Nov. 10, 1953 G. R. BENAK 2,658,755

SHIFTABLE BALL ROLLING BOARD AND CONTROL THEREFOR

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Fig. 1

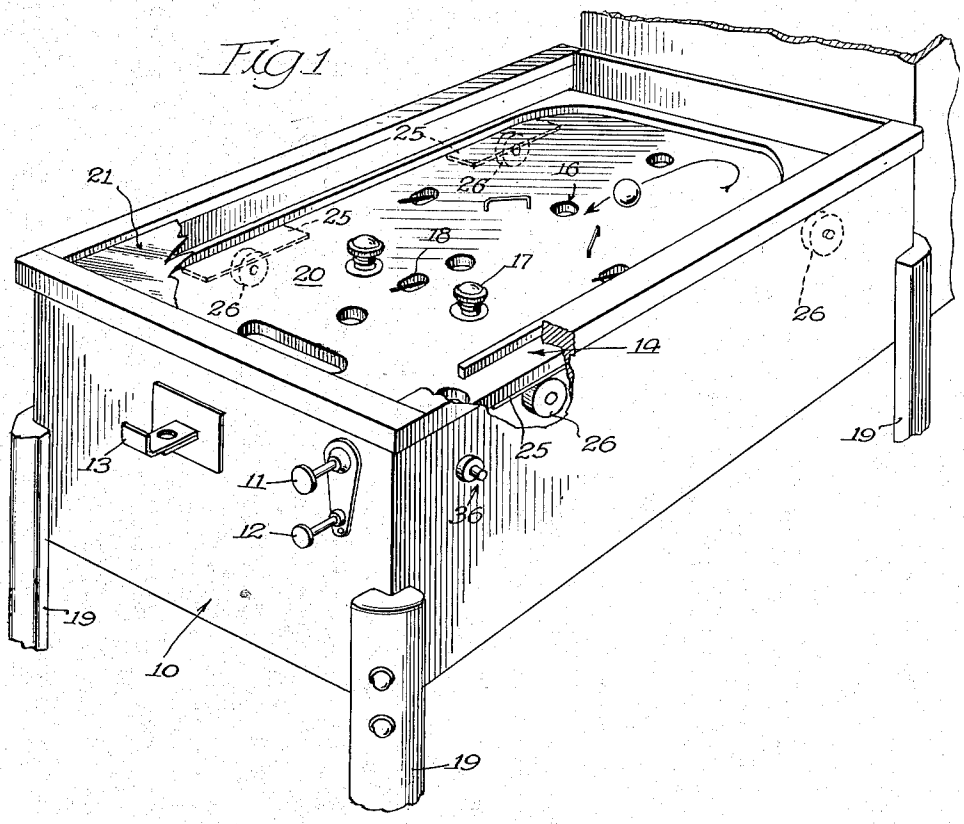


Fig. 2.

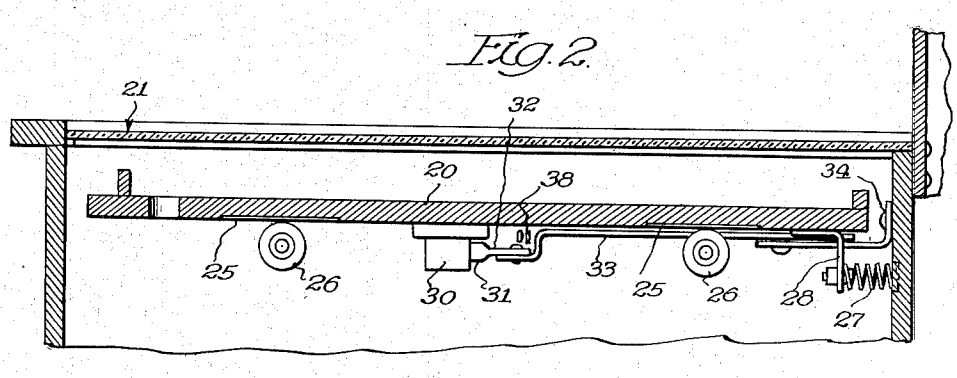
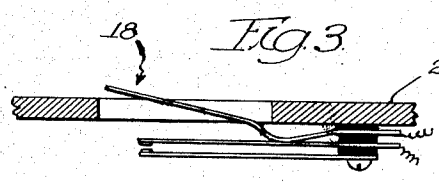


Fig. 3



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Fig 4

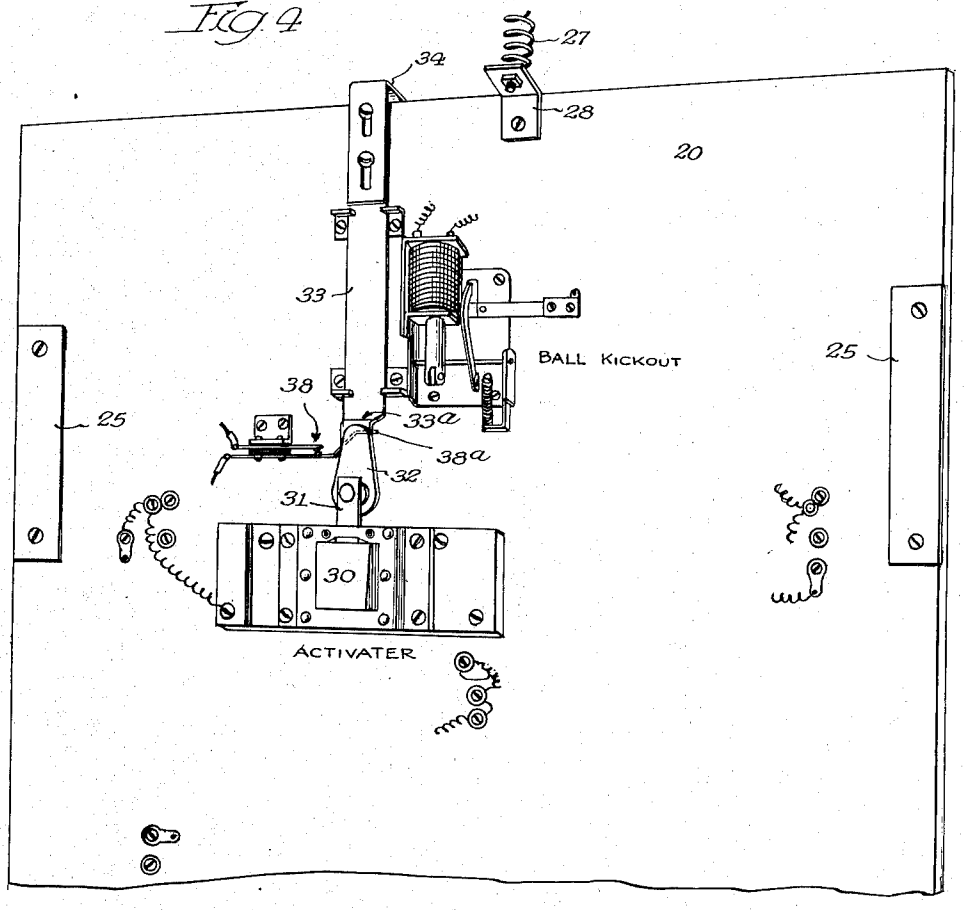
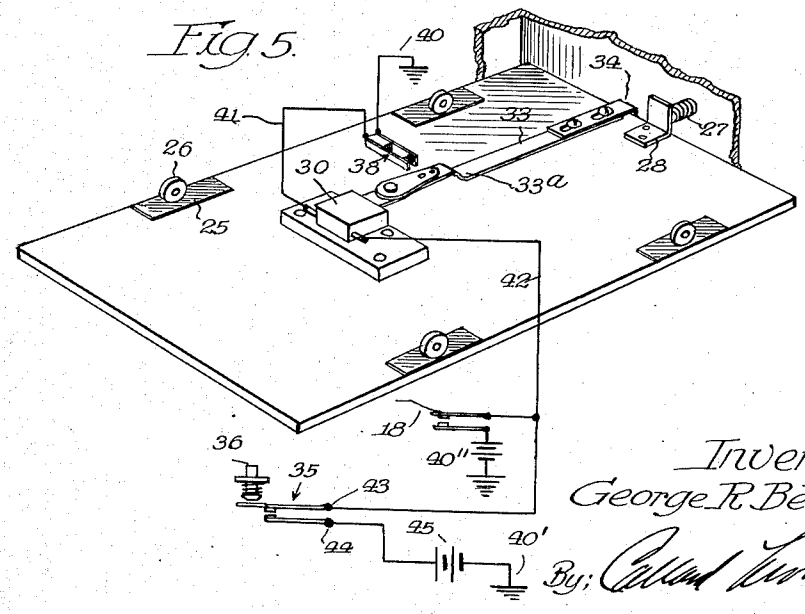


Fig 5.



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SHIFTABLE BALL ROLLING BOARD AND CONTROL THEREFOR

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Fig. 6

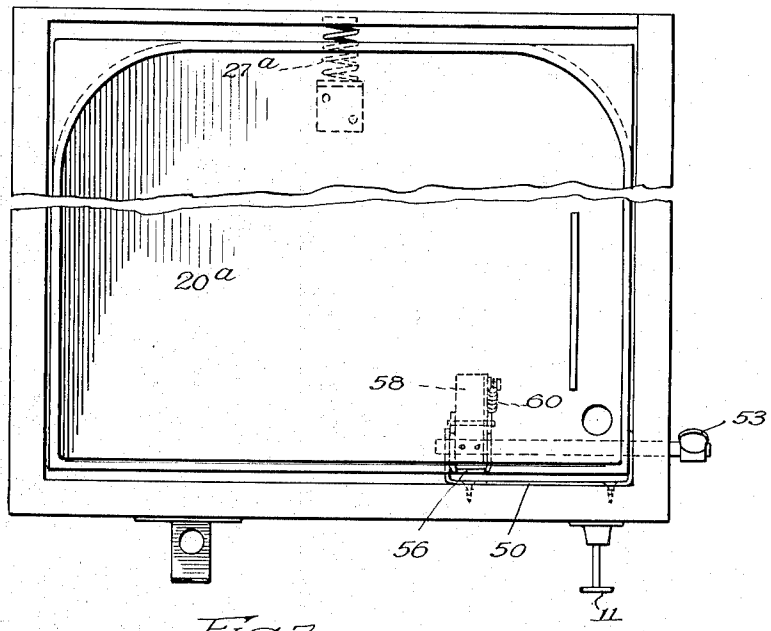


Fig. 7

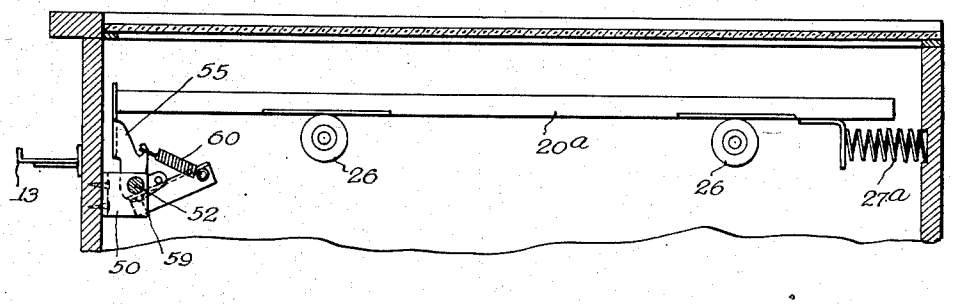
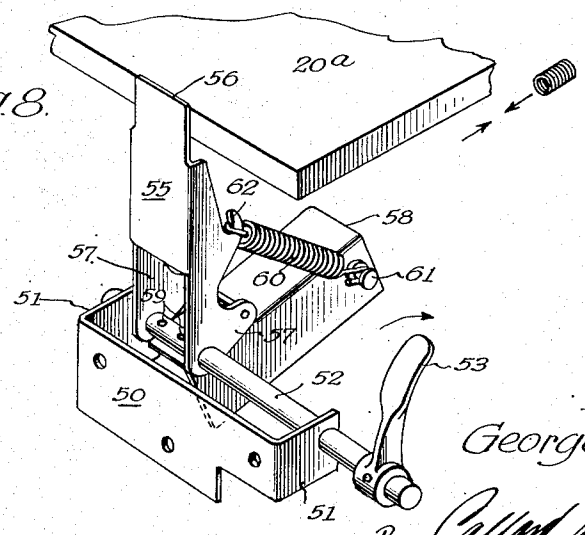


Fig. 8.



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Fig. 9.

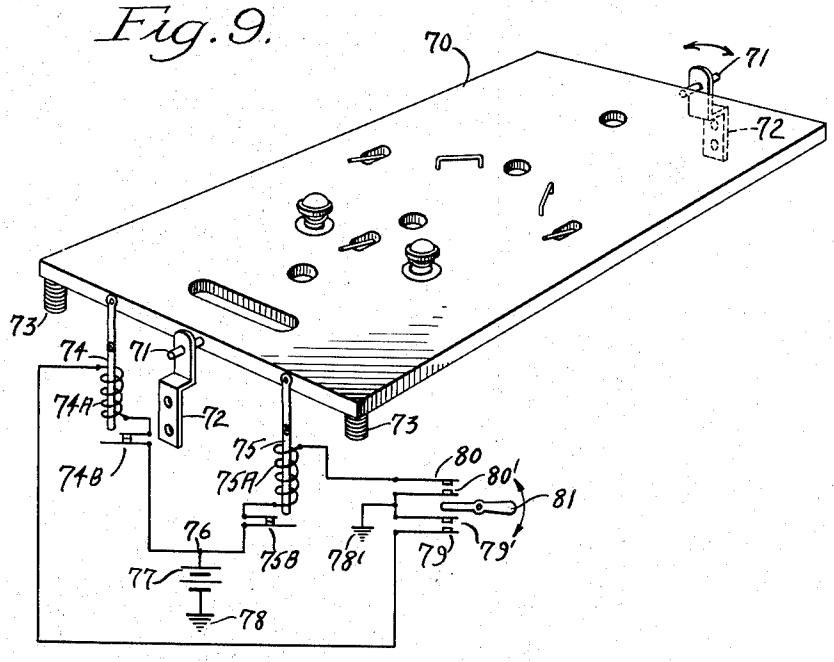
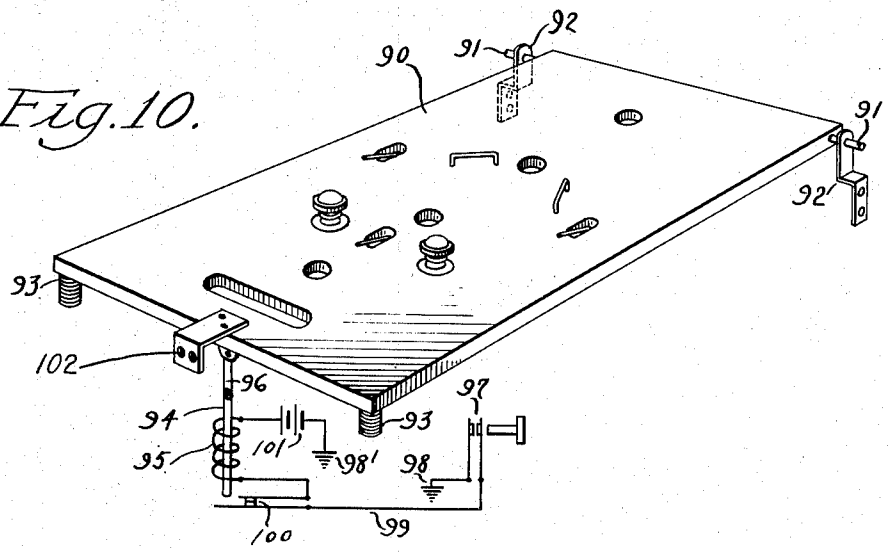


Fig. 10.



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SHIFTABLE BALL ROLLING BOARD AND CONTROL THEREFOR

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Application October 16, 1947, Serial No. 780,288

7 Claims. (Cl. 273—121)

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This invention pertains to ball rolling games and like amusement apparatus usually, but not necessarily, adapted for coin-controlled operation.

One of the principal objects of the invention is the provision, in such a game, of a movable ball field on which a projected or played ball gravitates or moves, and which ball field can be moved under control of the player for the purpose of deliberately altering the motion of the played ball to accomplish a desired travel of the same for scoring purposes.

Viewed from another aspect, it is an object of the invention to provide a ball game having a normally inclined and stationary ball playing field, a projector operable by the player to shoot a ball onto said field to travel thereover by gravitation, its initial projecting velocity, or a combination of these and other forces, with the object of getting the ball to hit some scoring element in or on the field, for example a bumper or an exit opening; and it is a further object to include in combination with the foregoing conventional ball game elements, means mounting said playing field for movement within its cabinet, and means either electrical, or mechanical, for moving the playing field to alter the direction, force, or trajectory of the ball at the will of the player.

Another object is the provision, in a game of the class described, of means for permitting a player to alter the travel of a projected ball skillfully and at will without shaking, pounding, tilting or otherwise abusing the game cabinet, the invention providing for a movable ball panel within the cabinet, and mechanism operated at will or automatically or both, for causing the ball panel to move for the purpose of modifying the initially imparted movement of the ball, thereby avoiding injury to the game mechanisms and at the same time affording additional skill tests and control and action effects for the players.

Additional objects and aspects of utility and novelty pertain to details of the illustrative embodiment described hereinafter in view of the annexed drawings in which:

Fig. 1 is a perspective fragmentary view of a ball rolling game equipped with the novel, shiftable playing field;

Fig. 2 is a fragmentary cross section of the game through the shiftable playing field;

Fig. 3 is an enlarged vertical sectional detail showing one of the scoring switches;

Fig. 4 is a fragmentary bottom plan view of the playing field or panel showing the electromagnetic form of shifting means;

Fig. 5 is a circuit diagram with the playing panel viewed from the bottom, i. e. upside down;

Fig. 6 is a fragmentary top plan view of a modified form of panel control, i. e. mechanical for manual actuation;

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Fig. 7 is a vertical section through the panel of Fig. 6;

Fig. 8 is an enlarged perspective of the mechanical panel shifting mechanism;

Fig. 9 is a perspective of a modified, longitudinally rockable panel;

Fig. 10 is a perspective of a modified, laterally rockable panel.

Referring to Fig. 1, the invention is described in conjunction with a well-known type of ball rolling game which includes a cabinet 10, a ball shooter or projector 11, a device 12 for elevating balls one at a time into shooting position, and a coin slide 13 for releasing a given number of balls for elevation and play.

In the conventional game, the player inserts a coin in slide 13, pushes plunger 12 to elevate a ball, and retracts and releases the shooting plunger 11 to project the ball along guideway 14 with whatever skill and force the objective calls for, with the object of getting the projected ball to engage one of the scoring elements, such as the exit opening 16, a bumper 17 or the roll-over switch 18, all on the playing field or panel 20.

In the prior devices of this class, the panel 20 has been fixed and stationary, although often there is associated with such a fixed panel, a subpanel which is slidable for the purpose of holding or freeing (depending upon the position to which it is moved) balls trapped in exit pockets such as opening 16; this type of holding and releasing panel, also well-known in the art as a shuffle panel, is not to be confused with the novel shiftable skill panel of this disclosure.

As in Figs. 1 and 2, the game cabinet is usually provided with legs 19 and a glass panel 21; the legs raise the cabinet to convenient playing elevation, and in the past have made it particularly convenient and inviting for the player to rock and shake the cabinet (although this is done on flat-mounting, counter type games, too) with the object of altering the course of the ball, which the player cannot otherwise affect because of the glass panel. All manner of cheating and interference with the normal operation of the game mechanism has resulted from this practice on the part of players, and it is well-known in the art to provide inertia switches acting automatically responsive to shaking of the cabinet, to disable the game circuits, such switches being known sometimes as "anti-tilt switches."

To accomplish the novel, controllable shiftability of the ball panel, the invention provides metal plates or tracks 25 on the underside of the panel in quadrangular array at the panel edges, and these tracks rest upon ball-bearing rollers 26 affixed to the inner walls of the cabinet.

The panel is normalized by a spring 27, Figs. 2 and 4, bearing against the inside back cabinet wall at one end, and against a bracket 28 on the underside of the panel at the other end.

Means for shifting or activating the ball panel includes, Fig. 4, an electromagnet 30 having plunger 31 connected by link 32 with rod 33 which is fixed at angled end 34 to the inside back wall of the cabinet; thus, when the electromagnet or solenoid 30 is energized, being fixed on the bottom of the panel, it moves in the direction of the relatively stationary plunger 31, thus shifting the panel in a direction to compress spring 27, and the solenoid circuit is thereupon automatically broken by normally closed breaker switch 38, in series with its energizing switch, the breaker switch being carried with the panel until the offset extension 38A engages the offset 33A of the rod 33. When the activating circuit is thus broken, spring 27 returns the panel to normalized position. The foregoing panel movements are abrupt and of a nature to effect a reactive motion of a ball thereupon, whether the ball be in motion or not.

In Fig. 5 is shown a circuit which may be used with the electromagnetic form of the invention, according to which one side of the breaker switch 38 is grounded at 40, and the other terminal is connected by conductor 41 to one terminal of the electromagnet or solenoid 30, the remaining terminal of the latter being connected by conductor 42 to one terminal 43 of a player-control switch 35, the remaining terminal 44 of which connects to one side of the power source or battery 45, the other side of which connects to ground 40'. Since breaker switch 38 is normally closed, closure of control switch 35, as by the player pushing button 36 (Fig. 1 also) completes an energizing circuit for solenoid 30, causing an abrupt shifting or activation of the panel as heretofore described, until switch 38 is carried against offset 33A to open said switch quickly and cause the panel to be abruptly restored to normal position by spring 27.

An added feature, where desired, is connection of a scoring instrumentality, such as ball roll-over switch 18, to connect operating power or battery 40'' to conductor 42, thereby activating the panel as a result of a movement of the ball, as distinguished from player control.

In the modification of Fig. 7, the ball panel 20A is mounted on rollers 26 to shift, as in the first embodiment, and spring 27A loads or normalizes the panel as before; however, instead of an electrically controlled and actuated shifter, mechanical means is provided to afford some measure of skillful control of the activation of the panel by the player.

The manual means of Fig. 8 includes a bracket 50 mounted on the inside front cabinet wall, as in Fig. 6 or 7; journaled in offset ends 51 of this bracket is a rocker rod 52 one end of which projects through the adjacent side wall of the cabinet to carry fixed thereon at its outside end a handle 53.

Loose on rod 52 is a pawl 55 having upper end 56 engageable with the front edge of ball panel 20A, the lower portion of the pawl including integral wing portions 57 engageable with the face of an angle plate 58 fixed by screws 59 on rod 52.

A spring 60 has one end fixed on pin 61 on a side of angle plate 58, while the other end of this spring is anchored on lug 62 of the pawl; thus, when the handle 53 is turned clockwise in Fig. 8, rod 52 turns accordingly carrying with it angle plate 58, and spring 60 pulls pawl 55 with it, thus shifting the ball panel toward the right. Shock due to violent and abusive manipulation of handle 53 is taken up by spring 60, and the latter

holds the pawl wing portions 57, close against the angle plate, so that anticlockwise movements of the handle 53 permit the pawl to be returned toward normal with any degree of delicacy of manipulation the player is able to effect; this manual embodiment of the invention distinguishes from the electromagnetic variety in the possibility of exercising skill in the activation of the ball panel or playing field.

In addition to substantially eliminating the troubles resulting from tilting and shaking of the game cabinet and apparatus by the players, the novel activating means affords new player appeal to these ball games. This movement or activation of the playfield as an entirety to effect a supplemental or supervisory motion of the ball, as distinguished from a mere random or novelty motion is not to be confused with prior arrangements in ball games for spinning a wheel relative to which the ball is projected, whether such wheel forms part of a playing field or is mounted above the plane of the field, because, among other things, these spinning or rotatable devices do not permit the player a choice in timing or selection in shifting the playfield to alter the travel of some particular ball at some particular time with regard to some particular target or objective.

It is contemplated that a variant form of the game combines the electromagnetic shifting means of Figs. 1 through 5 with the manually actuated panel shifting means of Figs. 6 through 8; this gives an added player appeal where the ball roll-over switch is connected as in the circuit of Fig. 5 for automatic shifting of the panel to give a surprise action in the course of the game, especially in those games affording a plurality of balls, say five, for each coin deposited.

It should also be understood that where both the manual and electromagnetic shifting means are provided, that the former is very abrupt, by design, because the breaker switch opens very quickly after the panel has begun to move, and in this sense, whether the electromagnetic shifting be effected by a ball switch or the manual switch, the reciprocatory displacement of the panel is sudden, whereas with the manual shifting leverage, the displacement is controllable at the will of the player from a very slight or very slow movement to a movement as nearly like the electromagnetically effected motion as the player's skill can command.

The conventional ball game of the class to which this invention appertains has its ball panel mounted approximately in a horizontal plane, usually tilted just enough to cause any dead balls (i. e. balls nearly at rest) to roll down toward an exit opening at the front of the panel for return to the projecting means. However, no limitations in this, or other respects, are intended by any detailed specification herein excepting as may be provided in the appended claims.

In Fig. 9 there is shown a modified form of panel mount and actuating means, wherein a panel 70 is supported for opposite rocking movement about a longitudinally extensive axis through opposite pins 71 pivotably supported in brackets 72 to be affixed to the inside walls of the game cabinet (not shown). Springs 73 normally maintain the panel in rest position, and solenoid plungers 74 and 75, respectively linked to the panel on opposite sides of its rocking axis, i. e. pin 71, can be respectively attracted by solenoid windings 74A and 75A, when energized, to rock the panel accordingly.

In the latter arrangement, one terminal of each

winding 74A and 75A connects through corresponding breaker switches 74B and 75B, both normally closed, to common terminal 76 of a power source 77 having its other terminal grounded at 78.

The remaining terminal of each solenoid winding connects, respectively, with a contact 79 or 80 of an operating switch having cooperative contacts 79' and 80' connected to ground 78'.

Thus, actuation of switch handle 81 in either of the two directions indicated will close contacts 79—79' or 80—80', and accordingly will energize winding 74A or 75A; in the former case, the panel 70 will rock counterclockwise; in the latter case, the panel will rock clockwise. Breaker switches 74B, 75B, are opened by the corresponding solenoid plungers in rocking the panel to deenergize the solenoids respectively, to effect abrupt return of the panel by springs 73.

In Fig. 10 is shown a modified panel mount in which the panel 90 is rockably mounted for movement about a lateral axis through pins 91 seated in cabinet wall brackets 92, springs 93 maintaining or normalizing the panel in a desired position of rest, and solenoid plunger 94 pulled downward by winding 95, when energized, through link 96 to the panel, depressing or tilting the panel to affect the travel of the ball.

The embodiment of Fig. 10 is actuated by the player's closure of switch contacts 97 thereby completing circuit from ground 98 via conductor 99, normally closed breaker contacts 100, and winding 95 to ground 98' through power source 101. In this form of the device, the pivotal axis through pins 91 may be either at the top or bottom of the play board. Stop bracket 102 limits the return motion of the panel by springs 93, which return occurs when the solenoid plunger 94 opens breaker switch 100.

It is contemplated that manual means, as distinguished from electromagnetic means, as in the embodiment of Fig. 7, for example, may be used in place of or with the shifting or activating means of Figs. 9 and 10; and further, that optionally operable manual switch means may be used with automatic, ball-operated switch means, as in Fig. 5, for the embodiments of Figs. 9 and 10.

The appended claims are not intended to be descriptively duplicative of the foregoing specification, but are intended to particularly point out and claim the parts and combinations claimed as the invention as required by R. S. 4888.

I claim:

1. In an amusement game of the type including a support with a relatively movable ball-rolling board with ball objectives thereon, improvements comprising, to wit: electromagnetic means operable to move said board to affect or effect motion of a ball thereon for the purpose of influencing the movement of such ball relative to a said objective or effecting a modified travel of a ball thereon; a circuit for energizing said electromagnetic means; and an operating switch in said circuit and including an operating part therefor cooperably associated with a said ball objective to be moved by a ball scoring on such objective to actuate said switch and cause a movement of said board by said electromagnetic means for the purpose set forth.

2. In a ball game apparatus, a shiftable ball-rolling panel including scoring means thereon at which a ball is to be directed; means for rolling a ball onto said panel; electromagnetic mechanism for shifting said panel to alter the travel of a ball thereon; a switch and circuit means controlled thereby for operating said electromagnetic mechanism; and actuating means for said switch and including a member exposed for engagement by a ball moving on said panel.

3. In a game apparatus, a ball-rolling panel including ball-scoring objective means and mounted to shift for the purpose of affecting the motion of a ball thereon relative to said objective means; protective enclosure means for said panel preventing access thereto by the player, but including a transparent portion for viewing the panel; player-controlled means for launching a ball to roll on said panel; electrically-controlled mechanism operable to shift said panel for the purpose aforesaid; a control circuit for said electrically controlled mechanism; switch means connected in said circuit for operation to actuate said mechanism; and switch-operating means situated in said game apparatus for engagement and operation by a ball on said panel and by a player of the game.

4. In a ball rolling game of the class described, a ball panel, a support including means mounting said panel for bodily movement from a normal position, spring means urging said panel into said normal position, a ball target on said panel, means for shooting a ball onto said panel, electromagnetic means for shifting said panel from normal position, a circuit including an operating switch means for energizing said electromagnetic means, and a breaker switch actuated by means moved responsive to movement of said panel a predetermined amount from normal position by said electromagnetic means for opening said circuit to deenergize said electromagnetic means.

5. Apparatus as set forth in claim 4 in which said operating switch means is situated in said game for access by the player to be manually actuated.

6. Apparatus as set forth in claim 4 in which said operating switch means includes an operating part associated with said target and operated by a ball on said panel.

7. Apparatus as set forth in claim 4 in which said operating switch means is both manually and ball-operated, and includes a switch situated in said game for access by the player to be manually actuated; and another switch having an operating part associated with said target and operated by a ball on said panel.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,364,632	Harrington	Jan. 4, 1921
2,010,266	Kemper et al.	Aug. 6, 1935
2,134,185	Hansen	Oct. 25, 1938
2,184,867	Williams et al.	Dec. 26, 1939
2,200,190	Plouvier	May 7, 1940
2,300,328	Wilsey	Oct. 27, 1942
2,317,506	Williams et al.	Apr. 27, 1943
2,423,725	Poole	July 8, 1947

FOREIGN PATENTS

Number	Country	Date
23,495	Great Britain	1900
416,709	Great Britain	Sept. 19, 1934
421,190	Great Britain	Dec. 17, 1934
450,096	Great Britain	July 9, 1935