Aug. 19, 1952 G. W. GRAY 2,607,865

GAME APPARATUS

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Fig. 1

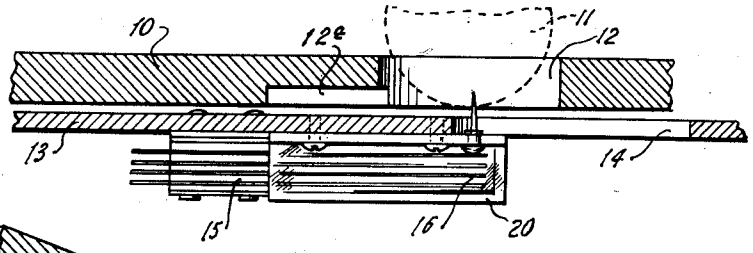


Fig. 2

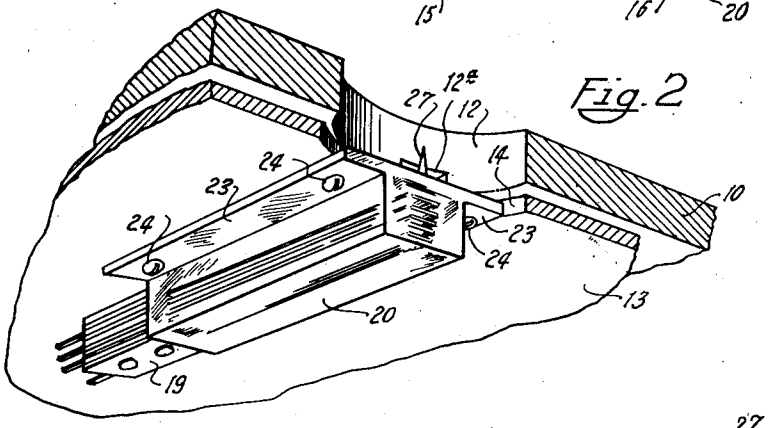


Fig. 3

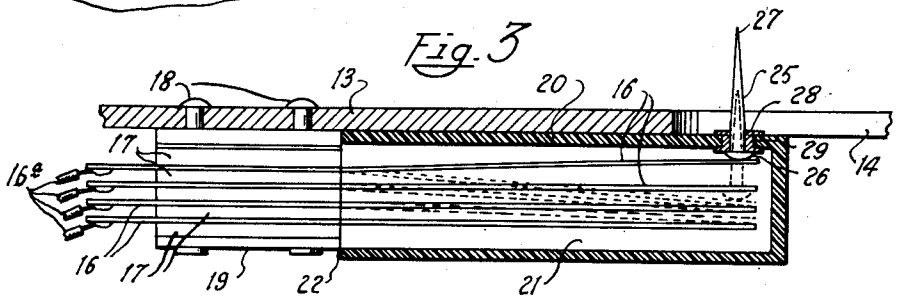


Fig. 4

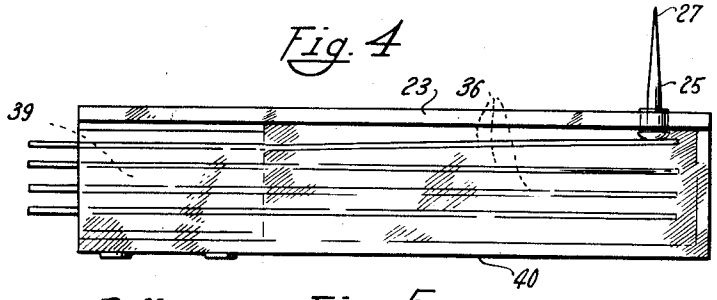
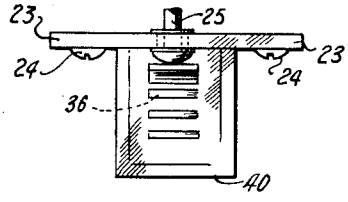


Fig. 5



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GAME APPARATUS

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6 Claims. (Cl. 200—52)

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This invention relates to new and useful improvements in game apparatus, and more particularly to cheat protectors for electrical contact switches of projectile type game apparatus wherein the projectile actuates the switch upon the attaining of a pre-determined objective to indicate a score or the like.

Heretofore, it has been possible for an unscrupulous player to trip the contact switches of game apparatuses by means of a wire or other instrument inserted from exteriorly of the apparatus and operated to press the contacts of the switch together to unfairly and illicitly obtain the benefits which would have accrued had the projectile been properly played and directed into the objective in an authorized and legal manner.

It is, therefore, one object of this invention to provide means for protecting the contact switches of game apparatus against tampering and unauthorized or illicit actuation of the switches contrary to the rules of the game apparatus.

A further object of the invention is to provide a protector of the character described which is adapted to be mounted on game apparatus presently in use for protecting the electrical contact switches of such apparatus against unauthorized illicit actuation.

Still another object of the invention is to provide a switch having the contacts enclosed to protect the same against illicit actuation or tampering, and having a switch actuating member projecting outwardly from the cover and disposed to be acted upon by a projectile to close the switch when the projectile has been deposited in a pre-determined objective.

Still another object of the invention is to provide a switch actuating member of the character described which is in the form of substantially a cylindrical pin having a conical projecting tip merging with the cylindrical portion of said member and presenting only a point at the apex of the tip for engagement by the projectile to actuate the switch, the absence of shoulders or planar surfaces on the member substantially preventing unauthorized or illicit movement of the actuating member to operate the switch.

A further object of the invention is to provide a device of the character described which is simple in structure, economical to manufacture and install, and which may be applied to the switch mechanisms of game apparatus presently in use without extensive alteration of the apparatus.

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Additional objects and advantages of the invention will readily be apparent from the reading of the following description of a device constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

Figure 1 is a fragmentary vertical sectional view through one objective opening of a game apparatus showing the switch protector of the invention installed in operative position on such apparatus,

Figure 2 is an isometric underside view of the apparatus of Figure 1,

Figure 3 is an enlarged longitudinal vertical sectional view of the protector showing the same in combination with a switch in place on a game apparatus,

Figure 4 is a side elevation of a modified form of switch and protector wherein the switch and protector are combined in an integral unit, and

Figure 5 is an end view of the switch and protector of Figure 4.

In the drawings, the numeral 10 designates an inclined playing board forming a part of a game apparatus, of the character generally known as a "marble board" or the like, wherein a projectile 11 is propelled onto the inclined playing board of the apparatus in any suitable manner and is permitted to roll down such inclined playing board until the projectile falls into an objective hole 12 provided in such inclined playing board. The playing board may be provided with one or more of the objective openings or holes 12, in the manner well-known in the art.

Arranged below the inclined playing board 10 is a sliding panel 13 having an elongate slot or opening 14 provided therein and normally offset from the objective opening 12 in the inclined playing board, so that a projectile or ball deposited in the objective hole will be supported upon the sliding panel until the panel has been moved to position the opening 14 below the objective hole to permit the projectile to fall through the objective hole and pass through the opening 14 to an inclined return shelf (not shown) disposed sufficiently below the sliding panel to permit the balls or projectiles to return thereon to a point for further use or playing in the usual manner.

Mounted on the sliding panel 13 below each objective hole 12 in the inclined playing board, is a circuit closing switch 15 in the form of a plurality of spaced resilient electrically conductive contacts 16 which are held separated from each

other at one end by means of a plurality of insulating spacer members 17 held together by rivets 18 or the like. The clamped spacers and contacts form a body block or base 19 for the switch by means of which the switch may be secured to the underside of the sliding panel 13. The spring contacts 16 extend outwardly from the block to a point in the opening 14 where they are normally disposed below the objective hole 12, and are arranged to be moved into contacting engagement with each other by the weight of the projectile or ball 11 falling into the objective hole.

Heretofore, the usual switch mechanism has had an upturned extension (not shown) formed on the uppermost of the spring contacts 16, and projecting upwardly through the elongated slot or opening 14 into the objective hole 12, whereby a ball or projectile 11 falling into the objective hole will engage such upturned extension to press the contacts downwardly into circuit closing position. However, this structure was readily vulnerable to tampering or cheating by use of a wire or similar implement inserted beneath the playing board to illicitly move the switch contacts into circuit closing position.

To prevent such tampering and unauthorized operation of the switches, an elongate protector housing 20, formed of plastic or other suitable non-conductive material and having a bore or chamber 21 formed therein with an open end 22 at one end of such housing, is positioned, in the manner shown in Figures 1 through 3, to completely cover the spring contact members 16 of the switch. The open end 22 of the protector is positioned to abut the base or block 19 of the switch, whereby such base or block closes such open end of the protector and the spring contact members are completely enclosed. The portector housing 20 is provided with integral laterally extending flanges 23 on each side of the upper portion thereof, whereby the protector housing may be secured to the underside of the sliding panel 13 by means of screws 24 passing through openings in said flanges. While the housing is shown as rectangular and such shape is preferable, any other suitable configuration of the housing may be used.

For actuating the spring contact members 16, an elongate pin 25, having a head 26 at its lower end and a gradually tapered substantially conical point 27 at its upper end, is movably positioned in an opening 28 formed in the upper surface of the protector housing near the outer ends of the spring contacts 16. The pin 25 is of such length that a projectile or ball acting upon the apexial point of the pin will press the same downwardly to move the spring contacts into electrical contact circuit closing positions. The uppermost spring contact 16 is arranged to normally hold the actuating pin 25 in a projecting position, as shown in full lines in Figure 3, but will yield when the weight of the ball is applied to the pin to move the pin and contacts downwardly to the position shown in dotted lines to close the electrical circuit. A metal bushing 29 is preferably mounted in the opening 28 for guiding the actuating pin and reducing wear between the pin and the protector housing at the opening.

Since the actuating pin 25 does not have any upwardly directed shoulders or planar surfaces, but is preferably formed in the manner shown to provide a conical point at its uppermost end, it will be seen that it will be extremely difficult to press the actuating pin downwardly to cause the spring contacts to be moved to circuit closing positions. Obviously, however, the projectile or ball 11, when in the objective hole 12, will be so positioned that the ball will engage against the apexial point of the actuating pin to move the same downwardly as has already been described.

It is readily apparent that the complete enclosure of the spring contact members 16 of the switch will prevent unauthorized illicit tampering or actuation of the contact members, since they are not accessible to a wire or other instrument illicitly inserted into the game apparatus for actuating the spring contacts. Furthermore, the protective cover will likewise reduce damage to the contacts and prevent deforming or undesirable injury to the contacts during servicing operations on the game apparatus.

In making installations of the protectors on game apparatus presently in use and having the upturned extension on the uppermost spring contact, as has already been described, it is only necessary to break or cut off the upwardly projecting extension and slip the protector over the contacts with the actuating pin 25 resting upon the uppermost contact member, whereupon the protector may be secured to the under side of the sliding panel 13 and the device is ready for operation in the manner already described.

It is also within the scope of the invention to construct a switch which is completely enclosed in and becomes an integral part of the protective cover. Such a device is shown in Figures 4 and 5, wherein the switch block 39 is enclosed in one end of the elongate non-conductive housing 40, and the spring contacts 36 extend from the block into the bore of the housing and are completely enclosed in such housing. The actuating pin 27 projects upwardly through the upper surface of the housing in the same manner as in the form first described, and all other parts of the device of this modified form are identical in all respects to those of the form first described, and bear the same identifying numerals. The switch and protector thus may be formed in an integral unit which may be mounted on the underside of the sliding panel 13 of the game apparatus to replace the usual switch and the separate cover of the form first described.

All the advantages of the form of the device first described are to be found in this modified form, and in addition the modified form provides a simple unitary enclosed protected switch mechanism which is economical and easy to install.

From the foregoing, it will be seen that an improved apparatus has been provided for protecting the electrical contact switches of game apparatus against tampering and unauthorized or illicit actuation of the switches contrary to the rules of the game apparatus; and that the protector is readily adapted for use on game apparatus presently in use, or may be installed as a part of new machines. It will further be seen that the protector and switch may be combined in an integral unit for replacing the present switches.

It is also important to note that the cheat protector apparatus has been provided with a switch actuating member which is so constructed

that only a point surface is presented for engagement by the projectiles of the game apparatus to actuate the switch, and that the absence of shoulders or planar surfaces on the switch actuating member substantially prevents unauthorized or illicit movement of the actuating member to operate the switch.

It will further be seen that the cheat protecting apparatus is simple in structure, economical to manufacture and install and may be applied to game apparatus presently in use without extensive alterations thereof.

The foregoing description of the invention is explanatory only, and changes in the details of the construction illustrated may be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A cheat protected electrical contact switch for a game apparatus including, a base member, a plurality of resilient movable contacts carried by the base member, a non-conductive cover enclosing the movable contacts, and an actuating member movable with respect to the cover for moving the resilient contacts into contacting position, said actuating member having only a smooth substantially conical end portion without shoulders or exposed planar surfaces projecting through an opening in the cover so as to be engageable by a projectile whereby the engagement of the projectile with the actuating member moves the actuating member to press the resilient contacts into contact with each other, said smooth substantially conical end portion of said actuating member preventing illicit actuation of said actuating member by a wire or the like, the resilient contacts normally holding the actuating member in projecting position.

2. A cheat protected electrical contact switch of the character set forth in claim 1 wherein, the cover and actuating member are separable from the base member and movable contacts of the switch.

3. A cheat protector for an electrical contact switch for a game apparatus including, an elongate cover member having means for fastening it to a game apparatus and having a bore adapted to receive the contacts of the switch, and an actuating pin movably mounted in the cover member and having only a smooth substantially conical end portion without shoulders or exposed planar surfaces projecting therefrom, said pin being disposed to engage the contacts of the switch when pressed inwardly with respect to the chamber in the cover to move the contacts into contacting position, said actuating pin projecting from the cover so as to be engageable by a projectile whereby such engagement moves the pin to move the contacts into contact with each other, said smooth substantially conical end portion of said actuating member preventing illicit actuation of said actuating member by a wire or the like.

4. A cheat protected electrical contact switch for a game apparatus including, a plurality of spaced resilient switch contact members, a base member supporting said contact members at one end, whereby the other ends of the contact members are movable toward and from each other into and out of contacting position, a cover for the projecting movable portions of the switch contact members completely enclosing the same, and an actuating plunger slidable in an opening in the cover and disposed to engage the contact members to move the same into contacting position, said resilient contact normally holding said plunger in a projecting position, the plunger having only a smooth substantially conical end portion without shoulders or exposed planar surfaces projecting from the cover so as to be engageable by a projectile whereby such engagement moves the plunger to cause the resilient contact members to be moved into contacting position, said smooth substantially conical end portion of said actuating member preventing illicit actuation of said actuating member by a wire or the like.

5. A cheat protector of the character set forth in claim 4 wherein, the cover member encloses and supports the base member for the resilient electrical switch contact members to provide an enclosed protected switch unit.

6. A game apparatus including a playing board having an objective aperture therein, an electrical switch disposed operatively below the objective aperture of the playing board and having a plurality of spaced resilient contact members exposed below said objective aperture whereby a projectile deposited in said aperture will move the contacts into contacting circuit closing position, a protective cover enclosing the resilient switch contacts and having a chamber in which the contacts are movable, and an actuating member in the form of a pin having a sliding fit in an opening in said protective cover and having a head disposed in the chamber of the protective cover and engageable with the contacts, said pin projecting upwardly from the protective cover toward the objective aperture in the playing board and being normally disposed with respect to such aperture that a projectile deposited in said aperture will depress the actuating pin to cause the pin to move the switch contacts into contacting circuit closing position, a portion of the actuating pin projecting upwardly from the protective cover being formed with a smooth substantially conical upper end without shoulders or exposed upwardly facing planar surfaces, whereby a projectile must be supported by the walls of the playing board aperture and engage the pointed upper end of the pin to move the pin to cause the switch contacts to be moved to circuit-closing position, said smooth substantially conical end portion of said actuating member preventing illicit actuation of said actuating member by a wire or the like.

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