Aug. 18, 1936. M. N. TIGERMAN 2,051,229

PINBALL GAME

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Fig. 1.

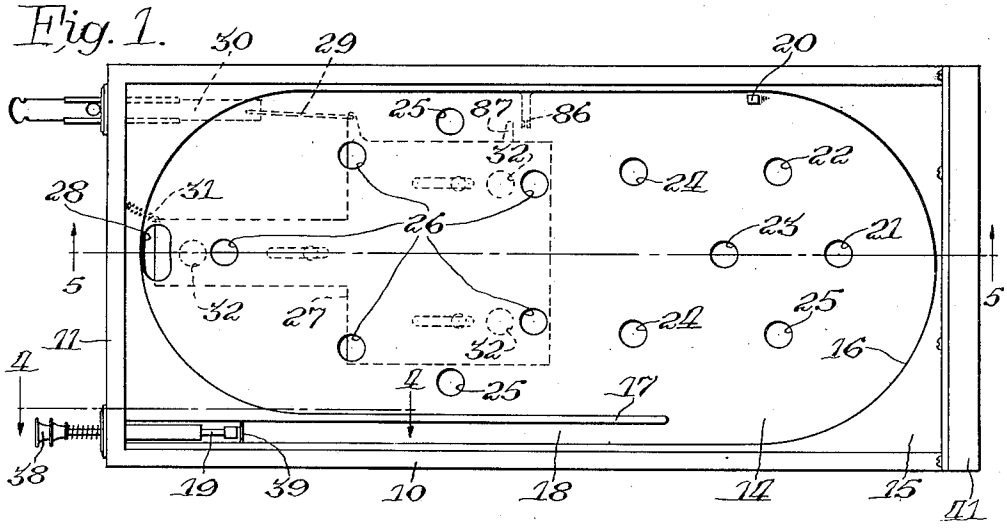


Fig. 2.

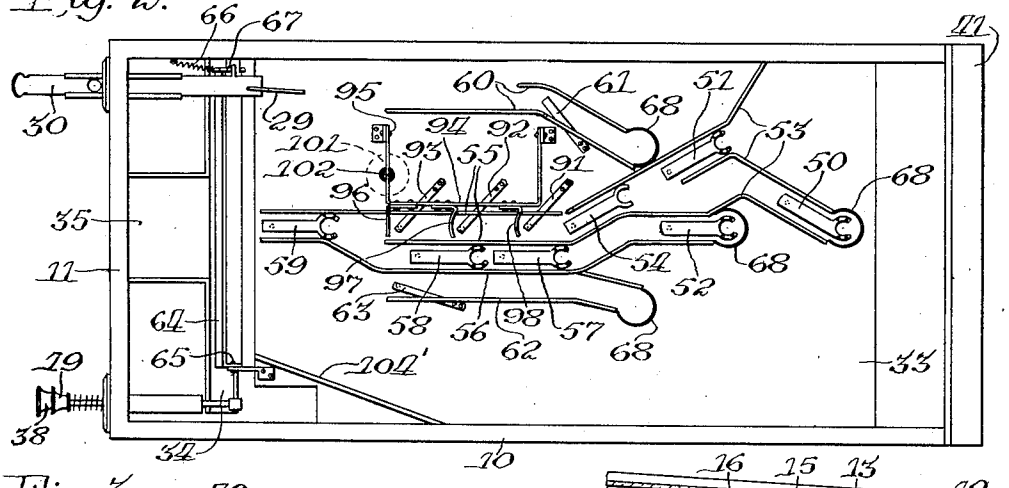


Fig. 3.

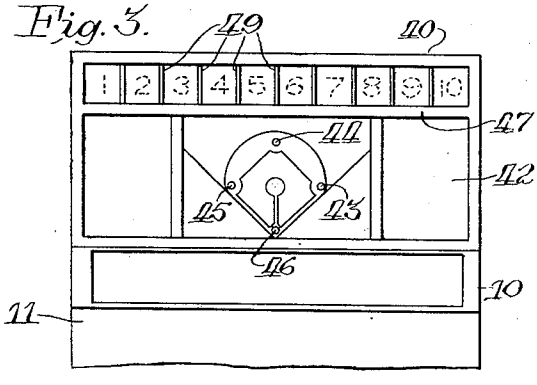
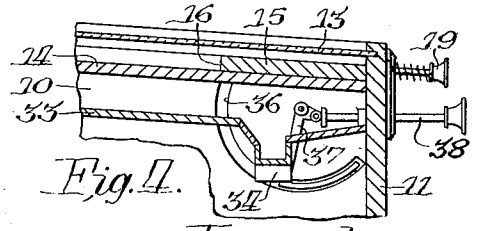


Fig. 4.



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PINBALL GAME

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Fig. 5.

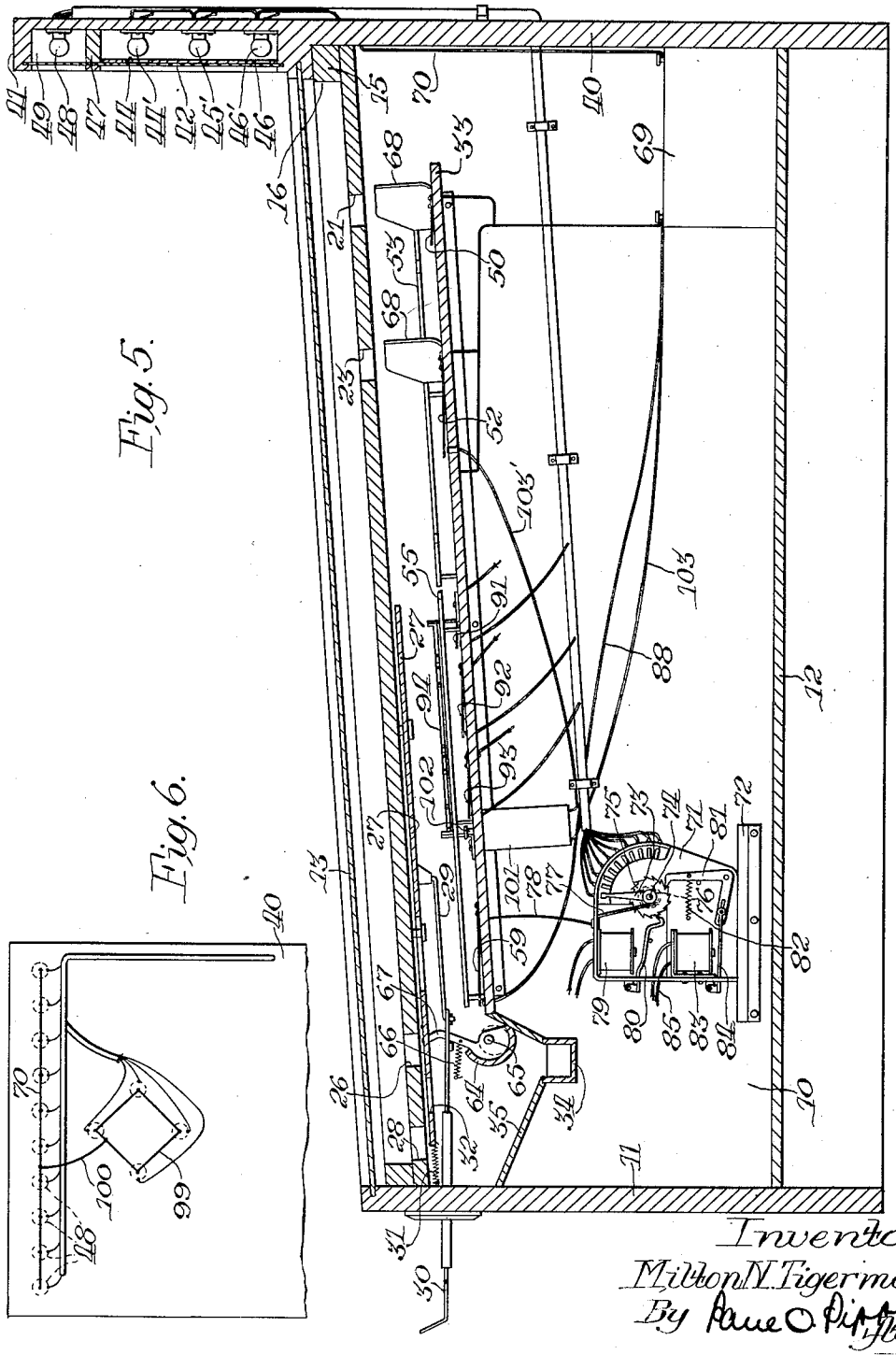

Fig. 6.

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Fig. 7.

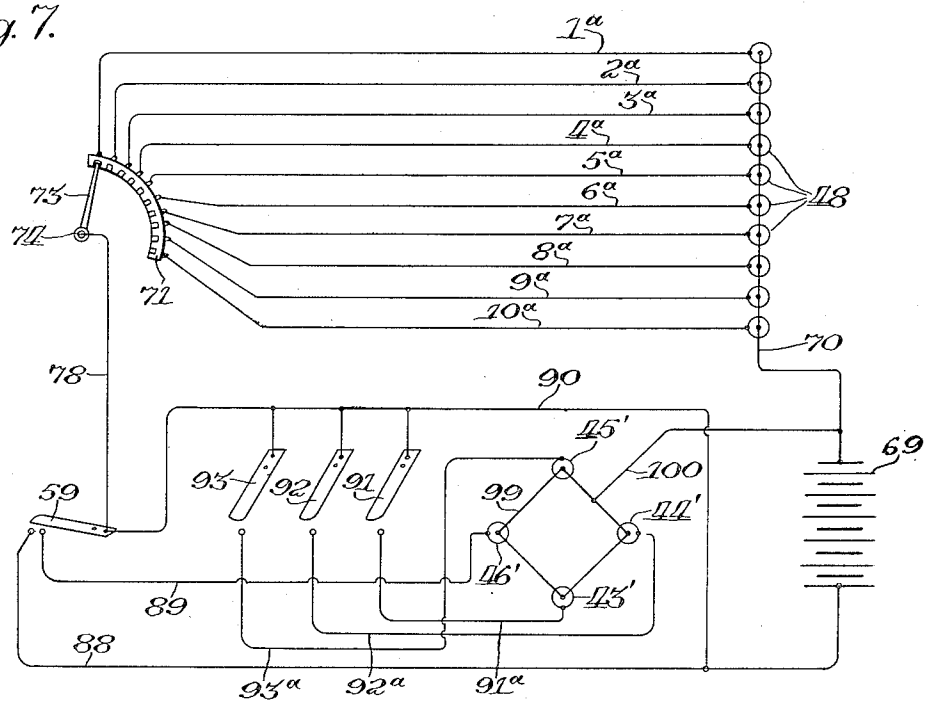


Fig. 8.

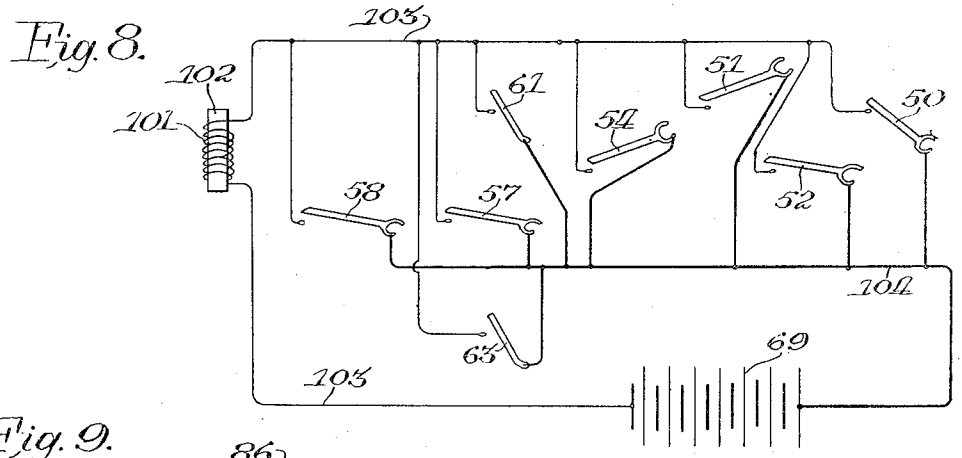
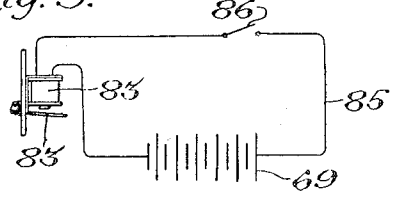


Fig. 9.



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UNITED STATES PATENT OFFICE

2,051,229

PINBALL GAME

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Application April 26, 1935, Serial No. 18,421

3 Claims. (Cl. 273—121)

The invention relates to ball rolling games in which projected balls roll over a play board, the board being provided with holes to trap the balls. Games of this type are generally known as pin ball games. In the present game each ball receiving hole having a scoring value has associated therewith a switch so that the trapped balls serve to close circuits leading to lamps arranged on a score board, or the like.

More particularly, then, the game is of the so-called light-up type, and especially one in which the score indicating lights advance progressively as the balls lodge in scoring positions.

An expedient way of depicting the progressive light score indicating invention is in connection with a baseball game, for example, where runners must advance around the bases of a diamond and the score total in runs must be increased as scoring plays take place. For that reason a structure simulating the play of a baseball game will be disclosed, although it is to be understood the progressive lighting may be utilized in other types of games, such for instance, as a race horse game in which the progressive lighting would indicate the advancing position of a simulated horse in the progress of a race.

Accordingly, the main object of the invention is to provide an improved game of the pin ball type having a novel progressive scoring arrangement utilizing lights.

Another object is to provide in such combination an improved form of ball controlled selector switch to regulate the progressive lighting.

Still another object is to provide an improved baseball game in which the play action and scoring are indicated by lights.

It is also an object to provide an improved circuit control mechanism for a progressive light up pin ball game.

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

These pin ball games comprise a cabinet including a play board inclined slightly from the horizontal so that balls projected to the upper end thereof may gravitate down the board to drop into and through holes formed therein. In the present form of the game some of these holes represent "hit" holes and include switches thereunder which are normally open. When a ball drops into a "hit" hole the switch therebelow is closed to close a circuit leading to an electromagnetic device such as a solenoid to energize same. The balls as they fall through the "hit" holes land on an under panel and are guided to roll through a passage having a series of normally open switches therein. There are four switches in this passage corresponding to the four bases of a baseball diamond, the representation of which appears on a vertical extension at the rear end of the cabinet. Each of these four switches on the under panel in said passage are for closing circuits leading to lights respectively located at the bases in the diamond representation. In the control passage mentioned are gates normally in a down position to prevent balls from rolling therethrough. When a ball drops through a "hit" hole it rolls over and closes a switch to energize the solenoid mentioned, which raises the gate. In this fashion a ball may roll progressively through the control passage and over the switches as hits are made to advance the lights around the diamond. When a ball has progressed in this fashion through the control passage the final switch closes a circuit to a progressive switch to close circuits to score runs by light indicators arranged in line on said cabinet extension adjacent the diamond.

Other holes are provided in the play board to take balls out of play. The balls that scored hits accumulate in a tiltable tray so that they cannot be played more than once. By means of a coin released slide and a movable member under the board all balls, at the termination of play, may be released to enable another playing of the game, said member serving to control resetting of the selector switch and open all score and play indicating circuits to turn off the indicating lights.

In the accompanying drawings showing one practicable embodiment of the inventon:

Figure 1 is a general plan view of the game;

Figure 2 is another plan view of the game with the top game board removed;

Figure 3 is a front elevational view of the vertical score and play indicating board extension at the rear end of the cabinet;

Figure 4 is a detail, longitudinal, sectional view, on a reduced scale, taken along the line 4—4 of Figure 1, looking in the direction of the arrows, to illustrate the ball lifter;

Figure 5 is a central, longitudinal, sectional view, on an enlarged scale, through the game, taken along the line 5—5 of Figure 1, looking in the direction of the arrows;

Figure 6 is a diagrammatic view showing a wiring diagram for the lights on the diamond and score indicating strip;

Figure 7 is a wiring diagram, showing the light circuits and switches controlling the same;

Figure 8 is another wiring diagram, showing

the solenoid circuit for regulating progression of balls through the control passage; and,

Figure 9 is another wiring diagram showing the resetting switch for restoring parts to game play starting position.

As shown in Figures 1, 2 and 5 the game is enclosed in a cabinet 10, having a front wall 11, a floor 12, and a glass panel top 13. A game board 14 is mounted in the cabinet, the same being sloped slightly from the horizontal, with its lower end being disposed adjacent the front wall 11. A marginal plate 15 provides an oval ball guide edge 16, and a wall 17 provides a ball projection passage 18 along the right hand side of the board 14, as shown. The front wall 11 carries the usual spring pressed plunger 19 for projecting balls, one at a time, through the passage 18, and along the upper edge 16, to a spring rebound element 20, as is usual in these games.

The upper end of the board 14 is formed with "hit" holes 21 and 22; a home run hole 23, and a pair of "sacrifice" holes 24. Also there are three "out" holes 25. Other holes 26 may also be provided to take balls received thereby out of play, there being a panel 27 shiftably mounted, in any appropriate manner, under these holes 26 to support balls entering these holes, so that they cannot fall through the board 14, in a manner well understood in this art. At the lower end of the board 14 is formed a spent ball pocket 28 under which an extension of the panel 27 is normally disposed. Thus, balls missing the holes on the board 14 gravitate to said pocket 28 to be temporarily held therein in an obvious manner.

This panel 27 carries a forwardly extending link 29 connected to the inner end of a conventional coin released slide 30 mounted, as shown, in the front wall 11 of the cabinet. The panel 27 is normally held in a forward position by a spring 31. Said panel is formed with a ball release hole 32 for some of the holes 26 in the board 14.

Obviously now, when the slide 30 is pushed rearwardly the link 29 pushes the slide panel 27 to cause release through holes 32 of balls lodged in the holes 26 in the board 14. As the rear edge of the plate 27 pulls out from under the pocket 28 any balls therein will also be released to drop through the board 14. A stationary ball routing panel 33 is carried in the cabinet below the board 14 and plate 27. Balls released from the holes 26 by said plate 27 fall onto the board or panel 33, and as the latter is forwardly inclined, these balls are directed into a transversely disposed trough 34. Balls from the pocket 28 fall onto an inclined guide plate 35 and are also directed to said trough 34.

As shown in Figure 4 this trough 34 is inclined toward the right hand wall of the cabinet 10, said wall having formed therein, an arcuate groove 36 into which the balls gravitate from the trough 34 in a well known manner. Adjacent the groove 36 said wall carries a pivoted ball lifter 37 operable by a manually actuated plunger 38 mounted in the front wall 11 of the cabinet. The lifter 37 when operated picks up a ball at the lower end of the groove 36 and elevates it therealong into the passage 18. Such balls so elevated then gravitate into a position against a stop 39 where they are in position to be projected onto the board 14, for play, by the shooter 19.

Looking at Figures 3 and 5 it will be seen that the cabinet 10 has a vertical rear wall 40 which extends upwardly to form a back board projecting above the top of the cabinet in the manner shown. This board 40 carries a top plate 41 to form a compartment closed at its front side by an opaque glass panel 42 having painted or otherwise formed thereon the representation of a baseball diamond including at the corners thereof, translucent spots to delineate first base 43, second base 44, third base 45, and home plate 46. Behind each base spot the board 40 carries respective lights numbered, 43' 44' 45' and 46'. (See also Figure 7.)

Above these lights is a plate 47 forming a transverse compartment above the diamond in which compartment the wall 40 carries ten lights 48, each arranged in its own box, provided by partitions 49 as shown in Figure 3. The front of this compartment is closed by the opaque glass 42 and is numbered with translucent numerals in order from left to right, reading 1 to 10 inclusive. This structure represents run totals, the lights 48 progressing from left to right as the runs are scored in a manner later to appear.

The under panel 33 carries a normally open spring switch 50 to receive and be closed by a ball dropping through the "hit" hole 21. A similar switch 51 is closed by balls dropping through "hit" hole 22; a switch 52 is closed by a ball dropping through the hole 23. Balls closing the switches 50, 51 are guided by rails 53 to roll over another switch 54.

From here the balls enter a progression passage delineated by parallel spaced rails 55. Between the inner rail 55 and a rail 56 is a passage to receive balls rolling over the switch 52, said balls then rolling to close switches 57, 58 in said passage. The outer rail 55 and the rail 56 at their lower ends are brought closer together to direct balls from these two passages to roll over a switch 59. Rails 60 form a passage to receive balls entering the left hand "sacrifice" hole 24, there being a normally open spring switch 61 in said passage. Similarly, a rail 62 forms a passage to receive balls entering the right hand "sacrifice" hole 24, there being a normally open spring switch 63 in said passage.

These "sacrifice" balls after they roll over and close the respective switches 61, 63 leave their respective passages and roll over the board 33 to the lower end thereof to be received by a transverse tiltably mounted tray 64, the ends of which include trunnions 65 for rockably mounting the same in the side walls of the cabinet, as appears in Figures 2 and 5. A spring 66 connected between the adjacent side wall of the cabinet and an upstanding lever 67 formed at the left hand end of the tray, serves to hold said tray in a normal ball receiving position. An extension boss (see Figure 2) on the inner end of the slide 30 is adapted to engage this lever 67, when the game is released for play, to tilt the tray forwardly about its trunnion mounting, to discharge the balls therefrom by gravity, said balls, in an obvious manner, thereupon gravitating into the ball delivery trough 34. Balls dropping through the "out" holes 25 also roll over the board 33 to said tiltable tray 64 to be taken out of play. Guides 68 may be mounted on the board 33 to guide balls dropping through the "hit" and "sacrifice" holes.

A battery 69 is mounted on the floor 12 in any appropriate place to serve as a source of electric energy. A main wire 70 leads from the battery, as shown in Figure 7 to connect with one terminal of each of the lamps 48. From the respective lamps, respectively, in order, lead circuit wires, 1^a, 2^a, 3^a, 4^a, 5^a, 6^a, 7^a, 8^a, 9^a and 10^a; leading respectively to ten contacts on an insulated plate 71 appropriately carried on a

bracket 72 as shown. Operatively associated with the ten contacts on said switch plate 71 is a turnable switch lever 73, made of conductor material, and turnable with a shaft 74 journaled in the plate 71.

This shaft carries fast thereon, a ratchet wheel 75, there being a coil spring 76 locked between the bracket and shaft, so that as the ratchet wheel turns step by step, the spring is energized. A brush 77 carried by the plate 71 connects the switch arm 73 electrically with a wire 78 leading to the switch 59. The plate 71 also carries an electro-magnet 79 with which is operatively associated a pivoted armature 80 formed as a pawl to directly engage the ratchet wheel 75 to move it every time the magnet is energized. A back lash preventing dog 81 is provided as a pivoted bell crank lever mounted on the plate 71, as shown in Figure 5, said lever being held normally to duty against the ratchet wheel 75, by a spring 82.

A second electro-magnet 83 is provided, the same having an armature 84 to release said dog 81. This magnet 83 is in a circuit 85 (see Figure 9) with the battery and a normally open switch 86, said switch being closed by a boss 87 on the shiftable plate 27 (see Figure 1) when the latter is moved rearwardly by the coin released slide 30. This energizes the magnet 83 to move the armature 84 to free the dog 81 from the ratchet wheel 75, whereupon the spring 76 is freed to drive the ratchet wheel reversely with the switch arm 73 to its initial starting position to the left side of the first contact on the plate 71.

The switch 59, which is the run scoring and indicating switch, cooperates with a pair of contacts, as shown in Figure 7, from one of which is led a wire 88 that is connected with the battery 69 to complete the run scoring light circuit. From the other contact for the switch 59 there is led a wire 89 that connects with the lamp 46' at the "home plate" position on the diamond. A wire 90 leads from said switch 59 back to the wire 88 as shown in Figure 7, said wire being tapped by short leads respectively to switches 91, 92 and 93, said switches being of the normally open spring type, and being mounted on the board 33 as appears in Figure 2. The open ends of these three switches lie in spaced relation across a control passage formed between the rails 55.

A U-shaped gate 94 is pivotally mounted at 95 on the board 33, said gate carrying three gate obstacles 96, 97 and 98 in spaced relation, as shown in Figure 2, which obstacles normally are positioned to obstruct passage of balls down the said control passage between the rails 55.

Looking now to Figure 7 the switches 91, 92 and 93 when closed respectively connect with wires 91^a leading to the "first base" lamp 43'; 92^a leading to the "second base" lamp 44'; and a wire 93^a leading to the "third base" lamp 45'. A common wire 99 connects these four base lamps 43', 44', 45' and 46' in parallel, and a lead 100 taps the wire 99 into the main line 70, as shown. This completes the description of the lamp circuits.

A solenoid 101 having a core 102 is mounted on the under side of the board 14, the core being of that type which in this instance will be pushed upwardly when the solenoid is energized. The core 102 is positioned to engage under one leg of the U-shaped gate 94 as shown in Figure 2, whereby to raise the same with its obstacles 96, 97 and 98 to allow balls in the control passage to progress toward the run scoring switch 59.

As shown in Figure 8 this solenoid is in a circuit wire 103 leading from the battery to the contact for "hit" switch 50, said switch in turn being tapped into a wire 104 leading back to the battery. Each of the switches 51, 52, 54, 57, 58, 61 and 63 is tapped into this wire 104; while the respective contacts for said switch arms are tapped into the wire 103. Obviously each of the switches shown in Figure 8 when closed will complete a circuit between the battery 69 and the solenoid 101, whereby momentarily to energize the latter. Thus, each said switch causes the gate 94 to be raised to permit the balls to roll progressively through the control passage between the rails 55. A rail 104' serves to guide balls rolling down the right hand side of the board 33 into the tray 64.

This completes the description of the game structure and the use and operation thereof will next be given.

In starting the play cycle, it is to be understood that a certain number of balls, such as ten, are sealed in the cabinet. These balls will be located in the holes 26, pocket 28, or in the tray 64. By coin releasing the slide 30 and pushing the same into the cabinet, the plate 27 is moved to register the holes 32 with the holes 26 so that balls therein will drop through onto the board 33. Balls from the pocket 28 also drop onto the board 33. At the same time the boss on the slide 30 engages the lever 67 to tilt the tray 64 to drop the balls therefrom. Consequently all ten balls roll into the trough 34. Movement of the plate 27 also momentarily closed the switch 86 to close the circuit of Figure 9, thereby energizing the ratchet release electro-magnet 83 to allow the spring 76 to return the switch arm 73 to its initial starting position on the plate 71, to the left of and to one side of the circuit with lamp wire 1^a. When the slide 30 is retracted the springs 31, 66 restore the plate 27 and tray 64 to normal position, as shown in Figure 5.

By means of the lifter 37 the balls may now be elevated one at a time in the conventional manner into ball projection position against the stop 39. By means of the shooter the balls can now be projected onto the top end of the board 14 to roll theredown toward the holes therein. Balls lodging in holes 26, and pocket 28, remain supported by the plate 27 and are thus taken out of play. Balls dropping through the "out" holes 25 roll down the board 33 and collect in the tray 64 also to be taken out of play.

If a ball drops into the "hit" hole 21 it is guided over the switches 50, 54 and comes to rest against the first obstacle 98 in the control passage. Of course, the solenoid 101 was twice energized, and the gate 94 raised and dropped twice in accordance, but nothing happened as no previously played balls had yet entered the passage. By the time this ball reaches the obstacle 98 the gate 94 is down again and said ball therefore comes to rest on the switch 91 to close the same. This closes the circuit 88, 90, 91^a, and 100 to light lamp 43' at "first base" on the diamond to indicate a hit has been made and that the runner is now on first base.

Let us assume now that another ball falls through a "sacrifice" hole 24. This ball is guided on the board 33 to close either the switch 61 or 63 and then rolls into the tray 64 to be taken out of play. If the switch 61 was closed the solenoid 101 was momentarily energized to raise the gate 94 so that the ball in the control passage progresses

from obstacle 98 to a position on switch 92 and against the obstacle 97. Thus the circuit 90, 92a has been closed to light the lamp 44' at "second base", and the "first base" lamp 43' circuit has been opened. The runner is now indicated to be on second base.

If the next played ball lodges in "hit" hole 22 the dropping ball rolls down the board 33 over switches 51 and 54 before lodging against the obstacle 98. Closing of the first switch 51 energized the solenoid 101 to raise the gate 94 so that the ball lodged against the obstacle 97 progresses to a position against the last obstacle 96 and on switch 93 to close same and light the lamp 45' to indicate the runner is on third base. As the same ball rolled over switch 54 the solenoid once more raised the gate 94 so that the ball against the obstacle 96 is now freed to roll over the run scoring switch 59. Closing of the switch 59 through wire 89 momentarily lights the lamp 46' to indicate the runner has crossed "home plate" and scored. Also the circuit to the magnet 79 has been closed through wire 78 and switch arm 73 by means of the brush 77, to cause the armature 80 to move the switch arm 73 from its initial starting non-score indicating position onto the first contact on the plate 71 to close the circuit 1a to the first lamp 48. Thus the score number 1 is lighted and displayed to indicate one run has been scored. The instant the scoring ball rolls off the switch 59 the same opens to deenergize the magnet and stop the switch arm, the ball then rolling into the tray 64 to be taken out of play. The last projected ball that initiated this action is now lodged against the obstacle 98 on the switch 91 which turns on the lamp 43' to show a runner is on "first base".

Let us assume the last, or tenth ball to be projected enters the "home run" hole 23. This ball rolls over the switches 52, 57 and 58. Each switch as it closes in order energizes the solenoid to raise the gate 94 so that the ball held against obstacle 98 in the first base position progresses over the light switches 91, 92 and 93, to light up the lights around the diamond to indicate the runner running around the diamond. Finally the ball leaves the control passage and rolls over the switch 59 which momentarily lights lamp 46' at "home plate" and also energizes the magnet 79 to cause the switch arm 73 to lodge on the second contact to close the circuit 2a leading to the lamp 48 for score numeral 2. The home run hit ball, which was the last ball projected, rolls over the switches 52, 57 and 58 in its path as above described and then rolls over the score and home plate light switch 59 to energize the magnet 79 again to cause the arm 73 to advance to the third contact to close the third circuit 3a to light run score numeral 3 in a manner that will now be readily understood. As all ten balls have now been played the game ends with a three run score total being displayed. Replay of the game is accomplished in the manner heretofore described.

It can now be seen that an improved progressive play indicating and score totaling light up game structure has been provided, which is simple and foolproof in operation and which achieves all of the desirable objects heretofore recited.

It is the intention to cover all such changes and modifications as do not depart from the spirit and scope of the invention as indicated by the following claims.

What is claimed is:

1. In a ball rolling game embodying a play board inclined from the horizontal and being formed with holes through which balls projected over the board may drop, a sloped panel below the board to receive balls therefrom, certain of the balls entering a control passage on the panel including a series of normally open light switches respectively in circuit with a series of play indicating lights, a movably mounted control gate embodying a number of spaced obstacles normally preventing rolling movement of balls through said passage and to hold the balls therein in light switch closing position, an electro-magnetic device to move the gate to free the balls for progression step by step between the obstacles and through the passage, and other normally open switches on the panel operable by balls to cause energization of the device to move the gate whereby to progress the balls over said light switches to progressively light the lights.

2. In a ball rolling game embodying a play board inclined from the horizontal and being formed with holes through which balls projected over the board may drop, a sloped panel below the board to receive balls therefrom, a control passage for the balls on the panel including a series of normally open light switches respectively in circuit with a series of play indicating lights, a movably mounted control gate embodying a number of spaced obstacles normally preventing rolling movement of balls through said passage and to hold the balls therein in light switch closing position, an electro-magnetic device to move the gate to free the balls for progression through the passage, other normally open switches on the panel operable by balls to cause energization of the device to move the gate whereby to progress the balls over said light switches to the final light switch, a rotary switch in circuit with the final light switch and means to operate the rotary switch, and said rotary switch including a series of contacts and score indicating lights included in the game, said final light switch serving to show a light in scoring position and at the same time operate the selector switch to tally the score on the score indicating lights.

3. For a ball rolling game embodying a play board inclined from the horizontal and being formed with holes through which balls projected over the board may drop, a sloped panel below said board and carrying a normally open switch, a series of score indicating lights included in the game including circuits for the lights, an indicator control for the lights comprising a rotary selector switch having contacts respectively disposed in said circuits, a wire leading from the panel switch to the selector switch, an electromagnetic device including means to turn the selector switch step by step from an initial starting position over the contacts to progressively close the light circuits and turn on the lights, said device being operative when balls rolling on the under panel roll over and close the switch thereon, means operatively associated with the panel to guide balls falling thereonto from certain of the holes in the top board over the panel switch to close the same, and operator controlled means for causing resetting of the selector switch by reversely moving it to its initial starting position.

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