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Bissell

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[54] **ELECTRONIC GAME OR EDUCATIONAL DEVICE**

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[52] **U.S. Cl.** ..... **273/130 AB,** 273/1 E
[51] **Int. Cl.** **A63f 9/14**
[58] **Field of Search** ..... 35/9 B, 22 R; 273/1 E, 273/130 AB, 138 A

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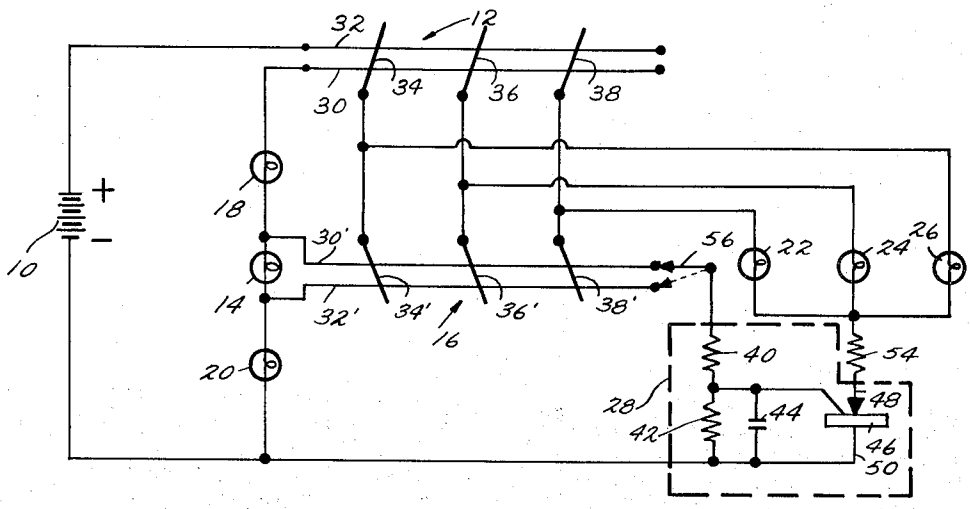
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[57] **ABSTRACT**

A game or educational device is provided employing an electronic circuit for enabling selection by a first player of one of a plurality of possible game plays. A "ready" light is provided in the circuit for indicating when selection of a game play by the first player has been accomplished. Switches are also provided for enabling selection by a second player of one of a plurality of possible game plays, and a "move" light is provided for indicating when the first and second players have selected different game plays. A "penalty" light is in the circuit to be illuminated instead of the "move" light when the first and second players select the same game play, and additional indicator lamps are provided for indicating the play selections of the players. A "lock-out" feature may also be employed whereby the second player must make his play selection within a predetermined time after the first player's selection and after illumination of the "ready" light, or the additional indicator lamp associated with the second player's selection will not light.

15 Claims, 2 Drawing Figures



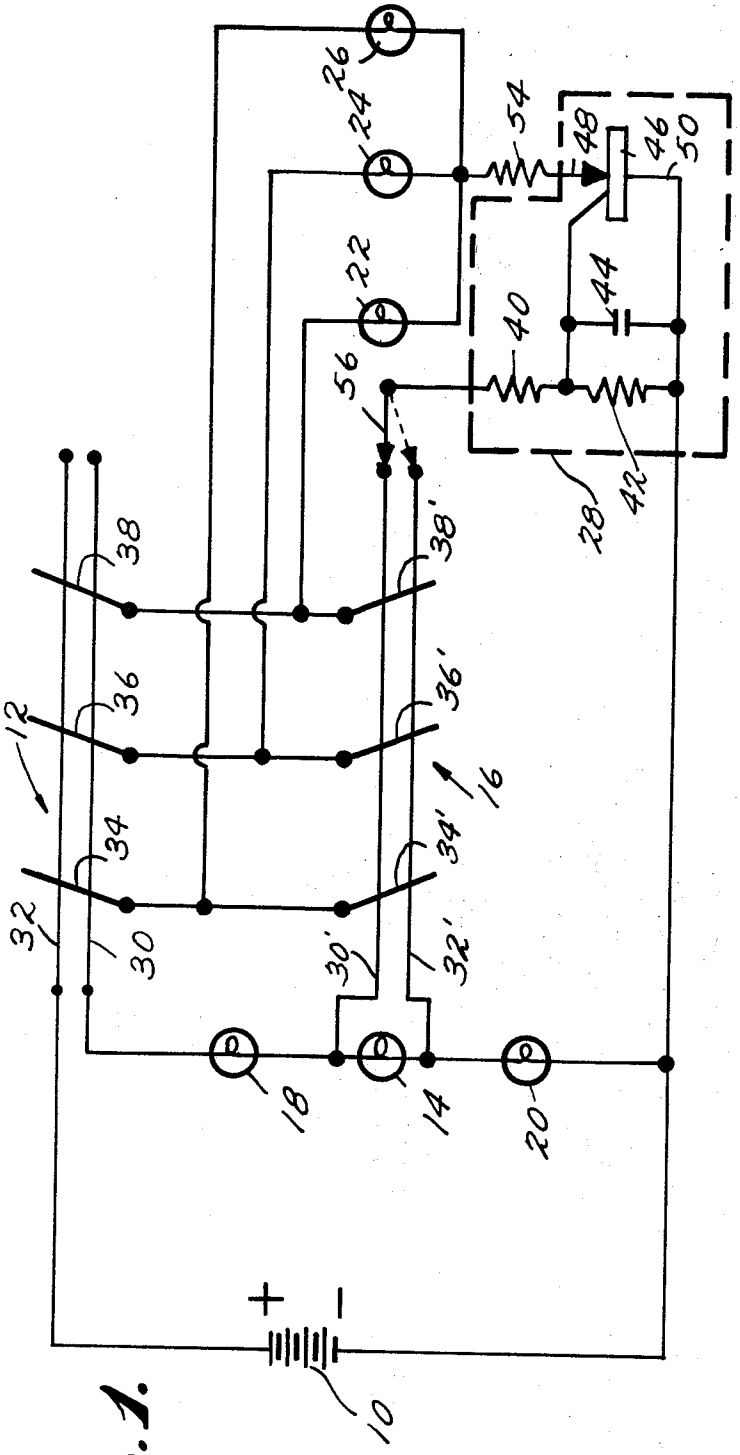

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Fig. 1.

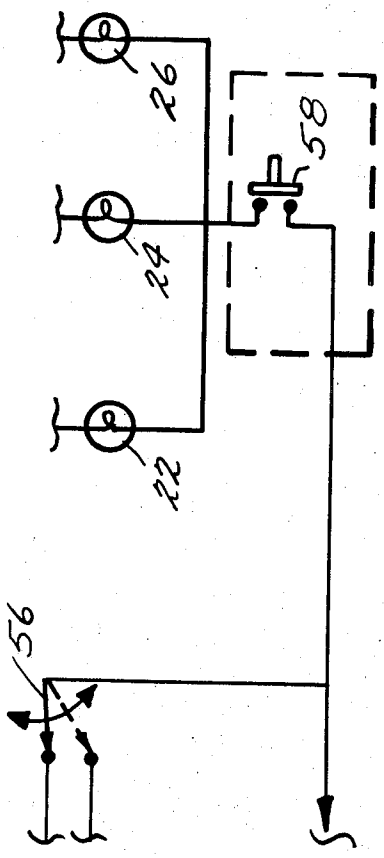

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Fig. 2.

ELECTRONIC GAME OR EDUCATIONAL DEVICE

This invention relates to games and educational devices and more particularly to a board game employing an electronic circuit for enabling the selection of various game plays by the players and for indicating results based upon the plays selected.

Various types of electronic games and teaching devices are available. U.S. Pat. No. 3,608,207 describes such a teaching device. The game of this invention, however, provides for a versatility not present in most existing games. Furthermore, the electronic game of this invention is inexpensive to manufacture and is sturdy in construction so as to avoid the inconvenience of frequent repairs and maintenance.

It is an object of the present invention to provide a game employing an electronic circuit whereby the game provides the players with options for a plurality of play selections.

Another object is to provide an electronic game of rugged and inexpensive construction.

A further object is to provide an electronic game and game circuit providing electronic means for indicating play results.

Additional objects and advantages of the invention will be set forth in part in the description which follows and in part will be obvious from the description or may be learned by practice of the invention. The objects and advantages are realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

To achieve these and other objects the present invention provides a plurality of play selection switching means in circuit with a plurality of play selection indicator means whereby the game players select the game plays by actuating the switching means and whereby the play results are indicated by the game play indicator means.

More specifically, the present invention includes an electronic game circuit having an electrical source, first switching means in circuit relationship with the source for enabling selection of one of a plurality of possible game plays; first indicator means in circuit relationship with the first switching means for indicating when selection of a game play by use of the first switching means has been accomplished; second switching means in circuit with the first switching means for enabling selection of one of a plurality of possible game plays; second indicator means in circuit with the first and second switching means and with the first indicator means for indicating when the first and second switching means are actuated in a first predetermined manner; third indicator means in circuit with the second switching means, with the first indicator means and with the source for indicating when the first and second switching means are actuated in a second predetermined manner; fourth indicator means in circuit with the first and second switching means and with the source for indicating play selections by the first and second switching means; and circuit means in operative relationship with the first and second switching means, with the fourth indicator means and with the source for controlling indication by the fourth indicator means of the play selection as selected by actuation of the first switching means and for controlling indication by the fourth indicator means of the play selection as selected by actuation of the second switching means.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are not restrictive of the invention.

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate examples of preferred embodiments of the invention and, together with the description, serve to explain the principles of the invention.

FIG. 1 is a schematic view of the electronic circuit of this invention; and

FIG. 2 is a partial schematic diagram of an alternate embodiment of the invention.

With reference now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in FIG. 1 the basic circuit utilized in the electronic game of this invention. The circuit of this invention includes an electrical source **10** coupled in circuit relationship with first switching means **12,** and first indicator means **14** is in circuit relationship with the switching means **12** for indicating when selection of a game play by use of switching means **12** has been accomplished by a first player.

Second switching means **16** are also located in circuit relationship with first switching means **12** for enabling selection of one of a plurality of possible game plays by a second player. Second indicator means **18** are also in circuit relationship with first and second switching means **12, 16** and with first indicator means **14** for indicating when the first and second switching means are actuated in a first predetermined manner. This will be explained in more detail infra. Third indicator means **20** are located in circuit with second switching means **16,** with first indicator means **14** and with source **10** for indicating when the first and second switching means are actuated in a second predetermined manner.

Fourth indicator means **22, 24, 26** are in circuit with first and second switching means **12, 16** and with source **10** for indicating play selections made by actuating the first and second switching means. In addition, circuit means **28** are in circuit relationship with fourth indicator means **22, 24, 26** and with source **10** for controlling indication by the fourth indicator means of the play selection as selected by actuation of first switching means **12** and for controlling indication by the fourth indicator means of the play selection as selected by actuation of second switching means **16.**

Each of first and second switching means **12** and **16** includes a first primary terminal **30, 30′** in circuit with second indicator means **18.** Similarly, each of the first and second switching means includes a second primary terminal **32, 32′** in circuit relationship with source **10.** In addition, a plurality of secondary contacts **34-34′, 36-36′, 38-38′** are in selective circuit relationship with primary terminals **30-30′** and **32-32′** of first and second switching means **12** and **16,** respectively; and secondary contacts **34, 36, 38** are coupled to respective ones of secondary contacts **34′, 36′, 38′** to form a plurality of pairs of secondary contacts.

Second primary terminal **32′** of second switching means **16** is further connected in circuit with third indicator means **20** whereby an electric circuit is completed through the first and second switching means and through third indicator means **20** when corresponding ones of secondary contacts **34-34′, 36-36′, 38-38′** are placed in closed circuit relationship with re-

spect to primary terminals **30-32, 30'-32'** and source **10.**

Circuit means **28,** in the embodiment of FIG. **1,** is a time delay circuit having a first electrical impedance **40** in circuit with second switching means **16.** A second electrical impedance **42** is in circuit with first impedance **40** and with source **10,** and a third electrical impedance **44** is in circuit with impedances **40, 42** and with source **10.** Third switching means **46** are also in circuit with indicator means **22, 24, 26** and with impedance **44** for controlling actuation of indicator means **22, 24, 26** whereby the time delay circuit **28** delays indication by indicator means **22, 24, 26** of the play selection chosen by the first player by actuation of first switching means **12.** Time delay circuit **28** of FIG. **1** also prevents indication by indicator means **22, 24, 26** of the play selection as selected by actuation of second switching means **16** by the second player when the second switching means is actuated by the second player later than a predetermined time after the first switching means is actuated by the first player. Impedances **40** and **42** may include resistors and impedance **44** preferably includes a capacitor. Third switching means **46** preferably includes a three terminal controlled-rectifier having a first terminal **48** in circuit with indicators **22, 24, 26,** a second terminal **50** in circuit with source **10** and a gate terminal **52** in circuit with resistors **40, 42** and with capacitor **44.**

A fourth electrical impedance **54** may be placed in circuit between indicators **22, 24, 26** and first terminal **48** of controlled-rectifier **46** for the purpose of preventing overload of indicators **22, 24, 26.** The value of impedance **54,** which may be a resistor, would depend on the voltage rating of indicators **22, 24, 26** and on the voltage drop across rectifier **46** at adjusted current value.

As here embodied, indicators **22, 24, 26** are preferably lamps or light bulbs and the number of lights used and the number of pairs of secondary contacts **34-34', 36-36',** etc. may vary depending upon the number of play selections desired. Indicator means **14, 18** and **20** are also preferably electrical lamps and are selected so that light **14** will fully illuminate on a fraction of the electrical current required to fully illuminate indicator lamps **18** and **20.** Indicator lamp **18** is also chosen so as to be fully illuminated on a fraction of the electrical current required to fully light third indicator lamp **20.** Further, indicator lights **22, 24, 26** are chosen to by fully illuminated on the same amount of electrical current required to fully illuminate first indicator lamp **14.**

An optional feature of the circuit of this invention is also illustrated in FIG. **1** wherein fourth switching means **56** is positioned in circuit between time delay **28** and second switching means **16** for enabling the time delay circuit to be selectively connected to one of first or second primary terminals **30'** or **32'** of second switching means **16.** Positioning of switch **56** in contact with primary terminal **30'** will provide the circuit of this invention with a "lock-out" feature which will be described in more detail infra. Positioning of switch **56** in contact with second primary terminal **32'** eliminates the "lock-out" feature of the circuit. Thus, the versatility of the game is further enhanced by this feature.

An alternative embodiment of this invention is illustrated in FIG. **2.** This embodiment eliminates time delay circuit **28** and substitutes a simpler circuit arrangement **28'** having a switch **58** in circuit between indicators **22, 24, 26** and source **10** whereby the play selections chosen by the players will be indicated by lamps **22, 24, 26** only when switch **58** is closed.

In operation of the basic embodiment of the invention illustrated in FIG. **1,** each of two game players inputs the circuit by selecting and depressing one of a plurality of buttons or switches **34-38, 34'-38'** on respective sides of the game board (not shown). Buttons **34-38** are used to activate the circuitry concurrently with the play selection chosen by the first player. All game plays are initiated by the first player controlling buttons **34-38.** As previously discussed, any number of buttons or switches **34-38, 34'-38'** may be provided.

When the first player depresses one of his buttons, "ready" light **14** will immediately flash on. The second player on the opposite side of the board having buttons **34'-38'** has a predetermined time period, e.g., 3 seconds, to depress one of buttons **34'-38'** corresponding to his play selection. If the second player waits longer than the predetermined time period to depress one of his buttons, one of lights **22-26** will flash on indicating the first player's selection and also indicating that the second player has been "locked-out." The term "locked-out" means that should the second player now depress his button the circuit will not accept or display his play selection via lamps **22-26.** When "lock-out" occurs, and prior to any play selection by the second player, only "ready" lamp **14** and one of indicator lamps **22-26** will be illuminated. The second player must then forfeit his turn. Since the "lock-out" advantage is always with the player positioned on the side of the board having buttons **34-38** (the first player), players should change sides after every game.

Should the second player depress one of his buttons **34'-38',** corresponding to his play selection, within the predetermined time interval before "lock-out" occurs and if the play selected by the second player is different from the play selected by the first player, the "ready" light **14** will go out and "move" light **18,** together with two "play-selection" lights **22-26,** will flash on. The two "play-selection" lights will reveal the plays secretly selected by each player, and these two plays are used in executing the players' moves on the game board according to the rules of the game then in play.

Should both players make the same play selection, "ready" light **14** will go out, "penalty" light **20** will flash on, followed within the predetermined time period, e.g., three seconds, by a single one of "play-selection" lights **22-26** indicating the play selected by both players. An appropriate penalty will then be imposed as determined by the rules of the particular game being played.

If either player depresses more than one of his play selection buttons **34-38** or **34'-38',** the "readout" display formed by lights **22-26** will indicate a foul. In the case of a "move" condition three or more of lights **22-26** will be illuminated to indicate a foul, and in the case of a "penalty" condition two or more of lights **22-26** will be illuminated to indicate a foul. The lights associated with the foul will be dimmer than the light activated by the player depressing only one button, and the rules governing fouls may vary from game to game.

In the circuit "ready" mode, one of buttons **34-38** is depressed by the first player so as to complete an electrical circuit from the positive side of electrical source

10 through second primary terminal 32 and through first primary terminal 30 of first switching means 12. The depressed button or contact 34-38 also connects the positive side of electrical source 10 to a respective one of fourth indicator means or lamps 22-26. It is to be understood, of course, that any number of buttons or contacts 34-38 and 34'-38' and associated lamps 22-26 may be used depending upon the game or educational application of the circuit. The games or educational devices made in accordance with this invention can be made as basic as two or three inputs per side and as complex as several hundred.

In the "ready" condition of the circuit one of contacts 34-38 completes the electrical circuit through terminals 32 and 30 to place lamps 14, 18 and 20 in series across power source 10. Because the lamp ratings are different, the current and voltage provided is sufficient only to light the lowest current rated lamp in the series circuit, i.e., lamp 14. If, for example, power source 10 is a six volt battery, voltages across the lamps would be 0.1 volt across lamp 20; 5 volts across lamp 14 and 0.9 volt across lamp 18, and the only lamp having a rating falling within the range to be illuminated would be lamp 14, the "ready" lamp. In this example, "ready" lamp 14 has a rating of 2 volts, "move" lamp 18 has a rating of 3.2 volts and "penalty" lamp 20 has a rating of 3.2 volts.

Because a 0.9 volt drop occurs across lamp 18, the voltage applied to time delay circuit 28 and to the gate circuit of SCR 46 via terminal 30' at zero time is 5.1 volts. The voltage across capacitor 44 at zero time is zero and it rises exponentially upon depression of one of buttons 34-38 and in a manner determined by the values of resistances 40 and 42 and by the value of capacitor 44. The capacitor voltage continues to rise until it reaches the gate voltage of SCR 46. In this example, the value of the SCR trigger voltage may vary between 0.5 and 0.75 volt depending on the SCR used. The voltage to the gate circuit is also limited by divider network 40, 42 to one volt in this example.

When capacitor 44 reaches the trigger voltage of SCR 46, the SCR will fire allowing current to flow through a respective one of lamps 22-26 as selected by depression of one of buttons 34-38. In the example, lamp 22 is illuminated through contact 38. When the voltage to capacitor 44 is removed by releasing contact 38, capacitor 44 will discharge through resistor 42 returning the voltage stored across capacitor 44 to zero.

In this "lock-out" condition after SCR 46 has fired, "ready" lamp 14 will be illuminated as will "play-selection" lamp 22. Should the second player elect to push one of his play selection buttons 34', for example, after this "lock-out" condition occurs, the circuit will not accept the second player's choice. Accordingly, "ready" lamp 14 will extinguish and either "penalty" lamp 20 or "move" lamp 18 will flash on depending upon whether the same play selection is made by the first and second players. In any event, the second player would not have "play-selection" lamp 26 illuminated to indicate his selection made by depressing button 34'. The reason for this is that SCR 46 would have fired, placing the common circuit of lamps 22 and 26 at 0.5 to 0.75 volt. Since the drop across lamp 20 is approximately 0.5 volt, the voltage across lamp 26 is almost zero and lamp 26 will not light.

In the "move" condition of the circuit, the first player selects contact or button 38, for example, corresponding to his play selection and thereby closes the circuit to power supply 10 through terminals 32 and 30 as well as applying power to one side of lamp 22. If the second player makes his play selection by means of button 34', for example, within the predetermined time interval, e.g., 3 seconds, he will short-out or by-pass lamp 14 via primary terminals 30' and 32' and will connect lamp 26 to an effective intersection of lamps 18 and 20. This will cause "ready" lamp 14 to be extinguished leaving lamps 18 and 20 in series circuit. Since lamp 18 has a lower rating than lamp 20, the voltage drop, e.g., 5 volts, will occur across "move" lamp 18 causing it to be illuminated. Under these conditions, the charge across capacitor 44 applied through divider network 40, 42 cannot exceed 0.25 volt. Since 0.5 to 0.75 volt is required to fire SCR 46, the SCR will not fire and will leave the circuit to lamps 22-26 open. Lamps 22 and 26 will then be effectively in series with each other and will be connected in parallel with respect to lamp 18. Accordingly, "move" lamp 18 and two "play-selection" lights 22 and 26 will be illuminated under these conditions and the SCR circuit will remain open. Since the voltage and current ratings of lamp 20 have not yet been met, lamp 20 will not be illuminated.

The same sequence outlined in the "move" condition will occur in the "penalty" mode except that when identical numbers are selected by the players the common wire contacts associated with each player will short out both "ready" lamp 14 and "move" lamp 18 placing "penalty" lamp 20 directly across power source 10. The voltage across time delay circuit 28 will also be at the supply voltage. When capacitor 44 is charged to the trigger voltage of SCR 46, the SCR will fire closing the circuit to lamp 24, for example, if contacts 36 and 36' are depressed by the players. Lamp 24 will then be placed across power source 10 and in parallel circuit relationship with "penalty" light 20. Accordingly, "ready" light 14 will extinguish, "penalty" lamp 20 will flash on and within a pre-set time delay, e.g., 3 seconds, lamp 24 associated with the play selection made by both players will flash on.

FIG. 2 illustrates an alternative embodiment of this invention wherein switch 58 is provided as circuit means 28'. Thus, there is no time delay feature built into this alternative embodiment and the play selections are indicated by appropriate indicating lamps 22-26 upon depression of switch 58. With the exception of the time delay feature, operation of the embodiment illustrated in FIG. 2 is the same as that described for the basic embodiment in FIG. 1.

The present invention provides for a circuit that can be employed with an electronic game or with educational devices. The circuit of this invention is simple in design, is economical to produce and is reliable so as to avoid costly maintenance and repair. The invention in its broader aspects is not limited to the specific details shown and described and departures may be made from such details without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. An electronic game circuit, comprising:

an electrical source;

first switching means in circuit relationship with said source for enabling selection of one of a plurality of possible game plays;

first indicator means in circuit relationship with said first switching means for indicating when selection of a game play by use of said first switching means has been accomplished;

second switching means in circuit with said first switching means for enabling selection of one of a plurality of possible game plays;

second indicator means in circuit with said first and second switching means and with said first indicator means for indicating when said first and second switching means are actuated in a first predetermined manner;

third indicator means in circuit with said second switching means, said first indicator means and said source for indicating when said first and second switching means are actuated in a second predetermined manner;

fourth indicator means in circuit with said first and second switching means and with said source for indicating play selections by said first and second switching means; and

time delay circuit means in operative relationship with said first and second switching means, said fourth indicator means and with said source for delaying indication by said fourth indicator means of said play selection as selected by actuation of said first switching means and for controlling indication by said fourth indicator means of said play selection as selected by actuation of said second switching means.

2. An electronic game circuit as in claim **1** wherein each of said first and second switching means includes:

a first primary terminal in circuit with said second indicator means;

a second primary terminal in circuit relationship with said source; and

a plurality of secondary contacts in selective circuit relationship with said primary terminals, said secondary contacts of said first switching means being coupled to respective ones of said secondary contacts of said second switching means to form a plurality of pairs of said secondary contacts.

3. An electronic game circuit as in claim **2** wherein said second primary terminal of said second switching means is further connected in circuit with said third indicator means whereby an electric circuit is completed through said first and second switching means and through said third indicator means when corresponding ones of said secondary contacts in said first and second switching means are placed in closed circuit relationship with the respective primary terminals of said first and second switching means.

4. An electronic game circuit as in claim **3** wherein each of said secondary contacts of said first and second switching means is associated with a game play selection.

5. An electronic game circuit as in claim **2** wherein said circuit means is a time delay circuit means including:

a first electrical impedance in circuit with said second switching means;

a second electrical impedance in circuit with said first impedance and with said source;

a third electrical impedance in circuit with said first and second impedances and with said source; and

third switching means in circuit with said fourth indicator means and with said third impedance means for controlling actuation of said fourth indicator means, whereby said time delay circuit means delays indication by said fourth indicator means of said play selection as selected by actuation of said first switching means and prevents indication by said fourth indicator means of said play selection as selected by actuation of said second switching means when said second switching means is actuated later than a predetermined time after said first switching means is actuated.

6. An electronic game circuit as in claim **5** wherein said first impedance includes a first resistor, said second impedance includes a second resistor and said third impedance includes a capacitor.

7. An electronic game circuit as in claim **6** wherein said third switching means includes a three terminal controlled-rectifier having a first terminal in circuit with said fourth indicator means, a second terminal in circuit with said source and a gate terminal in circuit with said first and second resistors and with said capacitor.

8. An electronic game circuit as in claim **7** further including a fourth electrical impedance in circuit between said fourth indicator means and said first terminal of said controlled rectifier.

9. An electronic game circuit as in claim **8** wherein said fourth impedance includes a third resistor.

10. An electronic game circuit as in claim **7** wherein said first, second, third and fourth indicator means are lights.

11. An electronic game circuit as in claim **10** wherein each of said fourth indicator lights are in circuit between said controlled rectifier and a respective one of said secondary contact pairs.

12. An electronic game circuit as in claim **11** wherein said first indicator light will fully light on a fraction of the electrical current required to fully light the second and third indicator lights, and wherein said second indicator light will fully light on a fraction of the electrical current required to fully light said third indicator light.

13. An electronic game circuit as in claim **12** wherein said fourth indicator lights will fully light on the same amount of electrical current required to fully illuminate said first indicator light.

14. An electronic game circuit as in claim **2** further including fourth switching means in circuit between said circuit means and said second switching means for enabling said circuit means to be selectively connected to one of said first and second primary terminals of said second switching means, whereby said circuit means is rendered operative to provide a "lock-out" feature when said fourth switching means is connected to said first primary terminal of said second switching means and whereby said circuit means is rendered inoperative to provide said "lock-out" feature when said fourth switching means is connected to said second primary terminal of said second switching means.

15. An electronic game circuit as in claim **1** wherein said circuit means include a switch in circuit between said fourth indicator means and said source.

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