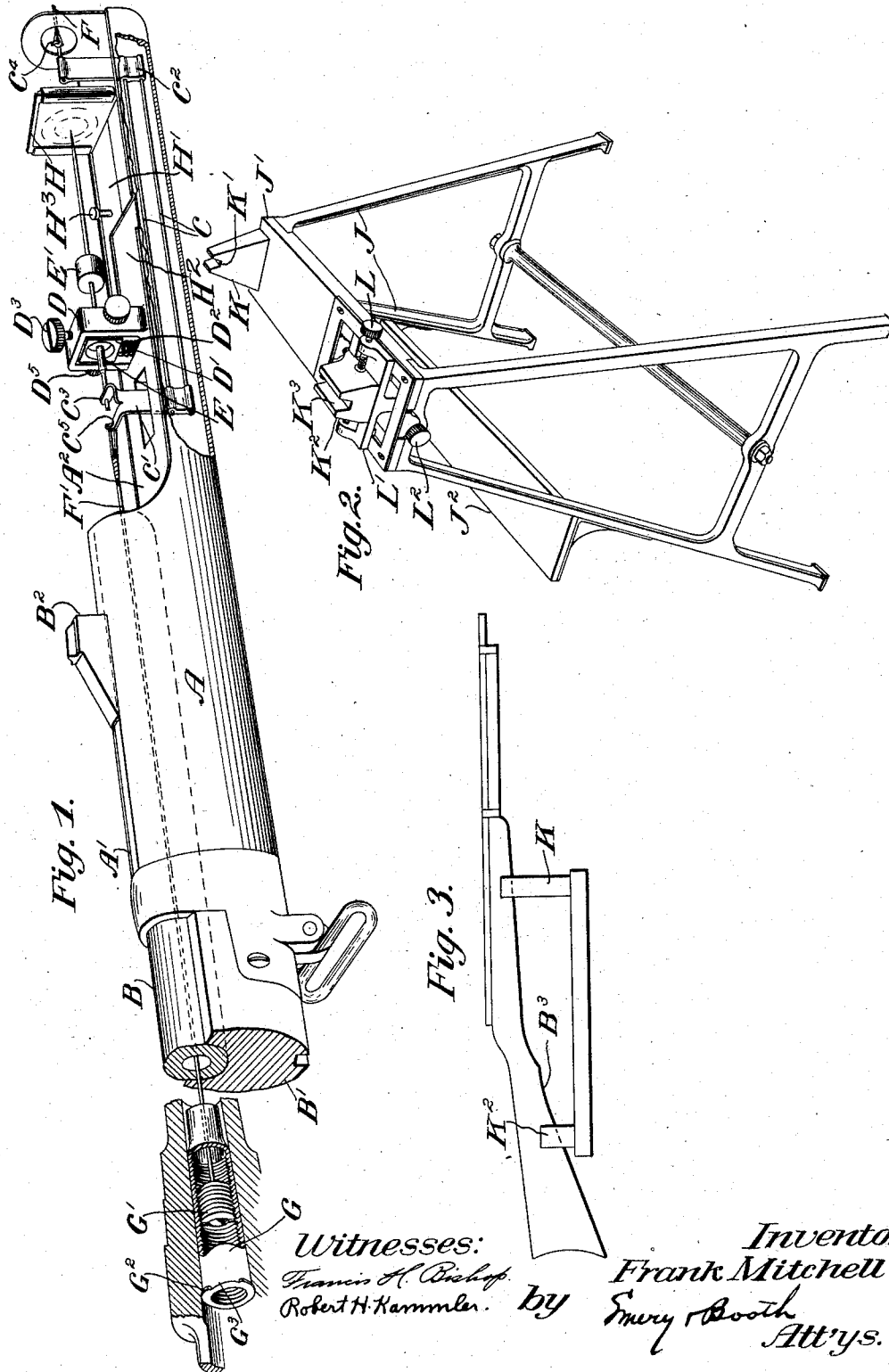


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 TARGET PRACTICE APPARATUS.
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1,015,391.



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UNITED STATES PATENT OFFICE.

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TARGET-PRACTICE APPARATUS.

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To all whom it may concern:

Be it known that I, FRANK MITCHELL, a subject of the King of Great Britain, residing at Hammersmith, London, W., England, have invented Improvements in Target-Practice Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is for improvements in or relating to apparatus for rifle, gunnery and like practice and particularly relates to apparatus of the kind set forth in the specification of Letters Patent of Great Britain No. 9977 of 1906 granted to Frank Mitchell, for improvements in and relating to apparatus for rifle, gunnery, and like practice.

One object of the present invention is to combine with automatic recording-apparatus of a particular type set forth in the specification of the aforesaid prior Letters Patent, *i. e.* what may for convenience be termed the "axial type", a well-known device for magnifying or multiplying the displacement of the needle or marker relatively to the actual angular displacement of the gun, the other parts remaining practically the same. This angular displacement in the operation of aiming is imparted to it in relation to the cord or other connector stretched from the gun to some point in front of it.

According to this invention a cord is employed as before which lies normally in line with the bore of the rifle or other firing piece and extends therefrom to a point in front of the rifle. This cord is interrupted by a device, for example a stirrup or yoke, at a point near the rifle and a needle or other recording member is pivoted to a support carried by the rifle and operatively engaged with the stirrup or other device. Preferably a housing is provided for the stirrup or other device that interrupts the cord and such housing also supports the recording member and is shaped to constitute an endwise extension of the stock of the rifle. By arranging the parts in this manner the recording mechanism does not foul the line of sight, and does not project laterally or vertically from the rifle in such a way as to distract the marksman or become easily damaged in use. The whole mechanism

is so arranged as to be readily detached from the rifle and that end of the cord which enters the bore of the barrel may be connected to a dummy cartridge.

In the accompanying drawings:—Figure 1 is a perspective view showing part of a rifle with mechanism constructed according to this invention attached thereto; Fig. 2 is a perspective view of a tripod or stand for use with rifles provided with such mechanism, and Fig. 3 is a diagrammatic view showing the position of the rifle on the tripod.

Like letters indicate like parts throughout the drawings.

The housing or carriage A is shaped to slip over the end of the barrel B of the rifle and it may butt against or also extend over the end of the stock B'. The housing when slid on to the end of the barrel and over or against the end of the stock may be held in place by friction or any suitable fastening may be provided if desired. It is slotted as at A' so as not to foul any lateral projections such as the sight B². The cross-section of that end of the housing which engages or butts against the stock is made of approximately the same area as that of the portion of the stock combined with the barrel thereon and all the mechanism mounted in and upon the housing conveniently made to lie within the area of an endwise extension of these parts. The upper portion of the forward end of the housing is cut away or reduced as at A² and the lower portion incloses a stirrup C having arms C' and C² that extend through openings in the top of the housing.

Fast on the upper face of the reduced portion of the housing is a rectangular frame D. The frame is disposed transversely to the barrel B and carries a fulcrum block D'. Mounted on the block and free to pivot in all directions is a recording needle E, one end of which has pivotal connection with a lug C³ on the arm C' of the stirrup. The needle is so mounted in the block D' that it cannot move endwise although it is free to rock in the block in any plane, but as these parts in themselves form no part of the present invention, a detailed description thereof is unnecessary.

The stirrup or yoke C is held in place by a cord F F' whereof it practically forms a

part, as the two portions are connected by it and cooperate as one. One end of the cord portion F is provided with a loop which engages a hook or claw C⁴ on the arm C² of the stirrup C and the other end of such cord portion is passed over a pulley or other guide and controlled by a spring or weight preferably on the far side of the target, the cord passing through the bull of the same, as described in the earlier specification No. 9977/06 already referred to. The cord portion F' also has a loop at one end which hitches over a claw C⁵ on the arm C' of the stirrup C and the other end of this portion of cord is secured to a screw-threaded plug G' which is entered in a dummy cartridge G whose interior is screw-threaded to receive the plug. The dummy cartridge is made externally of the same shape as the ordinary cartridge and consequently can be entered in the breech in the usual way. A portion however of the flange G² is cut away as shown at G³ so that the extractor with which rifles are usually provided will not withdraw the dummy cartridge when the firing bolt is withdrawn.

Opposite the free end of the needle E a miniature target H is mounted. This is carried by a frame that extends vertically from a horizontal sliding piece H¹. This sliding piece is mounted in a groove H² provided in the upper face of the housing A. The direction of the groove is parallel to the bore of the rifle and thus the target can be advanced toward or withdrawn from the needle without alteration of their relative positions in a lateral direction.

That end of the needle E which extends from the fulcrum block D¹ on the side remote from the arm C¹ of the stirrup is of greater length than the portion which extends from the fulcrum block to the arm C¹ so that any movement of the stirrup is proportionally magnified by the needle as will be readily understood. The longer end of the needle carries a weight E¹ that counterbalances the weight of the stirrup C.

The operation of this mechanism is as follows. The position of the needle E is controlled by the relative position of the cord F F¹ and the barrel B and the parts are so alined that when the rifle is correctly aimed at the bull of the distant target, the cord lies centrally within the barrel and the needle E is directly opposite the bull on the miniature target H as shown. With the parts so alined any aim that is not true will deflect the needle E through an angle that will be proportional to that made between the cord F F¹ and the bore of the barrel, but the needle will be deflected through a greater angle owing to the magnifying movement obtained by pivoting it in the block D¹; this magnifying movement, as is

well known, permits a larger miniature target to be used with the apparatus than would otherwise be possible. The record is effected by the target being moved forward, say by the movement of the firing bolt at the moment of firing and such movement of the bolt may be imparted to the target by pneumatic or other means, for example, a Bowden wire, connecting the firing bolt with the sliding piece H¹. The sliding piece carries a pin H³ to which the Bowden wire may be attached. By connecting the end of the portion F¹ of the cord to the plug G¹ and mounting this concentrically in the dummy cartridge G, adjustment of the cord may be effected by screwing the plug farther toward one end or other of the cartridge without deranging the alinement of the cord. The cord may be secured to the plug by passing it through a hole and knotting it on the farther side and if the hole is centrally situated no displacement of the cord laterally will take place when the plug is adjusted.

It will be seen that the whole of the miniature target apparatus is readily detachable. To remove the parts from the rifle it is only necessary to first unhitch the end of the cord portion F¹ from the claw C⁵ of the stirrup C. The housing A with the indicator mechanism thereon can then be withdrawn bodily from the rifle and the cord portion F¹ can be removed by withdrawing the dummy cartridge G. The cord portion F can be unhitched from the hook C⁴ on the arm C² of the stirrup C to release the cord from the rest of the indicator mechanism. Before removing the housing A the connection between the sliding member H¹ of the target H and the bolt of the rifle must be detached.

To allow for windage the fulcrum block D¹ is adjustably carried in the frame D. A spring D² always tends to move the block to the top of the frame and the vertical position is adjusted by a set screw D³ against which the block bears. In opposite sides of the frame D and engaging the block D¹ are other set screws D⁵. These control the lateral position of the block and by screwing them in one direction or the other adjustment may be effected for the purpose of displacing the needle relatively to the target H when it is desired to allow for windage.

For teaching recruits a tripod such as shown in Fig. 2 is found useful with a rifle provided with indicating apparatus of the kind described. The tripod or stand comprises a frame J having a table J¹. On this table is a fixed block K that is recessed at K¹ to receive the forward end of the stock of the rifle. The table carries a second block K² that is recessed at K³ to receive the rear end of the stock or that portion of the same that lies just in front of the magazine.

The block K² is adjustable laterally by means of a screw L and is carried on a plate L¹ that can be adjusted in the longitudinal direction of the table J¹ by a screw L².

5 As is well known the rear end of the stock of a rifle inclines away from the barrel as shown at B³ (Fig. 3) and it is this inclined portion which rests in the recess K³ on the block K². In use the tripod is alined so that
10 a line drawn through the recesses K¹ K³ is approximately in line with the bull of the target to be aimed at and the rifle is laid on the blocks. An expert then adjusts the rifle by moving the block K² laterally by means
15 of the screw L and forwardly or rearwardly by means of the screw L² until the rifle is correctly aimed. The recruit can then look along the sights and ascertain whether his method of sighting is correct. It will be
20 seen that the forward or rearward adjustment of the block K² changes the elevation of the rifle owing to its engaging the inclined rear portion B³ of the stock.

At the side of the stand a second table J²
25 is provided. This table is at a lower level than the table J¹ and may be provided with blocks in the same manner, the height being suitable for firing in a kneeling position while the height of the table J¹ may be suitable for a standing position. Obviously the
30 block K may also be made adjustable if desired and instead of employing the sloped portion B³ of the rifle stock for varying the elevation of the aim, one of these blocks may
35 have means for vertical adjustment.

Having thus described my invention, what I claim is:

1. In a target practice apparatus, the combination with an aiming device of a flexible
40 connector normally in line with the bore thereof, a connection between the connector and the aiming device, a pivotal support on the aiming device for the recording member and a rigid member interrupting the con-
45 nector at a point near the aiming device.

2. In a miniature target practice apparatus, the combination with an aiming device having a barrel, of a recording member, a
50 pivotal support for said recording member, a flexible connector associated with said recording member in the same axial line with the pivot thereof and passing into the barrel of the aiming device, and a connection between the connector and the aiming device.

3. In a miniature target practice apparatus, the combination with an aiming device having a barrel, of a dummy cartridge in the
55 breech end thereof, a recording member, a pivotal support for the recording member, a flexible connecting member associated therewith, said connector extending into the barrel of the aiming device, and a connection between said connector and said cartridge.

4. In a target practice apparatus, the com-

bination with an aiming device having a barrel, of a recording apparatus, a flexible connector associated with the recording apparatus and extending into the barrel of the aiming device, a dummy cartridge, and a
70 plug having threaded engagement with said cartridge and secured to said connector.

5. In a target practice apparatus, the combination with an aiming device having a barrel, of recording means, a flexible member associated therewith, and means within
75 the barrel of the aiming device for adjusting the attachment of the connector thereto.

6. In a target practice apparatus, the combination with an aiming device having a barrel, of a recording member, a flexible
80 connector associated with the recording member, a member constituting an endwise extension of the stock for the aiming device, said member supporting the recording member, and an interrupting member interrupt-
85 ing the flexible connector and housed within the said endwise extension member.

7. In a target practice apparatus, the combination with a gun having a barrel and a
90 stock, of a member constituting an endwise extension of the stock and secured thereto, and an aim recording apparatus supported upon said endwise extension.

8. In a target practice apparatus, the combination with a gun having a barrel and a
95 stock, of a member constituting an endwise extension of the stock and having a cross-section of approximately the same area as that of the firing end of the stock, recording means supported on said endwise extension,
100 including a target and a marker lying within the area of the said endwise extension, and a flexible connector associated with the said recording mechanism and having con-
105 nection with a point apart from the gun.

9. In a target practice apparatus, the combination with an aiming device, of a marker, a miniature target, a flexible connector lead-
110 ing from the aiming device to a point apart therefrom, and a rigid interrupting member having a hooked attachment to the connector.

10. In a target practice apparatus, the combination with an aiming device, of a
115 marker, a miniature target, a flexible connector leading from the aiming device to a point apart therefrom, and a rigid interrupting member having a hooked connection at each end portion of the flexible connector
120 and being also connected to the marker.

11. In a miniature target practice apparatus, the combination with an aiming device, of a flexible connector axially alined
125 therewith, means connecting the connector with the aiming device, a marker carried by the aiming device, a pivotal support for the marker and a stirrup connected at opposite ends to the flexible connector and having
130 also connection with the marker.

12. In a target practice apparatus the combination with an aiming device having a barrel of a supporting member adapted to be applied to the barrel of the aiming device, a miniature target carried by said member, a pivoted recorder also carried by said member, a flexible connector having one end connected to a point within the barrel of the aiming device and the other end to an extraneous object, and a connection between said connector and said pivoted re-

10 cording member, said recording member having a magnified movement over that of the connector.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANK MITCHELL.

Witnesses:

HARRY B. BRIDGE, Jr.,
PERCY W. HIGGINSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."