Nov. 17, 1942. E. LINKE 2,302,333

ELECTRIC DICE GAME

Filed Sept. 12, 1941 3 Sheets-Sheet 1

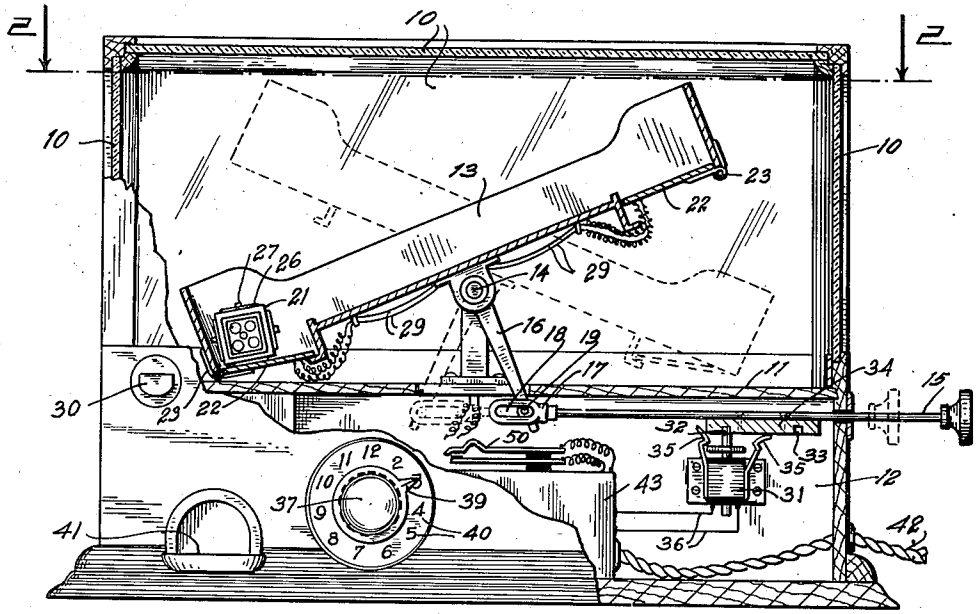


Fig. 1.

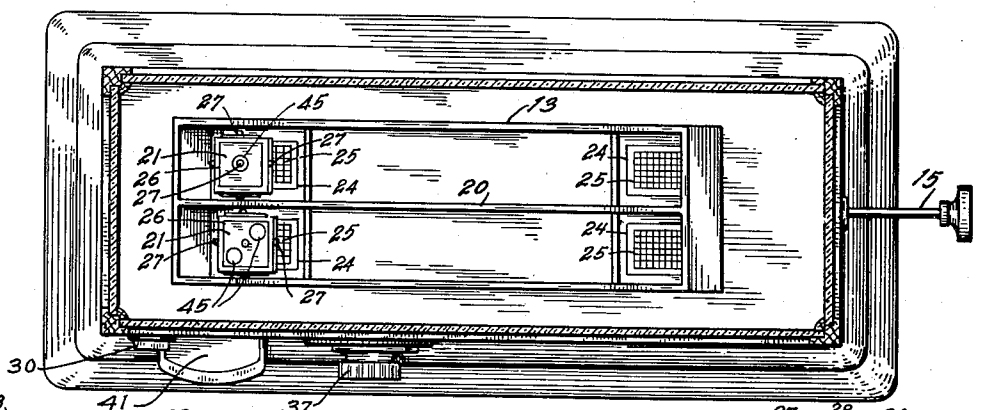


Fig. 2.

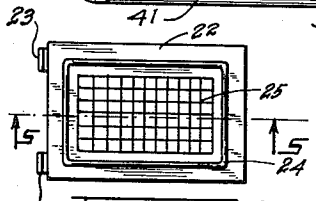


Fig. 4.

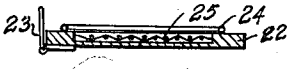


Fig. 5.

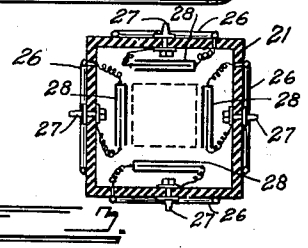


Fig. 3.

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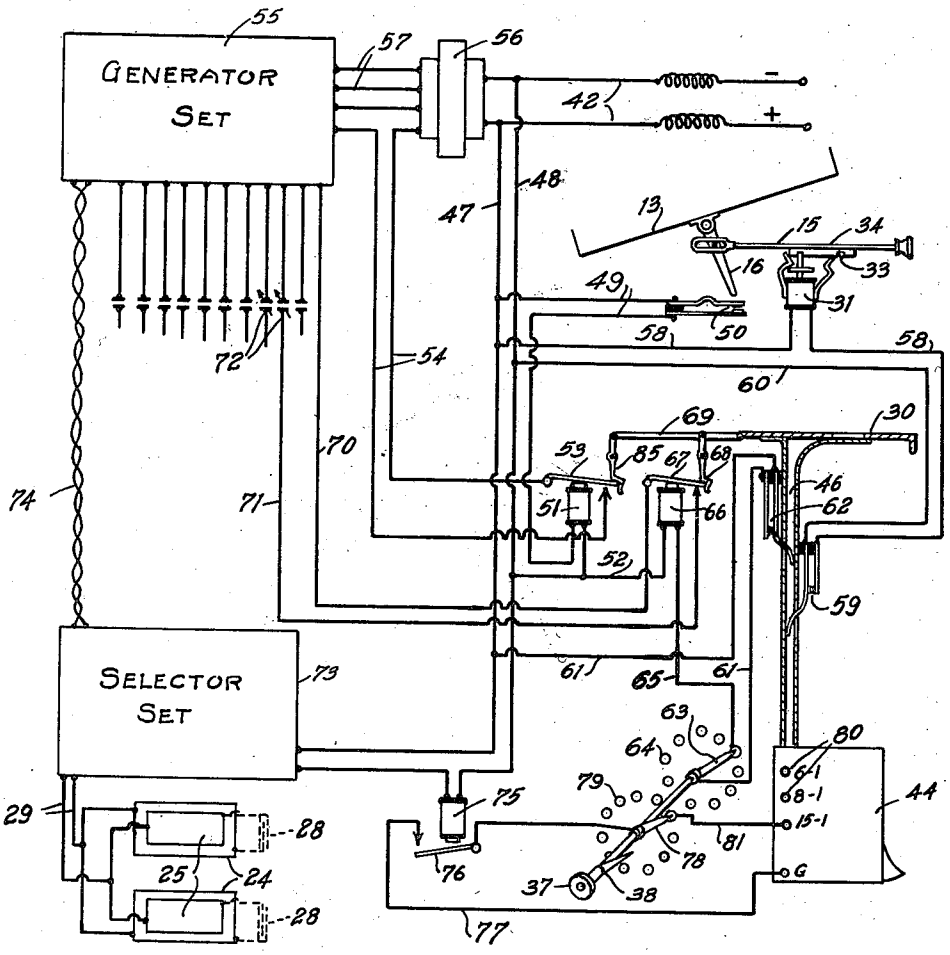


Fig. 6.

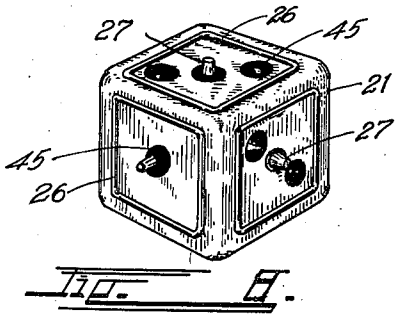


Fig. 4.

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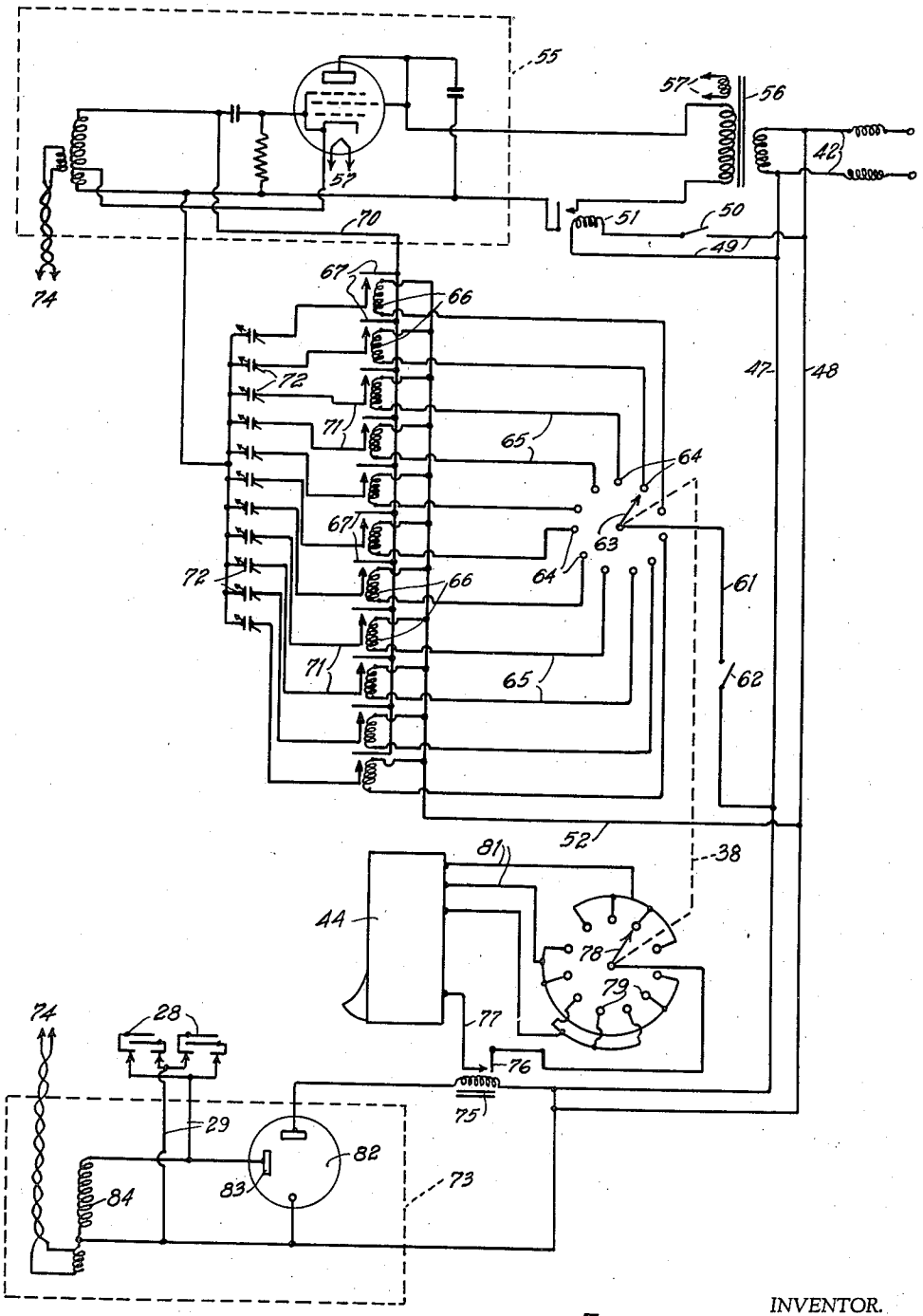


Fig. 7.

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UNITED STATES PATENT OFFICE

2,302,333

ELECTRIC DICE GAME

Elvin Linke, Denver, Colo.

Application September 12, 1941, Serial No. 410,499

8 Claims. (Cl. 273—145)

This invention relates to an electric game device and is more particularly designed as a dice game. The principal object of the invention is to provide an automatic device which at the actuation of the operator will roll a pair of dice and, if these dice roll a total number equal to a number previously chosen by the operator as his "point," the device will give a signal or deliver a prize preferably, but not necessarily, in money or tokens, the value of said prize being proportional to the chances of rolling the particular selected "point."

Another object of the invention is to provide a selective electrical circuit for operating any desired device or devices in accordance with the duplication of any given number by the laws of chance, such as the operation of signals, either audible or visible, or operating vending machines or coin delivering mechanisms.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which forms a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

Fig. 1 is a front view of one form of the improved game device, partially broken away to show the interior mechanism;

Fig. 2 is a horizontal section therethrough, looking downwardly on the line 2—2, Fig. 1;

Fig. 3 is a detail cross sectional view through one of the pair of dice employed in the device;

Fig. 4 is a detail view of the contact plate employed for receiving the dice;

Fig. 5 is a detail section through the contact plate, taken on the line 5—5, Fig. 4;

Fig. 6 is a partial circuit diagram illustrating the control circuits and one of a plurality of duplicate selective circuits employed in the device;

Fig. 7 is a circuit diagram illustrating the relation of the plurality of duplicate selective circuits and the circuits for generating an oscillating current and the selective determination of the frequency thereof; and

Fig. 8 is a perspective view of one die of a pair of dice employed in the device.

The device may be mounted in any desired manner and enclosed in any desired enclosure. In the form illustrated, in Fig. 1, the dice and the dice throwing or rolling mechanism is enclosed in a suitable glass case 10 having a floor 11 concealing a mechanism compartment 12 in the base of the case. The rolling mechanism comprises a tiltable cradle 13 mounted on a transverse shaft 14 across its middle. The cradle is rocked or tilted in any desired manner, such as by means of an operating rod 15 which actuates a tilting lever 16 secured to the cradle 13.

The extremity of the rod 15 terminates in a fitting 17 having an elongated slot 18 for receiving a wrist pin 19 in the lever 16. By this construction the operating rod forces the lever until it passes its dead center position then allows the cradle to fall the remainder of the distance to its oppositely inclined position.

The cradle is divided by means of a longitudinal center partition or ridge 20 into two runways each containing a die 21. A contact board 22 is positioned at both extremities of each runway. These boards are preferably mounted on light spring hinges 23 so that when the dice fall upon them they will be depressed to approach a horizontal position, as is shown in Fig. 1.

Each contact board carries a first peripheral contact 24 surrounding a second internal contact 25. The contact 24 is preferably a wire or rod frame of non-corrosive metal secured on the face of the board 22. The contact 25 is preferably a section of metallic screen. The two contacts 24 and 25 are electrically insulated from each other and from the boards.

Each face of each die carries a rectangular border contact bead 26 slightly elevated above its surface and each face contains a center contact 27 projecting outwardly beyond the border contact bead 26. The contacts 26 and 27 of each face are connected to the opposed plates of an independent dice condenser, as indicated at 28, each of the dice condensers for each of the six faces of each die has a different capacity.

When the dice rest on the contact boards 22 the contact beads 26 of the lower faces of the dice lie on the peripheral contact 24 and the center contacts 27 thereof rests on the internal contact screen 25 so that the condensers 28 of the lowermost dice faces are bridged across the contacts 24 and 25 in parallel circuit therewith.

A pair of dice conductors 29 lead to all of the contact board contacts so that when two dice are resting on the contact board the two condensers in circuit will be in parallel circuit across the conductors 29.

The device may, if desired, be arranged to be coin actuated, in which event a suitable coin slide

30 is provided for insertion of the coin. When the coin is inserted it releases the operating rod such as by means of a locking solenoid 31 which withdraws an armature latch 32 from a locking notch 33 in a latch plate 34 mounted on the control rod 15. The armature latch snaps below one of a pair of latch springs 35 which maintains it withdrawn until the rod 15 is actuated. Actuation of the rod in either direction forces the engaged latch spring 35 outwardly to release the latch 32 to allow it to lock the rod 15 at the extremity of its stroke. Current is conducted to the solenoid 31 through a pair of latch conductors 36.

Before placing the coin in the device, it is intended that the operator select a number from two to twelve which will be his "point" in the game. This selection is made by means of a selector knob 37 mounted on a selector shaft 38 and provided with an index pionter 39 which travels around an annular series of "point" numbers 40.

If the machine is intended to pay out coins, should the selected "point" be duplicated by the total of the upward faces of the dice, a suitable coin return pocket 41 is provided. Current for operating the electrical mechanism is fed to the device from any suitable conductor cord 42. The electrical control circuits are enclosed in a suitable housing 43. The coin return or pay off mechanism is indicated at 44. The details of this mechanism are not shown since such devices can be purchased on the open market.

Each time the operating rod 15 is pushed in or pulled out, the two dice will roll down their runways and fall upon the contact boards at the lower extremity of the cradle. Each die face is painted or otherwise supplied with indicating dots 45 indicating the numerals from one to six as is usual with game dice.

The basic principal of operation of the circuits of this device is the generation of a high frequency alternating current of selected frequency to be received on a second circuit of a frequency determined by the chance rolling of the dice. The frequency of the current generated by the oscillator or generator, indicated in its entirety at 55, is controlled by the setting of the dial pointer 39. Each numbered position of this pointer places a condenser of different capacity into the oscillator circuit so that each different setting thereof will cause the generator to generate a current of given frequency differing from the frequencies of the other settings. The oscillating current from the generator is transferred to a receiving circuit in which the capacity of the dice condensers 28 is interposed. If the particular dice condenser capacity is of the proper value to place the receiving circuit in phase with the selected frequency of the generator, current will flow to the "pay-off" circuit of the device.

The current from the conductor cord 42 may be fed directly into the machine or may be transformed to any desired voltage or frequency desired for use in the machine. This incoming current is fed into supply leads 47 and 48 in the machine. The incoming current also feeds a transformer 56 which supplies, through conductor filaments 57, current for the various vacuum tube filaments in the circuit. It also supplies current for operating an oscillator or generator set 55 through current supply wires 54. Current from the lead 47 is conducted through a conductor 49, a cradle contact 50, an electromagnet 51, and a return lead 52 to the lead 48.

The cradle contact 50 is positioned below the axis of the shaft 14 so as to be closed by the passing of the lower extremity of the lever 16. Thus, each time the cradle swings the electromagnet 51 is energized. This magnet controls an armature 53 which is in circuit with one of the current supply wires 54 to the generator set 55. Thus, each time the cradle tilts to roll the dice to a new position, the armature 53 will close to start operation of the generator set 55. The armature 53 is held closed in any desired manner such as by means of a manually releasable latch 85, the release of which is accomplished by operation of the coin slide 30.

Current is also supplied from the lead 47 through a conductor 58 to the solenoid 31 through a coin actuated contact 59 thence returning through a conductor 60 to the lead 48. Current is also supplied from the lead 47 through a conductor 61 and a second coin actuated contact closer 62 to a selector arm 63. The selector arm 63 is mounted on the shaft 38 of the knob 37 and travels over a series of contact buttons 64.

From each of the contact buttons 64, an independent conductor 65 leads to an individual solenoid 66, only one of which is shown in Fig. 6. Current from all of the solenoids returns through the common conductor 52 to the lead 48. Each of the solenoids 66 operates an individual interlocking armature 67, the interlocking mechanism of which, indicated at 68, is connected through a connecting rod 69 with the coin slide 30.

A common condenser circuit lead 70 connects all of the armatures 67 of all of the solenoids 66. The armatures 67 then selectively connect this lead with any one of a series of the individual condenser conductors 71. Each of the conductors 71 leads to an individual condenser 72 any one of which may be bridged across the oscillator circuit of the generator set 55.

The dice conductors 29 lead to what might be termed a receiving or selector set 73, the capacity of which varies accordin to the manner in which the two dice lie upon the contact boards. This selector set is connected to the output of the generator set 55 through a non-capacitative coupling such as a twisted cord 74. The selector set is fed with current from the conductors 47 and 48, one of which is in series with an overload solenoid 75.

If the capacity of the particular setting of the dice places the receiving circuit in resonance with oscillating current of the generator, current will flow through the solenoid 75 to actuate a signal armature 76. The coin signal armature 76, in the embodiment illustrated, is in circuit between a common coin control lead 77 and a rotating switch lever 78 mounted on the knob shaft 38. The switch lever 78 travels around a circumferential series of contact buttons 79 which are connected to pay-off terminals 80 on the pay-off mechanism 44 by means of pay-off conductors 81.

It is well-known that there are more chances of throwing a total of six, seven, or eight on the dice than there are of throwing a two or twelve. Therefore, the totals having the lesser chances of being thrown should pay higher amounts. This is accomplished by means of the pay-off terminals 80 which when energized cause the coin control mechanism to pay out differing amounts, which may vary, in the circuit illustrated, from six to one to fifteen to one. The buttons 79 corresponding to the 2–3–11–12 positions of the indicator 39 are connected to the 15–1 ter-

minal. The buttons corresponding to the 4–5–9–10 positions are connected to the 8–1 terminal. The buttons corresponding to the 6–7–8 positions are connected to the 6–1 terminal.

Operation

Referring to Fig. 6, let us assume that the player has selected the number "3" button. He places his coin in the coin slot **30** and presses the slide inwardly. This unlocks the armatures **53** and **67** so as to open the circuit to the generator set and open all the condenser circuits thereof. The coin now slides down the coin chute **46** first contacting and closing the contact closer **62**. This energizes the solenoid **66** and closes the "3" condenser circuit to the generator set. The coin next closes the contact **59** which closes the circuit to the solenoid **31** and snaps the latch **32** behind its retaining spring **35** to unlock the operating rod **15**.

The player now presses the rod **15** inwardly to tilt the cradle **13** downwardly to the right. As the cradle passes its middle position, the lever **16** closes the cradle contact **50** to close the circuit to the solenoid **51** which in turn closes the circuit to the generator set **55**. The dice now roll down the cradle onto the lowermost contact boards **22**. If a "two" and "one" show on the dice, the capacity in the combined condensers **28** will balance the "3" condenser **72** and a current will be impressed on the solenoid **75**. The latter will attract the armature **76** to cause it to close the circuit to the "15–1" terminal of the coin mechanism **44**. Should any other number total have turned up, the bridged condenser capacity across the conductors **29** would have placed the selector set out of phase with the generator set so that the solenoid **75** would not operate.

The generator set is any conventional high frequency, electron coupled, oscillator conducting every positive half-cycle of the A. C. plate voltage, see Fig. 7. The frequency of the generator is, of course, determined by the selected condenser **72**.

The selector set contains a cold cathode glow tube **82**. Such a tube will conduct current only when the voltage on a grid **83** exceeds the break down voltage of the tube. A resonant circuit consisting of a tuned coil **84**, across which the dice capacity is bridged, supplies the break-down voltage to the tube **82** whenever the frequency determined by the coil **84** and dice capacity is equal to the output frequency of the generator set. In other words, whenever the selector set is in resonance with the oscillator, current will pass from the supply leads **47** and **48** to the over-load solenoid **75**.

It is possible that other circuits could be employed, additional buttons could be inserted in the two series of buttons **64** and **79** and additional terminals **80** employed without effecting the ultimate object of the invention. The diagrams simply show one method of carrying out the principle of the device. It is, of course, within the skill of anyone skilled in the art to connect the leads **77** and **81** to any desired device such as an audible or visible signal, should a pay-off mechanism not be desired. The coin return mechanism **44** is simply illustrative of any device which might be operated in consequence of the chance combinations of condenser capacity.

While the game has been described as employing condensers of different capacity for the six dice faces, it is easily conceivable that coils or varying resistances could be employed in place of the condensers with appropriate changes in the circuit.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A game device comprising: a high frequency oscillator; a receiving circuit for the oscillating current of said oscillator; means for presetting the frequency of said oscillator to any desired frequency; a plurality of condensers of differing capacity; means for placing said condensers in motion so that when they come to rest, one of said condensers will be in circuit to determine for the frequency of said receiving circuit; and a signal circuit to be closed by said receiving circuit when the oscillator and receiving circuit are in resonance.

2. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; a plurality of oscillating circuits of differing frequency in said oscillator; means for closing any selected one of said circuits to preset the frequency of said oscillator; a receiving circuit in said receiver receiving the oscillating current from said oscillator; a movable series of capacitors of differing capacity; means for putting said series in temporary motion; means to be contacted by an undetermined one of said capacitors when the series comes to rest to place the latter capacitor in the receiving circuit to set the capacity of said receiving circuit; and means operable by the voltage of said receiving circuit for indicating when the latter is in resonance with the oscillations of said oscillator.

3. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; means for presetting the frequency of said oscillator to any desired frequency; a receiving circuit in said receiver upon which said oscillating current is impressed; a chance device; a plurality of condensers in said chance device; means for placing certain of said condensers in said receiving circuit to set the frequency thereof by chance at each operation of said device; and signal means operable by said receiving circuit only when it is in resonance with said oscillating circuit.

4. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; means for presetting the frequency of said oscillator to any desired frequency; a receiving circuit in said receiver upon which said oscillating current is impressed; a pair of dice; an electrical condenser in each die for each face thereof; condenser contacts on each face of each die in circuit with one of the condensers therein; receiving members for said dice contacting the condenser contacts on the lower face thereof; means for placing said receiving members in said receiving circuit so that the chance fall of said dice will determine the capacity of said receiving circuit; and signal means operable by said receiving circuit only when the latter is in resonance with said oscillating circuit.

5. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; means for presetting the fre-

quency of said oscillator to any desired frequency; a receiving circuit in said receiver upon which said oscillating current is impressed; a pair of dice; an electrical condenser in each die for each face thereof; condenser contacts on each face of each die in circuit with one of the condensers therein; receiving members for said dice contacting the condenser contacts on the lower face thereof; means for placing said receiving members in said receiving circuit so that the chance fall of said dice will determine the capacity of said receiving circuit; and means operable by said receiving circuit to indicate when the latter is in resonance with said oscillating circuit.

6. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; means for presetting the frequency of said oscillator to any desired frequency; a receiving circuit in said receiver upon which said oscillating current is impressed; a pair of dice; an electrical condenser in each die for each face thereof; condenser contacts on each face of each die in circuit with one of the condensers therein; receiving members for said dice contacting the condenser contacts on the lower face thereof; means for placing said receiving members in said receiving circuit so that the chance fall of said dice will determine the capacity of said receiving circuit; means operable by said receiving circuit to indicate when the latter is in resonance with said oscillating circuit; and means operable by the frequency presetting means of the oscillator for varying said indication in accordance with the variations in the capacity of the receiving circuit.

7. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; a receiving circuit in said receiver upon which said oscillating current is impressed; a chance device; a plurality of condensers in said chance device; means for placing certain of said condensers in said receiving circuit to set the frequency thereof by chance at each operation of said device; and signal means operable by said receiving circuit only when it is in resonance with said oscillating circuit.

8. A game device comprising: a high frequency oscillator; a receiver for the oscillating current of said oscillator; a receiving circuit in said receiver upon which said oscillating current is impressed; a pair of dice; an electrical condenser in each die for each face thereof; condenser contacts on each face of each die in circuit with one of the condensers therein; receiving members for said dice contacting the condenser contacts on the lower face thereof; means for placing said receiving members in said receiving circuit so that the chance fall of said dice will determine the capacity of said receiving circuit; and signal means operable by said receiving circuit only when the latter is in resonance with said oscillating circuit.

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