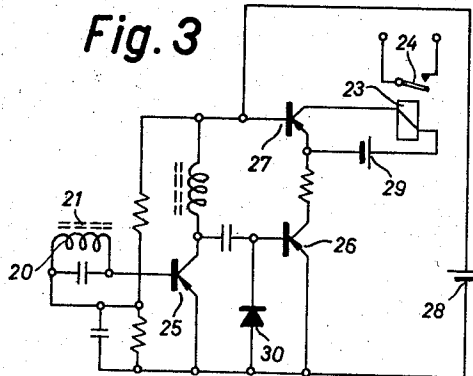
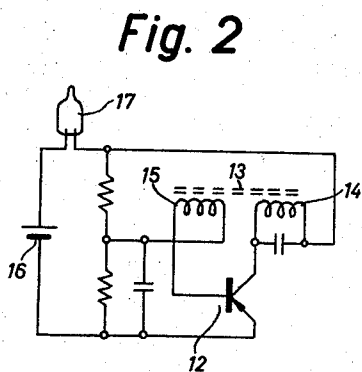
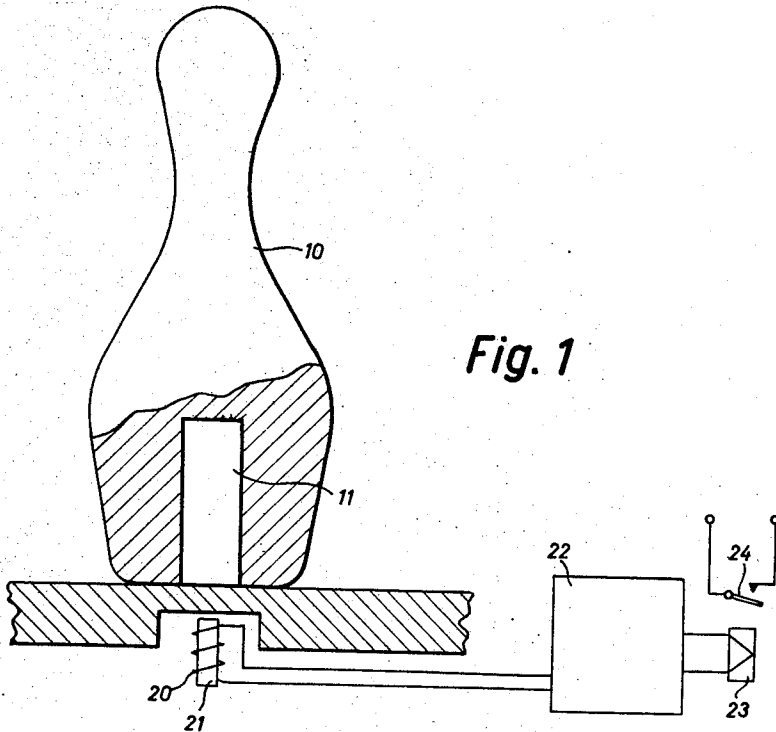


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SKITTLE GAME WITH ARRANGEMENT FOR AUTOMATICALLY
INDICATING THE FALLEN PINS
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SKITTLE GAME WITH ARRANGEMENT FOR AUTOMATICALLY INDICATING THE FALLEN PINS

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2 Claims. (Cl. 273-52)

This invention relates to a skittle game with arrangement for automatically indicating the fallen pins.

In contrast to the skittle games of the type known heretofore, the one according to the invention is principally characterized in that underneath the location of each pin there is arranged at least one electric coil and, within the foot of each pin, a member magnetically acting upon the coil, and that the coil forms part of an electric circuit designed to cause a relay to operate or release depending on whether the associated pin is standing on its location or not.

Further details of the invention will appear from the following description and claims, taken in conjunction with the accompanying drawing. This shows diagrammatically, purely by way of example, a form of embodiment incorporating the invention.

FIG. 1 shows the invention, in which a high-frequency generator is arranged with the pin shown and a coil of a high-frequency receiver is arranged underneath the location of the pin;

FIG. 2 is the electric circuit diagram of the high-frequency generator; and

FIG. 3 is the electric circuit diagram of the high-frequency receiver with the relay connected thereto.

Referring to the form shown in FIG. 1, the foot of a pin 10 accommodates a small high-frequency generator 11 whose electric circuit diagram is represented in FIG. 2. The generator 11 includes a transistor 12 and, on a high-frequency iron-core 13, an oscillating coil 14 and a feedback coil 15. The transistor 12 is supplied by a battery 16 via an inclination switch 17, preferably of the mercury type, so arranged that the supply to the generator will be automatically interrupted when the pin is tilted from its upright position, say, when it falls.

Underneath the location of the pin 10 there is a coil 20 wound on a high-frequency iron-core 21. Said coil forms part of a high-frequency receiver 22 which, in FIG. 1, is indicated diagrammatically by a rectangle only. Connected to the output of the receiver 22 is a relay 23 with a contact 24. The electric circuit diagram of the receiver and relay 23 is shown in detail in FIG. 3. The receiver includes a plurality of transistors 25, 26, 27 which are supplied by two sources 28 and 29. The relay 23 is put in the circuit of the one transistor 27. The high-frequency signal is amplified by transistor 25 in the input stage and then converted by means of a rectifier 30 into a corresponding D.-C. signal which is further amplified by means of the two transistors 26 and 30 to energize the relay 23. The described arrangement is provided for each pin.

The action of the described skittle game is as follows: With the pins 10 standing on their locations, the high-frequency generator 11 of each pin is in operation. Thereby the coil 14 produces a magnetic alternating field which partly traverses the core 21 of the receiver coil 20 and consequently induces in the coil 20 a high-frequency

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alternating voltage which is amplified in the transistor 25 and rectified by means of the rectifier 30. The rectified voltage is further amplified by transistor 26. The transistor 27 acts as a switch closing the circuit of relay 23 which is then energized so that contact 24 opens. The relay 23 is also energized if the associated pin is slightly displaced laterally from its true location by, say, a few centimeters. If, in the course of the game, some or all of the pins are knocked down, the generator 11 in each of the fallen pins will be automatically switched off through the built-in inclination switch 17. Voltage is no longer induced in the associated receiver coil so that relay 23 is deenergized and contact 24 is closed. Contacts 24 may be utilized to control light signals for visual indication of the fallen pins or to operate counters for indicating results, as described for instance in the Swiss patent specifications 330,860 and 332,516. In addition, contacts 24 may be used to start up a device which automatically sets up the pins, as is also explained in said specifications.

The generator 11 requires so little energy for its supply that in most cases the pins will require replacement owing to wear before the battery 16 is exhausted or has become unserviceable because of aging.

The invention is particularly advantageous for skittle games having a ropeless automatic device for setting up the pins, i.e. in which the individual pins are not attached to draw-ropes for raising and setting the pins. An important advantage lies in the fact that floor switches, actuated by the weight of the pins, are dispensed with.

What I claim is:

1. Skittle game with arrangement for automatically indicating the fallen pins, comprising a transistor sender in the foot of each pin which is capable of generating an electro-magnetic alternating field, a small coil in a location under each pin, a high frequency receiver in circuit with the coil, and a contact member which is actuated by the receiver when the sender sends an impulse and deactuated by the receiver when the sender omits such impulse, the sender including a battery and a mercury switch so that the switch will set the sender in operation only when the respective pin is vertical and will open the sender when the respective pin is at an angle to the vertical or falls over.

2. Skittle game with arrangement for automatically indicating the fallen pins, comprising a transistor sender in the foot of each pin which is capable of generating an electromagnetic alternating field, a coil located under each pin, a high frequency receiver in circuit with the coil, and a contact member which is actuated by the receiver when the sender sends an impulse and deactuated by the receiver when the sender omits such impulse, the sender including a battery and a switch to set the sender in operation only when the respective pin is vertical and will open the sender when the respective pin is at an angle to the vertical or falls over.

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