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APRIL 27, 1943.
BY A. P. C.

A. GERSTENBERGER
AIMING APPARATUS
Filed July 7, 1941

Serial No.
401,387
2 Sheets-Sheet 1

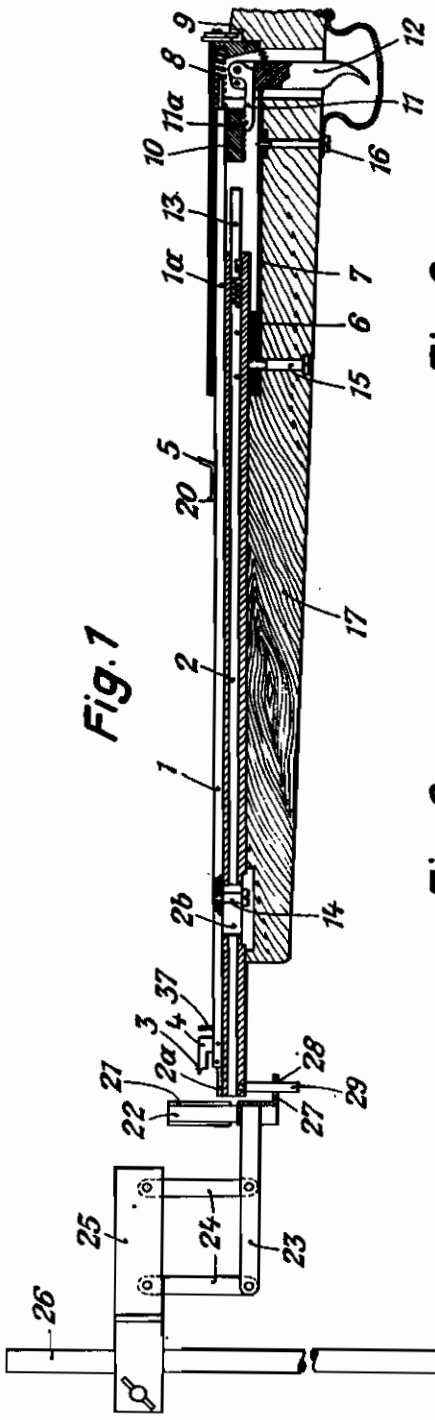

Fig. 1

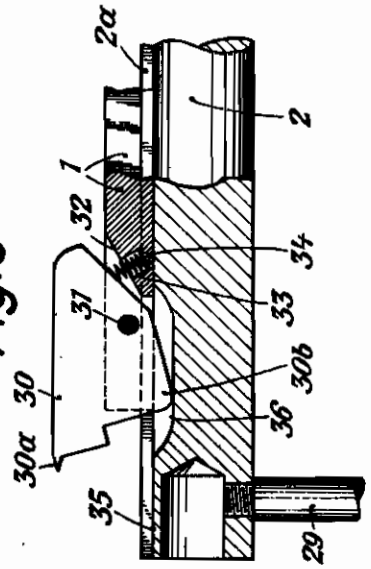

Fig. 3

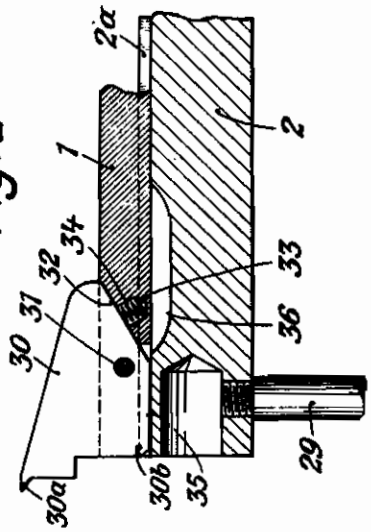

Fig. 2

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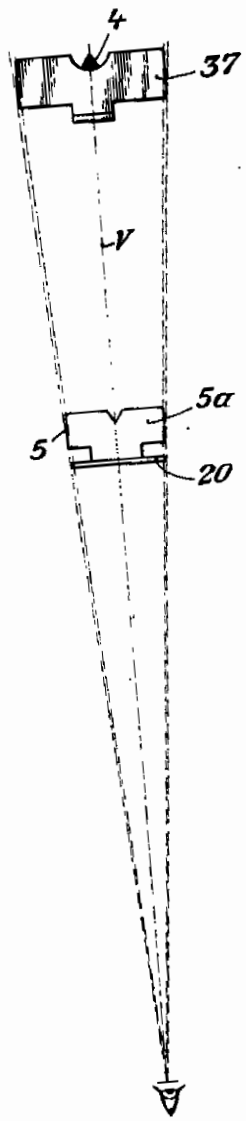

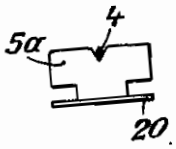

Fig. 5

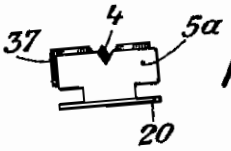

Fig. 6

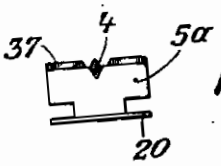

Fig. 7

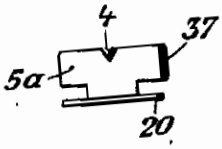

Fig. 8

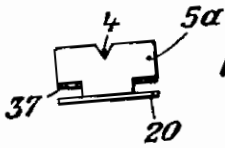

Fig. 9

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ALIEN PROPERTY CUSTODIAN

AIMING APPARATUS

Albin Gerstenberger, Zella-Mehlis in Thuringen, Germany; vested in the Alien Property Custodian

Application filed July 7, 1941

The invention relates to an aiming apparatus that is to a device which serves for teaching the aiming through notch and sight with harmless means to persons who are unexperienced in using fire-arms. These means are practically made similar to rifles or pistols, so that the persons who practise the aiming become acquainted with the handling of such arms, the manner of levelling and the steady overcoming of the trigger resistance at the shooting. Further the aiming point on the target is not only determined by observation, as for instance by means of an aiming-mirror, but marked on the target by the aiming apparatus itself. Further it is material to be able to recognize, examine and correct the aiming errors occurring at the practising.

The invention relates particularly to an aiming apparatus with an aiming arm and with a target yieldably coupled with the arm in which the aiming arm is equipped with a marking device to be cocked, released by means of the trigger and to be pushed against the target by the action of springs or the like.

According to the invention the marking needle striking the target in the direction of the shot is movable in the line of sight determined by the zero position of notch and sight, which means that the path of the marking needle after the pulling of the trigger of the aiming arm extends in the direction of and in this line of sight. By the guiding of the marking needle according to the invention in front of the target in the line of sight given by the zero position i.e. the normal position of notch and sight, all the inconveniences of the known devices of similar kind are avoided, and especially an extremely simple construction of the aiming apparatus is ensured and in any case perfect indication of the aiming results, so that to the person who shoots a real picture of his aiming practices is given, from which he can learn.

According to another feature of the invention notch, sight and marking needle are mounted on a bar movable on the barrel parallel to the line of sight and are moved all together towards the target, that is in the shooting direction.

According to an embodiment of the invention the marking needle is formed by the upper edge of the sight extended in forward direction. This form of construction possesses the special advantage, that only two points to be brought into register, namely notch and sight, are provided, whereas usually three points, notch, sight and marking needle have to be brought into register.

According to another embodiment of the invention the marking needle during the aiming is situated outside the line of sight but rises after actuation of the trigger instantaneously into the line of sight, so that it hits the target accurately in the direction of the lengthened line of sight. Hereby is attained, that the marking needle can not disturb during the aiming proceeding, a moment which occurs usually then, when the person who shoots takes full sight, practically looks down onto the line of sight.

Finally, in order to ensure the required distance between the aiming arm proper and the target carrier, and to enable at the same time a very extensive individual movability of the firm arm, relative to this target carrier, the aiming arm is coupled with the target carrier according to a further feature of the invention by a block guiding which can be easily detached from the aiming arm and target carrier and ensures the required constant distance between aiming arm and target and otherwise allows of the aiming movements of the arm which occur especially at the aiming without transmitting the same upon the target.

Another feature of the invention relates to a controlling device for controlling the aiming errors, adapted to be mounted on the aiming apparatus according to the invention but also to be used on other arms.

Good shooting performances require, besides control of will and body, chiefly the careful learning of the aiming, which means the capability to bring the individual elements of the aiming arrangement, i.e. notch and sight, into a predetermined relation. The careful learning of the aiming supposes that the rifleman learns to securely discern the aiming errors, in order to avoid the same. Mostly aiming errors are represented on boards or by auxiliary apparatus intended to show to the practising person the correct and wrong positions of notch and sight. Beyond this teaching activity the invention solves the problem to provide an apparatus which, as already mentioned above, is preferably mounted on the aiming arm itself and which during the aiming gives a signal to the rifleman as soon as he makes an aiming error. Hereby the recognizing of aiming errors is very much facilitated and learning of correct aiming is accelerated. Also for the instructor of the aiming this control device of aiming errors according to the invention is of advantage as, when he looks through the aiming mirror which mostly is placed on the rifle, he can easily and securely recognize the aiming errors.

The aiming errors-controlling device accord-

ing to the invention consists of a plate mounted on or near the sight, and, according to the invention, this control plate is, as regards shape and size, in the proportion corresponding to the aiming angle to an element of the aiming arrangement located behind it or to a second plate or the like, so that the control plate is invisible at medium sight.

Further particulars and characteristic features of the aiming apparatus according to the invention can be seen from the accompanying drawings and from the following description.

In the accompanying drawing

Fig. 1 shows by way of example a form of construction of the aiming apparatus according to the invention the aiming arm being shown in side elevation partly in section and the target carier in side elevation.

Fig. 2 and 3 show each a part of the aiming apparatus with the marking needle adapted during the aiming proceeding to be moved out of the line of sight, the aiming apparatus being uncocked in Fig. 2, the marking line being in the line of sight and in Fig. 3 the aiming apparatus is cocked the marking needle being moved out of the line of sight.

Fig. 4 shows diagrammatically the device for controlling the aiming errors and

Fig. 5 the correct position and

Fig. 6 to 9 inclusive the wrong positions of notch and sight.

In the aiming apparatus shown in Fig. 1 the aiming arm proper is shown as rifle but it may be quite as well a pistol.

In the aiming arm shown in Fig. 1 the marking needle **3**, the sight **4**, and the notch **5** are fixed on a bar **1** which is mounted in a guide groove **2***a* provided on the barrel **2**, as shown in Figs. 2 and 3, the sight **4** itself being constructed as marking needle **3** in that the upper edge of the sight is somewhat lengthened in forwaed direction.

The rear portion **1***a* of bar **1** slides in the sleeve head **6** and in the sleeve **7**. Onto the rear tapered end of the bar **1** respectively on the part **1***a* of this bar, the mainspring **9** is pushed, the rear end of this mainspring being supported in a bore of the breech block **9**.

On the rear end **1***a* of bar **1** a catch piece **10** is fixed, the notch of the catch piece serving for holding the nose of the catch piece **11**. This nose of the catch piece **11** is designated by **11***a*. The catch piece **11** cooperates with the trigger **12** in that when the trigger **12** is operated the nose **11***a* gradually moves out of the catch of the catch piece **10** until this piece and the bar **1** are liberated.

A bolt **13** with buffer spring is further mounted in the sleeve head **6** and the function of this bolt will be hereinafter described in the description of the manner of operation of the aiming apparatus.

The forward and backward movement of bar **1** is limitated by a screw **14**, which extends through a slit **2***b* in the barrel **2** and is screwed into the bar **1**.

The trigger- and guiding mechanism is connected with the rifle shank **17** by holding screws **15** and **16**.

The fluted sight foot **20** serves as handle for returning bar **1** into the cocking position.

In front of the aiming arm above described a target holder is arranged. The target proper **21** is backed by a plate **22** of hard rubber or of other suitable material. Disc **21** and plate **22** are mounted in a link **23** so that they can be easily exchanged, the link being connected by a parallelogram of link rods **24** with a clip **25** of the tripod, this clip being adjustable and adapted to be secured in the adjusted position on the tripod tube **26**. On the link which carries the disc **21** a clip **27** bent at right angles towards the aiming arm is fixed, which has a slot **28** extending transversely to the line of sight and in which during the aiming proceeding and during the actuation of the aiming apparatus a guide pin **29** engages, which is fastened on the barrel **2** of the aiming arm. By this coupling the effective distance between the aiming arm and the target is ensured during the aiming proceeding.

The operation of the aiming apparatus shown in Fig. 1 is as follows:

The rifleman firstly pulls back, by means of the fluted sight foot **20** the bar **1** in opposition to the action of the striking spring into the cocked position, that is so far that the nose **11***a* of the catch piece **11** engages into the catch notch of the rest piece **10** rigidly connected with bar **1**. The aiming arm is then leveled and the guide pin **29** introduced into a guide slot **28** of clip **27**, whereby the effective distance between aiming arm and target is ensured. The easy movability of the disc carrier in forward and backward direction prevents on the one hand the possibility of supporting the aiming arm and on the other hand equalizes the considerable vascillations of the body at the aiming proceeding. The parallelogram of link **24** ensures the permanently vertical position of the target **21**. The guide pin **29** and the slot **28** extending transversely to the line of sight are of such length, that the aiming arm can move over the whole surface of the target.

The person who shoots then aims through notch **5** and over sight **4** to the target **21** and pulls back the trigger **12** until the nose **11***a* of the catch piece **11** moves, under the influence of commonly used hinged guides, out of the notch of the rest piece **10**, so that the bar **1** can suddenly move forward under the action of the striking spring **8**. The marking needle then strikes against the target **21**, which by the guide pin **29** is securely held at the effective distance, that is according to the length of the travel of bar **1** and thereby of the marking needle **3**, the needle pricking into the target **21**. This stitch produced into the target is accurately in the direction of the lengthened line of sight, notch- sight, as notch **5**, sight **4** and marking needle **3** are of the same height and are fixed on the same moving element 1. e. the bar **1**. This point marked on the target **21** by the stitch of the marking needle indicates therefore the point aimed at the moment of the imaginary shot. As the forward movement of bar **1** takes place in opposition to the action of the buffer spring bolt **13**, this bolt pushes back the suddenly advanced bar **1** by a few millimeter, so that the marking needle **3** can detach again from the target **21** and this target cannot be damaged when after the shot the arm carries out further aiming movements.

In Figs. 2 and 3 another embodiment of a part of the aiming apparatus according to the invention is shown. **1** designates again the bar adapted to move in a guide **2***a* of the barrel **2**. The marking device **30** does not form part of the sight, but is mounted in the front end of bar **1** so that can turn about pin **31** and bears in its effective position against an inclined face **22** of bar **1** and in opposition to the action of the pressure spring **34** located in a bore **23** of bar **1**. When the aim-

ing apparatus is uncocked, i. e. after a shot, the marking device **30** rests on the front straight guide **35** of the barrel **2** and is thus accurately in the lengthened aiming line, as the height of the marking needle **30***a* evidently also in this case is such that the marking needle lies accurately in this lengthened line of sight. If then the aiming apparatus is cocked for firing a shot, i. e. the bar **1** pulled back in opposition to the action of the striking spring **8** in accordance with the explanations given relative to Fig. 1, the marking device **30** arrives at a recess **36** and, turning about pin **31** under the action of the pressure spring **34**, engages into this recess **36**, so that the point proper **30***a* of this marking device **30** is lowered from the line of sight as shown in Fig. 3. The apparatus is then cocked and when aiming through notch and sight the point **30***a* is not visible for the person who practices shooting and aiming. If then, by actuation of the trigger the bar **1** is released, the foot **30***a* of the marking needle slides out of the recess **36** onto the straight guide **35**, so that the point **30***a* of the marking needle moves also in this instance accurately in the line of sight on the greatest portion of its travel towards the disc **21**. In this form of construction of the marking device the sight is placed somewhat back relative to the notch.

The position of the aiming arm in the hand, the sighting, the movement of the trigger and the trigger resistance correspond to those of a real arm. The scale reduction of the target **21** is such, that the aiming to this target requires the same suppositions as the aiming to a more distant larger target. In order to make come out more strongly the bull's eye of the target and thereby to facilitate the aiming, the rings **1** to **9** and their designations may, when the bull's eye is dark or preferably black, show a lighter, preferably grey color tone. On either side of the target, at the height of the bull's eye, a thick, preferably black line might be arranged, to give to the practising person a hold against edging of the aiming arm.

The marking needles **3** or **30***a* can be pointed, as shown, to directly produce a prick on the target **21**, they might, however, be blunt or hollow in order, if painted with color, to produce a coloured point on the target. The bar **1** of the aiming arm, movable in the direction of shooting, and which carries the notch-, sight- and marking device, may also be the barrel itself.

In order to be able, to draw the attention of the person who practises shooting to aiming errors made by him, an aiming-error controlling device may be mounted on the aiming apparatus viewed in the direction of the shot.

Such a controlling device is shown in Fig. 4.

The device, which may also be provided in the aiming apparatus shown in Fig. 1, consists of a plate **37** preferably colored and fixed at right angles to the line of sight V near the sight **4**. This plate **37** is so large and of such shape that it is completely covered by the notch plate **5***a* which forms part of the notch **5**, when the person who practices aiming has taken the correct position of the sight called "medium sight", as shown in Fig. 5. If, however, the sight **4** is viewed in the notch displaced to the right as shown in Fig. 8, or to the left, as shown in Fig. 6, in upward direction as shown in Fig. 7 or in downward direction as shown in Fig. 9, i.e. if an aiming error has been made, the plate **37** becomes then visible as colored line situated at the right or at the left to the eye of the person who practises aiming when the sight is clamped right or left and above or below, when the sight is taken too full or too fine as shown in Fig. 5.

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