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C. JACOBSEN ET AL

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GUN SIGHT

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3 Sheets-Sheet 1

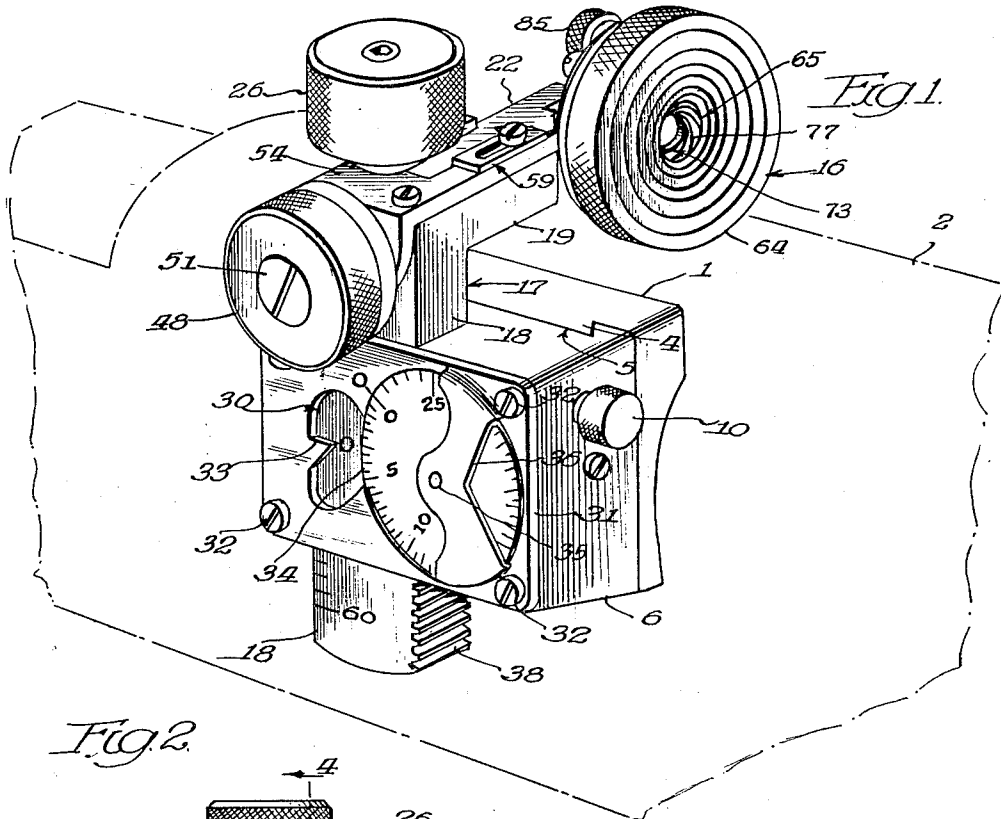


Fig. 2

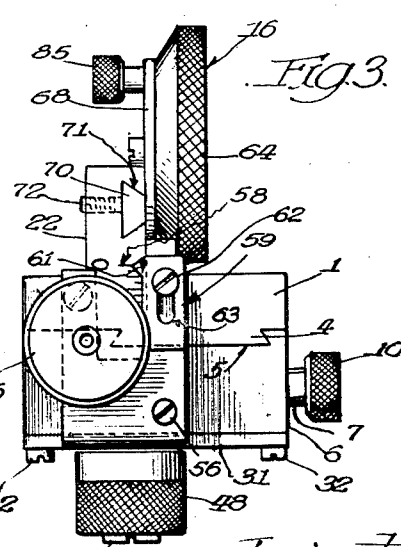
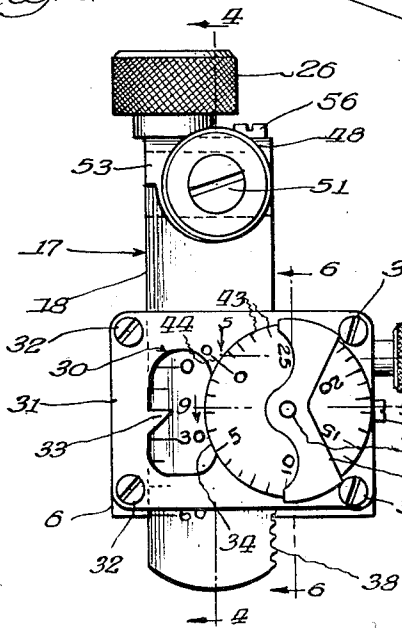


Fig. 3

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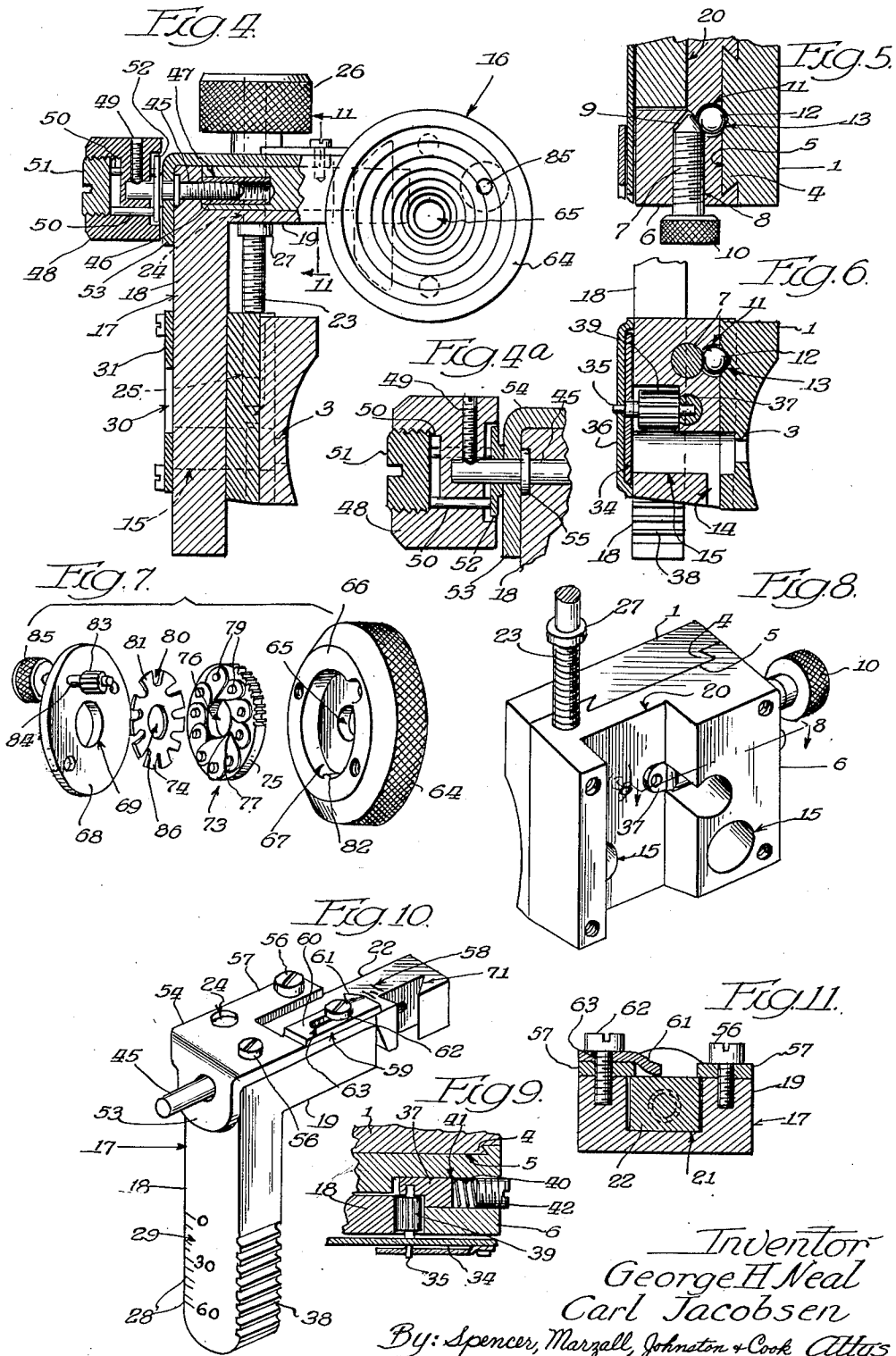
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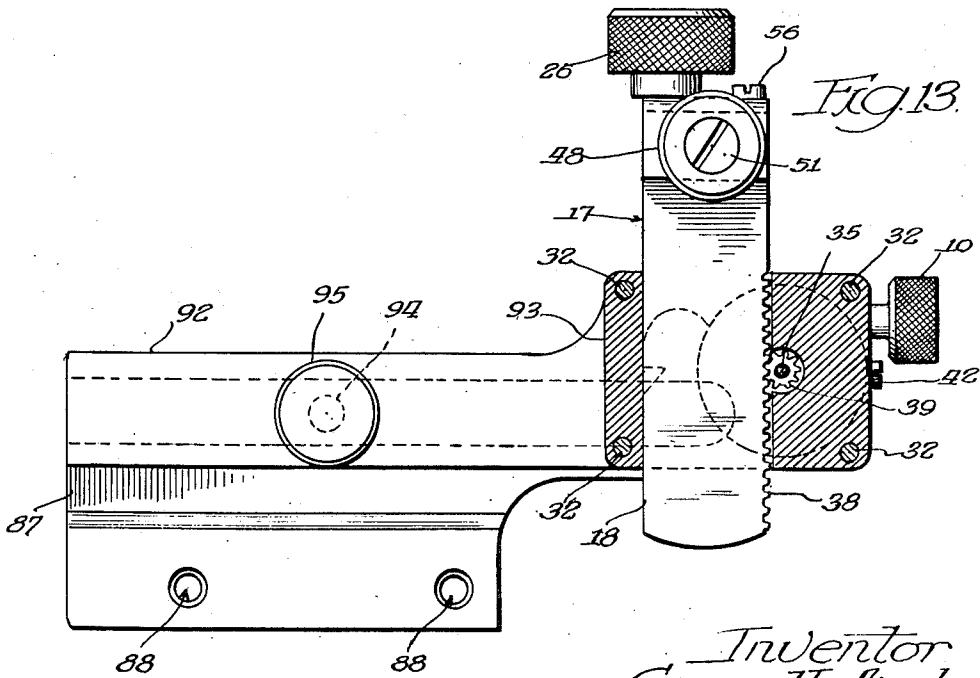
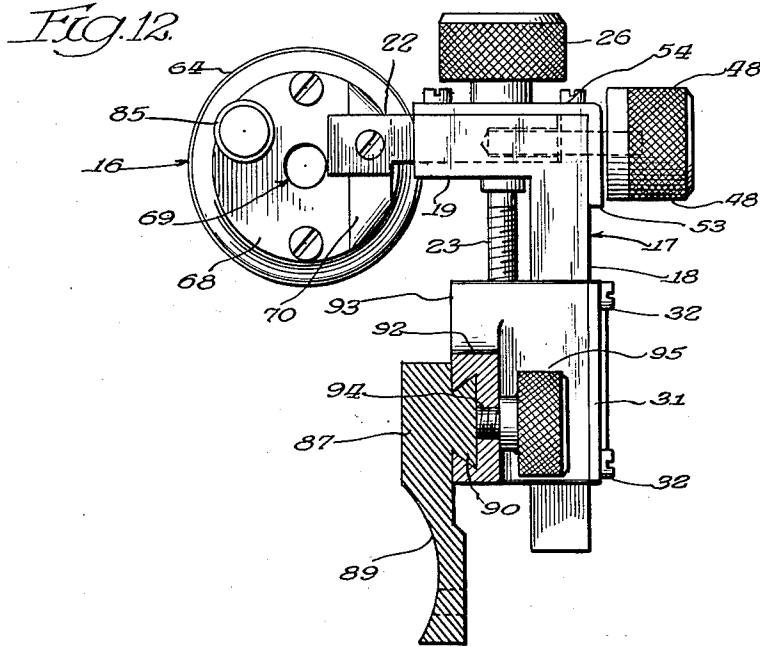
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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GUN SIGHT

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5 Claims. (Cl. 33—56)

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This invention relates to a gun sight, whether of the receiver or tang type, and its primary object is the provision of new and improved means for effecting and obtaining micrometer adjustment of the peep sight in either a vertical or a horizontal direction.

Another important object of the invention resides in the provision of a gun sight wherein there are a plurality of interfitting parts which may be easily and quickly assembled and made at a relatively low cost.

Another object of the invention is to provide a gun sight of the peep sight type which is provided with new and improved means for mounting the device on the tang or receiver of a gun, for effecting minute adjustment of the peep sight in various directions and properly calibrating the various elements with respect to the gun upon which it is mounted.

A further object is the provision of new and improved means for overcoming lost motion or backlash in certain of the operable parts which cause the vertical and horizontal adjustment of the peep sight.

A further object is the provision of a strong, durable gun sight composed of rigid parts which may be economically manufactured and which attains the highest desideratum with respect to range and elevation adjustment, wind adjustment, and other adjustments necessary and ordinarily required.

A still further object of the invention resides in the provision of a plurality of interfitting parts for effecting proper and minute adjustment of the peep sight and for positively calibrating the parts by means of visible calibration or vernier devices so that the proper adjustment may be made and read.

A still further object of the invention resides in the arrangement, construction and location of the various parts so as to provide a durable, highly efficient gun sight which is compact and which may be easily and readily applied to the gun either as a receiver sight or tang sight.

Numerous other objects and advantages will be apparent throughout the progress of the specification which follows:

The accompanying drawings illustrate a certain selected embodiment of the invention, and the views therein are as follows:

Fig. 1 is a perspective view of the gun sight, the same being shown mounted on the receiver of a rifle;

Fig. 2 is a detail side elevational view of the improved gun sight;

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Fig. 3 is a detail plan view thereof;

Fig. 4 is a transverse vertical section on line 4—4 of Fig. 2, the peep sight being in its extreme left hand position;

Fig. 4A is an enlarged detail longitudinal sectional view of the windage knob shown in Fig. 4;

Fig. 5 is a detail horizontal sectional view on line 5—5 of Fig. 2;

Fig. 6 is a detail transverse vertical sectional view on line 6—6 of Fig. 2;

Fig. 7 is an exploded perspective view showing the assembly of the various parts comprising the peep sight;

Fig. 8 is a perspective view showing one form of base mounting and support block which may be used in connection with the gun sight for maintaining the same on the gun receiver;

Fig. 9 is a detail horizontal sectional view on line 9—9 of Fig. 2;

Fig. 10 is a perspective view showing the assembly of the various parts of the gun sight which carry or support the peep sight element;

Fig. 11 is a detail transverse sectional view on line 11—11 of Fig. 4;

Fig. 12 is an end view showing a modified form of mounting base and supporting block used in connection with the device, parts of said base and block being shown in section for the sake of clearness; and

Fig. 13 is a side elevational view of the base and block shown in Fig. 12, the vernier dial and the cover plate being omitted.

The particular embodiment of the invention illustrated in Figs. 1 to 11, inclusive, for the purpose of describing the invention comprises a mounting base or attaching support 1 which is adapted to be fastened to a gun receiver 2 to provide an attachment on the gun to which the sight may be detachably secured, Fig. 1.

The base or support 1 is in the form of a block which may be fastened rigidly to the gun receiver by a pair of machine screws (not shown). The screws pass through a pair of transverse bores 3 in the mounting base and have threaded engagement with properly positioned tapped holes in the wall of the gun receiver, Figs. 4 and 6. The mounting base 1 is provided with a vertically disposed dovetailed tongue or boss 4 which slides into a corresponding vertical dovetailed groove 5 formed in a supporting block 6, Figs. 3 and 8. The supporting block 6 carries the operable mechanism or parts of the gun sight proper and is movably mounted on the mounting base 1.

It is desirable that the supporting block 6 be mounted detachably on the mounting base 1 so

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that the device may be readily removed from attachment to the gun. It is also desirable that means be provided for locking the supporting block to the mounting base so that the gun sight is attached rigidly to the gun when used in connection therewith. Means for locking and unlocking the supporting block to the base mounting to accomplish these ends comprises a screw 7 which is threaded in a tapped bore 8 in the block 6, Fig. 5. The inner end of the screw 7 is tapered as indicated at 9; and the outer end of the screw is provided with a knurled knob 10 so that the screw may be turned by the user. A spherical socket or chamber 11, which is formed in the block 6 between the inner end of the bore 8 and the dovetailed groove 5, loosely receives a ball 12. The arrangement is such that when the screw 7 is advanced into the bore 8, the tapered end 9 of the screw cams against the ball 12 and forces it against the dovetailed boss 4 on the mounting base 1. An indentation or groove 13, adapted to receive the ball 12, may be formed in the dovetailed boss 4 so that the supporting block may be locked rigidly with respect to the mounting base 1 and properly aligned therewith.

Should it be desired to remove the gun sight from its attachment to the gun, the screw 7 may be retracted from the bore 8 to release the ball 12 from mating engagement with the indentation 13. The supporting block 6 may then be detached from the mounting block 1 by pulling it upwardly and out of engagement with the dovetailed boss 4 on the mounting block. The supporting block 6 is provided with vertical slots 14 to allow the heads of the mounting screws which secure the base to the gun receiver to clear the base block when the base block is removed from the supporting block in the aforescribed manner. The block 6 may be provided with a pair of bores 15 so that access may be had to the screws which fasten the mounting base 1 to the gun receiver 2, Figs. 6 and 8.

The peep sight 16 is adapted to be adjusted vertically with respect to the supporting block 6 by means of an L-shaped adjustment member 17, Fig. 10, having a vertical leg 18 and a horizontal leg 19. The vertical leg 18 is arranged in a straight walled slot 20 formed in the block 6, Fig. 8, and has vertical slidable movement therein, whereby vertical movement of the leg 18 will cause comparable vertical movement of the horizontal leg 19. The horizontal leg 19 is integral with the vertical leg 17, and has a slot 21 formed therein, Fig. 11, to receive slidably a sight bar 22 which is detachably secured to a part of the body of the peep sight 16.

Means for raising or lowering the peep sight 16 is accomplished by raising or lowering the L-shaped member 17. The means for adjusting the member 17 with respect to the base 6 in order to make connection for target elevation and range comprises a vertical turnable rod 23 which passes loosely through a vertical bore 24, in the horizontal leg 19 of the L-shaped member 17, Fig. 4. The turnable rod 23 has threaded engagement at its lower end in a corresponding threaded bore 25 in the supporting block 6. The rod 23 is turned by means of a knurled knob 26 which is mounted on the upper end of the rod. An integral enlarged part or collar 27, disposed intermediate the ends of the rod 23, supports the leg 19 of the member 17. The L-shaped member 17 may be raised or lowered with respect to the block 6 by rotating the knurled knob 26 in the proper direction.

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The vertical leg 18 may be provided with a calibrated means 28 forming a scale 29, Fig. 10, so that the proper setting for the elevation adjustment of the peep sight may be made and read. The indicia 28 on the scale 29 may be viewed through a window or opening 30 in a front cover plate 31 which is fastened to the supporting block 6 by machine screws 32, Figs. 1 and 2. A pointer or indicator 33, which may be made integral with the cover plate 31, is provided to indicate the relative position of the peep sight 16 and the L-shaped member 17 with respect to the supporting block 6. By turning the elevation knurled knob 26 to raise or lower the L-shaped member 17 with respect to the block 6, the indicia 28 on the scale 29 are brought in alignment successively with the indicator or pointer 33 until the proper elevation adjustment may be made or read.

Extremely accurate adjustment of the elevation setting of the peep sight 16 is possible by means of the provision of a vernier dial 34 which is rotatively driven when the L-shaped member 17 is moved vertically by means of the elevation knob 26. The vernier dial 34 is mounted rigidly at its center on a shaft 35 which is journaled at its outer end in an integral bridge part 36 of the cover plate 31 and at its inner end to a floating bearing block 37. The vertical leg 18 of the L-shaped member 17 has, on one side thereof, a toothed rack portion 38 which engages a pinion 39 fixedly mounted on the shaft 35. The pinion 39 is maintained in proper engagement with the rack teeth 38 by means of a coil spring 40 which is arranged in a bore 41 in the supporting block 6. The spring 40 is interposed between the bearing block 37 and a set screw 42 in the bore 41 to keep the pinion 39 and the teeth 38 in engagement. Any vertical movement of the L-shaped member 17 with respect to the supporting block 6 causes the pinion 39 to rotate and drive the shaft 35 so that the vernier dial 34 is similarly rotated.

The vernier dial 34 may be provided with a plurality of circumferentially arranged indicia 43, Fig. 2, these indicia being adapted to be brought into alignment with an index 44 on the cover plate 31. The indicia 43 may, if desired, be spaced apart to indicate minutes of an angular degree of gun elevation. For example, in the embodiment illustrated herein, thirty indicia 43 are arranged circumferentially on the vernier dial 34. The spacing between any two adjacent indicia 43 corresponding to a gun elevation (above the normal) of one angular minute. The spacing between any two adjacent indicia 28 of the scale 29 in the vertical leg 18 corresponds to a gun elevation differential of ten angular minutes. The vernier dial 34 is actuated by the rack 38 in a manner such that if the pointer 33 is disposed between the indicia 28 from "1" to "30," inclusive, the particular index 43 that is in alignment with the index 44 will give a direct reading of the angular elevation of the gun above the "zero" point. If the pointer 33 is disposed between the indicia 28 from "30" to "60," the numerical value of the particular index 43 that is aligned with the index 44 is added arithmetically to "30" to obtain the reading of the angular elevation of the gun above the zero point. The result is such that any rotative movement of the rod 23 to give vertical movement to the L-shaped member 17 with respect to the block 6, causes the vernier dial

34 to rotate so that precise and accurate adjustments of the elevation setting are possible.

The peep sight 16 is adapted to be shifted in a horizontal direction to compensate for the effects of wind on the trajectory of bullets fired from the gun as well as perhaps for barrel misalignment, such as slight curvature in the gun bore. Also, minor misjudgments in sighting the rifle by the marksman may be compensated for by means provided in the sight. The sight bar 22 is made adjustable in the slot 21 of the horizontal leg 19 by the provision of a windage screw 45 having threaded engagement with a tapped insert 46 which is force-fitted into a bore 47 extending longitudinally in the sight bar 22, Fig. 4. The tapped insert 46 insures that the threads having engagement with the screw 45 will be uniform throughout so that lost motion or backlash is eliminated or at least reduced to a minimum. The screw 45 passes horizontally through the upper end of the L-shaped member 17 and is adapted to be rotated by means of a knurled windage knob 48 at its outer end which is rigidly secured thereto by means of a set screw 49. Rotation of the windage knob 48 causes the sight bar 22 to be moved horizontally with respect to the horizontal leg 19 of the member 17 so that the peep sight 16 may be moved to any desired predetermined position in a horizontal plane.

Additional means are provided for preventing lost motion or backlash when the windage knob 48 is rotated reversely in advancing or retracting the sight bar 22. This additional means may comprise a plurality of longitudinally extending pins 50 arranged within the windage knob 48. Each pin 50 has one of its ends abutting against the inner face of a set screw 51, which is threaded in the windage knob 48, Fig. 4A. The other end of each pin 50 abuts against one face of a washer 52, the other face of the washer being arranged against a downturned integral flange 53 on a bifurcated plate 54. A collar 55, which is integral with the screw 45, is positioned against the left-hand end of the slot 21 (Figs. 4 and 4A) so that the screw 45 is free to rotate but is prevented from moving axially. Backlash effects are eliminated by tightening the set screw 51 against the pins 50 so that the pins will cause the washer 52 to be pressed tightly against the flange 53. This arrangement insures a rigid connection between the windage knob 48 and the screw 45 and prevents axial movement of the screw 45 so that there will be no play or backlash in the windage adjustment.

The sight bar 22 is maintained and guided in the slot 21 by means of a bifurcated plate 54 which is fastened to the top of the vertical leg 18 by screws 56. Furcations 57 on the inner edges of the bifurcated plate 54 extend inwardly a short distance from the edges of the slot 21 so that the sight bar 22 will be guided properly in the slot 21.

A scale 58 having calibrations or indicia is provided on the sight bar 22 so that the gun sight may be properly "zeroed-in" to overcome shooting above or below, or on either side. In instances where the gun may shoot too much to the left a calibrated setting is made. The sight is then adjusted to a certain degree to shoot more to the right. If the next shot is too far to the right the setting is reversed within the proper limits until the correct line of fire is obtained. The vertical adjustments are made by rotating the screw 23 after the correct hori-

zontal adjustments have been made. After "zeroing-in" additional adjustments may be made for wind velocity. The scales 29 and 58, therefore, give the shooter an indication of the amount of adjustment to be made.

An indicator 59 cooperates with the scale 58, and this indicator comprises a flat strip 60 having an integral pointer 61 which extends laterally over the sight bar 22. The strip 60 is slidably mounted on top of one of the furcations 57 of the plate 54. The strip 60 is secured to the plate 54 by means of a machine screw 62 arranged in a slot 63 in the strip 60 so that the indicator or pointer 61 may be moved to a definite position over the scale 58 on the sight bar 22 when the gun is zeroed-in or when the sight is being adjusted initially. The indicator is free to be moved when the screw 62 is loosened, and then locked in adjusted position when the screw 62 is tightened.

The peep sight 16 comprises a rear disk-like member 64 having a centrally disposed opening 65 therein. An integral annular ring 66 is formed at the forward part of the disk 64 to form an internal chamber 67 in which certain operable parts are housed to vary the size of the peep opening through the peep sight. The front of the compartment 67 is closed by a circular disk or plate 68 having a centrally disposed opening 69 in alignment with the opening 65. The disk or plate 68 has a vertically disposed integral dovetail boss or tongue 70 formed on its rear face which dovetails with a vertical dovetail groove 71 formed near or at the end of the sight bar 22, Fig. 3. The boss or tongue 70 is slidably mounted in a vertical dovetailed groove or slot 71, and is locked in place by a set screw 72. The peep sight 16 is freely adjustably movable in the dovetailed groove 71 when the screw 72 is loosened, and locked in adjusted position when the screw 72 is tightened.

The peep opening through the peep sight 16 (the openings 65 and 69) may be enlarged or decreased in size by means of a shutter element 73, Fig. 7, which is arranged in the chamber or compartment 67 and cooperates with a pronged member or spider 74 also positioned inside of the chamber. The shutter element comprises a ring 75 having a central aperture 76. A plurality of overlapping shutter slides or blades 77 are arranged peripherally about the aperture 76, being pivotally mounted on one face of the ring 75 by pivot members 78 which may be struck out from the slides or blades and engaging holes in the ring 75, Fig. 7. The blades 77 have outwardly projecting lugs 79 formed on their free ends to be received in spaces 80 between the arms 81 of the spider 74. The spider 74 is locked from rotative movement by means of a lug or protuberance 82 formed on the ring 66. The ring 73 is adapted to have limited rotative movement by means of a pinion 83 which is fixed to a shaft 84 passing through the front plate or disk 68. The pinion meshes with teeth formed on the periphery of the ring 75; thus, when the shaft 84 is given rotary movement the lug 79 will engage the arms 81 of the spider 74 and press the slides or blades 77 inwardly or outwardly to decrease or increase, respectively, the size of the opening, depending in which direction the shaft is rotated. The shaft 84 extends through the disk 68 and carries a knurled knob 85 at its outer end to permit the shaft 84 to be operated manually exteriorly of the element to cause operation of the structure arranged

within the chamber 67. The opening through the peep sight 16 is enlarged or decreased as desired or required because the slides or blades 77 are operated to adjust the sight opening through the sight. The spider 74 has a central aperture 86 which aligns with the openings 65, 69 and 76 in the disk 64, disk 68 and element 73 respectively. The slope, size and construction of the parts and the manner in which the blades 77 are constructed and the manner in which the parts fit, particularly the cooperation of the lugs with the spider arms is such that the sight opening through the sight 16 may be operated from closed to a full opening.

Modified construction

The gun sight shown in Figs. 12 and 13 is a modified form of the gun sight heretofore described. The only difference between the modified gun sight and the gun sight shown in Figs. 1 to 11, inclusive, is the construction of the mounting base and of the supporting block. The modified construction of the combination of the mounting base and supporting block hereinafter described may be adapted for use with any type of gun but is particularly suited for use with certain types of guns, such as Winchester 30-06 rifles, and the like.

The modified form of gun sight comprises a mounting base or attaching support 87 which may be fastened to a gun receiver by a pair of machine screws (not shown). The screws pass through a pair of transverse bores 88 in the base 87 and have threaded engagement with a pair of tapped holes properly positioned in the wall of the gun receiver. The mounting base 87 is relatively elongated in shape and is provided with a concave surface 89 which rests against the outer surface of the gun receiver. The base 87 is positioned with a horizontally disposed longitudinally extending dovetailed boss or tongue 90 which is adapted to slide into a corresponding horizontally disposed dovetailed groove 91 formed in an arm or extension 92 which extends forwardly from its integral connection with the side of a supporting block 93. The supporting block 93 carries the same various operable sight adjustment parts carried by the supporting block 6, the only difference in the said blocks residing in the means and manner by which the blocks 6 and 93 are attached to their mounting bases 1 and 87, respectively. The arm or extension 92 may have a set screw 94 threaded therein for locking and unlocking the gun sight proper to the mounting base 87. The screw 94 has at its outer end a knurled knob 95 which may be rotated to tighten or loosen the screw from locking engagement with the mounting base 87. The supporting block 93, and therefore the gun sight proper, may be removed from its mounted position on the mounting base 87 by loosening the screw 94 and then moving the block 93 rearwardly.

Operation

The gun sight is applied to a gun by mounting either the base 1 or 87 to a part of the gun such as the gun stock. The base is secured in position by screwing the same onto a part of the gun such as the gun receiver. The supporting block 6 or 93 is adapted to cooperate with its respective base 1 or 87. Vertical adjustment of the peep sight 16 is effected by rotation of the knurled knob 26 to effect rotation of the threaded stem

23. The rotation of the knurled knob 26 causes rotation of the vernier dial 34 which has cooperation with the scale 29 on the vertical leg 18 whereby the setting may be readily ascertained and read. Therefore, when vertical adjustment for elevation or range is required, the knurled knob 26 is rotated in the proper direction. Horizontal or side-to-side adjustment of the peep sight 16 is accomplished by rotating the knurled windage knob 48. This windage knob 48 may be provided with graduations or calibrations or other indicia if desired. The opening through the peep sight 16 may be adjusted by rotating a knurled knob extending outwardly from the disk 68 so that a larger or smaller peep sight opening may be had as desired. The entire device is adapted to be shiftably or adjustably mounted on its supporting base and then locked in such adjusted position.

The gun sight of the invention is rigid, efficient and durable, and omits the usual click arrangement inherent in conventional gun sights. Ordinary gun sights are calibrated so that one minute of angle is equal to one inch of adjustment per 1000 yards. The present invention does not have any click adjustments which are variable throughout variable degrees, but is provided with an accurate construction so that the proper adjustments may be made even within minutes of a degree. The gun sight of the present invention is particularly adapted for marksman shooting, and when the sight of the invention is properly "zeroed-in" expert shooting may be obtained. The gun sight of the invention is particularly advantageous in providing accurate adjustment because it compensates to a great extent for so-called "drift shots." While drift shots are ordinarily inexplicable, they do occur with regular sequence, say one shot out of ten or twenty may be a drift shot. This may be due to the manner in which the cartridge is loaded. However, the present invention causes the gun barrel and line of sight to be properly and correctly adjusted so that even the so-called drift shot will be within the proper range, whereby a marksman employing the present gun sight is assured of a shooting score of a much higher average than would occur without the use of the present sight.

The gun sight of the present invention is provided with graduated indicia or calibrations so that the marksman will know the amount of adjustment necessary for the proper alignment or "zeroing-in" within fractions of one minute of an angle. When the gun sight is properly "zeroed-in" with respect to the line of fire or the rifle bore, the marksman is assured of accurate range and elevation and side direction. Compensation is provided for windage whereby a minor adjustment may be made to compensate for cross-wind velocity. There is no backlash in the adjustments and therefore when an adjustment is made it is positive and direct and can be made correct to a split hair.

The device may be readily and economically manufactured and may be easily and readily applied to existing rifles. The sight proper is universal in that it may be adapted to a mounting applied to the receiver or it may be used as a tang sight.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make any and all such changes

as fall clearly within the scope of the following claims.

The invention is hereby claimed as follows:

1. A gun sight comprising a mounting member adapted for attachment on a gun, a supporting member and fastening means for securing the supporting member on the mounting member, a carrying frame, having a support leg vertically movable in said support member and a mounting leg on said support leg and extending therefrom horizontally above said gun, means for raising and lowering said carrying member with respect to the supporting member, said mounting leg having a longitudinally extending groove therein, a sight bar supported on said mounting leg in said groove, a peep sight carried by the sight bar, outwardly of the end of said mounting leg remote from said support leg, means for moving the sight bar and peep sight thereon horizontally on said mounting leg, a graduated scale on and extending longitudinally of said sight bar, an index member on and adjustable longitudinally of said mounting leg in position overlying said scale, and means to secure said index member in adjustable position on said mounting leg.

2. A gun sight comprising a mounting member adapted for attachment on a gun, a supporting member and fastening means for securing the supporting member on the mounting member, a carrying frame having a support leg vertically movable in said support member and a mounting leg on said support leg and extending in a direction normal to said support leg above said gun, a peep sight mounting bar carried by and movable longitudinally of the mounting leg, an adjusting stem turnably mounted in a bore in said mounting leg adjacent its junction with the support leg and making threaded engagement in a socket in said support member for adjusting the carrying member vertically on the support member, and another adjusting stem turnably mounted in a bore in the end of said mounting leg at its junction with the support leg, said stem having threaded engagement in a threaded socket formed in the end of said mounting bar.

3. A gun sight as set forth in claim 2, wherein said adjusting stems are provided with knobs to facilitate the manual turning thereof, one of said knobs having adjustable means thereon for pressing in one direction on the carrying frame to eliminate axial lost motion of the stem in its bore, said stem having a shoulder thereon adapt-

ed to press upon the carrying frame in the opposite direction.

4. A gun sight as set forth in claim 2, including a plate secured on said carrying frame and providing a lug overlying the end of the mounting leg at its junction with the support leg, said lug being formed with a perforation in line with the bore in which said other adjusting stem extends, said other stem having an end projecting outwardly of the carrying frame through said perforation in the lug, and having a peripheral rib secured between the carrying frame and said lug to prevent axial movement of said other stem on said carrying frame.

5. A gun sight as set forth in claim 2, wherein said members are formed the one with a groove and the other with a matching tongue of dovetail sectional shape for slidable engagement in said groove, the top of said tongue and bottom of said groove forming relatively slidable facing surfaces on said members, and wherein said fastening means comprises a locking notch in the slidable surface of one of said members, a ball loosely mounted and retained in a chamber formed in the other of said members and opening on the slidable surface thereof in registration with said notch, and a screw having threaded engagement in a bore in the said other of said members, said bore communicating with said chamber and the screw being tapered at its inner end, whereby tightening of the screw, in said bore, will lock said ball in said notch and thereby secure the members together in a predetermined relative position.

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