

April 22, 1952

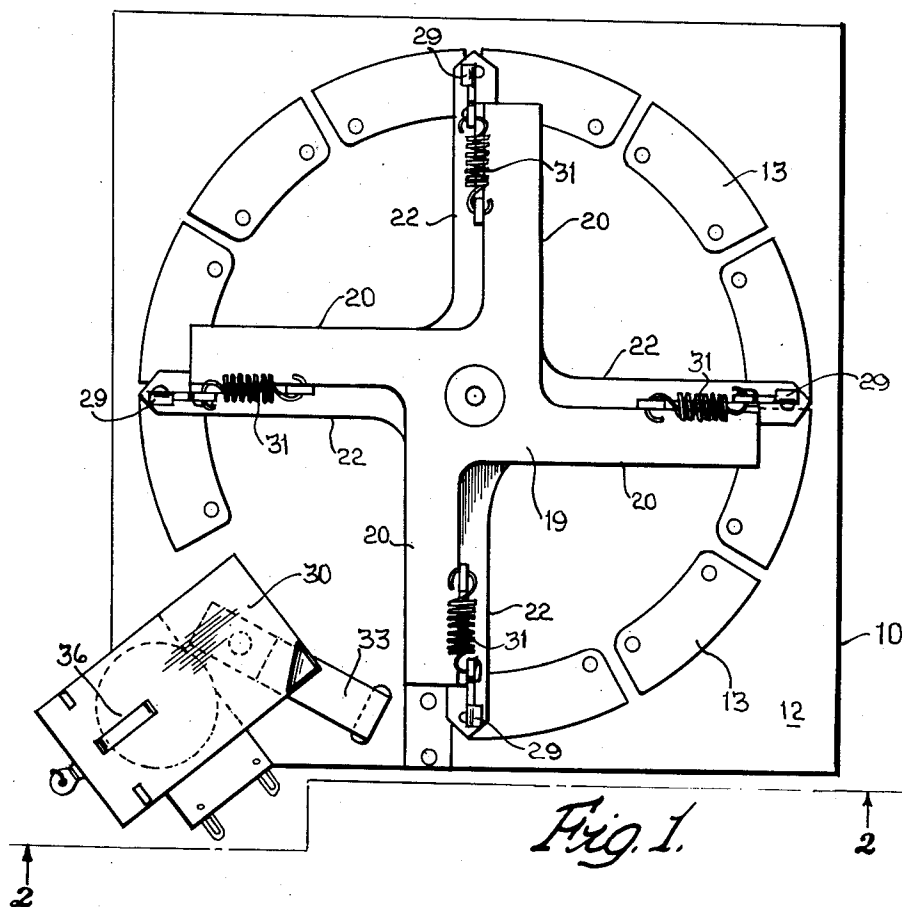
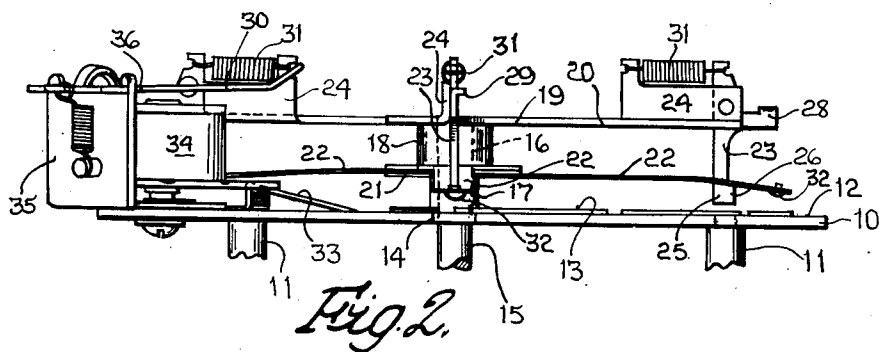
M. P. WOLVERTON

2,593,642

CIRCUIT CONTROLLING DEVICE

Filed Aug. 26, 1950

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

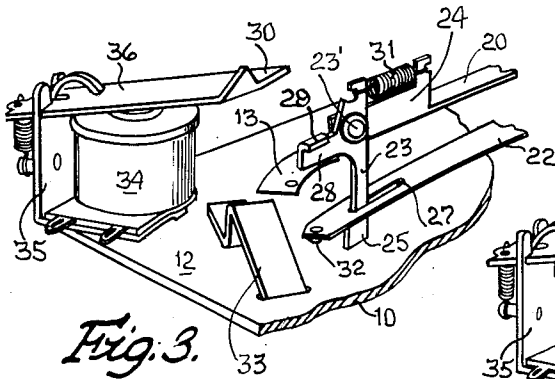


Fig. 3.

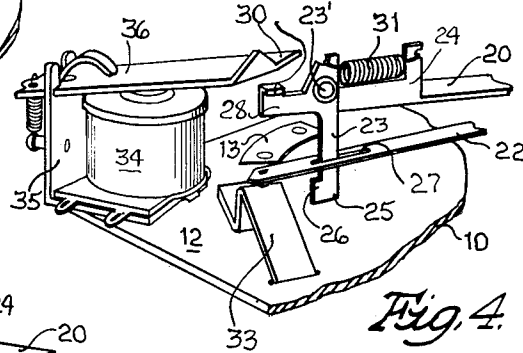


Fig. 4.

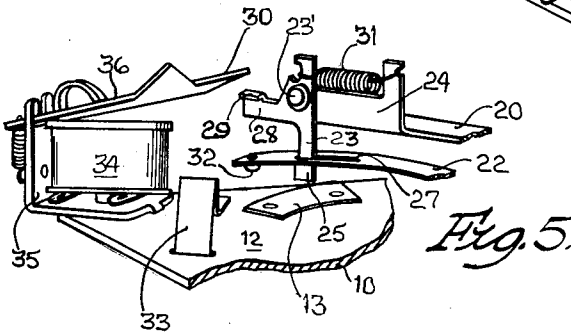


Fig. 5.

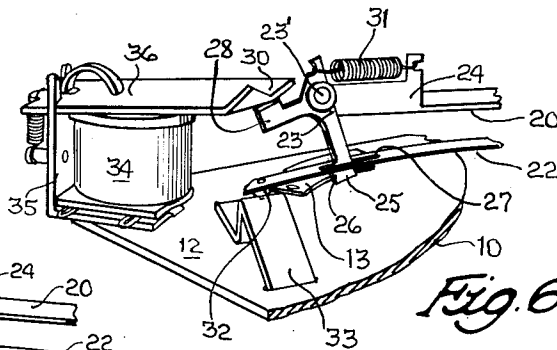


Fig. 6.

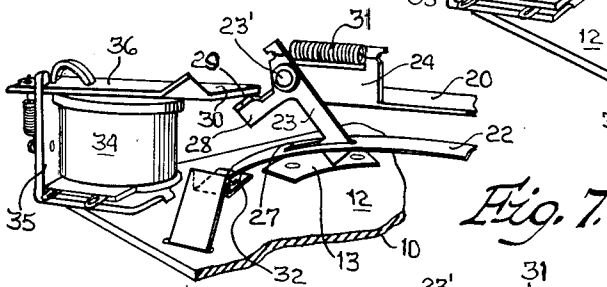


Fig. 7.

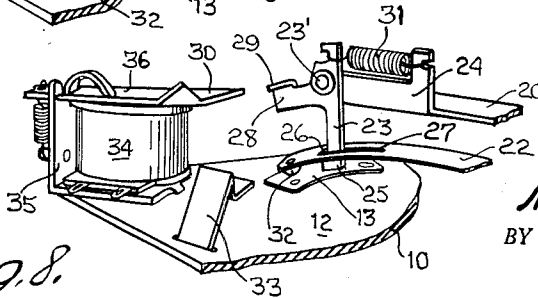


Fig. 8.

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UNITED STATES PATENT OFFICE

2,593,642

CIRCUIT CONTROLLING DEVICE

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7 Claims. (Cl. 200—12)

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This invention relates to certain new and useful improvements in circuit controlling devices of the type in which there are contacts arranged for successive engagement by a switch element. In this aspect of the invention a principal object is to provide an arrangement for releasably latching the switch element from engagement with the contacts and for actuating said latching arrangement to permit release of the switch element for engagement with such contacts.

A device of this character is capable of many uses. In the instant case it has been particularly designed for use in connection with amusement game apparatuses wherein it is desirable to employ a light arrangement to simulate the movement of an object or figure over a display panel or a playing board. To accomplish such use of the invention it is a further object to provide an arrangement of parts which will cooperate with each other to effectively and positively control in the most economical manner the electric circuit to such light elements.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a plan view of the invention;

Fig. 2 is an edge view of the same taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a perspective view showing a switch element in latched position;

Fig. 4 is a perspective view showing the switch element cooperating with a cam to dispose the former in latched position;

Fig. 5 is a perspective view similar to Fig. 3 showing the switch element in advanced position with respect to the elevating cam;

Fig. 6 is a perspective view similar to Fig. 5 illustrating the switch element partially released from latched position;

Fig. 7 is a perspective view similar to Fig. 6 illustrating the releasing mechanism in its relationship to the switch element latching means; and

Fig. 8 is a perspective view similar to Fig. 7 showing the switch element completely released by the releasing mechanism.

The drawings illustrate one embodiment of my invention.

In this connection a mounting plate is indicated at 10. This mounting plate is formed of non-conductive material such as Bakelite or the

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like. It is fixedly mounted upon posts 11 of which there may be four, one at each corner of the mounting plate 10. This mounting plate has arranged on one surface 12 thereof a plurality of independent contact plates 13 arranged in circle formation upon the plate 10. These contact plates 13 are connected by a suitable electric circuit to one side of a power source, the other side of the power source being connected to one side of the electric element, such as a lamp or the like, to be controlled by the device.

The plate 10 provides a centrally located opening 14 through which projects a driven shaft 15. This shaft 15 may be rotated by a suitable power mechanism, such for example, an electric motor or the like. This shaft 15 has its end portion fixedly secured in a bushing 17 formed as a reduced portion of a collar 18 and into which the outer end portion 16 of the shaft is fixedly secured.

The collar 18 has fixedly secured thereto for rotation therewith a plate 19 comprising radially extending arms 20, each of a like construction. Likewise fixedly secured to the collar 18 in spaced relation with respect to the plate 19, is a plate 21. This plate 21, like the plate 19, provides radially extending arms 22 of conductive material and arranged substantially in parallel relation with respect to the arms 20.

At the end of each arm 20 there is provided a latching mechanism for the adjacent arm 22. Such latching mechanism comprises a plate 23 pivotally connected as at 23' to an upstanding flange 24 formed as an integral part of the arm 20.

The plate 23 comprises a depending latch finger 25 having a latch head 26 adapted to project through an elongated slot 27 formed in the adjacent contact arm 22. The plate 23 also provides a trip finger 28 having a horizontally turned portion 29 which is adapted to be engaged by a trip arm 30. The plate 23 is limited in its pivotal movement by the action of a spring 31 and by the contact arm 22, it being noted that in either of the two positions of the arm 22 the finger 25 remains projected in the slot 27.

Each arm 22 is formed to maintain a curved formation with respect to its long axis so that the contact head 32 carried by the arm 22, when such arm is not in latched position with respect to the latch finger 25, will engage the contact plates 13 when the plates 19 and 20 are simultaneously rotated by rotation of the shaft 15.

A simple arrangement is provided for latching the arms 22 in latched position with re-

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spect to their respective latch finger 25. This is accomplished by providing upon the plate 10 an elongated cam 33. The position of this cam 33 upon the plate 10 is such that it will engage the contact heads 32 whereby to successively flex the arms 22 to the position shown in Fig. 4, in which position the latch head 26 engages beneath the arm 22 upon pivotal movement of the plate 23 by the action of the spring 31. Such arm will remain in such position until released from latched engagement with the latch finger 25.

This releasing operation is accomplished by mounting upon the plate 10 an electromagnetic coil 34. The mounting bracket 35 of this coil 34 pivotally carries the armature 36 of which the trip arm 30 is formed as an integral part. It is intended that the coil 34 be energized at a time when the trip finger 28 is disposed in the path of movement of the trip arm 30 so that upon energization of the coil 34 the trip arm 30 will be brought to bear upon the trip finger 28 and thereby pivot the plate 23 against the action of the spring 31 to move the latch head 26 from latched engagement with respect to the arm 22. That permits the arm 22 to assume its flexed position in engagement with respect to the contact plates 13 with which it is successively brought into contact.

From the foregoing description it will be seen that when one of the arms 22 is released from latched position, such arm will be in a position to engage successively the contact plates 13 and as these contact plates 13 are incorporated in a circuit controlling a plurality of electric elements such as lamps, the lamps will be successively illuminated to simulate a moving object or figure. Such figure may be a simulated baseball player which, when illuminated, will simulate the running of the bases of a baseball diamond.

At the end of the cycle of rotation of each finger, the finger is elevated by the elevating cam for latched engagement with the plate 23, in which position such finger is held until released by energization of the coil 34. This coil 34 may be energized by the closing of a target switch. When energized the trip arm 30 will in the manner hereinbefore stated pivot the plate 23 to release the finger for engagement successively with the contacts 13.

From the foregoing description it will be apparent that I have provided a simple and effective arrangement for controlling the illumination of electric lights used to simulate movement of an object or figure.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A device of the class described comprising a mounting plate having arranged on one side thereof in circular formation a plurality of separate contact plates, a shaft centrally extending through the mounting plate for rotation with respect to such plate, a member carried by the shaft and providing a plurality of

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radially extending arms, a second member carried by the shaft and having a plurality of radially extending arms for yieldable engagement successively with said contact plates, latch means carried by the arms of the first member and adapted for latched engagement with the arms of the second member to releasably latch said arms of said second member from engagement with respect to said contact plates, means carried by the mounting plate in the path of movement of the arms of the second member for moving said arms of said second member into position for latched engagement with said latch means, and means carried by said mounting plate and adapted for engagement with said latch means to unlatch the arms of said second member from said latch means.

2. A device of the class described comprising a mounting plate having arranged on one side thereof in circular formation a plurality of separate contact plates, a shaft centrally extending through the mounting plate for rotation with respect to such plate, a member carried by the shaft and providing a plurality of radially extending arms, a second member carried by the shaft and having a plurality of radially extending arms for yieldable engagement successively with said contact plates, latch means carried by the arms of the first member and adapted for latched engagement with the arms of the second member to releasably latch said arms of said second member from engagement with respect to said contact plates, cam means carried by the mounting plate in the path of movement of the arms of the second member for moving said arms of said second member into position for latched engagement with said latch means, and means carried by said mounting plate and adapted for engagement with said latch means to unlatch the arms of said second member from said latch means.

3. A device of the class described comprising a mounting plate having arranged on one side thereof in circular formation a plurality of separate contact plates, a shaft centrally extending through the mounting plate for rotation with respect to such mounting plate, a member carried by the shaft and providing a plurality of radially extending arms, a second member carried by the shaft and having a plurality of radially extending arms for yieldable engagement successively with said contact plates, latch means carried by the arms of the first member and adapted for latched engagement with the arms of the second member to releasably latch said arms of said second member from engagement with respect to said contact plates, means carried by the mounting plate in the path of movement of the arms of the second member for moving said arms of said second member into position for latched engagement with said latch means, and electromagnetic means carried by said mounting plate and adapted for engagement with said latch means to unlatch the arms of said second member from said latch means.

4. A device of the class described comprising a mounting plate having arranged on one side thereof in circular formation a plurality of separate contact plates, a shaft centrally extending through the mounting plate for rotation with respect to such plate, a member carried by the shaft and providing a plurality of radially extending arms, a second member carried by the shaft and having a plurality of radially extending arms for yieldable engagement successively

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with said contact plates, latch means carried by the arms of the first member and adapted for latched engagement with the arms of the second member to releasably latch said arms of said second member from engagement with respect to said contact plates, cam means carried by the mounting plate in the path of movement of the arms of the second member for moving said arms of said second member into position for latched engagement with said latch means, and electromagnetic means carried by said mounting plate and adapted for engagement with said latch means to unlatch the arms of said second member from said latch means.

5. A device of the class described comprising a mounting plate having arranged on one side thereof in circular formation a plurality of separate contact plates, a shaft centrally extending through the mounting plate for rotation with respect to such plate, a member carried by the shaft and providing a plurality of radially extending arms, a second member carried by the shaft and having a plurality of radially extending arms for yieldable engagement successively with said contact plates, latch means carried by the arms of the first member and adapted for latched engagement with the arms of the second member to releasably latch said arms of said second member from engagement with respect to said contact plates, means carried by the mounting plate in the path of movement of the arms of the second member for moving said arms of said second member into position for latched engagement with said latch means, said latch means each comprising a trip finger, an electromagnetic member carried by the mounting plate and including an armature and said armature having a trip arm adapted to engage said trip finger to actuate said latch means to unlatch the said arm.

6. A device of the class described comprising

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a mounting plate, a contact plate carried by the mounting plate, a rotatable shaft projecting centrally through the mounting plate, an arm rotatably carried by the shaft, a latch member pivotally carried by the arm, a contact arm carried by the rotatable shaft and having a slot formed therein and disposed substantially in spaced parallel relation with respect to the first arm and engageable with the contact plate, said last member having a latch head projecting through said slot and adapted for latched engagement with said contact arm, means for flexing said contact arm for said latched engagement with said latch head, and means adapted to engage said latch member to disengage the latch head from said contact arm.

7. A device of the class described comprising a mounting plate, a contact plate carried by the mounting plate, a rotatable shaft projecting centrally through the mounting plate, an arm rotatably carried by the shaft, a latch member pivotally carried by the arm, a contact arm carried by the rotatable shaft and having a slot formed therein and disposed substantially in spaced parallel relation with respect to the first arm and engageable with the contact plate, said latch member having a latch head projecting through said slot and adapted for latched engagement with said contact arm, means for flexing said contact arm for said latched engagement with said latch head, and means adapted to engage said latch member to disengage the latch head from said contact arm, said last named means including an electromagnetic coil mounted on said mounting plate and having an armature providing a trip arm and said latch member having a trip finger adapted to be engaged by said trip arm.

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No references cited.