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Draftsman

Feb. 16, 1926. 1,573,515

J. W. HARKOM

REAR SIGHT FOR HIGH VELOCITY WEAPONS

Filed Oct. 18, 1922

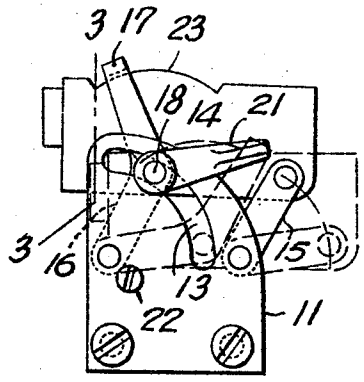


FIG. 1

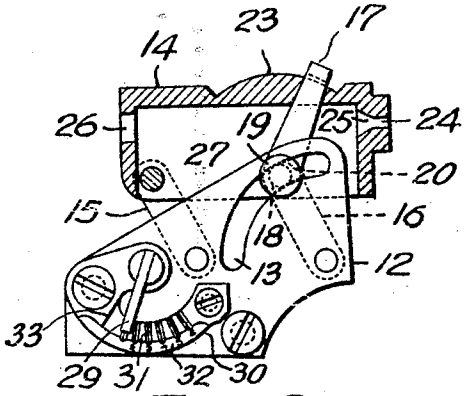


FIG. 2

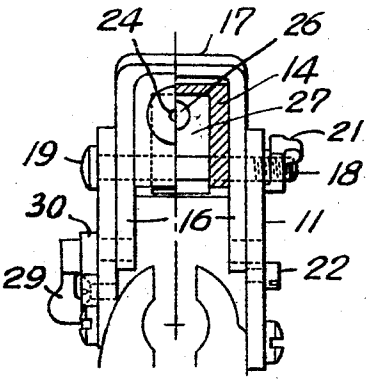
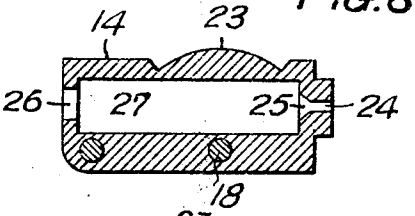


FIG. 3

FIG. 8.



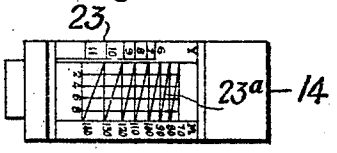


FIG. 9.

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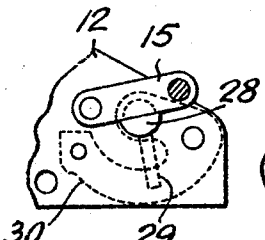


FIG. 4

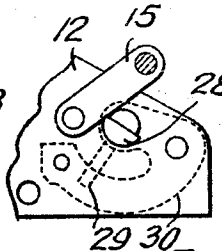


FIG. 5

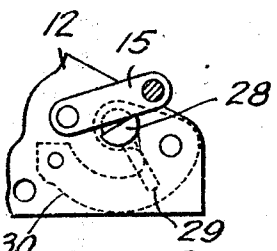


FIG. 6

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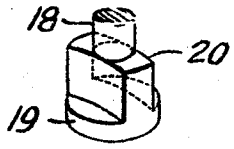


FIG. 7

Inventor
John W. Harkom
By
Atty.

Draftsman

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Patented Feb. 16, 1926. 1,573,515

UNITED STATES PATENT OFFICE.

JOHN W. HARKOM, OF MELBOURNE, QUEBEC, CANADA.

REAR SIGHT FOR HIGH-VELOCITY WEAPONS.

Application filed October 18, 1922. Serial No. 595,370.

To all whom it may concern:

Be it known that I, JOHN W. HARKOM, a subject of the King of Great Britain, and resident of the town of Melbourne, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Rear Sights for High-Velocity Weapons, of which the following is a full, clear, and exact description.

This invention relates to improvements in rear sights for high velocity weapons, such as are disclosed in my prior Patent No. 1,440,291, granted the 26th December 1922, and the object of the invention is to provide a simple, efficient and compact sighting device.

A further object is to provide a simple, durable and satisfactory means for effecting elevation adjustments, particularly for the lower ranges and for battle setting.

Still another object is to provide means for preventing cross rays of light interfering with clear definition of the foresight and object aimed at.

Another object is to provide a sighting member so constructed that when disposed in proper relation with a weapon the field of vision is invariably limited to include the foresight of the weapon and the line of sight always directed to the top of a foresight, whereby aiming is greatly facilitated.

Various other objects and advantages may be ascertained from the following description.

The invention comprises the provision of a sighting member having front and rear sight openings in axial alignment, between which is a cavity of such dimensions that cross rays of light do not interfere with the sharp definition of objects viewed through the apertures. The rearmost at least, of these sighting apertures is a cylindrical bore of such length and diameter that the shooter is substantially compelled to establish a line of sight coincident with the axis of the aperture in order to obtain clear vision, and thereby obtains a substantially correct aim without reference to the foresight which comes automatically in the line of sight. The sighting member, longitudinally curved on the top and inscribed on the curved top with range and elevation scales, is supported in any suitable form of frame by means of rockers or links. A setting lever, being preferably extensions of certain rockers connected above the block, is provided for adjustment to the scales on the sighting member to set the sighting member to any desired elevation. Means is provided for clamping the member in any position to which it is adjusted. A special setting means for short ranges and low elevations is provided and includes an adjustable stop disposed in the path of one or more of the rockers or links or of the sighting member itself and provided with an adjusting lever movable over a quadrant, the movement of the lever end being materially greater than the vertical movement of the sighting member, whereby at the lower ranges where the vertical movement is small the setting of the sight may be accurately determined. This same means may serve also in military weapons to determine the proper elevation for battle setting and conveniently the battle setting is effected by moving the lever to a different part of the quadrant from that which indicates definite ranges and also by providing a stop against which the lever may be pressed to give the battle setting, thus simplifying the operation.

In the embodiment of the invention illustrated in the accompanying drawings, and which is particularly adapted for one make of rifle;—

Fig. 1 is an elevation of the right-hand side of the device.

Fig. 2 is an elevation of the left-hand side of the device showing the sighting member in longitudinal central section.

Fig. 3 is a rear elevation showing the sighting member half in cross section on the line 3—3 Figure 1.

Figs. 4, 5 and 6 are elevations of the inner surface of one of the frame plates illustrating the operation of the adjustable stop.

Fig. 7 is an enlarged perspective view of the head of the clamping bolt.

Fig. 8 is a vertical longitudinal section at the centre of a sighting member showing an alternative construction.

Fig. 9 is a plan view of the sighting member showing the elevation scale thereon.

Referring more particularly to the drawings, 11 and 12 designate right-hand and left-hand frame plates respectively, which may be separate as in the present embodiment to adapt the sight to a particular rifle or may be otherwise formed; the said plates being each provided with a circularly curved slot 13. A sighting member 14 is swingingly mounted between the frame plates by

means of front and rear rockers 15 and 16 respectively, pivoted to the frame plates and to the sighting member. Conveniently there are two rockers in front and two in rear but this is a detail which depends largely upon the construction of the rifle for which the sight is adapted. An inverted U-shaped operating and setting lever 17 embraces the sighting member 14 and is connected at its ends to the front or rear rocker or rockers as may be found most desirable; the connection illustrated being to the rear rockers and preferably effected by forming the rockers and operating lever integral. By moving the upper end of the lever 17 the sight member or block 14 may be raised and lowered. The pivot pin designated 18 which connects the operating lever and attached rockers to the block 14, passes through the slots 13 of the frame plates and is provided at one end with a head 19 to engage the outer surface of one of the frame plates. The pin is also provided under the head with a substantially flat neck 20 which is slidable but irrevoluble in the slot 13 and serves to hold the pin against rotation about its own axis. The opposite end of the pin is threaded and carries a clamping lever 21 bearing against one of the frame plates and preferably retained against removal and loss by a stop 22 on the plate which limits the movement of the lever to that sufficient for loosening to move the sight and for tightening to clamp the sight. The top of the block is curved as at 23 in accordance with the arc of travel of the free end of the setting lever and this curved portion may be provided with range or elevation scales 23^a to any desired part of which an edge of the central part of the setting lever may be adjusted to give the desired elevation.

The block is provided at its rear end with a comparatively small cylindrical bore 24, the diameter and length of which may determine the field of vision, and preferably the forward end of this bore is flared, as at 25, to avoid too great restriction of the field of vision and to avoid sacrificing thickness of metal in the rear end of the block. At the front end of the block is a second cylindrical sighting aperture 26 axially in line with the aperture 24. Between the apertures 24 and 26 a cavity 27 is provided of such shape and size that cross rays of light do not affect the clear definition of any object viewed through the two apertures. The precise shape and size of this cavity is immaterial as long as the desired results are obtained, and therefore the cavity may be open-bottomed as shown in Figures 2 and 3 or may take the form of a simple bore as shown in Figure 8. In any case, the cavity must be of greater vertical and horizontal dimensions than the front opening 26.

An adjustable stop 28 is rotatably mounted in one or both frames to limit downward movement of the sighting member. This adjustable stop may be located in the path of the block 14 itself or in the path of any of the rockers as illustrated. The adjustable stop may conveniently be a cylindrical member having that portion designed for engagement with the block or rockers flattened, to provide surface or edge engagement as clearly shown in Figures 4, 5 and 6, or may take any other suitable form. The adjustable stop is provided with an operating lever 29 lying outside one of the frame plates and co-operating at its free end with a quadrant 30, preferably having the graduations thereof marked by notches or the like of appreciable depth, and designated 31. The lever 29 may be itself resilient for releasable engagement in the notches or may be provided with any suitable resiliently supported detent. The exact construction in this particular is immaterial as long as the lever is capable of being releasably locked at each graduation with sufficient firmness to guard against accidental displacement. A setting scale 32 may be provided adjacent the notches or graduations, each notch representing a predetermined amount of elevation. One end of the scale, which corresponds with the lowest setting or position of the sight block, is disposed some distance from one end of the quadrant and the scale extends toward the opposite end. At the first named end of the quadrant a fixed stop 33 is provided. The adjustable stop serves to determine the lowest point to which the sight block can be moved by the lever 17 and by rotating the adjustable stop the effective height thereof may be altered as desired. The normal position of the adjustable stop is illustrated in Figure 4 and corresponds with the position of the lever 29 shown in Figure 2. This position of the adjustable stop enables the sight block to come to its lowest elevation. By moving the lever over the graduations 31 the adjustable stop is positioned as shown in Figure 5 and determines a new low elevation for the sight block. By moving the lever in the opposite direction and against the fixed stop 33 the adjustable stop 28 is rotated to the position illustrated in Figure 6 and forms a stop slightly higher than that shown in Figure 4. The stop 33 provides a method of very quickly determining a low position for the sight which gives a certain predetermined elevation, and while designed primarily to give the battle setting for military small arms, may also be used as a quick method of determining elevation of the sight in sporting rifles. In either case, the feature is that the setting may be given without looking at the sight at all as the lever is merely moved into contact with the fixed stop. The same idea may be employed by

forming the last graduation on the quadrant to serve as a second fixed stop determining a different elevation from stop 33 and from the normal position. In such an arrangement all the notches 31, excepting that for the normal position, might be omitted or the depths of the notches may be varied to differentiate between different settings. Obviously many modifications may be made in the adaption of this feature of the invention to practical use. Obviously the movement of the lever end is much greater than the vertical movement of the sight block and therefore enables a very accurate setting for the lower ranges, and also enables intermediate settings, that is, fifty or twenty-five yard settings or less. While the cam arrangement just described is primarily intended merely as an adjustable stop or support to limit the downward movement of the sight block, it may, by suitable positioning and construction, be used as an elevating means for the sight block in which case the stop functions as a lever.

The operation of the sight is extremely simple. The clamping lever 21 is partially rotated in one direction to loosen the sight and the operator then grasps the cylindrical part or cross bar of the setting lever 17 lying above the block and moves the same forward or backward to raise or lower the sight block, the cylindrical part of the lever being adjusted according to any suitable scale inscribed on the curved top 23 of the block. When the block is properly adjusted the clamping lever 21 is rotated in a direction opposite to the first and clamps the sight block, rockers and setting lever to the frame plates. This may constitute an adjustment for all ranges but for the short ranges the adjustable stop 28 may be used to determine the setting. When the adjustable stop is used the block is unclamped as before and the lever 29 shifted over the quadrant 30 according to the scale 32 to position the adjustable stop 28 as desired. The positioning of the adjustable stop may serve to raise the block or the block may be raised until the stop is disengaged, and after the stop is properly positioned the block lowered until the stop checks further movement and then clamped. In the clamping and unclamping the neck 20 of the pivot pin holds the pin against rotation. In both setting devices the movement of the setting lever is greater than the vertical movement of the sight block and therefore the graduations are sufficiently large to permit very accurate, quick and easy setting and may also permit of the provision of graduations for intermediate ranges. The formation of the sight block provides for a very clear definition of a foresight and for great accuracy of aim, as the cylindrical openings 24 and 26 ensure proper alignment with the object aimed at independently of any foresight. The peep apertures in ordinary use are practically knife-edged so that one may obtain a clear view of an object to be aimed at at a very considerable angle to the barrel of the weapon and may thus have difficulty in bringing the foresight into the line of vision. The cylindrical rear aperture 24 must be axially coincident with the line of sight in order to secure a clear circular field of vision. If this alignment is not obtained the field of vision is an elongated one with sharp points and the definition is hazy. To avoid this haziness and to secure a clear view of the object the shooter instinctively brings the aperture axis into coincidence with the line of sight to the object and in doing so aligns the barrel of the weapon and brings the foresight into the line of sight. The shooter also instinctively centres the object aimed at in the field of vision as the best definition is thus obtained and in this centering the foresight is brought into proper position. In other words, by the use of a rear sight constructed as described, the shooter concentrates attention on the object aimed at and not on the foresight, which practically positions itself and serves merely to assist in the final alignment of the object and is not the primary means by which the aim is obtained as in ordinary sighting arrangements.

It will be understood that the details of construction herein illustrated and described are so given purely for purposes of explanation and therefore must not be regarded as limitative. That is to say, the form of the frame, the rockers and the cooperation of the specific relation of the adjustable stop 28 with other elements herein described and illustrated may be materially altered as desired or to adapt the sight to different weapons without departure from the spirit of the invention.

Having thus described my invention, what I claim is:—

1. In a rear sight, a frame, a sighting member movably connected thereto, means for moving the sighting member and means for limiting movement of the sighting member in one direction, the said means comprising a member rotatably mounted in the frame and disposed to serve as a movement-limiting stop, a notched quadrant on the frame, and a lever connected to the stop and engageable in the quadrant notches to releasably lock the stop in various positions.

2. A rear sight comprising a frame including a pair of side plates each having a quadrant-shaped slot therein, a sighting member, means swingingly supporting the sighting member between said frame plates including a pivot pin passing through the frame slots, a head on said pin in engagement with one frame plate, a neck on said pin engageable in one of the frame slots and

holding the pin against rotation, and a clamping lever screwed to the opposite end of said pin and engaging the other frame plate and adapted to clamp the frame plates, sighting member and supports together.

3. In combination with a device according to claim 2, means for raising and lowering the sighting member connected to the supporting means thereof and adapted to be clamped to the other members by the clamping means.

4. A rear sight including a base, a sighting member adapted within itself to determine a line of sight, means to movably support the sighting member on the base, an actuating member connected to the supporting means to move the same for adjustment of the sighting member to different elevations, said supporting means being adapted to automatically vary the inclination of the sighting member as it moves in a manner to maintain the line of sight through the member directed to a predetermined point at all elevations, said adjusting means being an extension of the supporting means overlying the sighting member and adjustable to predetermined points on the sighting member to effect movement of the sighting member to elevations corresponding to such points.

5. In a rear sight, a sighting member having a scale thereon, rockers to movably support the sighting member, extensions of said rockers at the sides of the sighting member connected together above the sighting member and constituting an elevating means and also constituting in cooperation with the sighting member scale an elevation gauging means for the sighting member.

6. In a rear sight, a sighting member, a frame including slotted side plates between which the sighting member may move, rockers to support the sighting member, an elevating lever, and clamping means including a pin passing through the slots of the side plates, through the sighting member, elevating member and certain of said rockers and serving also as a rocker and sighting member connection.

7. In a rear sight, a base, a sighting member having a scale thereon, supporting means hingedly related to the base and sighting member and means rigidly connected to the supporting means and adjustable on the sighting member to effect and gauge by the sighting member scale the movement of said sighting member.

8. In a rear sight, a base, a sighting member, links swingingly supporting the sighting member on the base, an adjustable stop engageable by the links and adapted when so engaged and upon adjustment to raise the sighting member, and means for adjusting the stop and gauging the adjustment thereof.

9. In a rear sight, a sighting member and setting means therefor, including mechanism to raise and lower the sighting member to different elevations, and a stop below the sighting member to limit downward movement thereof by abutment of the raising and lowering means on said stop, the said stop being adjustable to locate the abutment portion thereof at different levels according to the extent of downward movement desired for the sighting member to set the same for different ranges.

10. In a rear sight, a sighting member, means to adjust the sighting member to all elevations within the capacity of the sight and a supplementary means to determine minute differences of sight member position comprising a movable stop to limit movement of the sighting member in one direction and adjusting means for moving said stop.

11. In a rear sight, a frame, a sighting member adapted to rise and fall in said frame to different elevations, said sighting member and frame being each provided with a scale, the divisions of which are of greater length than the corresponding vertical movement of the sighting member, a lever to raise and lower the sighting member to all elevations traversing the sighting member scale, a lever traversing the frame scale, and a stop capable of raising the sighting member and of limiting downward movement thereof connected to said last mentioned lever for movement.

12. In a rear sight, a sighting member having a cylindrical rear opening, the length of which is greater than its diameter whereby a line of sight and field of vision are determined, the sighting member having a front aperture, the circumscribing wall of which lies just outside the field of vision determined by the rear aperture, whereby light coming from outside the field of vision is excluded from the rear opening, and means to position the sighting member in such relation to a weapon that the center of the top of the weapon foresight lies always in the center of the field of vision.

13. In a rear sight, a sighting member, frame members between which the sighting member is movably located, links each pivotally connected at one end to a frame member and at the opposite end to the sighting member and movably supporting the sighting member, and a rest for one at least of said links carried by a frame member, said rest being in effect a lever fulcrumed on the frame, and means to rock the lever to determine the lowest elevation to which the sight member may be moved.

In witness whereof, I have hereunto set my hand.

JOHN W. HARKOM.