April 2, 1935. T. W. LOARING 1,996,301

ELECTRICAL AMUSEMENT DEVICE

Filed Oct. 30, 1933 2 Sheets-Sheet 1

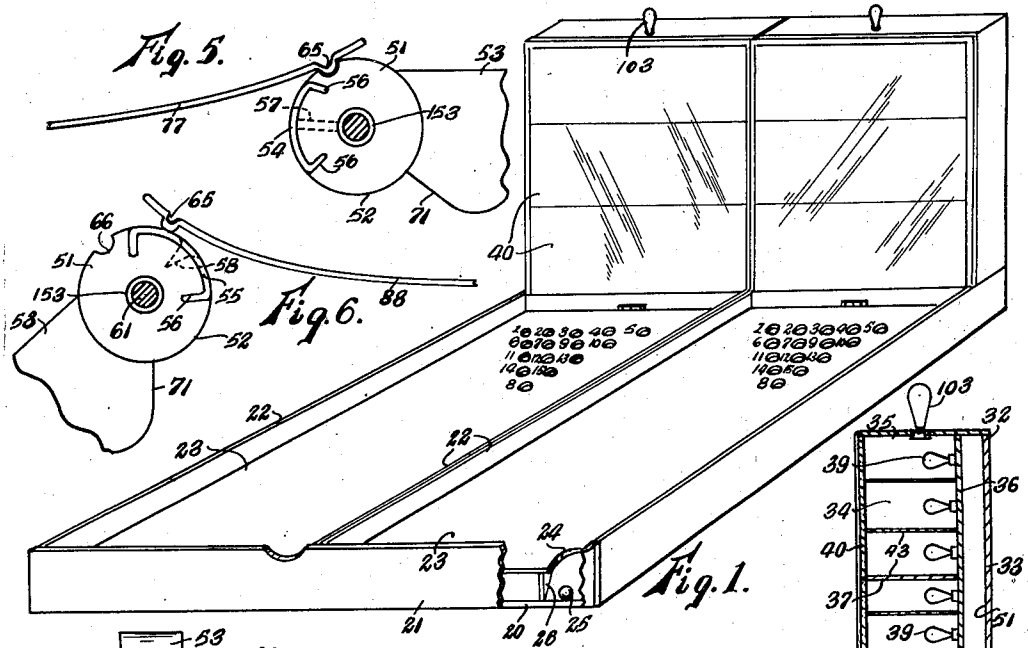


Fig. 1.

Fig. 2.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 3.

Fig. 4.

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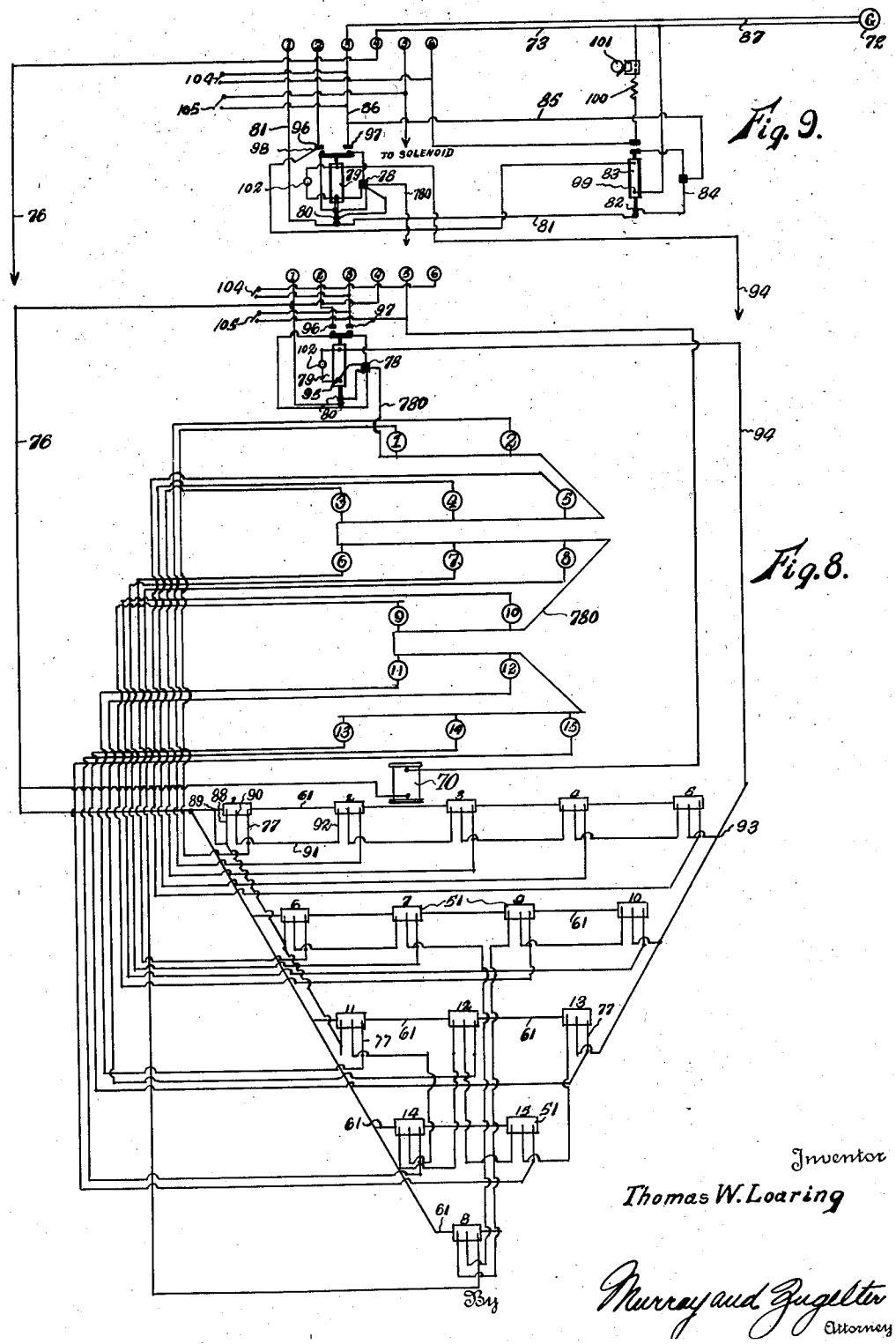


Fig. 9.

Fig. 8.

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UNITED STATES PATENT OFFICE

1,996,301

ELECTRICAL AMUSEMENT DEVICE

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Application October 30, 1933, Serial No. 695,771

6 Claims. (Cl. 273—125)

This invention relates to electrical circuit control means and is exemplified herein in connection with a competitive roll ball game or amusement device.

An object of the invention is to provide highly efficient but simple electrical circuits and associated means for visibly indicating the scores made in the game and for visibly and audibly announcing the termination of a game by a winner.

Another object is to provide an improved electrical means for operatively disposing the electrical switches of this invention in operative position after a game has been played.

Another object is to provide a new and efficient combination of the game table proper and the electrical apparatus adapted to be associated therewith whereby said parts may be readily set up in and removed from operative position.

Another object is to provide a new form of electrical multi-circuit switch.

These and other objects are attained by the means described herein and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of two of the game tables and associated means wherein the present invention is exemplified, a part of one table being broken away.

Fig. 2 is a cross sectional view taken longitudinally of the upper end of one of the game tables.

Fig. 3 is a plan view, with parts broken away, of the upper surface of the electrical contact board of this invention.

Fig. 4 is a view similar to Fig. 3 and showing the under portion of the contact board.

Figs. 5, 6, and 7 are fragmental detail views of the electrical switch member and associated brushes forming parts of the present invention.

Fig. 8 is an electrical wiring diagram of one of the game tables.

Fig. 9 is a wiring diagram representing the master relay and associated circuits used at one only of a group of tables, such means being additional to means illustrated in Fig. 8.

The present invention contemplates the use of a plurality of roll ball game tables which are adapted to be used by a number of persons in a competitive game in which the winner is the one who first completes a series of lights at his table and which lights are adapted to be energized by the rolling of balls into apertures at one end of the table, in a manner well known.

Two of the tables such as described are represented in Fig. 1 and each comprises the base portion 20 and the front and the side strips 21 and 22. An upper surface board 23 is suitably and removably supported by said front and side strips and in spaced relationship with the base 20. At the upper end of the boards 23 a plurality of ball receiving apertures in suitable formation are provided. At the lower or outer end of the boards 23, each board is notched as at 24 to provide an arm hole permitting access to a played ball 25 which is returned to the associated corner of the table by means of a vertical strip 26 positioned between the base 20 and board 23 so as to direct the played ball back to the player.

At the extreme upper end of the table, is provided a compartment 27, the latter being formed in part by the narrow transverse strip 28 and the adjacent upper ends of the side strips 22. Extending between the ends of said side strips 22 is a bar 29 to which a door 30 may be hingedly attached as at 31 for permitting access into the compartment. The members just described constitute supports for an upright casing 32, the lower end of which is adapted to fit in and be supported by the strips 22, 28 and 29. This casing 32 is adapted to contain visible signals or other indicia which are actuated or energized during the playing of the game. In the present instance this casing is formed to provide the back panel 33, side panels 34, a top board 35, an interior panel 36 and the bottom 47. Panel 36 has extending forwardly therefrom the division members 37 and 38 which divide the interior of the casing into three chambers. Each of these chambers has a plurality of electric light bulbs 39 disposed therein and suitably mounted on the interior panel 36. The three chambers mentioned may be subdivided into still smaller compartments by the division members 43 in each of which one of the electric light bulbs may be disposed. The front of the casing is closed by a glass plate 40, covering the three chambers mentioned. At the bottom of the casing the front apron strip 44 depends downwardly therefrom. This apron strip lies against a similar member 45 which is of greater length than the strip 44 whereby an offset or shoulder 46 results, the depth of the offset corresponding to the height of the narrow strip 28, so that when the casing is set down upon its supports, the bottom edge of the apron strip 44 seats upon the top edge of said strip 28 and the adjacent front face of the rear apron strip 45 lies against the rear of strip 28. In addition to this support, the side portions of the signal casing rest upon the top edges of the lateral double strips 22 and the rear bottom edge portion of the casing rests upon the transverse bar or strip 29. It will

be seen that the entire light casing unit may be readily lifted into and from operative position.

There is likewise provided according to the present structure, an electrical contact board 48 which is hingedly mounted as at 49 to the front of the apron member 44 adjacent the bottom thereof. The structure associated with this panel board will be later described but it may now be pointed out that said board may be swung up into parallel and substantially overlying relationship with the casing 32 and consequently forms part of the readily assembled game table. It will be understood that when the table is initially set up, the casing is inserted into position in the manner described before the top playing board 23 has been set down into position. The contact board 48 is then lowered into the position shown in Fig. 2 where it is supported laterally by suitable blocks 50 or the like provided on the inner face of the lateral strips 22. It will further be seen by reference to Fig. 2 that the playing board 23 is adapted to be positioned above and in spaced relationship with the contact board.

The electrical apparatus associated with the casing 32 comprises, as above mentioned, a plurality of electric light bulbs 39 mounted on the panel 36. The electric wiring for these bulbs may be disposed within the shallow compartment 51 resulting between the back and interior panels 33 and 36, respectively. Each one of these light bulbs is adapted to be electrically connected with a switch member, a corresponding number of which are on the contact board 48.

The individual switch members of this invention are preferably formed of insulation material such as bakelite and comprise a body or drum portion 52 and an integral extension 53. The drum portion 52 has a bore within which a metal bushing 153 is secured. Mounted on limited portions only on the outer face of the drum 52 is a pair of electrical contact plates, one of them 54 being of less width than the other 55. These contact plates are formed at their transverse edges with inwardly turned flange portions 56 which are embedded in the drum 52 during formation of the latter. The plate 54 is electrically connected by means of a pin 57 with the bushing 153. The other plate 55 may be secured in position by means of a short screw 58 which has no contact with the bushing 153.

The contact board 48 is provided with a number of rows of apertures 59 through which the played ball 25 is adapted to drop after it has passed through the apertures of the top board 23, the sets of apertures in said two boards being of corresponding number and position. The apertures 59 of the contact board have forwardly extending portions 60 and the drum portions 52 of the switches are rotatably mounted in these portions 60 upon electrical contact shafts 61 passing transversely across the face of contact board 48 and electrically connected at one end as at 62 with the wire 63 extending from a suitable source of electrical power.

The extensions 53 of the switches are adapted normally to project into the main or larger portions of the apertures 59. Said switches may be held in said normal position by means of the electrical brush members with which they are adapted to cooperate. The brush members may be mounted upon small blocks 64 (Figs. 2 and 3) which are positioned just forward of the apertures 59. The brush members are preferably copper strips secured three each upon one of the blocks 64 and having their rear ends formed with a bead 65 (Figs. 5 and 6). The brush members are adapted to bear against the drum portions 51 of the switches and are adapted normally to seat in a transversely extending channel portion 66 provided on each of said drums. By this means the switches may be held in operative position. The channel portions 66 are so located relative to the contact plates 54 and 55, that when the drum members are rotated by the striking of a ball against the extensions 53, the contact plates are moved into contact with the brushes for completing electric circuits to be later described.

The under face of the contact board 48 has slidably mounted thereon a rack 67 comprising transversely extending bars 68 each of which is disposed immediately beneath a row of the switch members positioned as described. The rearmost of the bars 68 has attached thereto the armature extension member 69 of a solenoid 70. When the switch members have been rotated by dropping of the playing ball, the extensions 53 thereof assume substantially the positions seen adjacent the right-hand side of Figs. 2, 3 and 4, that is, the extensions 53 are turned down into positions immediately at the rear of the bars 68 of said rack. When the solenoid is energized, the extension member 69 draws the rack 67 rearwardly of the contact board and the extensions 53 are carried rearwardly and upwardly by the bars 68, into the normal playing position of the switches. It may be noted that the extensions 53 of the switches are shown as formed with the heel portions 71 (Figs. 5 and 6) which are of such angular relationship with the bars 68 as to be readily engaged by them.

The novel electrical circuits and associated means will now be described. Initially it should pointed out that in the playing of the game, the first player closing a related group of the switches wins the game and at this time the group of lights illuminated by the winning player continues illuminated while all those at the remaining tables are extinguished. Simultaneously a bell and a signal light on the top of each casing 32 further indicate the termination of the game. In the present illustration the casings are shown as each provided with three groups of the lights. The closing of any one of the corresponding groups of switches would terminate the game. Hence it is obvious that the casing may be provided with only one group of the lights or with more than the numbers of groups shown herein. The various operations of this game are effected by electrical power from a common source 72. The power may be described as transmitted through a line 73 to one of the tables of the group. Each table is provided with a pair of triple contact sockets represented at 74 (Fig. 2) and a pair of short cables 75 each containing three wires corresponding to said triple contacts. A pair of these cables 75 may be extended between each pair of tables. The triple contacts are represented in Figs. 8 and 9 by means of the single rows of small circles embracing the numerals 1, 2, 3, 4, 5 and 6. The power described as entering at 73, is carried through the contacts indicated by the circles 4 along the common line 76 down to the ends of the electrical contact shafts 61 to which the wire 76 is electrically connected and upon which the switches are rotatably mounted. When the plate member 54, which contacts only the brush member 77, has been moved into this relation,

the current is carried to the brush member 77 of each group of brush members and from thence electrical current is transmitted to the electric light bulbs by the wiring represented on the left hand side of Fig. 8. It will be seen that the circuit from the brush 77 of the switch marked numeral 1 is carried up one side of the correspondingly marked light bulb No. 1 and so with all the remaining brushes 77 and lights. The other sides of the lights connect with a common line 780. This extends to a common contact member or block 78 which is associated with a relay 79, one of which relays is associated with each table. One of the normally closed contacts 80 of these relays are connected in common by a line 81 associated with the cable contact No. 1. In the normal position of the relays 79, the light current travels from the contacts 80 along the line 81 and passes through the normally closed contact 82 of a master relay 83, there being but one master relay provided for the whole group of tables. Passing through the master relay contact 82, the current continues over lines 84, 85 and 86 to contact No. 3 where it is returned along the line 87 to the source 72.

It will be noted adjacent the lower portion of Fig. 8, that a variation in the wiring of the groups of switches may be effected so that the rolling of a ball into a related group of ball receiving apertures is not too easily accomplished. In the instances shown, the rearmost row of switches 1, 2, 3, 4, and 5 represents one group. The second group has been given the relationship indicated by the switches 6, 7, 8, 9, and 10, the switch 8 being disposed at some distance from the remainder of the group. It is obvious that various arrangements of the groups may be resorted to as desired.

The switches of each group are connected in series. The topmost group 1, 2, 3, 4, and 5 may be taken as typical. It will be seen that the left-hand brush 88 is electrically connected as at 89 to the electrical shaft 61. When the contact plate 55 electrically joins the free ends of this and the adjacent brush 90, both of which contact said plate, the current is carried from brush 90 along the line 91 to the left-hand brush 92 of the adjacent switch. The remaining switches are similarly joined in series and the right hand switch is electrically connected as at 93 with a line 94 which extends to one side of the coil of relay 79. The other side of the relay coil is connected as at 95, to the contact block 78. It will be seen therefore that when a group of the light switches has been closed, the relay 79 is actuated at the winning table, that is, the table at which a full group of lights is first energized. At this time the armature of the relay is moved over to close with the contact points 96 and 97. The actuation of said relay 79 simultaneously actuates the master relay 83 so that the lights at all the remaining tables are extinguished while the lights at the winning table are immediately connected to a separate circuit so as to remain illuminated, as will be described. One side of the master relay 83 is connected as at 98 (Fig. 9) with one of the individual relay contacts 96, so that the circuit on this side may be traced to cable contact No. 3. The other side of the master relay coil is connected as at 99 with the other side of the power circuit 73.

The change over of the relay 79 completes a light circuit at the individual tables as represented by the line 76 already described and as completed by the common light line 780 entering the contact block 78 and from thence continuing over the now closed line 86 to cable contact No. 3 for completing this individual light circuit.

On the right-hand side of Fig. 9 it will be seen that the change over of master relay 83 completes a circuit through a bell transformer 100 and a bell 101 which further announces the termination of a game. Moreover, each individual relay 79 has connected therewith a signal light circuit 102 associated therewith. This signal light circuit 102 has associated therewith and energized upon actuation of this relay, an individual light 103 (Figs. 1 and 2) positioned one on the top of each casing 32.

The solenoid may be selectively actuated by an operator by actuation of a switch 104 (Figs. 8 and 9) which switch is associated with the contacts numbered 3 and 5. Furthermore a switch 105 and associated electrical circuit which comprises contacts 3 and 6 may be associated with the bell 101 so that the operator may announce by ringing of this bell the beginning of a game. As previously indicated, after a game has been completed, the operator actuates the solenoid 70 and returns the switch members to their playing position in readiness for a new game.

The individual relays at each table and associated wiring and the like may be conveniently disposed in the compartment 27 (Fig. 2), access to which is had through the door 30. The wiring from the switches to the lights may be passed through said compartment up into the shallow chamber 51 of the casing 32 so that the electrical apparatus associated with the units is substantially invisible and well protected.

It may be remarked that some suitable indicia is shown on the glass plates 40, 41 and 42 of the casing, which indicia becomes visible only upon illumination of the light bulbs. The indicia may take the form of pictorial illustrations which are progressively illuminated to complete the pictures, such, for example, as described in my copending application Serial No. 673,408, filed may 29, 1933.

The circuits, switch means and associated electrical mechanism may be applied in other environments than that illustrated herewith, but modifications of this kind are believed to be comprised within the spirit and scope of the present invention.

What is claimed is:

1. In combination, a plurality of electrical units adapted to be energized from a common line, each unit comprising a plurality of normally open switches and a plurality of signals electrically connected one each with one of the switches, the signals of each unit being connected in series, an individual relay associated one only with each unit, a common line connecting the normally closed contact of all said individual relays, a single master relay controllable by any one of the individual relays and likewise having a normally closed contact in said common line of the individual relays, closing of all switches at any one unit being adapted to energize the individual relay at that unit, said energized unit being adapted to effect actuation of said master relay for deenergizing the signals at all units, and a separate circuit closed by actuation of said initially energized individual relay whereby the signals of the associated unit are instantaneously reenergized.

2. Competitive game apparatus comprising a plurality of roll-ball tables, a plurality of cooperating electrical units provided one at each

table and each comprising a plurality of normally open switches closable by the players and a plurality of signals electrically connected one each with one of the switches, the signals of each unit being connected in series, an individual relay associated one only with each unit, a common line connecting the normally closed contact of all said individual relays, a single master relay controllable by any one of the individual relays and likewise having a normally closed contact in said common line of the individual relays, closing of all switches at any one unit being adapted to energize the individual relay at that unit, said energized unit being adapted to effect actuation of said master relay for deenergizing the signals at all units, and a separate circuit closed by actuation of said initially energized individual relay whereby the signals of the associated unit are instantaneously reenergized for indicating the winning table.

3. Competitive game apparatus comprising a plurality of roll-ball tables, a plurality of cooperating electrical units provided one at each table and each comprising a plurality of normally open switches closable by the players and a plurality of signals electrically connected one each with one of the switches, the signals of each unit being connected in series, an individual relay associated one only with each unit, a common line connecting the normally closed contact of all said individual relays, a single master relay controllable by any one of the individual relays and likewise having a normally closed contact in said common line of the individual relays, closing of all switches at any one unit being adapted to energize the individual relay at that unit, said energized unit being adapted to effect actuation of said master relay for deenergizing the signals at all units, a separate circuit closed by actuation of said initially energized individual relay whereby the signals of the associated unit are instantaneously reenergized for indicating the winning table, a bell and circuit energized by actuation of said master relay, and a light embraced in the individual relay circuit at each table and energized simultaneously with said relay for further indicating termination of play.

4. In a roll-ball game apparatus, the combination of a table provided with two spaced table top members the upper one of which is removable, a casing adapted to contain electrical signal means, support members at one end of the table top and adapted to slidably receive and support said casing in upright position, and an electrical contact board adapted to cooperate with said signal means and hingedly mounted on the lower front portion of the casing said contact board being adapted in inoperative position to be disposed in substantially parallel overlying relationship with the casing and to be swung forwardly and disposed in operative position beneath the plane of the upper table top member prior to positioning of the latter.

5. Competitive game apparatus comprising a plurality of roll ball tables a plurality of cooperating electrical units provided at each table and each comprising a plurality of normally open switches closable by the players and a plurality of signals electrically connected one each with one of the switches the signals of each unit being connected in series, an individual relay associated one only with each table and with the electrical units thereon, a common line connecting the normally closed contact of all said relays, a single master relay controllable by any one of the individual relays and likewise having a normally closed contact in said common line of the relays, closing of all switches of any one unit being adapted to energize the relay at the associated table, said energized unit being adapted to effect actuation of said master relay for de-energizing all the signals at all tables, and a separate circuit closed by actuation of said initially energized individual relay whereby the signals of said relay-energizing unit are instantaneously re-energized for indicating the winning table.

6. Competitive game apparatus comprising a plurality of roll ball tables, a plurality of cooperating electrical units provided at each table and each comprising a plurality of normally open switches closable by the players and a plurality of signals and electrically connected one each with one of the switches, the signals of each unit being connected in series, an individual relay associated one only with each table and with the electrical units thereon, a common line connecting the normally closed contact of all said relays, a single master relay controllable by any one of the individual relays and likewise having a normally closed contact in said common line of the relays, closing of all switches of any one unit being adapted to energize the relay at the associated table, said energized unit being adapted to effect actuation of said master relay for de-energizing all the signals at all tables, a separate circuit closed by actuation of said initially energized individual relay whereby the signals of said relay-energizing unit are instantaneously re-energized for indicating the winning table, a bell and circuit energized by actuation of said master relay, and a light embraced in the relay circuit at each table and energized simultaneously with said relay for further indicating termination of play.

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