

Jan. 6, 1942.

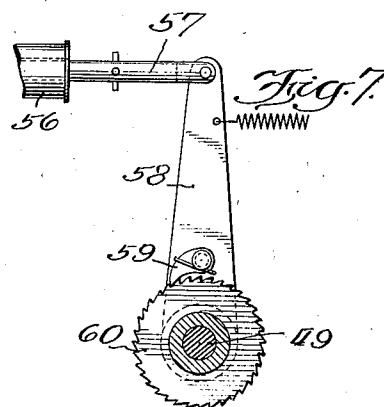
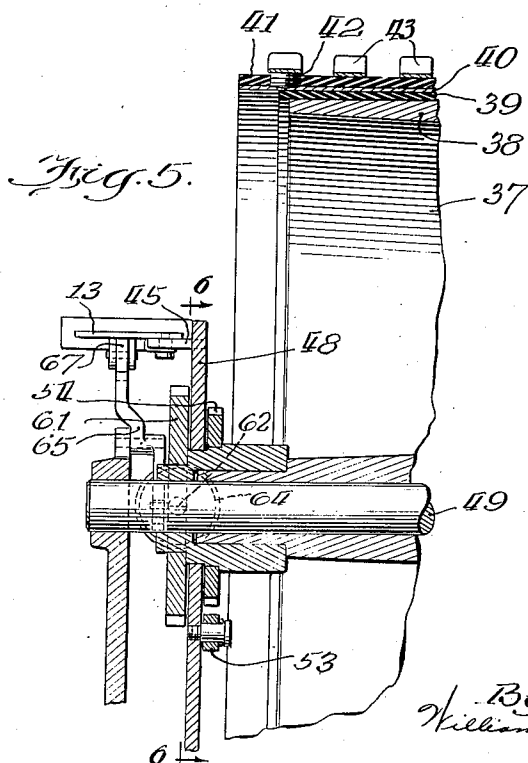
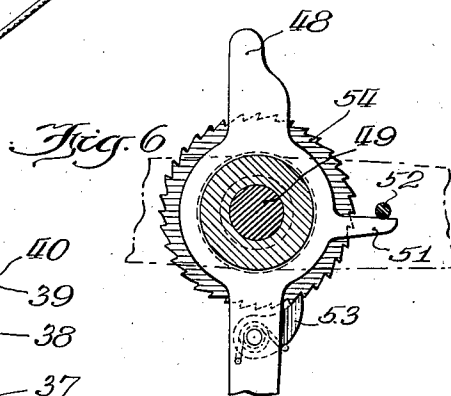
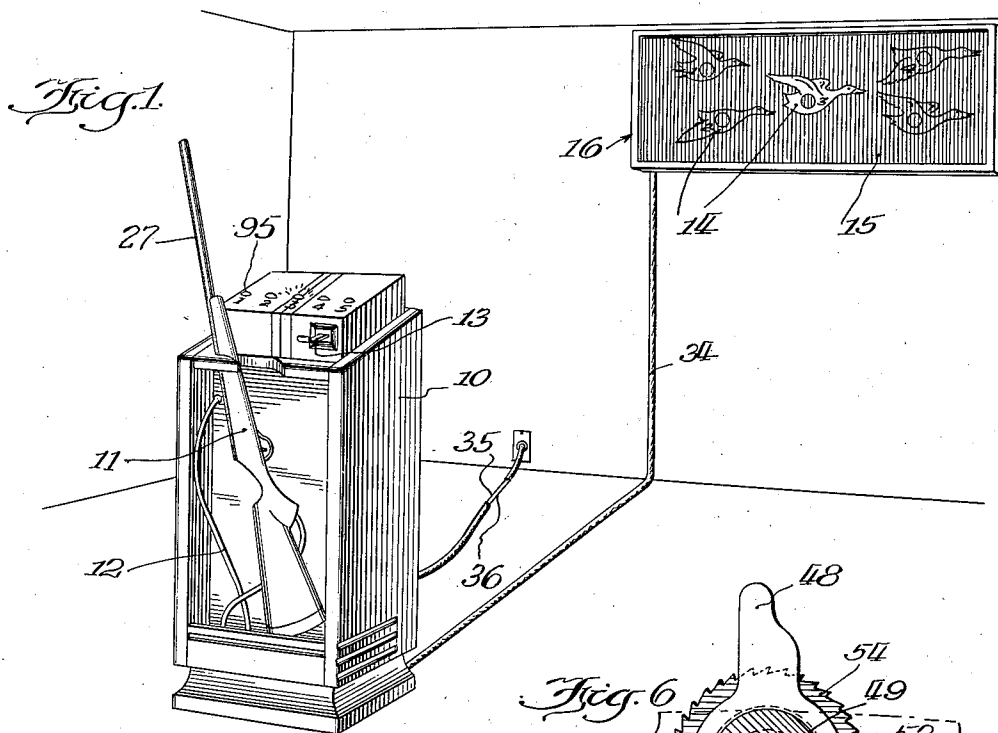
J. F. EAKINS

2,269,256

GUN GAME

Filed Dec. 30, 1936

3 Sheets-Sheet 1



Inventor:
John F. Eakins
By Williams, Bradbury, McCull & Nicks
Attys.

Jan. 6, 1942.

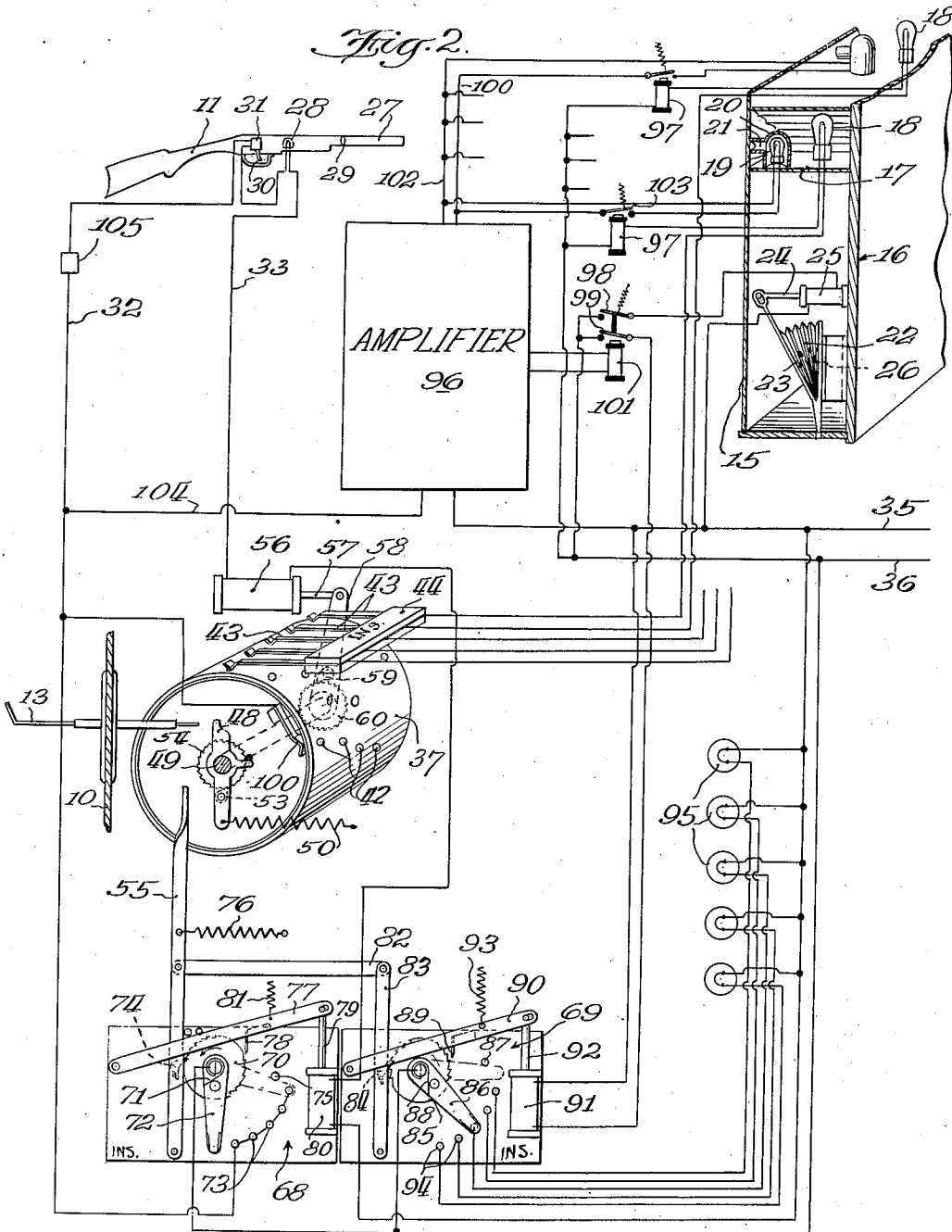
J. F. EAKINS

2,269,256

GUN GAME

Filed Dec. 30, 1936

3 Sheets-Sheet 2



Inventor:
John F. Eakins
By *William, Broadway, & Co. E. A. Miller,*
Attys.

Jan. 6, 1942.

J. F. EAKINS

2,269,256

GUN GAME

Filed Dec. 30, 1936

3 Sheets-Sheet 3

Fig. 3.

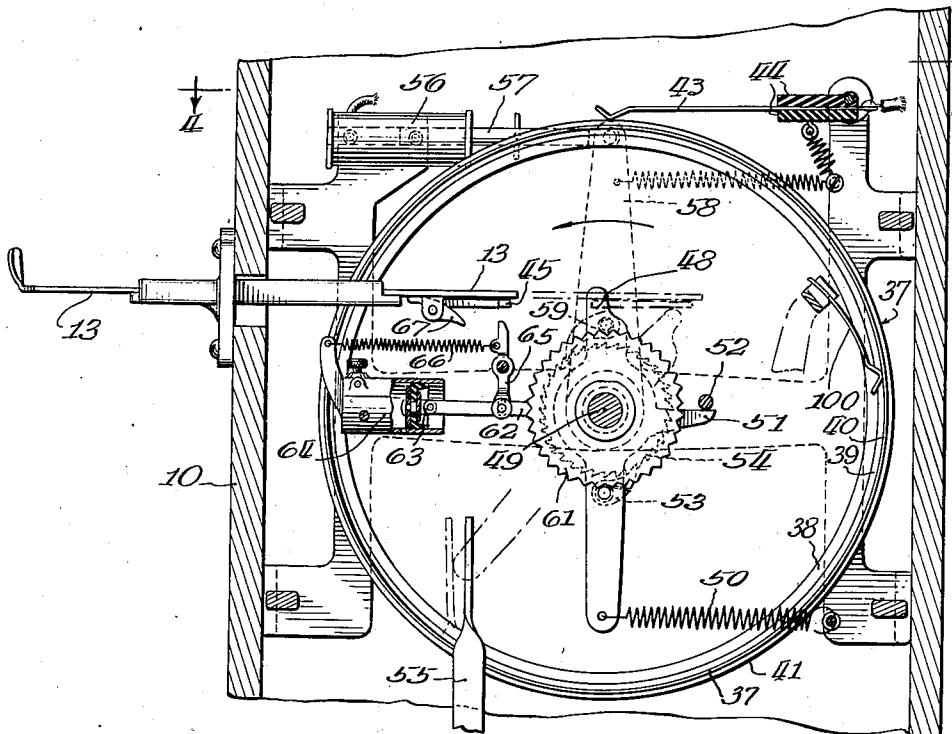
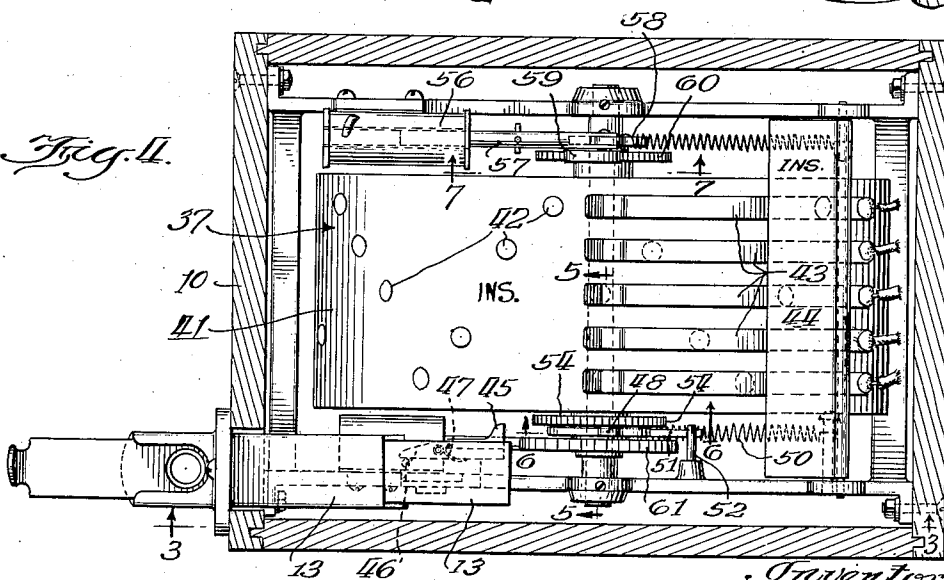


Fig. 4.



Inventor:
By John F. Eakins
Williams, Bradbury, McClellan & Hulse, Attys.

UNITED STATES PATENT OFFICE

2,269,256

GUN GAME

John F. Eakins, Evanston, Ill., assignor to Albert
G. McCaleb, Evanston, Ill.

Application December 30, 1936, Serial No. 118,210

1 Claim. (Cl. 273-101.1)

This invention relates to a gun game apparatus of the type in which a flash of light is directed by a gun to a target associated with a photoelectric cell which, when energized by a correctly aimed flash, actuates indicating devices which indicate the efficiency of the marksman.

In accordance with the present invention I provide an improved game of this type in which a plurality of targets are energized in sequence. The order of energization is controlled in an irregular order so that the marksman is always required to shoot at a target which is presented unexpectedly. The energization of a target is indicated by the illumination of a lamp associated therewith. Each target has a photoelectric cell which is operatively connected to the remaining apparatus only when the circuit of its associated lamp is completed.

The game apparatus comprises sound means responsive to a successful shot, visual means for indicating the number of successful shots, and other features which will hereinafter be fully described with reference to the embodiment of the invention shown in the accompanying drawings, in which:

Figure 1 is a perspective view showing the game apparatus;

Fig. 2 is a diagrammatic view and wiring diagram;

Fig. 3 is a sectional view through part of the apparatus, taken on the line 3-3 of Fig. 4;

Fig. 4 is a sectional plan view, taken on the line 4-4 of Fig. 3;

Fig. 5 is a sectional detail view, taken on the line 5-5 of Fig. 4;

Fig. 6 is a sectional detail view, taken on the line 6-6 of Figs. 4 and 5, and

Fig. 7 is a sectional detail view, taken on the line 7-7 of Fig. 4.

Referring to the drawings, the reference numeral 10 designates a cabinet located at the butt of the range. This cabinet serves as a support for the gun 11 when the same is not in use. The gun is secured to the cabinet 10 by means of a cable 12, which includes a plurality of conductors which will hereinafter be described. Upon the cabinet 10 is a coin slide 13 of known type. When a coin of the appropriate denomination is inserted by means of the coin slide 13, the apparatus is freed to the extent of a certain number of shots. In the present embodiment of the invention there are five targets 14 and five shots are permitted for each coin. It will be understood, however, that this precise number of targets or shots is quite arbitrary and that the

apparatus may be designed for any desired number, either of targets or of shots permitted for the payment of one coin.

The targets 14 may be formed to simulate flying ducks, or any other appropriate form of target may be employed. The targets 14 may suitably be transparent figures arranged upon a black background on a sheet of glass 15. The sheet of glass 15 may suitably form the front wall of a box-like frame 16 which may, for example, be supported on a wall. Within the box-like frame 16 are provided housings 17, one for each of the targets 14. Each housing 17 includes an incandescent lamp 18 and a photoelectric cell 19. The photoelectric cell 19 is enclosed within a housing 20 so that it is not illuminated by the lamp 18.

The housing 20 comprises a forwardly projecting tubular portion 21 which is directed outwardly towards the target 14. When the lamp 18 of a target is illuminated, the whole target is seen as a bright object with the exception of a portion corresponding to the tube 21, which is dark and serves as the object to be aimed at. Also contained within the box-like frame is a sound producing device 22 of the general form of a bellows, provided with a reed structure 23 which is caused to emit a sound when the bellows is contracted. The bellows is adapted to be contracted by the movement of an armature 24 into a solenoid 25 when that solenoid is energized. The bellows 22 may include a spring 26 which tends to return the bellows to initial position when the solenoid 25 is no longer energized.

The gun 11 comprises a barrel 27 through which light is adapted to be projected from an incandescent lamp 28 located within the gun. A lens 29 may be located in the barrel 27 so as to concentrate the beam of light into small compass. The trigger 30 controls a switch 31 of any suitable type which is adapted to open automatically almost immediately after it is closed by the trigger 30. The switch 31 and lamp 28 are in series and are provided with leads 32 and 33 which are located within the cable 12. The cabinet 10 is connected to the box-like frame 16 by means of a cable 34 and electric energy may be supplied to the cabinet 10 by means of leads 35 and 36 from any suitable source.

The remainder of the apparatus is located within the cabinet 10. Thus, a switch drum 37 is rotatably mounted within the cabinet 10. This drum may be of any suitable construction, but it is preferred to construct it as shown in Fig. 5. As shown in this figure the drum comprises a peripheral member 38 upon which is carried a

cylinder of insulation 39. A metallic sleeve or cylinder 40 is mounted over the cylinder 39, and a cylinder 41 of insulation is mounted over the metal cylinder 40.

Five circumferential series of plugs 42 are threaded into the cylinder 41 so that they lie flush therewith and make contact with the metal cylinder 40. The plugs 42 of the various circumferential series are staggered in the circumferential direction of the drum, as shown in Fig. 4. A plurality of brushes 43, corresponding in number to the number of targets 14 and the number of circumferential series of plugs 42, is carried by strips of insulation 44 carried by the cabinet. Owing to the irregular manner of locating the plugs 42 on the surface of the drum, only one of these plugs will make contact with one of the brushes 43 at any time. Furthermore, the number of plugs 42 is sufficiently great that the order in which the contacts 42 engage the brushes 43 is quite irregular. Thus, if we number the various circumferential series of plugs 42 in the downward direction, as viewed in Fig. 4, then the brushes will be energized in the following order: 4, 1, 2, 3, 5, 4, 2, 1, 3, 2, 4, 5, 3, 1, etc. The order in which the brushes are energized controls the order in which the targets are energized and illuminated and, consequently, the player receives no warning as to which target is going to be energized next during the operation of the game.

Means are provided whereby the drum 37 is rotated for a certain amount each time that a coin is inserted to release the apparatus for play. Thus, I may pivotally mount on the coin slide 13 a laterally projecting dog 45 which is pressed against a stop 46 into the position shown in Fig. 4, by means of a coil spring 47. When the coin slide 13 is forced inwardly the dog 45 strikes the upper end of an arm 48 pivotally mounted on the shaft 49 of the drum 37. A spring 50, secured to a stationary frame within the cabinet and to the lower end of the arm 48, tends to hold this arm in the position shown in Fig. 3 with a projection 51 of the arm in contact with a stationary stop 52. When the coin slide 13 approaches the innermost end of its stroke, as shown in dash and dot lines in Fig. 3, the dog 45 clears the arm 48 so that it sharply resumes its normal position under the influence of the spring 50.

The arm 48 carries a pawl 53 which is adapted to engage a ratchet wheel 54 which is rigid with the drum 37. During this return movement of the arm 48, the pawl 53 engages the ratchet wheel 54 and causes the drum 37 to rotate rapidly in the counter-clockwise direction as viewed in Fig. 3. When the arm 48 is thrown to its outermost position, as shown in dash and dot lines in Fig. 3, it displaces the lever 55 forwardly for a purpose hereinafter to be described.

The drum 37 is adapted to be driven step by step in the counter-clockwise direction, as viewed in Fig. 3, by means of a solenoid 56. This solenoid cooperates with an armature 57 which is pivotally connected to an arm 58 pivotally mounted on the shaft 49. The arm 58 has pivotally mounted thereon a pawl 59 which is adapted to cooperate with a ratchet wheel 60 which is rigidly connected to the drum 37. Also rigidly mounted on the shaft 49 is a star wheel 61 which is adapted to be engaged by a rod 62 so as to cause the drum 37 to be located in any one of a plurality of definite positions. Each of these definite positions brings one of the plugs 42 into contact with one of the brushes 43.

The rod 62 is pivotally connected to a plunger

63 of a dashpot cylinder 64. The rod 62 is also pivotally connected to a lever 65 which is mounted on a fixed pivot. A spring 66, connected to the lever 65 and to a stationary point, biases the spring 65 so as to force the pointed end of the rod 62 against the periphery of the star wheel 61. On the underside, the coin slide 13 has pivotally mounted thereon a dog 67. When the coin slide 13 is forced inwardly, the dog 67 engages the lever 65 and forces the rod 62 away from the star wheel 61. As the inward movement of the coin slide 13 is continued, the lever 65 clears the dog 67 and the spring 66 tends to carry the rod 62 back into cooperative relation with the star wheel 61. Owing to the action of the dashpot 64, some time elapses before the rod 62 thus returns and the drum 37 is adapted to rotate freely for a short time before it is again arrested by the rod 62.

The cabinet 10 also contains two counting devices 68 and 69. The counting device 68 is a main switch mechanism which regulates the number of shots which may be fired for each coin. It comprises a ratchet wheel 70 which is biased in the clockwise direction, as viewed in Fig. 2, by a spring 71. The ratchet wheel 70 rigidly carries a switch arm 72 which is adapted to cooperate with the contacts 73. The contacts 73 are connected in series and correspond in number to the number of shots permitted for one coin which, in the present embodiment of the invention, is five.

The lever 55 carries a pawl 74 which cooperates with the ratchet wheel 70 and is adapted to prevent rotation of this ratchet under the influence of the spring 71. When, however, the lever 55 is displaced by the arm 48 in the manner hereinbefore described with reference to Fig. 3, the pawl 74 is moved away from the ratchet wheel 70 and, consequently, the spring 71 moves the ratchet wheel 70 and switch arm 72 into the dotted line position shown in Fig. 2, at which position they are arrested by a stop 75. In this position the switch arm 72 is in engagement with the first contact 73.

The lever 55 is held in its normal position by a spring 76. A lever 77 is pivotally mounted adjacent the ratchet wheel 70 and carries a detent 78. The lever 77 is normally held in the position shown in Fig. 2, by means of a spring 81, with the detent 78 out of engagement with the ratchet wheel 70. The armature 79 of a solenoid 80 is pivotally connected to the lever 77. When the solenoid 80 is energized, the lever 77 moves downwardly and engages the ratchet wheel 70, causing it to rotate so as to move the switch arm 72 one step—that is, from one contact 73 to the next contact. The last step moves the arm 72 away from all the contacts 73 and the circuit of the machine is broken, as will hereinafter be described.

The lever 55 is connected by a link 82 to another pivot lever 83. This lever carries a pawl 84 which cooperates with a ratchet wheel 85 of the counting mechanism 69 in the same manner as the pawl 74 cooperates with the ratchet wheel 70. A switch arm 86 is rigidly carried by the ratchet wheel 85 and is adapted to reach an initial position determined by a stop 87 under the influence of a spring 88, when the lever 83 is moved simultaneously with the lever 55 on the insertion of a coin and the actuation of the coin slide 13. The ratchet wheel 85 is adapted to be rotated step by step in the opposite direction—that is, the clockwise direction as viewed in Fig. 2, by means of a detent 89 carried by a pivoted lever 90. The lever 90 is actuated by a solenoid 91, the

armature 92 of this solenoid being pivotally connected to the lever 90. The detent 89 is normally held out of engagement with the ratchet wheel 85 by means of a spring 93.

The switch arm 86 is adapted to cooperate with contacts 94 which are of the same number as the number of shots permitted by the insertion of each coin. In this embodiment that number is 5. When the lever 83 is swung in the manner described, the spring 88 throws the switch arm 86 into the position shown in dotted lines in Fig. 2. When the solenoid 91 is energized, which occurs when the marksman makes a hit, the arm 86 is moved into engagement with the first contact 94. At each successive hit the arm 86 is moved into engagement with the next contact 94. Each of the contacts 94 is connected to a signal lamp 95, these lamps being suitably arranged on the cabinet 10 so as to indicate visually the number of hits which have been made by the marksman.

The cabinet 10 also includes an amplifier 96 which is connected in the manner hereinafter described. The power line 35 is connected directly to the amplifier 96 to supply energy thereto. The power line 36 is connected through electromagnets 97 to the lamps 18. The other terminals of these lamps are connected individually to the brushes 43. The power line 36 is also connected through pole 98 and pole 99 of a double pole switch to the solenoid 25 and the solenoid 91, respectively. The other terminals of these solenoids are connected to the power line 35. The power line 36 is connected to the switch arms 86 and 72, respectively. The contacts 73 are connected to a brush 100 which is in continual engagement with the cylinder 40 of conductive material and, consequently, with the plugs 42 which make contact with the brushes 43. The contacts 73 are also connected to the lead 32 previously referred to, and to the other power terminal of the amplifier 96. The power line 35 is connected to terminals of the signal lamps 95 and to one terminal of the solenoid 80.

The output of the amplifier 96 is connected to an electromagnet 101 which is adapted, when energized, to move the poles 98 and 99 to closed position. One conductor 102 of the input circuit of the amplifier is connected to each of the photoelectric cells 19. The other terminals of these cells are connected through switches 103 to the other line 104 of the input circuit of the amplifier. The switches 103 are associated with the electromagnets 97, each switch 103 being associated with the electromagnet 97 in series with the lamp 18 which is associated with the particular photoelectric cell 19 controlled by that switch 103.

A time delay switch 105 is inserted in the line 32 so as to prevent operation of the gun until the tubes of the amplifier have warmed up to an operating temperature.

The operation is as follows. Initially, the position of the main switch arm 72 is that shown in Fig. 2. The switch arm 86 is normally found in a position indicating the score of the last player. Thus, it is shown in a position which completes a circuit through the third lamp 95, indicating the previous marksman has made three hits. This circuit is completed from power line 36, switch arm 86, third contact 94, third lamp 95 and power line 35. To free the apparatus for shooting, it is necessary to insert a coin in the coin slide 13 and to push the coin slide inwardly into the position indicated in dotted

lines in Fig. 3. In so doing the arm 48 is pushed into the position shown in dash and dot lines in Fig. 3 and is released so that it swings rapidly into its initial position under the influence of the spring 50.

The pawl 53 carried by the arm 48 causes the drum 37 to spin. The rod 62 is held out of engagement with the star wheel 61 so as to enable this spinning to take place. After a short time, however, the arm 62 moves into engagement with the star wheel 61 and holds the drum 37 in one of its predetermined positions with one of the brushes 43 in engagement with one of the plugs 42. As shown in Fig. 4, for example, the third brush is in engagement with the third plug 42.

The movement of the arm 48 displaces the lever 55, with the result that the pawls 74 and 84 are withdrawn from their ratchet wheels and these wheels rotate under the influence of their springs so as to bring the switch arm 72 into engagement with the first of the contacts 73 and the switch arm 86 out of engagement with all of the contacts 94. The particular lamp 95 which was illuminated now goes out and the main switch constituted by the switch arm 72, completes a circuit through the particular lamp 18 associated with the third brush 43. The completion of the energization of this lamp circuit energizes the associated electromagnet 97 and closes the switch 103 which connects the photoelectric cell 19 associated with that particular lamp 18 to the amplifier 96.

When the main switch arm 72 closes the main circuit, the power circuit of the amplifier 96 is completed and the tubes warm up. When this occurs, the delay switch 105 closes and the gun now can be aimed and operated so as to project a flash. If the marksman directs the gun correctly, the projected flash impinges upon the photoelectric cell 19 of the particular object which is energized. That energization is indicated to the marksman by the illumination of one of the objects. When the marksman pulls the trigger to illuminate the lamp 28, the circuit through the lamp is completed through the solenoids 56 and 80. The result is that the drum 37 is rotated one step by means of the pawl 59 and ratchet wheel 60 so that a different target is illuminated. Thus, a new target is presented whether or not the marksman has been successful in hitting his target, and which particular target is thereupon energized is unknown to the marksman until the target is energized as shown by its illumination. If the marksman is successful, the input circuit of the amplifier receives an impulse from the photoelectric cell, which impulse is amplified and is sufficient to energize the electromagnet 101, closing the circuits through the solenoid 25 and the solenoid 91.

The energization of the solenoid 25 operates the bellows 22, which causes the emission of a sound to indicate a hit. The energization of the solenoid 91 causes the switch arm 86 to move one step in the clockwise direction, as viewed in Fig. 2. Consequently, when the first hit is made, the first lamp 95 becomes illuminated, when the next hit is made the second lamp 95 is illuminated, and so on. Each time the trigger 30 is pulled to emit a flash, the solenoid 80 is energized and the switch arm 72 moves step by step in the clockwise direction, as viewed in Fig. 2. When 5 shots have been fired, the switch arm 72 moves away from all of the contacts 73 and the main circuit of the apparatus is opened and

the apparatus cannot be used until a further coin is inserted by the coin slide 13.

It will thus be seen that I have provided an apparatus in which a plurality of targets are energized in succession, the order of succession being unknown to the marksman in advance. Furthermore, my apparatus provides for the presentation of a new target each time the gun is fired, whether the aim has been successful or not. It is also to be noted that in this game a successful hit is indicated both by sound-producing means and by visual means.

Although the invention has been disclosed in connection with the specific details of a preferred embodiment thereof, it must be understood that such details are not intended to be limitative of

the invention except in so far as set forth in the accompanying claim.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

In a gun game apparatus, in combination, a plurality of targets adapted to be energized one at a time, a circuit connected to each target, a contact drum having a plurality of contacts adapted to complete said circuits one at a time, said contacts being arranged irregularly upon the drum, a coin slide for freeing the apparatus for play, and means cooperating with the coin slide for rotating the drum to a random initial position.

JOHN F. EAKINS.