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Feb. 13, 1940. N. L. BREWER 2,190,500

SIGHT FOR FIREARMS

Filed July 23, 1938 2 Sheets-Sheet 1

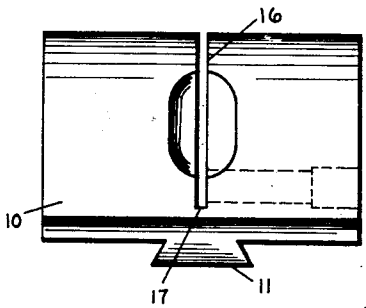


Fig. 3

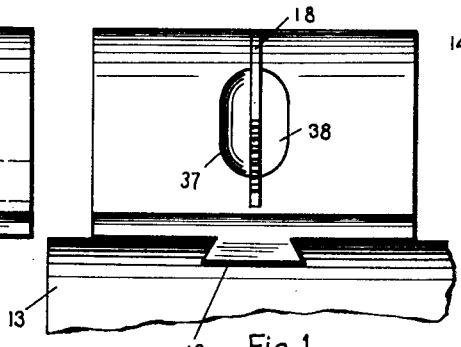


Fig. 1

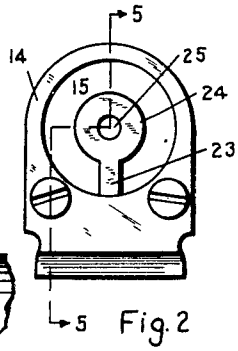


Fig. 2

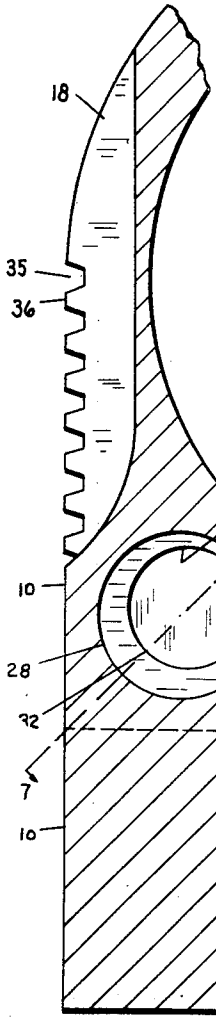


Fig. 6

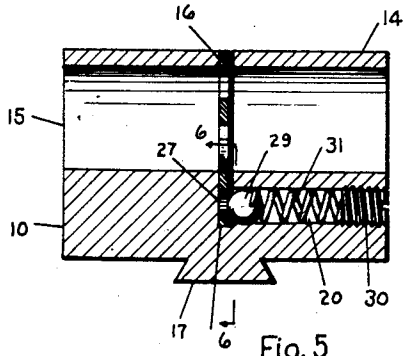


Fig. 5

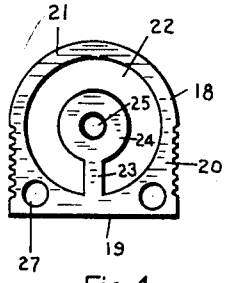


Fig. 4

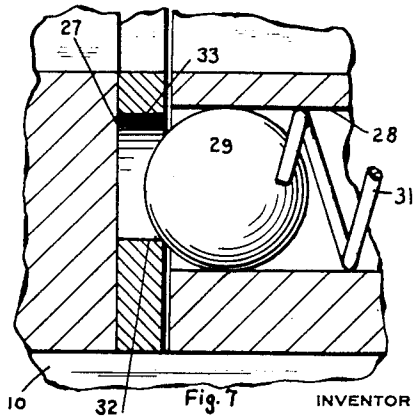


Fig. 7

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SIGHT FOR FIREARMS

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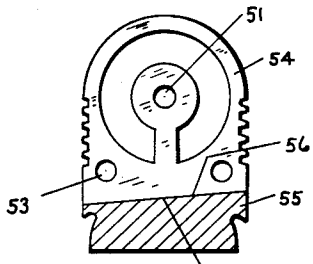


Fig. 12

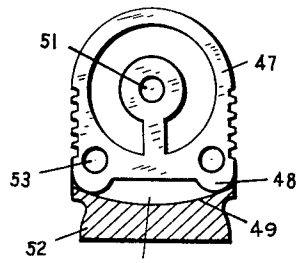


Fig. 11

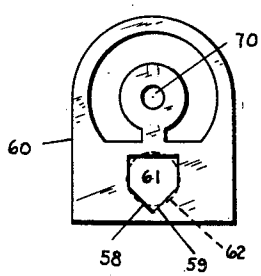


Fig. 13

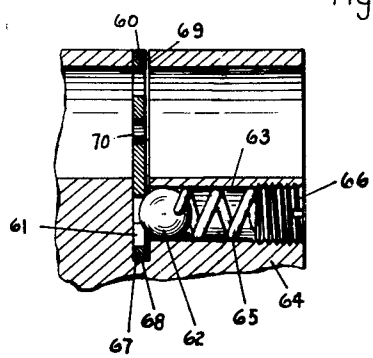


Fig. 14



Fig. 8

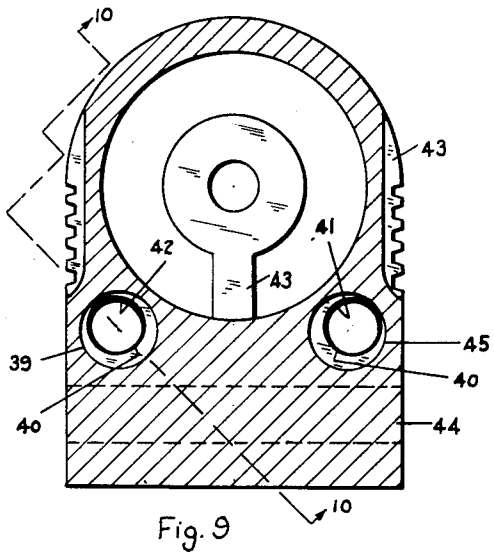


Fig. 9

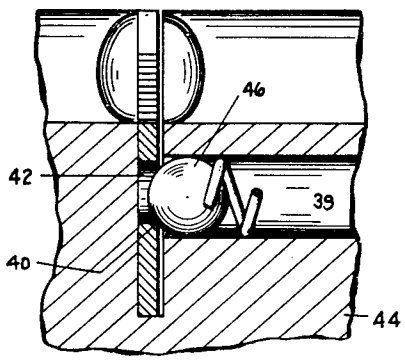


Fig. 10

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Patented Feb. 13, 1940

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UNITED STATES PATENT OFFICE

2,190,500

SIGHT FOR FIREARMS

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Application July 23, 1938, Serial No. 220,920

4 Claims. (Cl. 33—47)

This invention relates to a target type hooded or globe sight especially a front sight having removable sight inserts.

The purpose of this invention is to provide a new and improved sight of the type indicated and particularly a sight wherein the inserts may be directly removable and replaceable with the fingers without requiring the use of any tools or other extra pieces for the operation and particularly without requiring the separate or additional manipulation of any retaining device such as screws, latches, keys or springs prior to or following the removal or replacement of an insert.

More particularly the purpose of this invention is to provide a sight of the type described in the preferred form of which the retention of the insert is accomplished by the partial entrance of two spring-pressed hardened balls or semi-spherical fronted plungers into two holes in the insert which are slightly out of register with said balls or plungers in such a way as to hold the insert firmly and exactly in its proper position in its transverse receiving slot in the sight base; and further, to provide for an exactness of location of the insert in a sight as above outlined by means of having the spring-pressed balls or plungers located slightly out of alignment with the two holes in the insert in such manner as to force the insert downwardly to the bottom of the insert slot in the base and also to have the spring tension or pressure of the balls or plungers so arranged as to center the insert transversely in the sight base even if the insert be originally placed slightly to one side or the other of the center of the base.

Further purposes and advantages of this invention are to provide a sight of the general type above outlined which is simple and inexpensive in construction but which can be readily made with exactness where required so that the sight pieces can be readily inserted and will be accurately located in the sight base with a minimum of care on the part of the shooter and without the use of any appliances.

Further purposes and advantages of the invention will appear from the specification and claims herein.

Fig. 1 is a side elevation on a considerably enlarged scale of a sight embodying one form of this invention in the form of a front sight applied to the front end of a barrel of a gun or rifle.

Fig. 2 is a rear elevation of the sight shown in Fig. 1.

Fig. 3 is a side elevation of the combined sight base and hood of the sight shown in Figs. 1 and 2.

Fig. 4 is a plan view or face elevation of one form of a sight insert or removable sight piece that may be used with this invention and upon the same scale as in Figs. 1 and 2.

Fig. 5 is a longitudinal sectional view on line 5—5 of Fig. 2.

Fig. 6 is a detail vertical transverse sectional view on line 6—6 of Fig. 5 but on a greatly enlarged scale, and for clearness omitting the ball.

Fig. 7 is a detail sectional view on line 7—7 of Fig. 6 but showing a ball and Fig. 8 is a side elevation of a modified form of spring-pressed plunger.

Fig. 9 is a vertical cross-sectional view similar to Fig. 6 but on a smaller scale and of an entire sight showing a modified form of the invention. Fig. 10 is a sectional view on line 10—10 of Fig. 9.

Fig. 11 is a vertical transverse sectional view through a modified form of sight base and showing a plan view of an insert used therewith.

Fig. 12 is a vertical transverse sectional view through a further or third modified form of sight base and showing a plan view of an insert used therewith.

Fig. 13 is a plan view of an insert used in a still further or fourth modification of the invention.

Fig. 14 is a central vertical longitudinal sectional view through a sight using the insert of Fig. 13.

Referring to the drawings in a more particular description, and first to the form shown in Figs. 1–7 it will be seen that the sight illustrated comprises a sight base 10 having the usual dovetailed tenon 11 on its lower face to closely fit the usual corresponding dovetailed slot 12 in the barrel 13 of the gun or rifle. In the sight shown the hood 14 is conveniently and easily but not necessarily formed as being integral with the base 10 and these two parts as an integral unit provide a longitudinally extending bore 15 commonly and preferably circular in transverse section. About midway the length of the combined sight base 10 and hood 14 there is provided a transverse slot 16 extending straight down from the top of the hood through the whole diameter of the bore 15 and part way into the sight base 10. The bottom 17 of this slot is accurately located as to level and as to the actual location of the sight base upon the gun as this bottom 17 is the part of the sight to which the removable sight inserts 18 are to be closely fitted and closely forced by the bottom edges 19 of said inserts being forced by the spring tension means hereinafter described and along this bottom 17 of the slot the bottom edge of said

inserts will be slightly automatically adjusted by such spring tensioned means so as to automatically bring the inserts into proper centrally located position.

Fig. 4 is a plan or face elevation of one form of a removable insert 18 from which it will be seen that in general outline this insert follows the outline of the transverse slot 16 in the combined hood and base in that from its lower straight bottom edge 19 the opposite sides 20 extend upwardly to about the level of the center of the bore 15 and then these generally straight upright sides merge into a semi-circular top 21 coinciding with the top of the hood 14. Each insert 18 is provided with a large opening 22 preferably coinciding in size and location with the bore 15. Projecting upwardly from the lower portion of the insert there is provided any one of the desired forms of sighting devices such as a neck 23 carrying thereabove a head 24 having a centrally located sighting aperture 25. Different inserts will have different sizes of sighting apertures or the sighting device within the insert may be simply a post of conventional form.

It will be understood that the inserts 18 are relatively thin and will be formed of sufficiently strong, hard metal suitably tempered to permanently stand the strain of contact with the spring tensioned retaining means hereinafter mentioned. Each insert is formed with a pair of holes 27 such holes being located respectively in the lower outer corners of the insert. The holes 27 in the inserts are preferably symmetrically arranged, that is the same distance above the bottom edge 19 of the insert and the same distance from the side edges of the insert, so that not only will all the inserts of a set be workable with the hooded sight base with which they are intended to operate, but that either face of the insert may be towards the rear of the sight.

Approximately but not exactly opposite the holes 27 of a sight insert placed in the base there will be provided in the base two longitudinally extending guideways 28 extending from one end of the hooded base to the transverse slot 16. These guideways when suitably plugged at their outer ends form sockets in which are located spring pressed wedging or camming members having their innermost and active end normally projecting slightly into the slot 16 and adapted to bear against the lower and outwardly located edges of the holes 27 of the insert so as to force the insert downwardly until its bottom edge 19 bears flat against the bottom 17 of said transverse slot. The pairs of holes 27 in the insert and the slightly offset position of the spring-pressed camming members in the said guideways operate through the two said camming means to center the insert relative to the base.

These camming or wedging members projecting from said guideways into the holes in the insert are preferably and most conveniently hardened steel balls 29 and therefore the holes 27 in the inserts will be circular in shape and the guideways 28 in the sight base 10 will be circular in cross section and of a size to snugly but slidingly house the said balls 29. The outer end of each guideway 28 will be plugged with a plug 30 screw-threaded into the screw-threaded outer end of said guideway. Between the inner end of said plug 30 and the ball 29, located in that passageway there will be placed a coiled spring 31 of a size and strength to give the proper pressure to the ball 29.

The preferred and most convenient embodiment of this form of my invention is to have the guideways 28 in the sight base of appreciably larger diameter than the diameter of the holes 27 in the inserts 18 and to have the guideway 28 offset slightly downwardly and outwardly relative to the holes 27. This arrangement is most clearly shown in Figs. 5, 6 and 7. In Figs. 6 the point A represents the center line or axis of one guideway 28 and so the center of the round hole appearing in the sight base 10 in Fig. 6 while the point represented by the letter B indicates the axis or center of the corresponding hole 27 formed in this lower corner of the insert 18. The offset downwardly and to the left hand of the larger hole representing the guideway 28 relative to the smaller hole 27 in the insert is apparent from Fig. 6. The effect of this offset is best shown in Fig. 7 which is a sectional view on diagonal line 7—7 of Fig. 6 and so shows the offset where it is greatest. Upon inspection of this Fig. 7 it will be seen that the lower left hand portion of the hardened steel ball 29 will bear against the lower left hand edge portion 32 of this left hand hole 27 of the insert. It will also be seen that the ball 29 is appreciably away from the upper right hand portion 33 of this left hand hole 27. The ball 29 or a semi-spherically fronted plunger such as 34 of Fig. 8 will accordingly exert a camming action downwardly and outwardly upon this corner of the insert. It will be understood also that the opposite or right hand corner of the insert will have a corresponding pressure exerted thereupon by the ball at that side of the base exerting a camming action against the hole 27 in the right hand corner of the insert. The guideway at that side of the sight base, however, being offset downwardly but to the right hand will cause the camming action at that side of the insert to be downwardly and to the right hand. The result of this downward and outward pressure upon the opposite corners of the insert will be first to yieldingly press or cam the insert bodily downwardly straight against the bottom 17 of the transverse slot and in the second place to center laterally the insert relative to the sight base. This second result will follow from the fact that the spring tension given to the two balls 29 operating upon the insert is equal but in opposite directions and so after the insert is placed approximately at the center of the sight base the action of the two oppositely acting spring balls will automatically equalize the pressure given by the two balls to the insert by shifting the insert laterally until it is centered relative to the sight base at which point the pressure of the two spring-pressed balls will be equal. As long as the insert is slightly to one side or the other, the pressure of the two balls will be unequal and the ball giving the greater pressure will overcome the resistance of the other until the two forces become equal which will occur at the point where the insert is centered laterally of the sight base.

For the purpose of allowing an insert to be readily removed from the combined sight base and hood by the thumb and fingers the opposite upright side portions or sides 20 of the inserts are provided with serrations affording fine grooves 35 and intervening small projections 36. The immediately adjacent portions of the base and hood on both sides of the insert as at 37 and 38 are cut away so that the thumb or finger can engage the projections 36 or the indentations 35 and pull upwardly upon the insert. As the pressure of the spring-pressed ball 29 is very con-

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siderable the most convenient manner of removing the insert is to place the tips of the first two fingers of the hand against one side of the sight base and the thumb against the serrated edge of the insert on the opposite side. The thumb is then pressed inwardly and upwardly against its edge of the insert rocking it upwardly on that side. Still holding the thumb against its side of the insert the tip of the index finger is placed against the opposite side of the insert and that side of the insert is rocked upwardly. This method of disengaging first one side and then the other side of the insert from the hold or pressure of the spring-pressed balls requires less effort than if the two sides of the insert were raised at the same time. The same or another desired insert is placed in the base by moving it straight downwardly into the slot and pushing straight down until the balls snap into place in the two holes. In this operation more pressure can be easily placed against the insert so that the pressure of the two spring-pressed balls can be overcome at the same time instead of separately if desired.

In the form of the invention shown in Figs. 5, 6 and 7, the resultant forces of the two balls acting in a generally downwardly and outwardly direction upon the lower left hand edge portion **32** of the left hand hole **27** of the insert and upon the similar lower right hand edge portion of the right hand hole **27** of the insert may be resolved into their component forces. Obviously then the force acting upon the lower left hand part of the insert will resolve itself into a downwardly acting force (tending to push this part of the insert straight down to the horizontal support **17**) and a horizontally acting force tending to push the insert to the left. Similarly the force acting upon the lower right hand part of the insert will resolve itself into a downwardly acting force (tending to push this part of the insert straight down to the said support **17**) and a horizontally acting force tending to push the insert to the right. It will be seen that the horizontally or laterally acting forces are acting in opposite directions, that is each outwardly, and this operates to center the insert relative to the base because the two balls are equal in effective power when the insert is centered laterally relative to the base. The essential factor is that the acting forces act in opposite directions and the incidental and unnecessary factor is that they act outwardly.

In Figs 9 and 10 there is illustrated a first modification of my invention in that the laterally acting forces of the two spring-pressed balls **46** while acting in opposite directions exert a pressure inwardly or towards the vertical center line of the base. Fig. 9 is similar to Fig. 6 but on a smaller scale and shows both lower corners of the sight base **44** with passageways **45** and **39** in its opposite or right and left hand corners respectively to house the two balls **46** (see Fig. 10) that bear against the inner lower section or edge **40** of the two holes **41** and **42** of the insert **43**. When the laterally acting forces equalize themselves the insert will be centered relative to the base. It will be noticed that in this modification also the centering and laterally acting forces are operating substantially transversely of the line of the forces that determine the vertical placement of the insert.

In the second modified form of the invention shown in Fig. 11 it will be seen that the insert **47** is of the general form already described but instead of a flat bottom or foot it has two spaced feet **48** at the opposite lower corners of the insert and these feet rest upon the stop support **49** at the bottom of the insert-receiving slot **50**. The bottom of this insert-receiving slot may then be as shown of concave circular or curved formation as long as the two feet **48** bear upon the support **49** so as to hold the insert in upright position and with its sight aperture **51** properly centered relative to the sight base **52** and at the right elevation. This modification shows that the proper centering of the sight insert can be accomplished without the support **49** being straight or level and without the bottom of the insert being straight. This insert **47** is shown as having cam-engaging holes **53** in its opposite lower corners as used in the previously described forms of this invention.

Fig. **12** shows a third modified form of sight insert **54** and co-operating base **55**. The insert has a bottom **56** which is on a slight slant and co-operates with a similarly and equally-slanting support **57** in the base **55** at the bottom of the insert-receiving slot. Other parts of this modification are the same as shown in Fig. **11** and need not be further described. This illustration shows that where needed for a special reason the insert can be counterbalancingly centered by oppositely acting cams even though the bottom of the insert is supported on a slant.

In Figs. 13 and 14 there is shown a fourth modified form of this invention in that the two upwardly facing and oppositely slanting cam-engaging faces **58** and **59** upon the opposite lateral halves of the insert **60** are adjoining angles in one single recess **61** formed in the central part of the insert **60** and these two faces **58** and **59** are engaged by portions of one single cam. This cam is illustrated as being a ball **62** mounted in the centrally disposed rearwardly extending passage **63** of the hooded sight base **64**. The ball is yieldingly tensioned to bear forwardly as by the coiled spring **65** placed in the passage **63** to the rear of said ball and held therein under tension by the plug **66** threaded into the rear end of said passage.

In Fig. 13 there is shown in dotted line the approximate location of the outline of the ball **62**. It will be apparent that two portions of the face of this ball will engage on a plane farther forward than said outline of the ball the two slanting faces **58** and **59**. It will be obvious that the tension from the cam ball exerted upon these two faces **58** and **59** will operate to press the insert downwardly until its bottom **67** rests upon the stop support **68** at the lower extremity of the sight-inserting slot **69**. It will also be apparent that the said ball will exert laterally-directed pressure upon the two faces **58** and **59** until the pressure from said ball adjusts the insert laterally until it is centered relatively to the vertical longitudinal central plane of the sight base and so will bring the sight aperture **70** at the center line of said insert to coincide with the center line of the sight base.

While this form of the invention uses only one spring-pressed cam, the different parts of its spherical working face engage the oppositely slanting faces **58** and **59** on opposite halves of the insert and move the insert downwardly and laterally until it is centered relative to the base. It will thus be seen that this form of the invention is within some of the broad claims as presented.

What I claim as new and desire to secure by Letters Patent is:

1. In a firearm sight of the readily removable

and replaceable sight insert type, the combination of a hooded base having an upright, transverse, insert-receiving slot having at its bottom in the base a support for the insert, a sight insert fitting said slot and having a bottom to rest upon the said support, said insert having a hole in each of its lower corners and yieldingly tensioned cams mounted in the base opposite said holes in the insert and operating against the lower outer edges of said insert holes to yieldingly press the insert down upon said support and to center the insert laterally relative to the base.

2. In a firearm sight, the combination of a hooded base having an upright slot extending in from the top of the hood to a horizontal level in the base, said base also having extending lengthwise thereof a pair of sockets near the opposite sides of the base and closely above the bottom of said transverse slot and reaching to said slot, a readily removable and replaceable sight insert in said slot and bearing down upon the bottom of said transverse slot, and provided with a pair of holes in the opposite lower corners thereof and yieldingly tensioned camming members located in said sockets and cammingly engaging the lower and outer edges of the said holes in the insert whereby the insert is yieldingly pressed down to said horizontal level support and is centered laterally of the base.

3. In a firearm sight, the combination of a hooded base having an upright slot extending in from the top of the hood to a horizontal level in the base, said base also having extending lengthwise thereof a pair of sockets near the opposite sides of the base and closely above the bottom of said transverse slot and reaching to said slot, a readily removable and replaceable sight insert in said slot and bearing down upon the bottom of said transverse slot, and provided with a pair of holes in the opposite lower corners thereof, each hole being slightly upward and inward relative to the respective oppositely located socket and yieldingly tensioned camming members located in said sockets and cammingly engaging the lower and outer edges of the said holes in the insert whereby the insert is yieldingly pressed down to said horizontal level support and is centered laterally of the base.

4. In a firearm sight of the readily removable and replaceable sight-insert type, the combination of a hooded base having an upstanding, transversely arranged, insert-housing slot having at its bottom in the base a stop support for the insert, a sight-carrying insert fitting said slot and having a bottom to rest upon said support, said insert having symmetrically placed in its opposite side portions two upwardly-facing, oppositely slanting cam-engaging faces and yieldingly-tensioned equally-powered, cooperating cam means mounted in the base opposite said cam faces and bearing downwardly on said cam faces and pushing the insert downwardly upon said support and said cam means pushing laterally against said two cam faces in counterbalancing manner whereby the insert is centered laterally relative to the base.

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