May 16, 1950 E. H. HUGHES 2,507,716

BALL DEFLECTING DEVICE

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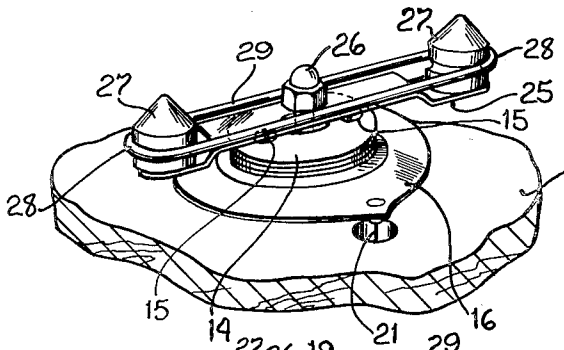
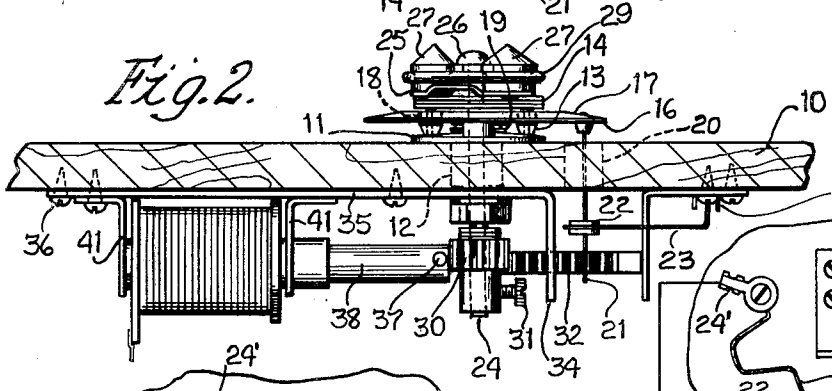


Fig. 1.

Fig. 2.



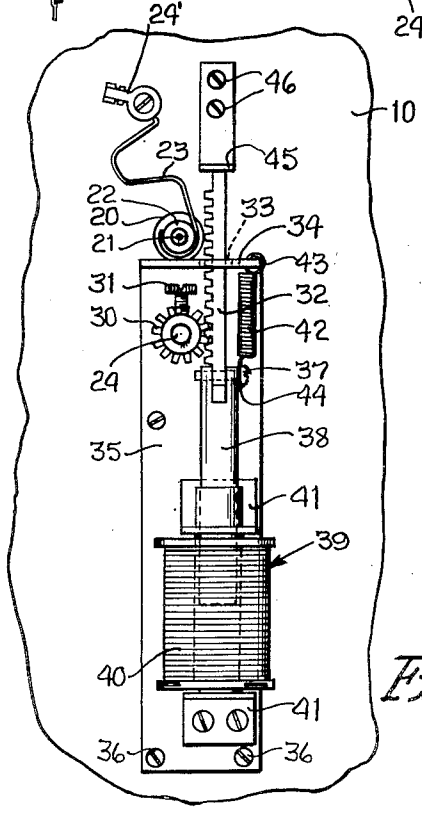


Fig. 3.

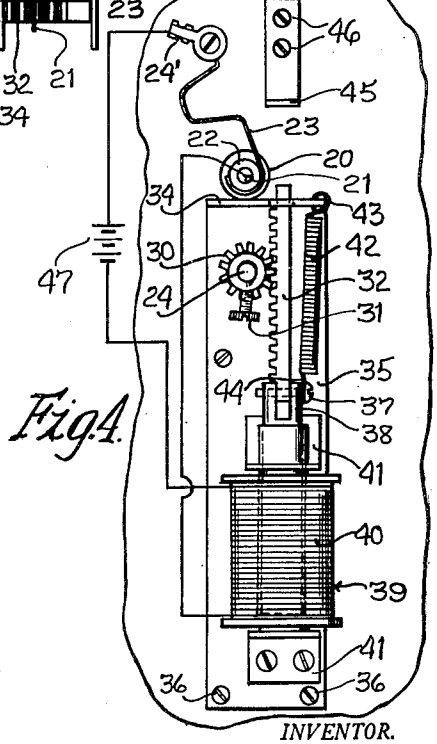


Fig. 4.

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BALL DEFLECTING DEVICE

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1 Claim. (Cl. 273—118)

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This invention relates to certain new and useful improvements in ball deflecting devices in which there is a rotatable bumper adapted to be set into rotary motion by the engagement therewith of a ball, to be projected by the bumper structure, with a tiltable disc the tilting action of which completes a circuit to the bumper rotating mechanism.

My improved rebound device is especially adapted for use as a target upon an inclined board of a ball rolling game.

An object of the invention is the provision of a device of this character arranged and constructed for placement on an inclined board, to be struck by a rolling ball and being adapted when struck by the ball to effect a rebound of the ball back upon the board through a path different from that travelled by the ball in its direction toward the device. This arrangement enables the player to exercise a certain degree of skill in deflecting the ball at different angles upon the board over which it is adapted to roll.

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 the rebound device mounted upon an inclined playing board;

Fig. 2 is a vertical sectional detail view through the board showing the device mounted thereon;

Fig. 3 is a bottom plan view of the board as seen in Fig. 2; and

Fig. 4 is a bottom plan view of the device similar to that shown in Fig. 3 but showing different parts thereof in different positions.

Referring more particularly to the drawings showing the preferred form of construction of my improved rebound device, a playing field or board is indicated at 10. This board is usually arranged within a suitable cabinet (not shown) at an inclination with respect to the horizontal so that balls projected to the upper end of the board are adapted to gravitate down thereover against one or more targets.

On this board 10, I mount my improved rebound device. This rebound device includes a base 11 having a central laterally extending boss 12 frictionally fitting into an opening formed in the board 10. This base 11 comprises radially disposed spacer bars 13 which carry a top plate 14. The top plate 14 is secured to the board 10

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by means of screws 15 projected through certain of the spacer bars 13.

Arranged beneath the top plate 14 is a disc 16 of circular formation having an outwardly and downwardly tapered peripheral edge portion 17 which is adapted to be engaged by a rolling ball.

This disc 16 has openings 18 formed therein through which freely project the spacer bars 13. The disc 16 is mounted upon a coil spring 19 arranged between the disc 16 and the base 11. The bumper structure thus far described is substantially similar to that described in U. S. Patent No. 2,302,184. The arrangement is such that a ball rolling down the board 10, upon engagement with the disc 16, will tilt the disc 16 against the action of the spring 19, the spring 19 serving to yieldably support the disc 16 in a substantially horizontal position.

Formed in the board 10 is an opening 20 through which projects a contact finger 21. This contact finger 21 extends beneath the board 10 and is projected through a contact ring 22 and is normally in spaced relation with the ring 22. The contact finger 21 will engage the ring 22 upon tiltable movement of the disc 16 by a rolling ball in the manner hereinbefore set forth. This contact ring is supported by a conductor arm 23 which in turn is connected to the board 10 by a conductor clip 24' to which a conductor wire is adapted to be attached. Projecting through the boss 12 and the base 11 and top plate 14 is a shaft 24. The upper end portion of the shaft 24 carries a striker arm 25, the same being attached to the shaft by means of a nut 26. This striker arm is of elongated formation and is adapted to be rotated in a plane parallel to the top surface of the board 10. The arm 25 at opposite end portions has secured thereto in any suitable manner grooved posts 27, into which grooves the end portions 28 of an elastic bumper 29 are mounted. This elastic bumper 29 is adapted to engage the ball which tilts the disc whereby upon such engagement the ball will be projected back upon the board for travel down a path different from that which it took in its travel toward the disc 16.

The means for rotating the arm 25 to accomplish this purpose includes a pinion 30 fixed to the shaft 24 by a set screw 31. This pinion meshes with a rack bar 32. This rack bar is slidably projected through an opening 33 formed in a depending end portion 34 of a supporting plate 35, the latter secured to the board 10 by means of screws 36.

The rack bar 32 is pivotally connected as at

37 to the plunger 38 of a solenoid 39 including a coil 40. This solenoid 39 is supported from the plate 35 by depending brackets 41. The plunger 38 and rack bar 32 are yieldably held in projected position by means of a spring 42 having one end connected as at 43 to the end portion 34 of the plate 35 and an opposite end portion connected to the plunger 38 as at 44. The outward projected position of the rack bar and plunger is limited by a stop 45 secured to the board 10 by screws 46. The conductor arm 23 through its conductor clip 24' is connected to one side of a suitable power source 47. The other side of this power source is connected to one side of the coil 40, the other side of the coil 40 being connected to the conductor finger 21.

The arrangement is such that a ball rolling down the board 10 upon striking the disc 16 will tilt the same relative to the board. The tilting of this disc 16 will move the contact finger 21 into engagement with the contact ring 22 and set up a circuit to the coil 40. Energization of the coil 40 will cause the plunger 38 to move inwardly of the coil, moving the rack 32 therewith and rotating through the pinion 30 the shaft 24. Rotation of this shaft 24 will rotate the striker arm 25, striking the bumper 29 against the ball. The striking of this bumper against the ball will rebound the ball back upon the board in a path at an angle with respect to the path travelled by the ball toward the disc 16. By the use of a rebound device of the construction herein described a livelier ball is presented upon the board much to the increased amusement of the player.

Any number of rebound devices of the construction herein described may be used upon the same board.

The rebound device herein described may be constructed at an economical cost and will be highly efficient in use. It may be sold as an accessory for incorporation upon the boards of games in use.

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 claim.

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

A rebound device including a base plate adapted to be mounted on a board providing a playing surface, a tiltable disc supported by said base plate, a shaft projecting upwardly through said base plate and said disc, a striker arm carried by said shaft above said disc, a pinion fixed to said shaft, a rack bar meshing with said pinion, an electromagnetic element including a plunger, means pivotally connecting the plunger to the rack bar, an electric circuit for said electromagnetic element, a switch including cooperating switch elements, one carried by the disc for movement therewith and the other carried by the board and engageable with said one element when said disc is tilted by engagement with a rolling ball, and yieldable means for moving the plunger and rack bar in a direction opposite to the movement of said plunger and said rack bar by said electromagnetic element.

EDWARD H. HUGHES.

REFERENCES CITED

The following references are of record in the file of this patent:

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2,004,190	Breitenstein	June 11, 1935
2,302,184	Caestecker	Nov. 17, 1942