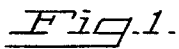


Filed Dec. 29, 1964

# PIN-BALL GAME APPARATUS

7 Sheets-Sheet 1



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3,383,111

PIN-BALL GAME APPARATUS

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7 Sheets-Sheet 2

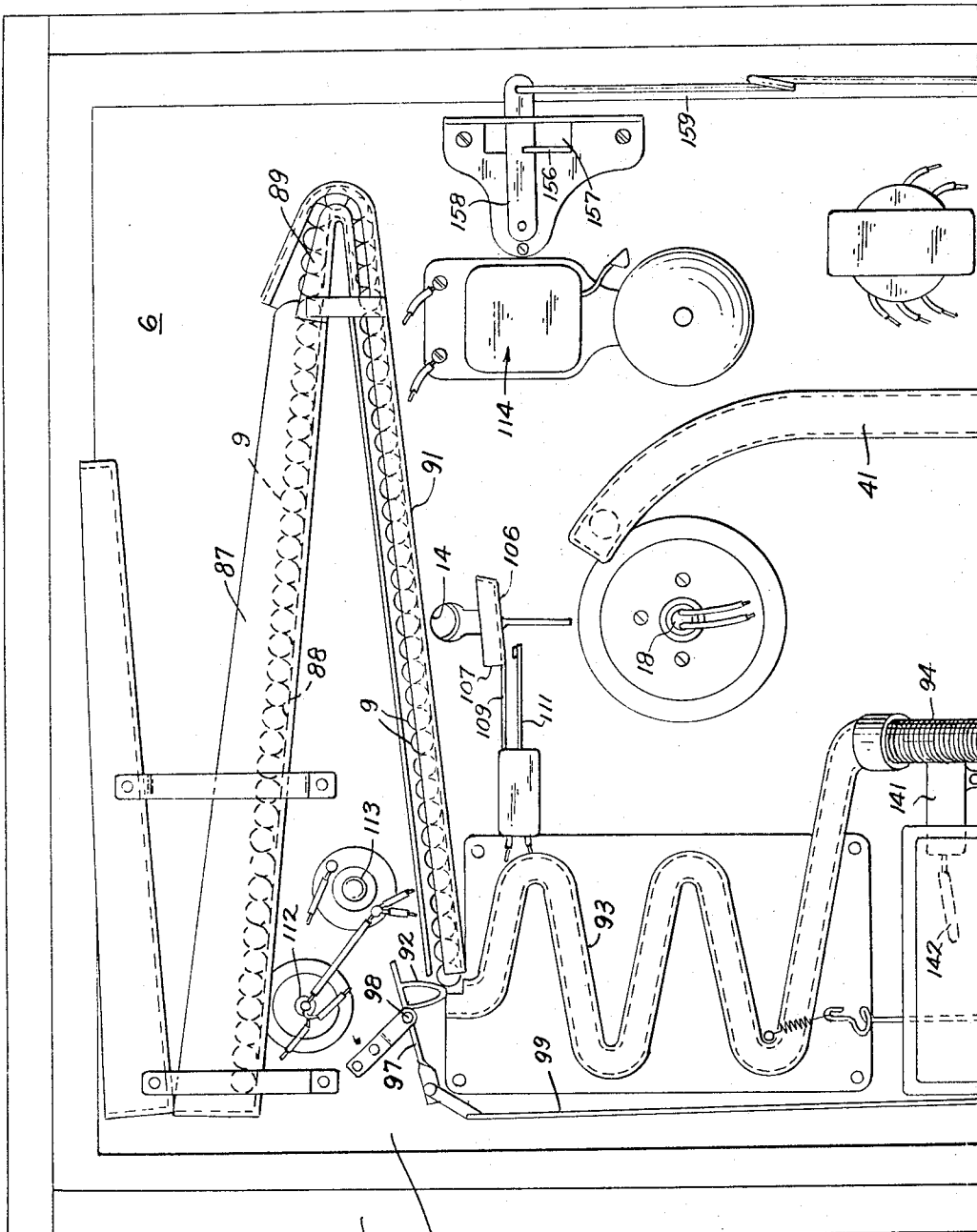


Fig. 2A

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7 Sheets-Sheet 3

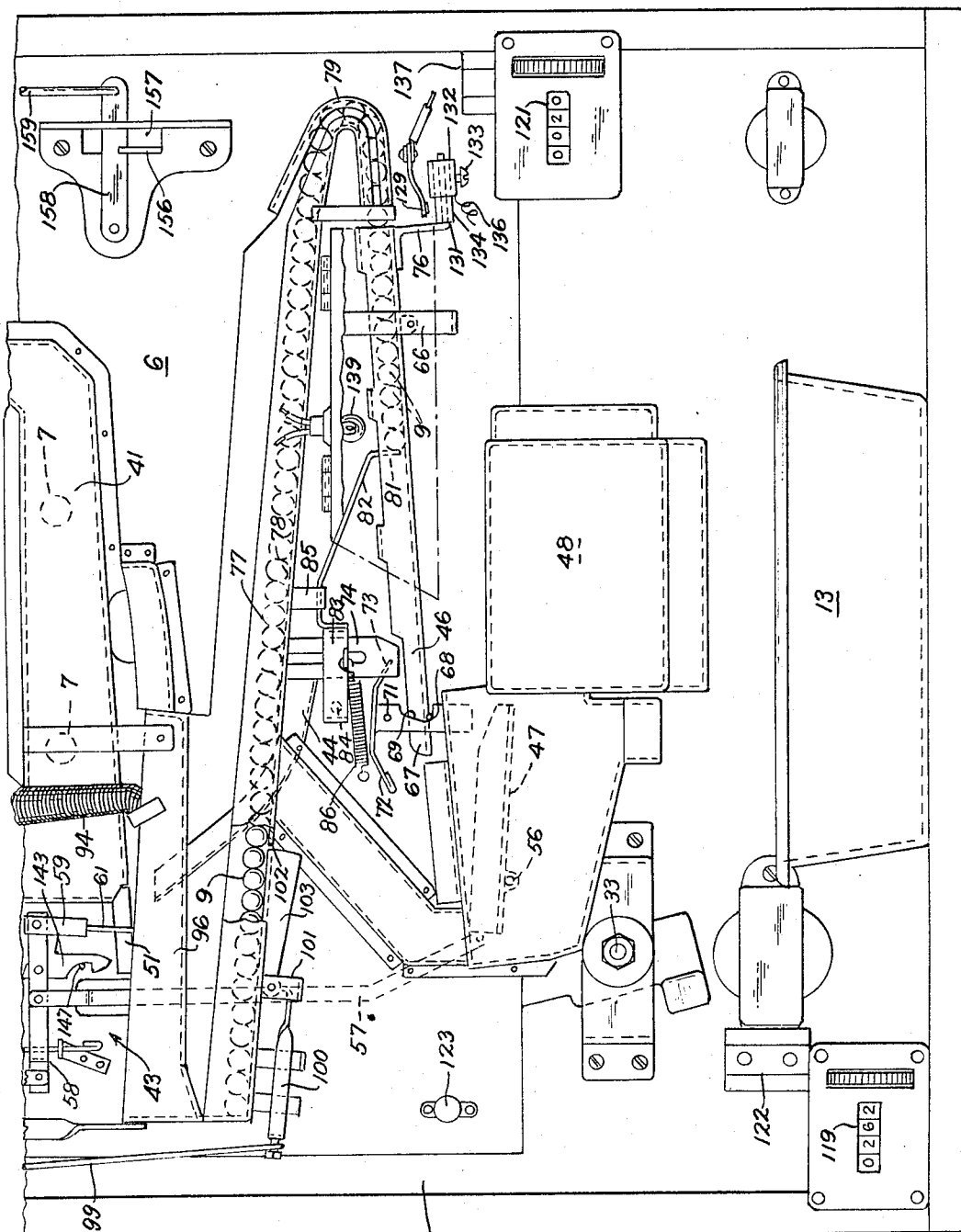


FIG. 2B

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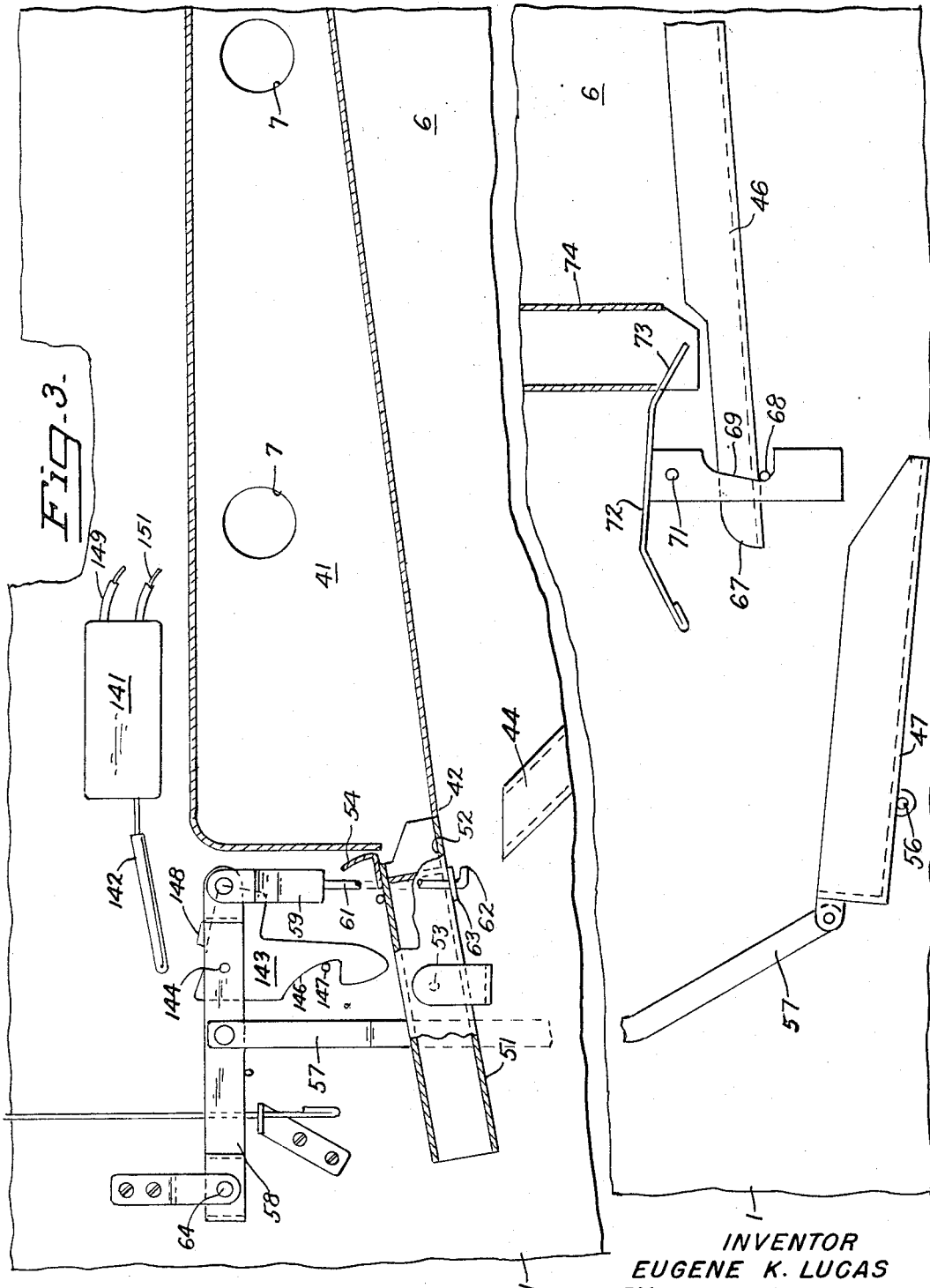
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PIN-BALL GAME APPARATUS

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Fig. 4.

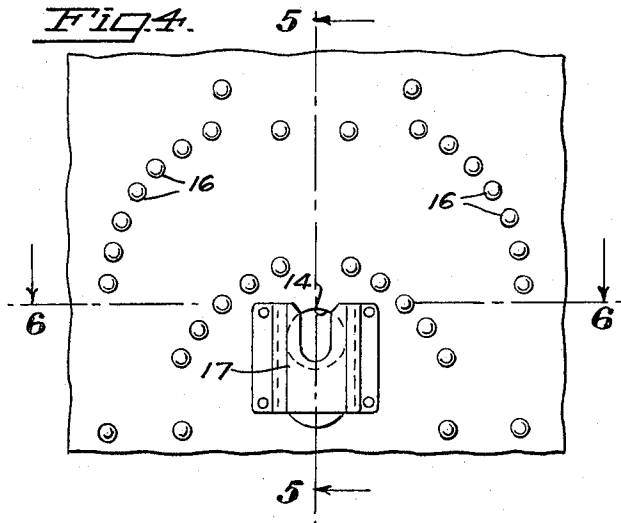
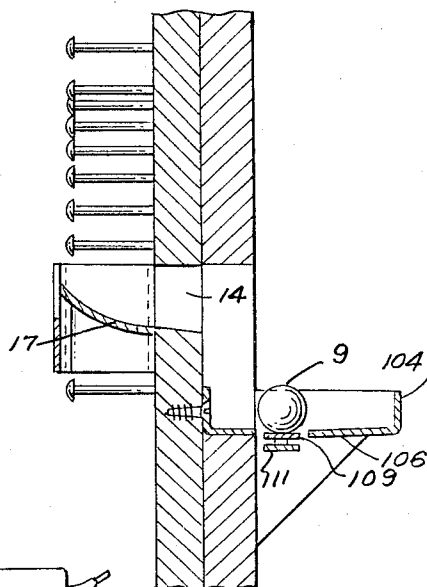


Fig. 5.

Fig. 6.

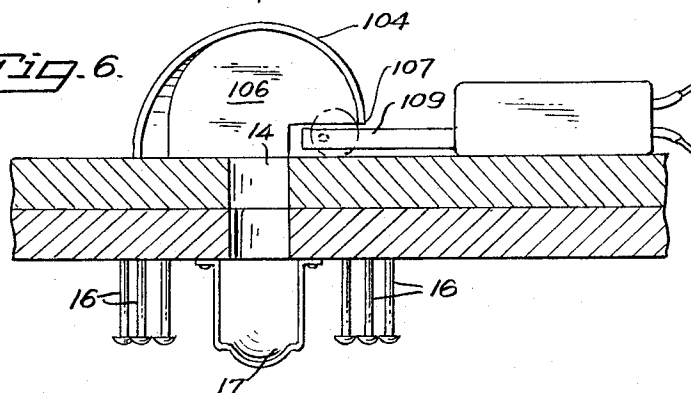
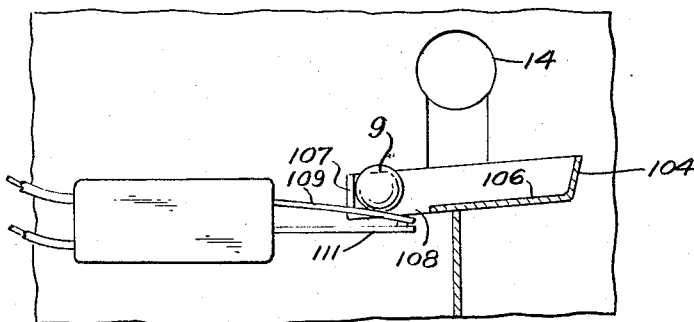


Fig. 7.



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Fig. 8.

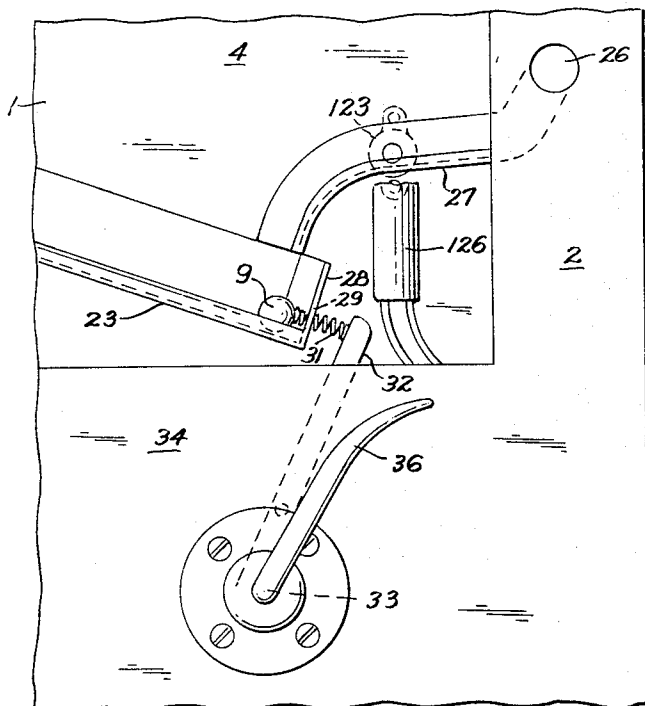


Fig. 10

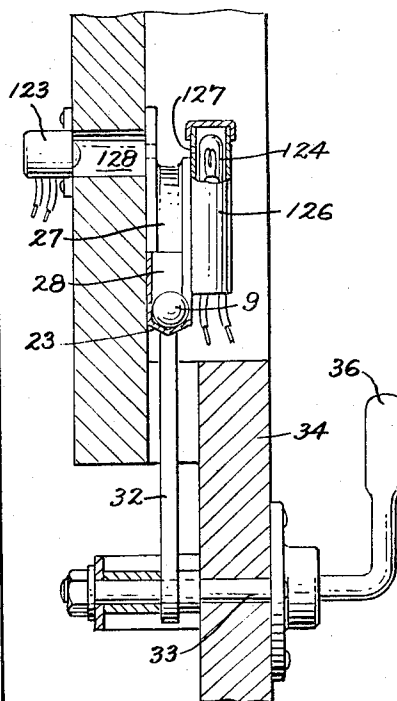


Fig. 9.

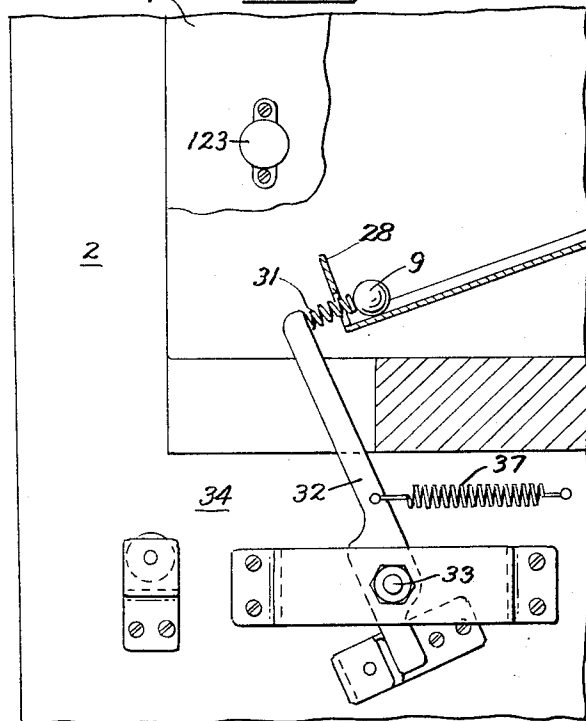
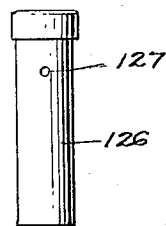


Fig. 11.

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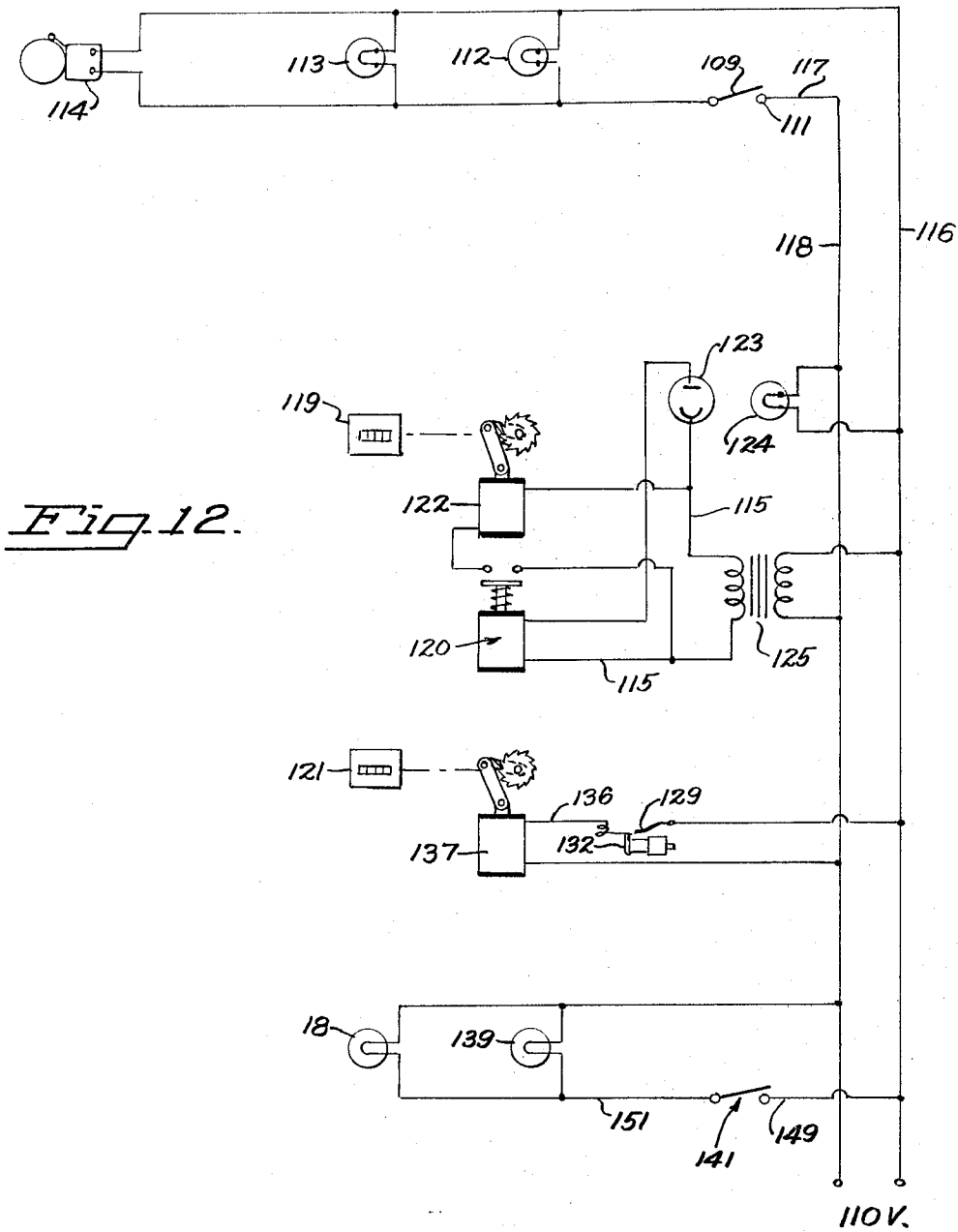
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PIN-BALL GAME APPARATUS

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Filed Dec. 29, 1964, Ser. No. 421,893  
13 Claims. (Cl. 273-121)

## ABSTRACT OF THE DISCLOSURE

A vertically mounted pin ball game apparatus in which the played ball is manually inserted into the apparatus and which includes a premium feature of delivering a plurality of playing balls along with the played ball to an exterior well accessible to the player.

A pin-ball game apparatus having a generally perpendicular playing board with a plurality of troughs projecting from the exposed face of the board and leading into openings through the board; one of said troughs leading to a discharge opening to return the played balls to a tray near the bottom of the rear face of the playing board; the other or playing troughs being connected to a common guide on the back of the playing board to guide the balls to a mechanism actuated by the weight of a ball for discharging a predetermined number of balls into a well accessible from the front of the apparatus; one of said troughs leading to a circuit breaker actuated by a ball so as to be held in circuit closing position by the ball for indication that that particular target or trough has been reached by a ball; all the troughs are protected by a plurality of abutment pins projecting out of the exposed face of the game board so that as a ball descends by gravity along the face of the board, it bounces from pin to pin; means being provided to propel the ball from the bottom to the top of the front face of the board manually.

Another feature of the invention is the provision in a pin-ball game apparatus, of a container near the top of the vertical game board to hold an initial reserve supply of comparatively heavy but small diameter balls, and another container spaced from the top and bottom of the game board and below such first container also to hold a number of balls; means being provided to discharge from the lower container a pre-determined amount of balls when actuated by a ball introduced through one of said troughs; and means being provided in said lower container to release balls from the upper ball container into the lower ball container whenever the lower ball container is emptied. The board is mounted in a wall and the playing face of the board is covered by a transparent panel; only the ball inserting propeller device and the well for the premium are accessible to the player, the operating mechanisms on the back of the playing board are accessible only to an attendant behind the wall.

I am aware that some changes may be made in the general arrangements and combinations of the several devices and parts, as well as in the details of the construction thereof without departing from the scope of the present invention as set forth in the following specification, and as defined in the following claims; hence I do not limit my invention to the exact arrangements and combinations of the said device and parts as described in the said specification, nor do I confine myself to the exact details of the construction of said parts as illustrated in the accompanying drawings.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, reference is had to the accompanying drawings for the illustrative embodiment of the invention, wherein:

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FIG. 1 is a front view of the pin-ball game apparatus.  
FIG. 2A is a rear view of the upper half of the back of the pin-ball game apparatus.

FIG. 2B is a rear view of the lower half of the back of the pin-ball game apparatus.

FIG. 3 is a fragmental rear view of the back of the pin-ball game apparatus showing certain of the operating mechanisms, partly in section.

FIG. 4 is a fragmental front view showing special arrangement of pins adjacent one of the ball receiving troughs.

FIG. 5 is a fragmental sectional view of the apparatus, the section being taken on lines 5-5 of FIG. 4.

FIG. 6 is a fragmental sectional view of the apparatus, the section being taken on lines 6-6 of FIG. 4.

FIG. 7 is a somewhat enlarged fragmental view, partly in section, showing a ball in circuit closing position for signals.

FIG. 8 is a front view of the ball propelling mechanism showing, partly in section, the ball guide and the path of the ball across an electric eye device.

FIG. 9 is a fragmental view of the back of the frame showing the ball propelling mechanism in rear view.

FIG. 10 is a fragmental sectional view of the apparatus showing the ball propelling mechanism and the ball guide relative to the photo sensitive cell.

FIG. 11 is a detailed view of the light and its casing for the photo electric actuation.

FIG. 12 is a wiring diagram for the electrical operation of the apparatus.

The apparatus herein includes a perpendicular game board 1 mounted in a frame 2 so as to be fixed in the wall 3, so that the game board is accessible to the public only from one side of the wall. Usually the inside of the wall is part of a room or compartment in which the back of the board is accessible to a serviceman or operator.

The pattern or outline of the game is on the exposed face 4 of the board 1. The operating mechanism is mounted on the back 6 of the board 1.

There are a plurality of holes 7 through the perpendicular game board 1. A receiving trough 8 under each hole 7 projects from the board face 4 so that when a ball 9 drops on a receiving trough 8 it will be guided to the hole 7 and then through said hole 7 to the back of the board 1.

A plurality of pins 11 project from the exposed face 4 of the game board 1 in a selected pattern so spaced as to shield the troughs and obstruct a descending ball 9.

The ball 9, guided to the top of the exposed face 4 of the board 1, is released there and as it descends it bounces from pin 11 to pin 11 irregularly. If the ball 9 does not drop in any of the receiving troughs 8, then it is discharged through a discharge hole 12 through the board 1 and it is dropped into a reserve container or tray 13 at the back of the board 1 below the level of the bottom hole 12.

A so-called "bonanza" or premium hole 14 is provided in the upper portion of the board 1. Pins 16 above and around this premium hole 14 are arranged closer together and in a more obstructive pattern than the pins 11 at the other holes 7 so as to provide more shielding of the approach to the receiving trough 17.

At about the center of the board there is a decorative light 18 which is illuminated in a manner to be hereinafter described.

Certain of the pins 11 are closer together and are arranged on an arc, which arcs converge toward spinner or rotating discs 19 journaled on shafts 21 projecting from the face 4 of the board 1.

The playing field on the face 4 of the board 1 is, in the present illustration, confined by a substantially circular guide flange 22, which, in the present illustration,

is interrupted at the top of the board 1. In the entrance side of the guide flange 22 is a spiral or tangential guide flange 23 on which the ball 9 is propelled upwardly to the entrance side of the circular guide flange 22 so that the ball 9 may be released somewhere about the top of the board face 4 according to the manipulation by the player. The ball 9 then descends along and between the pins 16 and 11 as heretofore described.

A substantially circular ball retaining flange 24 extends around the playing field generally parallel with and spaced from the circular guide flange 22 so as to confine the ball 9 within the playing field and guide the ball 9 which missed all the troughs 8 into the bottom hole 12. The retaining flange 24 is open at its top, namely the ends of this flange 24 are spaced apart at the top to permit the entry of the ball 9 down to the playing field over a considerably wide arc.

The ball 9 is a relatively small ball of sufficient weight to be propelled with suitable velocity along the guide flanges 22 and 23 and to descend with suitable speed along the face 4 of the board 1.

The ball 9 is inserted by the player through a hole 26 in the frame 2 above the bottom of the board 1. The ball 9 is guided along a chute 27 generally downwardly so as to be dropped on the lower end of the guide flange 23. A stop plate 28 on the lower end of the guide flange 23 positions the ball 9, as shown in FIG. 8. An aperture 29 in the stop plate 28 accommodates a plunger spring 31.

The plunger spring 31 is carried on a plunger arm 32, which latter is mounted on a rocking shaft 33 at its lower end. The rocking shaft 33 is suitably journaled in the lower cross-member 34 of the frame 2. The chute 27, stop plate 28 and the plunger arm 32 are on the face 4 of the playing board 1. The rocking shaft 33 extends through the cross frame member 34 and it has a handle 36 on it in front of the frame 2 as shown in FIG. 8. A coil spring 37 is anchored at one end to the inside of the frame member 34 and at its other end it is connected to the plunger arm 32 so as to normally pull the plunger arm 32 toward the stop plate 28. When the handle 36 is turned to the right, viewing FIG. 8, and then released, the stored energy of the spring 37 snaps the plunger arm 32 and the plunger spring 31 to the left, viewing FIG. 8, so that the plunger spring 31 strikes the ball 9 and propels it up the guide flanges 23 and 22.

On the left of the handle 36, viewing FIG. 1, is a well 38 for delivering a predetermined number of balls to the player when a playing ball 9 drops into one of the receiving troughs 8.

On the back of the perpendicular board 1, as shown in FIGS. 2A and 2B, are mounted electrical and mechanical devices to be actuated by a ball 9 entering through either one of the holes 7.

A common closed chute 41, mounted on the back of the board 1, is so shaped that it covers all the receiving holes 7 so that a ball 9, lodged in any of the receiving troughs 8, rolls through the adjacent hole 7 into the closed chute 41. The chute 41 is so inclined that the ball 9 rolls downwardly toward the bottom end 42 of the chute 41.

At the open bottom end 42 of the chute 41 is a transfer mechanism 43 which receives the ball 9 from the open bottom end 42 of the chute 41 and, in a manner to be hereinafter described, transfers the ball 9 into a second chute 44 directed downwardly from which the ball drops on a swingable chute 46.

This swingable chute 46 has, in the present illustration, ten balls stored in it, in a manner to be hereinafter described, which balls are released when the swingable chute 46 is swung downwardly by the action of a ball 9. Thereupon the ten stored balls fall into a second swingable chute 47, which latter guides the ten balls in a direction opposite and under the first swingable chute 46 so as to discharge the balls into a box 48 leading through a slot 49 into the well 38 for the player.

The transfer mechanism 43, as shown in more detail in FIG. 3, includes a tubular bar 51 which has a pocket 52 in one end thereof, and is pivoted on a pivot 53 substantially intermediate its ends. In the initially inclined position of the bar 51, as shown in FIG. 3, the pocket 52 is in registry with the bottom end 42 of the chute 41 as shown in FIG. 3. When the ball 9 rolls from the bottom end 42 into the pocket 52 the weight of the ball 9 swings the bar 51 around its pivot 53 downwardly so as to drop the ball 9 into the second chute 44. In this manner if the player plays too fast and if by any chance two balls 9 find receiving troughs 8 in quick succession, the second ball 9 cannot act until the bar 51 is returned to its initial position. The bar 51 has a gate 54 extended from the top of the pocket end so that when the pocket end of the bar 51 is lowered the gate 54 blocks the next ball 9 at the bottom end of the chute 41 and holds the ball 9 there ready for action after the bar 51 returned to its initial position.

The swinging of the bar 51 is coordinated with the downward swinging of the second swingable chute 47. The second swingable chute 47 is pivoted on a pivot 56 spaced from the upper end thereof. The upper end of the second swingable chute 47 is connected by a suitable link 57 to a horizontal lever 58. The end of the lever 58 above the pocket end of the bar 51 has pivoted thereto a perpendicular link 59 which terminates in a rod 61 with a bent end 62. The rod 61 extends through an apertured ear 63 extended from the bar 51. Thus, when the pocket end of the bar 51 is lowered by the weight of the ball 9, it pulls the rod 61 and turns the lever 58 about a fulcrum 64 at the other end of the lever 58. In this manner the links 57 and 59 are lowered simultaneously by the weight of the ball 9 in the pocket 52.

When the ten balls from the first swingable chute 46 are discharged into the second swingable chute 47, the discharge end of the latter is turned downwardly, viewing FIG. 2B, and thereby it raises the link 57 upwardly and thus pushes the lever 58 and the end link 59 also upwardly so that the bent end 62 of the rod 61 in engagement with the ear 63 raises the pocket end 52 of the bar 51 back to its initial ball-receiving position. In this manner, every time the ten balls are discharged from the machine through the second swingable chute 47, the transfer mechanism 43 is reset.

The first swingable chute 46 is pivotally supported on a bracket 66. The discharge end 67 of the first swingable chute 46 has a cross-pin 68 projecting beyond a side thereof and resting in a catch 69. The catch 69 is supported on a pivot 71 above the discharge end 67. A cross head 72 is secured on the top of the catch 69 above the pivot 71 so that a downwardly bent end 73 of the cross head 72 is in the path of the ball 9 descending in a guide 74 from the second chute 44. The ball 9 strikes the bent end 73 of the cross head 72 and tilts the cross head 72 so as to swing the catch 69 away from the cross pin 68, thereby freeing the first swingable chute 46. The first swingable chute 46 tilts downwardly and the ten balls stored in its intake end roll down and drop into the second swingable chute 47 to swing the latter downwardly and then to drop into the box 48 and out through the slot 49 into the well 38. After the ten balls 9 clear the discharge end 67 of the first swingable chute 46, the weight of the counterweight bracket 76 turns the first swingable chute 46 back to its initial position to be engaged by the catch 69 as heretofore described. In this initial position the first swingable chute is reloaded with ten balls 9 in a manner to be hereinafter described.

The reloading of the first swingable chute 46 is from a container 77 in which a number of balls are stored. The bottom 78 of the container 77 inclines downwardly and terminates in a guide tube 79 which curves so that the outlet end thereof is in registry with the intake end of the first swingable chute 46 as shown in FIG. 2B. The counterweight bracket 76 forms an obstruction when the first

swingable chute 46 is tilted. As the intake end of the chute 46 is raised, the adjacent portion of the counterweight bracket 76 blocks the outlet end of the guide tube 79. When the first swingable chute 46 is returned to its initial position, as shown in FIG. 2B, then the balls 9 from the container 78 and chute 79 roll into the first swingable chute 46 and reload the same.

The number of balls forming a predetermined load in the first swingable chute 46 is determined by a gate 81 on an arm 82 mounted on a lever 83. The lever 83 is supported on the back of the board 1 by a pivot 84. A coil spring 86, anchored on the board 1 and connected to the lever 83, normally urges the lever 83, the arm 82 and the gate 81 downwardly to hold the gate 81 in an initial ball-obstructing position in the first swingable chute 46 and against a stop 85, as shown in FIG. 2B. The distance between the intake end of the first swingable chute 46 and the position of the gate 81 determines the number of balls 9 loaded on the first swingable chute 46, which space, in the present illustration, accommodates ten balls 9.

The container 77 also can be reloaded with balls 9 from a reserve container 87 mounted on the back of the board 1 near the top thereof. This reserve container 87 also has an inclined bottom 88 which terminates in a guide 89 in extension of the bottom 88 and in a curved ball chute 91 leading back to under the reserve container 87, as shown in FIG. 2A. A gate 92 projects in front of the discharge end of the ball chute 91 to prevent the balls 9 from dropping out of the ball chute 91. A suitable multiple curved tube 93 extends from the outlet end of the ball chute 91 to above the container 77, and terminates in a flexible spout 94 leading into a hopper 96 which latter empties into the upper end of the inclined container 77.

The gate 92 is supported on one end of a bell crank lever 97 fulcrumed on a bracket 98 on the board 1. To the other end of the bell crank lever 97 is connected a link 99, which extends downwardly along the board 1, to the end of a lower bell crank lever 100, which latter is fulcrumed on a bracket 101 projecting from the bottom of the container 77. The bottom of the container 77 has a slit 102. The other end 103 of the lower bell crank lever 100 is formed into a follower slidable through said slit 102. The balls 9 in the container 77 normally push the follower 103 downwardly thereby raising the other end of the bell crank lever 100 and the link 99 upwardly thereby to hold the gate 92 in ball obstructing position at the discharge end of the ball chute 91. When the container 77 empties, the weight of the link 99 and the bell crank lever 100 turn the follower 103 upwardly so as to raise through the slit 102 into the container 77 and thereby turn the upper bell crank lever 97 to lift the gate 92 into an out of the way position. Thus the balls 9 from the ball chute 91 and from the reserve container 88 roll down into the curved tube 93 and through the spout 94 into the hopper 96 and then into the container 77. After there are sufficient balls in the container 77 to push the follower 103 down into the position shown in FIG. 2A, the gate 92 is again returned into its obstructing position.

The electrically actuated devices include signals and counters.

The receiving trough 17 is inclined so that the ball rolls through the premium hole 14 into a cup 104, the bottom 106 of which is inclined as shown in FIG. 7 so that the ball 9 rolls toward one side of the cup 104 and into a slot 107 and a bottom slot 108. The slots 107 and 108 are smaller than the ball 9 so that the ball 9 partly protrudes through said slots but cannot fall through. Under the bottom slot 108 is a movable contact finger 109 normally resiliently spaced from a lower contact finger 111. The weight of the ball 9 bends the contact finger 109 into contact with the other finger 111 to close a signal electric circuit, as shown in the wiring diagram in FIG. 12. When the contact fingers 109 and 111 are in contact, the circuits of a signal light 112 on the face of the board 1, and of another signal light 113 on the back of the board 1 are closed so that both the player and the

serviceman for the device know that a ball 9 was caught in the cup 104. An electric bell 114 is also connected with the lights 112 and 113 so as to be operated by the same contact fingers 109 and 111. As shown in the wiring diagram in FIG. 12, one terminal of each light 112, 113 and of the bell 114 is connected to one trunk line 116. The stationary contact finger 111 is connected by a line 117 to another trunk line 118. The movable contact finger 109 is connected to the other terminal of each, the light 112, the light 113 and the bell 114, so that the circuit is closed only when a ball 9 presses the upper contact finger 109 against the lower contact finger 111.

Whenever the signal lights 112 and 113 are lit, the operator or serviceman calculates the number of balls to be returned to the player. For instance, the number of balls returned to a player may be determined in accordance with the ratio of the number of balls inserted in the machine by players and the total number of balls ejected by the apparatus into the well 38. This is accomplished by a pair of suitable counters 119 and 121. These counters are of the usual construction and are operated by suitable relays. Operating relay 122 of counter 119 has its terminals connected to transformer lines 115. One of the connections to one of the transformer lines 115 is interrupted by the switch of the switch relay 120 when the latter is energized. One terminal of the switch relay 120 is connected to one of the transformer lines 115 and the other terminal thereof is connected to a light sensitive switch 123 kept closed by a light beam shining thereon. The other terminal of the light sensitive switch 123 is connected to the other transformer line 115. The transformer 125 is connected to trunk lines 116 and 117. A light 124 is mounted on the face of the board 1 in a shield 126, as shown in FIG. 1. The shield 126 has a pinhole 127, as shown in FIGS. 10 and 11, which is aligned with a hole 128 through the board 1. The light sensitive switch 123 is mounted on the back of the board 1 in registry with the small hole 128 so that it is subjected to the light beam shining through the pinhole 127 and the small hole 128, thus keeping the switch open. The relation of the light sensitive switch 123 to the path of the inserted ball is illustrated in FIGS. 8 and 10. The chute 27 is open at the top as shown in FIG. 10. The pinhole 127 is above a portion of the chute 27 so that when the ball 9 rolls over the chute 27 it interrupts the light beam momentarily and thereby momentarily opens the light sensitive switch 123, which in turn releases the switch relay 120 so as to close the circuit of the counter relay 122 and to turn the counter 119 once each time a ball interrupts the light. The counter 119 is the usual pawl and ratchet type which can be set back to zero position from time to time if desired. Thus the counter 119 counts and indicates the number of balls played by the player.

The other counter 121 is operated as shown in the wiring diagram FIG. 12 by a normally open circuit breaker formed by a fixed contact 129 mounted on the back of the board 1 adjacent the counterweight bracket 76. On a bent end 131 of the counterweight bracket 76 is an adjustable counterweight 132 held in place by a set screw 133, as shown in FIG. 2B. The counterweight 132 is on an insulator bushing 134 and it is connected by a line 136 to one of the terminals of counter relay 137 for the counter 121. The fixed contact 129 is connected to the trunk line 116 while the other terminal of the counter relay 137 is connected to another trunk line 118. Thus, whenever the swingable chute 46 is tilted for discharging the ten balls, the counterweight 132 is raised into contact with the fixed contact 129 to actuate the relay 137 thereby turning the counter 121 to indicate ten balls returned into the well 38 to the player. When the swingable chute 46 is returned to its initial position, as shown in FIG. 2B, the counterweight 132 is lowered and the circuit is broken. This is a comparatively quick operation and the counter 121 is adjusted in the usual manner to count ten every time the circuit is closed. In this manner the operator can quickly read on counter 119 the number of balls inserted in the

machine and on counter 121 the number of balls returned to the player.

Lights 139 light momentarily every time a ball 9 tilts the bar 51 indicating that ten balls will be returned into the well 38. This is accomplished by a normally resiliently opened switch 141. An arm 142 of the switch extends above the lever 58. As shown in FIG. 3A a switch actuator bell crank lever 143 is pivoted on a pivot 144 on the lever 58 near the end link 59 so that whenever the bar 51 is tilted by the ball 9 it moves the link 59 downward and thus moves the bell crank lever 143 also downward. One side of the bell crank lever 144 is formed into a cam 146 which rides on a fixed pin 147. The cam is so inclined as shown in FIG. 3, that as the lever 58 moves the bell crank lever 143 downwardly, the action of the cam 146 turns the bell crank lever 143 about the pivot 144 and thereby raises a switch actuator projection 148 against the switch arm 142 so as to move the latter into switch-closing position. When the lever 58 and the bar 51 are returned into the initial position shown in FIG. 3, the bell crank lever 143, by its own weight, follows the pin 147 and returns to its initial position permitting the switch 141 to return to its open position by its own resiliency. One terminal of switch 141 is connected by a line 149 to trunk line 116 as shown on the wiring diagram of FIG. 12. The other terminal of switch 141 is connected by a line 151 to the terminal of light 139. The other terminal of light 139 is connected to the other trunk line 118. In this manner, every time a ball 9 is caught in one of the receiving troughs 8 and tilts the bar 51, the lights 139 indicate to the player to expect ten balls in the well 38.

A viewing slot 150 in the game board 1 is in registry with the ten balls in the first swingable chute 46, so that the player can observe the balls from the front.

The front face 4 of the game board 1 is covered by a suitably transparent window pane 152 in a window frame 153. The frame 153 is mounted on hinges 154 on a side of the frame 2 in the wall 3. A pair of flat locking hooks 156 on the other edge of the window frame 153 shown in FIG. 2A and 2B extend through slots 157 of the frame 2 to the back side of the board 1 and are engaged by pivoted movable keepers 158, which latter can be moved into or out of engagement with the locking hooks 156 by a common operating bar 159 on the back of the board 1. Thus only the serviceman from inside of the wall 3 can release the window. But the well 38 is accessible to the player below the window as shown in FIG. 1.

The operation of the game apparatus herein described begins with the insertion of a ball 9 through the insert hole 26. The ball 9 travels along the chute or channel 27 and it interrupts the light beam from the light 124, and thereby through the light sensitive circuit control 123 operates the counter 119 and thus the number of played balls is indicated. The inserted ball comes to rest at the lower end of the guide flange 24 against the apertured stop plate 28. Then the player turns the handle 35 clockwise, viewing FIG. 8, to a desired angle and then abruptly releases the handle 35, whereupon the spring 37 snaps the lever 32 to its initial position and slams the spring plunger 31 against the ball 9. The ball 9 travels up the guide flange 23 and along the circular flange 22 according to the stroke of manipulation of the handle 36. Near the top of the circular flange 22 the ball 9 drops down the playing field on the face of the board 1 and bounces from pin to pin at random. If the ball 9 fails to reach any of the receiving troughs 8 or the receiving trough 17, it descends to the retaining flange 24 and rolls into and through the bottom hole 12 and drops into the reserve container 13.

If the ball 9 reaches any of the receiving troughs 8, it rolls through the adjacent hole 7 and into the common chute 41. Then the ball 9 rolls into the pocket 52 in the end of the bar 51 and tilts the bar 51 downwardly. The gate 54 on the end of the bar 51 prevents the dropping of another ball 9 from the chute 41 until the bar

51 is reset. As the bar 51 is so tilted the bell crank 143 is swung by its cam 146 on the cam pin 147 so as to abut the arm 142 and to close the switch 141 thereby to turn on the light 139 to indicate a successful play.

The downward tilting of the pocket end of the bar 51 drops the ball 9 into the guide 74. As the ball descends into the guide 74 it strikes the bent end 73 of the cross-head 72 and swings the catch 69 away from the cross-pin 68 and releases the first swingable chute 46. When so released the first swingable chute 46 swings away from the gate 81 and the stored ten balls 9 roll off the discharge end 67. The bracket 76 blocks the feeding guide tube 79 in the tilted position of the first swingable chute 46.

The upward swinging of the bracket 76 about the pivot 64 contacts the counterweight 132 with the fixed contact 129 and operates the counter 121 to indicate another ten balls returned to the player.

The balls 9 roll from the discharge end 67 of the first swingable chute 46 into the second swingable chute 47 and turn the latter so as to raise the link 57 and the lever 58 and link 59 thereby to reset the bar 51 in its initial position ready for the next playing ball 9.

The balls 9 of the stored series roll off the second swingable chute 47 into the box 48 and then through the slot 49 into the well 38 to be used by the player.

The counterweight 132 returns the first swingable chute 46 to its initial position uncovering the end of the guide 79, thereby freeing another series of ten balls to roll into the first swingable chute 46. The stored balls 9 roll against the gate 81, which is so spaced in this illustration, as to accommodate ten balls in each load.

When a playing ball 9 finds the receiving trough 17, it rolls through the hole 14 into the cup 106, as shown in FIG. 7, and closes the contact fingers 109 and 111 and thereby operates the signal lights 112 and 113 and rings the bell 114, whereupon a service operator in the back of the apparatus reads the counters 119 and 121 and calculates the number of balls to which the player is entitled.

The series of balls are fed from a container 77. Whenever the container 77 empties the released crank arm 103 rises through the slot 102 and the link 99 lowers to turn the lever 97 and raise the upper gate 92 from the ball chute 91, thereby allowing balls 9 to roll down from the upper reserve container 88, guide 89 and chute 91 into the tube 93 and then through the spout 94 into the hopper 96 and into the lower container 77. The weight of balls 9 in the container 77 depresses the crank arm 103 and resets the upper gate 92 in ball obstructing position.

The wall 3 is the wall of a compartment for the serviceman and the players have no access to this compartment. One or more perpendicular game apparatus, as herein described, is framed in said wall 3. Each game board 1 is covered by its window 152, so that the player has access only to the manipulating handle 36 and the well 38. The window can be opened by the serviceman from back of the wall 3. Thus, an operator or serviceman can readily observe and handle a number of pin-ball game apparatus as herein described.

I claim:

1. In a pin-ball game apparatus

- (a) a perpendicular game board having a face and a back,
- (b) a plurality of playing balls,
- (c) a plurality of holes through the game board larger than said balls,
- (d) a receiving trough under each hole to receive a ball and guide the ball to the adjacent hole,
- (e) a plurality of pins projecting from the face of said board arranged in a pattern to partially shield the respective receiving troughs from a ball descending on the face of said board, certain of said pins being so spaced as to permit the change passage of a ball

therebetween, said ball being smaller than said spacing between said certain of said pins so that said ball released near the top of said board bounces from pin to pin and by chance can reach one of said receiving troughs,

(f) manipulating means to propel a ball upwardly along the face of said board, including a ball feed open to the player's side of the game board for the insertion of a playing ball by the player and feeding said ball to said manipulating means,

(g) first means to guide the propelled ball so that said ball spins toward the top of the face of said board,

(h) a well in front of said board accessible to the player,

(i) a ball actuated mechanism to discharge a predetermined number of playing balls from the back of said board into said well accessible from the player's side of said game,

(j) second guide means on the back of said board to guide the ball from the respective holes to said ball actuated mechanism,

(k) the improvement of an electrical indicating system including an indicator light visible from the face of the board,

(l) a first switch actuated by said ball actuated mechanism to close an electric circuit to said light every time said mechanism is actuated by a ball,

(m) a ball holder on the back of one of said holes, (n) said switch being a normally open resilient switch at said holder closed by a ball in the holder,

(o) signal devices actuated by the closing of said switch to indicate the presence of a ball in said holder.

2. The invention as defined in claim 1 and

(p) an electrically actuated counter,

(q) a normally open electric circuit closing means for the counter,

(r) a light sensitive switch to close said circuit closing means,

(s) said board having a passage for the insertion of a ball for playing the game,

(t) ball feeding means to guide said inserted playing ball to said ball manipulating means,

(u) a pin light beam directed across the path of said playing ball on said ball feeding means whereby said light sensitive switch is actuated every time a ball is inserted to operate said counter,

(v) a second counter,

(w) an electrical actuator means for the second counter,

(x) a second switch actuated by said ball actuated mechanism to close said electric means and operate said second counter every time the predetermined amount of balls is discharged into said accessible well.

3. The invention defined in claim 1, and said ball actuated mechanism to discharge a predetermined number of balls from the back of said board into said accessible well including

(p) a swingable chute pivotally mounted on the back of the board,

(q) ball feeding means to guide a series of playing balls into an end of said chute,

(r) a ball actuated releasable catch device to hold said swingable chute in an initial position,

(s) means to direct a played ball from said holes to said releasable catch device so as to release said swingable chute for tilting so as to discharge the balls from said chute,

(t) discharge guide means to guide the discharged balls from said tilted swingable chute to said accessible well,

(u) means to return said swingable chute after each discharge to its initial position for reloading.

4. The invention defined in claim 3, and said means to return said swingable chute including

(v) a counterweight bracket on said end of said swingable chute blocking said series of balls in said ball feeding guide means when said swingable chute is tilted and unblocking said ball feeding guide means in the initial position of said swingable chute,

(w) a counterweight on said bracket,

(x) an electrically actuated counter on the back of said board,

(y) a normally open circuit breaker for said counter actuated by said counterweight to operate said counter every time said swingable chute is tilted.

5. The invention defined in claim 3, and said means to return said swingable chute including

(v) a counterweight bracket on said end of said swingable chute blocking said series of balls in said ball feeding guide means when said swingable chute is tilted and unblocking said ball feeding guide means in the initial position of said swingable chute,

(w) a counterweight on said bracket,

(x) an electrically actuated counter on the back of said board,

(y) a normally open circuit breaker for said counter actuated by said counterweight to operate said counter every time said swingable chute is tilted.

(z) a second electrically actuated counter,

(aa) said board having a passage for insertion of a playing ball to said manipulating means,

(bb) a light sensitive switch to control said second counter,

(cc) and a light source at said passage actuated by the playing ball moving through said passage to operate said light sensitive switch for actuating said second counter.

6. The invention defined in claim 1, said means on the back of the board to guide a ball from the respective holes to said ball actuated mechanism including

(p) a guide chute leading from said holes,

(q) a tiltable transfer member pivoted on the back of said board and registering with said guide chute to receive a ball therefrom in an initial position,

(r) a blocking member on said transfer member to block said guide chute to prevent dropping of a ball therefrom when said transfer member is tilted,

(s) said transfer member having a pocket in its end adjacent said guide chute and being tiltable by the weight of a ball received from said chute in said pocket thereby to transfer said ball to said ball actuated discharge mechanism,

(t) an arm on said first switch normally urged into circuit breaking position,

(u) means connected to said tiltable transfer member to engage said arm for closing said switch every time said transfer member is tilted by a ball,

7. The invention defined in claim 6, and

(v) means on the back of the board actuated by the balls discharged from said ball actuated discharge mechanism to reset said tiltable transfer member to its initial ball receiving position.

8. The invention defined in claim 1, and said ball actuated mechanism to discharge a predetermined number of balls from the back of said board into said accessible well including

(p) a swingable chute pivotally mounted on the back of the board,

(q) means to feed a series of balls into an end of said swingable chute,

(r) a ball actuated releasable catch device to hold said swingable chute in an initial position in registry with said second guiding means,

(s) said second guiding means guiding a played ball from said holes to said releasable catch device so as to release said swingable chute for tilting and discharging the balls from said swingable chute,

(t) means to block the balls from said ball feed means whenever said swingable chute is tilted,

- (u) a gate held on the back of the board and projecting into said chute spaced from said end of said swingable chute at a distance corresponding to the space occupied by said series of predetermined number of balls, said swingable chute swinging away from said gate when tilted at such distance that said balls roll under and past said gate. 5
9. The invention defined in claim 3, and
- (v) an inclined container on the back of said board containing balls so as to roll them to said ball feeding means, 10
- (w) a reserve ball container spaced above and connected to said inclined container for supplying balls into said inclined container,
- (x) a gate mechanism normally blocking the connection from said reserve ball container, 15
- (y) means actuated by the weight of the balls in said inclined container to hold said gate mechanism in blocking position,
- (z) means normally to urge said gate mechanism into unblocking attitude when said inclined container is empty and when said weight actuated mechanism is free of weight of balls. 20
10. In a pin-ball game apparatus
- (a) a perpendicular game board having a face and a back, 25
- (b) a plurality of playing balls,
- (c) a plurality of holes through the game board larger than said balls,
- (d) a receiving trough under each hole to receive a ball and guide the ball to the adjacent hole, 30
- (e) a plurality of pins projecting from the face of said board arranged in a pattern to partially shield the respective receiving troughs from a ball descending on the face of said board, certain of said pins being so spaced as to permit the chance passage of a ball therebetween, said ball being smaller than said spacing between said certain of said pins so that said ball released near the top of said board bounces from pin to pin and by chance can reach one of said receiving troughs, 35
- (f) manipulating means to propel a ball upwardly along the face of said board, including a ball feed open to the player's side of the game board for the insertion of a playing ball by the player and feeding said ball to said manipulating means, 45
- (g) means to guide the propelled ball so that said ball spins toward the top of the face of said board,
- (h) a well in front of said board accessible to the player, 50
- (i) a ball actuated mechanism to discharge a predetermined number of playing balls from the back of said board into said well accessible from the player's side of said game,
- (j) means on the back of said board to guide the ball from the respective holes to said ball actuated mechanism, 55
- (k) an electric signal system on said board,
- (l) a receptacle on the back of said board behind and under one of said holes to receive a ball from said hole, 60
- (m) a normally open resilient switch at said receptacle for controlling said signal system,
- (n) a ball pocket in said receptacle at said switch to hold said ball in said receptacle in engagement with said switch for closing said switch for actuating said signal system, 65
- (o) means for conducting a ball from the exterior of said game apparatus to said manipulating means.
11. In a pin-ball game apparatus 70
- (a) a perpendicular game board having a face and a back,
- (b) a plurality of playing balls,
- (c) a plurality of holes through the game board larger than said balls, 75

- (d) a receiving trough under each hole to receive a ball and guide the ball to the adjacent hole,
- (e) a plurality of pins projecting from the face of said board arranged in a pattern to partially shield the respective receiving troughs from a ball descending on the face of said board, certain of said pins being so spaced as to permit the chance passage of a ball therebetween, said ball being smaller than said spacing between said certain of said pins so that said ball released near the top of said board bounces from pin to pin and by chance can reach one of said receiving troughs,
- (f) manipulating means to propel a ball upwardly along the face of said board, including a ball feed open to the player's side of the game board for the insertion of a playing ball by the player and feeding said ball to said manipulating means,
- (g) playing guide means to guide the propelled ball so that said ball spins toward the top of the face of said board,
- (h) a well in front of said board accessible to the player,
- (i) a ball actuated mechanism to discharge a predetermined number of playing balls from the back of said board into said well accessible from the player's side of said game,
- (j) means on the back of said board to guide the ball from the respective holes to said ball actuated mechanism,
- (k) said manipulating means including an insert hole for a playing ball at one side of said board,
- (l) a guide channel to convey an inserted ball to the lower end of said playing guide means,
- (m) means to hold said inserted ball at said lower end,
- (n) a spring held lever fulcrumed on said board biased toward said inserted ball,
- (o) a spring plunger on said lever bearing against said inserted ball at the lower end of said guide means,
- (p) and a manipulating handle connected to said lever for cocking said spring held lever and snapping the lever and said spring plunger so as to strike the inserted ball and propel it up said guide means.
12. The invention defined in claim 11, and
- (q) a transparent element covering the face of said board,
- (r) means to cover said manipulating means so that only said handle is accessible to the player,
- (s) a shielded light in front of said board at said guide channel issuing a narrow light beam across said channel so as to be interrupted by each inserted ball rolling on said guide channel,
- (t) a light sensitive circuit control device on the back of the board and a hole through said board aligned with said light beam,
- (u) and an electrically actuated counter at the back of the board, controlled by said light sensitive circuit control to count the inserted balls.
13. In a pin-ball game apparatus adapted to be vertically mounted in a wall having an opening, 60
- (a) a frame in the wall opening,
- (b) a perpendicular game board mounted in said frame, having a face and a back,
- (c) playing balls,
- (d) said board having holes therethrough larger than said balls,
- (e) an element at each hole to guide a ball dropping on said element into the adjacent hole,
- (f) manipulatable means on the face of the board for striking a ball and propelling it upwardly along the face of said board,
- (g) a guide member on the perpendicular face of the board to guide the propelled ball upwardly along said face and to free the propelled ball in the upper por-

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- tion of said face thereby to permit descent of said ball along said face,
- (h) a plurality of projecting pins from said face of the board and being arranged in a pattern to form a perpendicular playing field on said face and hinder the ball from reaching said projecting elements, 5
- (i) a handle for said manipulatable means accessible from the playing side of the board,
- (j) a well near the bottom of said board accessible by the player from the face of said board, 10
- (k) means on the back of the board to collect and return a played ball and controllable by a played ball to deliver playing balls to said well,
- (l) means observable from both sides of said board and actuated by the playing ball introduced through one of said holes to indicate the introduction of said ball through the respective hole, 15
- (m) a transparent window covering said face of said board,

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- (n) lock means operable from the back of the board behind said wall releasably to lock said window,
- (o) means for conducting a ball from the exterior of said game apparatus to said manipulatable means.

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