Jan. 6, 1942. F. M. NEW 2,269,410

ELECTRICALLY OPERATED MACHINE GUN APPARATUS

Filed Nov. 2, 1939 5 Sheets-Sheet 1

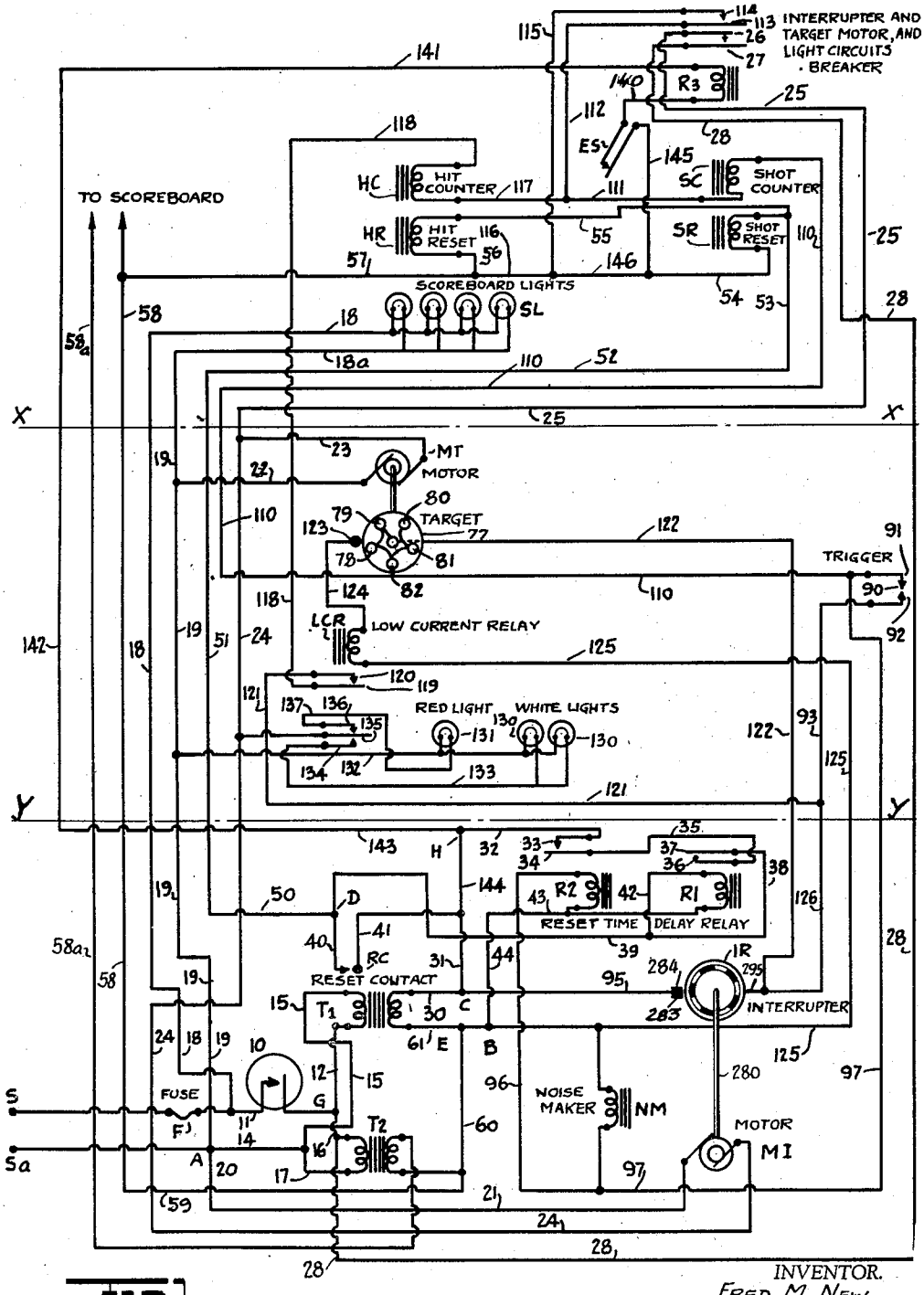


FIG. 1.

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ELECTRICALLY OPERATED MACHINE GUN APPARATUS

Filed Nov. 2, 1939 5 Sheets-Sheet 2

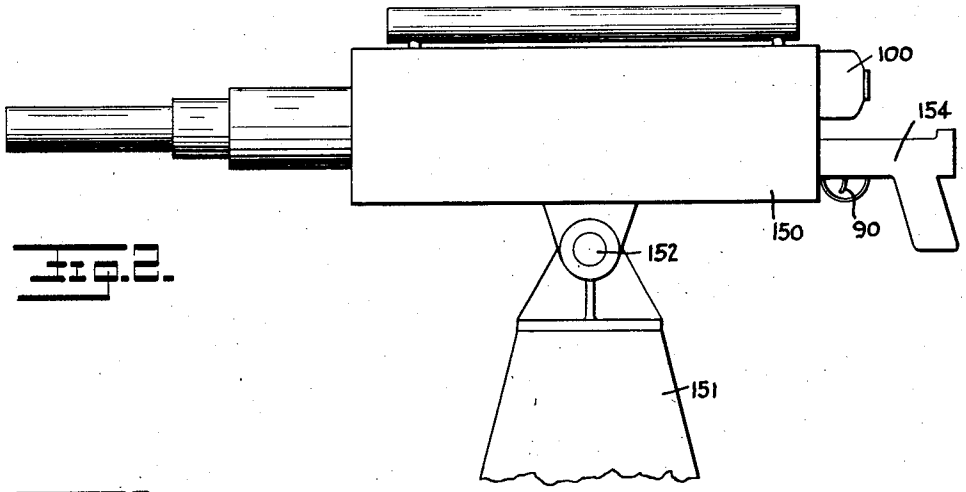
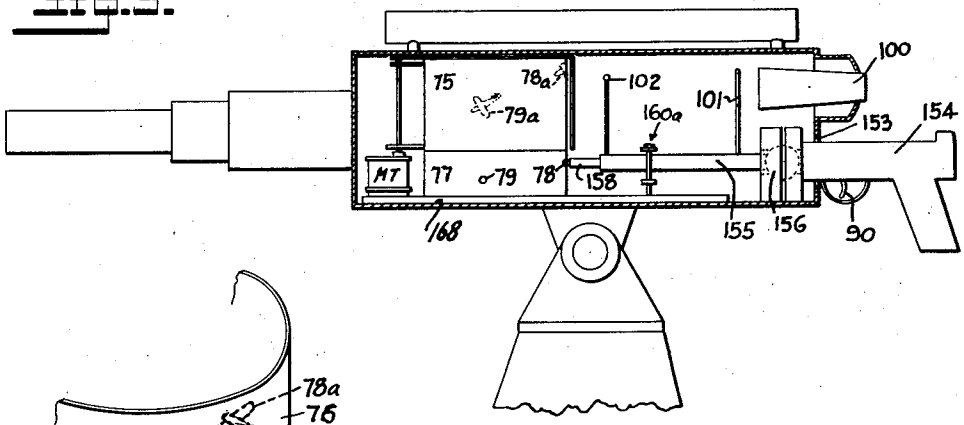


Fig. 2.

Fig. 3.



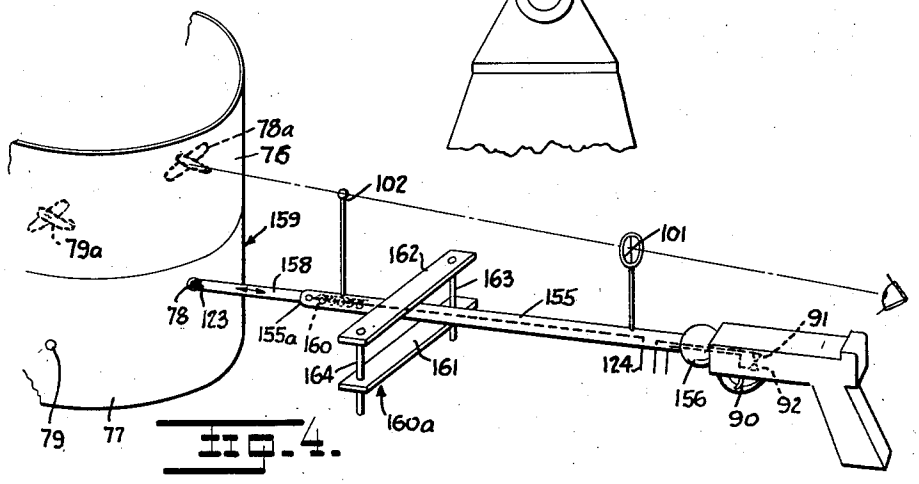


Fig. 4.

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ELECTRICALLY OPERATED MACHINE GUN APPARATUS

Filed Nov. 2, 1939 5 Sheets-Sheet 3

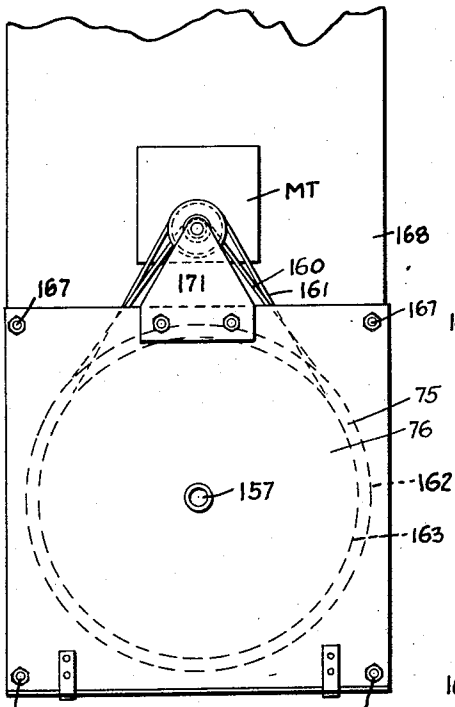


Fig. 6.

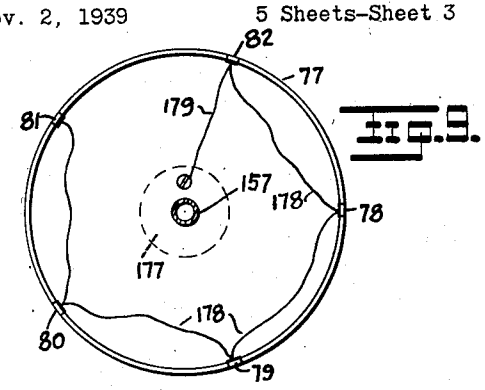


Fig. 9.

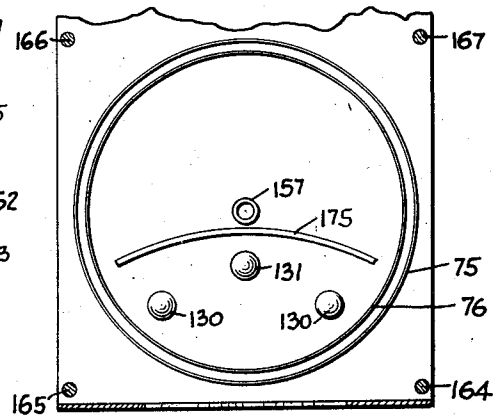


Fig. 8.

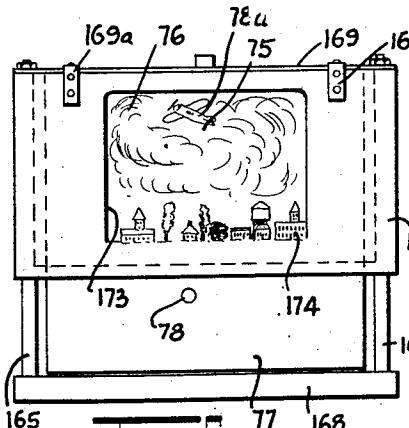


Fig. 5.

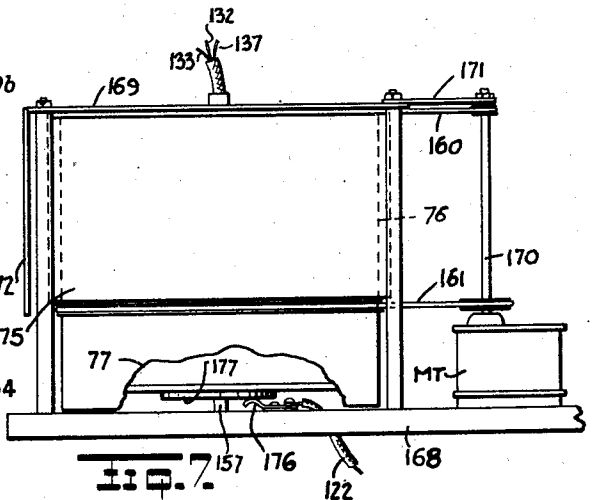


Fig. 7.

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ELECTRICALLY OPERATED MACHINE GUN APPARATUS

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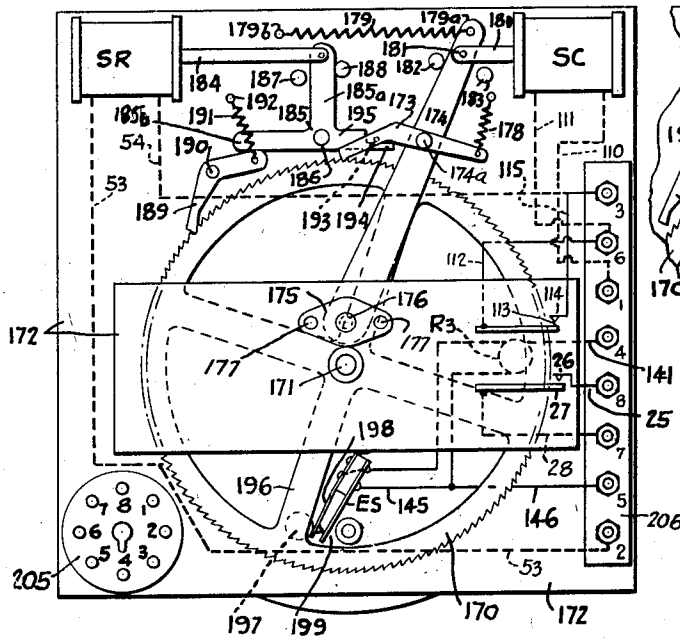


Fig. 10.

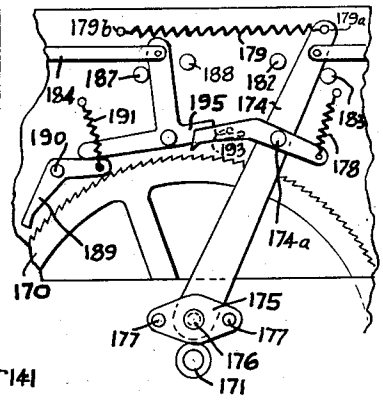


Fig. 11.

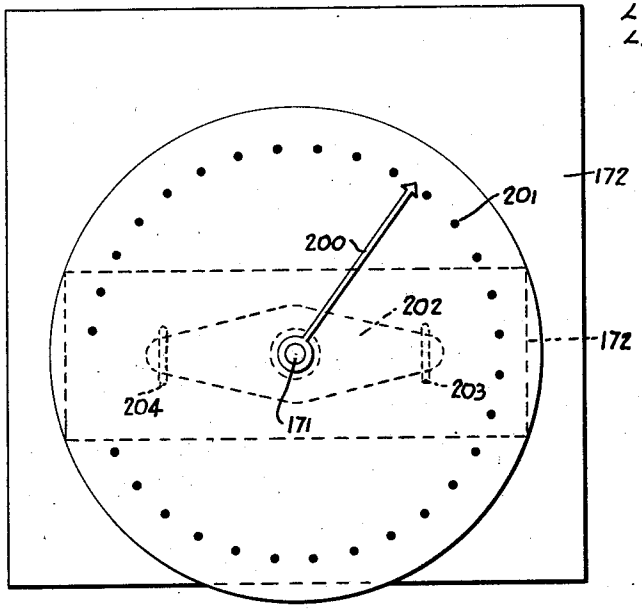


Fig. 12.

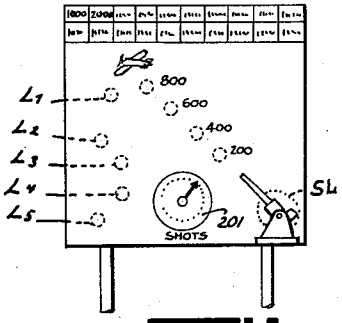


Fig. 13.

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ELECTRICALLY OPERATED MACHINE GUN APPARATUS

Filed Nov. 2, 1939 5 Sheets-Sheet 5

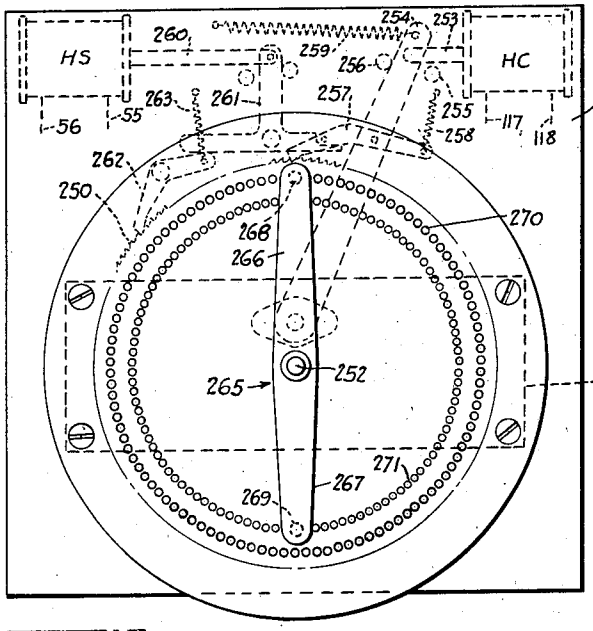


Fig. 13.

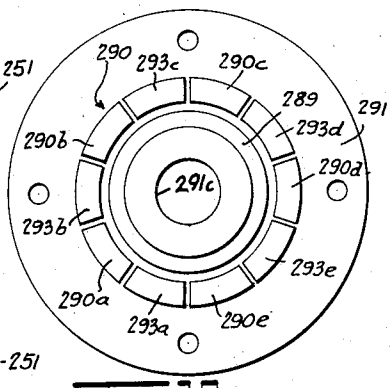


Fig. 15.

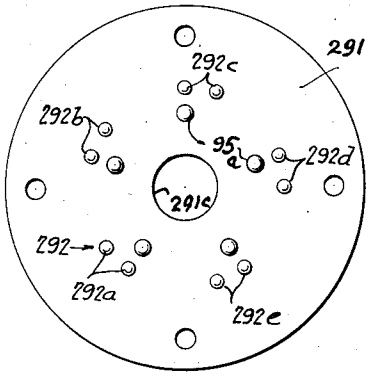


Fig. 16.

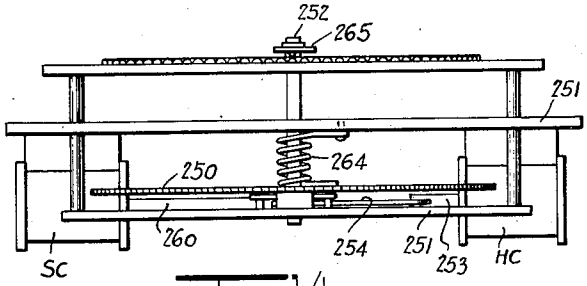


Fig. 14.

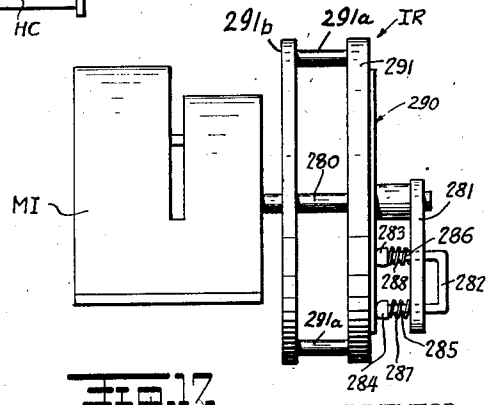


Fig. 17.

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Patented Jan. 6, 1942 2,269,410

UNITED STATES PATENT OFFICE

2,269,410

ELECTRICALLY OPERATED MACHINE GUN APPARATUS

Fred M. New, New York, N. Y., assignor to Fredcraft Corporation, New York, N. Y., a corporation of New York

Application November 2, 1939, Serial No. 302,580

20 Claims. (Cl. 273—101.2)

This invention relates to shooting devices and refers particularly to electrically operated ballistic game apparatus simulating machine gun operation.

It is a purpose of the present invention to provide apparatus of the above nature wherein objects are made to move at relatively different speeds and preferably in different directions, at least one of said objects forming a target to be aimed at.

It is another purpose of the present invention to mount at least some of such objects on rotatable transparent or translucent drums, which may be illuminated from within to make visible the objects from without in a substantially completely closed housing.

Still another purpose of the invention resides in the provision of electrical means to make and break electrical connection between a contact point adjacent an object, to which said point is related, and the aiming device carrying a complementary contact point.

A still further purpose of the invention is to arrange said aiming device (which is preferably swingably supported) with respect to a target and its related contact point such as, that, when the sight piece of said aiming device is coordinated with said target, electrical contact will be established between a part carried by the aiming device and said target contact point, thereby scoring a "hit" through an electrical circuit in which said aiming device is included, when a switch in the form of the trigger of said aiming device is closed.

Yet, a further purpose of the invention is to provide means to indicate a correct "hit" established by said closed circuit, both within and without the said housing of said apparatus.

A still further object of the present invention is to provide a circuit interrupting means operable independently of the aforementioned circuit (of which the trigger forms a part) for imitating the number of "shots" supposedly made, when the trigger is pulled; said interrupting means further operating mechanism to indicate the number of "hits" supposedly achieved.

Still another object of the present invention is to provide means for limiting swinging movement of said aiming device so that said contact part thereof always will be maintained in engagement with the outer rotatable drum carrying contact points complementary to said contact part, for which purpose the latter being made yieldable.

These and other objects are accomplished and this invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings particularly depicting a certain form of the invention have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:

Fig. 1 is a wiring diagram of electrical connections employable in an embodiment of the invention.

Fig. 2 is a side elevational view of an embodiment of the invention, the stand on which the apparatus is mounted being broken off.

Fig. 3 is a longitudinal section through the housing of the apparatus, shown in Fig. 2.

Fig. 4 is a detailed view of parts located within said housing including a portion of the inner drum.

Fig. 5 is a front elevational view of the drums visible through an end of said housing.

Fig. 6 is a top plan view showing the driving connections for the drums.

Fig. 7 is a side view of Fig. 5, parts being broken away to show certain electrical connections.

Fig. 8 is a partial plan view of the drums as seen from above to show the arrangement of the illuminating appliances, used in connection with the invention.

Fig. 9 shows the electrical connections within the lower part of one of the drums.

Fig. 10 is a rear elevational view of the shot counter unit with its relays in operative position.

Fig. 11 is a fragmentary rear elevational view of the shot counter of Fig. 10 in releasing position.

Fig. 12 is a front elevational view of the shot counter.

Fig. 13 is a front elevational view of the hit counter unit.

Fig. 14 is a bottom plan view of the hit counter unit illustrated in Fig. 13.

Figs. 15 and 16 are front and rear elevational views of a part of the interrupter unit employed in connection with the invention.

Fig. 17 is a side elevational view of the interrupter unit and its driving motor.

Fig. 18 is a schematic front view of the scoreboard employable in connection with the invention.

Now referring to the drawings and particularly to the wiring diagram shown in Fig. 1, the operation in outline of the apparatus, which in this example is coin-operated, is as follows:

The legs S, S*a* are connected to a source of power (not shown). Legs 18, 19, 18*a* lead from legs S, S*a* to the group SL of score board lights to attract the eye of the public. Leg S leads through fuse F to a timer-relay 10 and connects with one terminal of the primary of transformer T_1 through leads 11, 12 and to one terminal of the primary of transformer T_2 through conductor 16. The other leg S*a* connects with the other terminal of primary T_1 through leads 14, 15 and with the other terminal of primary T_2 through conductors 14, 17.

Timer-relay 10 is placed in circuit upon insertion of a coin in a conventional manner, whereby the slide (not shown), but well known in the art is retracted for operation of the timer-relay 10.

Secondary coils of transformers T_1 and T_2 are thereby energized making the "shooting" device ready for operation, as it will be explained hereinafter.

The apparatus is reset to its normal starting position in the following manner:

Shot reset relay SR and hit reset relay HR are set to zero through a circuit, in which momentary reset contact RC is included, which circuit comprises: secondary coil of T_1, conductor 61, terminal E, terminal B, conductors 44, 43, time delay relay R_1, conductors 42, 38, normally open switch contacts 36, 37, conductor 35, normally closed contacts 33, 34, conductors 32, 144, 31, terminal C, conductor 30 back to secondary coil of transformer T_1. Simultaneously momentary reset contact RC closes (by means of the coin-slide of the coin-operated machine) and establishes the following circuit: Secondary winding of transformer T_1, conductor 30, terminal C, conductors 31, 41, reset contact RC, conductor 40, terminal D, conductors 50, 51, 52, 53 through shot reset relay SR, conductors 54, 57, 58, 59, 60, terminal E, conductor 61 back to the secondary winding of T_1. Hit reset relay HR is in multiple with said shot reset relay SR through conductors 55, 56 and therefore, will operate simultaneously therewith.

The closing of the primary circuit of T_1 by closing the timer 10 upon insertion of said coin causes also energization of interrupter motor MI and target motor MT through the following circuits:

Motor MI: leg S*a*, terminal A, conductors 20, 21 through motor MI, conductors 24, 25, normally closed switch contacts 26 and 27, conductors 28, 16, terminal G, timer 10, conductor 11, fuse F and leg S;

Motor MT: leg S*a*, terminal A, conductors 19, 22, through motor MT, conductors 23, 25, switch contacts 26 and 27, conductors 28, 16, terminal G, timer 10, conductor 11, fuse F and leg S.

The apparatus is thus made ready for target "shooting" by the operator, who observes the targets and objects in motion on drums 75, 76 (Figs. 6 and 8) which are driven through target motor MT, which has been put in operation through the circuit hereinbefore described. Motor MT is drivingly connected to a drum 77 carrying target contacts 78, 79, 80, 81, 82. Target contacts 78, 79 are respectively related to targets 78*a* and 79*a* (Fig. 4). The target contacts 80, 81, 82 are likewise related to respective targets on drum 76, but which targets have been omitted from the drawings for the sake of clarity.

While aiming at the moving target, say 78*a*, through a lens system 100, such as for example described in copending application Serial No. 292,828, filed Aug. 31, 1939, and further through sight pieces 101, 102 (Figs. 3 and 4) the trigger switch 90 is pulled closing the following circuits through trigger contacts 91, 92:

Circuit of noise maker NM, which simulates machine gun firing noise, is established from contact 92 through conductor 93, interrupter IR, conductors 95, 30 through seconda y of transformer T_1, conductor 61, terminal B, conductor 44, reset time delay relay R_2, conductors 96, 97 back to contact 91 of trigger switch 90. Energization of relay R_2 through the said noise maker circuit causes breaking of contacts 33, 34 (normally closed) thus interrupting of the abovementioned circuit through reset time delay relay R_1 by opening contacts 36, 37 and consequently breaking the shot reset (SR) and hit reset (HR) circuits. The pulling of the trigger 90 sets shot counter SC and hit counter HC in starting operative position through the following circuits:

Shot counter SC

Contact 91 of trigger 90, conductor 110, through shot counter SC, conductors 111, 112, switch contacts 113, 114 (which are normally closed) conductors 115, 116, 57, 58, 59, 60, terminal E, conductor 61, secondary of transformer T_1, conductors 30, 95, interrupter IR, conductor 93, and then to contact 92.

Hit counter HC

Hit counter HC, conductor 118, through switch contacts 119, 120, conductors 121, 126, interrupter IR, conductors 95, 30, secondary of transformer T_1, conductors 61, 60, 59, 58, 57, 116, 115, switch contact points 114, 113, conductors 112, 117 to hit counter HC.

To actuate hit counter HC, switch contacts 119, 120, which are normally open, have to be brought into engagement which is achieved by the following circuit upon closing the same, when the target is "hit" by the operator, who is aiming at the same while pulling the trigger switch 90. This circuit comprises: Low current relay LCR, conductor 124, hunting contact 123, target contact 78, conductor 122, interrupter IR, conductors 95, 30, secondary coil of transformer T_1, conductor 61 and return conductor 125 to LCR.

Target drum 75 of translucent material is illuminated preferably from within said drum by white lights 130.

White lights 130 remain in circuit for display purposes and are only switched off when the red light 131 is put into circuit, all this being done automatically through double-throw-switch 134, 135, 136 and in the following manner:

Common leg 135 of said double-throw-switch is connected to conductor 24 and from there with conductor 25, switch contacts 26, 27, conductors 28, 16, terminal G, timer 10, conductor 11, fuse F, leg S of power line. Conductor 132 common to both white and red lights 130 and 131 is connected to conductor 19, terminal A and leg S*a* of power line.

Red light 131 is connected through conductor 137 with contact 136 of said double-throw-switch; whereas conductor 133 connects white lights 130 to the other terminal 134 of said switch. Leg 135 of the double-throw-switch is normally in

contact with terminal 134 in the white light circuit.

It is evident that, upon "hit" being made, energized relay LCR will disconnect leg 135 from contact 134 and will bring said leg 135 into contact with terminal 136, thereby putting out said white lights and switching on the red light to indicate that a "hit" has been made.

After predetermined "shots" have been made, including "hits" and "misses" normally open end switch ES is closed, as hereinafter further explained, establishing the following circuit through conductor 140, relay R_3, conductor 141, 142, 143, terminal H, conductor 144, 31, terminal C, conductor 30 to secondary coil of transformer T_1, conductor 61, terminal E, conductors 60, 59, 58, 57, 116, 146, 145 back to switch ES. The energization of relay R_3 in this circuit causes breaking of switch contacts 113, 114 as well as of switch contacts 26, 27, whereby hit counter HC and shot counter SC circuits and simultaneously the circuits for interrupter motor IM, target motor TM and white lights 130 are opened.

Referring now more in detail to the mechanical instrumentalities concerning the "shooting" apparatus, Fig. 2 shows the latter in assembled condition comprising a closed housing 150, swingably or pivotally mounted on a support 151 at 152. Projecting from the rear wall 153 of said housing 150 therewithin is a rifle-like or aiming device, generally indicated by numeral 154, having as main parts a trigger 90, a barrel 155, sight pieces 101, 102 mounted on the latter, and a universal bearing 156 positioned within said housing 150 and between said trigger 90 and said barrel 155. Further contained within said housing 150 is a drum arrangement consisting of two drums 75, 76, which are concentrically disposed and rotatable about a substantially vertical axis 157. One of said drums, for example drum 76 has a portion 77 carrying the contacts 78, 79 etc. (Fig. 4). Barrel 155 has a longitudinally slidable and yieldable end contact portion 158 carrying the contact point 123. Contact point 123 is constantly urged against the peripheral surface 159 of said drum portion 77 by means of a spring 160 seated in the barrel 155. Universal swinging movement of barrel 155 is limited by means of a stop device 160a having horizontal bars 161, 162 and vertical bars 163, 164 for the purpose to lead and guide said barrel 155 with its projecting end contact portion 158 in such manner that the contact point 123 will always contact the peripheral surface 159 of drum 77 and is prevented from slipping off or moving beyond predetermined extremities, thereby assuring smooth following of contact point 123 on said surface 159. Thus the yieldable and spring supported end portion 158 of barrel 155 is enabled to project and retract in order to span the varying distance between the peripheral surface of drum portion 77 of drum 76 and the end 155a of barrel 155, while said drum 76 is rotating.

Drums 75 and 76 may be rotated with different speeds (if desired in opposite direction) through target motor MT and by means of a suitable gearing and driving arrangement, indicated in Fig. 6 as being sprocket chains 160, 161, and sprocket wheels 162, 163, respectively.

Drums 75, 76 are concentrically mounted within a suitable framework having standards 164, 165, 166 and 167 which are fixed between base plate 168 and top plate 169. Drum 75 is supported by and journaled on the upper part of drum portion 77, the latter forming a continuation of drum 76. Target motor MT with its driving shaft 170a is also mounted on base plate 168 and is further secured in position by a spacer 171a extending between a standard of said framework and the end of said shaft 170a providing also a bearing for said shaft. Depending from top plate 169 to which it is attached, as at 169a and 169b and facing the operator is a frame or curtain 172a having a cut-out 173a through which may be viewed from the stand of the operator (not shown) scenery or panoramic view with stationary 174 and movable (78a, 79a etc. and 76a) objects, part of said movable objects 78a, 79a etc. forming the targets to be aimed at. In the present instance the stationary objects 174 are carried by said frame, while the movable objects 76a forming clouds or the like are mounted on or united with translucent drum 75 and the movable targets 78a, 79a, etc. forming airplanes are fixed to the drum 76, said drums forming rotatable screen means. It is understood that lighting effects emanating from white lights 130 and reflector screen 175 positioned behind said white lights will add life to and give anaesthetic touch to the panoramic view.

Fig. 7 illustrates cables which lead to common lead 132, white light conductor 133 and red light conductor 137 which cables project from the top of the drum 76 through hollow shaft 157.

From the interrupter IR, conductor 122 leads to a contact wiper 176, the latter engaging a disc 177 secured to the bottom of the contacts carrying drum portion 77 to rotate therewith about shaft 157. Contacts 78, 79, 80, 81 and 82 are connected together through wires 178, and to disc 177 through wire 179. Contacts 78, 79 etc. are related to targets 78a, 79a, etc. that is, for instance, when target 78a is sighted through sight pieces 101, 102 and aimed at by the operator, the contact point 123 at the barrel end contact portion 158 will engage with the contact point 78 of the drum portion 77 so that when the trigger 90 is pulled the closing of a hit counter circuit through 91, 92 (as hereinbefore described) is effected and current will flow from interrupter IR through conductor 122, contact 176, disc 177, wires 179 and 178, contact 78 on drum portion 77, contact 123 on barrel projection 158, the latter making connection through conductor 124 (see Figs. 1 and 4) to low current relay LCR.

At this moment a "hit" is counted in HC and signaled by red light 131, whereas the white lights are switched off, as heretofore explained.

Referring now to Figs. 10 to 12 which show the shot counter and shot reset mechanisms, there is provided ratchet wheel 170 on a shaft 171 rotatably mounted on frame 172. A spring (not shown) is provided to return wheel 170 to its initial starting position after the same has been rotated a predetermined amount by means of the dog 173. This dog 173 is pivotally mounted at 174a on an arm 174 which is swingable in bearing 175 about stud 176, said bearing 175 being secured to frame 172 by means of bolts 177. Dog 173 is urged into engagement with the teeth of wheel 170 by means of a spring 178. Arm 174 has attached to it at an end 179a, one end of a coil spring 179, the other end of which is secured at 179b to the frame 172. Plunger 180 of shot counter relay SC is pivotally connected at 181 to said arm 174, adjacent stops 182, 183, which limit the swinging movement of arm 174, as clearly seen in Figs. 10 and 11.

Further mounted on frame 172 is shot reset

relay SR into which slidingly projects plunger 184, at the free end of which is pivotally connected a T-shaped lever arm 185, the latter being pivoted to frame 172 at 186. Stops 187, 188 are provided for limiting swinging movement of arm 185a of said lever 185. Arm 185b of lever 185 cooperates with a pawl 189 which pivots about pin 190 on frame 172 to maintain the rotative position of wheel 170 after the latter has been moved by said dog 173. To this end pawl 189 has at one end thereof a coil spring 191 which latter is attached with its other end to frame 172 at 192 so as to urge pawl 189 against a tooth of said wheel 170. Dog 173 is guided by its stud 193 on a reduced portion 194 of arm 195 of lever 185.

Upon energization of shot counter relay SC in a manner hereinbefore explained, plunger 180 is attracted into the coil of relay SC, thereby swinging the arm 174 against action of spring 179 toward stop 183 and causing the dog 173 to engage with a tooth adjacent to the one which was previously engaged by said dog. Upon release of relay SC spring 179 which has been under tension will retract, carrying with it arm 174, the latter pushing dog 173 forwardly and thereby causing the latter to rotate said wheel 170 to a predetermined extent. To reset wheel 170 to its initial position: shot reset relay SR is actuated upon an insertion of a coin, in which case plunger 184 is drawn into coil of relay SR (upon energization of the latter in a manner hereinbefore explained) compelling lever 185 to swing about its pivot 186 against stop 187 and thereby causing pawl 189 to rotate about pivot 190 against action of spring 191. This will result in withdrawal of pawl 189 from the ratchet tooth of wheel 170, as shown in Fig. 11, and permit dog 173 through the connection of its pin 193 to be lifted against tension of spring 178, thus permitting wheel 170 by action of the said spring (not shown) to return to its starting position.

The apparatus is made inoperative by actuation of end switch ES after a certain number of shots have been made. Wheel 170 carries on one of its arms 196 an abutment 197 which closes switch ES after the wheel 170 with said abutment has been rotated to such extent representing a predetermined number of "shots," at which time said abutment 197 will cause contact between blades 198 and 199 of switch ES, thus energizing relay R_3 to disconnect switch contacts 113, 114 and 26 and 27 as explained hereinbefore. These disconnections will open up the circuits for the interrupter motor MI, target motor MT and white lights 130.

The apparatus may also be made inoperative by the timer 10 in the event that the total number of shots are not made within a predetermined time limit.

As will be realized by Fig. 12 wheel shaft 171 carries a pointer 200 which rotates over the face of dial 201. Pointer 200 may be counterbalanced by a lever 202 carrying two friction brake shoes 203 and 204 positioned at the rear of the dial plate 201.

Frame 172 may carry a distributor plug 205 which is connected by wires (not shown) to distributor panel 206 having connection terminals for the various electrical parts mounted on frame 172. Numbers indicated on panel 206 correspond to numbers on distributor plug 205. The wire connections leading to panel 206 in Fig. 10 correspond to like connections more particularly shown in wiring diagram of Fig. 1.

The hit counter HC and hit reset HR mechanisms are shown in Figs. 13 and 14 and are similar to those mechanisms illustrated in Figs. 10 and 11 regarding shot counter SC and shot reset SR, in that there is a ratchet wheel 250 rotatably mounted in a frame 251 and carried by a shaft 252. Further, relay HC and the parts in operative connection therewith, such as, plunger 253, arm 254, stops 255, 256, dog 257, springs 258 and 259 correspond to like parts and are arranged and associated and function as those parts described and shown with respect to Figs. 10 and 11.

Similarly relay HS and the parts in operative connection therewith, such as, plunger 260, T-shaped lever 261, pawl 262, spring 263 correspond to like parts and are arranged and associated and function as the parts described and shown with respect to Figs. 10 and 11.

The spring, which returns ratchet wheel 250 to its initial position (and which is similar to that stated but not shown with respect to wheel 170 of Figs. 10 and 11) is indicated by numeral 264 in Fig. 14. Whereas the mechanism of Fig. 10 is provided with a dial 201 (Fig. 12) the mechanism of Fig. 13 is provided with a contact carrying plate. On shaft 252 there is fixed to rotate therewith a double arm 265 having diametrically opposed fingers 266 and 267, the finger 266 being longer than the finger 267, said fingers carrying contact points 268 and 269, respectively. Point 268 is arranged to engage successively with contact points of a circumferentially arranged row of contacts 270 to which another row of contacts 271 is concentrically disposed. This latter or inner row 271 is engageable by contact point 269 of finger 267.

By energization of hit counter relay HC, as hereinabove explained, dog 257 will rotate forwardly wheel 250 to the extent of one tooth. Since the double arm 265 is fixed to shaft 252 on which toothed wheel 250 is likewise fixed, the said double arm will be rotated from one contact point to the next succeeding contact point on each row 270 and 271.

In my copending application Serial No. 287,047 filed July 28, 1939 (Fig. 4), there is shown a controller system with wiring connections to a score board, the controller having concentrically arranged rows of contacts for engagement respectively with contact fingers so that as "hits" are being made, circuits are closed for indicating the number of "hits" made, one row, for instance, representing scores of 200, 400, 600 and 800 and another row representing scores of 1000, 2000 etc. These rows correspond to the concentrically arranged rows 270, 271 of contacts in Fig. 13 herein and as "hits" are being made they will be reflected in a similar score board as disclosed in said copending application to which reference is hereby made for a clear understanding thereof. It is apparent, however, that any conventional hit counter system or score board may be employed for the apparatus made in accordance with this invention. In Fig. 1 two leads 58, 58a may connect with such controller system, one lead being electrically connected to the double arm 265 and the other being the return from the score board (not shown), the latter being wire connected with respective contact points of said rows 270, 271. Leads 58 and 58a are connected respectively to secondary winding of transformer T_2 (Fig. 1).

Fig. 17 shows the assembly of the interrupter unit IR with its driving motor MI. The inter-

rupter unit IR is connected to said motor MI by means of a shaft 280 having an end to which is secured a crank-like part 281. Said part 281 carries a U-shaped yoke 282 having contact shoes 283, 284. Between said part 281 and each of said shoes 283, 284 there are seated on the legs 285 and 286 of said yoke 282 respective coil springs 287 and 288 to resiliently urge said shoes respectively against the contact ring 289 and segmentary ring 290 fixed on one face of an insulated disc 291, the other face thereof carrying terminals 292. Segmentary ring 290 has its alternate segments 290*a*, 290*b*, 290*c*, 290*d*, 290*e* connected to common terminal 295 (Fig. 1) through the terminal connections 292*a*, 292*b*, 292*c*, 292*d*, 292*e*, whereas segments 293*a*, 293*b*, 293*c*, 293*d*, 293*e* are blanks and are only used to interrupt connections intermediate alternate current carrying segments 290*a*, 290*b*, 290*c*, 290*d*, 290*e*. Contact ring 289 is connected to conductor 95 (Fig. 1) through its terminal 95*a*. When motor MI is rotating shaft 280, the latter will carry with it yoke 282 and since the shoes 283, 284 bridge ring 289 and the aforesaid segments, said yoke will establish electrical connection between ring 289 and each current carrying segment 290*a* or 290*b* or 290*c* or 290*d* or 290*e* and therefore between conductors 95 and 295, but the current will be interrupted at the segments 293*a*, 293*b*, 293*c*, 293*d* and 293*e* between said current carrying segments.

Insulated disc 291 is fixed to studs 291*a* of a disc-shaped mounting 291*b*, the said disc having an opening 291*c* and the said mounting having a similar opening (not shown) through which shaft 280 projects for free rotation carrying with it part 281 and yoke 282.

By this simple and effective arrangement the current flowing through the trigger circuit, whether a target is "hit" or not, is interrupted and said circuit made and broken for producing impulses (representing "shots") to the shot counter relay SC for ultimate recording by the indicator 200 of Fig. 12 of the number of "shots" made.

Summarizing the operation of the apparatus, the same is actuated by insertion of a coin into a coin-slot of conventional type, which closes the timer circuit, when the slide of said coin-slot is pushed inwardly (as it is well known in the art), and energizes thereby the shot and hit counter reset circuits through transformer T_1. Since simultaneously white lights 130, the motor MI for interrupter IR and also the motor MT for target drums are put into respective circuits, the apparatus is thus placed in its initial starting position. If now trigger 90 is pulled, the circuit for the noise maker NM, as well as the circuit for shot counter SC are closed and will open and close again in accordance with the operations of interrupter IR. While moving barrel 155 of the "shooting" device 154 and if proper aim is made at the moving targets 78*a* or 79*a*, etc., electrical contact between contact point 123 of barrel part 158 and the contact point 78 or 79, etc. will be established, thus completing the circuit for low current relay LCR, which influences switch contacts 119—120 and double-throw-switch 134—135—136, whereby white lights 130 are shut off and the red light 131 is put on and further hit counter HC is actuated to rotate wheel 250 for further indicating the number of "hits" on a scoreboard, such as that shown schematically in Fig. 18.

Although the said scoreboard and the wiring connections between it and the conductors 58, 58*a* of Fig. 1 may be one of any of the conventional types to indicate the number of electrical make-and-breaks in an amusement device, it is preferable to employ an indicating device having a scoreboard and electrical wiring connections thereto similar to those disclosed in said copending patent application Serial No. 287,047.

Timer 10 sets the time limit during which the apparatus may be operated by a single coin, whether "hits" are made or not. However, if the predetermined number of "shots" have been consumed (each "shot" represented by an interruption caused by interrupter IR), shot counter unit (Fig. 10) which is thereby operated will close through its abutment 197 end switch ES, which latter will cause relay R_3 to be energized for actuation of the circuit breaker and separating its contacts 113, 114 and 26, 27, whereby the circuits for the motors MT and MI will be opened and the apparatus will thus cease to function (independently of the timer 10) until another coin is inserted in the coin slot (not shown). Upon insertion of said another coin, the apparatus is made operative again, reset mechanisms, as hereinbefore explained, will function to permit wheels 170 (Fig. 10) and 250 (Fig. 13) to be reset, thus disconnecting end switch blades 198, 199 from each other, deenergizing relay R_3 and closing again normally closed switch contacts 113, 114 and 26, 27 for a new performance.

The apparatus may be further equipped with a device similar to the interrupter unit IR as disclosed in Figs. 16 to 18, which device may be utilized to intermittently light up successive bulbs indicating various stages of a falling target (such as an airplane), when "hit" in accordance with the above-described manner. Such bulbs are generally outlined on scoreboard shown in Fig. 18 and indicated by L_1 to L_5.

It will thus be seen that there has been provided by this invention an apparatus of the character described in which the various objects hereinabove set forth, together with many thoroughly practical advantages, are successfully achieved.

As many possible embodiments may be made of the above invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matters hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Referring to Fig. 1 that portion thereof between dot-and-dash lines X—X and Y—Y is located within said housing 150, whereas the portion below line Y—Y is positioned in base 151, and the portion above line X—X is placed in scoreboard, shown in Fig. 18.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. An apparatus of the character described comprising a movable target having one contact point coordinated therewith, an aiming device for said movable target and having another contact point, and electrical means provided in a circuit, said circuit being closable, when said contact points are brought into electrical engagement with each other, to indicate through said electrical means, if said movable target is properly aimed at by said device, said electrical means including groups of lamps positioned behind said movable target to illuminate the latter in ac-

cordance with the make and breaks of said contact points.

2. An apparatus of the character described, comprising rotatable means, a target, a first electrical circuit, a contact point in said first circuit and coordinated with said target, said rotatable means having at least a translucent portion carrying said target thereon, a second electrical circuit, means in said second circuit to illuminate said translucent portion, said means including differently colored lamps, a first and a second group, respectively, a device for aiming at said target, a complementary contact point on said aiming device and adapted for engagement with said target contact point for closing said first circuit upon proper aiming at said target, and electrical means in said second circuit, said electrical means being under influence of said first circuit when the latter is closed for indicating through said translucent portion by one of said groups of lamps, if said target is properly aimed at.

3. An apparatus of the character described, comprising a housing, a first rotatable means, a second rotatable means, both of said means carrying different objects and rotating relatively to each other about an axis, one of said means being provided with electrical contact points, each contact point being coordinated with an object carried by said one of said means, lamp means adapted to illuminate said objects on both of said rotatable means, said rotatable means being concentrically arranged within said housing, an aiming device swingably mounted at a wall of said housing and projecting from without into said housing, said device being adapted for alignment with an object on said one of said means and being provided with an electric contact point complementary to each one of said first-named contact points, and an electric circuit, said circuit being closable by said complementary contact point upon producing electrical connection between it and one of said first-named contact points, whereby proper alignment of said device with an object with which said one of said first-named contact points is coordinated, is indicated through said circuit by said lamp means.

4. An apparatus of the character described, comprising a movable carrier, a target, a contact point coordinated with said target, said target and said contact point located on said carrier, means illuminating said target through said carrier, said illuminating means including groups of electric lamps, first and second group, respectively, a first electrical circuit, a second electrical circuit, said illuminating means being included in said second circuit, a device for aiming at said target and having a contact piece, said piece being brought in electrical connection with said contact point and closing said first circuit upon proper aiming at said target by said device, said closed first circuit electrically influencing said second circuit, whereby said first or said second group of electric lamps is put into said second circuit.

5. An apparatus of the character described, comprising, a target, an aiming device in front of said target, and means in the rear of said target, said means including groups of electric lamps, first and second, respectively, said aiming device being adapted to be swung into and out of alignment with said target, said first of said groups illuminating said target when said aiming device is in said aligned position, said second of said groups illuminating said target when said device is in out-of-alignment position.

6. An apparatus of the character described, comprising a translucent carrier, a target positioned on said carrier, indicating means, a device for aiming at said target and located in front of said carrier, said carrier being rotatable about said indicating means and illuminated thereby, and means for making inoperative one of said indicating means and making operative another of said indicating means upon said device being properly aimed at said target during rotation of said carrier.

7. An apparatus of the character described, comprising a housing, a translucent drum carrying a target thereon and rotatable about a substantially vertical axis, a device for aiming at said target and positioned in front of said drum, indicating means surrounded by said drum, said drum, said indicating means and the front portion of said device being positioned within said housing, and indicating means remote from said housing, both of said indicating means signalling the result of the accurate aiming at said target by said device.

8. An apparatus of the character described comprising screen means rotatable about a substantially vertical axis, a target, a contact point for said target and positioned in proximity of said target, said target being carried on said screen means, means to rotate said screen means together with said target and said target contact point, an aiming device for said target and carrying a contact point, an electrical circuit, and electrical means in said circuit, said circuit being connected to said contact points and being closable when both contact points are in engagement with one another whereby to indicate through said electrical means in said closed circuit if said target is properly aimed at.

9. An apparatus of the character described comprising a drum rotatable about a substantially vertical axis, means adapted to continually rotate said drum, said drum having a translucent portion, a target mounted on said portion, a target contact point positioned adjacent said target on said drum, an aiming device for said target and carrying a contact point, an electrical circuit, and electrical means in said circuit and positioned behind said portion, and circuit being connected to said contact points and being closable when both contact points are in engagement with one another whereby to indicate through said electrical means if said target is properly aimed at.

10. An apparatus of the character described comprising a drum rotatable about a substantially vertical axis and having a screen portion, means to rotate said drum, a target on said screen portion, a contact point for said target located on said drum, an aiming device for said target and carrying a contact point in front of said drum, an electrical circuit, said contact points being connected to said circuit, and electrical means in said circuit and located behind said screen portion, said circuit being closable when both said contact points are in engagement with one another whereby to indicate through at least one of said electrical means on said screen portion if said target is properly aimed at.

11. An apparatus of the character described comprising a drum rotatable about a substantially vertical axis, said drum being provided with a first portion forming a screen and a second portion, means to rotate said drum, a target on

said screen portion, a target contact point on said second portion, an aiming device for said target and carrying a contact point in front of said drum, an electrical circuit, said contact points being connected to said circuit, said contact point of said aiming device being movable over said second portion, and electrical means in said circuit and behind said screen portion, said circuit being closable when both said contact points are in engagement with one another whereby to indicate through at least one of said electrical means on said screen portion if said target is properly aimed at.

12. An apparatus of the character described comprising means provided with a curved surface and rotatable about a substantially vertical axis, a target, a target contact point, said target and said target contact point being carried by said surface in spaced apart relation, driving means to rotate said first means, an aiming device for said target and carrying a contact point engaging said surface, an electrical circuit, said contact points being connected to said circuit, and electrical means provided in said circuit, said circuit being closable upon bodily engagement of said contact points with one another whereby to indicate through said electrical means at said surface if said target is properly aimed at.

13. An apparatus of the character described comprising rotatable screen means, first and second, respectively, a target, a target contact point, said target and said contact point being carried by said first means, at least one object being carried by said second means, means adapted to rotate said screen means relatively to each other about a substantially vertical axis, a device for aiming at said target in front of said screen means, a contact point connected to said device, an electrical circuit, said circuit being operable for opening and closing the same by said contact points, and indicating means in said circuit, said indicating means signaling on said screen means opening and closing operations of said circuit whereby the result of aiming at said target may be determined.

14. An apparatus of the character described comprising rotatable screen means having a surface and provided with a substantially vertical axis, a target, a contact point for said target said target and said contact point being carried by said surface and in spaced apart relation means to rotate said screen means, an aiming device including sight means and a complementary contact point, said complementary contact point and said sight means being carried by said device in spaced apart relation, said complementary contact point being in permanent engagement with said surface and registrable with said target contact point, an electrical circuit, said contact points being connected to said circuit, and indicating means, said indicating means being includable in said circuit upon registry of said contact points with one another whereby said indicating means signal on said screen means if said target is properly aimed at through said sight means.

15. An apparatus of the character described comprising rotatable screen means provided with an upper portion and a lower portion, respectively, said upper portion being of translucent material, a target, a contact point for said target, said target being placed on said upper portion, said target contact point being located on said lower portion, means to rotate said screen means, an aiming device provided with sight pieces and carrying a complementary contact point, said complementary contact point and said sight pieces being disposed at said device in spaced apart relation, said complementary contact point being urged to abut against said lower portion and engageable with said target contact point, an electric circuit, said contact points being connected to said circuit, and indicating means adjacent said screen means, said indicating means being includable in said circuit upon engagement of said contact points with one another whereby to signal by said indicating means on said screen means that said target is properly aimed at through said sight pieces.

16. An apparatus of the character described comprising screen means rotatable about a substantially vertical axis, means to rotate said screen means, a target, a contact point coordinated with said target, said target and said contact point being carried by said screen means, a swingable aiming device for said target, said device being provided with a contact point projecting therefrom and springedly urged to rest on said screen means, an electric circuit, and electrical means including lamp means provided in said circuit, both said contact points being connected to said circuit, said lamp means being encased by said screen means, said circuit being closable when both said contact points are brought in engagement with one another to indicate through said lamp means, if said target is properly aimed at by said device.

17. An apparatus of the character described comprising a base, a target rotatable about a substantially vertical axis supported by said base, an electrical contact point for said target, said target and said contact point being disposed in fixed and spaced apart relation with respect to said axis, a device swingably mounted on said base and provided with sight pieces for observing therethrough and aiming at said target, an electrical contact point carried by said device and engageable with said target contact point, an electric circuit, said contact points being connected to said circuit, and electrical means for indicating when said target is in substantial alignment with said sight pieces, said indicating means being includable in said circuit upon said alignment being attained and upon engagement of said contact points with one another.

18. An apparatus of the character described comprising a translucent carrier rotatable about a substantially vertical axis, a target positioned on said carrier, means to rotate said carrier, colored lighting means to illuminate said target on said carrier and located adjacent the latter, a device provided with sight pieces for observing therethrough and aiming at said target, an electric circuit, and means in said circuit for changing-over from one to another of said lighting means whereby to indicate, if said target is properly aimed at.

19. An apparatus of the character described comprising a translucent drum, said drum being rotatable about a substantially vertical axis. means to rotate said drum, colored lamp means encased by said drum, and a device for aiming at said target and positioned in front of said target, said device and said lamp means being connected to an electric circuit, said lamp means illuminating said drum in different colors, respectively, for signalling the result of aiming at said target by said device.

20. An apparatus of the character described comprising stationary means carrying an object

representing a landscape, rotatable carrier means, first and second, respectively, an airplane target, a target contact point, said target and said contact point being carried by said first carrier means, another object representing part of the sky carried by said second carrier means, both said rotatable carrier means being adapted to move relatively to each other, means to move said rotatable carrier means relatively to said stationary means, a device for aiming at said target, a contact point connected to said device, an electrical circuit, said circuit being operable for opening and closing the same by said contact points, and indicating means in said circuit, said indicating means signalling said opening and closing operations of said circuit whereby the result of aiming at said target may be determined.

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