No. 812,400. PATENTED FEB. 13, 1906.

R. M. V. BREMER.

INDICATING TARGET.

APPLICATION FILED JULY 25, 1904.

2 SHEETS—SHEET 1.

Fig. 1

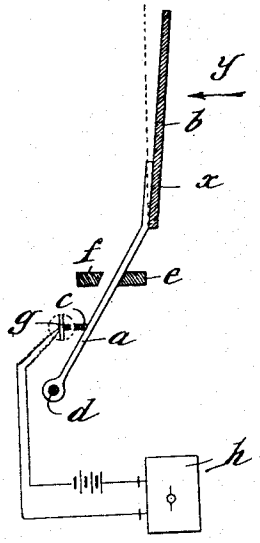


Fig. 2.

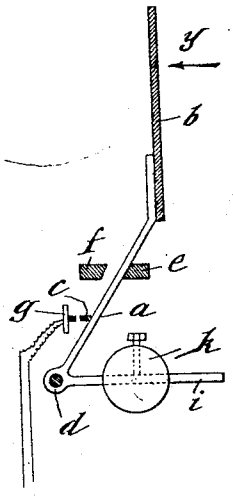
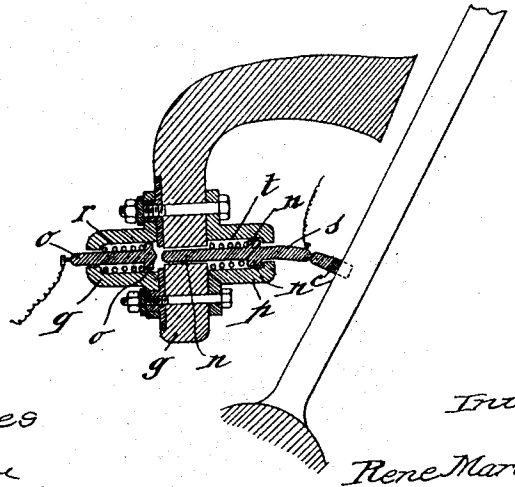


Fig. 5



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France 343,496 " 12 1904
British 6361 Mar 17 1904

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2 SHEETS—SHEET 2.

Fig. 3.

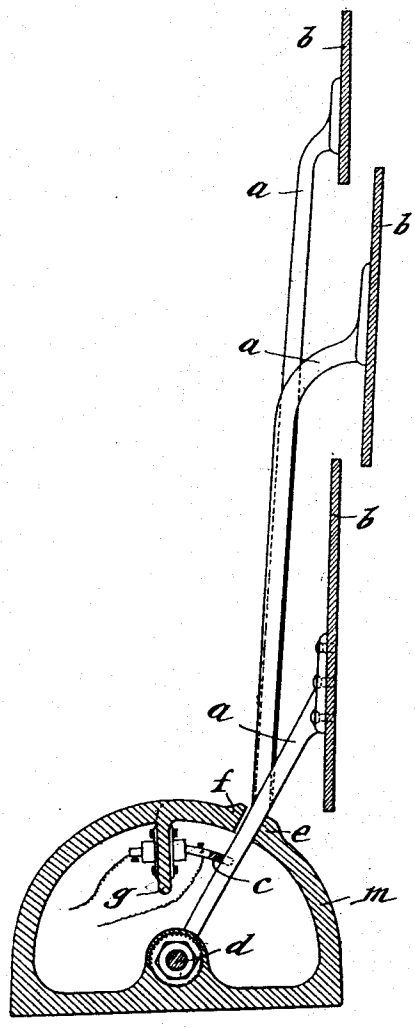
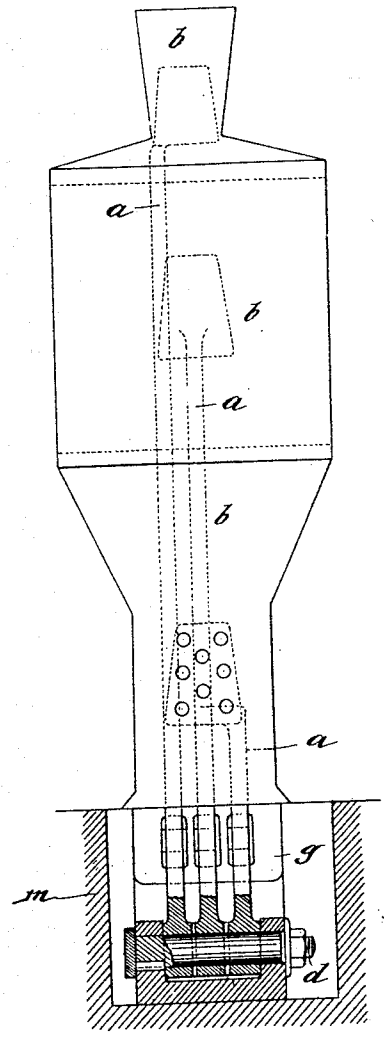


Fig. 4.



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INDICATING-TARGET.

No. 812,400. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed July 25, 1904. Serial No. 218,143.

To all whom it may concern:

Be it known that I, RENÉ MARIE VICTOR BREMER, a subject of the King of Belgium, residing at Schaerbeeck-Brussels, Belgium, have invented a new and useful Improvement in Indicating-Targets, of which the following is a specification.

This invention relates to an improvement applied to automatic indicating-targets which are arranged to rotate upon a pivot, and has for its object the provision of a pivoting target of which the sensitiveness can be regulated at will and of which the operation is absolutely sure and exact. Further, the said improvement permits an easy construction of a target, so that it is protected from injury by projectiles, carriage, or weather.

This invention is applicable to targets of all shapes and of one of more sections, giving outlines, disks, or rectangular faces, and permits the employment of targets in fixed positions or movable by horizontal movement or by eclipse.

The invention consists, essentially, in that the pivoting target may be arranged to lean at an angle toward the direction of firing by the action of its own weight or of a counterbalance-weight and may there rest upon a fixed abutment, so as to oppose in its position of rest a predetermined force of resistance to the shocks of the projectiles. The point of abutment is situated, preferably, in front of the center of rotation of the target, so that the lever forming the support of the latter is in an inclined position toward the direction of firing, and the angle of inclination of this lever forms one of the factors on which depends the force of resistance to the shock of the projectiles. Having regard to other factors effecting this force, such as the moment of the weight of the target and the length of the lever supporting the target, the sensibility to shock may be determined and regulated by the angle of inclination that is given to the pivoting-lever supporting the target. This will permit the exact regulation of the force of resistance in such manner that it would correspond to a determined amount, so that the whole energy of the projectiles may be absorbed by the target. As a consequence of this means of regulation the improved target is applicable for all kinds of firearms—such as rifles, field-artillery, and the like—and may be utilized for all distances and kinds of ranges from the smallest to the largest. The system, also, of regulation having regard to the surface of the target enables targets to be arranged, which, while sensible to the shock of projectiles, are uninfluenced by the force of the wind.

To carry out this invention, the angle of oscillation of the lever-support of the target is limited by two abutments, of which that on one side forms the stop in the inclined position of rest and that on the other side the stop for the movement of the recoil produced by the shock of the projectile.

The rocking support of the target carries on one side a block or other similar arrangement situated so as to operate a contact or electrical commutator by which the required signal or indication of its movement is effected. The arrangement of the rocking arm is adapted so that the pivot of rotation and the lower parts of the arms, as well as the electrical contacts, are inclosed in a cover or case placed on the ground, so that this delicate part of the apparatus is protected against the weather and against damage from stray projectiles. It is advantageous to reduce the oscillation of the rocking arm to the smallest possible amount, particularly where the targets are composed of many sections; but since this reduction of movement will produce the diminution in the duration of the electrical contact it may be necessary in such cases to use a special form of contact which will artificially increase the duration of the contact between the moving block and the fixed contact. For this purpose the fixed contact or either or both of the pieces of contact are arranged to press against a spring, which is compressed or expanded by the oscillation of the recoil and presses the contact-pieces together when the recoil has ceased, so that the two pieces of contact brought together by the first movement of the target will retain their metallic contact during some portion of the return movement of the target.

In order that this invention may be the better understood, it will now be described with reference to the drawings hereto annexed and to the letters marked thereon.

Figs. 1 and 2 show diagrammatically in elevation two simple forms of this improved target. Fig. 3 shows in sectional elevation the target made in several sections, such as representing the outline of a man. Fig. 4 shows the same target in front elevation. Fig. 5 shows in sectional elevation, to an enlarged scale, a detail of an electrical contact operating by the closing of the circuit.

The apparatus is composed of a rod or arm *a*, carrying the target *b* and a block *c*. This arm can turn upon an axis *d* and is limited in its movement of oscillation by the abutments *e* and *f*. The arm *a* is, by preference, bent as an elbow in order that in the supported mass the center of gravity (say at *x*) will be situated outside the vertical plane passing through the axis of rotation *d*. Under these conditions the arm *a* is inclined as regards the vertical by its own weight and is held in a position of rest upon the abutment *e*. The position of this abutment regulates the inclination of the arm *a*. The angle of inclination, the weight causing the target to lean forward, and the length of the arm of the supporting-lever are the factors which determine the resistance of the target—that is, its sensibility of movement—against the shock of the projectiles coming against it from the direction *y*. The block *c* is designed to set in action the apparatus of the electrical contact *g*, operating by the closure or the breaking of the current and influencing an electrical signal or indicator *h*, placed near the firer.

In the example shown in Fig. 2 the arm-support *a* of the target is formed as a bell-crank. It is provided with a horizontal arm *i*, carrying a balance-weight *k* in regulatable position. This disposition constitutes an auxiliary means for the regulation of the resistance to movement of the target. This auxiliary means of regulation is notably employed in targets of multiple sections and has for its object the power to give the same inclination to the arms of all the sections and to compensate the differences between the lengths of the supporting-arms *a* by the position of the counterbalance-weight *k*—that is to say, by the modification of the moment of the weight with which the target is pressed against the abutment *e*. Different sections of the target possess thus the same forces of resistance to the shocks of the projectiles, while at the same time having the same angle of inclination from the vertical constitutes a facility for the construction of this form of target.

In targets composed of multiple sections, as in Figs. 3 and 4, each section *b* is fixed to an independent oscillating arm *a*. The arms each carry a block *c*, which correspond also to contacts *g*. The arms *a*, placed one beside the other, as is indicated in Figs. 3 and 4, turn, by preference, upon the same axis *d*. The lower parts of the arms *a* and the contact apparatus *g* are all inclosed in a case *m*, provided with a slot or slots of which the edges *e f* constitute the abutments to limit the oscillating movements of the arms *a*. It is of utility to reduce these movements to the smallest possible amount in order not to create too great deviations between the different sections *b* of the target. As this small movement may produce evidently a very small duration of contact in the electrical indicating parts, which may result in a failure in the action of the indicator, it is advantageous to form the apparatus of contact *g* so that this would permit a prolongation of contact during the return movement of the target or section of target to its initial position.

In Fig. 5 is shown in vertical section the form of construction of contact apparatus according to this principle for operating by the closure of the current. At the same time the same principle of construction can be easily adapted to an apparatus operating by the breakage of an electrical current.

The apparatus is fixed upon a support *g*, attached in any convenient manner to the interior of the case *m* or forming an integral part of the latter.

The pieces of contact are composed of two pistons *n o*, moving in the cylinder *p q* and pressed toward the target-arm by springs *r t*, operating on the shoulders formed upon these pistons. The cylinder *q* with its piston *o* is completely insulated from the supporting-bracket *g*. The piston *o* is arrested at a short distance from the other piston *n*, which traverses the bracket *g*. The two pistons are preferably provided with round ends in platinum. The forward piston *n*, carries a continuation *s*, slightly curved, placed so as to receive the thrust of the block *c* of the arm *a*. The spring *r* of the rearward piston of contact *o* is slightly stronger than the spring *t* of the forward piston *n s*. Each piston may carry a terminal to which may be attached the conductors of the source of electricity. At the same time by reason of the insulation between *p* and *q* the terminals might be fixed to such cylinders. It will be readily understood that when the piston *s n* is thrust backward by the block *c* moving with the oscillation of the arm *a*, the piston *n* comes in contact with the piston *o*, the two springs *t r* being compressed under this action. When the arm *a* returns to its initial position, the springs thrust the two pistons *o n* forward. By reason of this movement and the differential forces of the springs, the two pistons maintain their metallic contact during a large part of the return oscillation of the arm *a*, which insures a duration of contact sufficient to overcome the inertia of the parts of the electrical apparatus operated by the closure of circuit by the contacts *n* and *o*. The springs *r t* constitute at the same time further means of adjustment, and their resistance is thus added to the forces of resistance of the target, as hereinbefore described.

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

1. In combination, a series of separate parts of the target all supported on distinct levers, a pin-support for the same at the basis of a case, a slot in the said case directed to-

ward the line of firing, one part of said slot forming a means of support of the target-arms at an inclined position of rest, the other part of the said slot forming an upward check to the recoil of the said targets, and means for making electrical contact when the targets are driven back.

2. In combination, a series of separate parts of the target all held in a position of rest with their weight passing beyond their supports toward the firing direction, a pin-support for the same at the basis of a case, a contact-piece upon the outer face of each bar, and two spring-pressed pistons, adapted to close together under the recoil of the beam, each of said pistons having differential springs to maintain an elongated contact.

3. In combination, a series of separate parts of the target, all held in a position of rest with their weight passing beyond their support toward the firing direction, and a counterbalance-weight extended toward the direction of firing to give an adjustable control to the resilience of the target-faces.

In witness whereof I have hereunto set my hand in presence of two witnesses.

RENÉ MARIE VICTOR BREMER.

Witnesses:

A. GRACH,

GREGORY PHELAN.