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Dec. 2, 1941. J. D. PEDERSEN 2,264,809

REAR SIGHT FOR SEMIAUTOMATIC GUNS

Filed Aug. 24, 1939 2 Sheets-Sheet 1

Fig. 1.

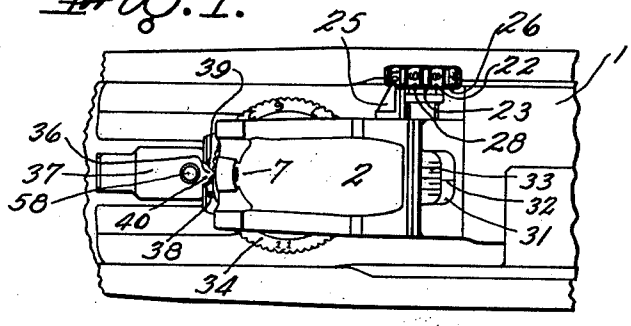
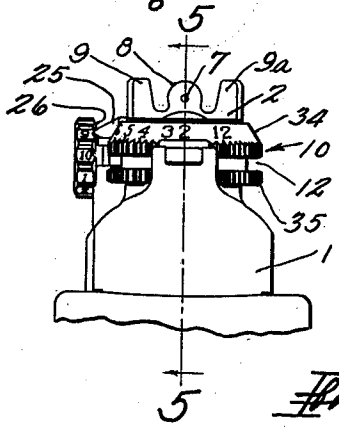


Fig. 2.



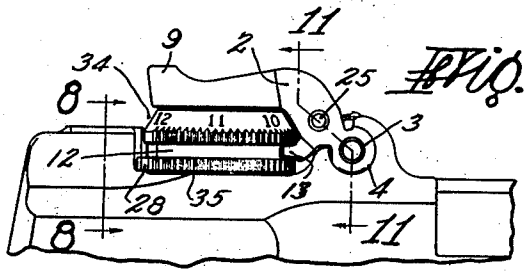


Fig. 3.

Fig. 4.

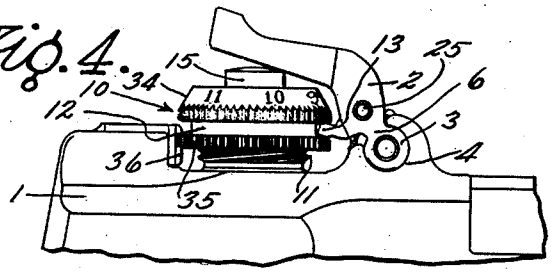
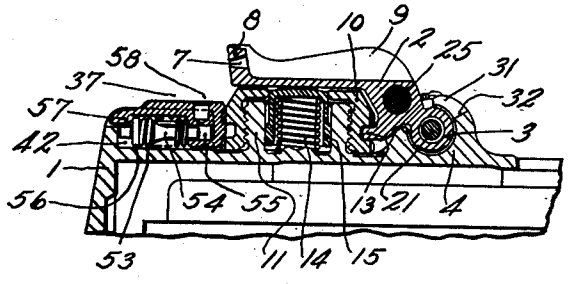


Fig. 5.



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Fig. 6.

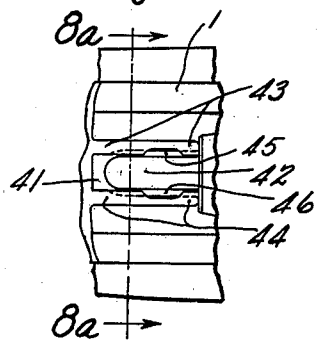


Fig. 7.

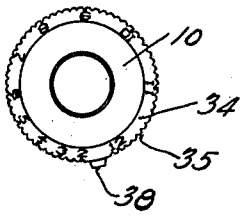


Fig. 8.

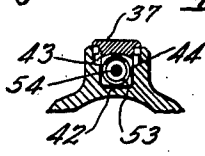


Fig. 8a.

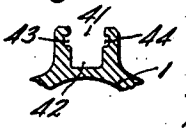


Fig. 11.

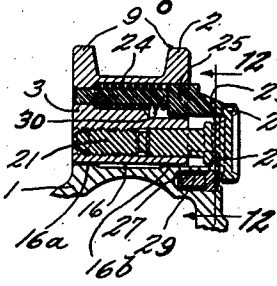


Fig. 12.

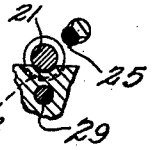
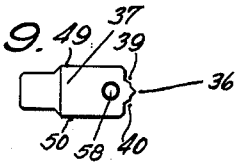


Fig. 9.



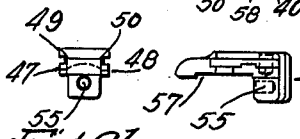


Fig. 9a.



Fig. 9b

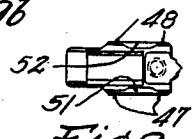


Fig. 9c.

Fig. 13.

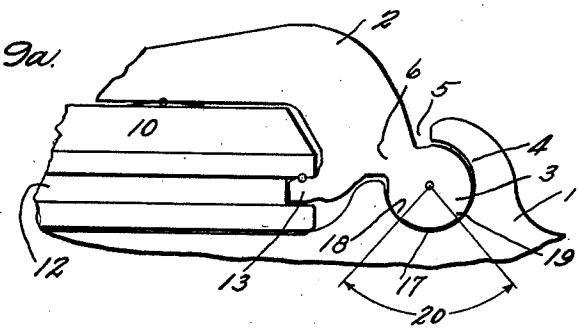




Fig. 10.

Fig. 10a

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33. GEOMETRICAL INSTRUMENTS.

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UNITED STATES PATENT OFFICE

2,264,809

REAR SIGHT FOR SEMIAUTOMATIC GUNS

John D. Pedersen, Jackson, Wyo.

Application August 24, 1939, Serial No. 291,641

7 Claims. (Cl. 33—56)

This invention relates to a rear sight for rifles, and has for its general object the production of a precision instrument of this character, the parts of which may be fabricated by usual methods for mass production.

To this end the sight mechanism and its several parts made with dimensional tolerances as may be practical are designed for the elimination of so-called "backlash" between all the relatively movable parts which contribute to the adjustment and positioning of the sighting element. In this connection a feature of special importance resides in means pivotally mounting the sight element carrying leaf upon the receiver or other fixed base member of the gun. The said sight leaf is formed with a doll's head at one end journaled in a socket formed in the base member. Due to the requirements of ordinary machine production the fitted engagement of the doll's head in its socket is relatively loose. Yet for any precision adjustment of the sighting element carried by the leaf, this loose fit of the doll's head in its socket has to be arranged to always provide a true bearing. It is well known that a true bearing for a rotating shaft may be provided by a so-called V-block bearing. The principle of such a bearing is employed in the present construction of the doll's head in its socket as will be hereinafter described.

In the preferred embodiment of the invention shown in the accompanying drawings,

Fig. 1 is a top view of the rear sight shown as mounted on the rear end of a receiver, only a fragment of said receiver being shown;

Fig. 2 is a rear view of the same;

Fig. 3 is a side view of the sight in its normal or "point blank" position;

Fig. 4 is a side view of the sight in its elevated position;

Fig. 5 is a vertical longitudinal section through the sight and a fragment of the receiver of the rifle, on line 5—5 of Fig. 2;

Fig. 6 is a top view of a fragment of the receiver with the sight parts removed;

Fig. 7 is a detailed top view of the nut;

Fig. 8 is a section on line 8—8 of Fig. 3;

Fig. 8*a* is a similar section with the detent removed, taken on line 8*a*—8*a* of Fig. 6;

Fig. 9 is a top view of the detent.

Fig. 9*a* is a side view of the detent.

Fig. 9*b* is a rear end view of the detent.

Fig. 9*c* is a bottom view of the detent.

Fig. 10 is a side view of the detent plunger.

Fig. 10*a* is a rear view of the detent plunger.

Fig. 11 is a section on line 11—11 of Fig. 3;

Fig. 12 is a section on line 12—12 of Fig. 11; and

Fig. 13 is an enlarged diagrammatic right side view of a fragment of the sight.

Referring more particularly to the drawings, the rear sight components are mounted on the top and rear of the receiver 1, relative to which the sight leaf 2 has elevating and lateral movements. Only part of the receiver of the rifle is here shown.

The sight leaf 2 is formed at its forward end with a cylindrically shaped head 3 commonly termed a "doll's" head, which is journaled in a bearing socket 4 formed in the receiver 1 so that the leaf may thus leave a pivotal movement on the receiver for its elevating adjustments. The head 3 is integrally joined to the body of the leaf 2 by a reduced neck portion 6 and the socket 4 is cut away with a narrow opening at 5 to provide room for movement of the neck 6 of the leaf when the latter is swung up and down for its elevating adjustments. The shape of the doll's head 3 beyond the neck 6 is in general cylindrical and the seating surface of the socket 4 which receives the doll's head is likewise generally cylindrical for a loose fit of the doll's head therein. Portions of both of these cylindrical surfaces have been cut away for a purpose hereinafter described. The peep hole 7 is formed in a small standard 8 rising integrally from the rear end of the leaf 2, Figs. 2 and 5. This standard is guarded on each side by side flanges 9, 9*a* which extend forwardly on the leaf.

The elevation adjusting nut 10 is threaded onto a receiver hub 11, Fig. 5. In operation, the nut is rotated through nearly one complete turn to swing the leaf 2 to its full elevation as shown in Fig. 4. The nut carries an annular groove 12 into which is engaged an arm 13 of the leaf. Inside the receiver hub and nut is an elevating spring 14 housed in a slidable case 15. The top of the case pressed upwardly by the spring 14, at all times bears against the underside of the leaf 2 to strain the top side of the arm 13 against the top wall of the nut groove 12. This spring tension thereby serves to hold the nut 10 firmly upward against its threads and to force the doll's head 3 downward on the socket 4 of the receiver. The action is such as to effectively eliminate vertical "backlash", and to accurately position the height of the peep hole 7 in any position of adjustment for range.

The bottom side of the arm 13 clears the bottom wall of the nut groove slightly, and acts as

a stop to prevent a considerable depression of the sight leaf from any position of adjustment.

The socket 4 in the receiver is formed with a central annular recess 16 located between two spaced apart and relatively narrow bearing portions 16a and 16b, one at each end of said socket as shown in Fig. 11. In other words the diameter of the socket 4 at each of its end bearing portions 16a and 16b is only large enough to permit free and easy turning therein of the "doll's" head 3 whereas the diameter of the intermediate annular recess 16 is larger than that of 16a and 16b so that there will be no contact of the "doll's" head 3 in the socket 4 except upon the relatively narrow and spaced apart end bearings 16a and 16b. This construction is to obviate any tendency toward transverse rocking of the "doll's" head in its socket.

In order to insure a true turning axis for the "doll's" head 3 in its socket 4 analogous to that of a shaft mounted in spaced apart V block bearings I have cut away a segmental portion of what would otherwise have been the lower cylindrical surface of said "doll's" head 3 as shown at 17 in Fig. 13. This cut away segmental portion 17 extends clear across the "doll's" head for its entire width so that the only cylindrical bearing portions of the "doll's" head indicated at 18 and 19 which have contact with the socket 4 are circumferentially spaced apart by a subtending angle 20 of almost 90°. The action of the spring 14 is to force the "doll's" head 3 down in its socket 4 and maintain the bearing surfaces 18 and 19 always at the lowest point in socket 4 consistent with the rotated position of head 3. By this means the turning axis of said head 3 will not at any time deviate from its predicted position. In other words it will be true at all times for precision adjustment of the sight leaf 2.

The windage or deflection screw 21 serves to adjust and to hold the sight leaf laterally with respect to the receiver. This screw is screw threaded into the doll's head along its axis. A receiver flange 22 at the left end of the socket 4 occupies an annular groove 23 in the screw 21 to secure the screw endwise, Fig. 11. A spring 27 and plunger 29 mounted in the receiver act constantly against the knob 26 of the windage screw 21 to hold the side of the groove 23 firmly against the flange 22, thus removing any backlash between the screw 21 and the receiver 1.

The knob 26 of the screw 21 is stamped with deflection scale figures and its inner edge is provided with detent notches 28. A knob detent plunger 25 is mounted crosswise in the leaf 2 and prevented from turning therein by a key at one side of its head engaging in a slotted portion 30 of the spring hole. A spring 24 continuously urges the pointed end of the plunger 25 into engagement with the detent notches 28 of the screw knob. The action of this spring is to eliminate "backlash" between the screw 21 and leaf 3, which would otherwise occur due to the necessary looseness in the fit of the screw threads.

All backlash is thus eliminated from every movable part employed in the positioning of the peep hole 7. The sight is, therefore, an instrument of precision which can be fabricated with the variations demanded by mass production methods. The upper side of the socket 4 is cut away for a bevel faced notch as at 31, Figs. 1 and 5. The bevel of the notch 31 may carry a zero graduation or other line of reference 32. The doll's head 3 may carry a graduated scale 33 which will measure the coarse scale deflection set-off for wind or other corrections. The fine scale deflection is measured on the scale figures of knob 26 of the windage screw by the point of the detent plunger 25.

The nut 10 has a bevel 34 on which are the range graduations. The periphery of the nut carries vertical notches 35 into which engages the point 36 of a nut detent 37. A stop lug 38 on the nut strikes against the shoulders 39, 40 of the nut detent, Fig. 9, to limit the rotation of the nut at the two extremes of its range adjustment.

The receiver at the rear of its hub 11 is cut with a slot formation shown in cross section, Fig. 8a. The upper slot portion 41 is open at the rear and the lower slot portion 42 is closed at the rear as shown in Fig. 5. The T-slots 43, 44 are interrupted along their top by entry cuts 45, 46, Fig. 6.

The nut detent, Fig. 9, is provided with side ribs 47, 48, and top flanges 49, 50. The ribs 47, 48 are interrupted by cuts 51, 52 so that the rear ends of said ribs will assemble downwardly through the entry cuts 45, 46 of the receiver when the nut detent is forward of its operative position. When in its operative position, the front and rear ends of the ribs on the nut detent are guided in the T-slots 43, 44 of the receiver. The top flanges 49, 50 serve to cover up the entry cuts 45, 46 of the receiver.

A coil spring 53 surrounding a plunger 54 continuously urges the nut detent 37 forward to engage with the nut 10. The front end of the plunger 54 is guided in the hole 55 of the nut detent. The rear end of said plunger bears against the end of the receiver slot 42 as a base. The flange 56 of said plunger engages in front of the shoulder 57, of the detent, when the latter is removed from the receiver. This engagement detachably holds the spring and plunger to the detent 37 when disassembled.

The sight may be disassembled by completely unscrewing windage screw 21 to move the doll's head 3 of the leaf to the right, partially out of the socket 4 of the receiver. The leaf 2 is then removed, to the right, from the receiver. The nut 10 is then elevated to its highest range, until stop 38 strikes against shoulder 39 of the detent 37. The detent 37 is then moved to the rear by a pointed instrument engaged in the hole 58 to permit the nut 10 to be completely unscrewed from hub 11 of the receiver. The detent 37 is then moved forward until the rear end of its ribs register with the entry cuts 45, 46 of the receiver. The nut detent, with its spring and plunger may then be lifted out of the receiver.

I claim:

1. In a rear sight for rifles in combination, a fixed base, a sight leaf pivotally mounted on said base for elevating movement, a spring mounted in position tending to swing said leaf upwardly in its elevating movement, and an elevation adjustment nut screw threaded on said base and a tongue groove connection between said nut and said leaf which prevents up and down movement of said leaf except when said nut is turned.

2. In a rear sight for rifles in combination, a fixed base, a sight leaf pivotally mounted on said base for elevating movement, a spring mounted in position tending to swing said leaf upwardly in its elevating movement, an elevation adjustment nut screw threaded on said base, a tongue and groove connection between said nut and said leaf which prevents up and down movement of said leaf except when said nut is turned, and a windage screw engaged with said base and operably

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connected to said leaf for shifting the leaf laterally on its pivot relative to said base and means associated with said windage screw winding to take up slack between said screw and said base and separate means to take up slack between said screw and said leaf.

3. In a rear sight for rifles in combination, a fixed base, a sight leaf pivotally mounted on said base for elevating movement, a spring mounted in position tending to swing said leaf upwardly in its elevating movement, an elevation adjustment nut screw threaded on said base, a tongue and groove connection between said nut and said leaf which prevents up and down movement of said leaf except when said nut is turned, a windage screw having a tongue and groove connection with said base and screw threadedly connected to said leaf for shifting the leaf laterally on its pivot relative to said base, a back-lash spring mounted with its thrust acting between said windage screw and said base for taking up back-lash therebetween, and a detent engaging said windage screw, a spring for said detent positioned with its thrust acting between said leaf and said windage screw to take up back-lash therebetween.

4. In a rear sight for rifles in combination, a fixed base, a sight leaf pivotally mounted at one end thereof on said base for elevating movement, an elevating adjustment nut screw threaded on said base beneath said leaf, a spring mounted axially in said nut and thrusting upwardly against said leaf tending to elevate the same, and an arm projecting from said leaf and engaging in a peripheral groove of said nut whereby said nut controls the elevation of said leaf against the tension of its spring.

5. In a rear sight for rifles in combination, a fixed base, a sight member mounted for different positions of elevation on said base, an elevating adjusting nut screw threaded on said base for controlling the elevations of said sight member, said nut having notches around its periphery and detent mechanism for holding said nut in different positions of adjustment, comprising a slide member detachably engaged in ways on said base and a spring actuated plunger carried on said slide interposed between said slide member and said base tending to keep the pointed end of said slide pressed against the notched periphery of said nut.

6. In a rear sight for rifles in combination, a fixed base, a sight leaf, means for pivotally mounting said leaf on said base comprising a cylindrically shaped head projecting from said leaf and a cylindrically shaped socket formed in said base to receive said head for being journaled therein, a segmental portion of said cylindrical head at the lower side thereof having been cut away, and means comprising a spring tending to elevate the rear of said leaf and to thrust the head of said leaf downwardly in said socket.

7. In a rear sight for rifles in combination, a fixed base, a sight leaf, means for pivotally mounting said leaf on said base comprising a cylindrically shaped head projecting from said leaf and a cylindrically shaped socket formed in said base to receive said head for being journaled therein, a segmental portion of said cylindrical head at the lower side thereof having been cut away, said socket having spaced apart end bearing portions with an intermediate clearance portion of larger diameter than said end bearing portions, and means comprising a spring tending to elevate the rear of said leaf and thrust the head of said leaf downwardly in said socket.

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