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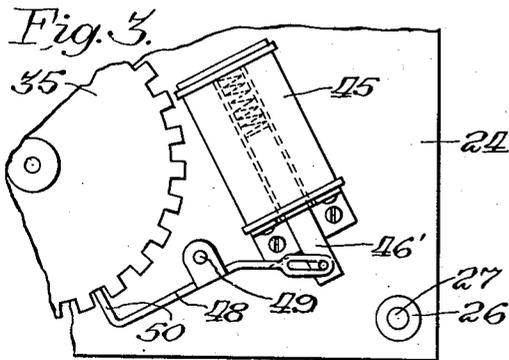
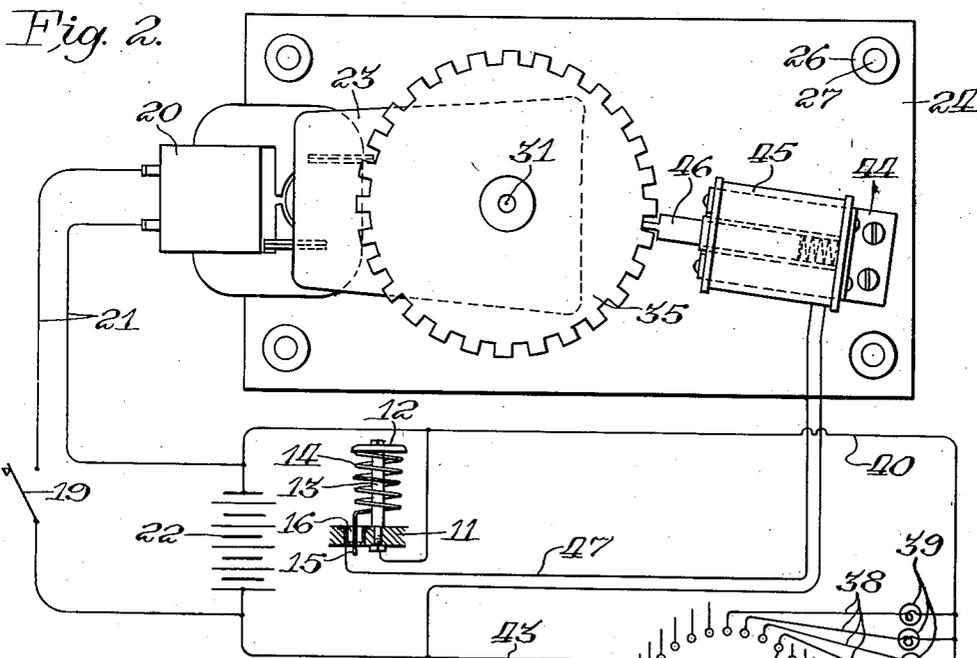
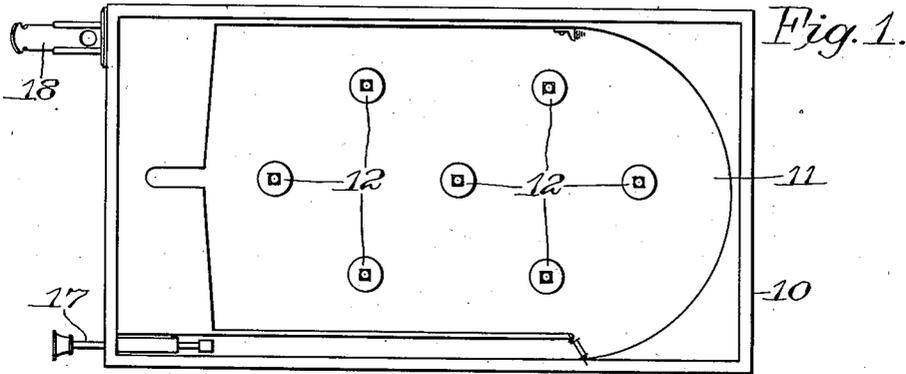
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2,291,749

CIRCUIT CONTROL FOR AMUSEMENT APPARATUS

Filed March 2, 1940

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

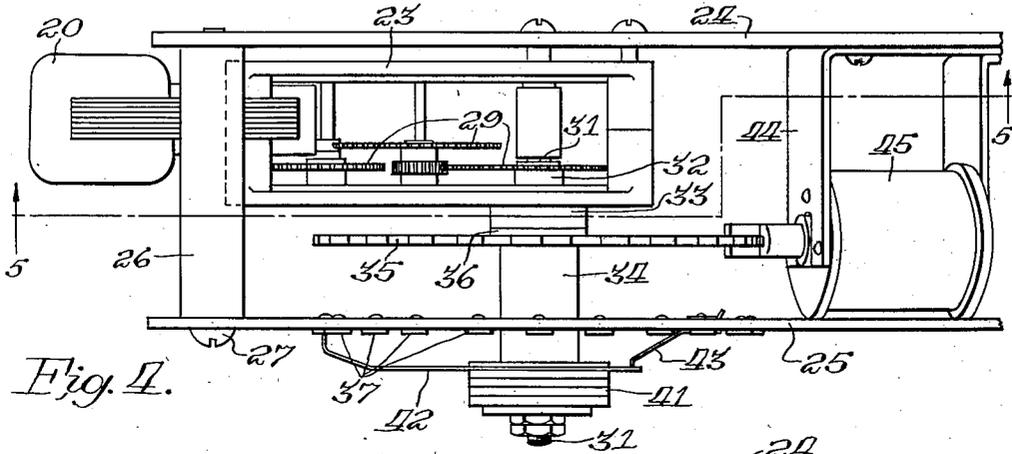


Fig. 4.

Fig. 5.

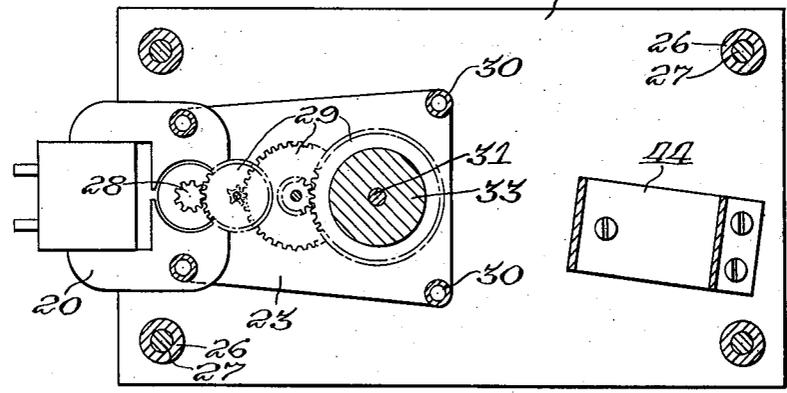
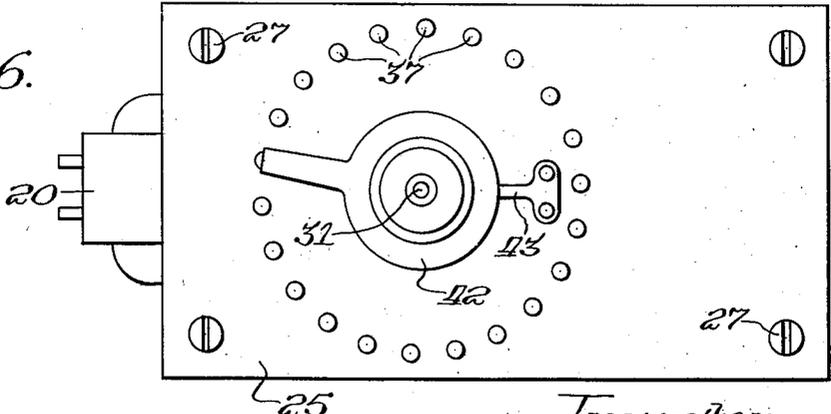


Fig. 6.



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UNITED STATES PATENT OFFICE

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CIRCUIT CONTROL FOR AMUSEMENT APPARATUS

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1 Claim. (Cl. 177—384)

The invention relates to a circuit variator and control means for use with amusement apparatus, such for example as pin ball types of games.

In such apparatus it is desirable to have illuminating effects on a back board or table portion thereof to create player appeal by having such effects correspond with a scoring achievement.

The present invention uses a motor-driven notched disk, said motor being set into operation when the game apparatus is released for play. A stationary contact carrying plate is proximately disposed to the disk and a wiper arm turns with the motor and disk and makes circuits through the plate contacts with a series of lamps when an obstacle switch member on the game table is bumped by a ball rolling on the table momentarily to close a circuit to energize an electromagnetic device that serves to release a normally locked brake device from the notched disk whereby to free it for turning and cause the light circuits to be changed. The motor shaft keeps turning, but a friction coupling serves to permit the motor to run while the notched disk and wiper arm are locked and stand still.

The main object of the invention is to provide an improved motor driven circuit changer and control means of the class described.

Another object of the invention is to provide a ball bumped obstacle switch control for the circuit changer to free the latter momentarily for operation when a score achievement is made.

Other important objects will become apparent to those skilled in this art as the disclosure is more fully made.

In the accompanying sheets of drawings illustrating a preferred example of the invention:

Figure 1 is a general plan view on a reduced scale of a typical pin ball game with which the novel circuit variator and control may be used;

Figure 2 is a face view of the improved circuit variator unit with the contact carrying plate removed, along with a typical wiring diagram to show a ball bumper control and lights used in creating the illuminating effects;

Figure 3 is a detailed face view, showing an alternate type of notched disk lock control device;

Figure 4 is a plan view of the unit shown in Figure 2;

Figure 5 is a cross sectional view taken along the line 5—5 of Figure 4, looking in the direction of the arrows; and

Figure 6 is a front face view with the contact carrying plate in place.

By way of example, a pin ball game is shown generally in Figure 1, the same having a cabinet 10, a table 11 and bumper spring switch obstacles 12, of which there may be any desired number. As shown in Figure 2 each obstacle 12 includes a conductor post 13 and coil spring 14, having a pendant leg 15 projecting normally centrally down into an opening in the table, which opening carries a conductor element 16. As is well known in the art when a ball is propelled onto the table 11 by a ball projector 17 it will, if properly directed, bump and deflect the spring 14 sufficiently to make momentary contact between conductor parts 15 and 16, to close a circuit presently to be described. A coin chute 18 is provided in the usual way to release the game apparatus for play, it being understood that when said coin chute is operated a switch 19 will be closed and kept closed automatically by a usual timer element, not shown, for a predetermined interval of time. This keeps running an electric motor 20 in circuit 21 with a source of energy 22.

This motor 20 is mounted in a frame 23, in turn securely fastened in a spaced, parallel plate mounting, comprising a rear plate 24 and a front plate 25 made of insulation material. Spacers 26 and screw bolts 27 hold the plates 24 and 25 together as a small, compact unit, positionable in any desired place inside the game cabinet 10. The motor shaft has fast thereon and drives a pinion 28, in turn driving a series of reduction gearing 29 suitably shaft mounted in the auxiliary frame 23. The frame 23 is secured by bolts 30 to the rear plate 24, as shown. The final gear 29 is supported on a shaft 31 which is stationary in the frame plates 24 and 23. The final gear 29 has a hub 32 journaled on the shaft 31 and said hub 32 passes through a side of the auxiliary frame and includes an enlarged driver disk 33 as a functionally integral part of the hub 32 and final gear 29.

The plate 25 and the shaft 31 carry turnably a sleeve 34 passed through the plate 25, said sleeve 34 at its end proximate the frame 23 carrying a large peripherally notched wheel 35. Between the driver disk 33 and wheel 35 is a friction washer or disk 36 acting as a driving clutch connection.

The front face of the plate 25 carries a circle of spaced contact buttons 37 from which are lead respective wires 38, to respective lamps 39 connected in turn to a common line connection 40 with the source of energy 22 all as shown in

Figure 2. Clamped by insulation washers 41 to turn with the sleeve 34 is a wiper arm 42 connected by a line 43 with the source of energy, successively to pass current through the contacts 37 to the lamps 39 in an obvious manner.

The plate 24 carries a bracket 44 for mounting, as shown in Figure 2, an electromagnet 45 which has an armature 46 normally spring pressed out of the coil radially into engagement with the peripheral notches in the wheel 35, the free end of the armature being suitably shaped for this purpose to serve best as a wheel lock member. Obviously, the wheel 35 is normally locked as the coil 45 is normally deenergized. However, when the bumper spring obstacle switch 15, 16 is closed a circuit 47 is closed to energize the coil 45 and retract the core 46 to free the wheel 35, whereupon the latter rotates and, of course, carries with it the wiper arm 42 to make circuits that light the lamps 39.

In Figure 3 a modified lock for the wheel 35 is shown. In this form the armature core 46' has pivotally and slidably connected to it a bell crank lever 48 pivotally mounted by a pin 49 on the plate 24 and having a detent end 50 to engage the notches in the wheel 35. This completes the detailed description of the parts and the manner of use and mode of operation will next be described.

Normally, when the game is at rest the parts would be in the condition depicted in Figure 2. The player then comes along and coin releases the coin chute 18 which makes the balls and plunger 17 available for use and also closes the switch 19 so that the motor 20, gears 29 and driver portion or disk 33 rotate as a unit. Since the switches 15, 16 are open, the coil 45 is deenergized so that the armature core 46 thereof is spring held, radially outwardly to engage the notches in the disk 35 and hold it against turning. Such result is made possible by the friction drive coupling or clutch part 36. It follows then that the wiper arm 42 is not turning and the lamps 39 are not being illuminated successively to produce a lighting effect, although if the arm 42 should be resting on one of the buttons 37 at this time, then such one light will be lighted. Now, when a ball on the table 11 bumps the obstacle 12 the switch ports 15 and 16 thereof will contact to close a circuit with the source of energy that will cause energization of the coil 45 and retraction of its core 46 whereby to free the wheel 35. This allows the wheel 35 to be driven

from the gears 29 through the friction coupling 36 so that the wiper arm travels over the contacts 37 successively to close the lamp circuits and cause lighting of the lamps 39. This creates an interesting, momentary, lighting effect which is most pleasing, especially when different colored lamps are used. The lighting effect corresponds with a score achievement in the playing of the pin ball game. It will now be understood that the instant the toothed wheel 35 is freed, the said wheel and wiper arm are quickly turned and the angular movement is through a number of contacts to give the light effect described, before the solenoid lock again holds the wheel. Of course, with a delayed action means operative on the solenoid, more lights could be flashed.

It will now be seen that a novel and pleasing game effect is provided which achieves the desirable objects of the apparatus as heretofore recited.

The intention is to cover herein all such changes and modifications of the embodiments disclosed, which do not in material respects constitute departures from the spirit and scope of the invention as defined in the subjoined claim. For instance, some other means could be substituted for the lamps 39 in the circuit wires 38.

What is claimed is:

A game embodying a normally open contact type switch closable momentarily while a movable game piece normally engages same, a source of electrical energy and a circuit for the switch, an electric motor having a circuit with a source of energy and operative continuously while the game is conditioned for play, a rotatable switch arm driven by the motor, a circular series of contacts for the arm, a circuit for said arm and contacts, said contacts also including circuits with respective lamps to be lighted when said contacts are closed by said arm, an electromagnetically releasable lock in circuit with a source of energy and normally holding the wiper arm against turning, and a drive coupling interposed between the motor and arm including means to permit lost motion between the motor and the arm, said lock being releasable to cause the motor to spin the arm over a succession of contacts to light corresponding lamps when the contact switch is closed by the game piece.

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