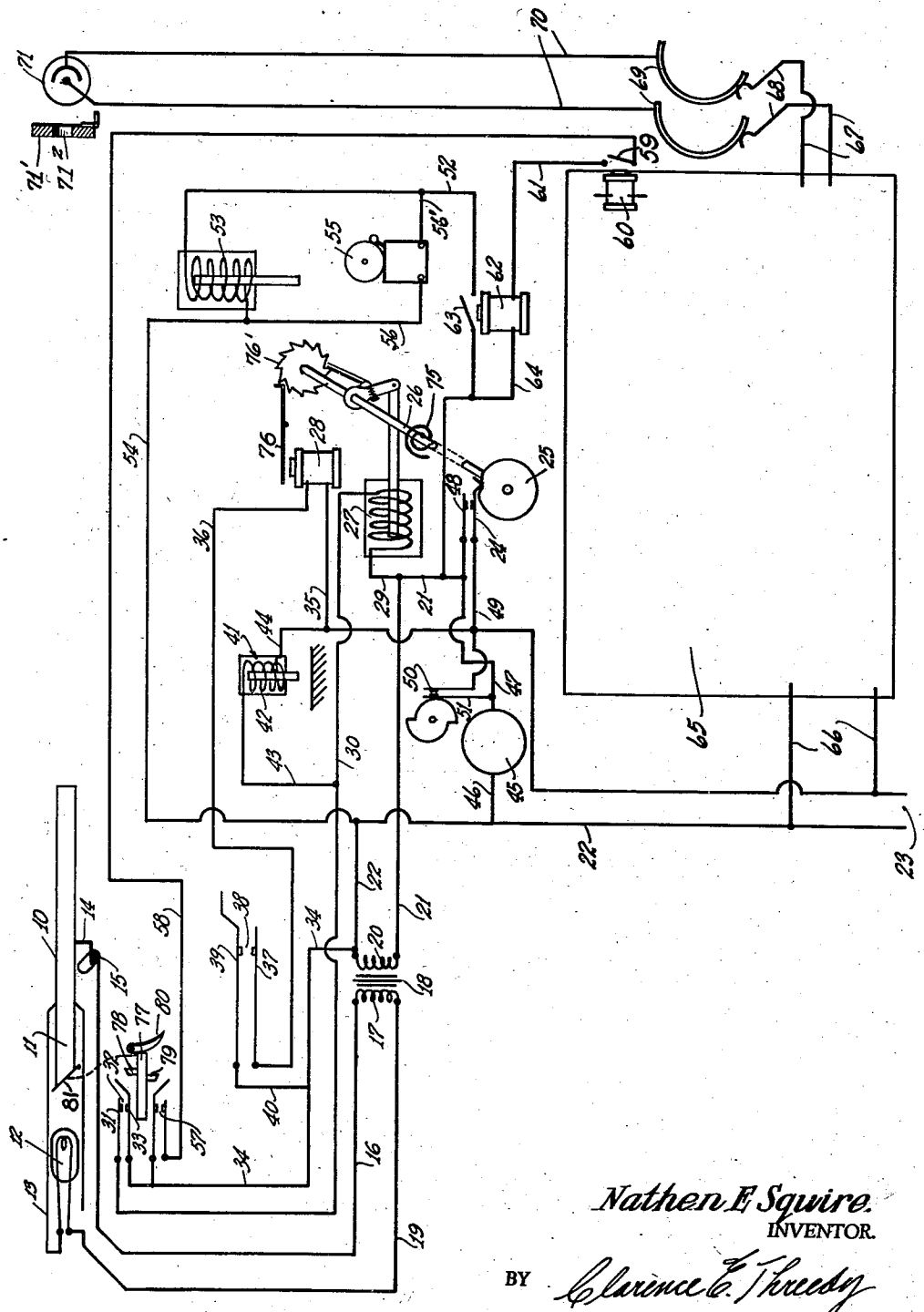
Jan. 23, 1940. N. E. SQUIRE 2,187,989

SHOOTING GALLERY

Original Filed April 17, 1936



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Patented Jan. 23, 1940

2,187,989

UNITED STATES PATENT OFFICE

2,187,989

SHOOTING GALLERY

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Original application April 17, 1936, Serial No. 74,837. Divided and this application October 9, 1936, Serial No. 104,850. Renewed November 27, 1939

12 Claims. (Cl. 273—101.1)

This invention relates to certain novel improvements in fraud preventive means for a shooting gallery, and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

This application is a division of that filed in the United States Patent Office on or about the 17th day of April, 1936, Serial No. 74,837, for Letters Patent on an amusement apparatus.

One of the objects of this invention is the provision of means for preventing the operation of the target releasing mechanism including an electrical relay by the use of a beam of light from a source other than that of the gun of the shooting gallery.

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 drawing showing the preferred form of construction, and in which the single figure is a diagrammatical view of the circuit and electrical instrumentalities of the invention.

Referring to the single figure, a gun is indicated at 10, and includes a barrel 11, through which a beam of light from a light bulb 12 is adapted to be projected. One side of this bulb 12 is connected by a conductor 13 to the barrel 10 of the gun.

The barrel 10 of the gun has leading therefrom a conductor 14 which connects to one side of a mercury switch 15 carried by the gun. The other side of the mercury switch is connected by a conductor 16 to the secondary side 17 of a transformer 18. The other side of the light bulb 12 is connected by a conductor 19 to the secondary side 17 of the transformer 18, the primary side 20 of the transformer being connected by conductors 21 and 22 through switch 24 to a main input indicated at 23.

Provided on the gun 10 is a special trigger-operated switch means including switch 32 and switch 57, adapted to be operated substantially in unison or at least in quick succession by an actuating element 77 having a pair of offset lateral pins 78 and 79 respectively engageable with switches 32 and 57 to operate the same when the actuating member 77 is reciprocated by the trigger mechanism 80.

The gun 10 is preferably of the type described in my aforesaid pending application, and is adapted to effect the projection of a flash of light when the trigger is pulled. In the schematic showing herein, the dotted line connection between the trigger 80 and the shutter 81 indicates the control of the shutter by the trigger, the detailed shutter mechanism not being shown herein since it does not, per se, constitute a part of the invention. Any shutter or light emitting means may be used, it being merely necessary that the gun have some form of trigger or analogous control for actuation of the trigger-operated switch means, the trigger control being desirably though not necessarily arranged to effect the emission of a flash of light when it is operated.

In circuit with the conductor 21 there is incorporated a shot limit switch 24. In the present instance the shot limit switch 24 is shown under the control of a cam 25 adapted to open the switch when the cam is rotated a certain distance from a normal position by a ratchet mechanism 76 driven by a solenoid 27 against the tension of a coil spring 75 and a latching pawl 76' releasable by a reset magnet 28.

One side of the magnetic solenoid 27 is connected by a conductor 29 to the conductor 21, the other side being connected by a conductor 30 to one side 31 of a trigger switch 32 formed as a part of the gun 10. The other side 33 of this trigger switch 32 is connected by a conductor 34 to the conductor 22. The reset magnet 28 has one side connected by means of a conductor 35 to the conductor 49, the other side of the reset magnet being connected by a conductor 36 to one side 37 of a coin controlled switch 38, which coin controlled switch 38 has its other side 39 connected by a conductor 40 to the conductor 34.

Incorporated in the circuit is a thud sounder 41 including a magnetic solenoid 42, one side of which is connected by a conductor 43 to the conductor 30, while the other side is connected by a conductor 44 to the conductor 35.

The target structure is substantially similar to that disclosed in my pending application heretofore referred to, and this target structure includes a motor 45, one side of which is connected by a conductor 46 to the conductor 22, and the opposite side is connected by a conductor 47 to the side 48 of the switch 24. From the opposite side of this switch 24 there is provided a shunt conductor 49 leading to one side of a shunt switch 50, the other side of the switch 50 being connected by a conductor 51 to the conductor 47, as shown.

From the side 48 of the switch 24 there leads a conductor 52 to one side of a controlled instrumentality which in this instance is the target re-

lease mechanism including the magnetic solenoid 53. The opposite side of this target release solenoid is connected by a conductor 54 to the conductor 22 whereby to complete a circuit between the main power line and the solenoid. In this circuit of the target release solenoid there is incorporated a signal 55, preferably though not necessarily in the form of a bell, the magnetic coil of which is connected by conductors 56 and 56' to the conductors 54 and 52, respectively.

The gun 10 provides a second or fraud preventive trigger switch 57, one side of which is connected by a conductor 58 to one side of a switch 59 of an amplifier or photo-cell relay 60. The other side of this switch 59 is connected by a conductor 61 to one side of a fraud preventive relay 62, the switch 63 of which is incorporated in the circuit of the target release solenoid. The other side of the fraud preventive relay is connected by a conductor 64 to the side 48 of the shot limit switch.

The coil of the amplifier relay is incorporated in the output side of an amplifier unit diagrammatically indicated at 65, the power input of the amplifier unit being connected by conductors 66 to the main power source 23, and the signal input side of the amplifier circuit being connected by conductors 67 to stationary contact elements 68 of the target structure, and these stationary contact elements 68 operatively engage movable contact elements 69 connected by conductors 70 to the photo-electric cell 71. A target member 71' having an opening 71'', through which light may pass, may be positioned before the photo-electric cell 71.

In operation, the beam of light from the bulb 12 directed to the photo-electric cell 71 will when impinging upon the cell 71 actuate the amplifier 65 and cause the energization of the photo-cell or amplifier relay 60 to close the switch 59 thereof. The closing of this switch 59 will not permit the flow of current through the fraud preventive circuit including the fraud preventive relay 62 unless the trigger switch 57 is closed. When the trigger switch 57 is closed and when the switch 59 of the amplifier relay 60 is closed, the fraud preventive or supervisory relay 62 will be energized by current from the main power source, and when thus energized the switch 63 will be closed, thus completing a circuit between the target release solenoid 53 and the main power source 23 to cause the energization and operation of the target release solenoid.

The present circuit is intended for use with a type of target mechanism such as disclosed in my co-pending application, and especially provides means for preventing the actuation of the target-release solenoid 53 by directing a flash or beam of light upon the cell from a source other than from the light bulb 12.

Upon closing the coin switch 38, an operation of the trigger closes the two trigger switches 32 and 57, the former closing a circuit through the thud-sounder 41 and stepping the shot counter 27—25 once, while the latter trigger switch 57 puts battery on the relay switch 59. Should the flash or beam from the gun strike the photo-cell 71, amplifier 65 will energize the photo-cell relay winding 60 and close switch 59, with the result that the supervisory or fraud preventive relay 62 will be energized to operate fraud-preventive relay switch 63, thus actuating the signal 55 and the target solenoid 53.

By the use of a fraud preventive circuit such as is here described, it is manifest that a beam of light from a source other than from the bulb 12 will not effect the operation of the target release solenoid, and therefore one is prevented from fraudulently operating the device by means of light from a source other than the bulb 12 in the gun.

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 electric shooting gallery of the type having a light gun and a photo-sensitive target device arranged in a circuit to control an electrical hit-indicating mechanism for actuation of the latter when the target device is struck by light, a control circuit including: a trigger-operated switch in said gun and connected in circuit with said hit-indicating mechanism and arranged to be effective to prevent operation of the latter mechanism unless said trigger switch is operated at substantially the same time said photo-sensitive target device is operated.

2. In an electric shooting gallery of the type having a main circuit including a light gun and a photo-sensitive target device and electrical hit-indicating means for operation by said device when the same is struck by light, a control circuit comprising: trigger-operated switch means in said gun and arranged in circuit with said hit-indicating means to prevent operation of the same unless said switch means is operated at substantially the same time said photo-sensitive target device is operated, and trigger means for said gun and arranged to actuate said trigger-operated switch means and effect emission of light from said gun at substantially the same moment upon pulling of the trigger.

3. A gun game comprising a target, a photo-electric cell associated therewith, a light gun and trigger control therefor arranged to project a flash towards said target responsive to operation of said trigger control, controlled means arranged for operation by said cell when energized, means normally rendering said cell-operated means incapable of actuation by the cell when the latter is energized, and means operatively controlled by said trigger control for rendering said photo-cell operated means capable of actuation by the cell when the latter is energized responsive to operation of said trigger control.

4. In a marksmanship or analogous aim testing device, a target, an aiming device adapted to be aimed at said target, a trigger control, electrically operated mechanism operatively associated with said target and arranged to indicate a hit when said aiming device is properly aimed at the target, said aiming device being arranged and constructed for coaction with said electrically operated mechanism to stimulate operation of the latter responsive to actuation of said trigger control and provided the aiming device is properly aimed at said target, means normally rendering said electrically operated mechanism incapable of actuation, and means operatively controlled by said trigger control for rendering said electrically operated mechanism operable for actuation to indicate a hit, the arrangement

being such that it is necessary to operate said trigger control in order that said electrically operated mechanism may indicate a hit, thereby preventing actuation of said electrically operated mechanism by stimuli from sources other than said aiming device.

5. In a shooting gallery, an aiming device including a trigger switch, a photo-cell target device operable by said aiming device, and a controlled instrumentality operable by said target device, together with fraud prevention means for rendering said controlled instrumentality operable by said target device only when said trigger switch and said target device are simultaneously actuated, said fraud prevention means including a supervisory relay for actuating said instrumentality, and a photo-cell relay actuated by said target device and having a relay switch in circuit with said trigger switch and said supervisory relay to operate the latter only when said trigger switch is closed and said photo-cell relay is actuated by said target device.

6. A fraud prevention circuit for use with shooting galleries of the type having a light gun, a photo-electric target device operated by light from the gun, and hit-indicating mechanism operably controlled by the target device when the same is struck by light, said circuit including a trigger switch on said gun and a fraud prevention relay operable to actuate said hit-indicating mechanism, together with means for actuating the fraud prevention relay and including a second relay operable by said target device and having a relay switch closed thereby to complete an actuating circuit through said fraud prevention relay and said trigger switch in such manner that the trigger switch and said second relay must be operated substantially at the same time to actuate said fraud prevention relay.

7. In an electric shooting gallery, a light gun having trigger-operated switch means and trigger-operated light control means, together with a photo-electric target device actuated by light from said gun, an amplifier in circuit with said target device, an amplifier relay actuated by said amplifier, electrical mechanism for indicating a hit, a fraud prevention relay operable to actuate said hit-indicating mechanism and connected in circuit for operation by said amplifier relay when said photo-electric target device is struck by light from said gun, said trigger-operated switch being connected in circuit with said fraud prevention relay and said hit-indicating mechanism in such manner that the operation of said amplifier relay and fraud prevention relay will be ineffectual to operate said indicating mechanism unless said trigger switch means is operated at the same time.

8. In an electric shoot gallery of the type having a light gun and trigger means operable to effect emission of light from said gun together with photo-cell target mechanism operable by light from said gun, a control circuit comprising: a photo-cell relay operable by said photo-cell target device, electrically operable indicating mechanism and a supervisory actuating relay therefor, said supervisory relay being connected in circuit with said photo-cell relay and a trigger switch operated by said trigger means on said gun such that the simultaneous operation of said trigger switch means and photo-cell relay will energize said supervisory relay and actuate said indicating mechanism.

9. An electric shooting gallery having a photo-sensitive target device, a light gun and trigger means operable to cause the emission of light from said gun to actuate said target device, electrical hit-indicating mechanism and a fraud prevention relay operably controlling the same and connected in circuit with said photo-sensitive target device for actuation by the latter to operate said indicating mechanism when the target device is struck by light, and a first trigger switch in said gun arranged in circuit with said fraud prevention relay for operation of said indicating mechanism when said fraud prevention relay is operated by said photo-sensitive device, together with electrically driven shot-counter and shot limit mechanism operably controlled by a second trigger switch in said gun and which is operated at substantially the same time as said first trigger switch by said trigger means.

10. A gun game comprising a target, a photo-electric cell operatively associated with said target, a gun adapted to be aimed at the target, means associated with said gun for producing a flash of light, indicating means operable by said cell when the same is energized, means normally rendering said indicating means incapable of actuation by the cell as aforesaid, and means operated coincidentally with the flash producing means of the gun for rendering said indicating means capable of actuation by the cell when energized.

11. A gun game comprising a target, a gun adapted to be aimed at the target, trigger mechanism therein, electrical means associated with the target for indicating a hit, means normally rendering said electrical means incapable of actuation by extraneous stimuli, and means controlled by said trigger mechanism for rendering said electrical means capable of actuation to indicate a hit.

12. A gun game comprising a target, a photo-electric cell operatively associated therewith, a gun arranged and constructed to discharge a flash of light and to be aimed at the target, a trigger arranged for operation to effect emission of said flash of light, indicating means arranged to be controlled by said cell when the same is energized, means normally rendering said indicating means incapable of actuation by the cell when the same is energized, and means controlled by the trigger for rendering said indicating means capable of actuation by the cell when the same is energized during the occurrence of the aforesaid flash of light.

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