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PLANETARY GAME APPARATUS
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This invention concerns an improved planetary ball race game.

The game embodying the invention is largely a game of chance but it has educational features in that it familiarizes players with names of planets in the solar system. According to the invention there is provided a game assembly including a dome in which is an illuminated motor driven revolving globe representing the sun. Surrounding the globe is a stationary housing provided with channels representing orbital paths of planets. The planets themselves are represented by balls which are discharged into the dome by a popgun.

A novel feature of the invention is that the popgun can be removed and used as a toy gun separately from the game assembly. Scoring lamps are provided at the several channels to indicate a numerical score attained when a planet enters a channel orbit. The globe and housing are preferably made of transparent multi-colored plastic parts to provide a spectacular display while the game is in operation.

It is therefore a principal object of the invention to provide a planetary ball game having a domed housing in which is a motor driven revolving globe which serves to throw off balls discharged thereon into channels representing planetary orbits.

A further object is to provide a ball game as described with a removable popgun used to discharge the balls into the housing.

Another object is to provide the ball game with an electric scoring system.

For further comprehension of the invention and of the objects and advantages thereof, reference should be had to the following description and accompanying drawings and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIGURE 1 is a perspective view of a game device or assembly embodying the invention,

FIG. 2 is a fragmentary sectional view on an enlarged scale taken on line 2—2 of FIG. 1,

FIG. 3 is a longitudinal sectional view taken on line 3—3 of FIG. 1,

FIG. 4 is a horizontal sectional view taken on line 4—4 of FIG. 3,

FIG. 5 is a fragmentary horizontal sectional view taken on line 5—5 of FIG. 3, and

FIG. 6 is a diagram of an electrical signal system employed in the game.

Referring first to FIGS. 1—5, there is shown a game assembly comprising a horizontal generally rectangular elongated base 10 having a horizontal wall 12, vertical peripheral wall 14 and open bottom. Inserted in the open bottom of the base is a baseboard or plate 18 having spaced apertured ears 19 which receive screws 20 inserted in holes in wall 14 so that the base plate is held in the tray and spaced from wall 12 to define a narrow compartment 21. In compartment 21 is a drive gear 22 secured on vertical drive shaft 24 of an electric motor 26 disposed in a recess 27 formed in wall 12 near one end of base 10. Gear 22 is meshed with speed reducing spur gear 30 on stub shaft 31. Gear 30 is in turn meshed with a spur gear 32 secured on an axially vertical shaft 34. Thrust bearings 35, 36 and 37 are formed in base plate 18 to journal the bottom ends of shafts 24, 31, and 34.

Shaft 24 extends through a hole 38 in wall 12. Shaft 31 is journaled at its upper end in a bearing 39 formed in the underside of wall 12. Shaft 34 is journaled in a sleeve bearing 40 extending upwardly from wall 12; see FIG. 3. At its upper end, shaft 34 carries an inverted hollow shell or globe 42. The globe has spider arms 44 supporting a central ring 45 in which the upper end of shaft 34 is engaged. The shell terminates in an upper hemispherical knob 46 which serves a purpose described below.

A lamp socket 48 is mounted on wall 12 inside of globe 42. The socket carries a lamp bulb 50. Wire 51 extends from the lamp socket to an electric circuit. Parts of the circuit are housed in circuit box 52 disposed next to motor 26 on wall 12. A housing 54 containing batteries 55 is mounted on the housing of motor 26 next to the circuit box 52.

At the other end of the base 10 is a stationary transparent plastic housing 60 in the form of a generally hemispherical shell surrounding the globe 42. The housing has a peripheral flange 61 which fits on wall 12 within wall 14. Integral with housing 60 is a laterally extending horizontal wall 62 which has an enlargement 65 at its end opposite housing 60 defining a chamber 64. A pair of passages 65 extending horizontally are defined between housing 60 and chamber 64. These passages are defined by upper wall 62, extensions of flange 61, and a thickened portion 12' of wall 12 in which recess 27 is formed.

Housing 60 is formed with a plurality of circumferentially spaced channels 66 which extend from the wider bottom end of the housing to an upper narrower intermediate plane P. These channels 66 are open at the inside of housing 60 to present concave sides to the convex outer surface of rotating globe 42. Near the upper end of each channel 66 is a knob 68 in which is seated a small signal lamp 70. Near the bottom end of each channel is another knob 71 in which is seated a microswitch 72. Each switch has a movable operating finger 73 extending into the channel. Wires 70', 72' are connected from the lamps 70 and switches 72 to the circuit in circuit box 52. Names of planets 67 and scoring numbers 69 are marked on the outer sides of channels 66. Further scoring numbers 69' are marked on knobs 68.

A hollow tapered dome 75 extends upwardly from plane P of housing 60. In the upper end of the dome is mounted a bell 76 connected to the circuitry in circuit box 52. A channel 77 is formed around the outside of the dome near its top. The channel opens at one end into the dome 75 just below bell 76. The other end of the channel terminates in a tubular fitting 80. The fitting 80 receives the discharge end of a tubular barrel 81 forming part of a popgun 82. The barrel is inclined downwardly from fitting 80 to retain a playing ball therein. Popgun 82 has a simulated trigger handle 84 removably seated in a stationary stand 85 extending upwardly from the top of battery housing 54. The barrel has a lateral tubular fitting 86 which receives a conical plug 87 attached by a cord 88 to an eye 89 on the barrel. A hand grip 93 is secured to the barrel. Balls 90 used in playing the game can be inserted through fitting 86 into the downwardly inclined barrel. A coil spring 91 in the barrel surrounds shaft 92 carrying a piston 93. The shaft extends through a hole in end wall 94 of the barrel and terminates in a knob 95. The knob can be pulled outwardly to retract the shaft and piston axially of the barrel. When the knob is released the spring will drive the piston toward the discharge end of the barrel to shoot a ball deposited in the downwardly inclined barrel into channel 77.

In channel 77 is a microswitch 96 having a projecting finger 97 disposed to sense the passage of a ball through channel 77. This switch is connected via wire 98 to the circuit in circuit box 52. Additional microswitches 99 have
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fingers 99' disposed in passages 65 to sense the passage of balls 90 therethrough into chamber 64.

The electric circuit 100 in which the various lamps, switches, motor, bell and batteries are connected is shown in detail in FIG. 6, to which reference is now made.

When one terminal 101 is connected in series with on-off switch 105 to one terminal of motor 26, lamp 50, and bus wires 102, 103 and 104. Bus wire 106 is connected to one terminal of each lamp 70. The circuit has a plurality of relays 108. One relay is associated with each of lamps 70 and one of switches 72. Each relay has two contacts C1, C2 and contacts C3, C4. Contacts C1, C2 are normally open with respect to contacts C3, C4 respectively except when relay coils 110 are energized. Each switch 72 is a pushbutton type of switch with two normally open contacts C9, C10. Contacts C9 are connected to bus wire 104. Contacts C10 are connected to one terminal 111 of each relay coil 110 respectively. The other terminal 112 of the relay coil is connected to bus wire 102. Relay contact C1 is connected to coil terminal 111. Relay contact C2 is connected to the other terminal of an associated lamp 70. Contacts C3 and C4 are connected to bus wire 103.

Switch 96, used to indicate the firing of a ball 90, is a two-position pushbutton type of switch. In one position shown in FIG. 6, switch contacts C5, C6 are normally closed by shorting or bridging bar 114. In the other switch position switch contacts C7, C8 are closed. Wire 106 is connected to contact C1 and contact C6. Contact C3 is connected to return terminal 115 of the batteries along with the other terminals of motor 26 and lamp 50. Switch contact C7 is connected to bus wire 102.

A relay 120 is associated with switch 96. This relay has a coil 121 which actuates two movable contacts C11, C12 normally open with respect to contacts C13, C14. Ball return switches 99 are also associated with relay 120. These pushbutton types of switches have normally closed contacts C15, C16 and C17, C18. Switch contact C8 is connected to relay coil terminal 123. Relay terminal 122 is connected to switch contact C17. Switch contact C18 is connected to switch contact C16 and switch contact C15 is connected to battery terminal 115 so that switches 99 are both in series with the return line of the battery. Bell 76 has one terminal T1 connected to battery terminal 115. Terminal T2 of the bell is connected to relay contact C12. Bus wire 102 is connected to relay contacts C11 and C14. Relay contact C12 is connected to coil terminal 121.

To operate the game assembly including circuit 100, switch 105 which is mounted at the side of circuit box 52, will be closed. This will start the motor 26 and light lamp 50. No other lamps will light because the contacts of relays 108 are open. Now the player will grasp knob 95 and retract shaft 92 and piston 93. Then the player will take one of balls 90 out of receiving compartment 64 and place it in the open barrel through fitting 86. When the player releases knob 95 the ball 90 in the barrel is projected through passage 77 and around the dome, when the ball upon the ball enters the globe 42. The ball will be thrown off the knob 46 centrifugally and will roll around the dome 75 and globe 42 until it enters the upper open end of one of channels 66. As the ball leaves channel 77 it operates switch 96 and as it passes through one of channels 66 the disc 78 will be attracted to the scoring lamp 70 at the lower open end of the channel. The ball rolls down along the downwardly inclined wall 12 of base 10, through one of passages 65 into receiving chamber 64. As it passes through a passage 65 the ball actuates one of the ball return switches 99.

When the ball operates one of switches 72, the associated motor 26 is energized. The switch 72 opens as the ball passes down to base 10 but the relay coil 110 remains energized because contacts C1, C3 constitute a holding circuit. When the coil 110 is energized, the scoring lamp 70 in the knob 68 of the channel lights up and the scoring numeral 69 is illuminated. Each channel 66 has a different color so that the entire transparent wall of the channel glows with this color to illuminate planet marking 67. Bell 76 begins to ring when the fired ball operates the firing switch 96 to close contacts C7, C8 and energize relay coil 121 so that contacts C11, C13 close. The bell continues to ring after the ball passes switch 96 because relay coil 121 remains energized via holding circuit contacts C12, C14.

When the ball passes through a return passage 65, one of switches 99 are opened. This opens the return power supply line of the relay coil 121 and the relay becomes deenergized. The contacts C1 and C2 and contacts C3, C4 are reconnected to the on position respectively. The lighted scoring lamp 70 remains lighted until the next ball is fired. Then as the newly fired ball passes switch 96 in channel 77 and contacts C5, C6 are momentarily opened. This results in deenergizing of the previously energized relay 108 so that its associated scoring lamp 70 is extinguished. The same lamp or a different one will light up when the newly fired ball passes switch 72 in the channel 66 through which the ball passes. The closure of switch 96 serves to start ringing of the bell indicating the start of a firing round and also serves to extinguish the previously lighted scoring lamp. The successive lighting of the colored channels as a score is made provides an interesting and spectacular display. The rotating illuminated globe 42 which is visible through the transparent wall of housing 60 may be decorated or painted in various colors. The rotation of the globe is clearly visible which heightens the interest of players and spectators in the game. The balls 90 can also be painted or otherwise decorated with stars, astronomical signs, etc.

It will be noted that the popgun 82 can be readily removed from stand 85 to serve as a separate toy gun. This increases the utility game assembly. Removal of the gun also facilitates packing of the assembly for shipment and storage. If desired a manually operable trigger 150 can be provided for firing the gun.

The game is easy to use and requires no particular skill. It is entirely safe and foolproof in operation. One or more players can use the game by firing balls 90 in turn. Since scoring in the game is almost entirely one of chance, there is no danger that any one player can gain so much skill in the game that he will always win. This arrangement maintains interest in the game on the part of all players, regardless of the skill with which they operate the firing gun.

While I have illustrated and described the preferred embodiments of the invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

What is claimed is:

1. A planetary ball game, comprising a base, a transparent housing mounted on said base at one end thereof, a curved shell rotatably mounted inside said housing, said housing having a plurality of circumferentially spaced longitudinally extending arcuate channels formed thereon and open laterally to the rotating shell, drive means under the base operatively connected to the shell to rotate the same, a dome on said housing, said shell being exposed to the interior of the dome, another channel integral with said dome and open at one end into the dome, said other channel terminating at its other end in a fitting for receiving the discharge from a gun barrel, and a wall integral with said housing and overlazing said base to define a pair of passages extending from the housing to the other end of the base, said wall being shaped to define a ball receiving chamber at the other end of the base.

2. A planetary ball game as recited in claim 1, further comprising a base housing made of metal and a gun barrel integral with the drive means for rotating said said continuously, said shell being transparent, and a lamp inside the shell for illuminating the same continuously.

3. A planetary ball game as recited in claim 1, further comprising a signal lamp disposed near one end of each of the
the arcuate channels, a switch located at each of the arcuate channels, each switch having an operating member extending into the arcuate channel for operation by a ball passing through the channel, each signal lamp being connected in circuit with a switch for lighting when a ball passes through an arcuate channel.

4. A planetary ball game as recited in claim 1, further comprising an electric bell mounted inside the dome at the top thereof, a switch in said other channel connected in circuit with the bell for energizing the bell to ring when a ball passes through said other channel, and another switch in each of said passages connected in circuit with bell for deenergizing the bell to stop ringing when a ball passes through either one of the passages.

5. A planetary ball game as recited in claim 1, further comprising a manually operable ball discharging gun having a generally cylindrical barrel, a simulated trigger attached laterally to said barrel, a stand carried by said base disposed to receive in an axially inclined position to receive a ball to be fired, and with the discharge end of the barrel engaged in said fitting.

6. A planetary ball game as recited in claim 2, further comprising a signal lamp disposed near one end of each of the arcuate channels, a switch located at each of the arcuate channels, each switch having an operating member extending into the arcuate channel for operation by a ball passing through the channel, each signal lamp being connected in circuit with a switch for lighting when a ball passes through an arcuate channel.

7. A planetary ball game as recited in claim 6, further comprising an electric bell mounted inside said dome at the top thereof, another switch in said other channel connected in circuit with the bell for energizing the bell to ring when a ball passes through said other channel, and further switches in the respective passages connected in circuit with the bell for deenergizing the bell to stop ringing when a ball passes through either one of the passages.

8. A planetary ball game as recited in claim 7, further comprising relays connected in circuit with the bell and signal lamps respectively, one relay serving to keep the bell ringing after a fired ball passes through said other channel, each of the remaining relays serving to keep a particular signal lamp lighted when a fired ball passes through an arcuate channel.

9. A planetary ball game as recited in claim 8, wherein said other switch is connected in circuit with said remaining relays to extinguish any signal lamp lighted by a previously fired ball which passed through one of the arcuate passages.

10. A planetary ball game as recited in claim 9, further comprising a manually operable ball discharging gun having a generally cylindrical barrel, a simulated trigger attached laterally to said barrel, a stand carried by said base disposed to receive said trigger for supporting the gun with the barrel disposed in an axially inclined position to receive a ball to be fired, and with the discharge end of the barrel engaged in said fitting.

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