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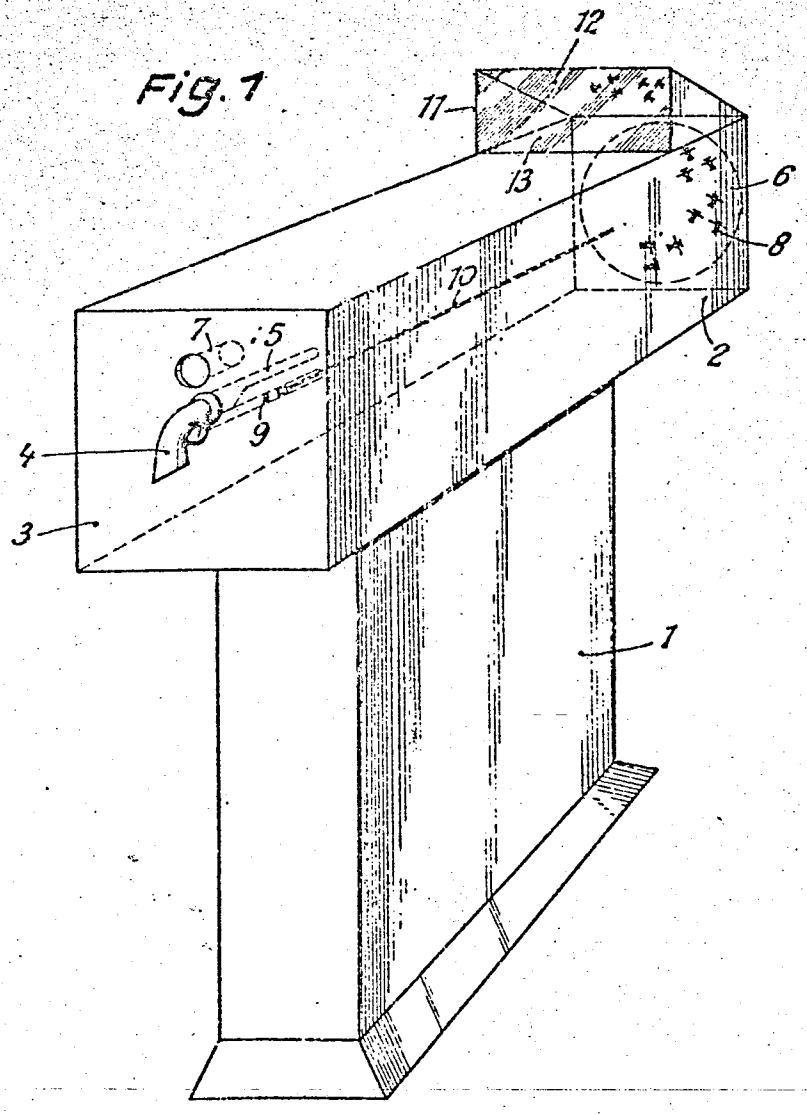
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Dec. 6, 1938. E. SAUERBIER 2,139,210

BALLISTIC GAME APPARATUS

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Fig. 1




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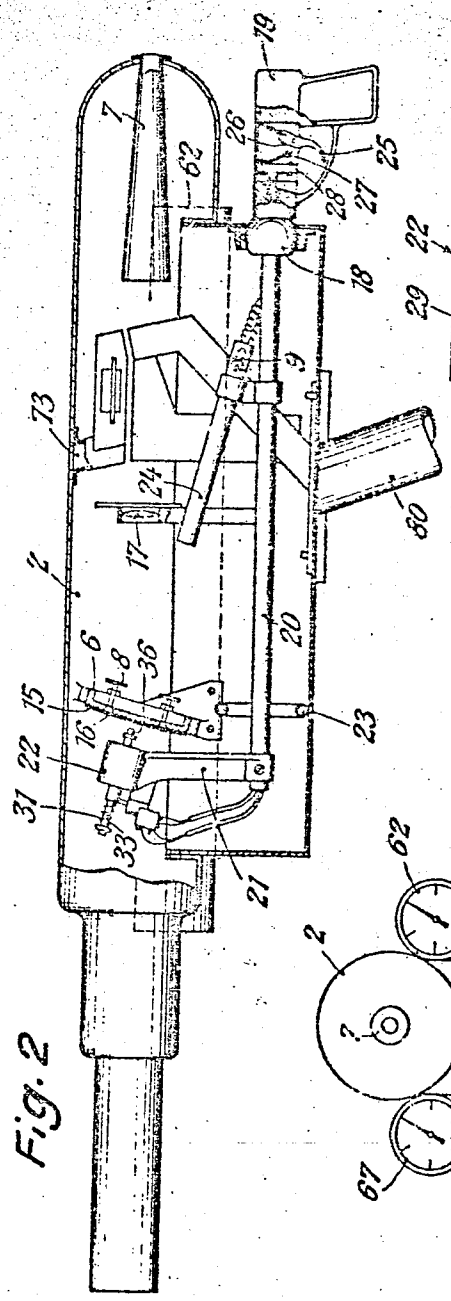


Fig. 2

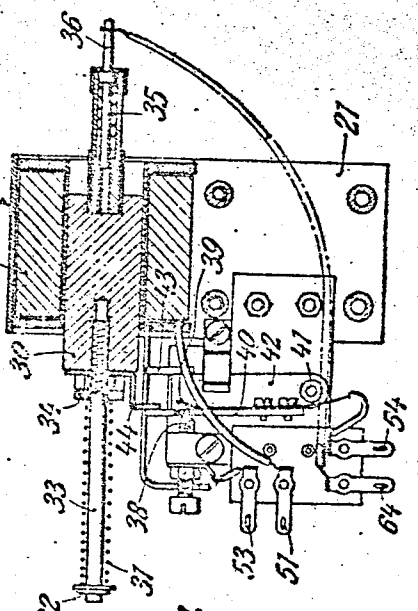


Fig. 4

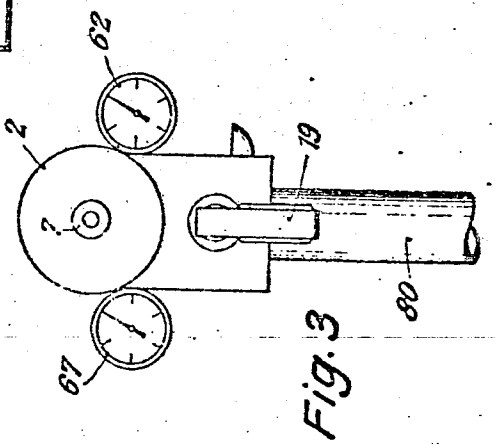


Fig. 3

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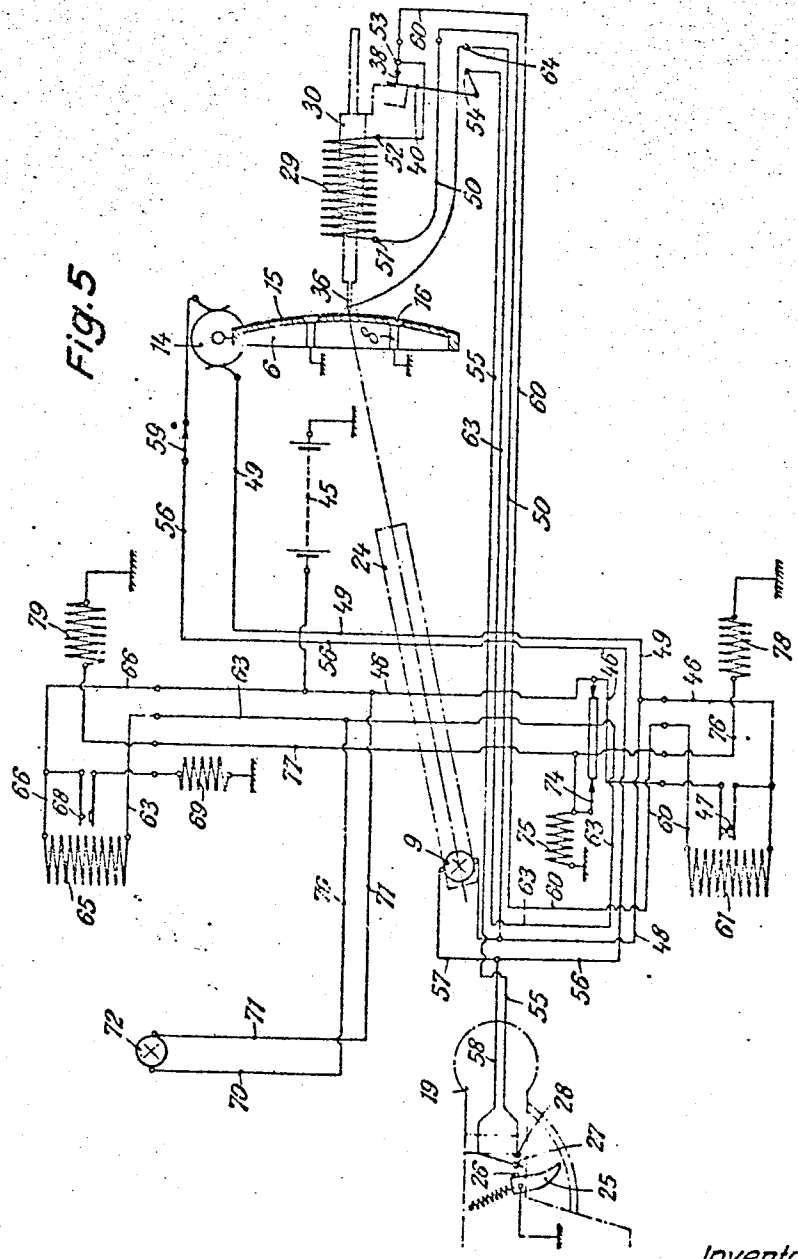
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Fig. 5



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# UNITED STATES PATENT OFFICE

2,139,210

## BALLISTIC GAME APPARATUS

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Application March 15, 1938, Serial No. 196,066
In Germany March 16, 1937

13 Claims. (Cl. 273—101.1)

This invention relates to ballistic game apparatus in which the player tries to hit a movable aim.

It is an object of the invention to provide an improved apparatus of the kind described.

To this end, the apparatus is equipped with a casing from which light is excluded, and a movable aim is arranged in the casing. In a preferred embodiment of the invention a target is mounted to rotate in the darkened casing and carries a plurality of aims, for instance, representations of airplanes. A projector projects a ray of light against the movable aim, or the rotary target, as the case may be, a sight is arranged for observing the aim, or aims, and a scanning device is combined with the projector and arranged to be operated in such manner that the axis of the projector and the axis of the scanning device intersect at the aim.

The scanning device may be independent of, or operatively connected to, the projector. In the first case, it is possible to operate the projector with one hand, and the scanning device with the other, to make their axes intersect at the aim. In the second case, the scanning device is operatively connected to the projector, and the intersection of the axes is effected positively.

The term "scanning device" includes an imitation of a gun by which a projectile is thrown against the aim, and a scanning device proper by which the aim is merely aimed at, and a scanning member, or scanning point, is provided for indicating when the aim would have been hit.

In the accompanying drawings an apparatus equipped in imitation of a gun as the scanning device, and one equipped with an electric scanning device, are illustrated by way of example.

In the drawings

Fig. 1 is a perspective illustration of the first-mentioned apparatus,

Fig. 2 is a partly sectional elevation of the second-mentioned apparatus,

Fig. 3 is an end elevation of the apparatus, viewed from the right in Fig. 2,

Fig. 4 is a partly sectional elevation of an interrupter forming part of the apparatus, and

Fig. 5 is a diagram of its connections.

Referring now to the drawings, and first to Fig. 1, a casing 2 from which light is excluded, is placed on a base 1. Projecting from the front end wall 3 of the darkened casing is the butt 4 of a gun whose barrel 5 projects into the casing. A target 6 is arranged at the opposite end of the casing, and rotated, or otherwise moved, continuously by a suitable motor, not shown. Aims 8, here shown as pictures of airplanes, are painted on the target 6.

A light projector 9 is rigidly connected to the scanning device, or gun, 4, 5 and its light ray 10 illuminates a small portion of the target 6. The axes of the gun and of the projector are so arranged as to intersect at the target.

A sight 7 is secured in the front end wall 3 of the casing above the butt 4 of the gun through which the player observes the target. If desired this sight may be equipped with optical means by which the aims 8 are enlarged or reduced to make them appear nearer or farther away.

If it is desired that other persons should observe the operation of the apparatus, a hood 11 is arranged above the target 6, with an inclined mirror 12 above a hole 13 in the top of the casing 2. Instead of cutting away the wall of the casing at 13, it may be made transparent at this point, for instance, be made of glass.

The scanning device, or gun, 4, 5, and the projector 9 which, as mentioned, is rigidly connected to the gun, are mounted in a spherical bearing, or some other suitable device, permitting of universal movement of the two elements. The player has the impression of a night sky, since the casing 2 is darkened, and the aims 8 only become visible if moving through the light ray 10. He now tries, by rocking the gun and the projector, to hit one of the aims 8 with a projectile from the gun.

Instead of being rigidly connected, as shown, the gun 4, 5 and the projector 9 may also be arranged for independent movement, as mentioned, so that the operator handles the gun with one hand, and the projector with the other.

Referring now to Figs. 2 to 5, this apparatus is one in which the aim is merely scanned, and no projectile is thrown against it. The number of scanning operations performed by the player is indicated on the dial 62 of an automatic counter, and the number of "hits" is indicated on a similar dial 61, Fig. 3. In the example illustrated, the apparatus is shaped like an anti-aircraft gun whose darkened casing 2 is supported by a suitable column, or tube, 60. It is coin-freed, 73 being the coin chute.

The scanning device is mounted in a spherical bearing 18 in the front end wall of the casing 2. The projecting end of the scanning device is shaped like the butt 19 of a pistol, with a trigger 25. The target 6 is inclined, as shown in Fig. 2, but has been shown vertical in the diagram Fig. 5 for the sake of simplicity. The sight 7 is ar-

ranged above the butt 19 and a lens 17 may be inserted between the sight and the target.

The target is rotated by a motor 14, Fig. 5, and is supplied with current from one terminal of a battery 45 whose other terminal is earthed. The target is made of metal, of spherical configuration, and covered with a layer 15 of insulating material at its back. The aims 8 are pins with widened heads 16 extending through the insulating material, and are earthed, or connected to the earthed terminal of the battery 45. A point 36 of an interrupter 22 is arranged to engage the heads 16 of the aim pins 6.

The interrupter 22 is mounted in a bracket 21 at the end of a rod 20 which extends inwardly from the ball bearing 18 of the scanning device. An annular check 33 limits the oscillation of the scanning device about its ball bearing 18 so that the movement of the interrupter point 36 is limited to the area of the target. A projector tube, with a lamp 9 at its lower end, is secured to the rod 20 at such an angle that its ray strikes the target 6 on its front side at a point which is exactly opposite the point where the armature point 36 of the interrupter 22 is positioned at the rear side of the target.

The trigger 25, as best seen in Fig. 5, is equipped with a return spring, and its pivot is earthed. A contact 26 is secured on the trigger. When the trigger is puller, its contact 26 first engages a contact 27 at the free end of a spring, and finally forces this contact against a fixed contact 28. The spring supporting the contact 27 is connected to a wire 53 from whose end a wire 57 extends to one terminal of the lamp 9 and a wire 56 with a manually operated switch 59 extends to one terminal of the motor 14. By the switch 59 the motor 14 is cut out for arresting the target 6.

From the fixed contact 28 a wire 55 extends to one terminal 54 of the interrupter 22. The interrupter is equipped with a coil 29 whose inlet end 51 is connected to the wire 58 by a wire 50.

When the trigger 25 is pulled, the contacts 26 and 27 close the circuits of the lamp 9 and the motor 14, the target 6 starts rotating and is illuminated by the ray of the projector 24. As in the apparatus described, the player sees what appears to be a night sky where the aims 8 only become visible when moving through the projector ray. By pulling further the trigger, the operator causes the contacts 27 and 26 to engage and to make the circuit of the interrupter 22.

The coil 29 of the interrupter, Fig. 4, has an armature 30 which it attracts, when excited, against the action of a return spring 31. The spring is placed on a rod 33 projecting from the armature, and is inserted between a disk 32 at the free end of the rod, and a fixed abutment 34 of the bracket 21. At the end which is opposite the rod 33, and facing the back of the target 6, is arranged the point 36 which is guided in a tubular extension of the armature 30, and urged toward the target 6 by a spring 35. When the armature is attracted by the excited coil 29, the free end of the point 36 is forced against the insulating layer 15 of the target 6 at that point where the target is struck by the projector ray at its opposite side. The point is determined by the anguiar position of the scanning device.

Connected to the terminal 54 which, as described, is connected to the contact 28 by the wire 55, is an interrupter comprising an adjustable check 38, and a spring 39. The spring 39 is arranged on an arm 40 which is pivoted on a support 42 at 41. 43 is a, preferably adjustable, check at the free end of the arm 40. A dog 44 on the armature 30 extends into the space between the check 43 and the arm 40.

When the coil 29 is de-energized the return spring 31 moves the armature 30 to the left in Fig. 4, and the dog 44 moves the arm 40 against the check 33 which now makes contact with the spring 39 through a hole in the arm. This makes the circuit of the coil 29. On the other hand, when the coil 29 is excited and attracts its armature, the dog 44 strikes the check 43 when it has moved far enough to the right and, upon further movement in the same direction, separates the spring 39 from the check 38, interrupting the circuit of the coil 29 and allowing the return spring 31 to return the armature 30 into its initial position where the circuit of coil 29 is again made. It will be understood that the interrupter 22 operates as an automatic cut-out but at a comparatively low frequency since the circuit of coil 29 is only interrupted after the armature 30 has moved through a given distance. The frequency can be regulated within certain limits by adjusting the check 43, and it must be such that the knocking of the point 36 against the back of the target 6 makes the impression of machine-gun fire.

The outlet terminal 52 of the exciter coil 29 is connected to the contact check 38 at 53. When the spring 39 on the arm 40 makes contact with the check, the terminal 52 is connected to the contact 28 through wire 55.

From 53 a wire 60 extends to a coil 61 which through a magnet armature, or the like, operates the operation counter 62, Fig. 3. The coil 61 is connected to the wire 46 which, as described, is connected to the terminal 51 of the coil 29 by wires 48 and 50 so that the counter coil 61 is connected in parallel to the interrupter coil 29. It is therefore energized and de-energized at the same time as the coil 29 and the indicator on the dial is moved on for one numeral for every reciprocation of the armature 30. By these means, the counter 62 shows how often the point 36 has engaged the back of the target 6 and is designed for opening the switch 47 in the wire 46 after a given number of scanning operations, say, 250.

The point 36 is connected to a terminal 64, Fig. 4, which, in turn, is connected to the coil 65 of the hit counter 67 by a wire 63. The coil 65 is also connected to battery 45 by wire 66. The hit counter coil 65 is excited when the point 36, upon attraction of armature 30, strikes one of the heads 16 at the back of the target, i. e., the aim has been hit by the player. Mechanical or optical signalling means such as an incandescent lamp 72 connected to the wires 63 and 46 by wires 70 and 71, may be provided for indicating the hits to other persons.

The hit counter 67 can be equipped with a premium-paying mechanism. The premia are paid by a device having an electromagnet 69 connected to wire 66 by a wire including a switch 68. The switch 68 is normally open and is closed by the counter 67 after a predetermined number of hits.

The coin control will now be described. A coin inserted in chute 72 passes a coin tester and then arrives in the position illustrated in Fig. 5 where it completes an auxiliary circuit 74. The auxiliary circuit is connected to magnet 75 which operates a delayed coin ejector which at the same time may be a counter, and to two magnets 78 and 79

by wires 76 and 77, respectively, which return the counters 62 and 67 into zero position.

As mentioned, the switch 47 is opened by the operation counter 62 when the maximum number of operations has been attained. When the magnet 78 returns the counter to zero position, the switch 47 is closed and the apparatus is returned into active position.

The operation is as follows:

The player seizes the butt 79 of the scanning device and pulls the trigger 25. When contacts 26 and 27 engage the circuits of lamp 9 and motor 14 are closed, as described, and the player now observes, through the sight 7, a bright circular spot of light at the centre of the target 6 at the rear of the apparatus. He now tries to catch one of the aims 8 on the target and to follow it with the spot of light by turning the scanning device in its bearing 18. He now pulls the trigger 25 further to place the contact 27 against the fixed contact 28 and to close the circuit of the interrupter coil 29. The point 36 of the armature 30 now begins to knock against the back of the target and the current impulses produced thereby are transmitted to the coil 61 of counter 62, and indicated. On the other hand, since the back of the target 6 is lined with insulating material 15, the circuit of the coil 65 of the hit counter 67 can only be closed if the point 36 strikes one of the heads 16. This, however, will only occur if the aim is exactly at the center of the light spot as the axis of armature 30 is the extension of the projector axis.

This operation is continued until the counter 62 opens the switch 47 so that the apparatus must be made ready for use by throwing in another coin at 73. The delayed operation of the ejector magnet 75 is provided in order to effect reliable operation of the electromagnets 78 and 79 after the insertion of a coin.

The column 80 may be made adjustable as to height, and may also be arranged to be tilted, if desired.

I claim:

1. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, a scanning device for positioning the point with respect to the aim, and electric means on the scanning device for operating the point.

2. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged to reciprocate in the axis of the ray, an automatic cut-out for operating the point, a scanning device for positioning the point with respect to the aim, and electric means on the scanning device for controlling the cut-out.

3. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged to reciprocate in the axis of the ray, an automatic cut-out for operating the point, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for controlling the cut-out, and an operation counter under the control of the automatic cut-out.

4. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged to reciprocate in the axis of the ray, an automatic cut-out including an exciter coil for operating the point, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for controlling the cut-out, and an operation counter including a coil connected in parallel to the exciter coil.

5. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged to reciprocate in the axis of the ray, an automatic cut-out for operating the point, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for controlling the cut-out, a circuit connected to the electric means, an operation counter under the control of the automatic cut-out, and an interrupter switch arranged in the circuit and under the control of the operation counter.

6. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for operating the point, and a hit counter under the control of the point.

7. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for operating the point, a hit counter under the control of the point, and a premium-paying mechanism under the control of the hit counter.

8. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for operating the point, and signalling means under the control of the point.

9. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, contact pins in the aim adapted to be engaged by the point, a circuit including the pins and arranged to be made and broken by the point, a hit counter in the circuit, a scanning device for positioning the point with respect to the aim, and electric means on the scanning device for operating the point.

10. In a coin-controlled ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged to reciprocate in the axis of the ray, an automatic cut-out for operating the point, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for controlling the cut-out, an operation

counter under the control of the cut-out, a circuit arranged to be made by a coin, and a coil in the circuit for returning the operation counter into zero position.

11. In a coin-controlled ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, a scanning device for positioning the point with respect to the aim, electric means on the scanning device for operating the point, a hit counter under the control of the point, a circuit arranged to be made by a coin, and a coil in the circuit for returning the hit counter into zero position.

12. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, an electric motor for driving the aim, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, circuits connected to the motor, the projector, and the scanning point, a scanning device for positioning the point with respect to the aim, and means on the scanning device for first making the projector and motor circuits, and then the circuit of the scanning point.

13. In a ballistic game apparatus, a casing from which light is excluded, a movable aim in the casing, an electric motor for driving the aim, a projector for projecting a ray of light against the aim, a sight for observing the aim, a scanning point arranged in the axis of the ray, circuits connected to the motor, the projector, and the scanning point, a scanning device for positioning the point with respect to the aim, a trigger on the scanning device, a contact on the trigger, a spring connected to the motor and projector circuits, a contact on the spring arranged to be engaged by the trigger contact, and a fixed contact connected to the circuit of the scanning point and arranged to be engaged by the contact on the spring after the contacts on the trigger and the spring have been placed into co-operative relation.

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