

No. 679,325.

Patented July 30, 1901.

J. L. McCULLOUGH.
TARGET APPARATUS.

(Application filed Mar. 15, 1900.)

(No Model.)

5 Sheets—Sheet 1.

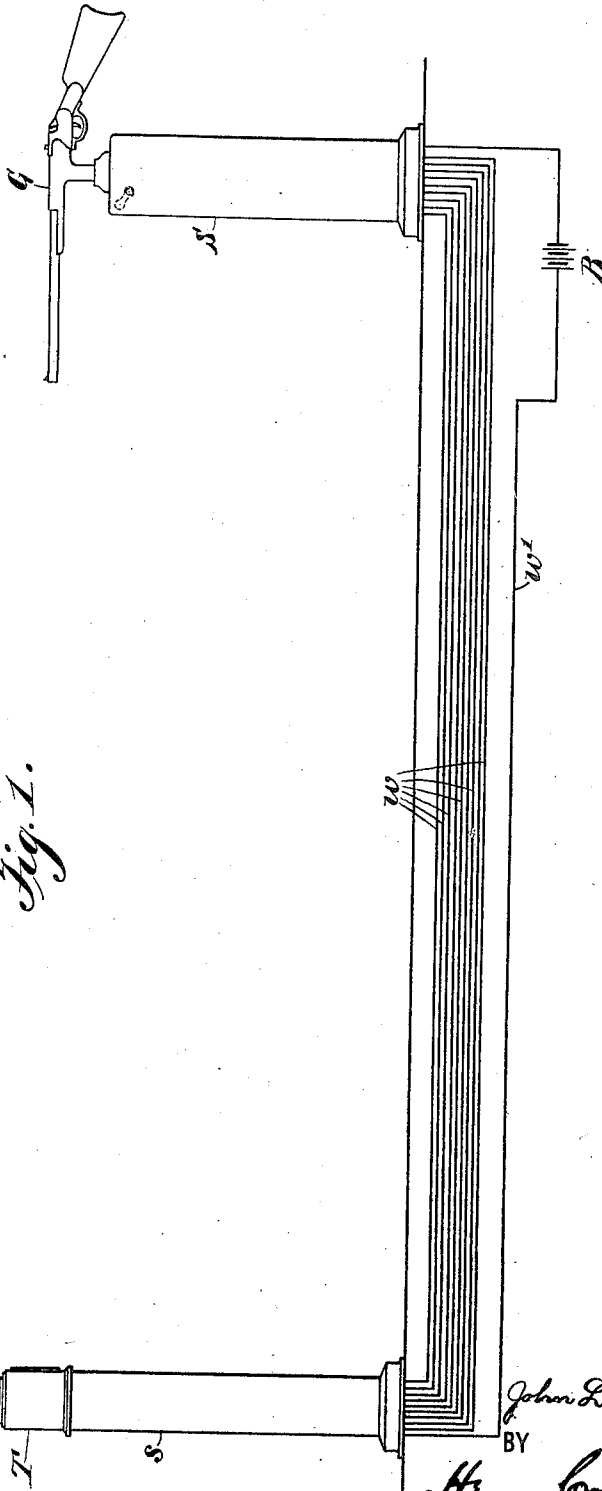


Fig. 1.

WITNESSES:

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No. 679,325.

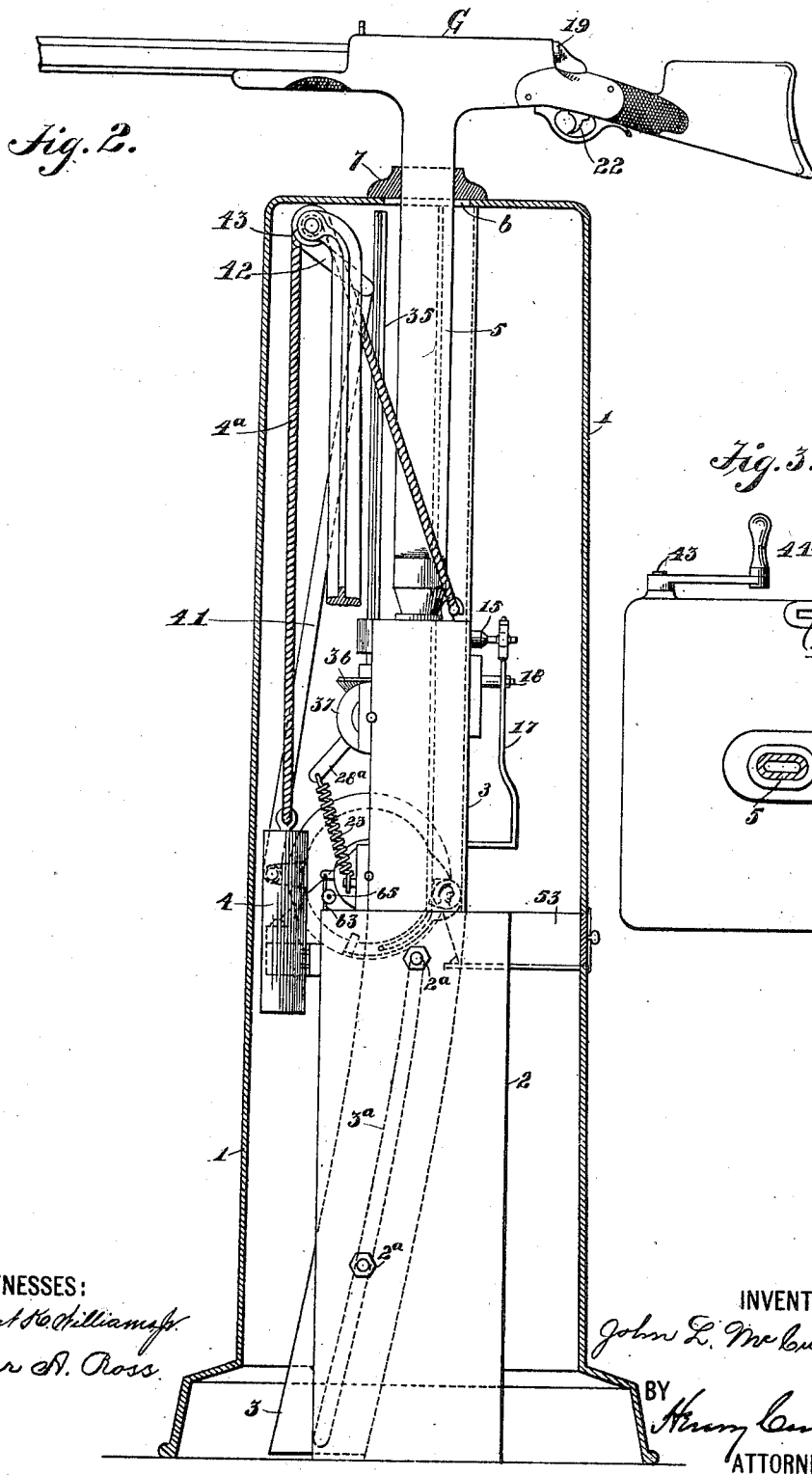
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(No Model.)

5 Sheets—Sheet 2.



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Fig. 4.

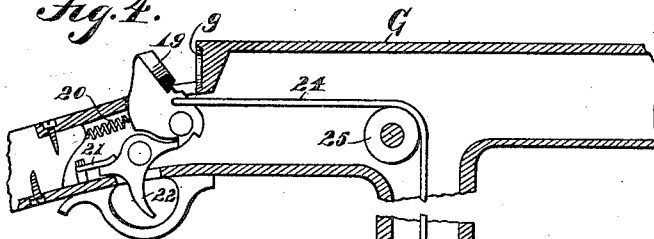
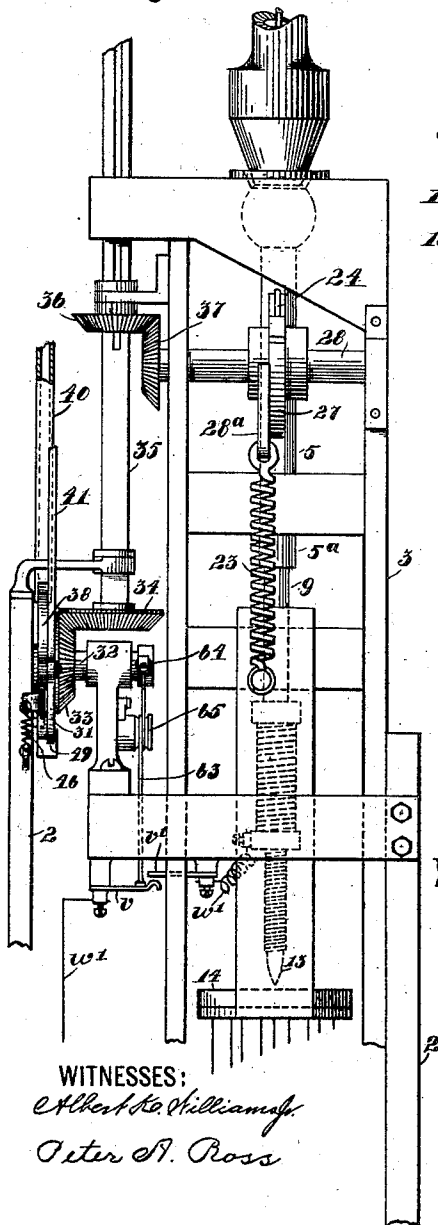


Fig. 5.



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Fig. 1^a.

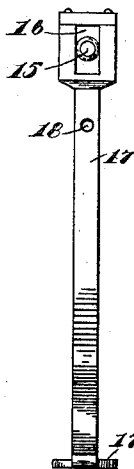
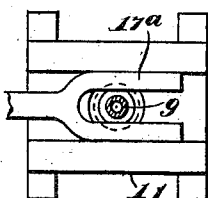
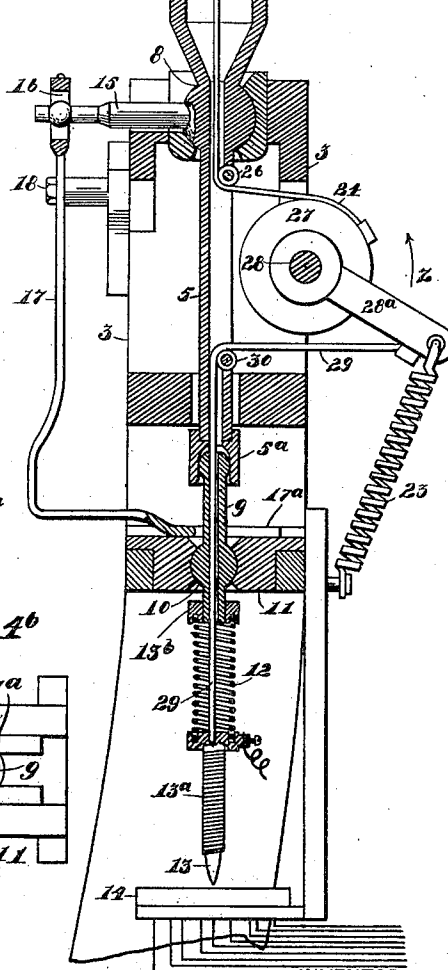


Fig. 2^b.



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Fig. 6.

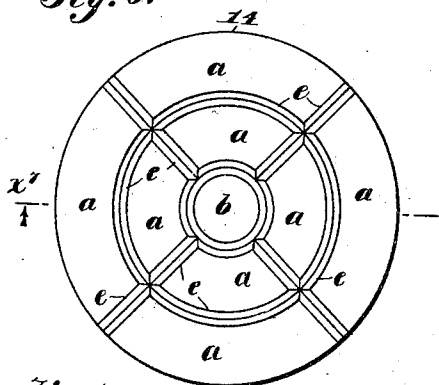


Fig. 7.

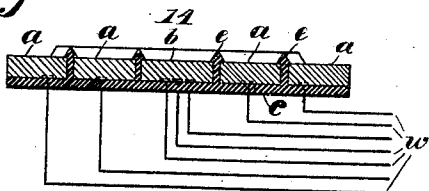


Fig. 8.

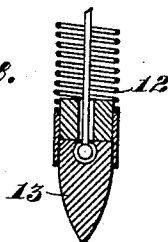


Fig. 9.

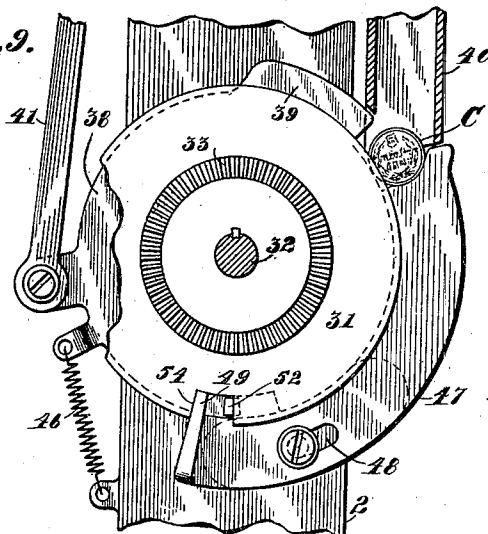


Fig. 10.

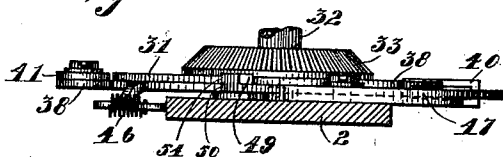
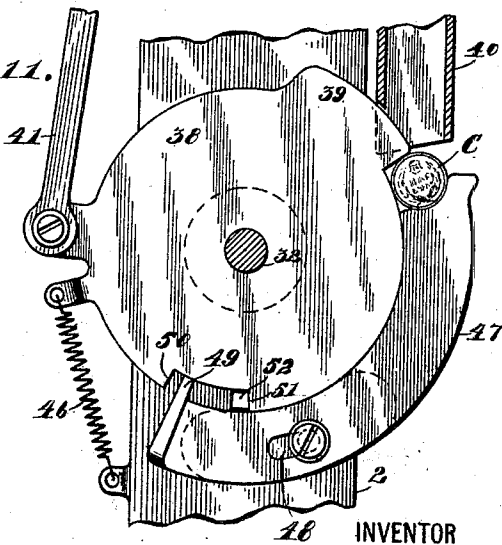


Fig. 11.



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No. 679,325.

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J. L. McCULLOUGH.
TARGET APPARATUS.

(No Model.)

(Application filed Mar. 18, 1900.)

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Fig. 12.

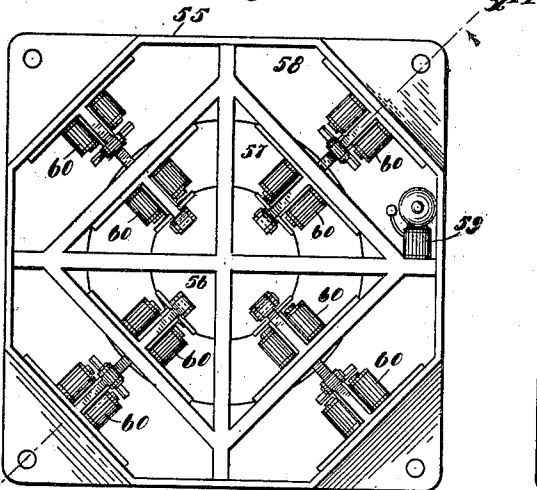


Fig. 13.

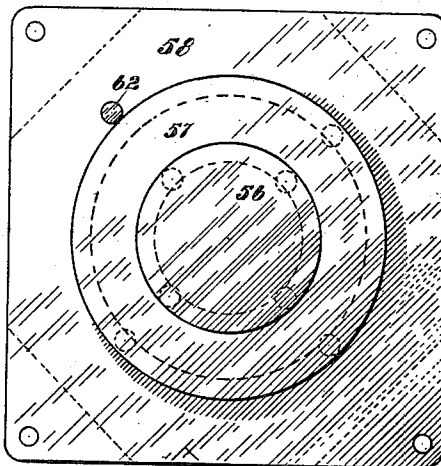


Fig. 11.

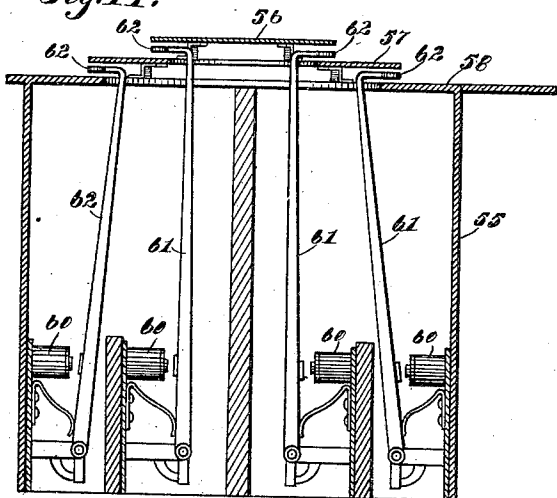
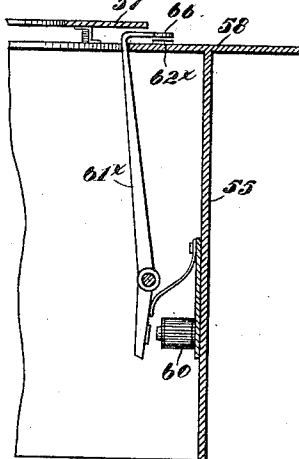


Fig. 15.



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UNITED STATES PATENT OFFICE.

JOHN L. McCULLOUGH, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE
AUTOMATIC TARGET MACHINE COMPANY, OF NEW YORK.

TARGET APPARATUS.

SPECIFICATION forming part of Letters Patent No. 679,325, dated July 30, 1901.

Application filed March 15, 1900. Serial No. 8,713. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. McCULLOUGH, a citizen of the United States, residing in the borough of Brooklyn, in the county of Kings and city and State of New York, have invented certain new and useful Improvements in Target Apparatuses, of which the following is a specification.

This invention relates to the class of target devices or apparatuses wherein the spot aimed at by the marksman is indicated electrically and wherein a gun or something which simulates a gun or firearm is employed, but no explosive or projectile is used. A target apparatus belonging to this general class is described and claimed in the United States Patent No. 561,124, granted to me June 2, 1896.

The novel features of the present invention reside partly in the gun and its mountings, partly in the means for completing the circuit when the trigger is pulled, partly in the target, and partly in other details of construction which will be hereinafter fully described.

In the drawings which illustrate the invention, Figure 1 is a general view of the apparatus, drawn to a small scale. Fig. 2 is a sectional elevation of the gun-stand, the casing thereof being in section and the interior mechanism in elevation. Fig. 3 is a plan of the casing of the gun-stand, the stem carrying the gun being in horizontal section. Fig. 4 is a vertical axial section of the gun and its mountings, on a larger scale than Fig. 2; and Figs. 4^a and 4^b are details thereof, which will be hereinafter described. Fig. 5 is a side elevation of the gun-mountings as seen from the right in Fig. 4. Fig. 6 is a plan of the contact plate or disk; and Fig. 7 is a diametrical section of the same, taken at line x^7 in Fig. 6. Fig. 8 shows the contact pencil or point detached. Figs. 9, 10, and 11 are detail views of the controlling device, which will be fully described hereinafter. Fig. 12 is a rear view, Fig. 13 a front view, and Fig. 14 a sectional view at line x^{14} in Fig. 12, showing the target; and Fig. 15 is a fragmentary view illustrating a slight modification of the same.

Referring to the general view, Fig. 1, S represents the gun-stand as a whole; G, the gun;

s, the target-stand, and T the target mounted thereon. This view shows the general arrangement on a small scale.

Referring now to the detail views, Figs. 2 to 8, 1 is the casing of the gun-stand, and 2 is a guide-frame fixed inside of same. Within the guide-frame 2 is a slide or slide-frame 3, which carries the gun G and which is capable of being moved up and down for elevating the gun bodily to adapt it to the height of the marksman. In order that the gun when so lifted or elevated may always be directed at the target, the slide-frame 3 is slotted, as seen at 3^a in Fig. 2, the slot or slots having a curvature drawn from a center at the target, and guide pins or bolts 2^a in the frame 2 pass through these slots. The weight of the frame 3 and the parts carried thereby is counterbalanced by a weight 4, as seen in Fig. 2. This weight is suspended from a cord 4^a.

The gun B is fixed on a hollow stem 5, which plays through an aperture 6 in the top of the casing 1, being embraced loosely by a collar 7, which slides on the top of the casing. This stem 5 has a ball 8, Fig. 4, which occupies a socket in the slide 3, so that the gun may be rocked in aiming it. At its lower end the stem 5 has a cup 5^a, which embraces the upper rounded end of an auxiliary tubular stem 9, which has a ball 10, with a bearing in a block 11, mounted to slide laterally or in one direction in bearings in the sliding frame 3. On the lower end of the stem 9 is a compressible coil-spring 12, which carries at its lower end a contact point or pencil 13, which has a laterally-flexible stem 13^a, that may be conveniently formed of a closely-wound coil of wire having electrical connection with the contact-point. The contact-point is adapted to play over and above or out of normal contact with a contact-plate 14. (Seen in detail in Figs. 6 and 7.) This plate is, in general, a counterpart of the target, to be hereinafter described, and it comprises a series of contact-segments *a*, a bull's-eye contact-disk *b*, and insulating material *c*, which separates and insulates the several parts *a* and *b*.

The gun G may be lifted vertically or nearly so, the contact elements moving with it. This is merely to adapt the gun to marksmen of

different heights. In aiming it has three possible movements—namely, first, a rocking movement to raise or lower the muzzle in a vertical plane, this movement rocking the stem 5 at the ball 8, and it, acting on the stem 9, rocks the latter on the ball 10, thus causing the point 13 to traverse the disk 14; second, a rocking or swinging movement laterally or sidewise about the ball 8, this movement also acting to rock the stem 9 and cause the point 13 to traverse the plate 14, and, third, a horizontal turning movement about the axis of the stem 5, which causes the muzzle to sweep or play in a horizontal plane. This movement would not act on the point 13 but for an auxiliary device, which will now be described.

An arm 15 extends out from the ball 8 and engages a vertical slot 16 in the upper arm of a lever 17, fulcrumed at 18 on the frame 3. The lower arm of the lever 17 is bent so as to extend inward and has a forked extremity 17^a, which extends about the stem 9, above the ball 10, this fork being fitted in a keeper-groove in the block 11. Now when the gun is rocked so as to move the muzzle up and down the arm 15 (which may have a ball at its bearing) plays up and down in the slot 16; but when the gun is turned about the axis of the stem 5 from side to side the lower or forked end of the lever 17 as the latter moves about its fulcrum slides the block 11 laterally, this block carrying with it the stem 9, which then finds a fulcrum above the cup 5^a. This swing of the stem 9 causes the point 13 to traverse the contact-plate 14. Fig. 4^a is a face view of the lever 17 as seen from the left in Fig. 4, and Fig. 4^b is a plan view of the sliding block 11 and the forked end of the lever 17, engaged therewith.

Referring to Fig. 4, the hammer 19 of the gun is adapted to be cocked by a spring 20 whenever the hammer is freed so that the spring 20 can act, and when cocked the hammer is held so by a trigger-spring 21, acting on the trigger 22. The hammer is caused to strike, when the trigger is pulled, by a spring 23, and this spring holds the hammer normally. This is effected through the medium of a flexible connector 24, which is attached at its upper end to the hammer, passes thence through the hollow of the gun over a guide sheave or pulley 25, thence down through the hollow of the stem 5 to another guide-sheave 26, and thence out through a slot in the stem to the periphery of a sheave 27, to which it is secured. This sheave is fixed on a rock-shaft 28 in the frame 3 and has an arm 28^a, between which and the frame 3 is the spring 23, which acts on the hammer. From the arm 28 a cord or connector 29 extends over a guide-sheave 30 into the stem 5, down through said stem, the stem 9, and the spring 12 to the block 13^b, which carries the point 13. Now with the construction above described when the spring 23 is in action normally the hammer will be drawn up against the seat *g*

on the gun and the point 13 will rest and bear on the plate 14; but if the shaft 28 be rocked in the direction of the arrow *z* thereat in Fig. 4 the connector 24 will be slackened, the spring 20 will cock the hammer 19, and the connector 29 will compress the spring 12 and lift the point 13 out of contact with the plate 14. This is the position of the parts seen in Fig. 4.

The shaft 28 may be rocked through mechanism that will now be described and which is controlled and made operative through the medium of an inserted operating-piece. For the better understanding of this device reference should be had especially to Figs. 2, 3, 5, 9, 10, and 11. The last three figures are respectively a side view of the controlling device, as seen from the right in Fig. 5, a bottom view of said device, and a side view similar to Fig. 9, but with the outer disk 31 removed and showing the mechanism in operation. These three views are on a larger scale than the principal views. This controlling device is mounted on the main frame 2 and comprises a rock-shaft 32, carrying the disk 31, which latter carries a bevel-wheel 33, which gears with a bevel-wheel 34, fixed on an upright shaft 35, on which is splined a beveled wheel 36, in gear with a bevel-wheel 37, fixed on the shaft 28. Thus a rotative movement of the disk 31 imparts a rotative movement to the shaft 28, and the splining of the shaft 35 keeps the wheels 36 and 37 in gear when the frame 3 is raised and lowered.

On the shaft 32, adjacent to the disk 31, is rotatively mounted a driving-disk 38. This disk has a driving-lug 39, which may enter a chute 40 and drive down an operating-piece *C* when said disk 38 is rocked. To the disk 38 is coupled a rod 41, which extends up, Fig. 2, and is coupled to a crank 42 on the inner end of a short rock-shaft 43, which is mounted in the casing 1 and extends through the same, being provided at its outer end, Fig. 3, with an operating-crank 44. It may be stated here that the chute 40 can extend up to the top of the casing, Fig. 3, and a slit 45 be provided in the latter for the insertion of the operating-piece. A spring 46 holds the disk 38 in the normal position seen in Fig. 9, and if no operating-piece be inserted the crank 44 may be actuated without in any way affecting the gun or mechanism other than rocking the disk 38; but under the lower end of the chute there is a support 47, which has a frictional slotted bearing at 48 on the frame, and a lug 49, which enters a recess in the edge of the disk 38 and is normally held up to said chute, as in Fig. 9, by a shoulder 50 at the extremity of said recess bearing on said lug 49. When an interposing operating-piece *C* is inserted, it takes the position seen in Fig. 9. Now if the disk 38 be rocked the interposed piece will be driven down out of said chute by the lug 39, depressing the support 47 through the medium of the interposed piece to the position seen in Fig. 11. The shoulder 51 at the other end of the recess in

the disk 38 now takes against a stop-pin 52 on the frame and limits the further movement of the disk in that direction. When the crank 44 is released, the spring 46 retracts the driving-disk, the first part of the movement freeing the piece C, so that it may drop into the casing 1 or into a locked drawer 53 therein, (seen in Fig. 2,) and the second part of the movement returning the support 47 to its first position through the shoulder 50, impinging on the lug 49.

In order that the movement of the support 47 may be transmitted to the disk 31, the lug 49 is made to extend out laterally far enough to engage a shoulder 54 on the said disk, as seen in Fig. 9, so that the movement of the part 47 carries the disk 31 with it. The spring 23 retracts the disk 31 or moves it back to the position seen in Fig. 9.

The above-described mechanism, comprising the disks, the support 47, and the interposing piece C, through which motion is transmitted to the support from the disk 38, forms no part of the present invention and is not specifically claimed herein, nor is the present invention limited thereto. If it be desired to use a controlling means adapted to count or register the number of "shots," there are many ways to effect this.

The target T and the electrical connections will now be explained with especial reference to Figs. 1, 5, 12, 13, 14, and 15, the last four figures illustrating the target in detail.

The target comprises a suitable frame or box 55, here shown as octagonal in vertical cross-section, and provided on its front end with three target-plates 56, 57, and 58, fixed in position, overlapping, and in different planes. The outer plate 56 constitutes the bull's-eye, the next, 57, is a ring and constitutes the inner circle, and the next, 58, fixed to the frame 55, constitutes the outer circle. The two latter are supposed to be each divided into four quadrants, thus corresponding to the eight segments *a* of the contact-plate 14. The bull's-eye 56 corresponds to the central part or disk *b* of said plate. There is an electric bell 59 at the target, which belongs to the bull's-eye, and each of the quadrants of the circles 57 and 58 has connected with it an electromagnet and indicating device. As these latter are all alike, a description of one will suffice. An electromagnet 60 is mounted in the frame 55 at the proper point and provided in the usual way with an armature-lever 61, carrying an armature and having an ordinary armature-spring. These are all of the usual kind, except that the armature-lever extends out to the front of the target and has an outwardly-extending arm carrying an indicator-marker 62, which is normally out of sight under the overlapping plate, as indicated in dotted lines in Fig. 13. When the circuit is closed through the magnet and its armature is attracted, the marker 62 is protruded outwardly into view. One of these markers so protruded is seen in Fig. 13.

The specific construction of the target has been illustrated and described herein because of its intimate relation with the gun and its operations; but I wish it understood that I do not specifically claim said target herein, as it is a distinct invention; nor is this invention limited to this particular construction of the target.

The electrical connections are simple. *w* represents the nine wires or conductors connecting the eight segments *a* of the contact-plate 14 with the respective eight electromagnets at the target and the central disk *b* with the bell 59 at the target. *w'* is the return-wire common to all the magnets at the target and terminating at the point or pencil 13. In this return-conductor *w'* is shown, Fig. 1, the battery B, and in it also is a circuit-closer. (Seen in Fig. 5.) This circuit-closer controls a normal break in the circuit, which is closed only when the shaft 32 is rotated, and it comprises spring-terminals *v* and *v'* in the conductor *w'*. The terminal *v* is connected by a cord 63 with an arm 64 on the shaft 32, said cord being passed around a stud 65 to put some friction on it. Rotation of the shaft 32 closes the circuit and the pulling of the trigger breaks it.

Let us suppose that the crank 44 is operated. The effect of this is to allow the spring 20 to cock the hammer 19 to raise the point 13 from the disk 14 and close the circuit at the terminals *v* and *v'*. The marksman now aims the gun as best he can at the target. As he does this the point 13 moves about above the plate 14. When he is satisfied with his aim, he pulls the trigger. The spring 23 brings the hammer up to the shoulder *g* on the gun and permits the point 13 to drop into contact with some part of the plate 14. If it falls on the central part *b*, the bell 59 at the target will ring, indicating a bull's-eye. If it falls on one of the segments *a*, the magnet 60, connected electrically with that segment, will protrude the marker 62, showing him where he has hit the target. In order to avoid the difficulty that would arise if the point 13 descended on the line between two segments *a*, the insulating material at the lines of division is elevated into a V-shaped ridge, as seen at *e* in Figs. 6 and 7, and the stem 13^a of the point or pencil is made flexible, so that the rounded end of the point will be deflected to one side or the other of the joint. In order that the circuit may not be broken at the terminals *v* and *v'* too quickly, but remain closed long enough to enable the magnet at the target to act and the marksman to see the marker or hear the bell, the cord 63 is wound frictionally about the stud 65, as before stated, so that the spring-terminals *v* and *v'* will be relatively slow in separating. It is not desired, however, to maintain the circuit closed for more than a moment, when it will break automatically and the marker 62 be drawn back out of sight.

Ordinarily the indicator or marker will contrast sharply in color with the target. For

example, it may be black and the target white. Fig. 15 shows a modification wherein the armature-lever 61^x is so fulcrumed that the disk at its end is protruded normally and is drawn back or in when the magnet is excited. In this case the disk 66 is a shield of the same color as the target and screens a marker 62^x, which is fixed on the target and contrasts in color therewith. Either of these constructions may be employed.

It is not desirable that the play of the gun in aiming shall be sufficient to allow the marksman to miss the target entirely. The curvature of the slot 3^a in the frame will be slight, and the movement out of line in elevating said frame will not be such as to put the wheels 36 and 37 out of gear. In fact, the shaft 35, which has one bearing in the main frame 2 and another in the sliding frame 3, will be loose enough in its bearings to permit of the movement in a curve in elevating the frame 3.

It will be noted that the "gun," so called, does not use any explosive or projectile and that the "hammer" and "trigger," so called, do not perform, of course, the normal functions of the parts so named as found in the usual target-rifle. The names have been used herein merely for convenience, as the parts simulate the real parts. Equivalents for the parts constructed and adapted to perform the proper and desired functions may be employed as well.

Having thus described my invention, I claim—

1. A target apparatus comprising a gun having a hammer and trigger, a spring which cocks the hammer automatically, a spring mechanism which holds the gun against cocking, and a manually-operatable spring-distending mechanism for putting the last-named spring mechanism under tension, whereby the cocking-spring may cock the hammer.

2. A target apparatus comprising a gun with universal mountings, a target provided with electromagnetic indicators to designate the point aimed at by the marksman, a contact-point which moves as the gun is moved in aiming, and over and above a contact-plate, the said contact-plate having insulated metal segments connected electrically with the respective indicating devices at the target, a spring which cocks the hammer of the gun, the latter being held at cock by the trigger of the gun, a spring mechanism which overcomes normally, the hammer-cocking spring and which holds said contact-point out of contact with the contact-plate, and a manually-operatable spring-distending mechanism for putting the last-named spring mechanism under tension, whereby the cocking-spring may cock the hammer.

3. In a target apparatus, the combination with the fixed casing of the gun-stand, of the fixed guide-frame therein, the sliding frame in said fixed frame and adapted to move upward therein in a curved path, the counter-

weight for said sliding frame, the gun, the stem thereof having a universal-joint bearing in said sliding frame, the target provided with electromagnetic indicators, the contact-plate carried by said sliding frame and its segments connected electrically with the respective indicators at the target, the contact-point carried by said sliding frame and coupled to the stem of the gun for movement therewith and means between the trigger of the gun and said contact-point for putting the latter into contact with the contact-plate when the trigger of the gun is pulled, substantially as set forth.

4. In a target apparatus, the combination with the fixed casing of the gun-stand, of the fixed guide-frame therein, the sliding frame in said fixed frame and adapted to move upward therein, in a curved path, the counterweight for said sliding frame, the gun, the stem thereof having a universal-joint bearing in said sliding frame, and the target, situated at a distance in front of the gun equal to the radius of the curved path in which said sliding frame moves, substantially as set forth.

5. In a target apparatus, the combination with the gun, provided with a hammer, a spring-actuated trigger, and a spring to cock the hammer, the stem of the gun, and a universal mounting for said stem, of the spring 23, mechanism connecting said spring and the hammer, whereby said spring holds the hammer against cocking, and a manually-operatable distending mechanism for distending the spring 23, whereby the spring 20 is permitted to cock the hammer.

6. In a target apparatus, the combination with a supporting-frame, of the gun, the stem 5 of said gun, having a universal bearing 8 in said frame, the said bearing, the slide-block 11 in said frame, the stem 9, loosely coupled at its upper end to the lower end of the stem 5, and having a universal bearing in the block 11, the said universal bearing, the lever 17, fulcrumed on the supporting-frame at 18, and coupled operatively to the block 11 at its lower end, the arm 15, projecting from the stem 5 at the universal joint and engaging a slot in the upper arm of the lever 17, the contact-point 13, the spring 12 connecting it with the stem 9, the contact-plate 14, and means for moving said point out of contact with said plate when the gun is cocked, and into contact therewith when the trigger is pulled, substantially as set forth.

7. In a target apparatus, the combination with a supporting-frame, of the gun, the stem 5 of said gun, having a universal bearing 8 in said frame, the said bearing, the slide-block 11 in said frame, the stem 9, loosely coupled at its upper end to the lower end of the stem 5, and having a universal bearing in the block 11, the said universal bearing, the lever 17, fulcrumed on the supporting-frame at 18, and coupled operatively to the block 11 at its lower end, the arm 15, projecting from the stem 5 at the universal joint

and engaging a slot in the upper arm of the lever 17, the contact-point 13, connected with the stem 9, and the contact-plate 14, under said point, substantially as set forth.

5 8. In an electrical target apparatus, the combination with the contact-point 13, having a flexible stem, of the said stem, the contact-plate 14, divided into sections and having elevated, deflecting-ridges *e* over the joints
10 between said sections, substantially as and for the purpose set forth.

9. In an electrical target apparatus, the combination with a gun mounted on universal bearings for aiming, a contact-point,
15 means between said gun and point compelling the latter to move relatively to the movements of the gun in aiming, a contact-plate 14, composed of insulated metal parts *a* and *b*, and means whereby the pulling of the trigger
20 puts said contact-point into contact with said plate 14, of a target having divisions corresponding to those of the plate 14, and provided with electromagnetic indicators to indicate said divisions, the said indicators, conductors
25 electrically connecting the several parts of the plate 14, and the contact-point with the respective indicators at the target, a

generator in the circuit, a circuit closer and breaker in the circuit, and means for automatically operating said circuit closer and
30 breaker, said means serving to close a break in the circuit when the hammer is cocked, and to open said break a little time after the trigger is pulled, substantially as set forth.

10. In a target apparatus, the combination
35 of the following coacting instrumentalities, namely, a gun having a self-cocking hammer, a rock-shaft 28, a disk 27 thereon, a connector 24 attached to the said disk at one end
40 and to the hammer of the gun at the other end, a spring 23, tending to rotate said shaft and oppose the cocking of the hammer, an upright shaft 35, geared to the shaft 28, a crank 44, and connecting means between the
45 shaft 35 and said crank whereby the latter operates said shaft.

In witness whereof I have hereunto signed my name, this 13th day of March, 1900, in the presence of two subscribing witnesses.

JOHN L. McCULLOUGH.

Witnesses:

PETER A. ROSS,
F. W. WIMAN.