

Nov. 24, 1953

L. A. DURANT

2,660,435

BALL DELIVERY DEVICE FOR BALL GAME APPARATUS

Filed July 16, 1951

2 Sheets-Sheet 1

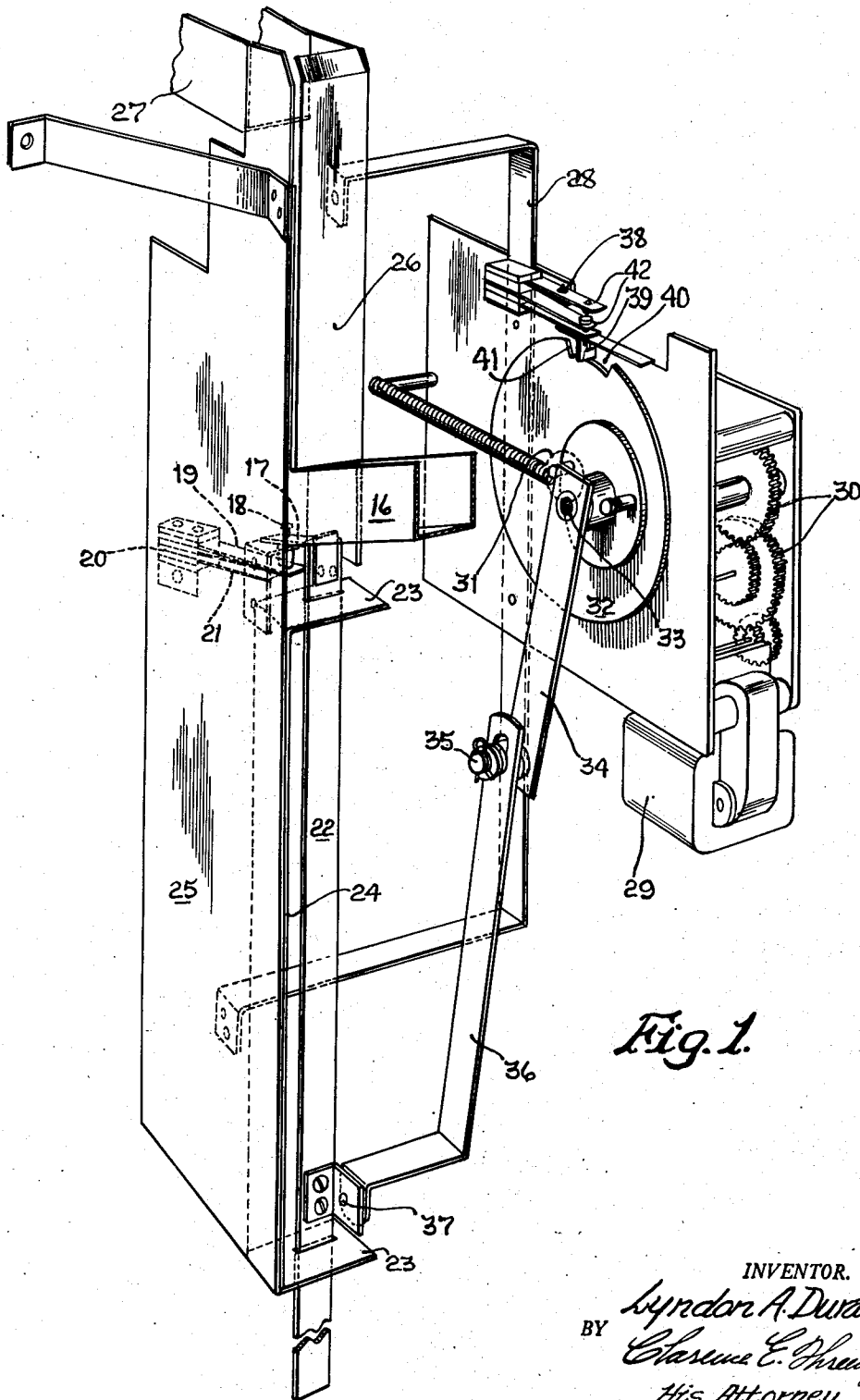


Fig. 1.

INVENTOR.
Lyndon A. Durant
BY *Charles E. Shredy*
His Attorney.

Nov. 24, 1953

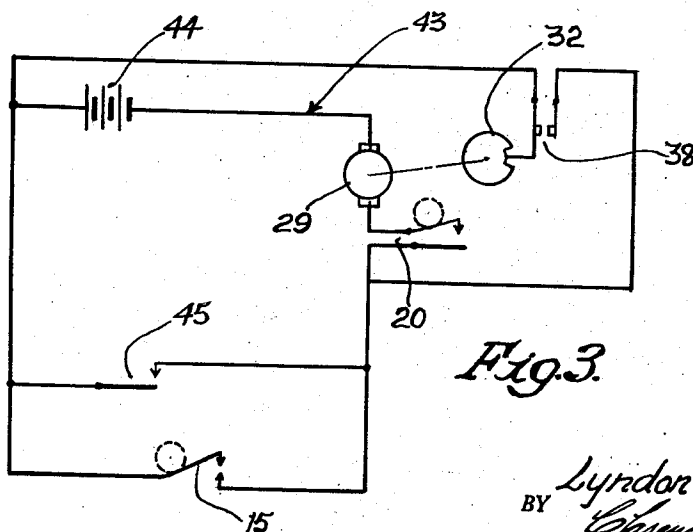
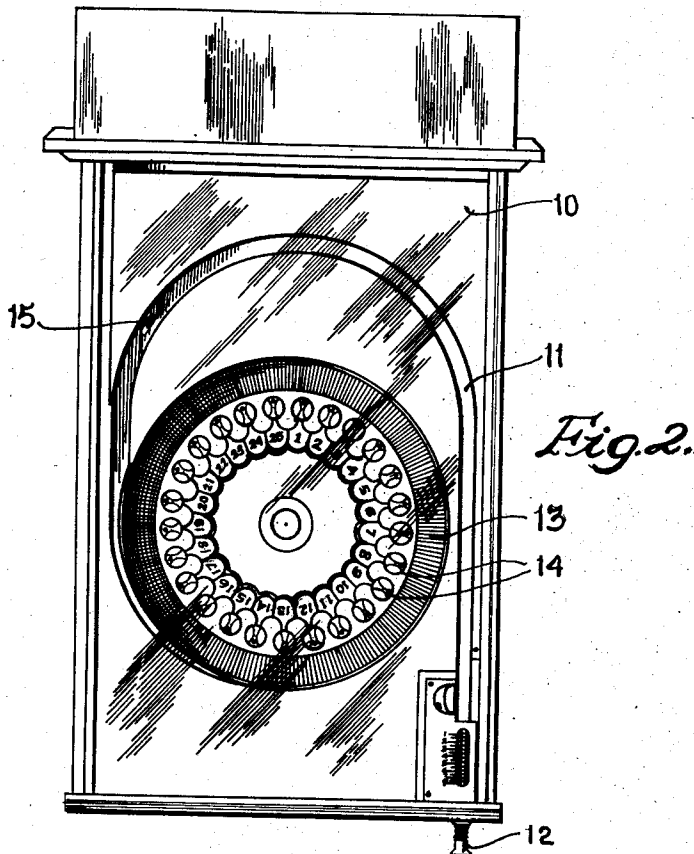
L. A. DURANT

2,660,435

BALL DELIVERY DEVICE FOR BALL GAME APPARATUS

Filed July 16, 1951

2 Sheets-Sheet 2



INVENTOR.

BY *Lyndon R. Durant*
Charles E. Shady
His Attorney.

UNITED STATES PATENT OFFICE

2,660,435

BALL DELIVERY DEVICE FOR BALL GAME APPARATUS

Lyndon A. Durant, Chicago, Ill., assignor to General Patent Corporation, Chicago, Ill., a corporation of Illinois

Application July 16, 1951, Serial No. 236,956

2 Claims. (Cl. 273—121)

1

This invention relates to a ball delivery device for ball game apparatuses, and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

A principal object of the invention is to provide a ball elevating device actuated by an electric motor which is arranged in a circuit such as will permit the elevator to be actuated by a pair of ball-actuated switches arranged in said circuit and in series, or by one of said ball-actuated switches and a coin-actuated switch in series with said one ball-actuated switch.

Another object of the invention is to provide in an amusement game apparatus a ball elevator which is automatically operable for delivering a ball to a channel through which the ball is projected.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of a ball elevator embodied in the invention;

Fig. 2 is a top plan view of an amusement game apparatus with which my invention is associated;

Fig. 3 is a schematic diagram of a proposed circuit for actuating the ball elevator.

The several objects of my invention are accomplished by the preferred form of construction shown in the accompanying drawings.

In this connection, 10 indicates a playboard usually supported within a game apparatus cabinet at an inclination with respect to the horizontal. This playboard 10 in the present instance is provided with a channel 11 through which a ball is adapted to be projected by a conventional projector 12. The channel 11 in the present instance terminates into a bowl 13 into which the ball from the channel passes for movement along the concave side walls of the bowl until the speed of the ball is spent, at which time the ball comes to rest in one of the several openings 14, where it is maintained until release by certain mechanism for return to the channel 11. In the channel 11, preferably adjacent the outlet end thereof is located a conventional ball roll-over switch 15 arranged in an electric circuit hereinafter referred to in greater detail.

The ball elevator is illustrated in Fig. 1 and comprises a return trough 16 through which balls are delivered to a ball seat 17. This ball seat 17

2

includes a pin 18 resting upon the top leaf 19 of a switch 20. The weight of the ball on the pin 18 flexes the leaf 19 so as to contact a cooperating leaf 21. The ball seat 17 is formed at the upper end portion of a lift rod 22 slidably arranged through slots formed in lateral extensions 23 of a bracket 24 secured to a mounting plate 25. The ball seat 17 is adapted to move through a channel-shaped member 26 to position the ball at the upper end of such channel for gravitation therefrom into a delivery trough 27 from whence the ball passes through a delivery opening into the channel 11.

A mounting bracket 28 is secured to the mounting plate 25 and the channel-shaped extension 26. This bracket 28 supports an electric motor 29 which through a train of gears 30 actuates a shaft 31. On this shaft 31 is a cam disc 32. Eccentrically connected as at 33 to the cam disc 32 is a link 34 in turn pivotally connected as at 35 to a link 36. This link 36 is pivotally connected as at 37 to the lift rod 22.

The arrangement is such that as the disc 32 is rotated in a clockwise direction as viewed in Fig. 1 the lift rod 22 will be elevated into the channel-shaped extension 26 to elevate a ball deposited on the seat 17 to a position where it will gravitate into the delivery trough 27 for movement through the delivery opening and thence into the channel 11.

A switch 38 has an extension 39 which normally rides in a cut-out portion 40 formed in the disc 32. When the disc 32 is rotated in the direction aforesaid, the tapered edge 41 engages the extension 39, and elevates the same so as to contact the spring leaves 42 of the switch 38.

This switch 38 is arranged in the circuit 43 for the motor 29. In this circuit 43, in addition to the switch 38, is a power source 44. The ball elevator switch 20 in this circuit 43 is connected in series with the ball switch 15. In addition, there is connected in this circuit in series with the switch 20 but parallel with the switch 15 a coin-actuated switch 45.

The arrangement is such that the motor 29 may be energized by the power source 44 by the closing of switches 45 and 20, or by the closing of switches 15 and 20.

By this arrangement, each time a ball is projected through the channel and each time a ball is deposited on the ball seat 17, the switches 15 and 20 will be closed to energize the motor and effect elevation of a ball to the delivery trough, 27. The initial operation of the motor by the closing of the switches 15 and 20 moves the cam

32 a sufficient distance to close the switch 38, which remains closed until the motor has made one complete cycle of revolution necessary to bring the ball lift rod 22 from its lowermost to its uppermost position and return again to its lowermost position.

By such arrangement the delivery of the balls is automatic during the playing of the game. To start the delivery of a ball to the channel 11, the coin switch 45 is operated in conjunction with the ball-actuated switch 20 but thereafter during the playing of the game, balls are delivered to the channel 11 by energization of the motor 29 by the closing of the ball-actuated switches 15 and 20.

In conventional amusement game apparatuses in which balls are used in the playing of the game, there is usually provided a hand-operated mechanism for effecting the elevation of the balls to the delivery opening for projection to the channels; during the playing of the game it is necessary that the player's attention be focused alternately on the playing of the game and the hand-operated ball elevator mechanism. By my construction, however, the ball is delivered automatically to the channel during the playing of the game, thereby enabling the player to focus his entire attention upon the playing of the game.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. The combination with a game board having a ball channel formed therein and a delivery opening for delivering a ball to the channel for projection through the latter, of means for delivering a ball to said channel through said delivery opening, means for directing balls to said ball delivering means, means including an electric motor for actuating said ball delivering means; a starting circuit for said motor, a power source in said circuit, a pair of ball-actuated switches connected in series in said circuit, one

of said switches located in said channel and engageable with a ball projected therethrough, and the other of said switches located in the path of a ball delivered to said ball delivering means, a holding circuit for said motor, a switch in said holding circuit in series with said other ball-actuated switch and actuated by said motor for maintaining energization of said holding circuit during one cycle of rotation of said motor, and a coin-actuated switch in said starting circuit and connected in parallel with said one of said ball-actuated switches and in series with the said other of said ball-actuated switches.

2. The combination with a game board having a ball channel formed therein and means for projecting a ball through the channel, of means for delivering a ball to said projecting means for projection through said channel, means including an electric motor for actuating said ball delivering means, a starting circuit for said motor, a power source in said starting circuit, a pair of ball-actuated switches connected in series in said starting circuit, one of said switches located in said channel for engagement with a ball projected therethrough and the other of said switches located in the path of a ball delivered by said ball delivering means to said projecting means, a coin-actuated switch in said starting circuit and connected in parallel with said one of said ball-actuated switches and in series with said other of said ball-actuated switches, a holding circuit for said motor, a cam-actuated switch in said holding circuit and actuated by said motor for maintaining energization of said holding circuit by said power source after said motor has been initially energized by the closing of said ball-actuated switches or by the closing of said coin-actuated switch and said other of said ball-actuated switches.

LYNDON A. DURANT.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,068,131	Holland	July 22, 1913
2,019,607	Hedenskoog	Nov. 5, 1935
2,068,178	Hooker	Jan. 19, 1937
2,127,267	Kramer	Aug. 16, 1938
2,177,725	Koci	Oct. 31, 1939
2,197,491	Bellah	Apr. 16, 1940