

March 17, 1959

J. C. KOCI
SLIDING DISC GAME

2,878,022

Filed June 10, 1958

5 Sheets-Sheet 1

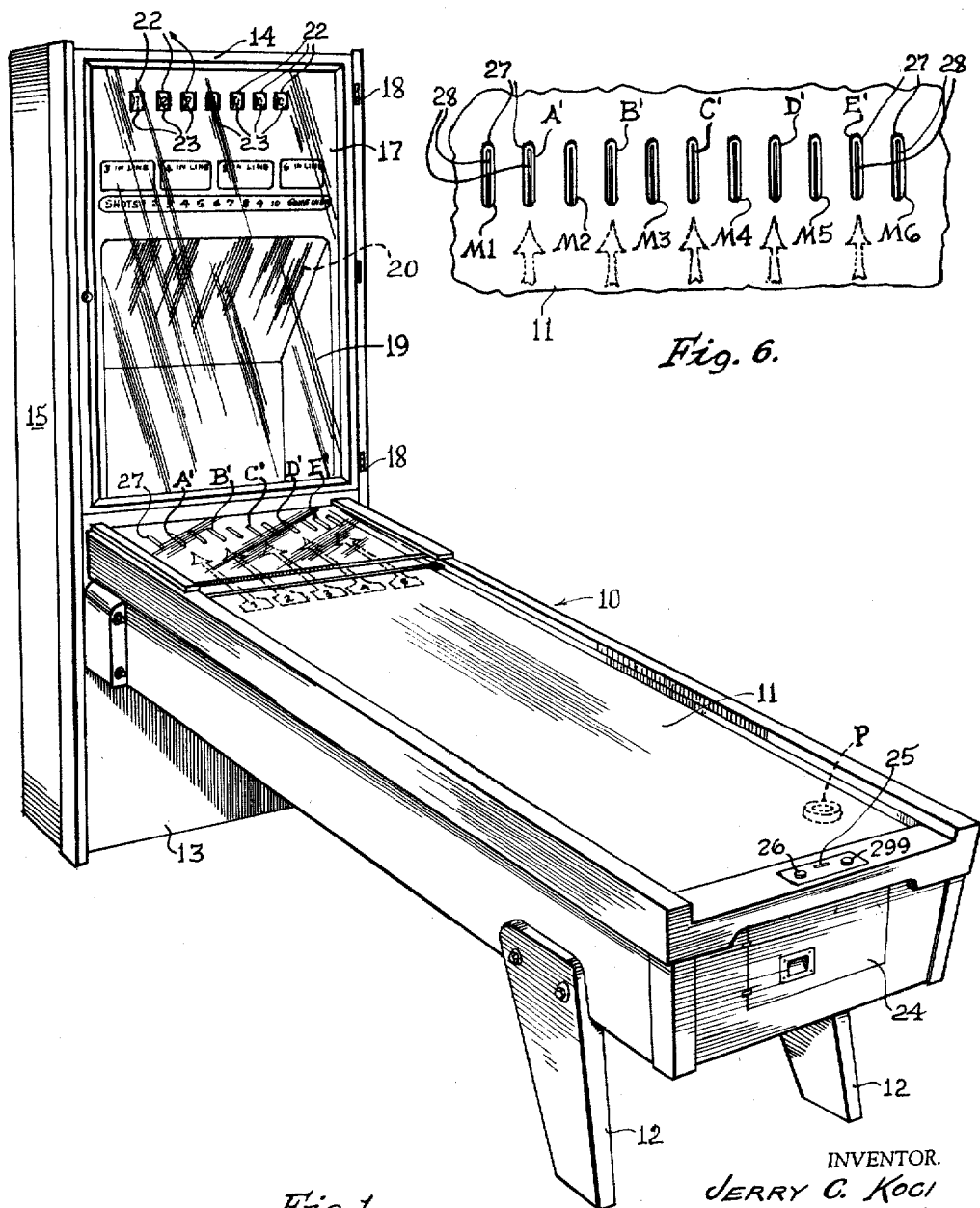


Fig. 1.

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5 Sheets-Sheet 2

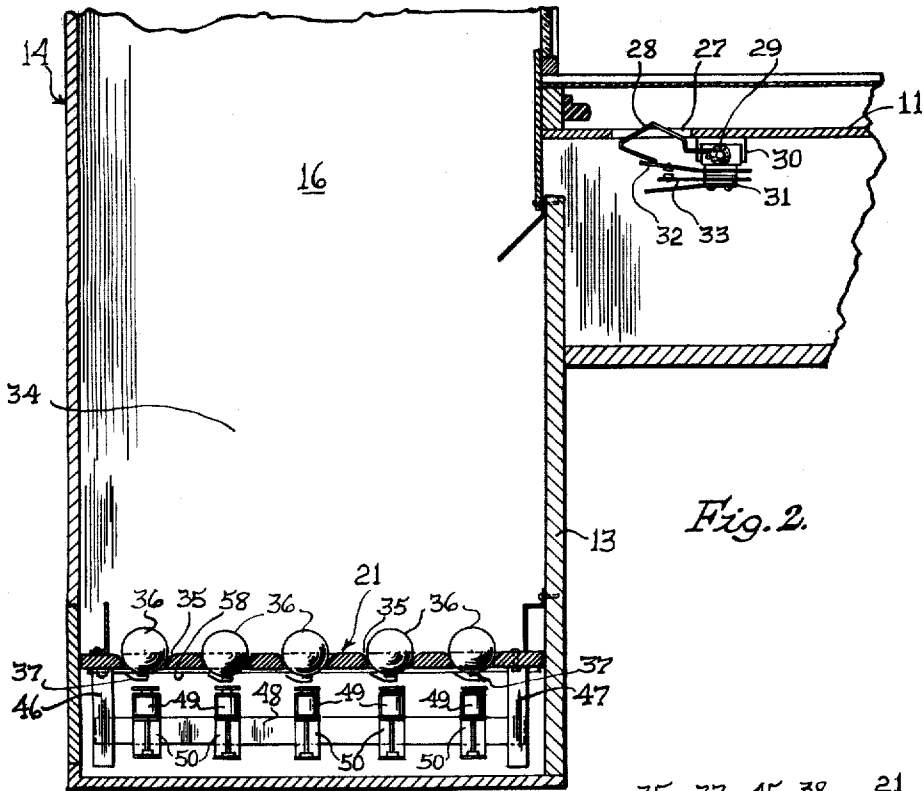


Fig. 2.

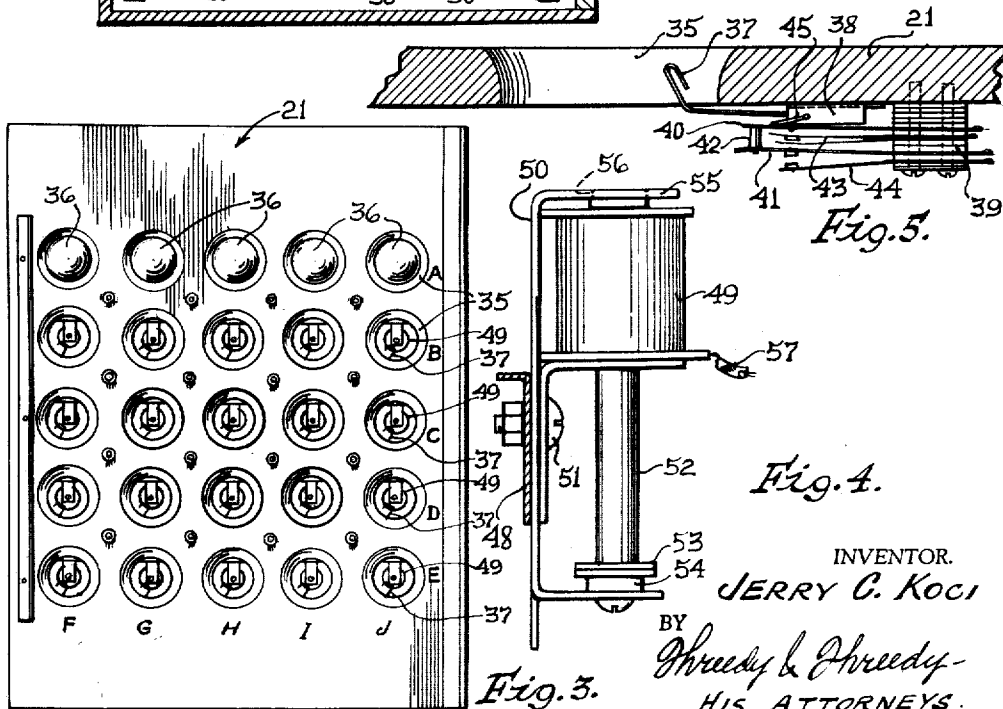


Fig. 5.

Fig. 4.

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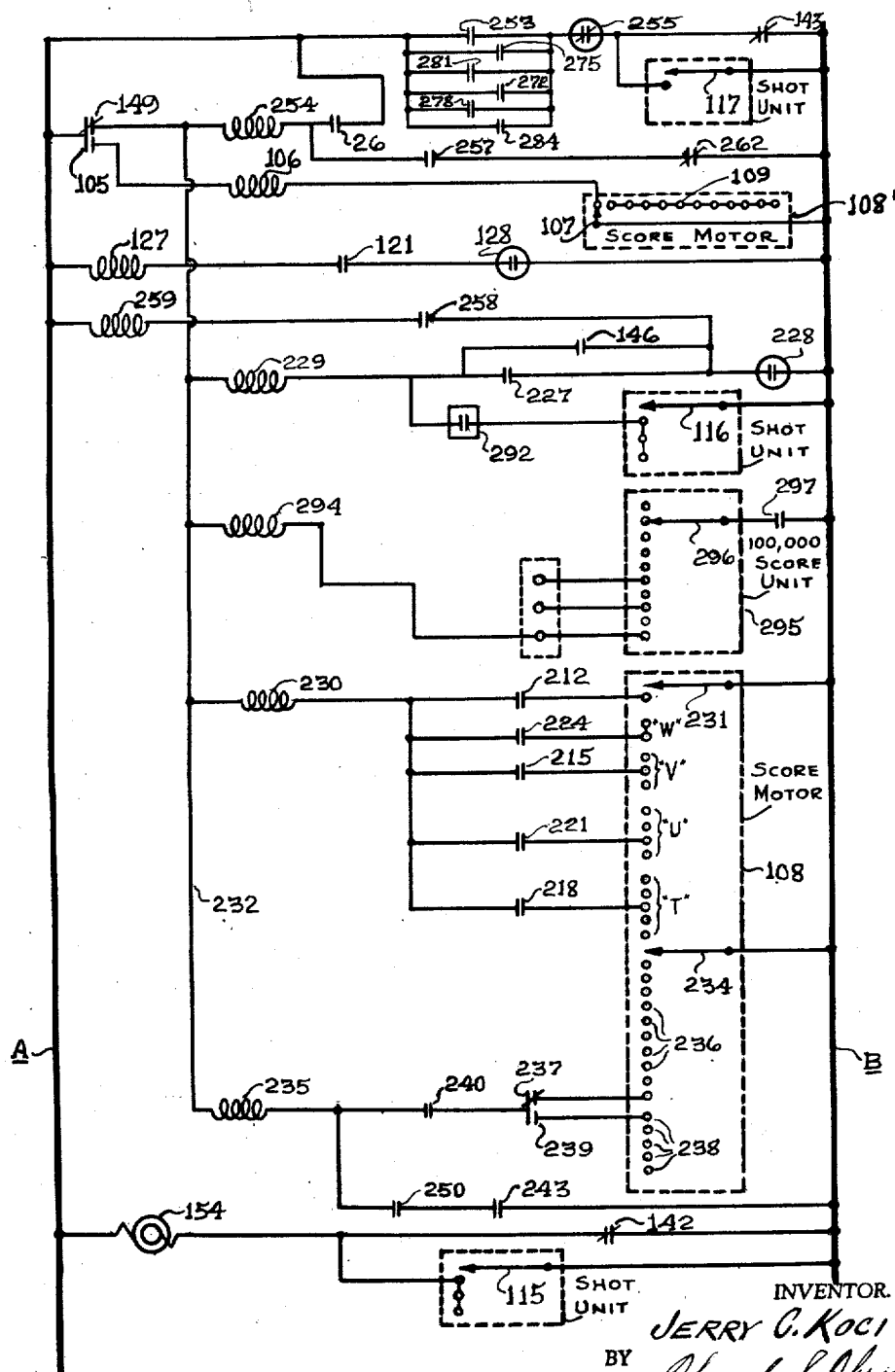


Fig. 7.

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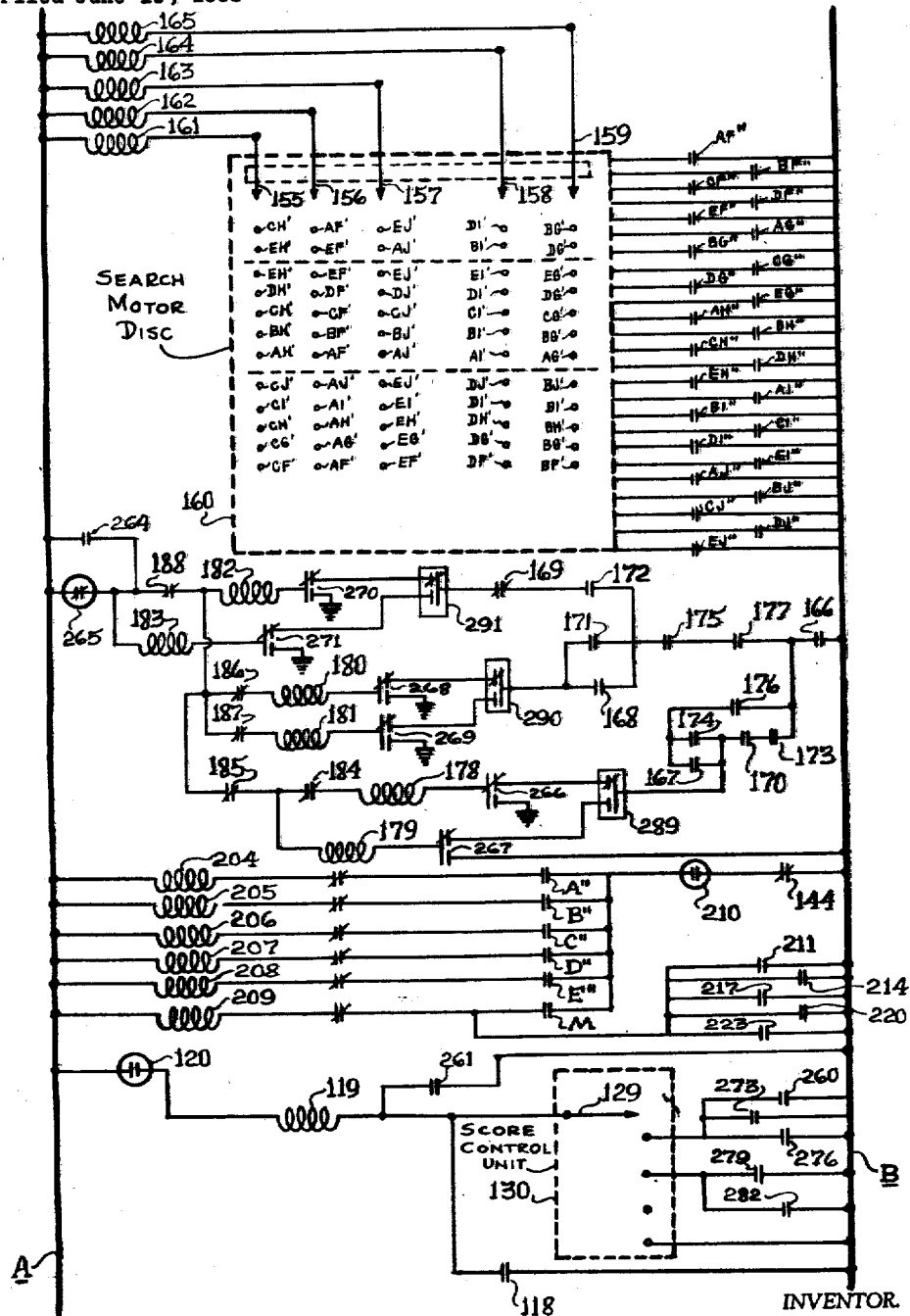


Fig. 8

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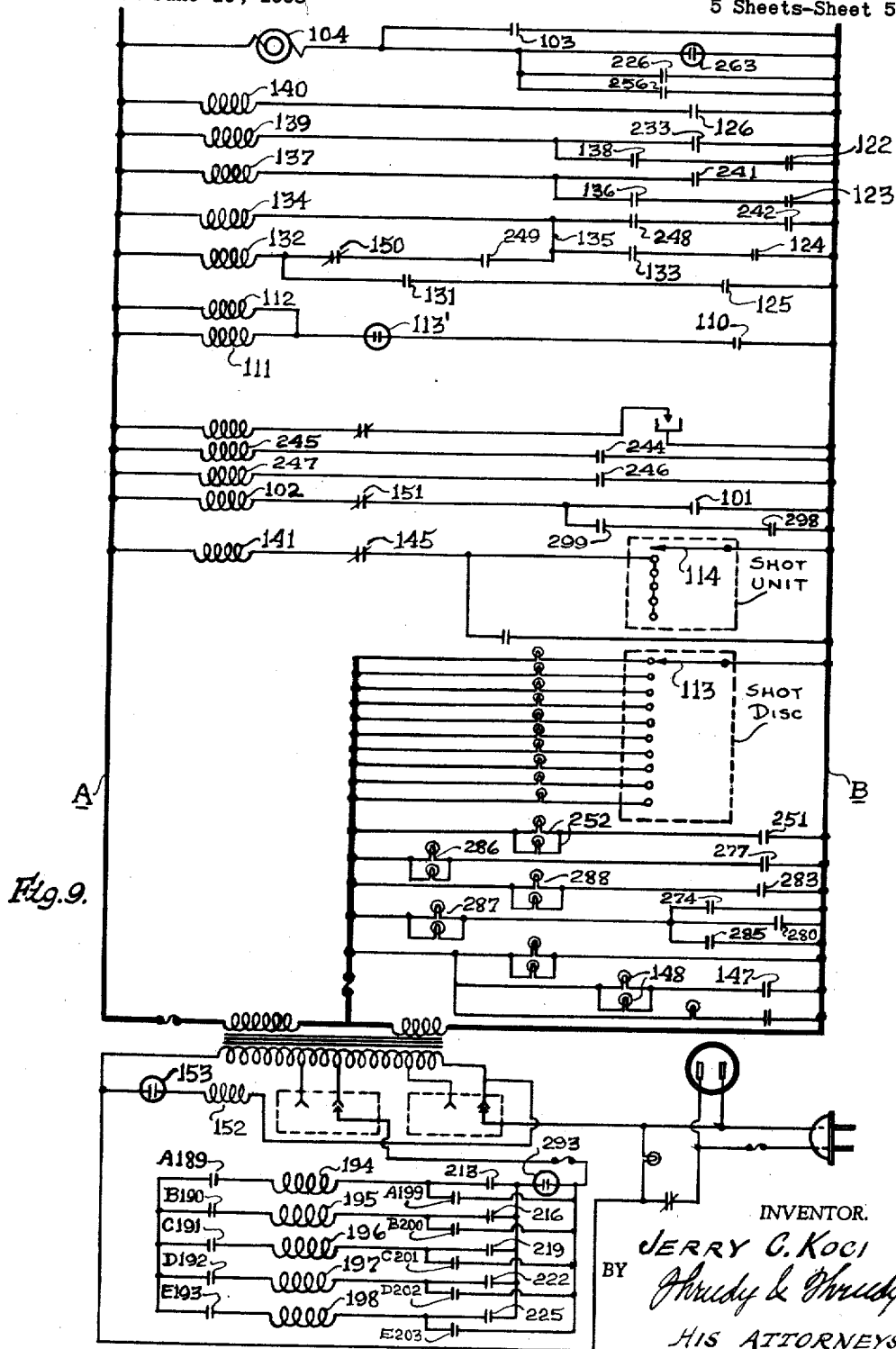
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SLIDING DISC GAME

Filed June 10, 1958

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2,878,022

SLIDING DISC GAME

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Application June 10, 1958, Serial No. 741,162

14 Claims. (Cl. 273—126)

This invention relates to new and useful improvements in a sliding disc game and more particularly to an amusement device which is coin-operated.

A principal object of my invention is in the provision in a device of this character of a novel combination comprising a cabinet including a horizontally extending playing board over which game pieces are propelled, and a vertical enclosed cabinet providing a well in which scoring elements are adapted to be actuated into free flight and permitted to fall into scoring positions.

Another object of my invention is in the provision of this character of a novel means for propelling scoring elements into free flight within a well area of an enclosed cabinet.

A further object of my invention is in the provision in a device of this character of providing a method of play which combines physical skill together with a choice of acquiring an illustrated score or continuing playing of the game in an endeavor to increase such illustrated score.

Still another object of my invention is in the provision in a device of this character of an electric circuit for indicating a scoring situation or which under certain circumstances will accumulate a scoring condition until a certain play is achieved.

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 my amusement device;

Fig. 2 is a fragmentary sectional detail view of a portion of the play board and enclosed well of the cabinet of my amusement device;

Fig. 3 is a top plan view of the scoring elements receptacle;

Fig. 4 is a side elevational view of the scoring element actuating member as associated with my amusement device;

Fig. 5 is a fragmentary side elevational view of a switch which is adapted to be actuated by the scoring elements of my game;

Fig. 6 is a fragmentary plan view of one end of the play board showing certain openings formed therein;

Fig. 7 is a portion of the scoring circuit of my amusement device;

Fig. 8 is a continuation of the scoring circuit of my device shown in Fig. 7; and

Fig. 9 is a continuation of the scoring circuit shown in Figs. 7 and 8.

Referring to Fig. 1 of the drawings, my improved amusement device comprises a cabinet 10 including a horizontally extending play board 11. One end of the play board 11 is supported by vertical legs 12. The opposite end of the play board 11 is supported by the base 13 of an enclosed vertical cabinet 14. The vertical cab-

2

inet 14 comprises side walls 15 and 16 and has a door 17 hinged as at 18 to the side walls 16. A transparent panel 19 is carried by the door 17. Through this transparent panel 19 is visible an inclined mirror 20 which is adapted to reflect scoring elements 36 and their receptacle 21. Behind the transparent panel 19 of the door 17 are visible a plurality of openings 22 through which score indicators 23 are seen.

The play board 11 consists of a hollow cabinet-like structure and is provided at one end with a removable door panel 24. A coin slot 25 is provided as it is desired that the operation of this amusement device be coin-controlled. A push button 26 is provided at the player's end of the play board 11 and its purpose and function will be hereinafter explained.

Adjacent the end of the play board 11 that is supported by the base 13 of the upright cabinet 14 there is provided a series of openings 27 extending in a parallel direction with respect to the longitudinal plane of the play board 11 and extending transversely in spaced apart relation with respect to the end of the play board 11.

Adapted to project slightly upwardly through each of the openings 27 is a switch actuating arm 28. As there are a plurality of such actuators 28 and as each is of identical construction, I shall describe but one. This switch actuating arm 28 as seen in Fig. 2 is pivotally carried on a pinion 29 horizontally extending from a mounting bracket 30. This mounting bracket 30 is attached to the underside of the playboard 11 adjacent the opening 27 and also carries a switch 31 comprising spaced apart switch leaves 32 and 33. The switch leaf 32 is in physical contact with a portion of the actuator 28 so that when the game piece P which is propelled over the play board 11 by the player, engages the actuating arm 28, it will pivot such arm in an anticlockwise direction as seen in Fig. 2 so as to bear the switch leaf 32 onto the switch leaf 33, thereby making an electrical contact. The result of this operation will be hereinafter explained.

The upright cabinet 14 provides a well portion 34 adapted to be out of the line of view of a player of the game. In the base of the well 34, there is adapted to be positioned a removable scoring element receptacle 21. This receptacle 21 is provided with a series of openings 35. Adapted to be freely seated in the openings 35 is a series of scoring elements 36. In the present instance, these scoring elements comprise light-weight balls.

When the balls 36 are seated in any of the openings 35, they will sit upon a switch actuating arm 37 which is pivotally carried by the bracket 38 connected to the underside of the receptacle adjacent the opening. A switch block 39 is connected adjacent the bracket 38 and the opening 35 as viewed in Fig. 5. This switch block 39 comprises a pair of movable switch leaves 40 and 41 connected together by an arm 42. These switch leaves 40 and 41 are adapted to be moved into contact with stationary switch arms 43 and 44. When the ball 36 sits in the opening 35, it will depress the switch actuating arm 37 about its pivotal connection with the bracket 38. The switch actuating arm 37 has a depending leg 45 which is in engagement with the movable switch leaf 40, so that when the switch actuating arm 37 is depressed the leg 45 will bear against such movable switch leaf 40 and close the switches hereinbefore mentioned.

It will be noted that the openings 35 are formed in the receptacle 21 in systematically designed lines, with the lines extending both from the front and back as well as from side to side. For explanation purposes, these systematically formed lines will be designated as follows: horizontal lines A to E and vertical lines F to J.

Referring to Fig. 2, it will be noted that the receptacle 21 is provided at either end thereof with a depending leg

3

46 and 47, there being a pair of such legs for each horizontal line A to E. These legs are connected by any suitable means such as by nuts and bolts to the underside of the receptacle 21. The legs 46 and 47 have extending therebetween an arm 48. The legs 46 and 47 as well as the arm 48 are so disposed so that they will be in line with one edge of the openings 35 of the line of openings which extend from front and back. Such relation is clearly shown in Figs. 2 and 4.

Directly beneath each of the openings 35 of each line A to E is an electromagnetic coil 49. This coil 49 is carried by a U-shaped bracket 50 which is connected as at 51 by any suitable means, such as nut and bolt, to the arm 48. A movable plunger 52 has one end projecting into the core of the coil 49. Such plunger 52 has its exposed enlarged head 53 positioned upon a seat 54 carried by one arm of the U-shaped bracket 50. The opposite arm 55 of the U-shaped bracket is provided with an opening 56 through which one end of the plunger 52 may pass when the plunger 52 is attracted into the score of the coil 49. The coil 49 is provided with suitable electrical connections 57 which are in series with certain switches hereinafter explained.

The receptacle 21 is adapted to be positioned in the base 13 of the cabinet 14 by sitting on inwardly extending flanges 58 provided by the side walls 15 and 16 of the cabinet.

From a study of Fig. 3, it will be seen that each opening 35 is provided with a switch actuator 37 and an electromagnetic coil 49.

The object of the game is to have the scoring elements or balls 36 become seated in adjacent openings so as to form a line. This line may extend either from front to rear (horizontal lines A to E) as shown in Figs. 2 and 3, or may extend from side to side (vertical lines F to J) or in openings that form the imaginary diagonal cross lines extending from each of the corner openings 35. The more balls 36 that form a line, the greater the score achieved.

The circuit for scoring the game is such that when any three of the scoring elements or balls 36 are in a line, the player is entitled to a score. If the player desires to register the score he is entitled to by having three scoring elements in a line, he depresses the push button 26 and a score will be indicated by the score indicators 23. If the player does not wish to register the score to which he is entitled, he may propel the game piece over the play board 11 toward any of the switch actuators 28 in an endeavor to close the switch 31 associated therewith, thereby to energize the coil connected thereto. The balls that are in such line of openings 35 will be propelled into free flight within the well 34 and thus the player may continue playing until he has achieved the highest possible scoring arrangement, which would be to have the balls 36 in a diagonal line across the scoring element receptacle 21.

It should be noted and will be made clear in the description hereinafter of the circuit, that the switches shown generally at 31 and associated with the openings 27 have a score value, so that each time any one of them is actuated the player will receive a score. The value of such score is determined by what switch of which line is actuated. This score is in addition to the possible scoring arrangements of the scoring elements 36.

The circuitries shown in Figs. 7 to 9 schematically illustrate step-up switches, step-up units, and wiper arms passing over a disc containing a plurality of contacts. All of these elements are well known in the coin machine art and are clearly illustrated in the applicant's United States Letters Patent No. 2,223,255.

Before the circuits shown in Figs. 7 to 9 are conditioned to permit play of the game, they must be reset. In order to reset the circuits to the condition shown in the schematic diagram illustrated in Figs. 7 to 9, I provide a coin switch 101, Fig. 9. Thus, when a coin is

4

deposited in the coin slot 25, the switch 101 will be closed, energizing a start relay 102, Fig. 9, the circuit being from line A through start relay 102, a closed switch 151, the coin-closed switch 101 to line B. When the start relay 102 is energized, it will close a start relay switch 103. The closure of the start relay switch 103 will energize a score motor 104, Fig. 9.

The start relay 102 will close a start relay switch 105, thereby energizing a score reset relay 106, Fig. 7. The score reset relay 106 is energized by the circuit from line A through the start relay switch 105, the shot reset relay 106, the wiper arm 107 on the score motor, to line B. Associated with the score motor 104 is a score motor disc 108. On this score motor disc 108, Fig. 7, is a plurality of contacts 109 which are adapted to be successively engaged by the wiper arm 107 and thus periodically energize the score reset relay 106.

The energization of the start relay 102 will close a shot relay switch 110 Fig. 9. This shot relay 110 is in the circuit to a shot unit reset coil 111 and a replay unit reset coil 112. In the circuit to each of the coils 111 and 112 is a motor cam switch 113'. Thus, when the motor cam switch 113' is closed by rotation of the score motor 104, the reset coils 111 and 112 will become energized. These reset coils 111 and 112 are associated with a step-up unit not shown but of the type shown and described in United States Letters Patent No. 2,281,262, which step-up unit is of the type that will be reset to its starting or zero position upon energization of a reset coil. Thus, the shot unit reset coil 111 will reset the wiper arms 113, 114 Fig. 9, 115, 116 and 117 Fig. 7 back to their starting position. The replay unit reset coil 112 Fig. 9 will reset the replay step-up unit (not shown) back to its zero position.

The energization of the start relay 102 will close a start relay switch 118. This start relay switch 118 is in circuit to a score control relay 119 Fig. 8. In the circuit of the score control relay 119 is a motor cam-operated switch 120. Thus when the motor cam switch 120, Fig. 8 is closed by the rotation of the score motor 104, Fig. 9, the score control relay 119, Fig. 8, will be energized. This is through the circuit from line A, now-closed motor cam switch 120, the score control relay 119, the now-closed start relay switch 118, to line B. The energization of the score control relay 119 will close the following score control relay switches 121, Fig. 7, 122, 123, 124, 125 and 126, the latter all in Fig. 9. The score control relay switch 121 is in the circuit of a score control reset coil 127. In this circuit is a motor cam switch 128, Fig. 7. Thus, when the motor cam switch 128 is closed by rotation of the score motor 104, Fig. 9, the score control reset coil 127, Fig. 7, will be energized through the circuit from line A, coil 127, the now-closed score control relay switch 121, the now-closed motor cam switch 128, to line B. The energization of the score control reset coil 128 will reset the wiper arm 129 back to its original or zero position on the score control disc 130.

In resetting the circuit to a condition for play there is required the resetting of the shot wiper arm 113, Fig. 9, 114, Fig. 9, 115, 116 and 117, Fig. 7, back to their original positions as well as removing any score that is indicated by the score indicators 23.

The score indicators 23 are associated with a plurality of score step-up units. Each of the units designates a different amount of score. These units include a scoring drum and associated parts as shown in United States Patent No. 2,281,262.

When a score is indicated by any of the scoring drums (not shown), a zero position switch thereof will be closed. In resetting the score of this circuit, the following will take place:

When the score reset relay 106, Fig. 7, is energized as hereinbefore described, the score reset relay switch 125,

Fig. 9, will be closed. If a score of a million or more is indicated, a zero position switch 131 will be closed and a million score unit step-up coil 132 will be energized, Fig. 9. The circuit for energizing the coil 132 is from line A, the coil 132, the zero position switch 131, the closed score reset relay switch 125, to line B. Thus, the million score step-up coil 132 will be energized until the zero position switch 131 thereof is opened.

If a score of 100,000 or more is indicated, a zero position switch 133, Fig. 9, of the 100,000 step-up unit will be closed and the 100,000 score step-up coil 134 will be energized, the latter by circuit from line A, through the coil 134, line 135, the zero position switch 133, the closed score reset coil 124, to line B.

If a score of 10,000 is indicated, a zero position switch 136, Fig. 9, on the 10,000 score step-up unit will be closed. This will result in the energization of the 10,000 score step-up coil 137, the latter through a circuit from line A, coil 137, zero position switch 136, the now-closed score reset relay switch 123, to line B.

If a score of 1,000 or more is indicated, a zero position switch 138, Fig. 9, on the 1,000 score step-up unit will be closed and a 1,000 score step-up coil 139 will be energized. The coil 139 is energized by the circuit from line A, through the coil 139, the zero position switch 138, the now-closed score reset relay switch 132 to line B. Each of the coils 132, 134, 137 and 139, Fig. 9, will be periodically energized as the wiper arm 107, Fig. 7, passes over the score motor disc 108' and engages the contacts 109 thereon, thus energizing the score reset relay 106, Fig. 7, closing the score reset relay switches 122, 123, 124 and 125, Fig. 9. The coils 132, 134, 137 and 139 are energized until their appropriate zero position switches 131, 133, 136 and 138, respectively, are opened. Thus, the score indicators 23 now indicate no score.

The energization of the score control relay 119, Fig. 8, will close the score control relay 126, Fig. 9, energizing the ball kicker relay 140, this for a purpose hereinafter described.

The energization of the start relay 102, Fig. 9, opened start relay switches 149, Fig. 7, 150 and 151, Fig. 9. The opening of the start relay switch 149 disrupted a circuit that led to a score relay hereinafter identified and explained. The opening of the start relay switch 150 prevented energization of the 1,000,000 score step-up coil 132 which may have been energized during the resetting operation under certain conditions which will be hereinafter made apparent. The opening of the start relay switch 151 deenergizes the start relay switches hereinafter identified, as well as the game-over relay switches hereinafter described, which are of the type that latch in their actuated position and must be reset.

In order to reset the start relay switches and the game-over relay switches after the score indicators have been returned to their zero position and the shot wiper arms returned to their zero position, I provide a switch reset coil 152, Fig. 9, which will be energized by the closing of a cam-operated switch 153. This reset coil 152 will actuate the start relay switches and game-over relay switches to their original conditions as shown in the schematic drawing of the circuit (see Figs. 7 to 9 inclusive).

In resetting the circuit of the game, it became necessary to again close certain game-over relay switches. These game-over relay switches were actuated by energization of the game-over relay 141, Fig. 9. This game-over relay 141 was energized when the wiper arm 114 moved on a certain contact of the shot unit disc. The energization of the game-over relay 141 opened game-over relay switches 142, Fig. 7, 143, Fig. 7, 144, Fig. 8, and 145, Fig. 9. The game-over relay 141 closed the game-over relay switches 146, Fig. 7, and 147, Fig. 9, the latter in circuit with game-over lights 148, which when illuminated indicated the playing of the game was finished.

When the scoring motor 104 Fig. 9 has returned to its original position and the start relay switches and the game-over relay switches have been restored to the condition shown in the circuit, a search motor 154 Fig. 7 will be energized, this through a circuit from line A, the search motor 154, the now restored closed game-over relay switch 142, to line B. This motor 154 will move the wiper arms 155, 156, 157, 158, 159, Fig. 8, over a search motor disc 160. This search motor disc 160 is provided with a plurality of contacts. Certain of these contacts are connected to one side of certain open switches which are contained on the scoring element receptacle 21 adjacent predetermined openings 35. For the sake of identity, the switches will be designated by the letters of their respective lines. Thus, in referring to Fig. 3, the switch that would be associated with the opening 35 appearing in the uppermost left-hand corner would be indicated as switch AF. In the circuit diagram (Fig. 8), the contacts that are connected to one side of this switch will be also designated AF' and the schematic showing of the switch in such circuit will also be designated AF''.

The wiper arms 155 through 159 have associated therewith corresponding relays 161, 162, 163, 164 and 165, respectively, Fig. 8.

Each of the relays 161 through 165 have corresponding relay switches. The relay 161 has a corresponding relay switch 166, Fig. 8. The relay 162 has corresponding relay switches 167, 168, and 169, Fig. 8. The relay 163 has corresponding relay switches 170, 171, and 172, Fig. 8. The relay 164 has corresponding relay switches 173, 174 and 175, Fig. 8, while relay 165 has corresponding relay switches 176 and 177, Fig. 8. These latter relay switches are in the line of circuitry with a three-in-line horizontal-vertical relay 178, a three-in-line diagonal relay 179, a four-in-line horizontal-vertical relay 180, a four-in-line diagonal relay 181, a five-in-line horizontal-vertical relay 182, and a five-in-line diagonal relay 183. The three-in-line diagonal relay 179 has a corresponding normally closed relay switch 184. The four-in-line horizontal-vertical relay 180 has a corresponding normally closed four-in-line relay switch 185. The four-in-line diagonal relay 181 has a corresponding normally closed four-in-line diagonal relay switch 186. The five-in-line horizontal-vertical relay 182 has a corresponding normally closed five-in-line relay switch 187; while the five-in-line diagonal relay 183 has a corresponding normally closed five-in-line diagonal relay switch 188. Each of these relays and their associated switches is identical at this time because of their close proximity to each other in the circuitry. The operation and function of each will be hereinafter described.

The particular relays 179 through 183, Fig. 8, have other corresponding relay switches which will be identified in a further description of the circuitry of this game.

Each of the openings 35 of each of lines A through E (Fig. 5) has associated therewith a normally open switch, and each switch of each opening in its respective line is connected in parallel so that the closure of any one switch of any opening in its respective line will, in effect, energize the circuit of the switches. These switches are schematically shown as normally open switches A-189, B-190, C-191, D-192, E-193, Fig. 9. The parallel circuit of switches A-189 is in circuit with each of the first line kicker coils 194. (One of such coils is illustrated and indicated at "49" in Fig. 4.) The parallel circuit of switches B-190 is in circuit with each of the second line kicker coils 195. The parallel circuit of switches C-191 is in circuit with each of the third line kicker coils 196. The parallel circuit of switches D-192 is in circuit with each of the fourth line kicker coils 197. The parallel circuit of switches E-193 is in circuit with each of the fifth line kicker coils 198.

In the circuit to the coils 194 through 198, are normally open kicker relay switches A-199, B-200, C-201,

D-202, E-203, Fig. 9. The complete circuit, function and operation of the kicker coils 194-198 will be explained hereinafter in describing the operation of the device.

Referring to Fig. 6, the openings 27 in the play board 11 are each identified as A' through E'. The game piece actuated switches (illustrated as switch 31 in Fig. 2) are associated with the openings A' through E' and will be designated on the schematic drawing as puck switches A'', B'', C'', D'' and E'', respectively, Fig. 8. Thus, line A of the receptacle 21 has an associated opening A' formed in one end of the play board 11, and the opening A' has a corresponding game piece actuated switch A'' associated therewith.

Referring to Fig. 6, it should be noted that on either side of each of the openings A' through E', there are a series of other openings (6 openings). These openings will be identified in Fig. 6 as M1, M2, M3, M4, M5, and M6. Each of the switches associated with the openings M1 through M6 are in parallel and, as such, is illustrated in the schematic circuit drawing as one switch M, Fig. 8.

The puck switch A'' is in circuit with a first line relay 204, Fig. 8. The puck switch B'' is in circuit with a second line relay 205, Fig. 8. The puck switch C'' is in circuit with a third line relay 206, Fig. 8. The puck switch D'' is in circuit with a fourth line relay 207, Fig. 8. The puck switch E'' is in circuit with a fifth line relay 208, Fig. 8.

The illustrated M switch is in circuit with a "miss" relay 209. The circuit for the relays 204-209 is from line A through each of the relays 204-209, through their respective switches A'' through E'' and M through a normally closed motor cam switch 210 and a normally closed game-over relay switch 144 to line B. Thus, if the game piece which is propelled over the playing board 11 closes any of the puck switches, the line relay associated therewith will be energized. The energization of a line relay will close its corresponding switches hereinafter referred to.

The energization of the line relay 204 will close its respective line relay switches 211, Fig. 8, 212, Fig. 7, 213, Fig. 9. The energization of the line relay 205 will close its respective line relay switches 214, Fig. 8, 215, Fig. 7, and 216, Fig. 9. The energization of the line relay 206 will close its respective line relay switches 217, Fig. 8, 218, Fig. 7 and 219, Fig. 9. The energization of the line relay 207 will close its respective line relay switches 220, Fig. 8, 221, Fig. 7, and 222, Fig. 9. The energization of the line relay 208 will close its respective line relay switches 223, Fig. 8, 224, Fig. 7, and 225, Fig. 9.

The respective line relay switches 211, 214, 217 and 220 and 223, all in Fig. 8, are in a by-pass circuit to the puck switch M so that regardless of what switch is closed by the game piece as it is propelled over the playing board 11, the "miss" shot relay 209 will be energized; this for a purpose hereinafter made apparent. The circuit, Fig. 8, for relay 209 through such by-pass circuit is from line A, through relay 209, through any of the switches 211, 214, 217, 220, 223 to line B.

The energization of the "miss" shot relay 209 will close the "miss" shot relay switches 226 Fig. 9 and 227 Fig. 7. The closing of the "miss" shot relay switch 226 will in effect energize the score motor 104 Fig. 9. The closing of the "miss" shot relay switch 227 will, when a motor cam switch 228 is closed, energize a shot step-up coil 229 Fig. 7; the latter through a circuit from line A, the normally closed start relay switch 149, the shot step-up coil 229, the closed "miss" shot relay switch 227, the closed motor cam switch 228, to line B.

The line relay switches 212, 215, 218, 221 and 224 Fig. 7 are in circuit to certain contacts on the score motor disc 108. The opposite side of these switches is in the circuit to a 1000 relay 230. Thus, when the score motor

104 is energized, the wiper arm 231 thereof will pass over the contacts on the score motor disc 108 Fig. 7 and if any of the line relay switches hereinbefore mentioned are closed, the 1000 relay 230 Fig. 7 will be energized; this from a circuit from line A, through the now-closed start relay switch 149, line 232, the 1000 relay 230, the closed line relay switch (whichever one it may be), the contacts on the score motor disc, the wiper arm 231, to line B. It should be pointed out that the closing of certain specific switches on the play board 11 results in obtaining a score greater than certain other switches of the play board 11.

It will be noted in this respect Fig. 7 that the line relay switch 218 is connected to five contacts T on the score motor disc 108. Thus, if the switch C'' Fig. 8 associated with the opening C' Fig. 6 is closed, the line relay 206 Fig. 8 will be energized and the line relay switch 218 Fig. 7 thereof will be closed and the 1000 relay 230 will be energized five times, as the wiper arm 231 passes over each of the five contacts T, on the disc 108 giving a score of 5000. The line relay switch 221 Fig. 7 of line relay 207 Fig. 8 is connected to four contacts U on the score motor disc 108 and as the wiper arm 231 passes over each of the four contacts U on the disc 108 gives a score of 4000. Line relay switch 215 Fig. 7 of line relay 205 Fig. 8 is connected to three contacts V on the score motor disc 108 and as the wiper arm 231 passes over each of the three contacts V on the disc 108 will give a 3000 score. Line relay switch 224 Fig. 7 of line relay 208 Fig. 8 is connected to two contacts W on the score motor disc 108 and as the wiper arm 231 passes over each of the two contacts W on the disc 108 will give a score of 2000. When the 1000 relay 230 Fig. 7 is energized, it will close 1000 relay switch 233 Fig. 9 which will energize the 1000 score step-up coil 139 Fig. 9 to move the score drum thereof so that its indicators 23 will show a score. The amount of the score, as heretofore described, would depend on which line relay switch 212, 215, 218, 221, 224 Fig. 7 is closed.

The score motor disc 108 Fig. 7 has a second wiper arm 234 which is adapted to pass over certain contacts of the disc 108 with certain of such contacts in circuit with a 10,000 relay 235. Contacts 236 are connected in series and are in turn connected to a three-in-line make-and-break relay switch unit 237. Contacts 238 of the score motor disc 108 are connected in series and in turn connected to the normally open switch 239 of the make-and-break switch 237. To energize the 10,000 relay 235, the circuit is from line A through the closed start relay switch 149, line 232, the relay 235, a score relay switch 240 (the operation of which will be hereinafter made apparent), either of the switches of the make-and-break switch 237, to either of the series of contacts 236 and 238, wiper arm 234 to line B. The energization of the 10,000 relay 235 will close a 10,000 relay switch 241, Fig. 9 which will in turn energize the 10,000 score step-up coil 137, Fig. 9 to step up the scoring drum thereof to indicate a score of 10,000 or more. The energization of the 10,000 relay 235 will also close a second 10,000 relay switch 242, Fig. 9 which, under certain conditions hereinafter explained, will cause energization of a 100,000 score step-up coil 134, Fig. 9 or a 1,000,000 score step-up coil 132, Fig. 9. The 10,000 relay 235, Fig. 7 may also be energized under certain circumstances when the 1000 relay 230, Fig. 7 is energized, closing the 1000 relay switch 233, Fig. 9. This latter circuit of energizing the 10,000 relay 235 will be explained hereinafter.

It should be noted that in the series of contacts 236 on motor scoring disc 108, Fig. 7 there are ten switch contacts which may be engaged by the wiper arm 234 and thus, under certain conditions, when such contacts 236 are "hot," the 10,000 relay 235 will be energized ten times. The series of contacts 238 on motor scoring disc 108, Fig. 7 have five contacts and therefore, under certain conditions (when the switches 239 and 240

are closed), the 10,000 relay 235 will be energized five times.

For creating interest in the playing of the game, when the 1000 relay 230, Fig. 7 is energized, it will close a 1000 relay switch 244, Fig. 9 which will cause energization of a chime coil 245, Fig. 9 which will result in the ringing of a chime every time the switch 244 is closed. When the 10,000 relay 235, Fig. 7 is energized, it will close a 10,000 relay 246, Fig. 9 which in turn will energize a bell coil 247 to result in the ringing of a bell every time a 10,000 relay 235 is energized.

To energize the 100,000 score step-up coil 134, Fig. 9, a switch 248 (which is a switch that is closed when the score drum of the 10,000 step-up unit 137 reaches its ninth position or when 90,000 score is indicated) cooperates with a 10,000 relay switch 242 which would be closed on the next subsequent energization of the 10,000 relay 235, thus energizing the 100,000 step-up coil 134. To energize the 1,000,000 score step-up coil 132, a 9th position switch 249 of the scoring drum of the 100,000 score unit must be closed, indicating a score of 900,000. Thus, when the 100,000 score step-up unit 134 is energized as hereinbefore described, and the 9th position switch 249 of such score drum is closed, the 1,000,000 score step-up coil 132 will be energized through the circuit, Fig. 9 from line A, the 1,000,000 score step-up coil 132, the now closed start relay switch 150, the now-closed 9th position switch 249, the 9th position switch 248 of the 10,000 score drum, and the closed 10,000 relay switch 242 to line B.

It should be noted that the 10,000 relay 235 will be energized when the 9th position switch 250 of the 1000 score drum is closed and the 1000 relay 230 is energized to close its relay switch 243. This circuit Fig. 7 is from line A, the now-closed start relay switch 149, line 232, the 10,000 relay 235, the now-closed 9th position switch 250 on the 1000 score drum, the closed 1000 relay switch 243 to line B.

All of the scoring heretofore described has been as a result of propelling the game piece over the play board 11 and closing certain puck switches A' to E'. The circuit, however, provides another means for achieving a score. This will be termed a bonus score and its circuitry is as follows:

In the event that after the circuitry has been reset as hereinbefore described and the ball kicker relay 140 Fig. 9 has been energized, closing its respective switches A-199, B-200, C-201, D-202, E-203 Fig. 9, which are in circuit to the kicker coils 194 through 198 of lines A through E, then, if any of the line hole switches A-189 to E-193 have been closed by reason of a ball 36 seating in any of the openings 35, the respective kicker coils 194 through 198 will have been energized to eject the balls 36 from the openings 35 for free flight within the well 49 of the cabinet 14. Now in the event that these free balls should fall back into such of the openings 35 so that there are three or more balls in either a horizontal-vertical or a diagonal line, the wiper fingers 155 through 159 Fig. 8 in scanning the search motor disc 160 will energize the respective relays 161 to 165, causing energization of any of the score conditioning relays 178-183.

Let us say, for example, that after any of the kicker coils 194 through 198 have been energized so as to eject balls for free flight within the well 49, the balls fall in the following openings: AF, BF, CF, DG, EH. The three balls 36 in the openings AF, BF and CF are in vertical alignment. These balls will close their corresponding switches AF', BF', and CF', Fig. 8. Thus, when the wiper arms 155 to 159 simultaneously engage the contacts AF', BF' and CF', (note bottom line of contacts on disc 106, Fig. 8) the relays 161, 162 and 165 will be simultaneously energized, closing the relay switches 166, 176 and 167, thereby causing energization of the three-in-line horizontal-vertical relay 178.

The circuit for such energization is from line B through the now closed switch 166, switch 176, and switch 167, the closed portion of the make and break switch 289, the closed portion of the make and break switch 226, the relay 178, the normally closed switches 184, 185 and 188, the closed motor cam switch 265 to line A. The energization of this relay 178 will close a three-in-line horizontal-vertical relay switch 251 Fig. 9, which in turn will complete a circuit to the three-in-one line lights 252, indicating that a bonus score has been indicated.

The three-in-line horizontal-vertical relay 178 Fig. 8 will close a three-in-line relay switch 253 Fig. 7. This latter switch 253 is in circuit with a bonus score relay 254 Fig. 7. In such circuit is a bonus score push button 26 and a motor cam-operated switch 255. When the three-in-line relay switch 253 is closed, a circuit Fig. 7 will be established to the bonus score relay 254 from line A, through the closed start relay switch 149, the bonus score relay 254, the closed push button switch 26, the now closed three-in-line relay switch 253, the closed motor cam switch 255, the normally closed game-over relay switch 143, to line B.

The energization of the bonus score relay 254 will close a bonus score relay switch 256 Fig. 9 which is in circuit to the scoring motor 104 and will energize the same. The energization of the bonus score relay 254 Fig. 7 closed the bonus score relay switch 240 Fig. 7 hereinbefore described. The energization of the three-in-line horizontal-vertical relay 178 will have closed the switch 239 connected with the contacts 238 on the score motor disc 108. Thus, the 10,000 relay 235 is energized each time the wiper arm 234 passes over the contacts 238, to-wit, five times to energize the 10,000 score step-up coil 137 five times, indicating a bonus score of 50,000.

The bonus score relay 254 will also close a bonus score relay switch 257, establishing a holding circuit to the bonus score relay 254 Fig. 7.

The bonus score relay 254 will close a bonus score relay switch 258 Fig. 7 which is in circuit to a score control step-up coil 259 Fig. 7. This score control step-up coil 259 is energized through the circuit Fig. 7 from line A, the coil 259, the now-closed bonus score relay switch 258, and a motor cam switch 228 which will be closed due to the rotation of the energized score motor 104. The energization of the score control step-up coil 259 will move a wiper arm 129 Fig. 8 thereof over a score control disc 130 onto its first contact thereof. The three-in-line horizontal-vertical relay 178, Fig. 8 has closed a three-in-line horizontal-vertical relay switch 260. Thus, when the wiper arm 129 moves onto the first contact of the score control disc 130 and a motor cam switch 120 is closed by reason of the rotation of the score motor 104, the score control relay 119 will become energized. The score control relay 119 will close a score control relay switch 261 which together with the motor cam switch 120 creates a holding circuit for the score control relay 119.

The energization of the score control relay 119 will open a score control relay switch 262 Fig. 7, interrupting the holding circuit to the bonus score relay 254. The score control relay 119 will close a score control relay switch 121 Fig. 7 which, when a motor cam switch 128 Fig. 7 is closed, will energize a score control reset coil 127 Fig. 7, thus resetting the wiper arm 129 Fig. 8 back to its original position off the first contact of the score control disc 130. As the bonus score relay 254 Fig. 7 has been deenergized, all of the bonus score relay switches 240 Fig. 7, 256 Fig. 9, 258 Fig. 7, 257 Fig. 7 will be returned to their normal condition. However, the score motor 104 Fig. 9 will continue to be energized through the now-closed motor cam switch 263. As the motor 104 continues to operate, it will close the motor cam switch 153 Fig. 9, energizing the reset bank coil 152 which resets all of the hereinbefore mentioned line relay switches which might have been closed during this

scoring operation. It should be noted that the three-in-line horizontal-vertical relay 178 Fig. 8 was held energized through a bonus score relay switch 264 which was closed when the bonus score relay 254 was energized. The three-in-line horizontal-vertical relay 178 has a secondary means of maintaining its energization through a circuit which includes a motor cam switch 265 Fig. 8.

The heretofore referred to relays 178 to 183 Fig. 8 all have associated therewith their own actuated make and break switches 266 to 271. The switches 266 to 271 have one side thereof connected to a ground so that when their respective relays are energized and the normally open part of such switches are then closed, the relays which were energized will be held in such energized condition.

It should be noted that relay 179 has associated therewith relay switches 272 Fig. 7, 273 Fig. 8 and 274 Fig. 9.

Relay 180 has associated therewith relay switches 275 Fig. 7, 276 Fig. 8 and 277 Fig. 9.

Relay 181 has associated therewith relay switches 278 Fig. 7, 279 Fig. 7 and 280 Fig. 9.

Relay 182 has associated therewith relay switches 281 Fig. 7, 282 Fig. 8 and 283 Fig. 9.

Relay 183 has associated therewith relay switches 284 Fig. 7 and 285 Fig. 9.

The relay switches 272, 275, 278, 281 and 284 are in the line circuit to the bonus score relay 254 Fig. 7.

The relay switches 273, 276, 279 and 282 are connected to the circuit contacts on the score control disc 130 Fig. 8, while the relay switches 274, 277, 280, 283 and 285 are in circuit with respective score indicating lights 286, 287 and 288 Fig. 9.

The search motor 154 Fig. 9 which has been hereinbefore described, actuates a series of make and break switches 289, 290 and 291. These switches 289, 290 and 291 of Fig. 8, as well as switch 292 of Fig. 7 are shown in rectangular boxes to distinguish them from the motor cam operated switches of the scoring motor 104 which are shown in circles throughout the schematic circuitry. These make and break switches are in the line circuit between certain of the relays 178 through 183. For example, the search motor cam switch 289, when in its original position is in the line circuit to the three-in-line horizontal-vertical relay 178. When the search motor cam switch 289 is actuated, it will break the circuit to the three-in-line horizontal-vertical relay 178 and become a part of the circuit to the three-in-line diagonal relay 179.

As the amount of score to be achieved by energization of the different relays 178 through 183 is determined by whether the scoring elements are in a horizontal or vertical line over the receptacle 21 or diagonally positioned thereon, it becomes necessary to include in the circuits to the respective relays these search motor cam switches 289, 290 and 291.

The search motor 154 has a search motor cam switch 292 Fig. 7 which is in a line circuit to the shot step-up coil 229. The purpose and function of such search motor cam switch 292 will be hereinafter made apparent.

The scoring as a result of the closing of the puck switches A"-E" Fig. 8 has been heretofore explained. The bonus scoring is a result of the closing of certain of the switches AF" through EJ" by the scoring elements or balls 36.

Let us assume, for purposes of illustration, that after the circuit has been reset and conditioned for play and after the scoring elements or balls have been propelled for free flight within the well 34, three scoring elements or balls have become seated in the openings AF, BG, and CH. The switches AF", BG" and CH" associated with such openings are now closed, therefore placing in a "hot" position the contacts AF', BG' and CH' on the search motor disc 160 Fig. 8.

As the wiper arms 155 through 159 pass over the contacts of the search motor disc 160, relays 161, 162 and

165 will be energized because the wiper arm 155 engaged contact CH' simultaneously with the engagement of the wiper arm 156 with contact AF' and simultaneously with the engagement of wiper arm 159 with contact BG'. The energization of the relays 161, 162 and 165 closed the relay switches 166, 167 and 176, thereby establishing a circuit to the three-in-line horizontal-vertical relay 178. The energization of the relay 178 closed the three-in-line relay switches 253 Fig. 7, 260 Fig. 8, 251 Fig. 9 and 239 Fig. 7, while opening the three-in-line relay switch 237 Fig. 7. The closure of the three-in-line relay switch 253 Fig. 7 will complete the circuit to the bonus score relay 254, when the bonus score push button 26 is closed. The three-in-line relay switch 251 Fig. 9 completed the circuit to the three-in-line lights 252 and the closure of the three-in-line relay switch 239 Fig. 7 connected the contacts 238 of the score motor disc 108 to the circuit of the 10,000 relay 235.

As the motor 154 continues to rotate, it will close its switch 289 Fig. 8 which will connect the three-in-line diagonal relay 179 with the closed relay switches 166, 167, and 176, thereby energizing the three-in-line diagonal relay 179. The energization of this relay 179 will open the relay switch 184, deenergizing the three-in-line horizontal-vertical relay 178 which had been held energized by reason of the actuation of its make and break switch 266.

It should be pointed out at this time that the score motor disc 160 Fig. 8 is schematically divided into three portions with certain contacts thereon being designated in the horizontal section, others in the vertical section, and still others in the diagonal section. As the search motor 154 is continuously energized from the start of the game to the finish, the wiper arms 155 through 159 continuously pass over the contacts on the search motor disc 160. The search motor cam switches 289, 290 and 291 are actuated only while the wiper arms 155 to 159 are passing over the contacts in diagonal section of the search motor disc 160.

The energization of the three-in-line diagonal relay 179 closed its relay switches 272 Fig. 7, 273 Fig. 8 and 274 Fig. 9, the latter switch 274 completing the circuit to the diagonal lights 287 Fig. 9. The relay switch 272 completed the circuit to the bonus score relay 254 when the push button switch 26 was closed Fig. 7. Thus, all the bonus score relay switches hereinbefore mentioned were closed. The closure of the bonus score relay switch 256 Fig. 9 energized the score motor 104. The score motor 104 began to rotate and when it closed its motor cam switch 228 Fig. 7, the score control step-up coil 229 was energized. Energization of the score control step-up coil 229 advanced the wiper arm 129 Fig. 8 thereof to the first contact on the score control unit 130. As the three-in-line diagonal relay switch 273 was now closed when the motor cam switch 120 closed, the score control relay 119 was energized. However, before the score control relay 119 was energized, it should be noted that the bonus score relay switch 240 Fig. 7 was closed. As the three-in-line horizontal-vertical relay 178 has now been deenergized, the three-in-line make and break relay switch 237 Fig. 7 returned to its original condition, placing in a "hot" condition the contacts 236 on the score motor disc 108. As the score motor 104 rotated, it moved the wiper arm over the contacts 236, thus energizing the 10,000 relay 235 each time a contact 236 was engaged. As there are ten contacts 236, the 10,000 relay 235 was energized ten times, closing the relay switch 241 ten times, energizing the score step-up coil 137 ten times. When the ninth position switch 248 Fig. 9 on the 10,000 score drum was closed, and on the tenth energization of the 10,000 relay 235 Fig. 7, the 10,000 relay switch 242 Fig. 9 was closed, thereby completing a circuit to the 100,000 score step-up coil 134, indicating that a score of 100,000 was achieved.

When the score control relay 119 Fig. 8 is energized

in the manner hereinbefore described, the score control relay switch 121 Fig. 7 will be closed, and when the score motor cam switch 128 is closed, the score control reset coil 127 will be energized, resetting the wiper arm 129 Fig. 8 back to its zero position on the score control unit 130. The energization of the score control relay 119 will open the score control relay switch 262 Fig. 7, deenergizing the circuit to the bonus score relay 254. The score control relay switch 126 Fig. 9 will be closed, causing energization of the ball kicker relay 140. The ball kicker relay 140 will close its respective kicker relay switches A-199, B-200, C-201, D-202 and E-203, thus causing the energization of the kicker coils 194 through 198.

The same scoring circuitry will follow for each of the relays 178 through 183, the only difference being that each of such relays requires a different arrangement of contacts on the search motor disc 160 to be in a "hot" condition.

When the tenth or last shot of the game is made and the shot step-up coil 229 Fig. 7 is energized, the shot unit wiper arms 114 through 117 will move off the tenth contact onto the eleventh. The wiper arm 114 Fig. 9 on the eleventh contact will energize the game-over relay 141. This game-over relay 141 will energize and actuate its respective relay switches. However, a scoring situation might develop by reason of the fact that such tenth shot will energize one of the relays 204 through 209 Fig. 8, which energized relay will in turn close its respective relay switches. As each of the relays 204 through 209 has relay switches in circuit with certain kicker coils, it follows that when a motor cam switch 292 Fig. 7 is closed, such kicker coils will be energized to propel the scoring elements or balls into free flight within the well 34. The scoring elements or balls might fall into a scoring pattern such as three in line, four in line, five in line, or three or four or five in line diagonally. Therefore, it is required that the search motor 154 Fig. 7 be energized even though the game-over relay 141 Fig. 9 is energized. This is accomplished through the wiper arm 115 of the shot step-up unit, which engages the eleventh contact which is in circuit with the search motor 154.

As the ultimate score which results in the energization of the five-in-line diagonal relay 183 is possible after the last shot of the game, it requires in order to register such score the energization of the score control step-up coil 254 Fig. 7 four times, thereby advancing the wiper arm 129 Fig. 8 thereof to the fourth contact on the score control unit 130. In order to energize the score control step-up coil 259 Fig. 7, it requires the closing of the bonus score relay switch 258. The circuitry to the bonus score relay 154 is disrupted by the opening of the game-over relay switch 143. However, when the wiper arm 117 Fig. 7 of the shot step-up unit is advanced to its fourteenth step, a circuit to the bonus score relay 254 is established which by-passes the game-over relay switch 143. In order to advance the wiper arms of the shot step-up unit to the fourteenth position, the shot step-up coil 229 is energized each time the search motor cam switch 292 is closed, this through a circuit Fig. 7 from the line A, the now-closed start relay switch 149, the shot step-up coil 229, the closed search motor cam switch 292, the eleventh contact on the shot step-up unit, the wiper arm 116 to line B. When the shot step-up coil 229 is energized for the fourteenth time and the wiper arm 117 is advanced to the fourteenth contact and the push button 26 is closed, the bonus score relay 254 is energized. The energization of the bonus score relay 254 results in the closing of the bonus score relay switch 256 (Fig. 9) which causes energization of the score motor 104 and the closing of the bonus score relay switch 258 (Fig. 7), causes the energization of the score control step-up coil 259 each time the motor cam switch 228 is closed.

The score motor 104 will not be deenergized until the holding circuit to the bonus score relay 254 is disrupted. This takes place when the wiper arm 129 Fig. 8 of the score control unit is stepped up four times onto the fourth contact thereof and the score control relay 119 is thereby energized, opening its score control relay switch 262 Fig. 7. In the meantime, the score motor 104 has caused the wiper arm 234 to pass over the contacts 236 four times Fig. 7, energizing the 10,000 relay 235 forty times, registering the score as hereinbefore described.

When the score motor 104 causes energization of the shot step-up coil 229 through the now closed game-over relay switch 146 and the motor cam switch 228 to be energized for the fifteenth time, the score motor 104 Fig. 9 becomes deenergized, the search motor 154 Fig. 7 is deenergized, the circuitry to the bonus score relay 254 Fig. 7 is disrupted, and the game-over relay 141 Fig. 9 is maintained through the wiper arm 114 of the shot step-up unit. Thus, the game is over and the score is achieved.

It may be that the game will include a means of allowing a free play after a certain score is attained. To do so, I have included in the circuitry a replay step-up coil 294 Fig. 7. This coil 294 is in circuit with a 100,000 score disc 295 which has a wiper arm 296 adapted to be advanced thereover step-by-step. Each time the 100,000 score step-up coil 134 is energized in a manner hereinbefore described, the wiper arm 296 will advance a step on the 100,000 score unit disc 295.

The scoring drum associated with the 100,000 score step-up coil 134 Fig. 9 has a switch 297 Fig. 7 attached thereto which will be closed upon the first energization of the coil 134 Fig. 9. The circuit for the replay unit is such that when the wiper arm 296 has been advanced onto the ninth contact of the 100,000 score unit disc 295 Fig. 7, a circuit will be complete to the replay step-up coil 294 which in turn will close a replay switch 298 Fig. 9 which is in circuit with the start relay 102.

Thus, when the desired score is obtained whereby the replay unit coil 294 is energized and the player is entitled to a free-play of the game and after completion of the game in which he was awarded the free play, all the player need do to condition the circuit for the free play is to depress a replay button switch 299 Figs. 9 and 1 which will energize the start relay 102 to condition the circuit herein described for further play.

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 claims.

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

1. An amusement game apparatus comprising a substantially vertical cabinet having a viewing window and a horizontally extending play board over which a game piece is adapted to be projected, switch elements carried by said play board at one end thereof and engageable and actuated by said game piece when it is propelled over said play board, a scoring element receptacle in the lower end portion of said cabinet and having a plurality of scoring element receiving openings formed therein, there being a greater number of openings than scoring elements, a plurality of scoring elements adapted to be received in and supported by said openings, scoring element ejecting means carried by said receptacle beneath and adjacent each of said openings and adapted to be actuated to eject the scoring elements from said openings for free flight within said cabinet, a circuitry for said scoring element ejecting means, switch means carried by said receptacle adjacent each of said openings formed therein and adapted to be closed by said scoring elements, means connecting

15

certain of said switch elements on said play board in circuit with certain of said switch means, means connecting certain of said switch means into a plurality of parallel circuits whereby each parallel circuit to be energized must have one or more switch means closed by one or more of said scoring elements when certain of said switch elements of said play board are closed by the game piece projected thereon, means connecting certain of said ejecting means in certain of said parallel circuits whereby certain of said ejecting means to be energized must have its parallel circuit completed by having one or more of said switch means thereof closed by one or more of said scoring elements and certain of said switch elements closed by a game piece projected over said play board.

2. The apparatus as defined in claim 1 wherein the scoring elements ejecting means comprises a plunger adapted to engage and project said scoring elements from said openings.

3. The apparatus as defined in claim 1 wherein the scoring elements ejecting means comprises an electromagnetic coil for moving a plunger into engagement with said scoring elements received and supported by said openings.

4. The apparatus as defined in claim 1 wherein the receiving openings are arranged in parallel rows with adjacent rows spaced with respect to each other.

5. The apparatus as defined in claim 1 wherein the scoring elements receptacle comprises a horizontally extending plate positioned adjacent the bottom of said cabinet.

6. An amusement game apparatus comprising a substantially vertical cabinet having a viewing window and a horizontally extending play board over which a game piece is adapted to be projected, switch elements carried by said play board at one end thereof and engageable and actuated by said game piece when it is propelled over said play board, a horizontally extending scoring element receptacle in the lower end portion of said cabinet and having a plurality of scoring element receiving openings formed therein, there being a greater number of openings than scoring elements, a plurality of scoring elements adapted to be received in and supported by said openings, electromagnetic scoring element ejecting means carried by said receptacle beneath and adjacent each of said openings and adapted to be actuated to eject the scoring elements from said openings for free flight within said cabinet, a circuitry for said scoring element ejecting means, switch means carried by said receptacle adjacent each of said openings formed therein and adapted to be closed by said scoring elements, means connecting certain of said switch elements on said play board in circuit with certain of said switch means, means connecting certain of said switch means into a plurality of parallel circuits whereby each parallel circuit to be energized must have one or more switch means closed by one or more of said scoring elements when certain of said switch elements of said play board are closed by the game piece projected thereon, means connecting certain of said ejecting means in certain of said parallel circuits whereby certain of said ejecting means to be energized must have its parallel circuit completed by having one or more of said switch means thereof closed by one or more of said scoring elements and certain of said switch elements closed by a game piece projected over said play board, said scoring element ejecting means including a plunger adapted to engage and project said scoring elements from said openings.

7. An amusement game apparatus comprising a substantially vertical cabinet having a viewing window and a horizontally extending play board over which a game piece is adapted to be projected, switch elements carried by said play board at one end thereof and engageable and actuated by said game piece when it is propelled over said play board, a scoring element receptacle in the lower end portion of said cabinet and having a plurality of scoring element receiving openings formed therein, there being a greater number of openings than scoring elements, said openings being arranged in parallel rows with ad-

16

jacent rows spaced with respect to each other, a plurality of scoring elements adapted to be received in and supported by said openings, scoring element ejecting means carried by said receptacle beneath and adjacent each of said openings and adapted to be actuated to eject the scoring elements from said openings for free flight within said cabinet, said means including a plunger adapted to engage and project said scoring elements from said openings, a circuitry for said scoring element ejecting means, switch means carried by said receptacle adjacent each of said openings formed therein and adapted to be closed by said scoring elements, means connecting certain of said switch elements on said play board in circuit with certain of said switch means, means connecting certain of said switch means into a plurality of parallel circuits whereby each parallel circuit to be energized must have one or more switch means closed by one or more of said scoring elements when certain of said switch elements of said play board are closed by the game piece projected thereon, means connecting certain of said ejecting means in certain of said parallel circuits whereby certain of said ejecting means to be energized must have its parallel circuit completed by having one or more of said switch means thereof closed by one or more of said scoring elements and certain of said switch elements closed by a game piece projected over said play board.

8. An amusement game apparatus comprising a substantially vertical cabinet having a viewing window and a horizontally extending play board over which a game piece is adapted to be projected, switch elements carried by said play board at one end thereof and engageable and actuated by said game piece when it is propelled over said play board, a scoring element receptacle extending horizontally in the lower end portion of said cabinet and having a plurality of scoring element receiving openings formed therein, there being a greater number of openings than scoring elements, said openings being arranged in parallel rows with adjacent rows spaced with respect to each other, a plurality of scoring elements adapted to be received in and supported by said openings, electromagnetic scoring element ejecting means carried by said receptacle beneath and adjacent each of said openings and adapted to be actuated to eject the scoring elements from said openings for free flight within said cabinet, said means including a plunger adapted to engage and project said scoring elements from said openings, a circuitry for said scoring element ejecting means, switch means carried by said receptacle adjacent each of said openings formed therein and adapted to be closed by said scoring elements, means connecting certain of said switch elements on said play board in circuit with certain of said switch means, means connecting certain of said switch means into a plurality of parallel circuits whereby each parallel circuit to be energized must have one or more switch means closed by one or more of said scoring elements when certain of said switch elements of said play board are closed by the game piece projected thereon, means connecting certain of said ejecting means in certain of said parallel circuits whereby certain of said ejecting means to be energized must have its parallel circuit completed by having one or more of said switch means thereof closed by one or more of said scoring elements and certain of said switch elements closed by a game piece projected over said play board.

9. An amusement game apparatus comprising a substantially vertical cabinet having a viewing window and a horizontally extending play board over which a game piece is adapted to be projected, switch elements carried by said play board at one end thereof engageable and actuated by said game piece when it is projected over said play board, a scoring element receptacle in the lower end portion of said cabinet and having a plurality of scoring element receiving openings formed therein, there being a greater number of openings than scoring elements, a plurality of scoring elements adapted to be received in and

supported by said openings, a mirror in the upper portion of said vertical cabinet positioned to reflect said scoring elements and said openings through said viewing window, scoring element ejecting means carried by said receptacle beneath and adjacent each of said openings and adapted to be actuated to eject the scoring elements from said openings for free flight within said cabinet, a circuitry for said scoring element ejecting means, switch means carried by said receptacle adjacent each of said openings formed therein and adapted to be closed by said scoring elements, means connecting certain of said switch elements on said play board in circuit with certain of said switch means, means connecting certain of said switch means into a plurality of parallel circuits whereby each parallel circuit to be energized must have one or more switch means closed by one or more of said scoring elements when certain of said switch elements of said play board are closed by the game piece projected thereon, means connecting certain of said ejecting means in certain of said parallel circuits whereby certain of said ejecting means to be energized must have its parallel circuit completed by having one or more of said switch means thereof closed by one or more of said scoring elements and certain of said switch elements closed by a game piece projected over said play board.

10. The apparatus as defined in claim 9 in which the scoring elements ejecting means comprises a plunger adapted to engage and project said scoring elements from said openings.

11. The apparatus as defined in claim 9 wherein the scoring elements ejecting means comprises an electromagnetic coil for moving a plunger into engagement with said scoring elements received and supported by said openings.

12. The apparatus as defined in claim 9 wherein the receiving openings are arranged in parallel rows with adjacent rows spaced with respect to each other.

13. The apparatus as defined in claim 9 wherein the scoring element receptacle comprises a horizontally extending plate positioned adjacent the bottom of said cabinet.

14. An amusement game apparatus comprising a substantially vertical cabinet having a viewing window and a horizontally extending play board over which a game piece is adapted to be projected, switch elements carried by said play board at one end thereof engageable and actuated by said game piece when it is projected over said

play board, a scoring element receptacle extending horizontally in the lower end portion of said cabinet and having a plurality of scoring element receiving openings formed therein, there being a greater number of openings than scoring elements, said openings being arranged in parallel rows with adjacent rows spaced with respect to each other, a plurality of scoring elements adapted to be received in and supported by said openings, a mirror in the upper portion of said vertical cabinet positioned to reflect said scoring elements and said openings through said viewing window, electromagnetic scoring element ejecting means carried by said receptacle beneath and adjacent each of said openings and adapted to be actuated to eject the scoring elements from said openings for free flight within said cabinet, said means including a plunger adapted to engage and project said scoring elements from said openings, a circuitry for said scoring element ejecting means, switch means carried by said receptacle adjacent each of said openings formed therein and adapted to be closed by said scoring elements, means connecting certain of said switch elements on said play board in circuit with certain of said switch means, means connecting certain of said switch means into a plurality of parallel circuits whereby each parallel circuit to be energized must have one or more switch means closed by one or more of said scoring elements when certain of said switch elements of said play board are closed by the game piece projected thereon, means connecting certain of said ejecting means in certain of said parallel circuits whereby certain of said ejecting means to be energized must have its parallel circuit completed by having one or more of said switch means thereof closed by one or more of said scoring elements and certain of said switch elements closed by a game piece projected over said play board.

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