

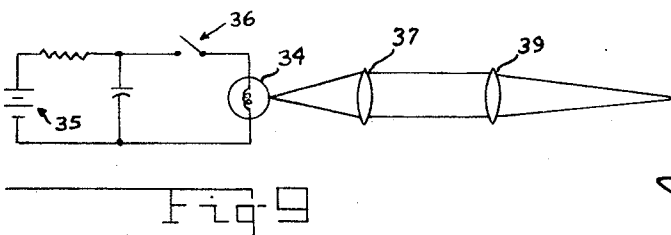
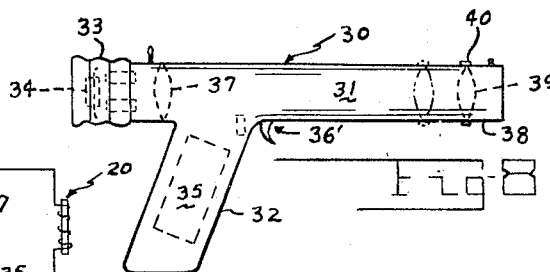
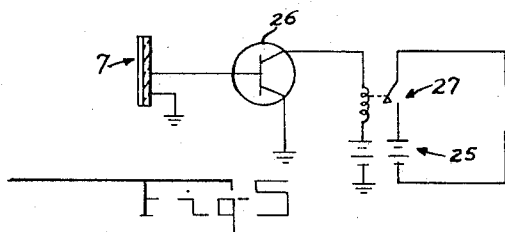
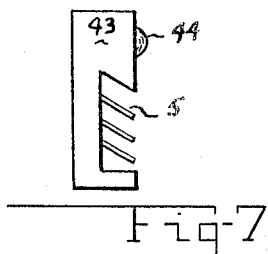
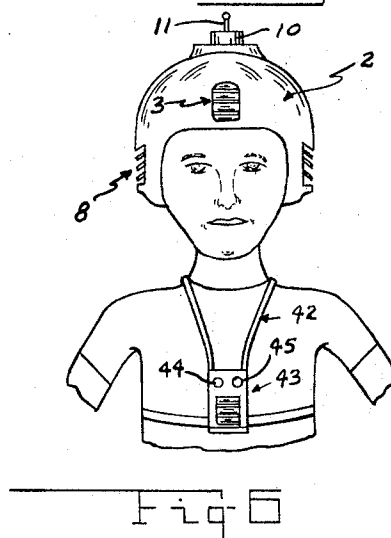
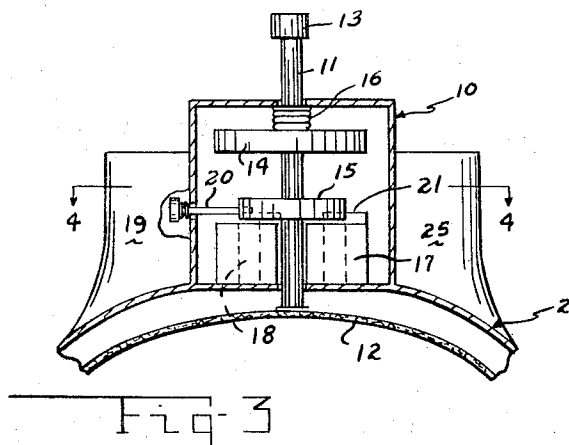
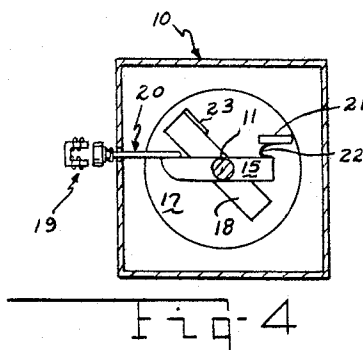
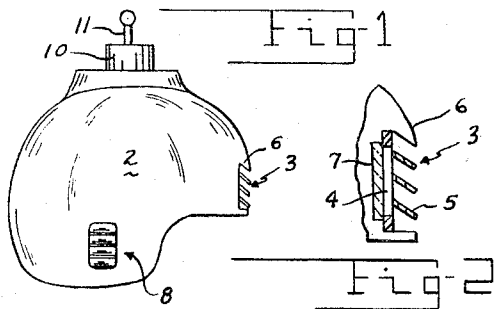
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3,294,401

ELECTRONIC TARGET GAME

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ELECTRONIC TARGET GAME

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This invention relates to electronic amusement devices enabling game kits offering optimum play value for minimal cost.

Embodiments include novel target devices which can be activated by an intense beam of light. Preferred embodiments provide game kits including simple but effective ray guns and unique light activated target devices to be worn by participants.

A primary object of the invention is to provide electronic amusement devices that are simple and economical to fabricate, easy to employ, most satisfactory in use and unlikely to malfunction.

A further object of the invention is to provide amusement apparatus including a unique light activated target.

Another object of the invention is to provide a novel toy helmet incorporating means which respond to an intense beam of light to induce the helmet to be displaced with reference to the head of its wearer.

A further object of the invention is to provide electronic amusement devices possessing the advantageous structural features, the inherent meritorious characteristics and means and mode of operation herein described.

With the above and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the accompanying drawing wherein is shown one but obviously not necessarily the only form of embodiment of the invention.

FIG. 1 of the drawings is a side elevation view of a helmet type target device as contemplated by the present invention;

FIG. 2 is a fragmentary cross-sectional view of the device of FIG. 1 revealing details of its target portions;

FIG. 3 is a fragmentary cross-sectional view of the helmet of FIG. 1 illustrating mechanism which induces displacement of the helmet from the head of the wearer in response to its target portions being hit by a beam of light;

FIG. 4 is a cross-sectional view taken on line 4-4 of FIG. 3;

FIG. 5 is a schematic diagram indicating the control means for the mechanism illustrated in FIGS. 3 and 4;

FIG. 6 illustrates the helmet of FIG. 1 being worn in conjunction with a further target device;

FIG. 7 is a side elevation of said further target device;

FIG. 8 is a diagrammatic showing of a simple ray gun for use with the invention; and

FIG. 9 is a schematic diagram illustrating the controls for the ray gun of FIG. 8.

Like parts are indicated by similar characters of reference throughout the several views.

It is to be understood that the drawings illustrate preferred embodiments of the invention which will be particularly described with reference thereto. However, it should be obvious from the following that neither the form of embodiment nor application of the invention need be so limited.

Referring to the drawings, the helmet illustrated in

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FIGS. 1-6 includes a shell 2 formed to cap the top of a head and depend to its rear and either side. The fore part of the shell, which is designed to terminate immediately above the wearer's eyes, includes a recessed portion 3 having a central aperture 4. The aperture 4 is bridged by vertically spaced visor plates 5. The plates 5 are parallel and have a downward inclination to their projected extremities. However, they do not overlap in a vertical sense. The plates 5 are so arranged to define narrow vertically spaced slits for passage of light therebetween and through the aperture which they bridge. It is to be noted that the portion of the shell 2 which defines the upper edge of the aperture 4 includes a dependent lip 6, the undersurface of which lies in spaced parallel relation to the adjacent plate 5. The lip 6 depends to limit the passage of light to the interior of the shell 2 over the upper plate 5.

In the example illustrated, the upper surface portions of the visor plates 5 are blackened to avoid reflecting light while their undersides are silvered. A photocell 7 is fixed to bridge the aperture 4 in the shell 2 to the rear of the visor plates 5.

Each of the dependent side portions of the shell 2 include recessed portions 8. Each of the portions 8 mount a photocell 7 to the rear of a central aperture, which aperture is partially shuttered similarly to the aperture 4.

Fixed on the top center of the shell is a box 10, the bottom wall of which is formed by the shell 2. The box 10 has a central aperture at its top in coaxial alignment with an aperture in the top of the shell 2. A rod 11 extends through these aligned apertures to have one end project exteriorly of the box 10 and its other end project interiorly of the shell 2. Fixed to the innermost end of the rod 11 is a plate 12, the innermost surface of which is curved and cushioned. The outermost end of the rod 11 is expanded to provide it with a stop 13. Fixed at right angles to the portion of rod 11 in box 10 are bars 14 and 15. The bars 14 and 15 are parallel and vertically spaced, the bar 14 being uppermost.

A coil spring 16 is positioned about the rod 11 to have one end abut the top of the box 10 and its other end abut the bar 14 which is most adjacent thereto. The spring 16 applies a bias on the rod 11 through the medium of bar 14 tending to move it inwardly of the shell 2.

An annular block 17 fixed on the top of shell 2 projects inwardly thereof about the rod 11 and in the direction of the bar 15. Formed centrally of the upper surface of the block 17 is a rectangular recess 18 of a size to accommodate the bar 15. In the drawings, the rod 11 is shown in a cocked position, at which point bar 15 lies immediately adjacent the upper surface of the block 17, pivoted out of alignment with the recess 18 to overlies a solid portion of the block.

Mounted at one side of the box 10, on its exterior, is a solenoid unit 19. When the solenoid 19 is unenergized, its plunger core 20 is adapted to project through an aperture in the box and into the path of the bar 15, as shown in FIG. 4 of the drawings, to prevent its displacement into alignment with the recess 18. Fixed on the top of block 17 to its side remote from the solenoid 19 and offset parallel to the plunger 20 is a plate 21. Fixed to the plate 21 is a leaf spring 22 which in the cocked position of the rod 11 is placed under compression by the end of bar 15 remote from the solenoid 19.

It may be readily observed that when the solenoid 19 is energized, it will cause the retraction of the plunger 20, displacing it from the path of the bar 15. At this point the energy stored in the spring 22 is released to induce the bar 15 to pivot until it abuts a stop plate 23 at a remote side of the recess 18. This establishes the bar 15 in a position of vertical alignment with the recess 18.

The spring 16, previously under compression, is then free to act on the bar 14 to project the rod 11 downwardly and in a direction inwardly of the shell 2, nesting the bar 15 in recess 18 in the process.

A housing at the side of box 10 remote from solenoid 19 accommodates battery 25 connected to power the solenoid 19 in a manner to be described.

When the helmet shell 2 is placed on the head, the rod 11 is normally in the uncocked position just described, at which point the bar 15 nests in recess 18. As the helmet is placed on the head, the rod 11 may be pushed upwardly and outwardly of the shell 2, through the medium of the plate 12, sufficiently for the bar 15 to clear the block 17. A slight counter-clockwise twist of the plate 12 by a twist of the head or the rod 11 by a twist of the fingers causes the suitably contoured end of bar 15 adjacent the solenoid 19 to pivot past plunger 20, momentarily pressing the plunger inwardly of the solenoid housing in passing. The plunger 20 is then biased outwardly of the solenoid housing to prevent reverse rotation of the bar 15 until the solenoid is energized. In the process, as is obvious, the end of bar 15 remote from the plunger 20 places the spring 22 under compression to store energy therein. As the rod 11 is projected outwardly, the spring 16 is also placed under compression between the bar 14 and the top of box 10.

FIG. 5 of the drawings shows a schematic indication of the electrical connections between photocells 7 and solenoid 19. When a photocell is directly hit by a beam or ray of light of predetermined intensity, it will transmit a signal through a transistor 26 and a relay 27, powered by battery 25, to energize the solenoid 19 and effect a retraction of its plunger core 20. This frees the bar 15 and rod 11 for subsequent movement as previously described. The inwardly directed force produced by the release of the rod 11 which impacts through plate 12 on the adjacent head, causes a reaction producing an upward thrust tending to displace the helmet from the wearer's head.

A preferred game or toy kit includes, in addition to the above helmet, a ray gun 30. The gun 30, shown schematically in FIGS. 8 and 9 of the drawings, provides a medium for simply projecting a concentrated beam of light of a nature to enable the activation of the photocell 7 in the apparatus above described.

The gun 30 includes a barrel 31 mounting a hand grip 32. Fixed in a housing 33 at the rear of barrel 31 is a gaseous discharge flash tube 34. The hand grip accommodates battery 35. Also included at the rear of barrel 31 are a capacitor and resistor which are incorporated in a circuit with tube 34 and battery 35 as indicated in FIG. 9 of the drawings. This circuit includes a normally open switch 36 of which a gun trigger 36' is a component part. As will be obvious, the circuit provides that the capacitor is constantly storing energy. On pulling the trigger, the energy stored is discharged to the tube 34, causing it to produce an intense beam of light of short duration.

A lens 37 is fixed to bridge the barrel 31 adjacent and forwardly of the tube 34. The top and bottom of the discharge end of the barrel are formed with vertically aligned longitudinally oriented slots 38. A second lens 39 is positioned to bridge the slotted extremity of the barrel and have relatively fixed pins 40 project through its vertically aligned slots. The pins 40 are provided with expanded heads beyond the slots as a containing device and serve to slidably mount the lens 39 for adjustment longitudinally of the barrel 31, as may be required. FIG. 8 illustrates forward and retracted positions of the lens 39.

It may be readily seen that the fixed and adjustable lens elements provide a simple but effective means of focusing the light beam produced by the tube 34 on pulling of the trigger 36'. A simple sliding adjustment of the outermost lens produces a focus of the light to have

a predetermined intensity in a predetermined range of operation.

The gun 30 above described is very simple. When fired, it produces an intense beam which can be directed towards a light responsive target. The system for flashing the discharge tube which produces a firing is optimum since the included capacitor is slowly charged through the resistor. This serves to reduce the drain on the batteries and enables a "one-shot" effect on firing, a situation desirable for producing maximum amusement potential in use of the devices above described. Thus, a game kit in accordance with the invention includes the described helmets in conjunction with ray guns 30 in a preferred form. The participants of this game will each wear a helmet and carry a ray gun. As previously set forth, the mechanism in the helmet is cocked as the helmet is placed on the participant's head and the participant is then ready for play. The participants so dressed may then engage in a war game, triggering their guns at each other in an effort to directly strike a photocell 7 in an opponents helmet through the visor plates 5. The novel shuttering of the photocells in the described helmet enables the game to be played indoors or outdoors. The predetermined formation of the visor plates for limited passage of light therebetween prevents light other than that produced by the ray guns from triggering the photocells. It is to be understood, of course, that the photocells incorporated in the helmets will not respond to light of less than the predetermined intensity.

Noting FIGS. 6 and 7 of the drawings, the game kit above described may be enhanced by addition of a harness 42 which mounts a target case 43. A participant in the game may don the harness to present the target 43 in any predetermined position on his body. The target device 43 contains a photocell shuttered in the manner of the photocell 7 in the helmet.

It should be obvious from the above that a very unique game kit is provided. The simple gun 30 may be manipulated to adjust its focal length and enable participants to use ingenuity in handling thereof so maximum effect may result. The effect of striking the photocell 7 by the ray gun also produces a unique thrust on an opponent's helmet which results from the inward projection of the uncocked rod 11 in the manner previously described to forcefully displace the helmet from the opponent's head. The results are stimulating and interesting to a degree not previously contemplated in similar devices.

Although the present invention has been described in a limited manner for purposes of illustration, it should be readily obvious to those versed in the art that it may be embodied otherwise and for other purposes. The gun and target devices may be combined in other ways for testing the skill of a single individual in a manner believed obvious. A particular element of novelty in the invention embodiments is evidenced by the inclusion in the target components of means responding to an intense beam of light or equivalent signal medium to produce a physical movement of the target devices on being hit.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

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Having thus described our invention we claim:

1. Amusement apparatus consisting of a structure to be worn on the person, means incorporated for storing energy therein, apertures in said structure, said structure having means exposed at said apertures capable of being activated by a light beam of predetermined intensity to release the stored energy and means connecting with said energy storing means responding to release of the stored energy and reacting on the person of the wearer to produce a predetermined physical movement.

2. Apparatus as set forth in claim 1 characterized by shutter means limiting access to said exposed means and formed to prevent inadvertent activations thereof.

3. Amusement apparatus including, a helmet, at least one photocell mounted in said helmet, said helmet being apertured to expose said photocell, visor plates bridging the aperture exposing said photocell to define narrow spaces limiting the passage of light therebetween to said photocell, spring means in said helmet, means for cocking said spring means operatively related to said photocell to be triggered thereby to release said spring means,

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said spring means being oriented on release thereof to produce a vertical thrust on said helmet.

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