

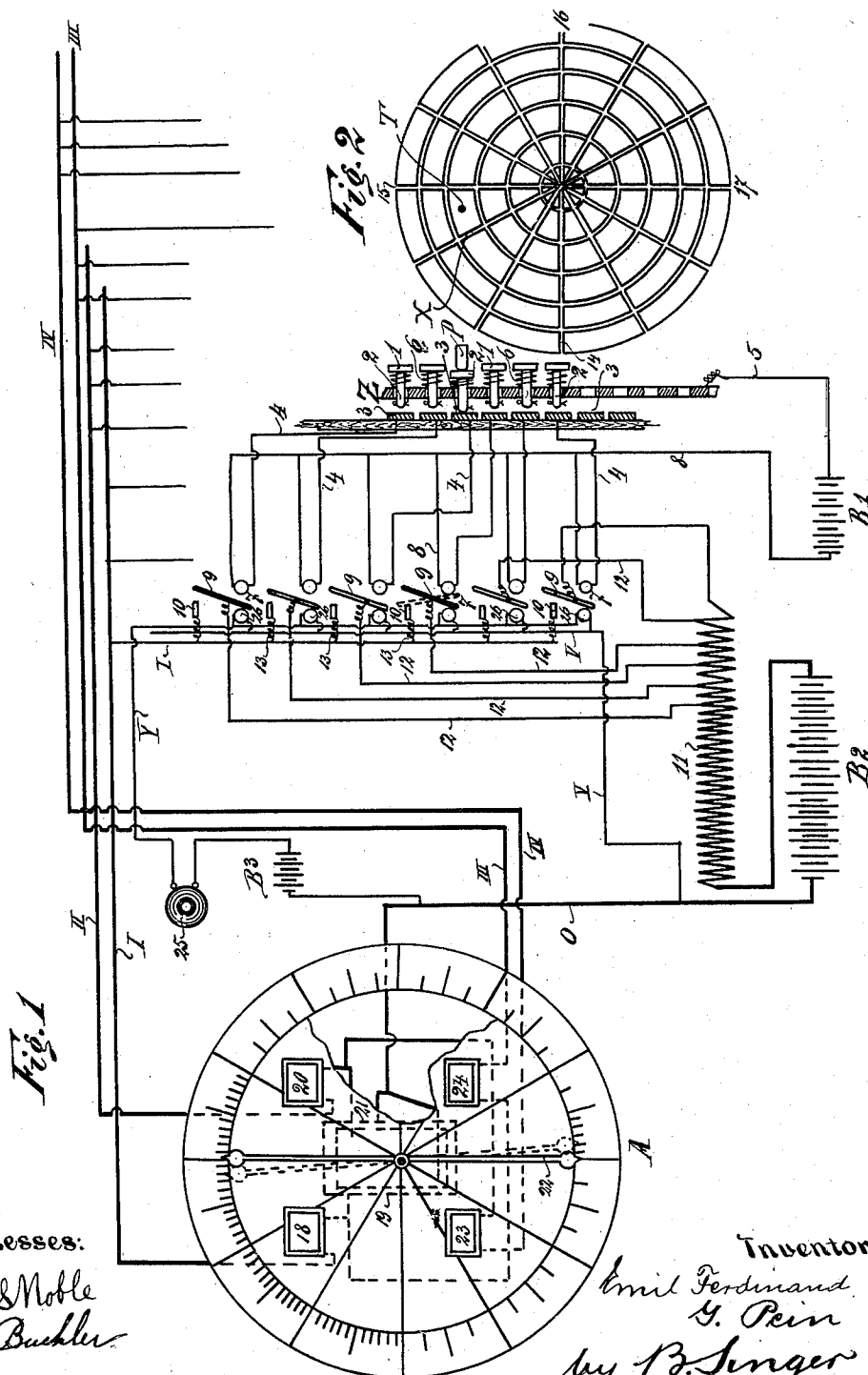
E. F. G. PEIN.

TARGET.

(Application filed June 26, 1899.)

2 Sheet—Sheet 1.

(No Model.)



Witnesses:

*S. Noble*  
*J. Buchler*

Inventor,

*Emil Ferdinand*  
*E. Pein*  
*by B. Singer*  
*Att'y.*

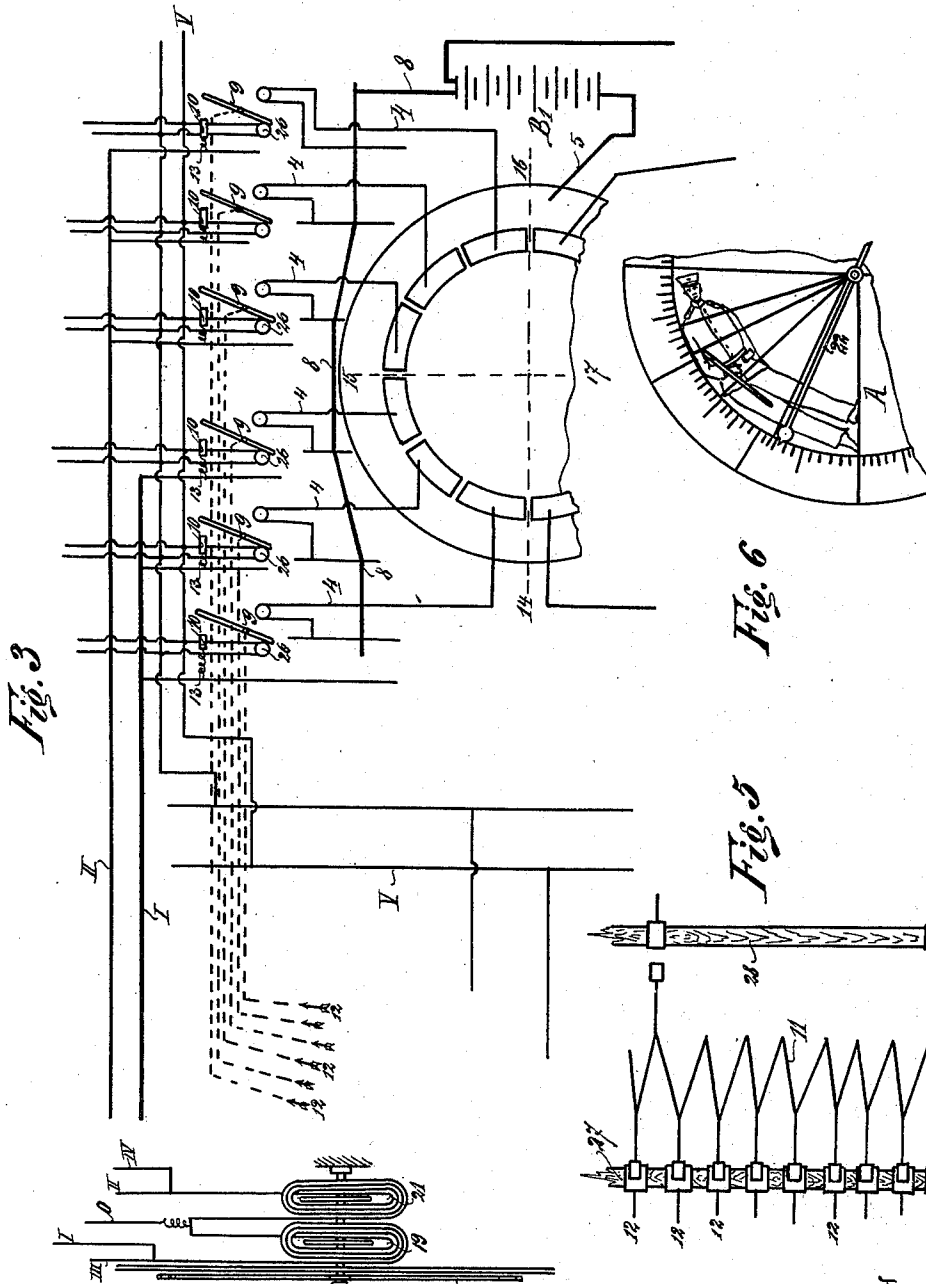
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2 Sheets—Sheet 2.



Witnesses:

SS Noble  
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Fig. 4

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# UNITED STATES PATENT OFFICE.

EMIL FERDINAND GUSTAV PEIN, OF HAMBURG, GERMANY.

## TARGET.

SPECIFICATION forming part of Letters Patent No. 638,986, dated December 12, 1899.

Application filed June 26, 1899. Serial No. 721,973. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL FERDINAND GUSTAV PEIN, engineer, a subject of the German Emperor, residing at Neustädter Neustrasse 68, Hamburg, in the German Empire, have invented new and useful Improvements in and Relating to Targets and the Like, (for which I have made applications for patents in Germany, February 28, 1899; Great Britain, June 6, 1899, and France, June 6, 1899,) of which the following is a specification.

This invention relates to apparatus in connection with targets for shooting practice for automatically signaling the score of the projectile at the marksman's stand, thus avoiding the necessity and accompanying danger of posting markers at the target; and it consists in combining with a target having its face in independently-yielding sections a registering-dial located at the markman's or inspector's stand and electric circuits of varying resistances for each section closed mediately or immediately by the yielding of said section, whereby the section depressed by the impact of a ball is indicated on the dial; in combining with a target having its face in independently-yielding sections a dial located at the shooting-stand having its face marked off in quadrants, an annunciator drop or shutter in each quadrant, and electric circuits connecting each of said annunciators with the corresponding quadrant of the target and closed mediately or immediately by the depression of any one of the sections in said quadrant; in combining with a target having its face in independently-yielding sections a dial located at the shooting-stand, annunciator-drops in each of the quadrants of said dial, oppositely-wound galvanometer-coils corresponding to the right and left sides of the dial, scoring-circuits for each yielding section of the target grouped relatively to the quadrants and right and left sides of the target to pass through the corresponding annunciator and galvanometer coils, and circuit-closing instrumentalities for said circuits operated by the depression of said yielding sections; in combining with a target having its face in independently-yielding sections a local circuit bridged in parallel, each bridge including a yielding section of the target with its corresponding con-

tact-plate and a relay-coil, an indicating-dial at a distance, and scoring-circuits including said dial in which the relay-levers and their contact-points are independently bridged with varying resistances, whereby the depression of any target-section closes a local circuit, operates a relay, and closes the corresponding scoring-circuit to operate the dial mechanism, and in the various other combinations and features of construction herein-after pointed out and claimed.

In the drawings, Figure 1 is a diagrammatic representation of apparatus and intermediate circuits embodying my invention. Fig. 2 is a front elevation of the sectional target. Fig. 3 is a diagrammatic representation of the electrical connections or circuits for a single target-ring. Fig. 4 shows diagrammatically the means for operating the dial-pointer. Fig. 5 is a detail indicating the removable contacts of the resistance, whereby certain of the relay-bridges may be permanently cut out and others left in with the same or changed resistances in order to conform to the outline of the dummy on the sectional target; and Fig. 6 is a fractional view of the dial, representing one quadrant thereof adapted for dummy-target practice.

Referring now to the first three figures, Z is a target-disk the face of which is composed of a suitable number of independently-yielding sections 1, of bullet-proof material, mounted by guide-pins 2 in a perforated back plate, which is a good electrical conductor, and held away from contact-plates 3, one to each section, by means of coiled springs 6, upon which they are seated and against which they yield under the impact of a bullet.

The contact-plates are insulated from each other and are separately connected to conducting-wires 4, forming independent bridges, including relay-coils 7, between the two sides of a local circuit comprising the battery B', leads 5 and 8, and the aforementioned back plate of the target. Thus if one of the target-sections be depressed, as by impact of bullet P, a circuit will be immediately closed from battery B' through lead 5, back plate, guide-pin, and contact-plate of said section, conductor 4, appertaining to said contact-plate, relay-coil 7, corresponding thereto, and lead 8, back to battery.

The target-sections and their contact-plates will usually be arranged in concentric rings, and the target itself will be covered with the usual sheet of paper having divisions corresponding to the sections of said disk.

A represents the indicator-dial, marked or scaled to agree with the divisions of the target and its covering and having a pointer 22, controlled by galvanometer-coil 19, in a scoring-circuit composed of battery B<sup>2</sup>, resistance 11, line-wire I, and return-wire O. Independently bridged in this circuit are the relay-levers 9 and their contact-points 10, by means of wires 12, leading from the resistance to said levers, and wires 13, leading from said contact-points to the line-wire I or a branch thereof. In order to effect the graduated deflection of the pointer, provision is made for the graduated switching on of the resistance according to the relay that is closed by connecting the wires 12 leading to the relay-levers 9 each at a different point along the resistance, thereby operating each bridge-circuit with an individual pressure.

Now it is evident that if one of the target-sections 1 is struck by bullet P it will close the local circuit of battery B' through its own special relay-coil 7 and move the corresponding relay-lever 9 upon its contact 10, thereby completing a scoring-circuit of definite voltage, differing from the voltage of any other possible scoring-circuit, from battery B<sup>2</sup> through the galvanometer-coil 19 and causing the dial-pointer to move to a position on the scale indicating the value of the target-section struck. In this position the pointer will remain until the relay-lever is thrown off of its contact-point 10 and the particular circuit thereby broken, which is accomplished by a switch-out circuit closed by key 25 and including battery B<sup>3</sup>, line-wire V, wire O, a branch therefrom, and the electromagnet-coils 26, one for each relay-lever, bridged between the two sides of said switch-out circuit.

As thus far described the apparatus is complete for the purpose of scoring the value of the hit or the identifying-number of the target-section struck; but it will not indicate at a glance or without considerable mental calculation the position of the shot, whether to the right or left or above or beneath the center of the target. Instead, therefore, of leading the scoring-circuits of all the target-sections through line-wire I that wire is assigned to a group of scoring-circuits representing one quadrant of the target—for instance, the quadrant 14 15—and is led through the operating-coil of a visual signal—such as annunciator-drop 18, located in the corresponding quadrant of the indicator-dial—on its way to the galvanometer-coil 19, this latter coil being so wound as to cause the deflections of the pointer to take place in said quadrant.

If now it should be that there are five sectional rings and a sectional bull's-eye on the target, with three sectors to each quadrant,

the corresponding quadrant of the dial is divided into three sectors, each with its scale, and that the scoring-circuits are grouped with reference to the successive radial rows of target-sections and corresponding dial-sector, with increasing voltage from the bull's-eye outward and from row to row, a projectile striking the target at point T in row X, Fig. 2, in the first radial row of sections to the left of a vertical diameter and above a horizontal diameter will cause the closing of a scoring-circuit that will induce the falling of annunciator-drop 18 in the left-hand upper quadrant of the dial and the deflection of the pointer to the appropriate position on the scale in the first sector of said quadrant. The inspector will therefore be instantly notified by the falling of the drop that the shot has taken effect above and to the right of the center, by the position of the pointer in the first sector that it is adjacent to a vertical above the center, and by the reading of the scale that it is in such and such a ring. Due record of the score having been made or instructions given, key 25 will be depressed and the switch-out circuit closed, thereby breaking the scoring-circuit just effective and releasing the pointer for return to zero, when, the annunciator-drop having been restored, the apparatus is ready to report another shot. In the same manner the scoring-circuits of the right-hand upper quadrant 15 16 of the target are connected up in parallel to the circuits of the left-hand quadrant through line-wire II, annunciator 20, galvanometer-coil 21, wound oppositely to coil 19, and common return-wire O to battery B<sup>2</sup> and resistance 11, so that a shot in said quadrant 15 16 will be immediately signaled in the upper right-hand division of the dial. The scoring-circuits of the lower quadrants of the target are similarly connected, each in parallel, as a group, to the connections of the other quadrants—i. e., the quadrant 16 17 is connected up through line-wire III, annunciator 24, galvanometer-coil 19, (since the pointer is again to turn to the left,) common return O, battery B<sup>2</sup>, and resistance 11, and the quadrant 14 17 through line-wire IV, annunciator 23, galvanometer-coil 21, common return O, and so on. This is more clearly shown in Fig. 3, which represents the connections for the sections of a single ring, the dotted lines being conductors which branch off from the resistance 11 and lead to the relay-levers 9 to individualize the resistance of the scoring-circuits.

When a dummy target is employed it becomes necessary to cut out the scoring-circuits of the circular target and switch in circuits representing the relays of the dummy sections with, perhaps, different resistances, or, supposing the dummy to be pasted over the circular target, the scoring-circuits of the sections outside of its contour will be cut out and the others altered to conform. This may be done by terminating the conductors 12 between the resistance 11 and the relay-levers

representing the sections of the circular target in contact-plates arranged along the length of a movable insulating-bar 27, so as to be bodily movable away from corresponding contact-points arranged along the length of the resistance-coil 11, and connecting branches from the relay-levers, representing the dummy-sections, with terminal contact-plates upon a second movable non-conducting bar 28 to coact with contact-points correspondingly arranged along the length of the resistance-coil, all as shown in Fig. 5, so that by moving bar 27 out of contact and bar 28 into contact the required change of scoring-circuits is at once effected.

A representation of the dummy may be pasted in the quadrants of the indicator-dial, as in Fig. 6, heads up in the upper quadrants and heads down in the lower quadrants. Lines marking sectors will then suitably apportion the various members of the body, so that the position of the pointer will at once indicate whether a hit is in the head, below the knee, or elsewhere. The annunciator, if used, will show whether on the right side or the left and the scale-reading will determine the definite point.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a target composed of independently-yielding sections and a registering-dial located apart therefrom, of normally open scoring-circuits of varying resistances, one for each section, for operating said dial, and means brought into action by the yielding of the individual sections whereby the scoring-circuits appertaining thereto are closed.

2. The combination with a target having its face in independently-yielding sections, of a dial located apart therefrom, and having its face marked off in quadrants, a visual signal in each quadrant, electric circuits corresponding to the respective quadrants of the target

for operating each of said signals, and means operated by the depression of a section in any quadrant whereby its particular circuit is closed through the representative signal on dial.

3. The combination with a target having its face in independently-yielding sections, of a dial located apart therefrom a visual signal in each of the quadrants of the dial, oppositely-wound galvanometer-coils corresponding to the right and left sides of the dial, scoring-circuits of varying resistances for each yielding section of the target, grouped relatively to the quadrants of dial and target to pass through the corresponding signal and galvanometer-coils, and circuit-closing instrumentalities for said circuits, operated by the depression of said yielding sections.

4. The combination with a target having its face in independently-yielding sections, of a local circuit bridged in parallel, each bridge including a yielding section of said target with its corresponding contact-plate and a relay-coil, an indicating-dial at a distance, and scoring-circuits including said dial, in which circuits the relay-levers and their contact-points are independently bridged with varying resistances, whereby the depression of any target-section closes its respective local circuit, operates the accompanying relay and closes the corresponding scoring-circuit.

5. The combination of the sectional target, the local circuits for its individual sections, the relays arranged to be closed by said local circuits, the scoring-circuits closed by said relays, the indicating-dial through which said scoring-circuits pass, and the switch-out circuit with its key for reopening said relays and scoring-circuits.

In testimony whereof I affix my signature in presence of two witnesses.

EMIL FERDINAND GUSTAV PEIN.

Witnesses:

E. H. L. MUMMENHOFF,  
GEO. LANDRÉ.