

Sept. 1, 1936.

J. H. TIGERMAN

2,052,678

AMUSEMENT APPARATUS

Filed Nov. 15, 1935.

2 Sheets-Sheet 1

Fig. 1.

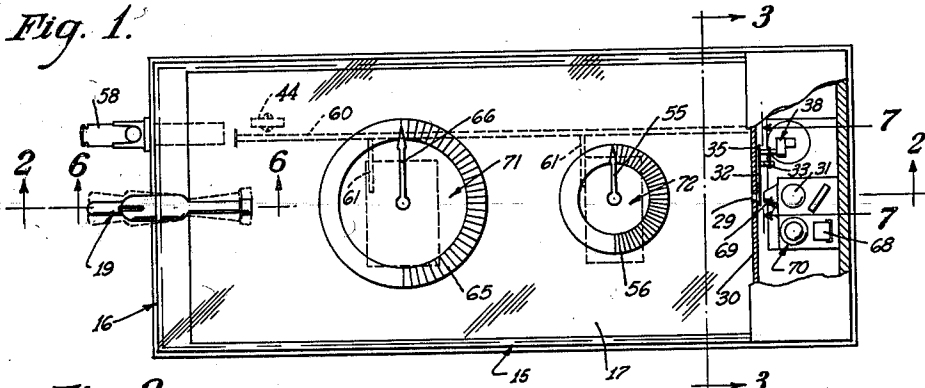


Fig. 2.

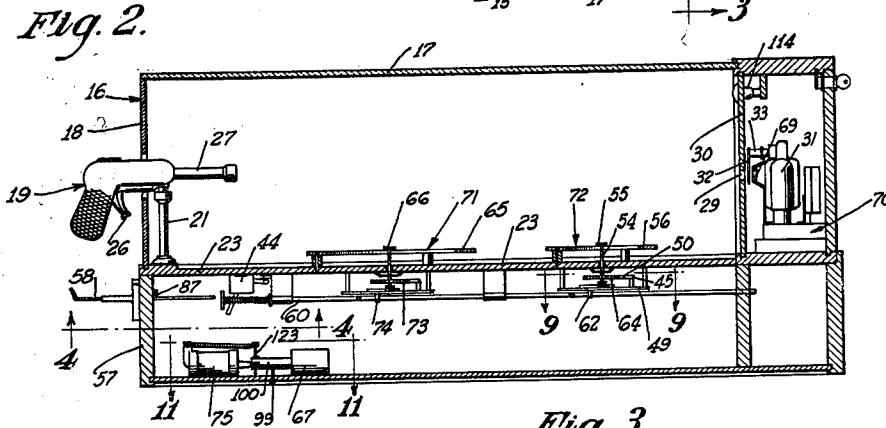


Fig. 3.

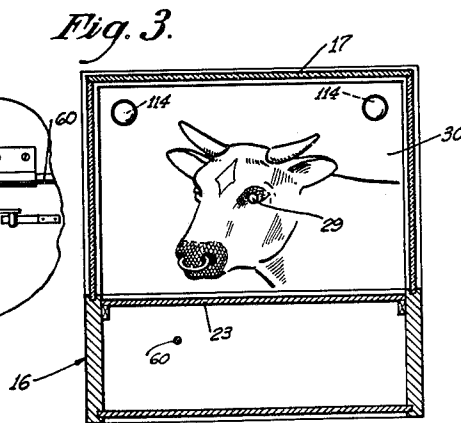


Fig. 4.

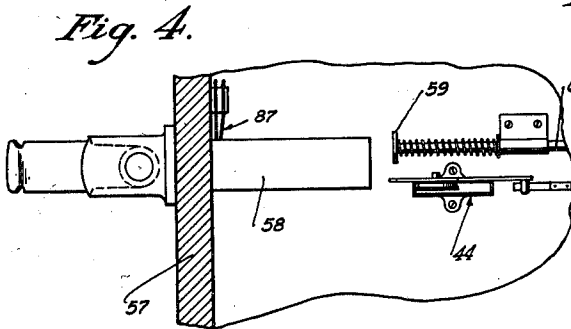
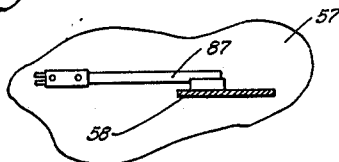


Fig. 5.



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2 Sheets-Sheet 2

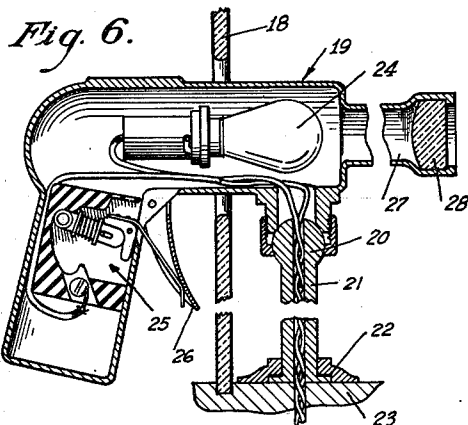
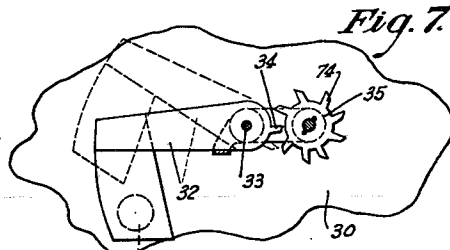
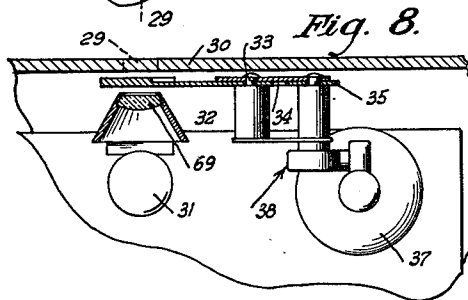
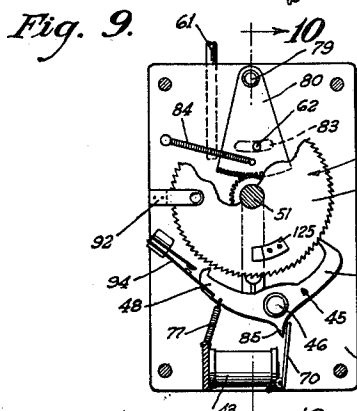


Fig. 11.

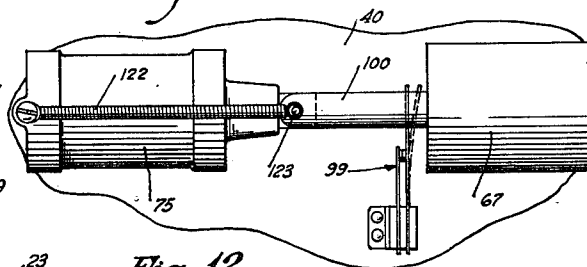
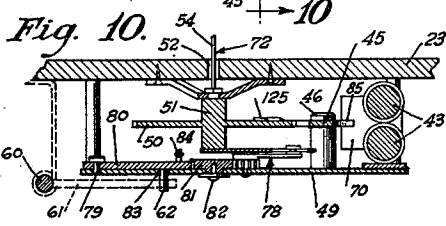
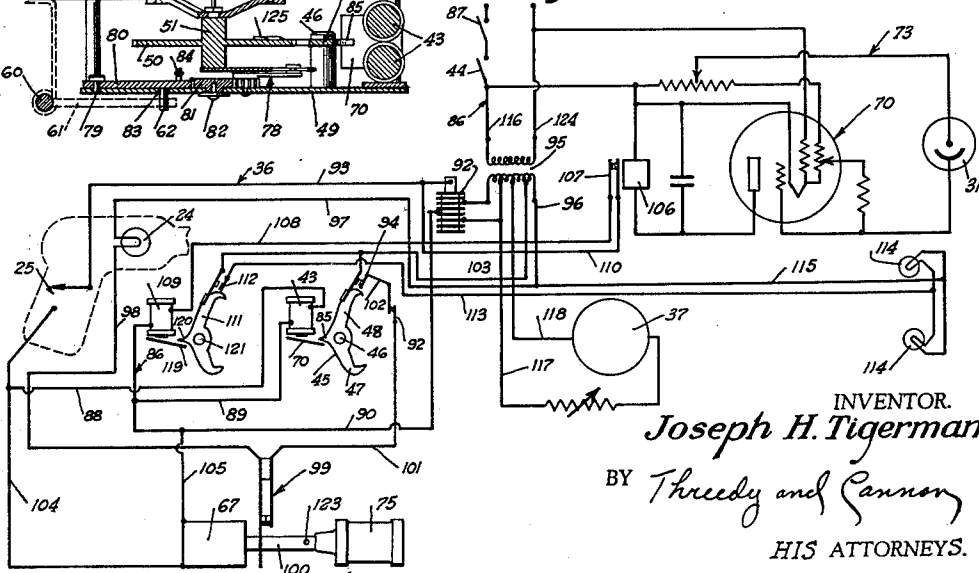


Fig. 12.



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UNITED STATES PATENT OFFICE

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AMUSEMENT APPARATUS

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Application November 15, 1935, Serial No. 50,004

8 Claims. (Cl. 273—1)

This invention relates to amusement apparatus. It is an object of this invention to provide an improved amusement apparatus which is relatively simple and inexpensive in construction and efficient in use.

Another object of the present invention is to provide a novel amusement apparatus in which a beam of light may be directed from an adjustable or movable pistol through a relatively small orifice or target toward a photo-sensitive cell so as to actuate a mechanism, such, for example, as a score-registering device, which indicates the player's success or failure in directing the beam through the orifice or "target."

An additional object of the invention is to provide a novel device for retarding the action of the manually operated trigger switch which controls the operation of the lamp from which the beam of light is directed so as to allow the lamp to become incandescent.

A further object of the invention is to provide a device by means of which the hazard or difficulty experienced by the player in directing the beam of light through the orifice or target is increased.

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 top plan view of an amusement apparatus embodying a preferred form of the present invention, part of the top wall of the cabinet being broken away to show certain of the operating parts;

Fig. 2 is a central longitudinal vertical sectional view on line 2—2 in Fig. 1;

Fig. 3 is a transverse vertical sectional view on line 3—3 in Fig. 1;

Fig. 4 is a bottom detail plan view on line 4—4 in Fig. 2;

Fig. 5 is a detail view showing the relationship between the coin slide and the full stroke switches;

Fig. 6 is a sectional view of the pistol member or gun on line 6—6 in Fig. 1;

Fig. 7 is a sectional view on line 7—7 in Fig. 1, showing the shutter-operating mechanism;

Fig. 8 is an enlarged sectional detail view of the shutter-operating mechanism shown in Fig. 1;

Fig. 9 is a sectional view on line 9—9 in Fig. 2, showing the shot register-operating mechanism;

Fig. 10 is a sectional view on line 10—10 in Fig. 9;

Fig. 11 is an enlarged top plan view of a switch

operating mechanism embodied in the invention and is taken on line 11—11 in Fig. 2; and

Fig. 12 is a schematic wiring diagram of the electrical circuits embodied in the invention.

An amusement apparatus embodying a preferred form of the present invention is shown in the drawings, is therein generally indicated at 15, and comprises a cabinet 16 which includes a transparent top 17 and a transparent end wall 18.

Movably or adjustably mounted in the end wall 18 of the cabinet 16, for both vertical and horizontal movement, is a pistol or gun which is generally indicated at 19, this pistol 19 being mounted, by means of a ball and socket or universal joint 20, upon the upper end portion of a post or supporting member 21, and the latter having a swivel mounting 22 upon a horizontal wall 23 of the cabinet 16.

Arranged in the pistol 19 is an electric lamp 24, and circuit to this lamp 24 may be opened and closed by means of a conventional switch, which is generally indicated at 25, and which is operable by means of the trigger or finger grip 26 of the pistol 19 (Fig. 6).

Arranged in the barrel 27 of the pistol 19 is a lens 28 by means of which light may be focused at an aperture or "bull's-eye" 29 which is provided in a vertical wall 30 of the cabinet 16 (Figs. 1, 2 and 3).

Arranged in the cabinet 16 behind the wall 30 is a photo-electric cell, generally indicated at 31, and of conventional design, and this cell 31 is actuated by a beam of light directed through the aperture or orifice 29, this photo-sensitive cell 31 being intended to actuate any mechanism which it may be desired to arrange in the cabinet 16, such, for example, as the score-registering device, which is generally indicated at 71, or any other desired mechanism, such, for example, as a visible signal, an audible signal, or the like.

Arranged between the aperture 29 and the photo-sensitive cell 31 is a light-gathering lens 69 (Fig. 2), and associated with the cell 31 is a conventional amplifying device 70, (Fig. 12), the cell 31 and the amplifying device 70 being arranged in a circuit 73 (Fig. 12).

To increase the hazard incidental to the playing of the present game apparatus, that is, to make it relatively more difficult to direct a beam of light through the orifice or aperture 29 against the photo-sensitive cell 31, a shutter 32 is pivotally mounted in the cabinet 16, as at 33, between the photo-sensitive cell 31 and the orifice or aperture 29 for oscillatory movement. This shutter

32 has an arm 34 which is engageable with the teeth 74 of a ratchet 35 (Fig. 7), and the teeth 74 of the ratchet 35 are arranged or spaced at irregular intervals radially therearound (Fig. 7) for a reason to be explained hereinafter.

The present apparatus includes a shot-registering device which is generally indicated at 72 (Figs. 1, 9 and 10) and which registers the number of times the player has operated the trigger switch 25—26. This shot registering device 72 is operated through the medium of an escapement mechanism which includes an escapement pawl 45 which is pivotally mounted between its ends, as at 46, upon a supporting wall 49 which is arranged in the cabinet 16 (Figs. 9 and 10). This escapement pawl 45 includes a pair of spaced arms 47 and 48 which are engageable with the teeth of a ratchet 50 (Figs. 9 and 10), and the pawl 45 is normally urged by a spring 77 (Fig. 9) in a direction (counterclockwise, Fig. 9) to urge the arm 47 thereof into engagement with the teeth of the ratchet 50.

The pawl 45 has an extension or arm 85, and engageable with this arm 85 is an armature 70 of an electromagnet 43 (Fig. 9).

The ratchet 50 has a hub portion 51, and attached to and projecting upwardly from the hub portion 51, through an opening 52 which is formed in a wall 23 of the cabinet 16, is a shaft 54. Carried by this shaft 54 is a pointer or indicator arm 55 which is movable over the face of a registering dial 56 (Fig. 1) which is arranged in the cabinet 16 below the transparent top 17 of the same.

Pivotally mounted in the cabinet 16, upon a horizontal support 49 (Fig. 10), as at 79, is a segmental gear 80 which meshes with a pinion gear 81, the pinion gear 81 being rotatably mounted, as at 82, upon the support 49. A link mechanism, generally indicated at 78, operatively interconnects the hub 51 of the ratchet 50 with the pinion gear 81. The segmental gear or rack 80 is normally urged by a spring 84 (clockwise, Fig. 9).

Mounted in the end wall 57 of the cabinet 16 (Fig. 4) is a coin slide 58, and the inner end portion of this coin slide 58 is engageable with an end portion 59 of a plunger 60 which is slidably mounted in the cabinet 16 below the floor 23. Carried by and projecting laterally from the slide rod or plunger 60 are arms 61 one of which is engageable with a lug 62 which is attached to and depends from the segmental gear 80 (Fig. 10), this lug 62 working in a slot 83 which is formed in the supporting wall 49, (Figs. 9 and 10).

The mechanism 60—61—62—80—81—78—51 forms a resetting device for resetting the ratchet 50 and the score indicator or pointer 55 back into their initial or zero positions, after each game played upon the apparatus, as will be described more fully hereinafter.

Arranged in the cabinet 16 adjacent the shot-registering device 55—56, is a score-registering device, generally indicated at 71 (Fig. 1), and which includes a dial 65. Movable over this dial 65 is a score-indicating arm or pointer 66 (Figs. 1 and 2). This score-registering device 71 is similar to the shot-registering device 72, is operated by a similar mechanism, (not shown), and is reset by a similar resetting device (not shown), it being deemed unnecessary to show the operating and resetting mechanisms for the score-registering device 71 since these mechanisms are substantially duplicates of the operating and resetting mechanisms for the shot-registering device 72

and which latter mechanisms are shown in Figs. 9 and 10.

The score-indicating arm or pointer 66 of the score-registering device 71 is operated by means of an electromagnet 109 and associated devices, which are similar to the corresponding parts of the shot-registering device shown in Figs. 9 and 10, and this electromagnet 109 is arranged in a circuit 86 (Fig. 12), the shot-registering device 72 being arranged in the circuit 36 (Fig. 12). Embodied in the circuit 86 (Fig. 12), and operated by the coin slide 58, is a conventional so-called timing or master switch 44 (Figs. 4, 5 and 12) and arranged adjacent the timing switch 44 is a so-called "full stroke switch" 87.

The present invention embodies a plurality of electrical circuits which are shown, diagrammatically, in Fig. 12.

The first of these circuits, which is generally indicated at 36, comprises the trigger-operated switch 25—26, a conductor 88 which leads from one side of the switch 25—26 to one side of the electromagnet 43 which is associated with the shot-registering device 72 and its operating pawl 45, conductors 89 and 90 which lead from the opposite side of the electromagnet 43 to one side of a rectifier 92, and a conductor 93 which leads from the other side of the rectifier 92 back to the trigger switch 25—26 (Fig. 12).

The second of the several circuits embodied in the present invention (Fig. 12) comprises a switch 94 which is associated with the pawl 47 of the shot-registering device 72, a transformer 95, conductors 96 and 97 which lead from one side of the transformer 95 to one side of the lamp 24, a conductor 98 which leads from the other side of the lamp 24 to a switch 99 which is associated with the movable element or piston 100 of a dash-pot 75, a conductor 101 which leads from the other side of the switch 99 to one side of a switch 92, a conductor 102 which leads from the other side of the switch 92 to one side of the switch 94, and a conductor 103 which leads from the other side of the switch 94 back to the transformer 96.

The third of the several circuits embodied in the present apparatus comprises a conductor 104 which leads from one side of the trigger switch 25—26 to one side of a solenoid 67, conductors 105 and 90 which lead from the other side of the solenoid 67 to one side of the rectifier 92, and the conductor 93 which leads from the other side of the rectifier 92 back to the trigger switch 25—26.

The fourth circuit embodied in the present apparatus is generally indicated at 73 (Fig. 12) and comprises the photo-electric cell 31, a relay 106, a switch 107 which is associated with the relay 106, a conductor 108 which leads from one side of the switch 107 to one side of an electromagnet 109 which is in the circuit 86 and which is associated with the score-registering device 71, and a conductor 110 which leads from the other side of the switch 107 to the rectifier 92, (Fig. 12). Associated with, and forming, in effect, a part of the last-named or fourth circuit 73 is a switch 112 which is associated with the pawl 111 of the score-registering device 71, a conductor 113 which leads from one side of the switch 112 to one side of a group of score-indicating signal lights 114, and a conductor 115 which leads from the other side of the score-indicating lamps 114, through the conductor 96, into the transformer 95, out of the latter by way of the

conductor 103, and back to the other side of the switch 112 (Fig. 12).

The fifth circuit embodied in the present apparatus comprises a full-stroke switch 87 which is operated by the coin slide 58 when the latter completes a full stroke, the timing switch 44, a conductor 116 which leads from one side of the switch 44 to the transformer 95 (Fig. 12), a conductor 117 which leads from one side of the transformer 95 to one side of the shutter-operating motor 37, and a conductor 118 which leads from the other side of the motor 34 to the transformer 95.

Operation

In order to play the present amusement apparatus, the player must first insert a coin or token into the coin aperture of the slide 58, and operate the latter, thereby causing the conventional timing switch 44 to close, and thus closing the motor circuit 87—44—116—95—117—37—118—124, thereby causing the motor 37 to operate the shutter 32, through the medium of the parts 35—74—34, that is, when the motor 37 is thus operated it causes the ratchet 35 to rotate (counterclockwise, Fig. 7), whereupon the teeth 74 of the ratchet 35 successively engage the arm 34 of the shutter 32, thus causing the latter to oscillate back and forth.

The player may then, by operating the trigger 26, illuminate the lamp 24. When the trigger 26 is thus moved, it closes the switch 25, thereby energizing the shot-registering device circuit 25—88—43—89—90—92 and 93 (Fig. 12), thus actuating the electromagnet 43 and the shot-registering device 72 associated therewith. When the electromagnet 43 is thus actuated, it attracts its pivotal armature 70, thereby moving one end portion of the same into engagement with the arm 85 of the pawl 47 and thus pivoting the latter, at 46, (clockwise, Figs. 9 and 12); thereby causing the pawl 47 to advance the ratchet 50 so as to move the indicator or pointer arm 55 of the shot-registering device 72 over the face of the dial 56 a circumferential distance corresponding to the distance between two teeth on the ratchet 70, and thus indicating that a shot has been made upon the apparatus; and each time the shot-registering device 72 (Fig. 9) is thus actuated it advances the pointer or indicator 55 one step over the dial 56, thereby registering the total number of shots made by the player for each coin inserted into the coin aperture of the slide 58.

When the shot-registering device 72 is thus actuated the pawl 47 thereof engages and closes the switch 94 (Fig. 12), whereupon current will flow through the circuit 94—102—92—101—99—98—24—97—96—95 and 103, thereby illuminating the lamp or light source 24 which is arranged in the pistol 19.

As the lamp 24 in the pistol 19 is thus illuminated, by the closing of the circuit 94—102—92—101—99—98—24—97—96—95—103, the player may, by skillfully manipulating the pistol 19 about its mountings 20 and 22, direct a beam of light from the lamp 24, through the lens 28 and aperture 29, past the vibratory or oscillating shutter 32, and through the lens 69 into the photo-sensitive cell 31, thereby actuating or energizing the latter.

When the photo-sensitive cell 31 is thus energized or actuated, by a beam of light from the lamp 24, it energizes, the circuit 73 which includes a conventional amplifying device 70 and associated devices (Fig. 12). This circuit 73, in addition to including the photo-sensitive cell 31,

also includes a relay 106 and when the photo-sensitive cell circuit 73 is closed the relay 106 is energized, and when the relay 106 is thus energized it closes the switch 107 (Fig. 12). When the switch 107 is thus closed current will flow from one side of the switch 107, by way of the conductor 108, to one side of the electromagnet 109, which is associated with the score-registering device 71, from the opposite side of the electromagnet 109 through the conductor 90 into the rectifier 92 and from an opposite pole of the latter by way of the conductor 110 back into the switch 107 thereby energizing the electromagnet 109 (Fig. 12).

When the electromagnet 109 is thus energized, it attracts its movable armature 119, and the latter thereupon engages an arm 120 of the pawl 111, thereby pivoting the latter, at 121, (clockwise, Fig. 12). When the pawl 111 is thus pivoted (clockwise, Fig. 12) by the action of the electromagnet 109, it moves the pointer arm 66 over the face of the dial 71 a circumferential distance or step corresponding to one score thereon, thus indicating that the apparatus has been successfully operated by the player and that a score has been made thereon.

When the pawl 111 is thus pivoted (clockwise, Fig. 12), to actuate the pointer or indicator arm 66 of the score-registering device 71, it closes the switch 112, whereupon current will flow from the switch 112, by way of a conductor 113 to the signal lights 114, which, when thus illuminated indicate that the device has been operated successfully by the player and a score made thereon, current then flowing by way of the conductors 115 and 96 through the transformer 95 and into the conductor 103 and back into the switch 112.

When the trigger switch 25—26 is closed, current flows by way of the conductor 104 to one side of the solenoid 67, thence through the latter and by way of conductors 105 and 90 to one side of the rectifier 92, and thence by way of the conductor 93 back to the trigger switch 25—26.

When the solenoid 67 is thus actuated, it attracts the movable element or piston rod 100 of the dash-pot 75 (left to right Fig. 11), thereby moving the latter, against the action of its resetting spring 122 (left to right, Fig. 11). During this movement of the piston rod 100 of the dash-pot 75 (left to right, Fig. 11) a laterally extending arm 123, which is carried by the piston rod 100, engages one of the contacts of the switch 99, (Fig. 11) and thereby opens the latter and the circuit to the lamp 24, thus extinguishing the latter, whereupon the person operating the trigger switch 25 will release the latter and the piston rod 100 of the dash pot 75—100 will be reset back into its initial position (as in Fig. 11) by the resetting spring 122; it being noted that the action of the dash pot 75—100 in opening the switch 99 and the circuit to the pistol lamp 24 controls, in effect, the length of time during which the pistol lamp 24 may be kept illuminated by the action of the player in holding the trigger switch 25—26 closed.

When the coin slide 58 is pushed in (left to right, Figs. 1 and 2), the inner end portion of the same engages the arm 59 of the plunger 60, thereby moving the latter (left to right, Fig. 2), whereupon the laterally projecting arm 61 of the plunger 60 (Fig. 10) engages the depending lug 62 of the segmental gear or rack thereby pivoting the latter at 79, (counterclockwise, Fig. 9).

This movement of the segmental gear or rack

80 acts, through the medium of the link mechanism 78, to rotate or reset the ratchet 50—51, and the shot indicator or pointer arm 55, back into their initial positions; a similar resetting device (not shown) being provided for the score-registering device 71 and its pointer or indicator arm 66.

When the player has made a predetermined or allotted number of shots, that is, after the player has operated the trigger switch 25—26 and the shot-registering device 72 a predetermined number of times, a non-conductive element 125, which is carried by the ratchet 50 of the shot-registering device 72 (Fig. 9) engages and opens the switch 92 (Fig. 12), thereby opening the circuit 92—101—99—98—24—97—96—95—103—94 to the pistol lamp 24, and this circuit can not again be closed until the coin slide 58 and plunger 60 are operated to reset the ratchet 50 and the pointer or indicator 55 of the shot-registering device 72 back into their initial positions, this resetting operation moving the arm 124 of the ratchet 50 out of engagement with the switch 92.

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. In an amusement apparatus, the combination of: a cabinet or casing; a photo-sensitive cell in said cabinet; a light source for directing a beam of light at said cell; a switch for opening and closing circuit to said light source; a shutter movably mounted in said cabinet in the path of a beam of light traveling from said light source to said cell; and means for operating said shutter so as to oscillate the latter back and forth in the path of a beam of light traveling from said light source to said cell.

2. In an amusement apparatus, the combination of: a cabinet including a wall having an aperture formed therein; a photo-sensitive cell in said cabinet adjacent said aperture; an electric lamp in said cabinet; a switch for operating said lamp so as to direct a beam of light from the same at said cell; a shutter movably mounted in said cabinet between said aperture and said cell; and means for operating said shutter so as to oscillate the latter back and forth in the path of a beam of light traveling through said aperture toward said cell.

3. In an amusement apparatus, the combination of: a cabinet including a wall having a light-penetrable aperture formed therein; a photo-sensitive cell in said cabinet adjacent said aperture; a pistol in said cabinet; an electric lamp in said pistol; a switch in said pistol for opening and closing circuit to said lamp so as to direct a beam of light from the latter toward said cell; a shutter mounted for oscillatory movement in said cabinet between said aperture and said cell; and means for actuating said shutter so as to oscillate the same in the path of a beam of light traveling from said lamp through said aperture to said cell.

4. In an amusement apparatus, the combination of: a cabinet including a wall having a

light-penetrable aperture formed therein; a photo-sensitive cell in said cabinet adjacent said aperture; a pistol adjustably mounted in said cabinet for both horizontal and vertical movement; an electric lamp in said pistol; a switch in said pistol for opening and closing circuit to said lamp so as to direct a beam of light from the latter toward said cell; a shutter mounted for oscillatory movement in said cabinet between said aperture and said cell; and means for actuating said shutter so as to oscillate the same in the path of a beam of light traveling from said lamp through said aperture to said cell.

5. In an amusement apparatus, the combination of: a cabinet including a wall having a light-penetrable aperture formed therein; a photo-sensitive cell in said cabinet adjacent said aperture; a pistol in said cabinet; an electric lamp in said pistol; a switch in said pistol for opening and closing circuit to said lamp so as to direct a beam of light from the latter toward said cell; a shutter mounted for oscillatory movement in said cabinet between said aperture and said cell; means for actuating said shutter so as to oscillate the same in the path of a beam of light traveling from said lamp through said aperture to said cell; and an operating mechanism in the said cabinet including a movable element operated by actuation of said cell.

6. In an amusement apparatus, the combination of: a cabinet including a wall having a light-penetrable aperture formed therein; a photo-sensitive cell in said cabinet adjacent said aperture; a pistol in said cabinet; an electric lamp in said pistol; a switch in said pistol for opening and closing circuit to said lamp so as to direct a beam of light from the latter toward said cell; a shutter mounted for oscillatory movement in said cabinet between said aperture and said cell; means for actuating said shutter so as to oscillate the same in the path of a beam of light traveling from said lamp through said aperture to said cell; and a score-registering device in said cabinet including a movable indicator element operated by actuation of said cell.

7. In an amusement apparatus, the combination of: a cabinet including a wall having a light-penetrable aperture formed therein; a photo-sensitive cell in said cabinet adjacent said aperture; a pistol adjustably mounted in said cabinet for both horizontal and vertical movement; an electric lamp in said pistol; a switch in said pistol for opening and closing circuit to said lamp so as to direct a beam of light from the latter toward said cell; a shutter mounted for oscillatory movement in said cabinet between said aperture and said cell; means for actuating said shutter so as to oscillate the same in the path of a beam of light traveling from said lamp through said aperture to said cell; and an operating mechanism in said cabinet including a movable member operated by actuation of said cell.

8. In an amusement apparatus, the combination of: a cabinet or casing; a photo-sensitive cell in said cabinet; a lamp in said cabinet for directing a beam of light at said cell; a switch for opening and closing circuit to said lamp; a shutter movably mounted in said cabinet between said lamp and said cell; and means for operating said shutter at irregular intervals so as to oscillate the latter back and forth at irregular intervals in the path of a beam of light traveling from said lamp to said cell.

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