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BALL GAME SWITCH

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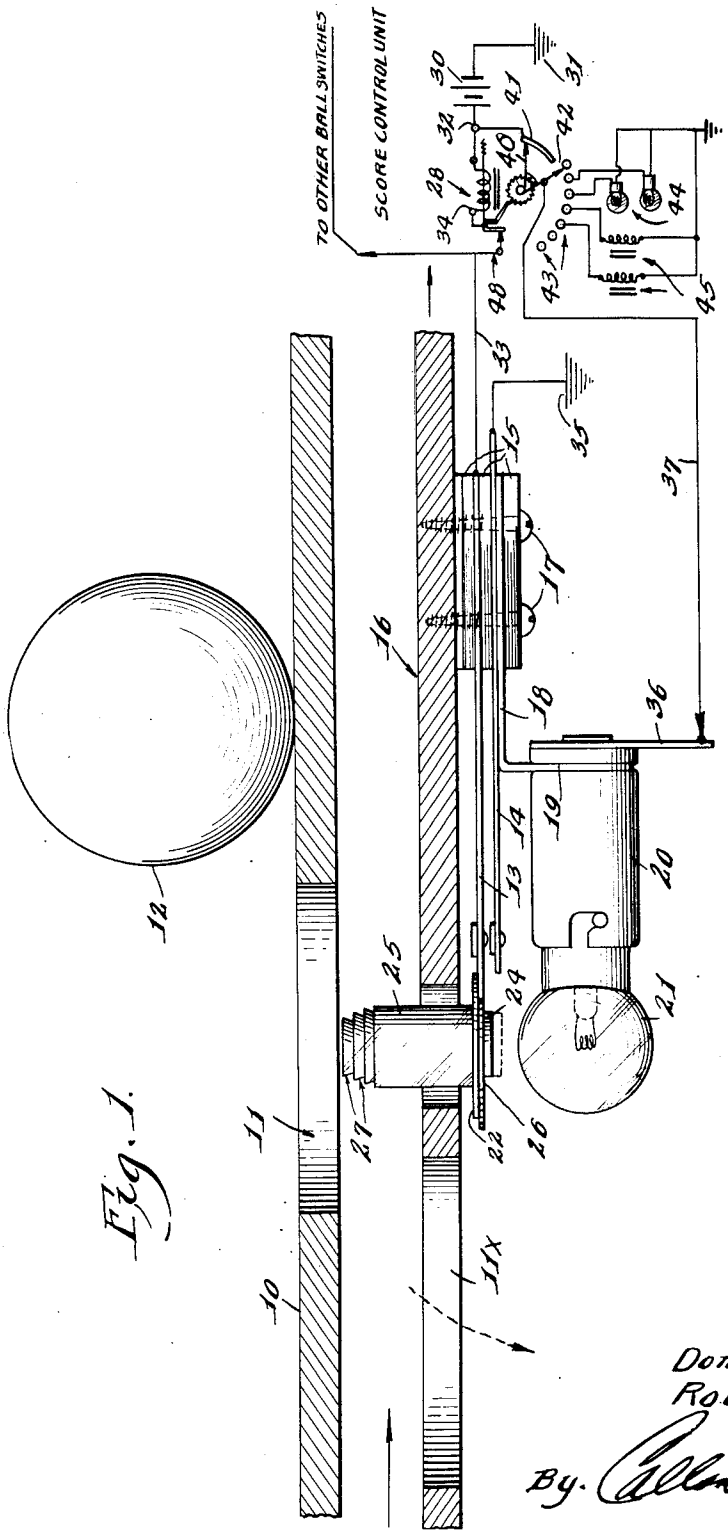


Fig. 1.

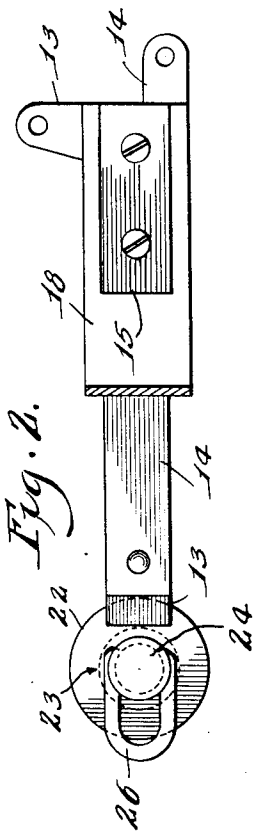


Fig. 2.

Inventors.
Donald E. Hooker.
Robert Brgither.
By. Allen Withington
Attorney.

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BALL GAME SWITCH

Donald E. Hooker, Skokie, and Robert H. Breither, Mount Prospect, Ill., assignors to Raymond T. Moloney, Chicago, Ill.

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This invention pertains to amusement apparatus of the ball-rolling variety, and to improved, ball-operated switch means especially adapted for use with bagatelle and similar games, said switch means, however, being adaptable to other uses and applications, such that the invention is conceived to reside both in the switch means itself, and in combination with certain game structure, as will hereinafter more fully appear.

The principal objects of the invention are, therefore, the provision of ball game apparatus including a ball rolling board with one or more ball exits therein, and a switch having an operating element positioned in the ball exit to be engaged by a ball, the weight of which closes the switch for various control purposes, there being a small light which is part of the switch, and the aforesaid operating element being translucent and illuminated by said light.

A further object is the provision of certain circuit connections for the switch and light such that the presence of an illuminated switch operating button or member in a ball exit will have a significance to the player as to whether the associated ball switch is at that time in a scoring circuit or not.

Additional objects and aspects of novelty in the invention relate to details of construction and operation of the preferred embodiments hereinafter particularly disclosed and described in view of the accompanying drawing, in which:

Fig. 1 is a fragmentary vertical cross section, to enlarged scale, of a ball-rolling game board, showing the novel switch structure in elevation, together with certain illustrative circuit connections;

Fig. 2 is a bottom plan view of the novel switch structure.

Referring to Fig. 1, the upper section 10 of the usual ball rolling game is provided with a plurality of ball exit openings 11, of which only one is shown, and into which exit the ball 12 may roll following release or projection under control of the player, such balls commonly being shot out upon the surface of the play field or board 10 by some form of plunger projector (not shown) well-known in the art.

In prior forms of these games, some kind of retaining means is normally disposed beneath the ball hole or pocket 11 to support the ball temporarily therein: commonly, a form of leaf spring or jack switch was employed for this purpose, the switch being operated by the ball for divers control purposes.

In accordance with the present invention, a

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leaf-spring switch, consisting of a pair of spring contacts 13 and 14, supported between insulating wafers 15, is attached to the underside of a movable subpanel or shuffle panel 16, as by screws 17.

A bracket 18 is assembled with the switch, and has an offset end portion 19 upon which is mounted a lamp socket 20 adapted to support a light bulb 21 in the region beneath the outer end of the longer of the two contact springs 13.

Affixed to said outer end of contact arm 13, as by soldering or the like, is a metal piece 22 provided with an opening 23 (Fig. 2) in alignment with the center of brilliancy of lamp 21, and into which projects the reduced end 24 of a switch button or stud 25, which has an annular groove formed in the lower projecting portion thereof to receive a spring retaining washer 26 (Fig. 2 particularly) holding the stud 25 in assembled relation with the seating piece 22.

The switch button 25 is formed from a translucent material, such as a plastic, for example Lucite rod stock, in which the lower attaching or mounting projection 24 is molded or turned down, and in which the upper end portions are recessively flanged or terraced to provide a plurality of annular lands or shoulders 27 affording enhanced luminosity and radiation of light from bulb 21.

The switch buttons or studs 25 are also preferably of various colors to afford variety as well as distinctive identification for the various ball pockets.

When a ball 12 lodges in the pocket or exit 11, it rests on the switch button 25 and by its weight closes switch contacts 13 and 14 to actuate some controlled instrumentality in the game, such as a conventional score control circuit or unit 28, which, among other things, may operate to extinguish a previously illuminated lamp 21 to indicate that the associated ball pocket 11 was now dead or occupied.

In the illustrative circuit arrangement shown in Fig. 1, the lamp 21 is illuminated from battery or power source 30, one terminal of which is grounded at 31, and the remaining terminal of which connects with one terminal 32 of the score circuit control unit 28, the operating circuit for which is completed, as far as pocket 11 is concerned, by connection 33 from unit terminal 34 to one of the ball switch contacts 13, the remaining switch contact 14 being grounded at 35, such that when switch contacts 13 and 14 are ball-closed, the score unit is energized in a known manner to produce desired control functions,

such as closure of score lamp circuits, relay circuits, and the like.

In the circuit shown, which is illustrative of only one of numerous applications of the device, the lamp 21 will remain illuminated as long as the stepping switch contact 40 rests on the elongated contact 41, this circuit being from ground 35, contact spring 14 commoned to lamp socket bracket 18, socket contact 36, conductor 37, now closed contacts 40—41, terminal 32, battery 30, to ground 31.

Since the score control stepping switch 28 is adapted for connection to similar ball switches in the game, wiper contact 40 might be stepped away from contact 41 before any ball were lodged in pocket 11, in which case a second stepping switch wiper contact 42 would no longer rest on any of the scoring contacts 43, and the particular ball switch shown would be considered dead until such time as it might again be switched into a scoring circuit. Various scoring indicators or instrumentalities are shown schematically in the form of lamps 44 and relay coils 45, and since wiper contact 42 is looped to contact 40, it will be understood that any of the devices 44 or 45 may be energized by appropriate stepping of the control unit switch means 28.

A play field utilizing a number of the novel switches, each provided with an integral luminosity button or member 25 of different color from the others, give a very attractive effect to the game and greatly enhances the player appeal; moreover, the action resulting from flashing on and off of the colored indicators in the ball pockets themselves adds greatly to the action effects of a given game.

When a ball is lodged in pocket 11, closure of contacts 13 and 14, as heretofore mentioned, energizes the score control unit stepping switch 28, and this switch will step a plurality of times by reason of the breaker contacts 48 in the energizing circuit thereof, as a result of which contact 40 will leave contact 41 and lamp 21 will ultimately be extinguished.

When the game is completed, as by shooting a determined number of balls onto the playfield, the shuffle panel 16 will be moved in the direction of the solid-line arrows, thereby withdrawing button 25 from supporting position beneath the ball, so that the latter drops through the release passage 11X, which is brought into alignment with pocket 11 by the aforesaid release motion of the shuffle panel.

It is contemplated that the novel switch will have applications and utility apart from any kind of amusement apparatus, for example, as an illuminated push-button switch of inexpensive, unitary structure, by which is meant that the lamp, switch, and luminosity element are all assembled in one unit for expedient mounting in operative position by one or two screws.

Having thus described our invention, improvement, and discovery in full, clear, concise and exact terms as required by statute, we particularly point out and distinctly claim the parts, improvements, and combinations which we claim as our invention as follows:

1. In a stack switch of the type including at least two cooperable spring switch blades fixed at one end so that their opposite free ends may flex relative to each other in switching operation, a luminous button structure comprising, to wit: an annulus attached at one side thereof to a free end of one of said blades with the annulus lying in a plane closely parallel to the plane of the blade and the hole in the annulus disposed beyond the end of the blade, an elongated stud of translucent material having one end reduced to fit into said hole and project beyond the annulus, whereby the stud is seated on the annulus, clip means engaging the projecting portion of the reduced end of the stud to retain the latter on the annulus, with the stud projecting at substantially right angles to the planes of the annulus and blades, said stud being adapted to be illuminated by light directed inwardly thereof through said reduced end.

2. An illuminated ball switch comprising plural flat spring switch blades fixed at one end in a mounting stack and adapted to flex to bring their outer free ends into and out of circuit-closing engagement, a particular one of said blades having its free end projecting beyond the ends of the others, said particular free end having means providing a light passage therethrough, and an elongated stud of translucent material having one axial end reduced in diameter to project through said light pasage, means engaging the projecting part of the stud for holding the same on said particular blade end, the opposite free end of said stud projecting substantially beyond the plane of said particular blade for engagement by a ball, means secured in assembly with said blades for supporting a lamp beneath said reduced end of the stud to transmit light through the latter.

3. A switch structure according to claim 2 and further characterized in that said stud has a plurality of circular lands formed one above another at said free end of the stud, said lands being circumambient of the long light transmission axis, and being of decreasing diameter from the innermost land toward the outermost land, whereby to afford light facets in a terraced or stepped relation.

DONALD E. HOOKER.
ROBERT H. BREITHER.

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