March 5, 1940. L. A. DURANT 2,192,596

INDICATING AND CONTROL MEANS FOR GAME APPARATUS

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Fig. 1.

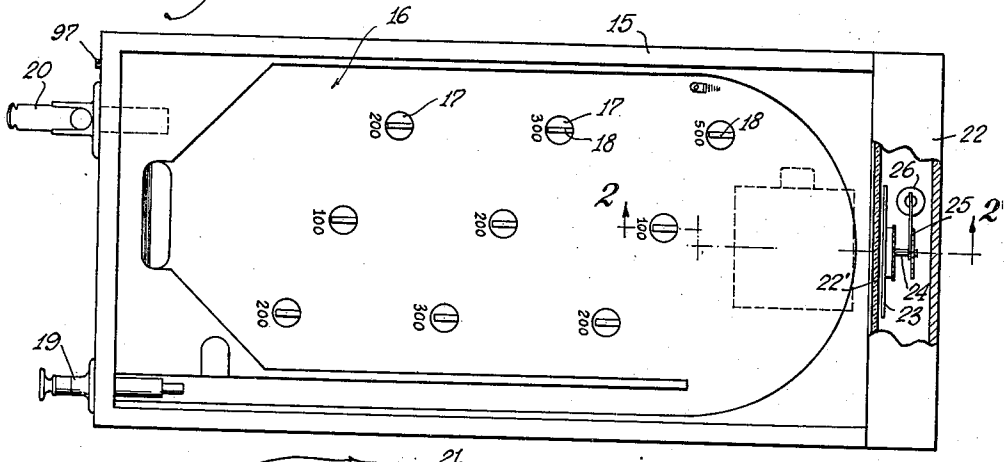


Fig. 3.

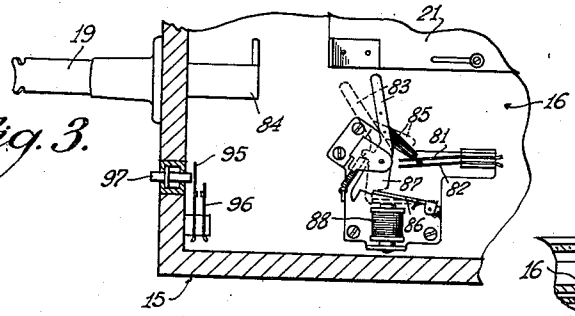


Fig. 2.

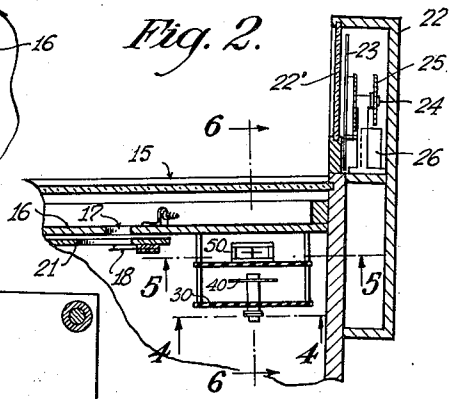


Fig. 4.

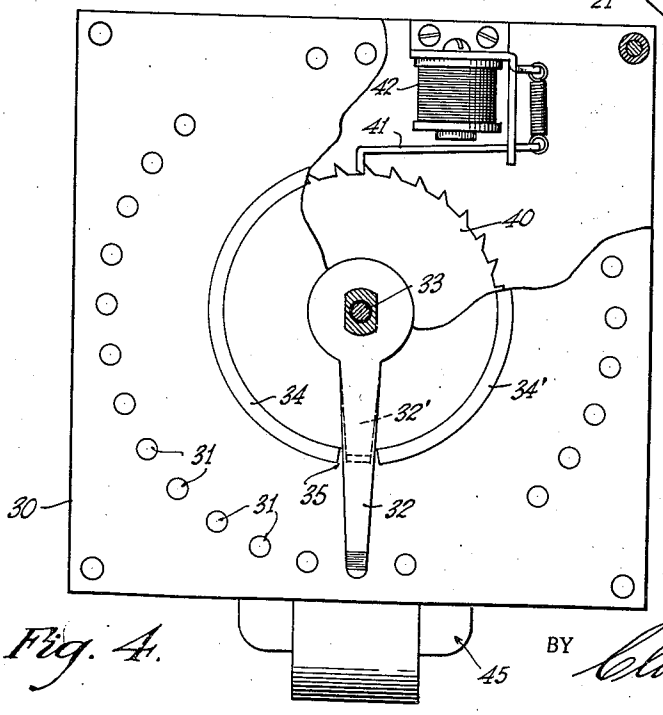
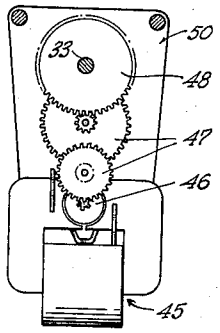


Fig. 5



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Fig. 6

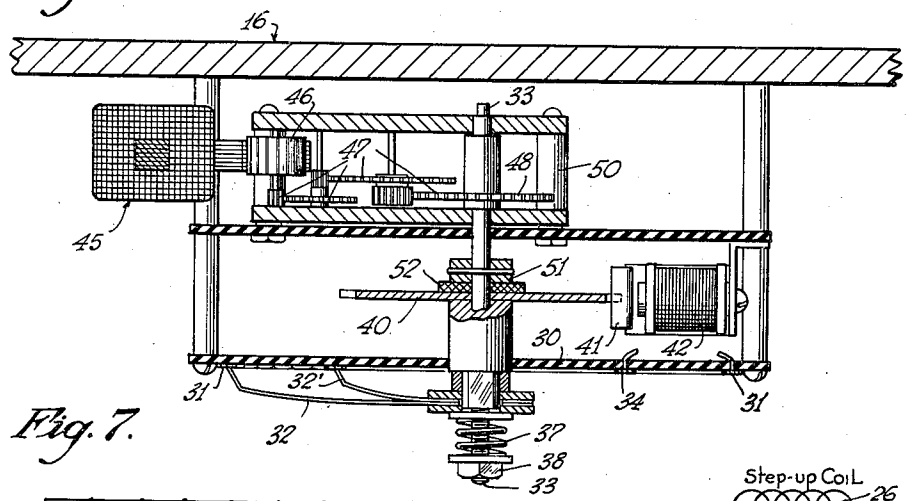
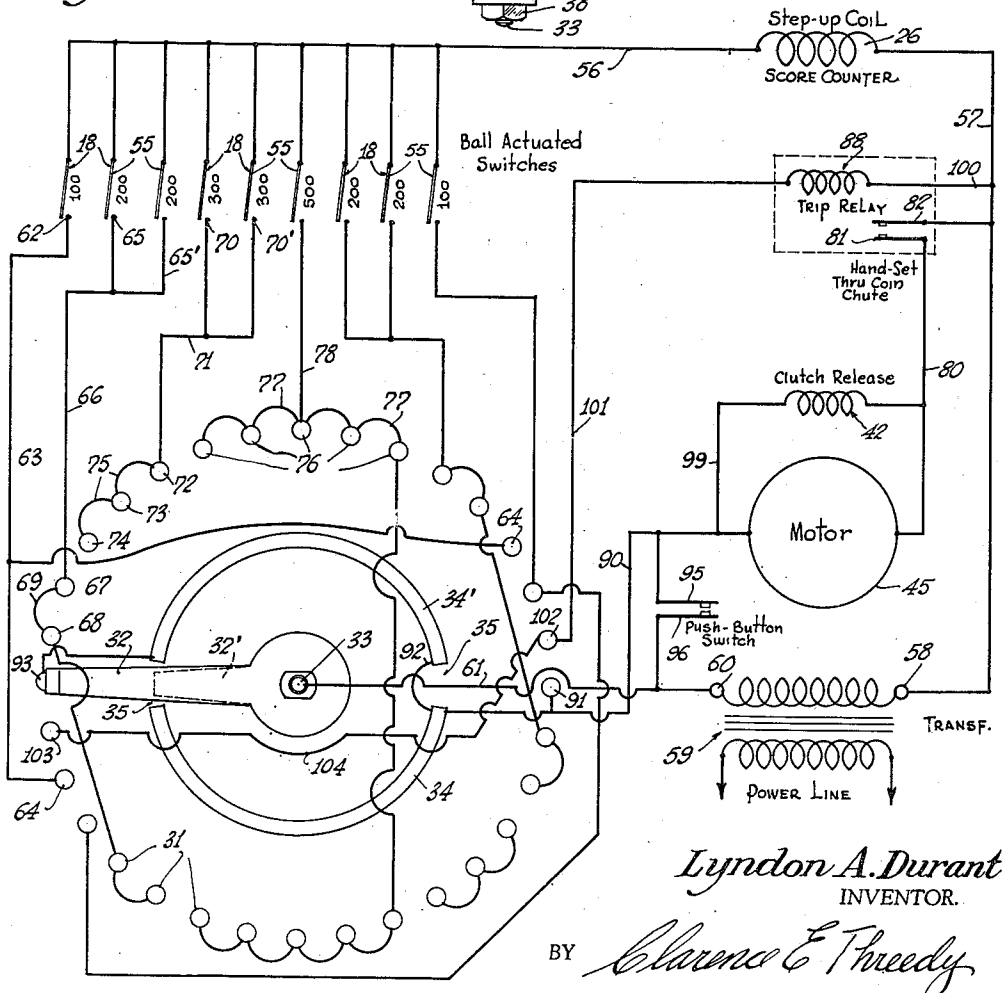


Fig. 7.



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Fig. 9.

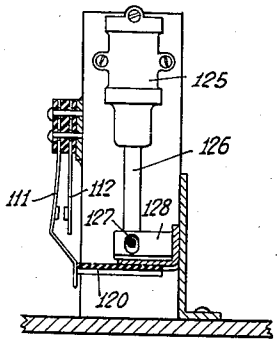


Fig. 8.

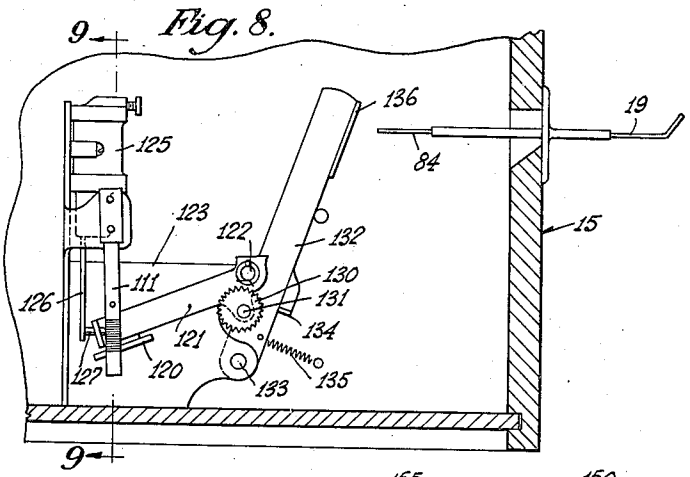


Fig. 10.

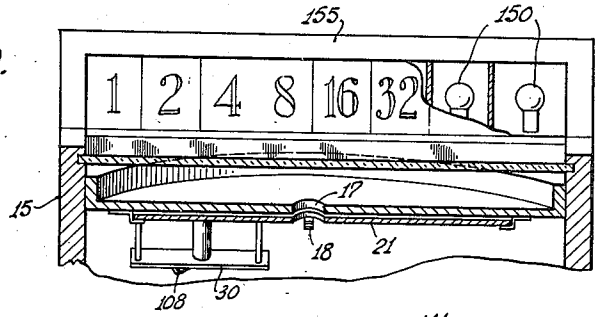
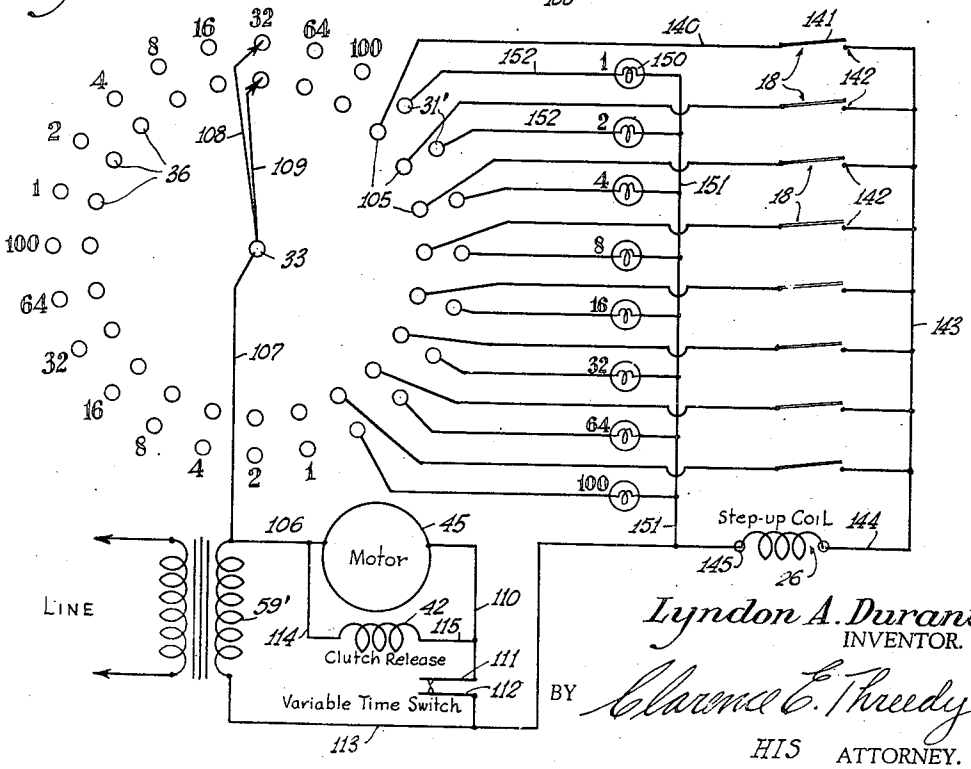


Fig. 11.



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UNITED STATES PATENT OFFICE

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INDICATING AND CONTROL MEANS FOR GAME APPARATUS

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Application August 22, 1938, Serial No. 226,013

8 Claims. (Cl. 273—121)

This invention relates to indicating and control means for use particularly, but not exclusively, in game and amusement apparatus, one of the principal objects being the provision of a switching and circuit arrangement by means of which a player may totalize a score set up in playing the game and involving a plurality of scoring members, such, for example, as a number of switches which have been operated by balls lodged in scoring pockets in a ball game.

Viewed from another aspect, it is an object of the invention to provide a single totalizer operated by electrical impulses, and switching means actuated by the player at the conclusion of the game for successively connecting the totalizer to each one of a number of score switches having different score values so that the totalizer will be impulsed whenever it is connected to a score switch which has been operated, there being, moreover, a plurality of impulsing contacts for each score switch depending in number upon the relative score value of the switch, whereby the total score values of all successfully operated score switches may be registered at the will of the player.

Another object is the provision of automatic preselecting means for cooperation with the aforesaid totalizing arrangement, or which may be used independently, if desired, whereby different score switches will be connected in circuit for operation at different times, the change being effected automatically each time, preferably, the game is operated.

Another object is the provision of signal means coacting with the aforesaid preselecting means for designating which score switches are in circuit and hence constitute an objective for the player.

A further object is the provision of switch mechanism especially suitable for use in conjunction with the indicating and control means heretofore described and also suitable for general application.

Other novel aspects and advantages peculiar to the invention will be brought out in the following description taken in conjunction with the appended drawings, in which:

Fig. 1 is a top plan view of an amusement apparatus;

Fig. 2 is a fragmentary vertical section through the apparatus of Fig. 1 and taken along line 2—2 thereof;

Fig. 3 is a fragmentary horizontal section looking upwardly at the under side of the playboard;

Fig. 4 is a top plan view of the electric switching device with portions cut away to show the stopping ratchet, as viewed in the direction of line 4—4 of Fig. 2;

Fig. 5 is a plan view of the motor gear train of the device of Fig. 4, to reduced scale, as viewed in the direction of line 5—5 of Fig. 2;

Fig. 6 is a transverse section through the electric switching means, as seen along line 6—6 of Fig. 2;

Fig. 7 is a circuit diagram for the totalizing arrangement;

Fig. 8 is a side elevational detail of the variable time switch;

Fig. 9 is an elevational view of the time-delay means for the device of Fig. 8 as viewed in the direction of line 9—9 thereof;

Fig. 10 is a fragmentary transverse section through a game board such as shown in Fig. 1 and illustrates one arrangement of the indicating lamps for the predetermined or preselected scoring means; while

Fig. 11 is another circuit diagram for the preselected score indicating arrangement.

It will be understood that the indicating and control circuits hereinafter described for purposes of illustration are not restricted to any particular application in game apparatus although they are specifically described herein in conjunction with such apparatus.

In a preferred arrangement, the game apparatus includes a cabinet 15 having a playboard 16 in which there may be a plurality of exit openings or pockets 17, each preferably designated as having a certain score value. A plurality of selectively operable devices or switches 18 are arranged beneath the playboard so as to be operated by a ball or other instrumentality used in the game when the same enters one of the pockets 17. A manually operated plunger is arranged to project the balls one at a time toward the upper end of the board 16 for movement down the latter relative to the various exits 17, the skill of the operator being employed in lodging the ball in the exits having the higher score values. A master control in the form of a coin slide 20 mounted on the cabinet, is arranged for operation by deposit of a coin therein to free a predetermined number of balls for projection by the device 19, in a manner well known in the art. The arrangement is such that when the master control 20 is operated, a shuffle panel 21 (Figs. 2 and 3), slidably mounted beneath the playboard 16 and having the switch members 18 mounted thereon, will be shifted so as to withdraw the switch members 18 from blocking posi-

tion relative to the openings 17, thereby permitting the entrapped balls to move back to an initial position to be fed to the projector 19.

Arranged conveniently at the upper end of the game cabinet or playboard is an indicating panel 22 (Figs. 1 and 2) in which is situated a totalizer or score indicator of any convenient form and of a type which is preferably operated in step by step fashion. In the illustrative embodiment, the score indicator includes a dial 23 mounted for rotation on a shaft 24 before a window 22', there being various score indicating characters on the disc and which are presented to view before the window as the dial is moved around. A usual form of pawl and ratchet mechanism 25 arranged for operation by an electromagnet or solenoid 26 may be utilized to move the dial in steps. The form of construction of the totalizer or score indicating means is not of importance, except that it is desirable in the present arrangement that there be an electrical operating means, such as the solenoid 26, which may be impulsed or intermittently energized to effect step by step indicating operation of the totalizer.

Means arranged for manual operation by the patron of the game to totalize his score includes an electrically operated switching device of novel design and which is illustrated particularly in Figs. 4, 5, and 6, and schematically in Figs. 7 and 11. This switch includes a plurality of stationary contacts and movable contact means engageable therewith, together with electrically energized driving means for moving the movable contact, as will be pointed out hereinafter.

Referring to Fig. 4, the electrically operated switch includes an insulating panel 30 on which are circumferentially arranged a plurality of stationary contacts 31 and a pair of movable contact arms 32 mounted on a shaft 33 for rotation over the several stationary contacts. In the arrangement of Fig. 4, the inner movable contact arm or wiper 32' is arranged to move over contact segments 34 and 34' separated by circuit breaking interruptions 35, whereas in the circuit arrangement shown schematically in Fig. 11, the continuous contact segments 34 are replaced by a plurality of stationary contacts 36 arranged in an inner ring concentric with the outer contacts 31, the purpose of which arangement will appear hereinafter.

A stopping ratchet 40 is keyed for rotation with the shaft 33 and the wipers (Figs. 4 and 6), there being a stopping pawl 41 arranged to engage the teeth of the ratchet to stop the latter and the contact wipers at positions in engagement with the several contacts. The stopping pawl 41 constitutes the armature of an electromagnet 42 and the latter is connected in circuit with the electrical driving means for the wiping contacts, so that when the driving means is deenergized the wiping contacts will be arrested in proper position in engagement with the selected stationary contact, all of which will be pointed out more particularly hereinafter.

Means for driving the movable contacts includes an electrically energized motor, preferably a synchronous motor 45, the rotor 46 of which (Fig. 6) is drivingly connected through a train of gears 47 to a driven gear 48 on shaft 33 mounted on a frame 50 behind the main contact panel 30. A driving connection is established between the ratchet 40 and the wiper shaft 33 by a slip clutch arrangement including a collar 51 rigid with the shaft 33 and having a suitable clutch washer 52 disposed for movement therewith and bearing against the face of the ratchet plate 40 by virtue of the fact that the ratchet 40 is slidable on the shaft 33, and the ratchet is forced by spring means 37 against the clutch disc 52. When the ratchet 40 is freed for movement by withdrawal of the armature pawl 41, the wiping or movable contacts 32 and 32' will rotate with the shaft 33. A spring 37 and nut 38 on the shaft 33 are arranged to effect firm contacting engagement of the wipers with the stationary contacts and also to assure firm engagement of the ratchet plate with the clutch member. The arrangement of this driving means for the electrically operated switch is such that the motor 45 may be running while the ratchet 40 is restrained against movement by the pawl 41 as a result of slippage in the clutch, but as soon as the magnet 42 is energized, the ratchet 40 will be free to rotate and the clutch arrangement 52 will take hold and cause the wiping contacts 32 to move over the stationary contacts.

The circuit arrangement for totalizing a score set up in playing the game of Fig. 1, is illustrated in Fig. 7 wherein the several ball-operated switches 18 each have one contact 55 connected in common with a conductor 56 which in turn is connected to one side of the score counting magnet or solenoid 26, the opposite side of the latter being connected by a conductor 57 to one terminal 58 of the secondary winding of a transformer 59. The remaining terminal 60 of the transformer secondary is connected by a conductor 61 to the shaft 33 of the electrically operated switch, and hence the wiping contacts 32 and 32' are connected to one side of the power source.

The remaining contacts of the several ball-operated switches 18 are variously connected to one or more of the stationary contacts on the electrically operated switch depending upon the score value of the individual ball pockets with which the ball switches are associated. For example, the contact 62 on the first ball switch 18 in Fig. 7, corresponds to a pocket having a score value of 1 (10, 100, or 1000) and is therefore connected by a conductor 63 to only one contact 64 of the group of stationary contacts 31. The next ball switch 18 has its remaining contact 65 connected by a conductor 66 to two contacts 67 and 68 of the group of stationary contacts 31, the two stationary contacts 67 and 68 being looped together by a connecter 69. The score value of the ball pocket with which the contacts 65 are associated corresponds to 2 (20, 200, or 2000), and it will be observed that there is a second switch 18 having a contact 65' also connected to the conductor 66, because the ball pocket with which the contact 64 is associated also has a score value of 2 or some multiple of two.

Coming next to the contact 70 which is associated with the next ball switch 18 in Fig. 7 (the ball pocket of which has a score value of 300), the arrangement is such that this contact is connected, along with a contact 70' of similar value, by a conductor 71 to three contacts 72, 73, and 74 on the electrically operated switch, the latter contacts being looped together by a common conductor 75.

The foregoing multiplication of values for the various ball switches may be carried out indefinitely, the only limitation being as to the number of stationary contacts available in a given instance. For example, the ball switch 18, which is associated with the pocket having a score value of 5 or 500, is connected to five contacts 76, all looped together by a conductor 77.

In the illustrative embodiment, the score values do not go above 500 for any given ball pocket, but since there are a number of score pockets having the same score values, the remaining available stationary contacts are connected to the remaining ball exit switches in accordance with the values of the latter in the manner heretofore described in conjunction with the first five ball switches.

As a result of the foregoing arrangement, and assuming that the transformer 59 is energized and the motor 45 running, the score counting solenoid 26 will be energized by movement of the wiping contact 32 over the various groups of stationary contacts, depending upon which of the ball switches 18 happens to be operated at the time. For example, when the movable contact 32 first engages the single contact 64 connected to that one of the ball switches 18 having the contact 62, the solenoid 26 will be impulsed once and therefore step the indicating dial once. As the moving contact arm 32 moves over contacts 67 and 68, the totalizing solenoid 26 will be impulsed twice provided one or more of the ball switches 18 to which the conductor 66 is connected happen to be operated at the time. When the contact arm 32 reaches the five contacts 76 which are all looped together, the totalizer will be stepped or impulsed five times provided one or more of the switches 18 corresponding to the ball pockets having a score value of 500 (and connected by conductor 78 to the stationary contacts 76) happens to be operated.

A master control circuit for controlling the energization of the electrically operated switch, and particularly the motor 45 thereof, includes the connection of one side of the motor 45 by a conductor 80 to one contact 81 of a manually set master switch. The other contact 82 of this latter switch is connected to the conductor 57 and hence to one side of the transformer or power source. The manually set contacts 81 and 82 form part of a switching device shown in Fig. 3, and which includes a lever 83 positioned for engagement by the inner end 84 of the master control or coin slide 19 when the latter is pushed inwardly so as to force a projection 85 against one of the contact springs 81 for movement against the companion contact spring 82 to close the circuit from one side of the power source or transformer 59 to the driving motor 45. The switch operating lever 85 is locked in operated condition by the projection of the end of a spring-urged armature 86 into a notch 87 on the end of the lever. A resetting magnet 88 may be energized to attract the armature 86 and release the manually set switch members 81—82, as will hereinafter appear.

The remaining contact of the motor 45 is connected by a conductor 90 to a stationary starting contact 91 in the group of contacts 31 and also to the segments 34 and 34' which are connected together by a loop 92. There is a second starting contact 93 diametrically opposite the contact 91 and which is connected with the segment 34'. Assuming that the manually set switch means 81—82 is closed, power may be connected to the motor 45 through the agency of a manually operated switch including a pair of normally open contacts 95 and 96 arranged to be closed by operation of a push button or plunger 97 (Fig. 3) conveniently disposed in the front of the cabinet. The contact 95 is connected with the conductor 90 and hence with the remaining side of the motor 45 while the contact 96 is connected to the remaining terminal 60 of the power source or transformer. By pushing the button 97, the motor 45 will be connected across the transformer.

The motor 45 will remain energized after the push button 97 is released by virtue of the connection of the wiping contacts 32 with the terminal 60 of the transformer, which arrangement is effective to connect the terminal side of the motor and conductor 90 with the terminal 60 of the transformer through the segments 34 and the stationary starting contact 93. Thus, the motor 45 will continue to run after the push button is released until the wiping contact 32 reaches the interruption 35 between the segments 34 opposite the companion starting contact 91. The next time the push button 97 is operated, a similar locking circuit for the motor will be set up by virtue of the connections to the starting contact 91 and segments 34. In this manner the motor 45 may be energized by operation of the push button to cause the movable contact to travel intermittently in steps halfway around the group of stationary contacts.

The clutch release magnet 42 is shunted across the motor terminals by conductors 98 and 99 so that whenever the motor is energized, the armature pawl 41 will be disengaged from the stopping ratchet to permit rotation of the moving contacts by the motor; the instant the power is cut off from the motor, the clutch release magnet will be deenergized and pawl 41 will fall back into stopping engagement with the ratchet 40 so as to stop the moving contacts on one or another of the stationary contacts—in the illustrative embodiment, either on the contact 91 or the contact 93.

Means for automatically effecting release of the manually set switch includes the connection of the reset magnet 88 (Figs. 3 and 7) by a conductor 100 to one side of the transformer 58 and by conductor 101 to a trip contact 102 in the group of stationary contacts. There may be two such trip contacts disposed in substantially diametrically opposite positions in the group where the group of contacts is divided in half as illustrated in Fig. 7 (corresponding to two interruptions 35 in the segments 34). The second trip contact 103 is connected by a conductor 104 with the first trip contact 102. By this arrangement, when the contact 32 approaches one of the interruptions 35, it will engage the trip contact 102 and energize the reset coil 88, thus withdrawing the latching armature 87 from the lever 85 so that the latter may move to normal position with the contacts 81 and 82 open and the main motor circuit broken. It may be observed that after the wiper engages the tripping contact 102, it moves thereafter onto the starting contact 91 before the motor circuit is broken.

The foregoing arrangement is therefore effective by operation of a master control to set up a power circuit for the motor of the electrically actuated switch, such power circuit subsequently being connected by operation of a manual switch, that is, the push button 97, to energize the driving motor 45, the electrically operated switch automatically setting up its own locking circuit so that the driving motor will remain energized until the switch has operated a predetermined length of time. During its operation the electrically actuated switch successively contacts the ball switches of the various exit openings and energizes a totalizer a number of times depending upon the number of ball switches operated

and upon the predetermined value of the ball pockets with which those switches are associated.

In Fig. 11, there is shown a circuit diagram which may be used independently or in conjunction with the circuit diagram of Fig. 7, whereby the scoring value of certain ball pockets may be varied prior to the playing of the game, so that each time the game is operated the scoring pockets may be assigned different values. In this latter arrangement, an electrically actuated switch, such as shown in Figs. 4 and 7, may be used with a slight modification which replaces the segments 34 by a series of stationary contacts 105. The driving motor 45' has one of its terminals connected by a conductor 106 to one terminal of a transformer 59', this same terminal also being connected by conductor 107 to a pair of wiping contacts 108 and 109 similar to the contacts 32 and 32'. The remaining terminal of the motor 45' is connected by a conductor 110 to one contact 111 of a variable-period time-delay switch. The remaining contact 112 of this switch is connected by conductor 113 to the remaining terminal of the transformer. Thus, when the switch contacts 111 and 112 are closed, motor 45' will be energized. As in the case of the arrangement of Fig. 7, the clutch release magnet 42 is shunted by conductors 114 and 115 across the motor terminals so that whenever the motor is energized, the clutch pawl will be withdrawn to permit the contact arms 108 and 109 to rotate.

A variable-period time-delay switch suitable for use in the circuit arrangement of Fig. 11 is illustrated in Figs. 8 and 9. The contacts 111 and 112 are arranged to be normally closed, the contact 111, however, being moved to open circuit position by engagement with a member 120 mounted on a lever arm 121 which is pivoted as at 122 on a mounting plate 123 situated conveniently in the region near the inner end 84 of the master or coin slide control 19. A time-delay device in the nature of a dashpot 125 is mounted on the member 123 and has a plunger rod 126 connected by pin means 127 with an offset end portion 128 of the arm 121. By moving the arm 121 upwardly as viewed in Fig. 8, the dashpot will be set and the member 120 withdrawn from engagement with the contact spring 111, so that the latter may engage the companion contact 112, thus closing the motor circuit for the electrically operated switch.

The length of time during which the contacts 111 and 112 will remain closed is determined basically by the period of time necessary for the dashpot plunger 126 to return to its normal position, such return rate being substantially constant. The operating period for the time-delay or dashpot means is varied by the provision of a gear 130 having an eccentric mounting 131 on a projection from the arm 121. An operating lever 132 is pivoted at one end as at 133 on the mounting plate 123 and has an offset lug 134 positioned to engage in the teeth of the gear 130 when the lever is pushed from its normal position toward the left against the tension of its normal spring 135. The upper end portion 136 of the operating lever is positioned oposite the end 84 of the master control or coin slide so that whenever the latter is operated, the lever 132 will be moved to cause the lug 134 to engage in the teeth of the eccentric gear 131 with a consequent movement of the arm 121 to set the dashpot and operate the switch 111 and 112. Each time the lug 134 engages in the teeth of the eccentric gear, the latter will be turned so that the stroke of the arm 121 will be varied with each operation of the coin slide, due to the eccentric mounting of the gear 130 with relation to the driving lug 134. In this manner, the period of time during which the switch 111—112 remains operated may be varied and as a consequence the travel of the moving contacts 108 and 109 is likewise varied so that the latter will stop on different sets of contacts 105 and 31'.

Each of the contacts 105 is connected by a conductor 140 to one contact 141 of one of the ball-operated switches 18 and the remaining contacts 142 of these switches are connected in common to a conductor 143 and thence to one terminal 144 of the totalizer solenoid 26, the remaining terminal 145 of this solenoid being connected to the conductor 113 and hence to the remaining terminal of the transformer 59'; thus whenever the moving contact 109 rests on one of the contacts 105 connected with the switches 18, the totalizer solenoid 26 will be energized, provided the particular ball switch is operated.

In order to indicate which of the ball switches is connected in circuit for energization of the totalizer, there is provided a signal means in the preferred form of a plurality of lamps 150 each having one terminal connected in common to a conductor 151 which in turn connects with the conductor 113 to one side of the transformer. Each of the remaining terminals of the several indicating lamps is connected by conductor 152 to a particular one of the outermost ring of contacts 31'. Thus, whenever the moving contact arms 108 and 109 come to rest on any pair of the contacts 31' and 105, the corresponding lamp 150 will be illuminated and the corresponding ball-operated switch 18 will be connected in a power circuit with the totalizer magnet 26, so that if a ball subsequently operates that particular ball switch, the totalizer will automatically be energized.

The signal means or lamps 150 may be arranged in a separate group, as illustrated in Fig. 10, in a suitable panel 155 mounted at the upper end of the game cabinet, as in the case of the panel 22 of Figs. 1 and 2 (and may form a part of the latter, if desired). Each of the lamps 150 may be separated from the other and provided with a window having the various score values corresponding thereto arranged to be illuminated when a particular one of the lamps is energized; or, if desired, the indicating lamps 150 may be positioned adjacent their respective ball pockets on the playboard 16.

In operating the arrangement of Fig. 11, the patron will deposit a coin in the master control and shove the slide 19 inwardly to release any balls from the pockets 17 and also to set the time-delay device 121—125 so that the switch 111—112 will be closed for a certain period of time with a consequent energization of the motor 45' during such period. The wiping contacts 108 and 109 will move from a starting position corresponding to the last stopping point and engage one or another pair of the contacts 101—105, depending upon how long the motor 45 remains energized, this period, of course, differing with each operation of the master control 19. When the time-delay switch contacts 111—112 are finally opened, one of the lamps 150 will remain lighted and the corresponding ball switch 18 will be connected in a power circuit with the totalizer coil 26, and the player of the game will be apprised of the fact

that a particular one of the pockets is connected with the totalizer and constitutes his objective.

In the event that it is desired to combine the totalizing feature with the score assigning feature, the conductors to the terminals 58 and 60 on the secondary of the transformer 59 should be disconnected and connected at the terminals 144 and 145 in a second switching unit such as shown in Fig. 11, the totalizer coil 26, of course, being disconnected from the terminals 144 and 145. In such case, the coin slide will operate the control means of both Figs. 3 and 8.

When this is done, operation of the coin slide 19 will cause the motor 45' of the preselecting switch of Fig. 11 to be operated in the manner described, and as soon as the time-delay switch opens, the motor will stop. Since there will be no balls in the pockets at this time, the totalizer circuit will not be energized. However, if the player has succeeded in lodging balls in the pockets designated by illumination of certain of the lamps 150, he may at the completion of the game operate the push button 97 as described in the explanation of Fig. 7, to start the motor 45 of the second switching mechanism connected in accordance with the arrangement of Fig. 7, as modified, so that the totalizer will set up his score for each of the ball switches which have been operated by lodgement of a ball in one of the pockets designed by illumination of a corresponding lamp 150.

The objects and advantages of the invention may be accomplished by other arrangements and forms of construction than that specified in the foregoing description of the illustrative embodiment, and it is not intended that the invention shall be restricted to any of the details heretofore specified, except as may be provided in the appended claims.

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

1. In a game apparatus of the type including a plurality of score switches which may be operated or closed as a result of playing the game and further including a master control operable by the player to condition the apparatus for use, indicating and control means comprising: an electrically operated totalizer, automatic commutating switch means including a driving motor therefor and arranged for operation to connect said totalizer with various of said score switches, means operated by said master control for energizing said driving motor each time the game is conditioned for use as aforesaid whereby to connect different score switches with said totalizer at different times, and manually controlled commutating switch means arranged for operation to successively connect the several score switches in circuit with a source of electric power, such that those score switches which have been closed or operated in playing the game as aforesaid and which have been connected by said automatic commutating switch as aforesaid, will complete a circuit to energize said totalizer.

2. In a game apparatus of the type including a plurality of score switches to be operated variously as a result of playing the game and further including a master control operable to condition the game apparatus for play, indicating and control means comprising: an electric totalizer and source of power therefor, a first commutating switch means operably controlled by said master control to connect different score switches in circuit with said source of power, and a second and manually controlled commutating switch arranged for operation to connect said totalizer successively with said score switches in such manner that the totalizer will be energized whenever it is connected with one of said score switches which has been operated by playing the game as aforesaid and which has been connected by both the first and second commutating switches as aforesaid.

3. In combination with a game apparatus of the type including a plurality of score switches operated or closed by an instrumentality used in playing the game and a master control operable to condition the game for play, score totalizing means comprising: an electrically operated totalizer and manually controlled electrically operated commutating switch means arranged in electrical circuit with said totalizer, said score switches, and a source of electric power, all in a manner such that operation of the commutating switch will successively connect the several score switches in circuit with the totalizer and power source so as to energize the totalizer each time a score switch is connected which is operated or closed as aforesaid, and switch means actuated by said master control each time the latter is operated to condition said game for play to connect said electrically operated commutating switch means with said source of power for manually controlled operation as aforesaid, and electrically actuated means controlled by said commutating switch and connected to automatically render the latter inoperative after each totalizing operation until said master control is again operated.

4. The combination with an amusement apparatus of the type including a plurality of selectively operable scoring switches which may be actuated in the course of operation of said apparatus, of score-indicating means comprising an electrically operated indicator, an electrically operated commutating switch having contacts arranged in a power circuit with said indicator and said selectively operated switches and effective when energized to successively connect said selectively operable switches in circuit with said indicator, said indicator being thereby energized provided one or more of said selectively operated switches is closed, and manually controlled switch means for energizing said electrically operated commutating switch.

5. In a game apparatus, in combination, a plurality of selectively operable switches each having an assigned relative score value, a score totalizer operated in steps by electrical impulses, a series of stationary contacts, a number of which are connected to each selectively operable switch depending on the relative score value of said switch, movable contact means arranged for movement to successively engage said stationary contacts and electrically connected with said totalizer so as to impulse the latter upon each engagement with one of said stationary contacts, and manually controlled motor means for moving said movable contact means, whereby the relative score represented by the operation of one or more of said selectively operable switches may be indicated by said totalizer by operation of said manually controlled motor means.

6. In an amusement apparatus, a plurality of scoring switches arranged for operation variously by means involved in the operation of said apparatus, an electrically operated score indicator, a totalizing switch having a plurality of stationary contacts connected in groups of one or more with

certain of said score switches; a source of power connected to said score indicator through said score switches, said stationary contacts, and movable contact means cooperable with the stationary contacts; various score switches having pre-assigned relative scoring values and the number of contacts in said groups which are connected thereto corresponding to the relative score value of the particular score switches to which the several contact groups are connected, and manually controlled motor means for moving said movable contact means, whereby the indicator will be energized each time the movable contact means engages one or more stationary contacts whose corresponding score switch is closed, the number of times which the indicator will be energized for any given score switch depending upon the number of stationary contacts connected thereto.

7. In combination, a plurality of selectively operable switches, a score totalizer of a type adapted to be operated by electrical impulses, an electrically operated switch including a plurality of relatively stationary contacts connected in accordance with a predetermined plan to said selectively operable switches in accordance with arbitrarily assigned score values of said selectively operable switches, said electrically operated switch including relatively movable contact means and motor means for moving the same to successively engage said stationary contacts, a manually controlled switch arranged for operation to start said motor means, circuit connections through said movable and stationary contact means for automatically deenergizing and stopping said motor means after said movable contact means has been moved a predetermined amount, and circuit connections between said totalizer and the contact means of said electrically operated switch for impulsing said totalizer a number of times dependent upon which of said selectively operable switches is closed at the time said motor means is started by operation of said manual switch.

8. In an amusement apparatus of the type having a plurality of selectively operable switches arranged to be operated by use of the apparatus, pre-selecting mechanism comprising: an electrically operated totalizer, an electrically operated change-over switch means arranged for operation to connect different ones of said selectively operable switches in a power circuit with said totalizer whereby the latter may be operated provided the selectively operable switch thus connected is operated as aforesaid, a master control and variable-period time-delay switch means actuated by said master control and arranged to energize said change-over switch for different periods each time the master control is actuated whereby to render different selectively operable switches effective prior to each playing of the game.

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