July 4, 1939. J. C. KOCI 2,165,059

GAME

Filed Nov. 26, 1937 6 Sheets-Sheet 1

Fig. 1.

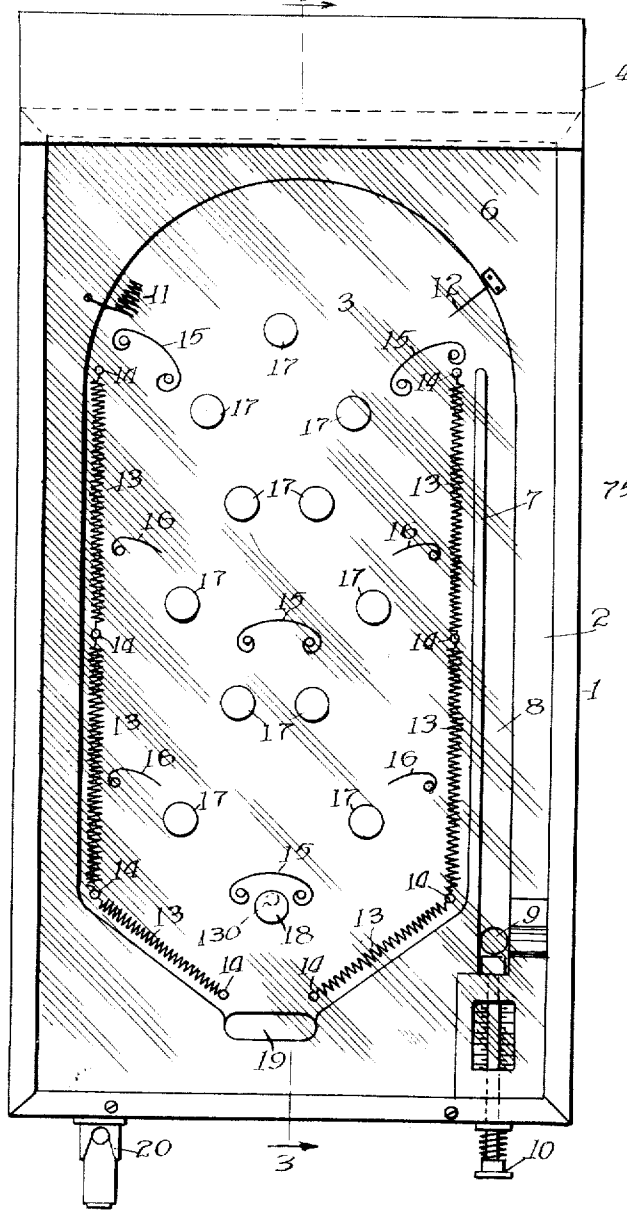



Fig. 9.

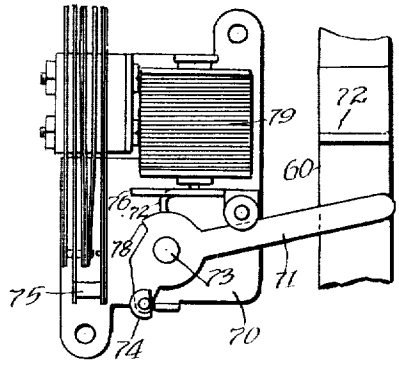
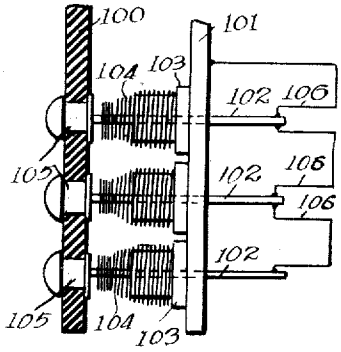



Fig. 10.




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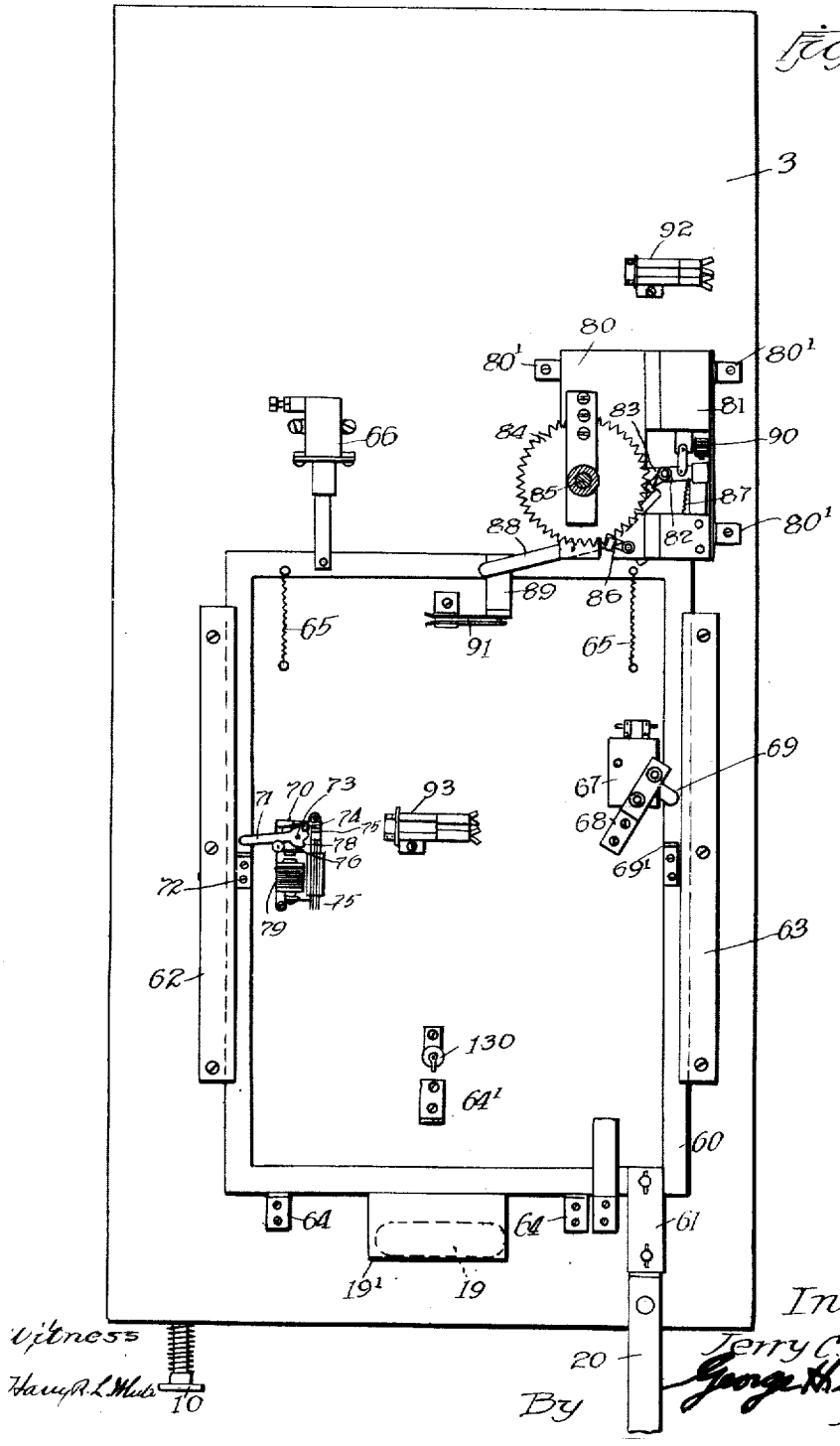
PAI

July 4, 1939. J. C. KOCI 2,165,059

GAME

Filed Nov. 26, 1937 6 Sheets-Sheet 2

Fig. 2.




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July 4, 1939. J. C. KOCI 2,165,059

GAME

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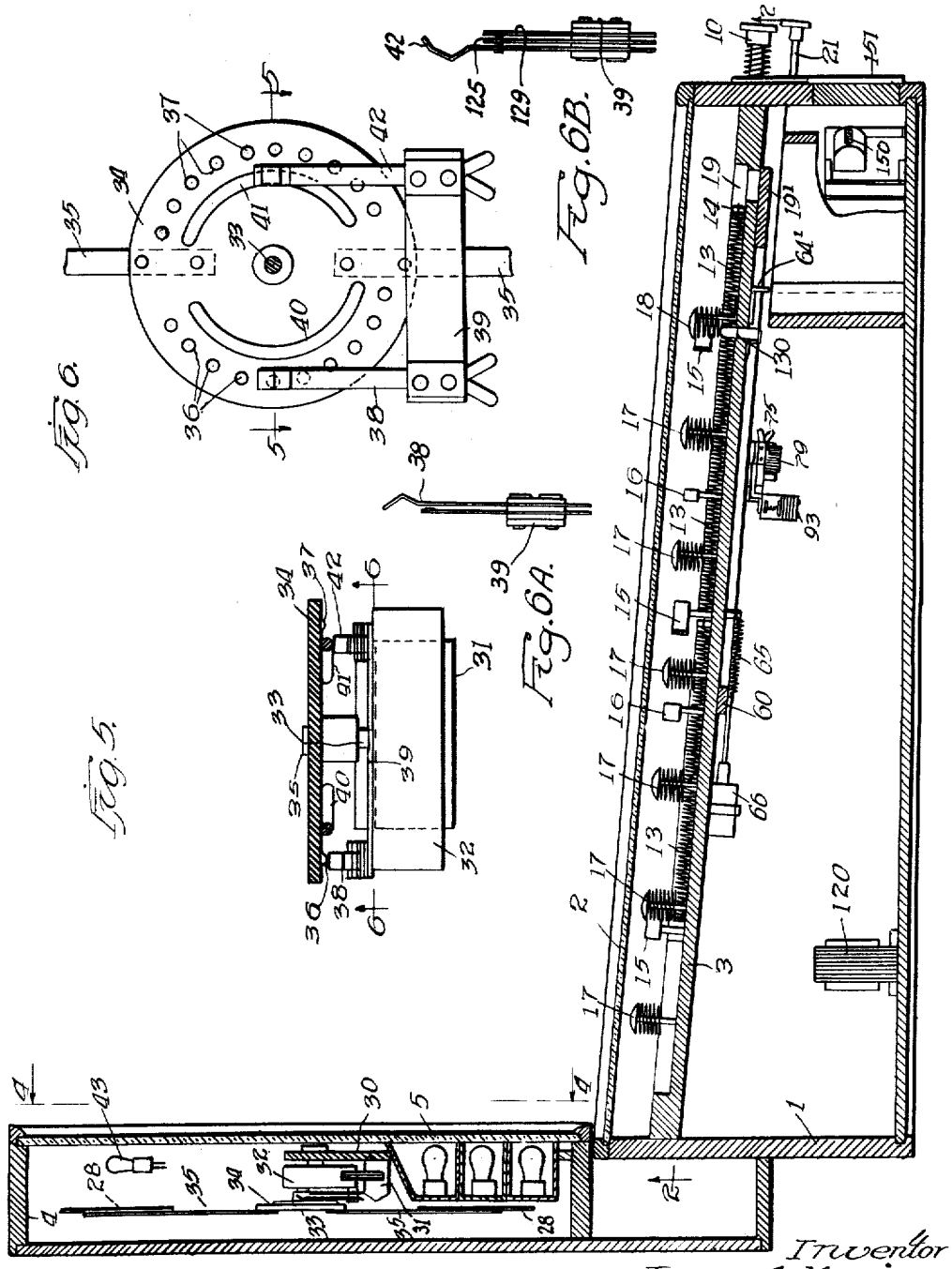


Fig. 6.

Fig. 6B.

Fig. 6A.

Fig. 5.

Fig. 3.

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July 4, 1939. J. C. KOCI 2,165,059

GAME

Filed Nov. 26, 1937 6 Sheets-Sheet 4

Fig. 4.

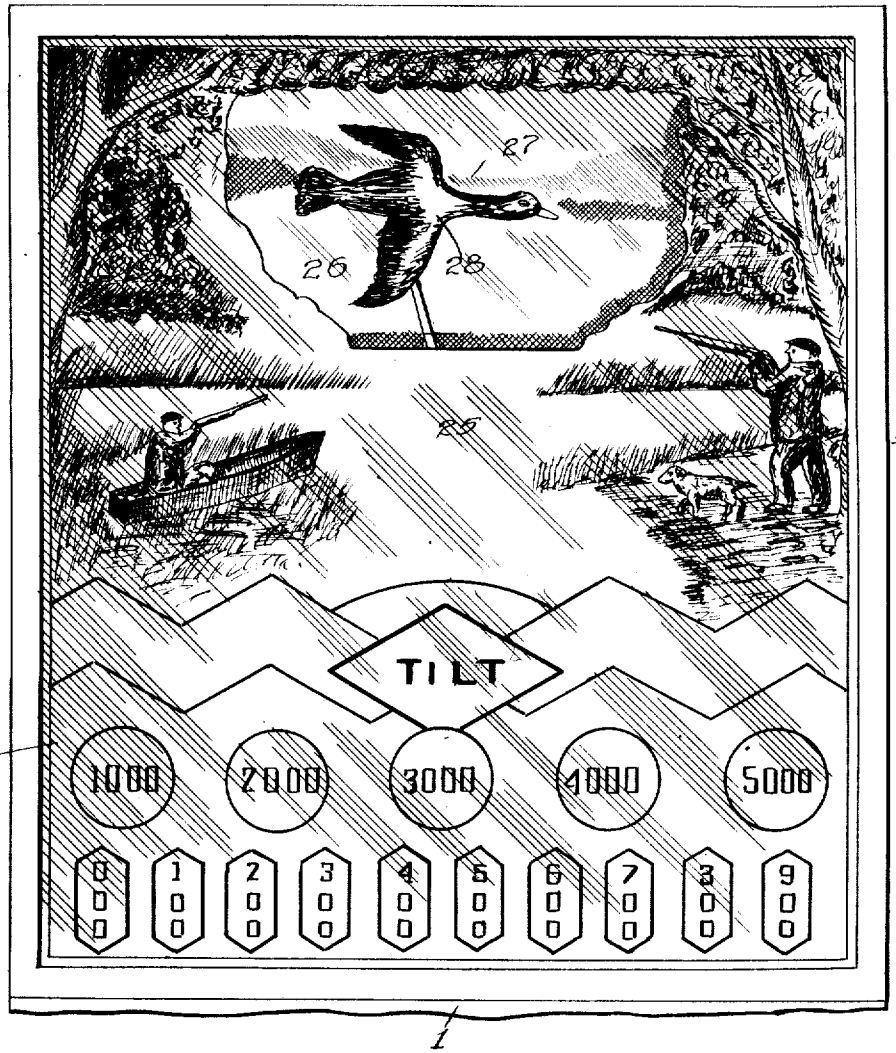



Fig. 7.

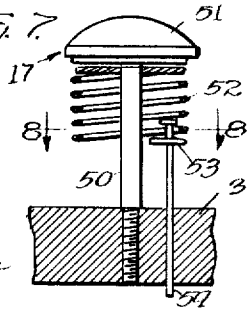
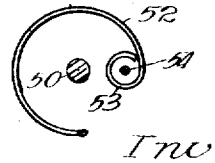



Fig. 8.




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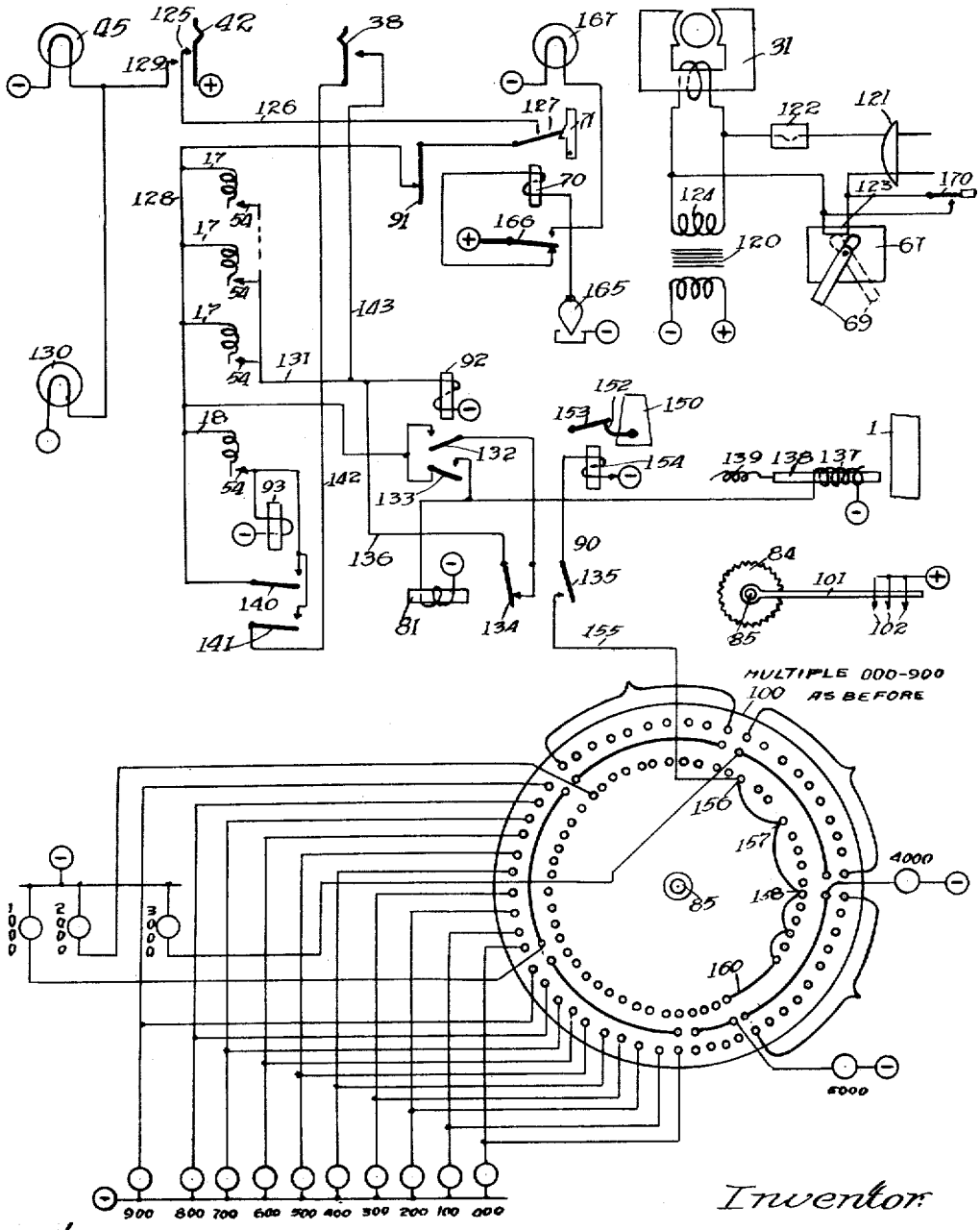
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GAME

Filed Nov. 26, 1937 6 Sheets-Sheet 5

Fig 11.




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GAME

Filed Nov. 26, 1937 6 Sheets-Sheet 6

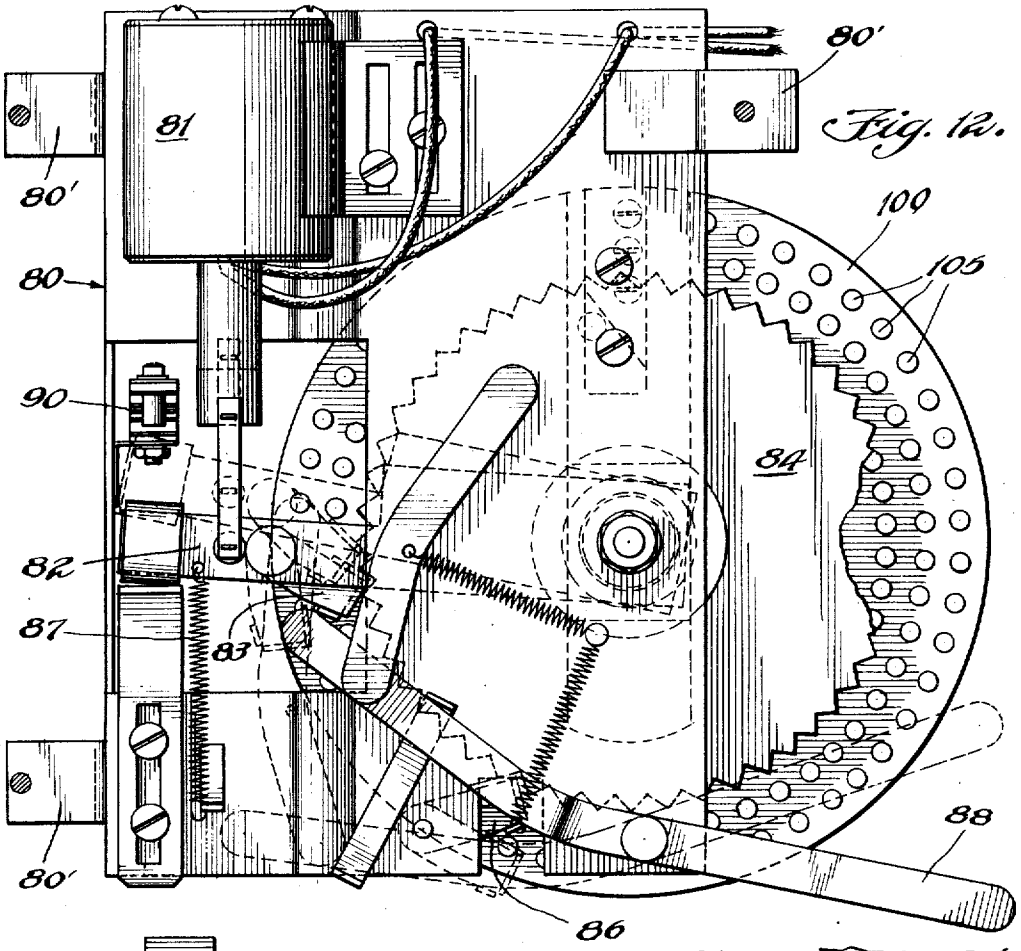



Fig. 12.

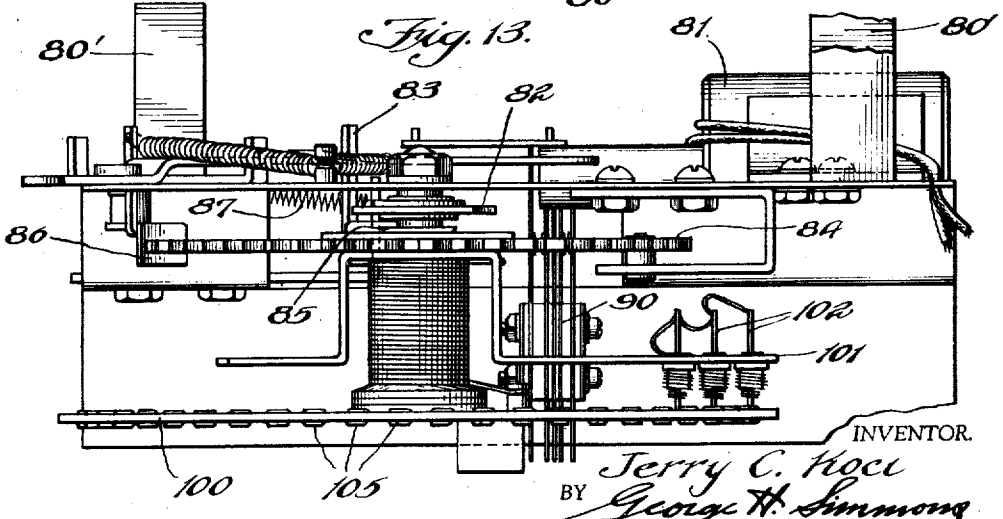



Fig. 13.

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Patented July 4, 1939 2,165,059

# UNITED STATES PATENT OFFICE

2,165,059

## GAME

Jerry C. Koci, Berwyn, Ill., assignor to Chicago Coin Machine Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application November 26, 1937, Serial No. 176,596

8 Claims. (Cl. 273—121)

This invention relates to game devices of the type adapted to be conditioned for play by the operation of a coin mechanism and has for its principal object the provision of a new and improved game of this type.

A further object of the invention resides in the provision of a novelty game which builds up player appeal by action in the game device during the playing of a game.

It is a further object of the invention to provide a game in which the score achieved by the player is automatically registered and indicated and in which the indications are changed simultaneously with a change in the score during the playing of the game.

It is a further object of the invention to provide a game in which the number of steps taken by the scoring device beyond a predetermined number of steps is counted on a counting device within the machine visible only to the operator or owner of the game.

Still another object of the invention resides in the provision of a game device having play balls adapted to gravitate over a playing field and to come into contact with devices thereon to increase the score of the game only when the balls engage the devices during particular periods or intervals.

A further object of the invention resides in the provision of a game where a contact of a ball with any one of a plurality of devices on the playing field during a particular interval will advance the scoring mechanism one step and the contact of a ball with a particular device during the interval will advance the scoring mechanism a plurality of steps.

Still another object of the invention is to provide a game of substantial construction which can be maintained in operative condition by relatively inexperienced workmen.

Further objects of the invention not specifically mentioned here will be apparent from the detailed description and claims which follow, reference being had to the accompanying drawings in which a preferred embodiment of the invention is shown by way of example and in which:

Figure 1 is a plan view of the playing field of a game device built in accordance with the teachings of the invention;

Figure 2 is a bottom side plan view of the playing field showing the mechanisms of the game;

Figure 3 is a cross-sectional view through the game taken substantially along the line 3—3 of Figure 1, looking in the direction of the arrows;

Figure 4 is a front elevational view of the backboard of the game;

Figure 5 is a cross-sectional view through the motor driven disk mechanism contained in the backboard of the game and taken substantially along the line of 5—5 of Figure 6;

Figure 6 is a fragmentary elevational view of the disk mechanism;

Figure 6A is a detail view of the spring assembly controlled by spring 38;

Figure 6B is a detail view of the spring assembly controlled by spring 42;

Figure 7 is an elevational view partly in section of a switch mechanism of the game;

Figure 8 is a cross-sectional view through the switch mechanism taken substantially along the line of 8—8 of Figure 7, looking in the direction of the arrows;

Figure 9 is a plan view of the mechanically locked "tilt" relay of the game;

Figure 10 is a fragmentary cross-sectional view through the wiper arm of the stepping switch of the game showing the arrangement of contactors thereon and contacts engaged thereby;

Figure 11 is a schematical diagram of the circuits of the game.

Figure 12 is a plan view of the stepping switch shown in Figure 2 drawn to an enlarged scale;

Figure 13 is a side elevational view of the switch shown in Figure 12.

Games of the class to which the present invention relates are usually contained in cabinets which are mounted high enough to be readily available to a player standing in front of the game. This type of the cabinet contains a glass top through which is visible a playing field that inclines slightly towards the front of the game, and over which the play balls which are propelled to the top of the playing field may gravitate during the play on a particular ball. A glass faced backboard assembly extends above the cabinet at the back edge of the game and contains, in the case of the game shown in the drawings, a part of the mechanism in addition to the score indicating devices of the game.

A coin chute mechanism projects from the front side of the game to permit the player to condition the game for play by the insertion of a coin followed by the usual manipulations of the coin chute mechanism. An elevator handle also projects from the front side of the game to permit the player to bring the balls into the playing field one at a time, and there is also a plunger mechanism which the player manipulates to propel the balls over the playing field. The present

invention employs a number of devices which will be familiar and readily understood by one skilled in the art.

A game built in accordance with the teachings of the present invention belongs to the class of games known as novelty games, in which the player seeks to register the highest possible score. The insertion of a coin and manipulation of the coin chute mechanism releases for play five balls which are propelled over the playing field, preferably one at a time, to constitute a game. During the travel of a ball over the playing field, the ball is buffeted around by spring buffers to add to the action of the game and thereby increase its player appeal.

Located upon the playing field in addition to the buffers, are a plurality of switching mechanisms, each containing contacts adapted to be closed by a ball moving into engagement with the mechanism from any direction. Located in the backboard is a mechanism constantly moving during the period of play of the game and arranged to alternately connect and disconnect a source of power to and from the switch mechanisms, thereby to form "on" and "off" intervals or periods. The circuits of the game are arranged so that the scoring mechanism in the game will be actuated each time a ball contacts a switching mechanism during an interval during which the switch mechanisms are connected to the source of power. In the game illustrated in the drawings by way of example, the intervals during which the score may be increased by bringing a ball into contact with one of the switching mechanisms are indicated by a game figure moving across the backboard of the game and visible to the player, suitable lighting being provided and flashed on during the intervals when the game figure is visible.

In order to add to the action of the game and thereby increase its player appeal, one of the switching mechanisms is connected in a circuit adapted to cause the scoring mechanism to be operated repeatedly during the remainder of the interval during which the game figure is visible in the backboard. Thus, if a ball is brought into contact with this particular switch mechanism at the very beginning of an "on" interval during which the game figure is visible, the scoring mechanism will be operated a relatively large number of times to add corresponding amounts to the score. If the ball is brought into engagement with this particular switch mechanism, later in the same "on" interval during which the game figure is visible in the backboard, the scoring mechanism will be operated a fewer number of times to increase the score by a smaller amount.

The score indicating mechanism is preferably a step by step switch having a magnet and pawl mechanism adapted to advance an arm of the switch step by step from a normal position. The arm contains a plurality of contactors which are thus advanced over a series of contacts to control the indicating means in accordance with the score at the moment.

Referring now to the drawings in more detail, particularly Figures 1, 2 and 3, the game device consists of a cabinet 1 closed by a glass plate 2, through which is visible the playing field 3 that is inclined slightly with its low end at the front of the game. A backboard, which consists of a box-like structure 4, rises above the cabinet 1 at the rear end thereof and is closed by a suitable glass plate 5.

The playing field 3 is bordered by a rigid border 6 and a wall member 7 that serves to form a chute 8 through which a ball 9 is propelled onto the field by a spring pressed plunger mechanism 10. The ball travels around the circular end of the field into engagement with a spring buffer 11, which throws it backward, there being a gate 12 arranged to prevent the ball from re-entering the chute 8.

The active part of the playing field, that is, the part over which the ball gravitates, is bounded by springs 13 which are stretched between suitable post 14 and serve to cause the ball to rebound back into the field. Located upon the field are a plurality of buffers 15, each of which consists of a pair of posts upstanding from the field and between which are extended buffer springs, the springs being wound around the posts spirally to add resiliency to the buffer. The field also contains flag buffers 16 which consist of a single post upstanding from the field and carrying a spring which extends around the post in a spiral path and extends therefrom over the playing field.

The playing field also contains a plurality of switch mechanisms 17, each of which contains contacts adapted to be closed by a ball moving into engagement with the mechanism from any direction, the contacts being connected in the circuits of the game in such a manner that the scoring mechanism will be operated through one step each time the circuit is completed through the contacts of one of the switch mechanisms 17.

The playing field also contains a switch mechanism 18 which may be of construction identical with the switch mechanisms 17, which is connected in the circuits of the game in such a manner that the scoring mechanism may be operated through a plurality of steps each time the switch mechanism 18 is engaged by a ball, as will presently appear.

Located at the bottom of the playing field is a trap 19 in which the balls that have been played are retained throughout the remainder of the game and from which the balls are released to condition the mechanism for the playing of another game.

The playing field may contain figures and characters indicative of the game if desired, these figures being omitted from the drawings to avoid an unnecessary complication thereof. The particular arrangement of the bumpers and other instrumentalities upon the playing field may be varied within the teachings of the invention, the arrangement shown in the drawings being shown by way of example.

The coin chute mechanism indicated at 20, Figure 1, is of usual construction familiar to those skilled in the art and is adapted to receive a coin and to be operated to condition the game for play in the usual manner. An elevator operated through a plunger 21, Figure 3, is provided to elevate the balls into the chute 8, one at a time, the game preferably being provided with five play balls. The particular type of elevator mechanism used for this purpose is not of the essence of the present invention and inasmuch as there are several mechanisms available to those skilled in the art which may be used in the game, the details of the mechanism have been omitted from the drawings to avoid unnecessary complications.

As will be seen in Figures 3 and 4, the backboard consists of a box-like structure 4 closed by a glass plate 5 upon which plate is painted a scene indicating the nature of the game. As shown in the drawings, the game is a duck hunt-

ing game and the scene 25 is appropriate thereto. The scene painted upon the front plate 5 of the backboard contains an opening or sight 26 through which a background scene 27 is visible. A play figure of the game, such as the duck 28, is likewise visible through the sight 26 as it is moved across the background scene 27.

Located within the backboard behind the glass panel 5, is a mounting bracket 30 upon which is mounted an electric motor 31 and a speed reduction gearing 32, from which gearing is projected a shaft 33 that carries a disk 34. The particular type of motor and speed reduction gearing used may be varied within the teachings of the invention. Preferably, however, the shaft 33 will be rotated at a speed of about 8 revolutions per minute.

Projecting from the disk 34 are arms 35 which carry the game figures 28 so that as the disk is rotated, figures will travel across the sight 26 and will be visible to the player.

The disk 34 carries an outer row of contactors which are divided into two groups, 36 and 37, each group being shown as containing 10 contactors, although this number may be varied, if desired, within the teachings of the invention. As will be seen in Figure 5, the contactors, project from the face of the disk and serve as cams. A cam spring assembly 38 mounted upon a suitable plate 39 carried by the motor includes a main spring adapted to be moved as the individual contactors are brought into and out of engagement with the spring. The main spring is thus alternately moved into and out of engagement with cooperating contacts as will presently appear. The disk 34 also contains two contactors 40 and 41 located inside the circle defined by contactors 36 and 37 and engaged by a second spring assembly 42 carried upon the mounting plate 39. Contactors 40 and 41 likewise extend beyond the surface of the disk and serve as cams to move the main spring of the assembly 42 relative to the disk as the contactors are brought into and out of engagement with the spring. Cooperating springs are engaged by this movement of the main spring, as will presently appear.

The backboard housing also contains a pair of lamps 43, one of which is located at each end of the sight 26 and behind the scene painted upon the front panel 5, the light serving to light the interior of the backboard so as to render visible the game figure as it moves across the field of vision of the player.

The switching mechanisms 17 and 18 located upon the playing field 3 are of the type arranged to close a pair of contacts when struck by a playing ball moving into engagement with the mechanism from any direction, there being a number of available switch mechanisms for this purpose. As shown in the drawings, the mechanisms consist of a central post 50 capped by a suitable cap 51 beneath which is suspended a helical spring 52 which terminates in a loop 53, Figure 8. A pin 54 extends upwardly through the playing field and into the loop 53. One side of the circuit is connected to the post 50 and thence to the loop 53 through the helical spring 52, and the other side of the circuit is connected to the post 54. It will be readily apparent that a ball moving the helical spring 52 in any direction, will move the loop 53 into engagement with the pin 54, thereby closing a circuit between the two.

As will be seen in Figures 2 and 3, there are mounted upon the underside of the playing field 3, a number of instrumentalities of the game. The shuffle board 60 connected to the coin chute 20 by a suitable link 61, is slidably carried in guides 62 and 63 and is adapted to move upwardly in Figure 2, away from stops 64 and against the tension of springs 65 as the coin mechanism 20 is moved inwardly to condition the game for play. A dash pot 66 of usual construction well known to those skilled in the art, is connected to shuffle board 60 and serves to regulate the speed of travel of the same in the usual manner, and a stop 64' serves to limit the upward movement of the shuffle board 60.

A timing switch 67 is mounted upon the playing field 3 by a suitable bracket 68 and is provided with an operating arm 69 that overlies the shuffle board and is adapted to be engaged by a bracket 69' thereon to operate the switch. Timing switches per se are old and well understood by those skilled in the art, the type most commonly used having a clock-work mechanism driven by a spring that is tensioned as the arm 69 is moved by an operation of the shuffle board, the arm also closing a set of contacts which are released subsequently after a given interval of time measured by the clock mechanism. The device is used to limit the length of time during which the game may be kept in operative condition responsive to the insertion of a single coin, as will be well understood by those skilled in the art.

The playing field also contains a tilt relay 70 best seen in Figure 9 and containing an arm 71 which overlies the shuffle board 60 and is adapted to be engaged by a bracket 72 carried thereon and moved in a clockwise direction, Figure 9, by the inward movement of the coin mechanism. The arm 71 is pivoted at 73 and carries a cam bushing 74 which is moved into engagement with a spring assembly 75 to move that assembly into its operated position. An armature 76 pivoted upon the relay contains a latch 72' which moves behind a shoulder 78 on the arm 71 to hold the arm in its operated position. An electromagnet 79 is connected in a circuit through a tilt bob in the game, so as to be energized if the game is tilted by the player in effort to advance his score. An energization of the magnet 79 moves the armature so as to release the arm 71 to permit it to return to its normal position in which it is shown in Figure 9. Springs 75 are thereby permitted to resume their normal position, where they will remain until the coin chute is again operated responsive to the insertion of a coin in the machine.

The playing field also carries a stepping switch indicated generally at 80, Figure 2, which is mounted on suitable brackets 80' which permit the switch to hang beneath the shuffle board 60. There are a number of stepping switches available which may be used within the teachings of the invention. As shown in Figure 2 and in more detail in Figures 12 and 13, the switch consists of a solenoid 81 having a plunger connected to a pivoted armature 82 which carries a pawl 83 that engages a toothed disk 84 carried upon a rotatable shaft 85. A detent 86 likewise engages this disk 84. Each time solenoid 81 is energized, armature 82 and the pawl 83 are moved upwardly, Figures 2 and 12, to permit the pawl to ride over into engagement with the tooth immediately above the one with which it is shown engaged. Spring 87 is tensioned and as soon as the magnet is de-energized this spring pulls the armature back into its normal position, the pawl 83 rotat-

ing the disk one step in a clockwise direction as seen in Figure 2. Pawl 86 rides over into engagement with the next tooth and serves to hold the disk in its advanced position. The switch also contains an arm 88 adapted to be engaged by a bracket 89 on the shuffle board 60, as the shuffle board is moved upwardly, Figure 2, this arm pivoting to move pawls 83 and 86 out of engagement with the disk 84. A spring wound around the shaft 85 of the switch in the usual manner, returns the disk to its normal position.

The switch also contains a spring assembly 90 having main springs which are engaged and operated by armature 82 each time the solenoid 81 is energized. Bracket 89 also engages a spring assembly 91 to close the main spring thereof against its make contact when the shuffle board is in its normal position, for a purpose which will presently appear.

A stepping relay 92 and a repeat relay 93 are mounted in convenient locations upon the playing field and connected in the circuits of the machine as will presently appear. These relays are of the usual type having a coil and armature moved thereby to operate one or more main springs into and out of engagement with associated contacts. The particular type of relay used is not of the essence of the present invention and the details have been omitted from the drawings.

The shuffle board 60 carries a gate 19' which overlies the pocket 19 in the playing field, into which the play balls drop after they have passed over the playing field. When the shuffle board is operated by moving the coin chute mechanism 20 upwardly, as seen in Figure 2, gate 19' moves out of registration with the pocket 19 and the balls fall through the playing field into a suitable chute, not shown, which carries them to the elevator mechanism for return to the playing field.

The particular arrangement of the devices mounted upon the underside of the playing field may be varied within the teachings of the invention, the arrangement shown in the drawings illustrating a preferred arrangement shown by way of example.

The shaft 85 projects through a stationary disk 100, Figures 2, 11, 12 and 13, and the shaft carries an arm 101 located adjacent to this disk. The arm carries three contactors, 102, each of which projects through a bushing 103, and is spring pressed in the direction of the disk 100 by a coil spring 104. The disk contains 3 rows of contacts 105, one contact in each row being at all times engaged by one of the contactors 102. The contactors are connected together by suitable pig tails 106 and are connected to the arm 101, which in turn is connected to one side of a source of power, as will presently appear.

Located in the bottom of the backrack of the game are a plurality of lamps, 10 of which are arranged in a row, one behind each of the windows 000—900, Figure 4. These lamps are connected to the outer row of contacts on the disk 100 and to one side of a source of power so that when the switch is in its normal position the lamp 000 will be lighted to indicate that the score is "0". When the stepping switch is moved one step, lamp 000 will be extinguished and lamp behind legend 100 will be lighted as the contactor moves into engagement with it. Successive steps of the stepping switch light the lamps consecutively until lamp behind legend 900 is illuminated. The backrack contains a second series of lamps 1000—5000 located behind corresponding numerals painted upon the glass panel 5 and connected on the disk 100. Lamp 1000 is connected to the contacts beginning with the 10th contact out of normal position and extending to the 19th contact. Thus with the wiper standing upon the contacts through which lamp behind legend 900 is illuminated, an additional step of the switch will extinguish this lamp, will light lamp 1000 and as the outer one of the contactors 102 moves into engagement with the 10th contact out of normal position in the row of contacts engaged by it, lamp 000 will again be lighted, this contact being multipled to the normal position contact. By this arrangement, as the stepping switch advances its arm 101, one or more lamps in the backrack will be lighted to indicate a score in thousands and hundreds of points.

In Figure 11 the contacts in the outer row are shown multipled together and connected to the lamps 000—900 only in the first two groups of 10 contacts, and it will be understood that this multiple is extended to the remaining groups of ten contacts and that these connections have been omitted to avoid an unnecessary complication of the drawings.

As will be seen in Figures 3 and 11, power for operating the game is provided by a transformer 120 which is located within the cabinet and connected to a suitable convenient source of commercial current, not shown, the connection extending through the timing switch 67 and through a fuse 122. Thus, when the game is conditioned for play by the operation of the coin chute following the deposit of a coin therein, arm 69 of the timing switch 67 is moved into position in which it is shown by dotted lines in Figure 11, the contacts 123 within the switch will be closed and the primary winding 124 of the transformer will be connected across the source of commercial current. The secondary winding of the transformer will be energized, the terminals of this winding being indicated in Figure 11 by circles, one of which contains a negative sign and designated as negative, and the other a positive sign, designated as positive, these designations being for convenience only.

The winding of the motor 31 is connected in multiple with the primary winding 124 of the transformer so that the motor will operate so long as the transformer is energized.

The circuit arrangement of a game embodying the teachings of the present invention are shown in Figure 11. Assuming that the tilt relay 70 has not been operated and is, therefore, in the position in which it is shown in Figure 11, and assuming that the coin chute mechanism has been returned to normal so that springs 91 will be closed by the bracket 89 on the shuffle board and that the timing switch 67 has been operated to extend the commercial current to the motor and transformer, as disk 34 is rotated by the motor to bring contactor 40 or 41 into engagement with springs 42, it will be seen that positive will be connected through spring 42 and its make contact 125 to conductor 126 whenever the spring 42 engages contactor 40 or 41. Conductor 126 leads through tilt relay springs 127 and through normally closed springs 93 to a common conductor 128 which is extended to one side of each of the switch mechanisms 17 and 18. Positive is also connected through springs 42 and 125 to make contact 129 to extend a circuit through lamps 43 in the backboard to negative thereby to light these lamps. This circuit also extends

through a lamp 130 which is located beneath the switch mechanism 18, as will be seen in Figure 3, to negative to light this lamp.

Inasmuch as the movement of the disk 34 alternately moves spring 42 into and out of engagement with its make contacts 126 and 129, lamps 48 and 130 will flash off and on, the position of the contactors 40 and 41 on the disk being so that the lamps will be on when the game Figure 28 is visible through the sight 26. The intervals during which positive is connected to conductor 128 may be termed as "on" periods and the intervals during which this potential is removed therefrom "off" periods. Preferably the "on" periods are slightly longer than the "off" periods, but this may be altered within the teachings of the invention.

Contacts 54 of the switch mechanism 17 are connected together by a conductor 131 which extends to the winding of stepping relay 92, the other terminal of that relay being connected to negative. Thus, if the switch mechanism 17 is contacted by a play ball during the interval that spring 42 is engaging its make contact 125, relay 92 will be energized. Relay 92 carries main springs 132 and 133 which are normally disengaged from their respective make contacts and move into engagement therewith when the relay is energized. Magnet 81 of the stepping switch, as above explained, operates a spring assembly 90 which consists of a main spring 134 that normally engages a cooperating break contact and a main spring 135 that is normally disengaged from a cooperating make contact. The movement of main spring 132 into engagement with its make contact extends a circuit from the common conductor 128 through springs 132, through springs 134, conductor 136 to the winding of relay 92, thereby to lock the relay under the control of solenoid 81.

Relay 92, by closing main spring 133, extends a circuit from common conductor 128 through the winding of magnet 81 of the stepping switch to negative with a branch of this circuit extending through the winding of a solenoid 137. Magnet 81 energizes over this circuit and moves its armature preparatory to advancing the wipers of the stepping switch one step, the armature operating spring assembly 90 to open the locking circuit of relay 92 which falls back and opens the circuit of relay 81 whereupon the switch arm of the stepping switch is advanced one step. By this arrangement it will be seen that so long as the closing of the contacts in one of the switch mechanisms 17 is long enough to permit stepping relay 92 to be energized, that relay will be locked and maintained in energized position long enough to insure that the stepping switch magnet is fully energized preparatory to advancing the switch arm one step.

The solenoid 137 is a noise maker, having a plunger 138 which is moved against the tension of spring 139 when the solenoid is energized, the plunger striking against a part of the cabinet 1 to make a noise simulating the explosion of a gun. The use of this arrangement is optional within the teachings of the invention.

Contact 54 of the switch mechanism 18 is connected to one terminal of locking relay 93, the other terminal of this relay being connected to negative. Should a play ball come into contact with the mechanism 18 during the time spring 42 is in engagement with its make contact 135, relay 93 will be energized. The energization of this relay closes a locking circuit for itself, extending from conductor 128 through main spring 140 and its make contact through the winding of relay 93 to negative. Thus, when once energized, relay 93 will remain in its operated position so long as the main spring 42 is engaged with its make contact 125, provided, of course, that the game is not tilted in the mean time.

Relay 93 extends the positive potential on conductor 128 through spring 140 and its make contact, through the make contact of and spring 141, conductor 142 through cam spring 38 and its make contact conductor 143 through the winding of relay 92 to negative, to energize the relay 92 as soon as spring 38 engages its make contact. Relay 92 locks in the manner previously explained and closes the circuit to magnet 81 of the stepping switch. Cam spring 38, as hereinabove pointed out, engages the outer set of contactors on the disk 34 and alternately moves into and out of engagement with its make contact, so that so long as relay 93 remains in operated position, relay 92 will be repeatedly energized and the stepping switch will be caused to take a plurality of steps.

In many instances, it may be advantageous to the operator of the game device to have a record of the number of times that the stepping switch operates beyond a certain point. To this end there may be provided a mechanical counter 150 located within the cabinet, as shown in Figure 3, so as to be visible through the door 151 through which the coins or tokens are removed from the machine. The particular type of mechanical counter used is immaterial, for example, a counter of the type shown in United States Patent No. 2,046,810 has been found to be satisfactory for this purpose.

The operating arm 152 of the counting device is connected to the armature 153 of a magnet 154, so that the counter will be operated through one step each time the magnet is energized. A circuit for the magnet is extended from negative through the winding of the magnet through spring 135 and its make contact, conductor 155 to certain contacts on the inner or third row of contacts on the disk 100 of the stepping switch. As shown in Figure 11, conductor 155 is connected to the 31st contact 156 in this row so that when the inner one of the contactors 102 engages this contact, the circuit of magnet 154 will be closed to positive.

Conductor 155 may also be extended to other contacts such as 157, 158, etc. and if desired a plurality of adjacent contacts 160 may be bridged together so that the magnet 154 will be operated each time the stepping switch magnet 81 is operated to advance the switch arm over these adjacent contacts. The particular contacts 157 and 158 to which conductor 155 is multipled, will depend upon the information that it is desired to record upon the counter 150, the multipling shown in Figure 11 being shown by way of example and being subject to variation within the teachings of the invention.

In games of this type it is customary to provide a tilt relay to indicate when the game has been jiggled or tilted by the player in effort to gain a more advantageous score. This arrangement consists of a suitable tilt bob 165 or other similar device which when moved out of perpendicular, closes a circuit from negative through the winding of relay 70 through spring 155 and its break contact to positive, the relay being energized over this circuit to unlatch its armature 71 and permit its springs to move into position opposite that in which they are shown in Figure 11.

Spring 127 opens the circuit previously traced from cam spring 42 to the common conductor 128 so that engagement of the play ball with one of the switch mechanisms 17 or switch mechanism 18 will be without effect. Spring 166 extends a circuit from positive through its make contact through tilt lamp 167 to negative thereby to light that lamp. The tilt lamp is located in the backrack behind a suitable legend "tilt" as illustrated in Figure 4, and when lamp 167 is lighted the word "tilt" appears to inform the player that further playing of the game will be without effect.

In games of this type there is usually provided a test switch which enables the operator or repairmen to shunt around the timing switch and test the operation of the motor and lamps without inserting a coin in the machine. In Figure 11 I have shown such a switch at 170 which may be included in the game if desired.

From the foregoing it will be apparent that I have provided a new and improved game of the novelty type in which the play is lively and fascinating. The movement of the play balls over the playing field may cause the stepping switch to be operated once or a plurality of times, depending upon whether or not the ball comes into contact with one or the other of two types of switch mechanisms on the playing field. Engagement of a play ball with the switch mechanisms will not operate the stepping switch if this engagement occurs during an off period, that is, during a period during which no game figure is visible in the backrack.

The game device is of simple construction, capable of operating over a long period of time with a minimum of attention.

While I have chosen to illustrate my invention by showing and describing a preferred embodiment of it, I have done so by way of example only and am not to be limited except by the scope of the appended claims.

Having thus complied with the statutes and shown and described a preferred embodiment of my invention, what I consider new and desire to have protected by Letters Patent is pointed out in the appended claims.

What is claimed is:

1. In a game, a playing field, means for propelling a ball thereover, a plurality of switch means projecting above said field and adapted to be engaged one at a time by said ball, means for dividing the interval during which a ball is traveling over said field into "off" and "on" periods, an electromagnetic switch, and means responsive to the engagement of a ball with any one of said switch means during an "on" period for operating said electromagnetic switch.

2. In a game, a playing field, means for propelling a ball thereover, a plurality of switch means projecting above said field and adapted to be engaged by a ball and including contacts closed when the ball moves into engagement with the switch means from any direction, a stepping switch, means for dividing the interval during which a ball is traveling over said field into "off" and "on" periods, and means including a circuit closed by said contacts for operating said stepping switch each time a ball engages any one of said switch means during an "on" period.

3. In a game, the combination with a playing field over which play balls are adapted to be rolled and having bumpers for directing the course of the balls, of a plurality of switch means upstanding from the field and containing contacts closed by a ball moving into engagement with the switch means from any direction, a source of power, motor driven means for connecting said source of power to said switches periodically, a stepping switch, means including a circuit closed through the contacts of any of one of one said switch means during a period during which said source of power is connected to said switches for operating said stepping switch one step.

4. In a game having a playing field over which play balls may be propelled, a source of power, a common conductor, cam means for connecting said source of power to said conductor for intervals of time separated by intervals of approximately equal length, a plurality of switches on said playing field adapted to be closed by play balls, a relay, means for operating said relay over a circuit through said switches whenever one of them is operated during an interval during which said conductor is connected to said source of power, a stepping switch operable to register the scores made in the game, an operating magnet for said switch, contacts operated by said magnet, a locking circuit for said relay extending through said contacts to said conductor, and a circuit for said magnet controlled by said relay over which the relay is operated to step the switch and to break said locking circuit.

5. In a game, a playing field over which play balls may be moved, switch means on said field each having contacts closed by a ball moved into engagement with the switch means from any direction, a common conductor connecting together one of said contacts from each switch means, a source of power, means for alternately connecting said source of power to said common conductor to form an "on" period and for disconnecting the power from said conductor to form an "off" period, a stepping switch, means including a circuit closed through the contacts of said switch means for operating said stepping switch one step each time a ball engages a switch means during an "on" period, a relay, a circuit for said relay closed through the contacts on a particular one of said switch means and over which said relay is operated when said switch means is engaged by a ball during an "on" period, means for locking said relay to said common conductor, and means including a circuit through contacts on said relay closed when the relay is in operated position for operating said stepping switch repeatedly during the remainder of said "on" period.

6. In a game, a playing field, means for propelling a ball thereover, switch means projecting above said field and including contacts closed by a ball moving into engagement with the switch means from any direction, a source of power, means for connecting said source of power to said switch and for disconnecting the source of power therefrom alternately, to form "on" and "off" periods, a relay, a circuit for said relay closed through said contacts to operate the relay whenever the switch is engaged by a ball during an "on" period, means for locking said relay in operated position during the remainder of the "on" period, a stepping switch, and means including a circuit closed through said relay in operated position for operating said stepping switch repeatedly.

7. In a game device having play balls, a stepping switch having a motor magnet, a relay, a source of power, circuit means closed by said relay in energized position for operating said stepping switch motor magnet, a circuit for said

relay including parallel branches, an intermittently closed interrupter contact set in one of said branches, and contacts in each of said branches of said circuit closed by a play ball, said relay being operated once when one of said branches of said circuit is closed, and a plurality of times when the other one of said branches of said circuit is closed.

8. In a game, the combination with a playing field over which play balls are adapted to be rolled and having bumpers for directing the course of said balls, of switch means upstanding from the field and containing contacts closed by a ball moving into engagement with the switch means from any direction, a source of power, means for connecting said source of power to said switch means periodically to establish "on" periods, an interrupter having contacts closed a definite number of times during each "on" period, a relay controlled by said switch means to extend said source of power to said interrupter contacts, a stepping switch, circuit means therefor extending through said interrupter contacts, said circuit means being closed to operate said stepping switch when said switch means is closed by a ball during an "on" period, said stepping switch being then operated by said interrupter contacts a plurality of times less in number than said definite number of times by the number of times said interrupter contacts have been closed during said "on" period before said switch means is operated.

JERRY C. KOCI.

CERTIFICATE OF CORRECTION.

Patent No. 2,165,059. July 4, 1939.

JERRY C. KOCI.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 6, second column, line 6, claim 3, for the words "of one of one said" read one of said; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of September, A. D. 1939.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

relay including parallel branches, an intermittently closed interrupter contact set in one of said branches, and contacts in each of said branches of said circuit closed by a play ball, said relay being operated once when one of said branches of said circuit is closed, and a plurality of times when the other one of said branches of said circuit is closed.

8. In a game, the combination with a playing field over which play balls are adapted to be rolled and having bumpers for directing the course of said balls, of switch means upstanding from the field and containing contacts closed by a ball moving into engagement with the switch means from any direction, a source of power, means for connecting said source of power to said switch means periodically to establish "on" periods, an interrupter having contacts closed a definite number of times during each "on" period, a relay controlled by said switch means to extend said source of power to said interrupter contacts, a stepping switch, circuit means therefor extending through said interrupter contacts, said circuit means being closed to operate said stepping switch when said switch means is closed by a ball during an "on" period, said stepping switch being then operated by said interrupter contacts a plurality of times less in number than said definite number of times by the number of times said interrupter contacts have been closed during said "on" period before said switch means is operated.

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