closure of the switch **126** manual operation of the switch **7** enables one of the lights **78** to be lit through the switch-half **7***x*. Tilting of the rocker **70** causes the ball **72** in each compartment **71** to enable one of the lights **76** to be lit by closure of the switch **130**. If the switch **7** has been set so that the corresponding lights of the two sets **78**, **76** are lit, the circuit is completed through the switch-half **7***y* to the lamp **81** and to the counter **82** indicating correctness of selection.

In Fig. 6 only three sets I, II, III of lights **76**, **78**, **81** are shown, these corresponding to the three compartments **71**, but of course any other suitable number of sets may be provided, say 12, as described with reference to Figs. 1–5. In view of a possible tendency for a ball in one compartment to enter one socket in preference to the other sockets and for the balls in the other compartments to show a similar preference, corresponding leads **83** (Fig. 6) from contacts **74** are connected to lamps **76** of different colour, so that such a tendency is not reflected as a tendency for lamps of one given colour to light in preference to those of any other colour.

Having described our invention, what we desire to secure by Letters Patent is:

1. Game or amusement apparatus comprising a plurality of groups of devices adapted to be controlled by the distribution of balls, a second and corresponding plurality of groups of devices adapted to be manually controlled, a plurality of corresponding groups of means each adapted when engaged by a ball to initiate actuation of a device in one of the first plurality of groups, means for distributing a plurality of balls to said initiating means, one and only one for each group of means, whereby a ball co-operates with one of the means selected at random from each group to provide for the actuation of one device in each of the first plurality of groups, a plurality of manual controlling means for the second plurality of groups of devices, and a plurality of indicators for indicating correctness between the manual control and the control by a ball of corresponding groups of the first and second plurality of devices.

2. Game or amusement apparatus according to claim 1, comprising a rocking tray to contain the plurality of balls, and means for tilting the tray so as to effect the required random distribution of the balls.

3. Game or amusement apparatus comprising a rocking tray, a plurality of elongated sockets at one end of the tray, a plurality of balls of different sizes in the tray, means for tilting the tray so as to distribute the balls to the sockets, means for preventing more than one ball entering any one socket, the width of each socket varying progressively along its length so that differently sized balls are restrained at different points in the lengths of the sockets, means disposed at each such point to be engaged by a ball, a plurality of devices associated with the group of means in seach socket for selective actuation by a ball distributed to each socket, a further and equal plurality of devices, means for manually controlling the further plurality of devices, and means for indicating correctness between the manual control of any one of the further plurality of devices and the control by a ball of the corresponding one of the plurality of devices controlled by the distribution of the balls.

4. Game or amusement apparatus according to claim 3, comprising plungers in the sockets, and means to raise the plungers to eject distributed balls from the sockets.

5. Game or amusement apparatus according to claim 3, comprising plungers in the sockets, means to raise the plungers to eject distributed balls from the sockets, means to hold the tops of the plungers just below the tops of the sockets when the tray is tilted to distribute balls to the sockets, so that each socket can only receive one ball, and means to lower the plungers to allow the one ball in each socket to fall into the socket and rest at a level corresponding with the diameter of the ball.

6. Game or amusement apparatus according to claim 3, wherein the tray has lengthwise compartments, there being a plurality of the sockets at one end of each compartment and a plurality of balls greater than the number of sockets in each compartment.

7. Game or amusement apparatus comprising a rocking tray, elongated sockets each of varying width in one end of the tray, a plurality of balls in the tray, means for tilting the tray to distribute balls to the sockets, plungers in the sockets, means to position the tops of the plungers just below the tops of the sockets when the balls are being distributed so as to allow only one ball to enter each socket, means to lower the plungers to allow each such ball to fall in the socket and rest at a point corresponding to its diameter, electric contacts at each such point in each socket, a plurality of indicating devices electri-

cally connected to such contacts, means to raise the plungers to eject the balls after actuation by the balls of a number of the devices selected in accordance with the distribution of the balls to the sockets, a further and equal number of associated electrical indicating devices, a plurality of manually controlled switches for selection of such devices, and a further plurality of electrical indicating devices each of which is actuated when a manual switch has selected a device corresponding to one selected by a ball.

8. Game or amusement apparatus according to claim 7, comprising an electric motor for controlling the rocking tray and the plungers, and a further motor for stopping and re-starting the first motor to permit more than one cycle of selections.

CONSTANCE MATILDA ROY,
Executrix of the Estate of the said Hector Buchanan Roy, Deceased.
JOHN CYRIL KINGSLEY SWAN.