

Feb. 2, 1943.

F. W. MOXEY

2,310,163

BUMPER SWITCH FOR BALL ROLLING GAMES

Filed June 29, 1942

2 Sheets-Sheet 1

Fig. 1.

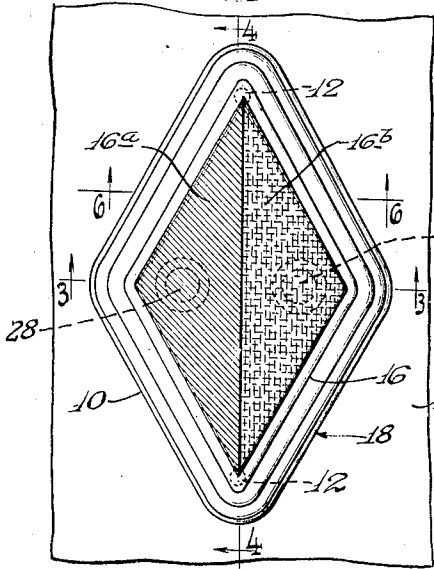


Fig. 2.

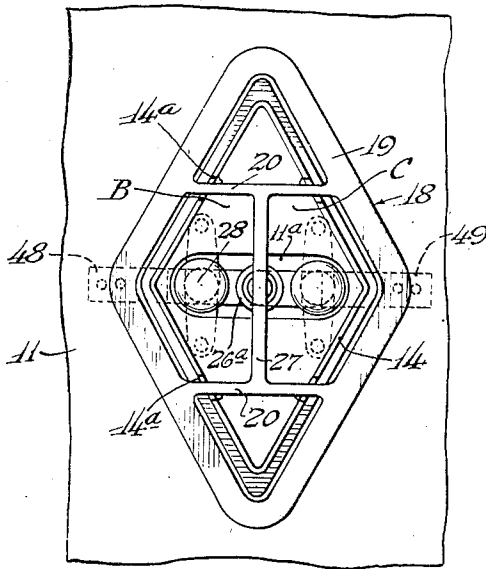


Fig. 3.

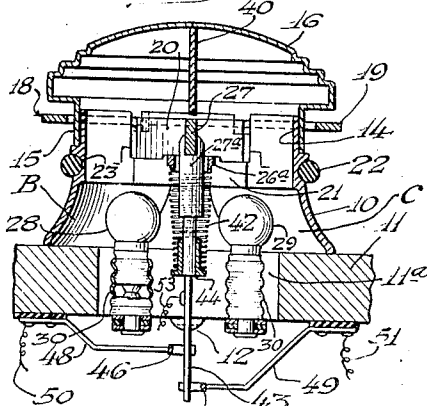


Fig. 4.

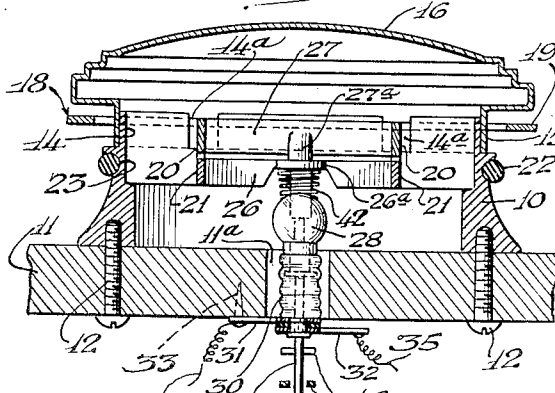


Fig. 5.

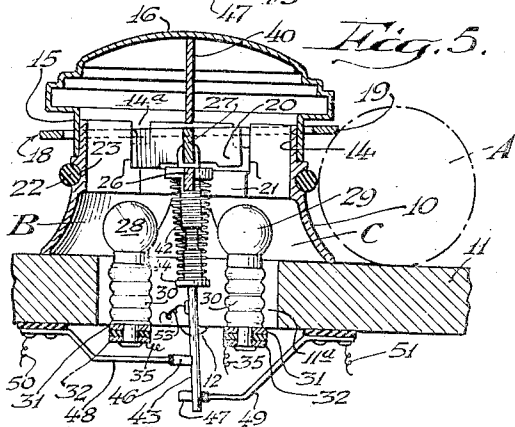
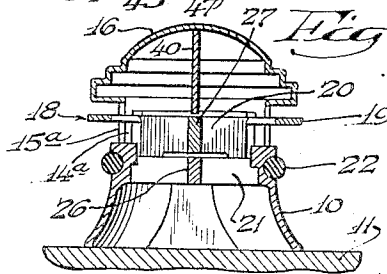


Fig. 6.



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BUMPER SWITCH FOR BALL ROLLING GAMES

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2 Sheets-Sheet 2

Fig. 7.

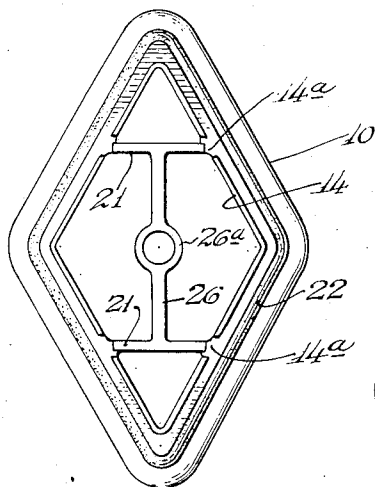


Fig. 8.

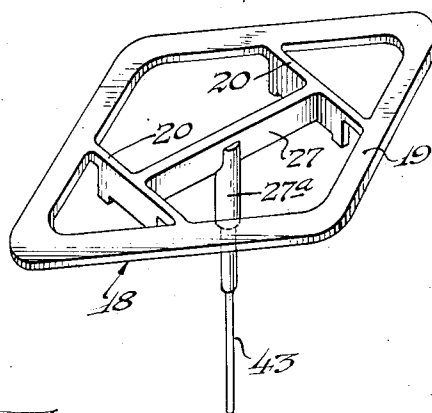
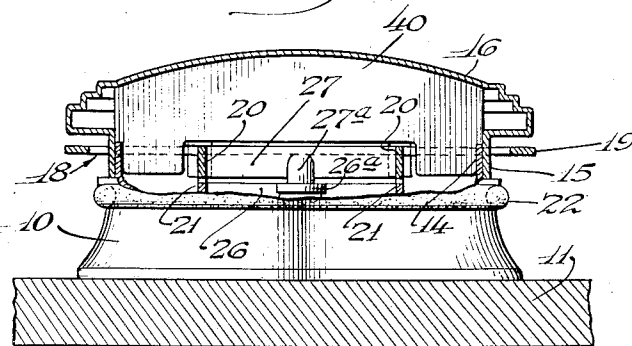


Fig. 9.



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UNITED STATES PATENT OFFICE

2,310,163

BUMPER SWITCH FOR BALL ROLLING
GAMESFred W. Moxey, Aurora, Ill., assignor to American
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tion of Illinois

Application June 29, 1942, Serial No. 449,004

16 Claims. (Cl. 177—384)

The present invention relates to combination bumper and switch devices for use in connection with ball rolling games of the type including a table top, inclined slightly to horizontal, and over which balls are rollable. Devices of this general type are often termed "targets" or "target switches," and are mounted on a table top in position to be encountered by a ball. The switch structure associated with such devices is provided for the purpose of controlling certain electrical circuits which may include electric lamps, recorders and various other types of electrically energized devices or apparatus associated with the game and adapted to be energized incident to completion of the circuit by closing of the switch. Such devices are usually provided for the purpose of creating, stimulating and maintaining interest and player appeal in the game.

The present invention is directed to a novel and improved bumper or target switch device, which is constructed to provide novel control of a plurality of electrical circuits for actuating a wide variety of auxiliary devices and apparatus associated with the game.

One of the objects of this invention is to provide a novel form of combined bumper and switch device, characterized by the provision of a rockable member, formed and supported in a manner to be engaged by a ball rolling over the surface of the table top of the game apparatus, for selectively completing one of a plurality of electrical circuits, depending upon the point of contact of the rockable member by the ball.

Another object is to provide a novel combination bumper and switch device of the character indicated, including a rockable ball engaging member adapted for completing a predetermined electrical circuit, depending upon the point of contact of the ball with the rockable member, and wherein the ball engaging surface of said member is of such contour as to permit mounting of the device in various angular positions on the surface of the game board, to vary the element of chance of the ball being caused to travel in a predetermined path over the board.

A further object is to provide a novel device of the character indicated, including a hollow body provided with two separate compartments in which electric lamps may be mounted, and wherein the cover of said body is formed of translucent material for emitting light from the respective compartments and a rockable ball engaging member mounted on the body, together with switch means for selectively energizing electrical circuits including the respective lamps, depending upon the point of contact of the rockable member by a ball.

Still another object is to provide an improved device of the character indicated, including an elongated body and an elongated rockable mem-

ber adapted to be engaged by a ball and supported on the upper end of the body for rocking movement at two longitudinally spaced apart transverse planes, together with switch means operably connected to the member for completing separate electrical circuits, depending upon the direction of rocking movement of said member.

A still further object is to provide an improved device of the character indicated, which is of simplified construction, composed of relatively few parts, durable in use, and capable of being economically manufactured.

Other objects and advantages of this invention will be apparent from the following description, taken in connection with the accompanying drawings, in which:

Figure 1 is a top plan view of the novel combination bumper switch device, embodying the present invention, shown mounted on a portion of a game board;

Figure 2 is a top plan view of the device with the cover element removed;

Figures 3 and 4 are vertical sectional views through the device, taken substantially as indicated at lines 3—3 and 4—4 respectively on Figure 1;

Figure 5 is a vertical sectional view similar to Figure 3, showing the parts in one operated position of adjustment, incident to actuation by a ball;

Figure 6 is a transverse vertical section through the device, taken as indicated at line 6—6 on Figure 1;

Figure 7 is a top plan view of the body of the device with all other parts omitted;

Figure 8 is a perspective view of the rockable ball engaging member; and

Figure 9 is a side view, partly in elevation and partly in section, showing the separator plate for dividing the interior of the body into two compartments.

The device embodying the present invention, and as illustrated in the drawings, includes a hollow body 10, adapted to be rigidly attached to the upper surface of a game board 11, by means of two screws 12. The upper marginal portion of the lateral wall of the body is inwardly offset, as indicated at 14, and over this offset portion there is adapted to be telescoped a depending skirt portion 15 of a cover element 16. As may be seen in the drawings, said body and cover element are of generally oblong form, and, more specifically, are of generally diamond-shaped outline. The purpose of such formation will hereinafter be referred to.

Supported on the upper end of the body is a rockable ball engaging member 18, having a contour similar to the contour of the body. As shown in the drawings, said member 18 is of open formation, including a frame 19 surrounding the

offset wall portion 14 of the body 10. The frame portion 19 has its opposite side portions connected by a pair of transversely extending, longitudinally spaced apart webs 20 which extend through slots 14^a and 15^a, formed respectively in the upper marginal portion 14 of the body 10 and the depending skirt 15 of the cover element 16. Said webs 20 are adapted to be supported for rocking movement upon, and disposed in vertical alignment with, corresponding webs 21 in the interior of the body 10, and, in effect, provide two longitudinally spaced apart rockable supports. When the marginal edge of the frame portion 19 of the rockable member is engaged by a ball, as indicated at A, said member is caused to tilt laterally about both rockable supports, as seen in Figure 5 of the drawings. It may be understood that the rockable connection or supports for the member 18 are such that even when the ball engages either of the extreme end portions of the frame 19, said member 18 will be rocked in longitudinal direction about the support at the end opposite that engaged by the ball.

In order to cushion the blow of impact of the ball, as indicated at A, in Figure 5 of the drawings, upon encounter with the marginal edge of the rocking member 18, there is provided a resilient band 22, seated in a socket 23 formed in the outer wall of the body 10, in position to be impinged by the ball. Said band, in addition to absorbing the impact of the ball, because of its resilient nature, also serves to rebound the ball in a direction away from the device.

The two transverse webs 21 of the body 10 are connected by a central, longitudinally extending, vertical web 26, and the two transverse webs 20 of the rockable member are interconnected by a central vertical web 27, disposed in alignment with the web 26, and substantially in contact therewith so as to divide the interior of the body 10 into two separate compartments, as indicated at B and C, in which are disposed electric lamps 28 and 29. Said lamps are carried in sockets 30, extending upwardly through an opening 11^a formed in the game board, and each of said sockets includes a pair of terminal connections 31 and 32, at least one of which is connected to the under side of the board 11, as by a nail 33, for supporting the lamp in proper position. The ends of the terminals 31 and 32 are connected by conductor wires 34 and 35 of an electrical circuit.

To complete the formation of the compartments within the body proper and the area enclosed by the cover, there is provided a removable separator plate 40, which is shouldered for a snug fit in the end portions of the body, as seen in Figure 9 of the drawings. Said plate is disposed in vertical alignment with the webs 26 and 27 of the body and rockable member respectively, with the upper marginal edge thereof disposed in abutting engagement with the under surface of the cover element 16, as seen in Figure 9 of the drawings. It is to be understood that the areas of the cover element in alignment with the respective compartments B and C is composed of a translucent material. These areas, which are indicated at 16^a and 16^b, are preferably of contrasting colors, as indicated in Figure 1 of the drawings, so as to clearly indicate when the lamps of the respective compartments are illuminated.

The rockable member 18 is normally held in stabilized condition, as seen in Figure 3 of the drawings, by means of a coil spring 42, which is seated against the under side of an annular body

26^a, formed as a part of the web 26. The web 27 of the rockable member includes an elongated, depending boss 27^a, extending through the annular body 26^a, and carrying a downwardly projecting pin 43, constituting the operating member of the switch structure. The spring 42 is held in position by abutment against a ferrule 44, which is snugly telescoped over the lower end of the projecting body portion 27^a.

Said switch operating member 43 extends a substantial distance below the surface of the board in spaced apart relation to two horseshoe-shaped terminal ends 46 and 47 of switch members 48 and 49 respectively. Said switch members 48 and 49 are connected by conductor wires 50 and 51 respectively, into electrical circuits, which may include said lamps 28 and 29, and/or other apparatus or devices which it is desired to energize.

When the ball A engages the marginal edge of the rockable member 18, said member is tilted against the reaction of the coil spring 42, as seen in Figure 5 of the drawings, at which position the lower portion of the switch member 43 is disposed in contact with one of the terminal ends of the switch members 48 and 49, depending upon the direction of rocking movement of said member. A conductor wire 53 is connected to the switch member 43, for completing the electrical circuits including the respective switch members 48 and 49. When the rocking member 18 is tilted, as indicated in Figure 5, with the switch member 43 in circuit making relation to the terminal portion 47 of switch member 49, it is to be understood that an electrical circuit is completed, which may or may not include either of the lamps 28 or 29, or other apparatus, or said lamps together with other apparatus. Other electrical circuits may be completed when the rockable member is tilted in the opposite relation to that seen in Figure 5 of the drawings, at which position switch member 43 will engage in circuit making relation the terminal portion 46 of the switch member 48.

For simplicity and economy in manufacture, the body 10, together with the cover element 16 and the rockable member 18, are preferably formed of plastic material. In the use of plastic material it is a simple expedient to utilize sheet material of different colors for fabricating the top portion of the cover element 16, in which case the cover element is formed as a frame and the respective portions, as represented by areas 16^a and 16^b, may be composed of colored, translucent sheets, conveniently secured in place in the frame portion of the cover element by a suitable solvent, by virtue of which the parts become integrally connected together as a unitary article.

By forming the body 10 and rockable member 18 of generally diamond-shaped contour, it is possible to vary the mounting of the devices upon the surface of the game board in a manner so as to obtain a relatively wide range of what is termed "percentage adjustment," or variation in the element of chance in causing a ball traveling over the surface of the game board to pursue a predetermined path of movement.

Although I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting my invention to the precise form herein disclosed, except as I may be so limited by the appended claims.

I claim:

1. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes, and having the major portion of its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about both of said rockable supports, incident to engagement by a ball, and switch means below the table top including an operating element connected to said member and adapted for completing one of a plurality of electrical circuits incident to rocking movement of said member in one direction, and for completing another circuit incident to rocking movement in the other direction.

2. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes and having the major portion of its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about both of said rockable supports, incident to engagement by a ball, spring means tending to yieldingly maintain said member at normal inoperative position, and switch means below the table top including an operating element connected to said member and adapted for completing one of a plurality of electrical circuits incident to rocking movement of said member in one direction, and for completing another circuit incident to rocking movement in the other direction.

3. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes, and having the major portion of its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about both of said rockable supports, incident to engagement by a ball, and switch means below the table top including an operating element connected to said member and adapted for completing one of a plurality of electrical circuits incident to rocking movement of said member in one direction, and for completing another circuit incident to rocking movement in the other direction, said rockable supports for said member being constructed and arranged to permit endwise rocking of said member about either one of said supports, incident to encounter by a ball adjacent said respective ends.

4. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table

top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes and having the major portion of its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about both of said rockable supports, incident to engagement by a ball, a cover element telescopically associated with the upper end of the body for closing said upper end and serving to confine said member in operative relation to the body, and switch means below the table top including an operating element connected to said member and adapted for completing one of a plurality of electrical circuits incident to rocking movement of said member in one direction and for completing another circuit incident to rocking movement in the other direction.

5. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes and having its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about said rockable supports, incident to engagement by a ball, a cover element telescopically associated with the upper end of the body for closing the same and serving to confine said member in operative relation to the body, the top of said cover being formed of translucent material, partitioning means for separating the interior of the device to form two separate compartments in the device for accommodating electric lamps therein, and switch means below the table top including an operating element connected to said member and adapted for completing an electric circuit including one of said lamps, incident to rocking of said member in one direction, and for completing another electric circuit including the other lamp incident to rocking of said member in the other direction.

6. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes and having its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about said rockable supports, incident to engagement by a ball, a cover element telescopically associated with the upper end of the body for closing the same and serving to confine said member in operative relation to the body, the top of said cover being formed of translucent material, partitioning means for separating the interior of the device to form two separate compartments in the device for accommodating electric lamps therein, said translucent top of the cover having two separate areas of different colors, dimensioned for registration with the respective compartments, and switch means below

the table top including an operating element connected to said member and adapted for completing an electric circuit including one of said lamps, incident to rocking of said member in one direction, and for completing another electric circuit including the other lamp incident to rocking of said member in the other direction.

7. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, an elongated member rockably supported on the upper end of said body at two longitudinally spaced apart transverse planes and having its marginal edge projecting outside of the wall of the body in position to be encountered by a ball, whereby said member may be rocked laterally to either side about said rockable supports, incident to engagement by a ball, said body and member including vertically aligned longitudinally extending webs, a cover element telescopically associated with the upper end of the body for closing the same and serving to confine said member in operative relation to the body, the top of said cover being formed of translucent material, a removable separator plate seated in the body in alignment with and above said webs and terminated adjacent the inner surface of the cover, said plate and webs serving to form two separate compartments in the device for accommodating electric lamps therein, and switch means below the table top including an operating element connected to said member and adapted for completing an electric circuit including one of said lamps, incident to rocking of said member in one direction, and for completing another electric circuit including the other lamp incident to rocking of said member in the other direction.

8. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow body having an upwardly extending wall, a member rockably supported on the body for tilting movement in either of two lateral directions, and including a marginal portion extending beyond the body in position to be engaged by a ball for effecting such tilting movement, a cover element including a translucent top connected to the upper end of the body, means for separating the interior of the body into two compartments for accommodating electric lamps therein, and switch means below the table top including an operating connection to said member for completing an electric circuit including one lamp incident to tilting of said member in one direction and for completing another electric circuit including the other lamp incident to tilting of said member in the other direction.

9. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow body having an upwardly extending wall, a member rockably supported on the body for tilting movement in either of two lateral directions, and including a marginal portion extending beyond the body in position to be engaged by a ball for effecting such tilting movement, the external lateral surfaces of said body and member being of generally diamond-shaped outline, a resilient band surround-

ing the body adjacent said member in a position to be impinged by a ball engaging said member, a cover element including a translucent top connected to the upper end of the body, means for separating the interior of the body into two compartments for accommodating electric lamps therein, and switch means below the table top including an operating connection to said member for completing an electric circuit including one lamp incident to tilting of said member in one direction and for completing another electric circuit including the other lamp incident to tilting of said member in the other direction.

10. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a body having an upwardly extending wall, a member rockably mounted on said body for tilting movement in either of two lateral directions and including a marginal portion extending beyond said body in position to be engaged by a ball for effecting such tilting movement, and switch means disposed below said table top and including an operating connection to said member for completing an electric circuit incident to tilting of said member in one direction and for completing another electric circuit incident to tilting of said member in the other direction.

11. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a body having an upwardly extending wall, a member rockably mounted on said body for tilting movement in either of two lateral directions and including a marginal portion extending beyond said body in position to be engaged by a ball for effecting such tilting movement, the external lateral surfaces of said body and member being of generally diamond-shaped outline, a resilient band surrounding the body adjacent said member in position to be impinged by a ball engaging said member, and switch means disposed below said table top and including an operating connection to said member for completing an electric circuit incident to tilting of said member in one direction and for completing another electric circuit incident to tilting of said member in the other direction.

12. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a body having an upwardly extending wall, a member rockably mounted on said body for tilting movement in either of two lateral directions and including a marginal portion extending beyond said body in position to be engaged by a ball for effecting such tilting movement, the external lateral surfaces of said body and member being of generally diamond-shaped outline, a resilient band surrounding the body adjacent said member in position to be impinged by a ball engaging said member, said rockable mounting for said member being constructed and arranged to permit endwise tilting of said member in endwise direction incident to engagement by a ball adjacent the opposite end of said member, and switch means disposed below said table top and including an operating connection to said member for completing an electric circuit incident to tilting of said member in one direction and for completing another electric circuit

incident to tilting of said member in the other direction.

13. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, a pair of longitudinally spaced apart web members connecting opposite walls of said body, an elongated member rockably supported on said webs for tilting movement in either of two lateral directions, and including a frame surrounding the body in spaced relation, in position to be engaged by a ball for effecting such tilting movement, and a pair of longitudinally spaced apart webs connecting opposite sides of the frame, seated upon and disposed in alignment with the webs of said body, the contacting surfaces of said pairs of webs being formed to permit lateral rocking of the member in two opposite directions, a cover element adapted to be telescopically connected to the upper end of the body for closing the upper end of the body and serving to confine the member in operative relation to the body, spring means acting on the member tending to yieldingly maintain it in stable inoperative position, and switch means below the table top and including an operating connection to said member for completing an electric circuit when said member is tilted in one lateral direction and for completing another electric circuit when said member is tilted in the other direction.

14. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, a pair of longitudinally spaced apart web members connecting opposite walls of said body, an elongated member rockably supported on said webs for tilting movement in either of two lateral directions, and including a frame surrounding the body in spaced relation, in position to be engaged by a ball for effecting such tilting movement, and a pair of longitudinally spaced apart webs connecting opposite sides of the frame, seated upon and disposed in alignment with the webs of said body, the contacting surfaces of said pairs of webs being formed to permit lateral rocking of the member in two opposite directions, a cover element adapted to be telescopically connected to the upper end of the body for closing the upper end of the body and serving to confine the member in operative relation to the body, the upper marginal edge of the wall of said body and the lower marginal edge of the cover element being notched to accommodate the webs of said member and permit free tilting movement thereof, spring means acting on the member tending to yieldingly maintain it in stable inoperative position, and switch means below the table top and including an operating connection to said member for completing an electric circuit when said member is tilted in one lateral direction and for completing another electric circuit when said member is tilted in the other direction.

15. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted

to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, a pair of longitudinally spaced apart web members connecting opposite walls of said body, an elongated member rockably supported on said webs for tilting movement in either of two lateral directions, and including a frame surrounding the body in spaced relation, in position to be engaged by a ball for effecting such tilting movement, and a pair of longitudinally spaced apart webs connecting opposite sides of the frame, seated upon and disposed in alignment with the webs of said body, the contacting surfaces of said pairs of webs being formed to permit lateral rocking of the member in two opposite directions, a cover element adapted to be telescopically connected to the upper end of the body for closing the upper end of the body and serving to confine the member in operative relation to the body, said body and frame having centrally disposed vertically aligned, longitudinally extending webs connected to their respective pairs of spaced apart webs, a longitudinally extending separator plate seated in the upper end of the body in alignment with the longitudinal webs, said longitudinal webs and plate serving to form two separate compartments in the body for accommodating electric lamps therein, and switch means below the table top and including an operating connection to said member for completing an electric circuit including one of said lamps incident to tilting of said member in one direction and for completing another electric circuit including the other lamp incident to tilting of said member in the other direction.

16. A bumper switch device for use with a ball rolling game having a table top inclined slightly to horizontal and over which a ball is adapted to roll, said device being mounted upon the table top and including a hollow elongated body having an upwardly extending wall, a pair of longitudinally spaced apart web members connecting opposite walls of said body, an elongated member rockably supported on said webs for tilting movement in either of two lateral directions, and including a frame surrounding the body in spaced relation, in position to be engaged by a ball for effecting such tilting movement, and a pair of longitudinally spaced apart webs connecting opposite sides of the frame, seated upon and disposed in alignment with the webs of said body, the contacting surfaces of said pairs of webs being formed to permit lateral rocking of the member in two opposite directions, and endwise tilting of said member about one rockable connection incident to engagement by a ball of the opposite end portion of the frame of said member, a cover element adapted to be telescopically connected to the upper end of the body for closing the upper end of the body and serving to confine the member in operative relation to the body, spring means acting on the member tending to yieldingly maintain it in stable inoperative position, and switch means below the table top and including an operating connection to said member for completing an electric circuit when said member is tilted in one lateral direction and for completing another electric circuit when said member is tilted in the other direction.

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