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B. G. MacDOUGALL ET AL

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BALL ROLLING GAME

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2 Sheets-Sheet 2

Fig. 2.

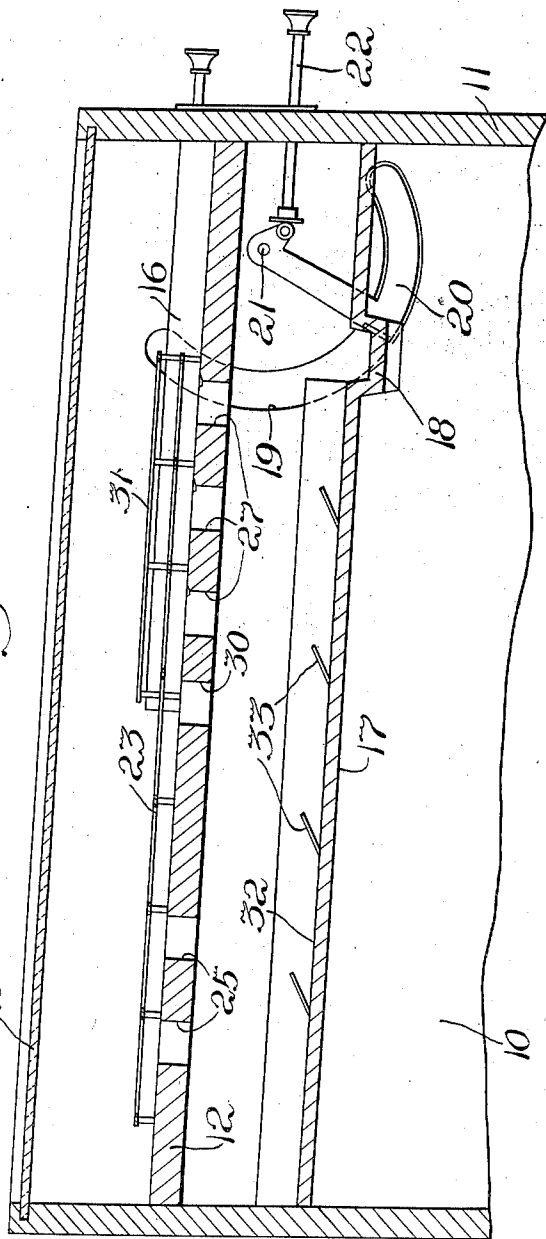
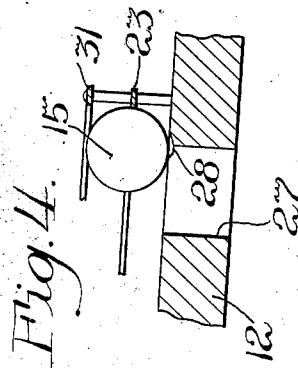
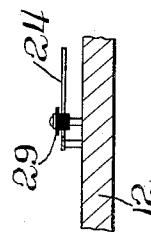


Fig. 3.



Inventors
Bon G. MacDougall
and Herbert G. Breitenstein
By Paul O. Pippel
Att'y.

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BALL ROLLING GAME

Bon G. MacDougall and Herbert G. Breitenstein,
Chicago, Ill., assignors to Raymond T. Moloney,
Chicago, Ill.

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3 Claims. (Cl. 273—112)

The invention relates to a ball rolling game.

More particularly it relates to an improved
baffle or obstacle means to be located on the ball
rolling surface whereby to achieve an interesting
effect for the player's amusement and to test
his skill in propelling the balls.

The primary object of the invention is to provide an improved ball rolling game.

Another object is to provide such a game having a spiral rail construction providing a spiral ball passageway.

Still another object is to provide ball drop openings or pockets in said spiral passageway arranged or located in a special manner to enhance amusement values.

It is also an object to provide a ball rebound element at the inner terminal end of the spiral passageway to achieve a novel game effect.

Another object is so to locate ball drop openings in the passageway as to cause balls, when they reach a position of equilibrium or rest that they will automatically fall through a hole or pocket by gravity so as to keep the passageway at all times clear.

Another object is to provide the spiral passageway on a table sloped slightly from the horizontal so that a propelled ball moving in the passageway is subjected to centrifugal and gravitational forces to produce the illusion of an accelerating ball although its linear speed is constant while kinetic energy remains.

Other important objects will become apparent to those skilled in this art as the disclosure is more fully made.

Briefly, these desirable objects may be achieved in a ball rolling game of the type comprising a cabinet containing a table sloped slightly from the horizontal to provide a ball rolling surface. A ball projector at one side and at the low end of the table is used forcibly to propel a fairly heavy ball into the outer edge of a spiral passageway provided on the higher end of the table by rail members. A ball thus can be rolled around the spiral passageway inwardly toward the center of the spiral, said ball hugging the outer edge of the passageway by virtue of the centrifugal force developed. As a result, while such force is sufficiently strong, the ball will miss holes formed through the table in said passageway along its inner edge. At the low loop side of each spiral form such a hole is placed a distance, from the rail forming the spiral, equal to substantially one-half the diameter of the ball. It follows, therefore, when a ball has spent its energy that it must come to rest by gravity at the low side of a loop

and thus must fall by gravity through the proximate hole in the board to keep the spiral passage always clear of balls that would obstruct same if not so cleared.

The improved game structure is illustrated in one practicable form in the accompanying sheets of drawings, wherein:

Figure 1 is a general plan view of the improved game;

Figure 2 is a longitudinal sectional view through the game taken along the line 2—2 of Figure 1, looking in the direction of the arrows;

Figure 3 is a detail, sectional view taken along the line 3—3 of Figure 1 to show the terminal bumper; and,

Figure 4 is a cross sectional view taken along the line 4—4 of Figure 1 to show in detail a portion of the rail structure forming the spiral passageway.

The improved game is housed in a conventional cabinet 10 having a front wall 11 and carrying in its upper portion a table 12 sloped slightly from the horizontal so that balls rolled onto the high end of the ball rolling surface provided by the table will have a tendency to gravitate, when the propelling force is spent, toward the low end of the table, or in the direction of the front wall 11. The cabinet top is closed by the usual glass cover 13. The front wall 11 at one side thereof, carries a manually operable ball shooting plunger 14 of well known form, to project balls one at a time, such as the ball 15 shown in Figure 1, along a projection passageway formed by the side wall of the cabinet and a parallel partition member 16 carried on the table all in a manner well known in this art.

Below the table 13 the cabinet carries a ball routing panel 17 sloped from the horizontal to enable balls received thereon to gravitate in the direction of the front wall 11 and into a cross trough 18, which in the well known way slopes transversely in the direction of the side wall of the cabinet which is proximate the projector 14. Said side wall has its inner face formed with an upwardly and forwardly extending groove 19 into which balls from the trough gravitate one at a time to enable a ball lifter member 20 of standard construction to be moved about its pivot 21 by a manually operable plunger member 22 also carried in the front wall 11.

The upper or higher end of the table 12 carries a spiral rail structure 23 elevated a suitable distance, such as half the diameter of a ball to be rolled, above the table. Said spiral rail is helically coiled inwardly toward its terminal end

designated at 24 thus to form a spiral passageway as shown. The entrance to the spiral passageway begins at the discharge end of the ball projection passage formed by the partition 16 so that a ball projected by the projector 14 must enter the spiral passage and travel the course inwardly in a counterclockwise direction, provided by the rail structure 23.

The spiral passage, it will be noted, is of uniform width, which width is considerably more than the diameter of the ball 15 used, so that when a ball is forcibly projected into the spiral passage, the centrifugal force will cause the ball to hug the outer rail 23 of the passage. Thus the centrifugal force is used to advantage in locating certain holes or pockets 25 at the high loops of the rail but at the low side of the passage at the points mentioned. It can be seen that if a ball is entering the spiral passage with sufficient momentum the centrifugal force holds the ball outwardly to miss said holes 25 thus enabling the ball to continue its travel circumferentially inwardly toward the point about which the helix is generated.

In the spiral passageway along a transverse diameter as viewed in Figure 1, the slope of the table makes the force of gravity a consideration, especially if the centrifugal force of a rolling ball is spent, and therefore along this line it will be observed that holes 26 are provided in the table, in each loop of the spiral passage, but these holes are spaced a slight distance in an outward direction away from the inner rail portion at the points mentioned. These holes 26 are thus positioned to trap a down hill rolling ball losing, or having lost, its centrifugal force and therefore unable to hug the outer rail side of the spiral passage.

Some balls moving around the spiral passageway will lose their momentum and finally come to rest, or equilibrium at the low point of the various loops, it being remembered that the table 12 slopes downwardly toward the front wall 11. To clear balls coming to rest at these low points of the several loops of the spiral, a series of holes 27 is formed through the table in the spiral passageway. Each of these holes 27 is spaced a distance away from the low rail side of each loop, a distance equal to about one half the diameter of a ball used so that when a ball rolls around a loop with sufficient momentum, the centrifugal force holds the ball outwardly against the rail to keep clear of the holes 27 in a manner readily understandable. Each said hole has a forwardly cut kerf 28 arranged in the table so that a ball coming to rest at these points becomes unbalanced and falls through the holes 27 to clear the passageway.

At or near the terminal inner end of the spiral passageway is arranged a resilient bumper obstacle 29 preferably made of live rubber so that a ball hitting same may rebound. In the final inner loop of the spiral passageway adjacent rail part 24 is formed a hole 30 through the table to permit a ball losing momentum and missing the bumper 29 to be trapped and fall through the table 12.

Thus, it will be seen that all balls entering the spiral passageway will find an outlet through one or another of the holes described and drop to a position below the table.

Because of the action of gravity, balls rolling down the table 17 on the downside of the spiral passageway, which is at the left in Figure 1, since the balls travel counterclockwise, there is an ap-

parent, if not actual acceleration in the speed of travel of the balls. To keep balls confined in the passageway, especially in the outer loop thereof, the outer rail part of the lower half of said loop carries an upper rail part 31. The entire spiral rail structure may be constructed of separate short arcuate sections as shown in Figure 1 to simplify manufacture and assembly and the joints between adjacent sections may be smooth to encourage faster travel of a ball around the passageway, or by having the said joints slightly offset a retarding effect on the speed of travel of a ball can be achieved.

When balls fall through the holes in the table 12 they are received by the ball routing panel 17 which may be formed with appropriate alley grooves such as the one shown at 32 in Figure 2. In such grooves may be located one or more roll-over spring blade switches for an electrical circuit, not shown, to operate a conventional score keeping mechanism. These alleys 32 will be suitably arranged to receive balls from the various holes in the game table and the positioning of the switches 33 can be used to take care of a different score value for each of the holes in the well known manner.

Balls rolling down the panel 17 enter the cross chute 18 and the groove 19 so that the lifter 20 can function to lift them one at a time to a position on the table 12, where they can be propelled by the projector 14.

The use and operation of the game structure is now perfectly plain from the above description and it can now be seen that an improved ball rolling game has been provided, which achieves all of the desirable objects heretofore recited.

It is the intention to cover herein all such changes and modifications of the example shown for the purposes of the disclosure, which do not in material respects constitute departures from the spirit and scope of the invention.

What is claimed is:

1. For a ball rolling game having a table sloped slightly from the horizontal and including means to propel a ball onto the surface of the table, an obstacle means comprising a spiral rail structure carried on the table and providing a spiral passageway open at its outer diameter to receive a ball propelled onto the table, all convolutions of the spiral passageway lying in the plane of the table surface, said passageway providing a series of loops to cause a ball having the necessary momentum to roll around the passageway toward the center or point of generation of said spiral rail structure, said rail structure at said point forming a pocket on the table with a hole in said pocket formed through the table, and a resilient bumper element separate from the terminal end of the spiral rail and carried on the table closely adjacent the inner terminal end of the spiral passageway in advance of the hole and spaced therefrom so that a ball may either pass the bumper element for delivery through said hole or hit the element for rebound from said pocket.

2. For a ball rolling game having a table sloped slightly from the horizontal and including means to propel a ball onto the surface of the table, an obstacle means comprising a spiral rail structure carried on the table at a level thereabove to permit a ball to ride centrifugally thereagainst and providing a spiral passageway open at its outer diameter to receive a ball propelled onto the table with all convolutions of the spiral

passageway lying in the plane of the table surface, and an auxiliary superposed rail carried above the lower half portion of the outer loop of the spiral rail structure.

5 3. For a ball rolling game having a table sloped slightly from the horizontal and including means to propel a ball onto the surface of the table, an obstacle comprising a spiral track structure carried on the table and providing a spiral passage-
10 way open at its outer diameter to receive a ball propelled onto the table, all convolutions of the spiral passageway lying in the plane of the table surface, the portions of the track structure at the low side of the sloped table having a greater
15 height than the portions thereof at the high side of the table, said passageway providing a series

of loops to cause a ball having the necessary momentum to roll around the passageway toward the center or point of generation of said spiral track structure, said track structure at said point forming a pocket on the table with a hole 5 in said pocket formed through the table, and a resilient bumper element disposed in said pocket closely adjacent the inner terminal end of the spiral track structure but in advance of said hole and spaced therefrom so that a ball may either 10 pass the bumper element for delivery through said hole or hit the element for rebound from said pocket.

BON G. MacDOUGALL.

HERBERT G. BREITENSTEIN. 15