

No. 815,117.

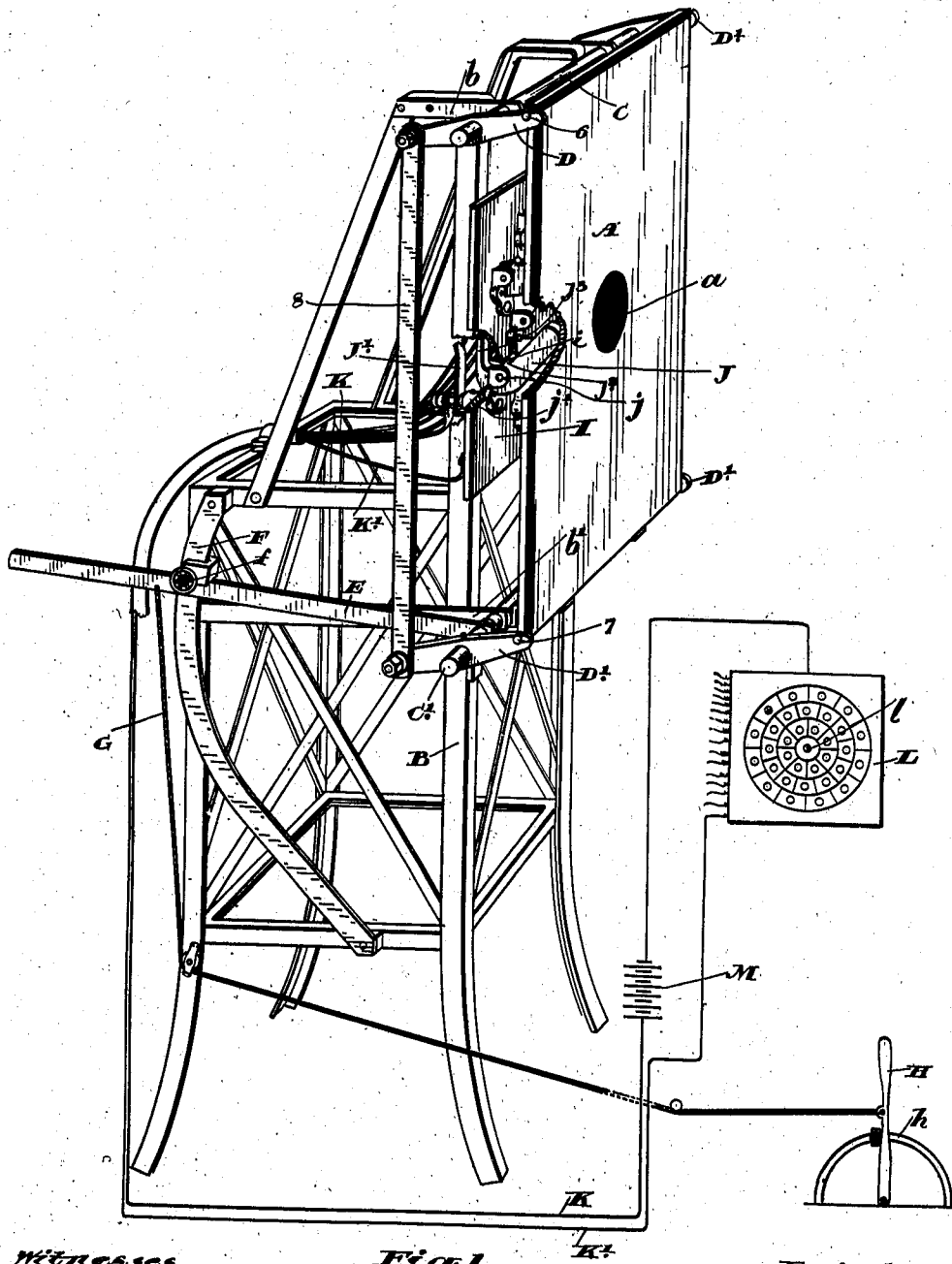
PATENTED MAR. 13, 1906.

G. A. PETERS.

SELF REGISTERING ELECTRICALLY OPERATED SECTIONAL TARGET.

APPLICATION FILED APR. 5, 1904.

2 SHEETS—SHEET 1.



Witnesses.
Henry S. Goring.
Chas. R. K.

Fig. 1.

Inventor
G. A. Peters.
by
Fred B. Lathrop
Att'y.

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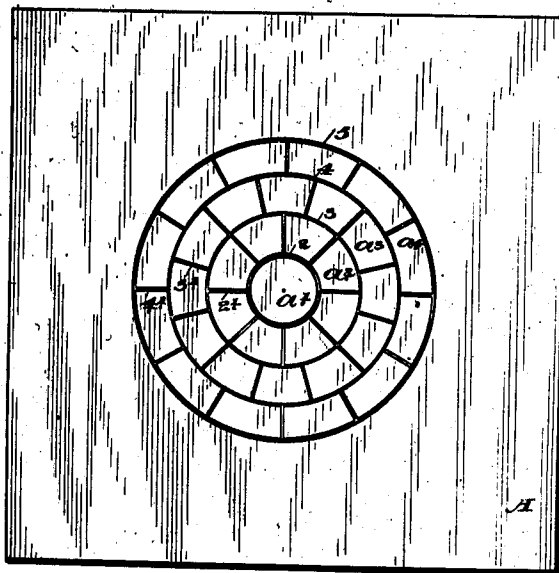
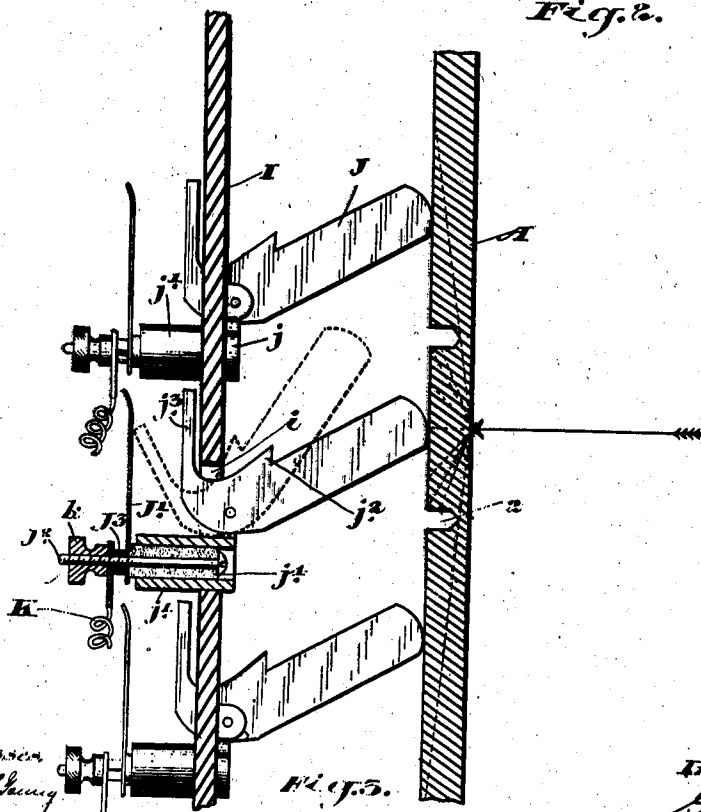


Fig. 2.



12 Messrs.
Henry J. S. J. J.
J. B. B.

Trevorton:

G. A. Peters

Key
Fred B. Litchford
Atty.

UNITED STATES PATENT OFFICE.

GEORGE ARMSTRONG PETERS, OF TORONTO, CANADA.

SELF-REGISTERING ELECTRICALLY-OPERATED SECTIONAL TARGET

No. 815,117.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed April 5, 1904. Serial No. 201,779.

To all whom it may concern:

Be it known that I, GEORGE ARMSTRONG PETERS, physician, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Self-Registering Electrically-Operated Sectional Targets, of which the following is the specification.

My invention relates to improvements in self-registering electrically-operated sectional targets, application for which was filed in the United States Patent Office on the 26th of March, 1903, under Serial No. 149,745.

The present invention is designed to simplify and cheapen the construction of the target, make it more durable and less liable to get out of order, insure accuracy of registration, and secure a construction in which all portions of the operating mechanism will be entirely shielded. Provision is made whereby the operating mechanism is capable of being adjusted for different ranges and for different weights and velocities of ammunition; further, to produce a challenge mechanism which will test accurately every portion of the operating and registering mechanism.

It consists of a target made of a single plate of metal divided on the back surface by radial grooves into a central circle and a series of arc-shaped concentrically-arranged potential sections corresponding to the individual units of the operating mechanism at the back of the target-plate; a rocking frame consisting of rocking shafts journaled in bearings on the main frame, to which shafts are attached; at each end rocking arms pivotally connected at their front ends to the top and bottom corners of the target-plate and connecting together by vertical connecting-rods at their rear extremities; of hammers pivotally supported in suitable bearings on a supporting-plate at the back of the target-plate designed to rest with their front ends against the back of the target-plate, so as to divide it potentially into sections, the division of the target-plate into the aforesaid sections being set up by the impact of the bullet upon any particular area responding to any particular hammer; of corresponding contact-fingers for the hammers suitably insulated from the supporting-plate of the hammers; of an annunciator and electrical connections between such contact-fingers and the several registering sections of the annunciator corre-

sponding to the potential sections of the target, and of a lever connected to the rocking frame and means for adjusting such lever so as to vary the position of the target-plate, and consequently the angular relation of the hammers to the same and to the contact-fingers, while maintaining the hammers in the same relative position at their points of rest on the potential sections; as hereinafter more particularly explained.

Figure 1 is a perspective view of the target, showing the target-plate and supporting-plate partially broken away, the rocking frame and the annunciator, to which the target is electrically connected, diagrammatically. Fig. 2 is a view back of the target-plate, showing the sections formed by the grooves. Fig. 3 is an enlarged vertical section of a portion of the target, showing the construction of the hammers and supports, the contact-springs, and insulating-plugs and exhibiting the approximate lines of force caused by the impact of the bullet on a particular section.

In the drawings like characters of reference indicate corresponding parts in each figure.

A is the target-plate, the front surface of which is plane and provided with a bull's-eye *a*.

a' is a circular space corresponding in size and located opposite to the bull's-eye on the opposite side of the plate.

*a*², *a*³, and *a*⁴ are arc-shaped sections concentrically arranged to the circular section or space *a'*.

2, 3, 4, and 5 are annular grooves, and 2', 3', and 4' are radial grooves by which the sections *a*², *a*³, and *a*⁴ are formed, the surface of such sections being flush with the surface of the back of the plate. In Fig. 3 these grooves are shown in section. The object of these grooves is to limit the area over which any individual hammer will respond to an impact upon the front of the target-plate, and the principle on which this is accomplished is illustrated in Fig. 3 by the dotted lines shown as radiating from the point of impact of the bullet, since it is seen in that figure that the grooves intercept a large number of the lines of force before they reach the hammers resting against the sections adjacent to that upon which the impact is received.

B is the main frame of the target, support-

ing the rocking frame, from which is suspended the target-plate A, and also supporting the back plate I, to which the hammers J and the registering mechanisms associated therewith are attached. This plate I is situated in the main frame B in a position directly behind the target-plate A at such a distance that the ends of the hammers rest at an angle against its posterior surface at which the hammer will be caused to move upwardly upon the impact taking place. The rocking frame is composed of two rocking shafts C and C', which pass horizontally through bearings b and b' on the uprights of the main frame B in positions toward the upper and lower extremities of the target-plate A. To each end of each rocking shaft are attached rocking arms D and D'. These are firmly secured to the rocking shafts C C'. The front ends of these rocking arms are pivotally attached to the back part of the target-plate A, so that the latter is suspended from them. The length of these arms from the center of the rocking shaft to the pivotal center, by which they are joined to the target-plate, is the same as the hammers from their pivots to their anterior extremities, where they rest against the target-plate. These arms also project rearwardly and are joined together at a distance corresponding to the length of the anterior arms by vertical connecting-rods 8. A lever E, attached to one of the rocking shafts, is used to raise and lower the target-plate A through the action of the rocking frame just described. At a suitable distance behind the main frame of the target a quadrant or curved bar F is attached firmly to the main frame, and the lever E is located adjacent to the bar F and is designed to have upward and downward movement.

f is an adjustable stop attached to the quadrant or curved bar F in such a way that it limits the upward movement of the lever E. The target-plate A is designed to be of such a weight that the lever E will remain in contact with the stop J.

G is a cord or wire rope attached to the lever E and passing over a pulley affixed to the lower portion of the main frame of the target in such a manner that when a pull is made upon the cord the lever E is drawn downward, so that the rocking frame operates in such a way as to raise the target-plate A, and with it the hammers resting against the back surface. The cord G, connected with the lever E, is designed to pass to any such position as may be convenient and may be attached to any lever H coacting with any suitable quadrant h and stop h'.

The hammers J are disposed upon the back plate I in such positions as to respond to the number of sections or spheres of influence

which the target-plate A is designed to have and may be one or more in number, as may be required. Each hammer occupies and passes through a slot i in the plate I and is supported by a pivot passing through the lugs which are situated one on either side of each slot.

j' is a metal sleeve passing horizontally through the back plate I and inclosing an insulating-plug j'. This sleeve forms a portion of the bracket j in which the hammers J are pivoted, or may be formed by drilling a hole through the plate and from a projection cast upon its posterior surface.

J² is a bolt passing through the insulating plug j' and threaded at its rear end, where it projects beyond the plug, so as to support the contact-finger J', held in place by a nut J³. K represents the wire passing from the end of this insulating-plug back to the annunciator L, and of course there is a separate wire for each hammer and contact-finger. X is a thumb-nut which holds the wire in position, and K' is a common return-wire attached to the back plate or main frame of the target, through which the circuit back to the annunciator is completed for each hammer. The battery M is situated upon this wire.

The hammer J is provided with a shoulder J² and by coming in contact with the back plate above the slot is designed to limit the backward movement of the hammer, and J³ is the spur of the hammer J, which projects through the slot i in the plate I and is designed to be brought into electric contact with the finger J' when the hammer J is driven back by the impact of the bullet on the front of the target-plate A. The angle at which the spur j³ is formed upon the hammer is such as will limit the forward-and-downward movement of the hammer J by coming in contact with the posterior surface of the back plate I above the slot. It is thus apparent that the movements of the hammer J are limited by the shoulder j², on the one hand, and the spur j³, on the other, thus insuring that the hammer can never be driven so far back that its own weight will not restore it to its position against the back of the target-plate and also insuring that it will not fall forward to the horizontal nor, indeed, beyond a certain predetermined angle. The object of the latter limitation is to provide that the hammer J can never approach so near the horizontal as to be incapable of being driven backward by a sufficiently heavy impact and also to provide that the target-plate A may be removed from the front of the rocking frame at any time and may again be placed in position or replaced by another plate without danger that the rocking frame will not bring the target-plate in position against the hammer. It is necessary that

the rocking arms of the rocking frame should occupy the same angle with reference to the target-plate that the hammers occupy, and if this be done it is obvious that when the rocking frame is lowered by raising the lever E so that its rocking arms are horizontal the target-plate will rest upon a support on the main frame, and when in that position none of the hammers will touch the posterior surface of the target-plate. If the lever E be raised still higher, the hooks on the anterior ends of the rocking arms D and D' will become disengaged from the pivots on the backs of the target-plate, and the latter may then be lifted off.

The target may be adjusted for different ranges or for different weights of ammunition by the movement of the lever E, controlled by the stop f, in this manner: If the lever E be depressed, the target-plate A is carried by a rotary movement upward and backward, so as to occupy a position closer to the back plate I. This movement causes the hammers J to be carried in the same direction to the same degree, so that they now rest against the back of the target-plate A at a higher or more acute angle, and at the same time the movement throws the spurs j³ of the hammers J backward, so that they lie in a position closer to the contact-finger j². Thus as regards the impact of the bullet the hammers will respond to a lighter impact and, moreover, a shorter movement will be required to complete the circuit through the wires K and K' back to the annunciator L. In this manner the same target without any alteration other than the adjustment of the rocking frame by means of the lever E can be made available for different ranges and different velocities and weights of ammunition.

The challenge of the target is effected simply by a continual movement, as above described, for the adjustment of the target, since it is obvious that if the lever E be depressed sufficiently the spurs j³ of the hammer J will each and all be brought into electric contact with the fingers J', thus completing the circuit of each hammer back to the annunciator L and causing each drop on the annunciator to operate. If the lever E be now released by discontinuing the pull on the cord G, the target-plate A will return by its own weight to the position to which it is limited by the stop f, and the hammers also acting by gravity will return with the target-plate to their original positions, and thus break the circuits completed by their spurs with the contact-fingers. If all the drops on the annunciator operate when this challenge is made, it proves that all the circuits are complete, and if on the restoring apparatus of the annunciator being operated all the drops are restored to their normal positions it proves that all the circuits have been

broken, and consequently all the hammers are in working position against the target-plate. If, however, when the challenge mechanism is operated by drawing down the lever E any of the drops on the annunciator should fail to fall, this will show that some portion of the operating or registering mechanism is out of order and requires readjustment. Again, if all the drops should fall and on operating the restoring mechanism of the annunciator the drops were found to be not all capable of being restored it would prove that some of the hammers had remained with their spurs in contact with the contact-finger J', or, in other words, had failed to fall back to their positions of rest against the back of the target-plate A. Thus a perfect challenge may be effected of every part of the operating and registering mechanism.

What I claim as my invention is—

1. In a self-registering electrically-operated sectional target, an integral target or target-plate having a series of sections forming distinct potential areas of influence on the back of the plate, whereby the lines of force caused by the impact of the bullet on the face of the target are confined in proximity to the point of impact of the bullet as and for the purpose specified.

2. In a self-registering electrically-operated sectional target, a target or target-plate having a series of sections forming distinct potential areas of influence formed on the back of the plate by grooves in the plate, whereby the lines of force caused by the impact of the bullet on the face of the target are confined in proximity to the point of impact of the bullet as and for the purpose specified.

3. In a self-registering electrically-operated sectional target, a target or target-plate having on the back of the target opposite the bull's-eye on the face a circular central section of corresponding size to the bull and forming a distinct potential area of influence, and a series of rings of arc-shape sections concentric to the central section, each forming a distinct potential area of influence, such central section and the remaining sections being formed by circular and radial grooves made in the back face of the target as and for the purpose specified.

4. In a self-registering electrically-operated sectional target, in combination a target or target-plate having a series of sections formed on the back of the plate by grooves in the plate, whereby the lines of force caused by the impact of the bullet on the face of the target are confined in proximity to the point of impact of the bullet, an annunciator having a corresponding number of sections and drops to the sections formed at the back of the target-plate and electrical connections from the corresponding sections on the back of the target to the corresponding sections of

the annunciator, whereby the impact of the bullet on a section or sections throws in the circuit to the corresponding drop or drops of the annunciator as and for the purpose specified.

5. In a self-registering electrically-operated sectional target, the combination with the target or target-plate having a series of sections formed on the back of the plate by grooves in the plate, a back plate forming a support for the hammers, hammers pivoted on same and designed to normally rest on the corresponding sections in the target-plate extending through slots in the supporting-plate and having rear spurs, a sleeve for each hammer extending through an opening in the plate and provided with a bracket on which each hammer is pivoted, an insulating-plug extending through the sleeve, spring contact-fingers secured to the plug and with which the spur of the hammer is designed to contact when the hammer is thrown upwardly by the impact of the bullet on the face of the section, and electrical connections from the finger to the annunciator as and for the purpose specified.

6. In a self-registering electrically-operated sectional target, the combination with the supporting-plate and hammers of the target-plate having the integral and independent sectional back surfaces and means for supporting and imparting movement to the target-plate, so that it may be brought nearer to or farther from the supporting-plate without altering the position of the hammers on the plate as and for the purpose specified.

7. In a self-registering electrically-operated sectional target, the combination with the supporting-plate and pivoted hammers, of the target-plate having the integral and independent sectional back surfaces, the rock-shafts journaled in suitable bearings, the rocking arms on the rock-shafts pivotally connected to the target-plate at radial distances from the center of the rock-shafts corresponding to the radii of the hammers from their center, and means for turning the rock-shafts so as to hold the target-plate parallel to the supporting-plate of the hammers and at a predetermined distance from the same as and for the purpose specified.

8. In a self-registering electrically-operated sectional target, the combination with the supporting-plate and pivoted hammers, of the target-plate having the integral and independent sectional back surfaces, the rock-shafts journaled in suitable bearings, the rocking arms on the rock-shafts pivotally connected to the target-plate at radial distances from the center of the rock-shafts corresponding to the radii of the hammers from their center, bars connecting the rear ends of the rocking arms and a lever secured to one

of the rock-shafts as and for the purpose specified.

9. In a self-registering electrically-operated sectional target, the combination with the supporting-plate and pivoted hammers, of the target-plate having the integral and independent sectional back surfaces, the rock-shafts journaled in suitable bearings, the rocking arms on the rock-shafts pivotally connected to the target-plate at radial distances from the center of the rock-shafts corresponding to the radii of the hammers from their center, bars connecting the rear ends of the rocking arms and a lever secured to one of the rock-shafts, and an adjustable stop designed to hold the lever in any predetermined position as and for the purpose specified.

10. In a self-registering electrically-operated sectional target, the combination with the supporting-plate and pivoted hammers, of the target-plate having the integral and independent sectional back surface, the rock-shafts journaled in suitable bearings, the rocking arms on the rock-shafts pivotally connected to the target-plate at radial distances from the center of the rock-shafts corresponding to the radii of the hammers from their center, an annunciator having corresponding sections and drops to the sections at the back of the target-plate, electrical connections from the hammers to the annunciator having their circuits normally broken and means for throwing the target-plate toward the supporting-plate for the hammers, so that all the hammers simultaneously complete the circuit to the annunciator and cause the drops to fall as and for the purpose specified.

11. In a self-registering electrically-operated sectional target, the combination with the supporting-plate and pivoted hammers, of the target-plate having the integral and independent sectional back surfaces, the rock-shafts journaled in suitable bearings, the rocking arms on the rock-shafts pivotally connected to the target-plate at radial distances from the center of the rock-shafts corresponding to the radii of the hammers from their center, an annunciator having corresponding sections and drops to the sections at the back of the target-plate, electrical connections from the hammers to the annunciator having their circuits normally broken, connecting means for the rocking arms, a lever secured to a rock-shaft, a coacting lever placed a suitable distance from the target and a cord connecting such levers and a suitable stop to limit the movement of either lever as and for the purpose specified.

12. In a self-registering electrically-operated target, the combination with the supporting-plate vertically disposed and the hammers, and target-plate vertically dis-

posed, of means for varying the distance between the supporting-plate and the target-plate, as and for the purpose specified.

5 13. In a self-registering electrically-operated target, the combination with the supporting-plate vertically disposed, and the hammers, and target-plate vertically disposed, of means for varying the distance be-

tween the supporting-plate and the target-plate by imparting a parallel movement to one of the plates as and for the purpose specified.

GEORGE ARMSTRONG PETERS.

Witnesses:

B. BOYD,

M. McLAREN.