



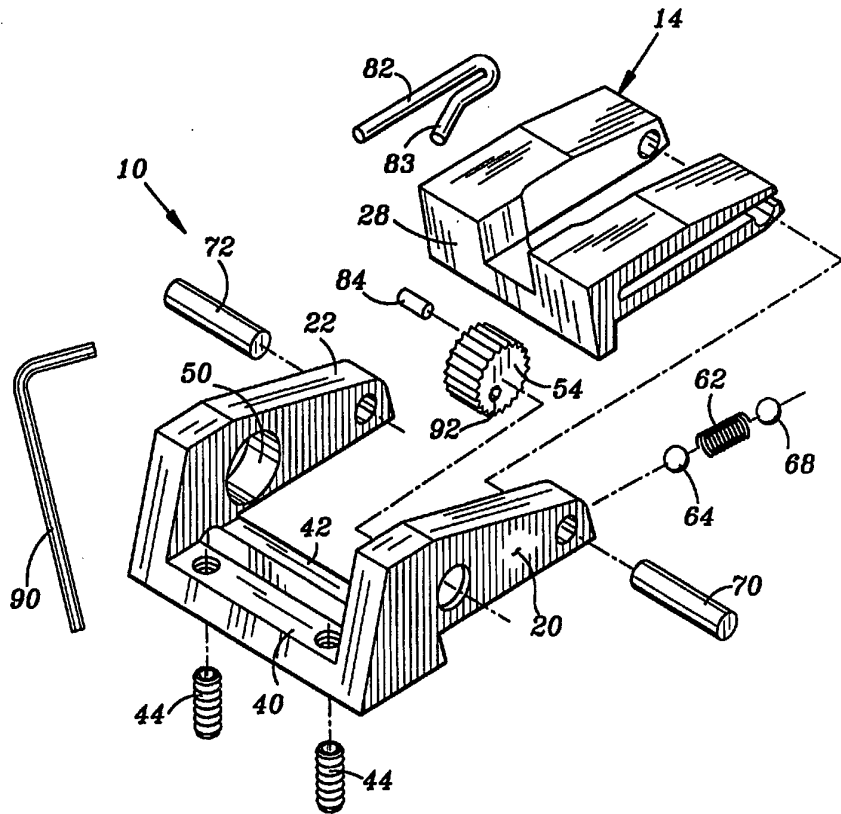
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(54) Title: ADJUSTABLE REAR SIGHT ASSEMBLY FOR A FIREARM

(57) Abstract

An adjustable rear sight (10) for a firearm, said firearm being of the type that has a front, a rear, a top, a bottom, a front sight, and right and left sides with a width therebetween, and the firearm having a frame and a barrel with a longitudinal axis. The firearm's top has a mounting groove that extends transversely across a major portion of the firearm for receiving a rear sight. The adjustable rear sight includes a rigid base (12) having a lower portion (16) and an upper portion (18). The lower portion (16) is shaped and sized to fit snugly within the firearm's mounting groove. The base's upper portion (18) is shaped and sized to extend above the top of the firearm to provide the protection of a combat sight. The rear sight also has a central structural element (14) that is mounted for up and down movement with respect to the rigid base (12).



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Adjustable Rear Sight Assembly For A Firearm

Technical Field

This invention relates generally to adjustable rear sights for firearms (e.g., rifles and pistols), especially those sights that are relatively compact and are considered to be "combat" sights; more specifically, it relates to a rear sight assembly that is capable of being adjusted to a very low elevation with respect to the top of the firearm.

Background Art

Rear sights for firearms (e.g., rifles and pistols) routinely include one or more sighting elements that are mounted at the top of the firearm near the rear of the firearm's frame or slide, so that a shooter can visually align two spaced-apart sighting elements (one at the front of the firearm and the other at the rear). These sighting elements are aligned by a shooter in order to achieve a desired spatial relationship between the sighting elements and the firearm's bore. For purposes of this description, it will foster simplicity to concentrate on pistols; but it should be understood that the invention can be utilized on any firearm that has the requisite structural features, and the claims provided at the conclusion hereof will make this apparent.

There are several ways in which the rear sights for pistols may be classified. First, they may be categorized as to whether they are adjustable or fixed. By the term "fixed" it is meant that a sight is mounted by a manufacturer or gunsmith at a set and relatively permanent position with respect to the pistol. Adjustable sights traditionally have a fixed base and at least one element that can be selectively moved by the shooter with respect to the base, in order to align front and rear sighting elements with respect to the pistol's bore. The desired alignment is usually a very technical matter involving the precise establishment of an imaginary line through the sighting elements; the sighting elements are adjusted until the imaginary line is approximately parallel to the bore's axis. With some adjustable sights the movable element may be caused to move only vertically (i.e., up and down) with respect to the fixed base; with others, the movable element may be movable horizontally (i.e., to the right or the left) from a central position; and still others may provide movement both vertically and horizontally. The categorization of a rear sight as being fixed or adjustable can be made by almost any informed person by a casual glance at the structural features of the sight. This invention is concerned with adjustable rear sights.

Another basis for classifying sights is the intended use for the pistol to which the sights are attached. Using this approach, sights may be classified as combat, target and hunting. The term "combat" is used in connection with sights for pistols that are expected to be carried as sidearms by military personnel, police forces and the like, and they are normally carried in leather or cloth holsters that are worn by the personnel who must be able to quickly extract the pistols from their holsters and use them for self-defense, etc. To be servicable as a combat sight, the height of structural parts of a sight should be relatively low (with respect to the top of the pistol), and a height of about 0.250 to 0.300 inch is a reasonable goal for practicable combat sights. Target pistols, on the other hand, are most often stored and carried in relatively large boxes and rigid cases, and they are very slowly and deliberately withdrawn from their storage slots or holders. The fact that haste is usually not a consideration in withdrawing a target pistol from its holder means that a relatively bulky size or awkward shape for a rear sight would not normally be considered to be a detriment. Hence, target sights have historically been much larger and less streamlined than so-called combat sights. In size and appearance, hunting sights have probably fallen somewhere between the other two kinds of sights, with the speed at which a pistol can be withdrawn from a holster still being a significant design factor.

A typical rear sight is normally mounted on a firearm in a transverse groove that is machined, cast or otherwise provided at the top of the firearm. With some firearms, that part of the frame that receives and holds ammunition during firing (i.e., the receiver) is exposed at the top of the firearm and serves to anchor the rear sight. Other firearms have a receiver that is mostly concealed, and the structural part that is exposed at the top of the firearm is a slide that moves (rearwardly and forwardly with respect to the frame) during a firing cycle. Hence, with some firearms the transverse groove will be provided on top of an exposed part of the frame, and in other firearms it may be provided on top of the slide. In still other firearms, especially rifles (such as the Winchester Model 1890), a transverse groove for a rear sight is built into the top of the barrel. With this invention it is immaterial whether the transverse groove is provided on a fixed part of the frame or a movable slide or the top of the barrel.

The typical sight-mounting groove has a trapezoidal shape (as viewed from the side of the firearm) that is more narrow at its top than at its bottom. Such a shape is commonly referred to as dovetailed, and some writers have even converted the term into a noun, as when they say, "Insert the base of the

sight into the dovetail from the right side of the pistol." A reason that the direction of installation of a rear sight is often important is that the dovetailed groove in the firearm is not always uniform from one end to the other; rather, it is often tapered in such a way that one end of the groove is slightly wider than its other end. Alternatively, the dovetailed groove may be of uniform width but the sight base is wider at one side than at the other. For example, the rear sight of a US Carbine, Caliber .30 M1 has a relationship with its dovetail slot that dictates that a rear sight must be inserted from the right side of the receiver. When such a rear sight has been correctly positioned, so that the front and rear sights are desirably aligned with the barrel, a punch is used to mechanically deform (i.e., "upset") a small quantity of the steel adjacent the dovetailed groove—in order to "stake" the rear sight to the receiver.

When the receiver or slide of a firearm has been hardened to the extent that it cannot be mechanically upset with a punch, some other technique must be used to secure the base of a rear sight to the firearm. One common approach is to provide a threaded bore in the base of the sight, and use a set screw to apply pressure against the firearm when the sight has been properly aligned. Even this approach may not be a perfect solution with pistols that are chambered for ammunition that may be categorized as being relatively high powered, e.g., the .40 SMITH & WESSON cartridge. This is because firing each round can impose recoil forces on a firearm that will eventually loosen a rear sight and permit it to be moved in an unwanted manner. It is an object of this invention to provide a mounting arrangement that can foster the mounting of a rear sight in a dovetailed groove of a firearm, regardless of the hardness that has been imparted to the firearm's receiver or slide.

On some pistols, and especially those pistols designed by Glock Ges.m.b.H. (an Austrian company) in the 1980s, a slightly different mounting problem exists. On GLOCK™ pistols the dovetailed groove is more narrow at its middle (or "waist"), by about 0.010 inch, than at either of its two ends. This would not necessarily be a problem if the slides of GLOCK™ pistols were as soft as, say, the receiver of an M1 carbine. But the steel in GLOCK slides has been heat treated at the factory to create a substantial surface hardness, and there is essentially no way that a gunsmith can expect to deform such steel in order to mechanically lock a rear sight at a desired location. So while the factory has special tools for installing rear sights on a GLOCK slide, there has been a desire for gunsmiths and others who are not associated with the factory to be able to remove and install rear sights on GLOCK™ pistols.

It is a further object to provide a sight-mounting system that is particularly effective for use in conjunction with a dovetailed groove that is wider at its two ends (or entrances) than at its middle.

Another object is to provide a mounting arrangement for a rear sight in which a vertically adjustable sighting element can be placed very low with respect to the top of a firearm.

One more object is to provide an adjustable rear sight that has a very low profile, such that it may be advantageously placed on a combat handgun without projecting upward from the top of the handgun for a distance that would be functionally unacceptable.

These and other objects and advantages will be understood from a careful reading of the description that follows, along with an analysis of the attached claims and the several figures of the drawing that are provided herewith.

Disclosure of the Invention

The invention consists primarily of an adjustable rear sight for a firearm, said firearm being of the type that has a frame with a front and a rear and a longitudinal axis therebetween. A typical firearm with which the invention is usable will also have a top, which may constitute a fixed part of the frame, or it may be a movable slide or, in a long gun, an upper portion of a barrel. The firearm will also have a bottom, right and left sides (with a width therebetween), and a barrel with a longitudinal axis. At the top of the firearm will be a mounting groove for a rear sight, said mounting groove typically extending transversely across essentially the full width of the firearm. Most mounting grooves on firearms are dovetailed, so it will be presumed that the mounting groove that is to be engaged by the rear sight will be dovetailed. However, it should be understood that this invention is primarily concerned with certain spatial relationships between fixed and moving parts; and the specific shape of a firearm's transverse mounting groove will not likely be critical to effective use of the invention.

The adjustable rear sight has a rigid base with upper and lower portions. The lower portion of the base is shaped and sized to fit snugly within the firearm's mounting groove; the upper portion of the base is shaped and sized to extend above the top of the firearm. The base's upper portion will typically include a pair of upstanding sidewalls that are fixedly spaced from one another by a distance that is about the same as the width of the firearm's slide or receiver. The sidewalls extend in a direction that is approximately

parallel to the barrel's longitudinal axis, and they offer protection against accidental contact with any movable (i.e., adjustable) part of the sight that is located between the sidewalls. The sidewalls will usually have a relatively short height above the firearm's top; hence, the sidewalls may be aptly described as being relatively low, and the entire mechanism may be considered to be an adjustable, open-top combat sight.

A central element, also referred to as a blade element, is mounted for vertical (i.e., up and down) movement with respect to the static base. The central element is oriented transversely with respect to the firearm, and it has a sighting member with a pair of spaced-apart and rearwardly facing surfaces. The spaced-apart sighting surfaces are oriented so that a shooter may visually align a front sight with the rearwardly facing surfaces in order to achieve a desired sight picture during aiming of the firearm. A major factor in the structural arrangement of the central element is that the rearwardly facing sighting surfaces are located with respect to the fixed base so that at least a portion of the central element will extend downwardly into the firearm's mounting groove when the central element is at its extreme lower elevation. This arrangement makes it possible to lower the rearwardly facing sighting surfaces lower than would normally be possible with adjustable rear sights of the prior art.

A mechanical means is also provided for selectively moving the central element up and down with respect to the static base, whereby the central element may be selectively moved to a desired elevation with respect to the firearm on which the base is mounted. A spring-biased mechanism is provided for securely holding the central element at a desired one of a plurality of possible elevations, said possible elevations being bounded by the central element's extreme lower elevation and its extreme upper elevation.

Brief Description of Drawings

FIG. 1 is a perspective view of a preferred embodiment of the invention, with a central structural member (also referred to as a blade member) shown in its lowest position, with a part of the blade member protruding downwardly into the spatial envelope defined by a dovetailed member;

FIG. 2 is a perspective view of a preferred embodiment of the invention, with a central structural member shown in its highest position, and with most of the blade member being significantly elevated with respect to the spatial envelope defined by the dovetailed groove of a firearm (as well as the matching dovetailed part of the sight base);

FIG. 3 is a rear elevational view of the sight, showing the relative position of the sight's major parts when they are in the position shown in FIG. 1;

FIG. 4 is a rear elevational view of the sight, showing the relative position of the sight's major parts when they are in the position shown in FIG. 2;

FIG. 5 is a cross-sectional view of the sight taken longitudinally in the plane represented by lines 5-5 in FIG.3;

FIG. 6 is a bottom plan view of the sight, revealing how a bridge of material in the central structural element can fit into a slot that has been cut into the dovetailed portion of the fixed base;

FIG. 7 is a top plan view of the sight, showing where two screws are provided to anchor the rigid base to a pistol by tightly wedging the lower portion of the base into contact with a dovetailed groove of the pistol;

FIG. 8 is an exaggerated drawing of the deflection of the thin part of the base's lower portion, showing how the thin part can take on an inwardly bowed shape as the two mounting screws are tightened;

FIG. 9 is a side elevational view of the left side of the sight, showing an access hole that is cut into the left sidewall in order to permit a counterbore to cut in the inside of the right sidewall, thereby creating a recess that is sized to receive an eccentric device that is used to selectively adjust the elevation of the central structural element;

FIG. 10 is an elevational view of the inside of the right sidewall, showing the installed position of the eccentric device in the right sidewall;

FIG. 11 is a longitudinal cross sectional view through the right sidewall of the base, showing the passage in which is captured a coiled spring that holds the eccentric element in a given one of its many possible positions;

FIG. 12 is a left side elevational view of the central structural element, showing a machined recess into which is fitted a spring that continuously biases the central structural element upward with respect to the static base;

FIG. 13 is an exploded perspective view of the adjustable rear sight, showing the thirteen operative parts of the sight—and the Allen-head wrench that is preferably used both to install the sight on a firearm and to make elevation adjustments;

FIG. 14 is a elevational view of an eccentric element that is used to selectively raise and lower the blade member for elevation adjustments;

FIG. 15 is an exemplary showing of a firearm (e.g., a GLOCK™ pistol) on which the invention—an adjustable rear sight—may advantageously be mounted; and

FIG. 16 is a top plan view of a fragment of the rear portion of a pistol, showing a dovetail configuration with a narrow "waist" and wide openings where the dovetail groove intersects the sides of the pistol.

Best Mode For Carrying Out the Invention

Referring initially to FIGS. 1 and 2, an adjustable rear sight 10 for a firearm is shown. Of course, firearms *per se* do not constitute anything new, and neither is a particular firearm an integral part of this invention. But to provide a frame of reference for certain parts of the adjustable rear sight, an exemplary firearm in the form of a GLOCK™ pistol is shown (in elevation) in FIG. 14. This elevational showing may be considered to be typical of the GLOCK™ Models 17, 17L, 19, 20, 21, 22 and 23, for the reason that all of them have a similar external appearance; as far as this disclosure is concerned, the various GLOCK models differ from one another primarily in the specific ammunition for which they are chambered. For those persons who are not familiar with such pistols, the subject matter of US Patent No. 4,893,546 to Glock entitled "Automatic Pistol" should hereby be deemed to be incorporated herein in its entirety. The pistol shown in the '546 patent to Glock is an excellent candidate for optimum utilization of this invention, and those person who are familiar with the pistol will recognize that it has a frame, a slide, a barrel, a front, a rear, a top, a bottom, and right and left sides (with a width therebetween). As is common with many firearms, a GLOCK™ pistol is provided with a dovetailed mounting groove for the purpose of mounting a rear sight on the top of the pistol's slide, near its rear end. For convenience and simplicity in this specification, the invention will be described as being applied to such a pistol, although it should be remembered that it could just as easily be used on other pistols as well as rifles and shotguns, etc.

Additionally, it will perhaps be worth mentioning that terms like up and down, horizontal and vertical, etc., are intended to be relative and not absolute terms. So if a given pistol should ever be held so that its barrel is generally parallel to the ground but its frame is canted by, say, some 30 degrees away from a true vertical plane, it should be understood that moving a sighting element "up" would mean moving the sighting element in a plane that passes longitudinally through the frame of the pistol, and which (at that moment) is tilted by 30 degrees away from vertical.

The rear sight 10 has two major structural parts, namely, a rigid base 12 (that is intended to be fixedly mounted to a pistol), and a central structural

element 14 (that is intended to be vertically movable with respect to the base). Both of these major parts are normally machined from single blocks of steel. The base 12 has a lower portion 16 and an upper portion 18. The base's lower portion 16 is sized and shaped so that it will fit snugly within the pistol's mounting groove; so when the mounting groove is dovetailed, the lower portion 16 will naturally have a complementary shape. The base's upper portion 18 includes a pair of upstanding sidewalls 20, 22 that are spaced from one another by a substantial distance, e.g., a distance that is almost as great as the width of a pistol to which the sight 10 is expected to be attached. The two sidewalls 20, 22 extend forwardly, in a direction that will be at least generally parallel to the longitudinal axis of the barrel. The bottom surfaces of the sidewalls 20, 22 are expected to lie essentially flush with the top of the firearm's slide, and the tops of the sidewalls are relatively low. Hence, the sight 10 will protrude upwardly from the top of a pistol for a relatively low distance, and the sight may aptly be called an adjustable, open-top combat sight.

Referring additionally to FIGS. 3 and 4, which are rear elevational views corresponding to the perspective views in FIGS. 1 and 2, the potential movement of the central structural element 14 can be between an extreme lower elevation (FIG. 3) and an extreme upper elevation (FIG. 4). In FIG. 3 it will be seen that the central structural element 14 has a central slot that basically defines a U-shaped member that can be visually aligned with a longitudinal blade at the front of the pistol. This central slot or sighting element, identified in FIG. 3 by the numeral 26, is bounded on either side by a pair of rearwardly facing surfaces 28, 30. The rearwardly facing surfaces 28, 30 may advantageously be provided with light-reflective material, or tritium, etc., to improve a shooter's ability to orient the pistol toward a desired target. The shape of any added material (such as tritium) will be largely a matter of choice, and can include round spots, narrow bars, wide bars, etc.

At this time, comparison of FIGS. 3 and 4 will reveal that there is a substantial "bridge" of structural material that extends horizontally between the surfaces 28, 30 in FIG. 4, said material being concealed in FIG. 3. This is because the bridge 32 descends downward into a groove in dovetailed portion 16 when the central structural element 14 is lowered. Another way of expressing the relationship is to state that the spatial envelope defined by the dovetailed base is able to accommodate the central structural element 14 as it is selectively lowered as a part of a sight-adjustment procedure. The

full vertical excursion of the bridge 32 (about 0.12 inch in a preferred embodiment) may not be needed in simple sight adjustment with a factory-original front sight; but it will probably be comforting to at least some pistol owners to know that the sight 10 can produce an elevation adjustment as large as 0.12 inch. The slot 38 in the base's lower portion (into which the bridge 32 can be made to selectively descend) can be seen in FIG. 5, a cross-sectional view taken longitudinally in the plane represented by lines 5-5 in FIG.3. Of course, the central member 14 has been omitted in this view, to promote clarity in the showing of the structure of the base. An examination of FIG. 6 (a bottom plan view of the sight 10) should also help explain how the bridge 32 can pass downwardly into a slot or vertical cut 38 that has been provided in the base's lower portion 16.

Turning attention next to FIGS. 6 and 7 (bottom and top views, respectively, of the entire sighting apparatus 10), it will be seen that the transverse slot 38 has been cut off-center with respect to the lower portion 16. The net effect of this is to produce one relatively thick (and hence relatively rigid) portion 40 and one relatively thin portion 42 in the dovetailed piece 16. When threaded members (represented by the Allen-head screw 44 in one of the two threaded bores in lower portion 16) are rotated so as to move into the threaded bores, the base portions 40, 42 will be pushed against the dovetailed groove in the pistol. The thick portion 40 will not likely experience much deflection as a result of tightening the two mounting screws 44; but the thin portion 42 can be expected to bend inwardly by at least a small amount—and take on the shape of the juxtaposed portion of the pistol's dovetailed groove. As explained earlier, the rear-sight mounting grooves in GLOCK™ pistols have narrow centers (or "waists"), which means that a thin portion 42 can be expected to take on an inwardly bowed shape as the screws are turned further into their threaded bores and the lower portion 16 is pushed upward. This inward deflection of the thin portion 42 is shown, with some exaggeration (to make the bending effect more evident) in FIG. 8.

Turning next to FIG. 9, a side elevational view of the left side of the sight is shown. An access hole 50 is cut into the left sidewall 22 in order to permit a counterbore to be cut in the inside of right sidewall 20. This access hole 50 may appear relatively large, but there is ample steel left in the sidewall 22 to ensure that the structural integrity of the sidewall will not be adversely affected. The recess that is cut on the inside of right wall 20 is sized to snugly receive an eccentric element 54 that is used to selectively

adjust the elevation of the central structural element 14. FIG. 10 shows the inside of the right sidewall 20; in this elevational view the installed position of the eccentric element 54 within the right sidewall is revealed. Although perhaps not readily visible in the drawing, there is a difference in the diameter of the eccentric element 54 as shown in FIG. 10, in contrast to the amount of the same eccentric element that is visible in FIG. 2. This difference in the quantity of element 54 that is visible from the right side of the sight 10 is because an exterior retaining lip 21 (in sidewall 20) hides the periphery of element 54 when the right side of the sight is examined.

The lip 21 serves to capture the eccentric element 54 and hold it in place within the right sidewall 20. An installed eccentric element 54 is later captured on its left side (and thereby precluded from removal from the sight 10) by subsequent installation of the central structural element 14.

More of the operation of the eccentric device 54 can be gleaned by an examination of FIGS. 11, 13 and 14. FIG. 11 is a longitudinal cross-sectional view through the right sidewall 20, showing the slightly inclined, elongated passage 60 in which is captured a coiled spring 62 (FIG. 13) that biases the eccentric element 54 to a given one of its many possible positions. The periphery of the element 54 has a plurality of parallel recesses, each of which is sized to be engaged by a small ball bearing 64 that is urged toward the eccentric element by the small spring 62. (FIG. 14) A typical eccentric element will have a diameter of about 0.16 inch, and the recesses 56 will actually be so small that the eccentric element will almost look like its periphery has been knurled. A preferred eccentric element will have about 22 peripheral recesses, which will provide 22 positive steps in the adjustment of the central member's elevation. Another ball bearing 68 serves as a mechanical "stop" for the forward end of the spring 62. The spring 62 and the two ball bearings 64, 68 are captured in passage 60 by one of two fulcrum pins for the central structural element 14. The fulcrum pins 70, 72 are shown in the exploded perspective view (FIG. 13).

Turning additionally to FIG. 12, which is a left side elevational view of the central structural element 14, a thin recess 80 has been machined into the left side of the element. In this recess 80 there is wedged (during the assembly process) a spring 82 (FIG. 13) that continuously biases the central structural element 14 upward with respect to the static base 12. But while the element 14 is urged upward, it is precluded from actually moving upwardly by a small pin 84 that is fixed in the inside surface of eccentric element 54. This inwardly protruding pin 84 fits into a machined groove 86

on the right side of central element 14.

FIG. 13 is an exploded perspective view of the adjustable rear sight 10, showing the thirteen operative parts of the sight—and the Allen-head wrench 90 that is preferably used to install the sight on a firearm as well as to make elevation adjustments in the central structural element. That is, the Allen wrench 90 is used to tighten the two vertically oriented screws 44 and thereby anchor the base 12 to a firearm. If a windage adjustment is needed, the screws 44 are simply backed off slightly, the base 12 is manually slid sideways with respect to the pistol on which the sight is mounted, and then the screws are turned back into their respective bores. When an elevation adjustment is needed, the Allen wrench 90 is first inserted into a small hex-shaped opening 92 in the exposed (outer) surface of the eccentric element 54. This serves to "lock" the Allen wrench 90 and the eccentric element 54 together, so that the Allen wrench can effectively serve as a handle for rotating the element about a central axis. By manually rotating the Allen wrench 90 and the eccentric element 54 about an horizontal axis, the pin 84 (which is offset with respect to the geometric center of the eccentric element) will be caused to move up or down with respect to a static base 12. As the pin 84 moves up and down, the element 14 will also go up or come down (depending on where the element was when rotation began) by virtue of the engagement of the pin 84 with groove 86. The spring-biased ball 64 then functions as a part of the means for securely holding the central element 14 in a desired one of the plurality of possible vertical positions. This holding action of a spring-biased ball 64 against the periphery of the eccentric element 53 is shown schematically in FIG. 14.

To assemble the light-weight sight 10 (which, incidently, weighs significantly less than one ounce), the two major parts 12, 14 are initially tested to verify that they can be nested together without any binding, etc, and that smooth movement between the two is possible. The "hair-clip" shaped spring 82 is then wedged into its recess 80 on the left side of the central element 14. The eccentric element 54 is then dropped into the counterbore in the inner surface of sidewall 20. With the sight 10 pointed forwardly, the central element 14 is placed at the rear of the base 12 and slowly brought forwardly, making sure that the eccentric pin 84 has engaged the groove 86 on the right side of element 14. The spring 82 will be gently compressed (in a vertical direction) during this maneuver, as its lower end 83 makes contact with an upper surface of the base portion 16. Next, the combination of the first ball bearing 64, the coiled spring 62 and the second ball bearing 68 are

inserted in the frontal opening of linear passage 60 in sidewall 20. The coiled spring 62 is compressed by pushing on ball bearing 68. Once the coiled spring 62 has been compressed, a fulcrum pin 70 is slipped into a transverse bore behind the ball bearing 68; this secures the elements 62, 64 and 68 in the sidewall 20 and provides one of the fulcrums for the rotatable element 14. The opposite fulcrum pin 72 is then inserted in the front portion of sidewall 22, thereby providing balanced rotatability of central element 14 with respect to the base 12—about a horizontal axis established by pins 70, 72.

The assembled sight 10 (and a wrench 90) can then be shipped to a customer, who does not even need to be a professional gunsmith in order to mount the sight on a pistol. Once the sight 10 has been mounted on the top of a pistol P (as indicated in FIG. 15), windage adjustments can be achieved by selectively moving the sight 10 to one side or the other of the pistol. Elevation adjustments can be accomplished by inserting a wrench 90 into hole 92 and rotating the eccentric element 54 in its vertical plane. Perhaps it should be mentioned here that giving the passage 60 a slight downward inclination has the effect of increasing the number of possible elevations of the central element 14 beyond what could be realized if the passage were horizontal. The slight downward inclination, as shown, provides a distinct elevation (in an absolute sense) for each of the recesses 56 that are engaged by a ball bearing 64. So if there are 22 recesses, there will be 22 distinct elevations that are possible for the central element 14 with respect to a fixed base 12.

Another advantage of the invention disclosed herein is that there is no way to over-run an elevation adjustment by taking the movable blade 14 too far down or too far up. Once the lower-most relative position of a blade 14 has been reached, continuing to turn the wrench 90 in the same direction will simply have the effect of changing the direction of blade movement to an upward movement. That is, the wrench 90 can be repeatedly rotated a full 360 degrees without causing the eccentric piece 54 to bump into any kind of a mechanical stop; this is because the eccentric piece essentially "floats" within the counterbore in right sidewall 20. After a full 360 degree excursion of the eccentric piece 54, the blade 14 will simply be back at the same place where it started—after travelling both up and down with respect to its starting point. Expressed in other words, there are no mechanical stops in the sight 10 for the movable blade 14 at either its maximum-up or

maximum-down positions; and it is not possible to strip out the threads of an adjustment screw or the like by applying too much torque to a wrench or screw driver, etc. Those skilled in the art will recognize that this cannot be said of adjustable sights of the prior art.

It is perhaps appropriate to mention at this time that the concept of an adjustable combat sight for a pistol like the GLOCK line of pistols (including existing models No.17, 17L, 19, 20, 21, 22, and 23) is not new. GLOCK™ pistols either manufactured or distributed in the United States by Glock Inc. of Smyrna, Georgia are offered with either fixed or adjustable rear sights. But the factory-offered adjustable GLOCK sight extends very far back on the slide, and, in fact, extends beyond the rear end of the pistol. It is believed that this extension beyond the original outline of the pistol is not desirable, because any portion of a sight that extends beyond the pistol's boundaries is likely to snag on clothing, a holster, a tent flap, etc., thereby creating a potential safety hazard. Therefore, the concept of lowering a sighting element at least partially into the sight-mounting groove of a pistol is believed to be an improved way of installing an adjustable sight on a firearm.

While only the preferred embodiment of the invention has been disclosed herein in great detail, those skilled in the art will no doubt recognize that variations and modifications could be made without departing from the broad concept that has been disclosed herein. Therefore, it should be understood that the breadth of the invention should be measured only by the attached claims.

What is claimed is:

Claim 1. An adjustable rear sight for a firearm, said firearm being of the type that has a front, a rear, a top, a bottom, a front sight, and right and left sides with a width therebetween, and the firearm having a frame and a barrel with a longitudinal axis, and the firearm's top having a mounting groove that extends transversely across a major portion of the firearm for receiving a rear sight, comprising:

a. a rigid base having a lower portion and an upper portion, said lower portion being shaped and sized to fit snugly within the firearm's mounting groove, and the base's upper portion being shaped and sized to extend above the top of the firearm;

b. a central structural element that is mounted for up and down movement with respect to the rigid base, said movement being between an extreme upper elevation and an extreme lower elevation, and said central structural element having a central sighting member and a pair of spaced-apart and rearwardly facing surfaces, said central sighting member being oriented so that a shooter may align a front sight with the central sighting member in order to achieve a desired sight picture when the firearm is being aimed, and said central structural element being located with respect to the base in such a way that at least a portion of the central structural element will extend downwardly into the firearm's mounting groove when the central structural element is at its extreme lower elevation;

c. means for selectively moving the central structural element up and down with respect to the base, whereby the central element may be selectively moved to a desired elevation with respect to the firearm; and

d. means for securely holding the central structural element at a desired one of a plurality of possible elevations, said possible elevations being bounded by the central structural element's extreme lower elevation and its extreme upper elevation.

Claim 2. The adjustable rear sight as claimed in Claim 1 wherein the base's upper portion includes a pair of upstanding sidewalls that are spaced from one another by a substantial distance, said sidewalls extending in a direction that is approximately parallel to the barrel's longitudinal axis, and the sidewalls having a height above the firearm's top that is relatively low so

as not to interfere with placing a firearm into a holster or removing the firearm from a holster, such that the sight may be aptly categorized as an adjustable, open-top combat sight.

Claim 3. The adjustable rear sight as claimed in Claim 1 wherein the firearm is a pistol and the frame is molded of a synthetic material comprising a high impact-resistant polymer, and the pistol is selected from the group of pistols consisting of the GLOCK Model Numbers 17, 17L, 19, 20, 21, 22 and 23.

Claim 4. The adjustable rear sight as claimed in Claim 1 wherein the distance between the central element's extreme lower elevation and its extreme upper elevation is about 0.12 inch.

Claim 5. The adjustable rear sight as claimed in Claim 1 and further including means for anchoring the rigid base at a selected one of a plurality of possible locations in the firearm's mounting groove, whereby a windage adjustment may be effected by manually moving the base sideways to a desired position in the mounting groove before the base is anchored to the firearm.

Claim 6. The adjustable rear sight as claimed in Claim 5 wherein the means for anchoring the rigid base includes a pair of threaded elements, each of which has a head and a shank, and each of the two heads having an exposed hex-shaped recess that is selectively engagable with a 0.035 inch Allen-head wrench.

Claim 7. The adjustable rear sight as claimed in Claim 1 wherein the firearm's mounting groove has a longitudinal span at its top that is less than the longitudinal distance across its bottom, such that a longitudinal cross-sectional view of the mounting groove may be described as dovetailed, and wherein the lower portion of the sight's base has a shape that is generally complementary to the shape of the firearm's mounting groove.

Claim 8. The adjustable rear sight as claimed in Claim 7 wherein the lower portion of the base is divided into two transversely oriented portions by a generally vertical cut that runs lengthwise through most of the base's lower portion, and one of said two portions is relatively thick and hence substantially rigid, and the other of the two portions is relatively thin.

Claim 9. The adjustable rear sight as claimed in Claim 1 wherein the means for selectively moving the central element up and down with respect to the base includes an eccentric mechanism.

Claim 10. The adjustable rear sight as claimed in Claim 9 wherein the eccentric mechanism is manually adjustable with relatively small wrench, and said wrench is a 0.035 inch Allen-head wrench.

Claim 11. The adjustable rear sight as claimed in Claim 9 wherein the eccentric mechanism includes a floating eccentric element that is continually rotatable for a full 360 degrees without causing mechanical interference with any moving or static part.

Claim 12. The adjustable rear sight as claimed in Claim 9 wherein the eccentric mechanism provides at least 20 positive-stop elevations of the central element with respect to a static base.

Claim 13. The adjustable rear sight as claimed in Claim 1 wherein the means for holding the central structural element at a desired elevation with respect to the base includes a hardened ball that is continuously biased into a selected one of a plurality of grooves in the periphery of a disk-shaped member.

Claim 14. The adjustable rear sight as claimed in Claim 1 wherein the total weight of said sight is significantly less than one ounce, and the distance between the central element's extreme lower elevation and its extreme upper elevation is about one-eighth inch, such that a range of sight adjustment of as much as one-eighth inch may be accomplished with a relatively light-weight rear sight.

Claim 15. The adjustable rear sight as claimed in Claim 1 wherein there are a plurality of possible positions for the central element that lie between its extreme lower elevation and its extreme upper elevation, and wherein immediately adjacent possible positions vary in elevation from one another by a distance as small as a few thousandths of an inch.

Claim 16. The adjustable rear sight as claimed in Claim 1 wherein the means for holding the central structural element at a desired location includes a coiled spring that continuously biases an eccentric member to a selected position.

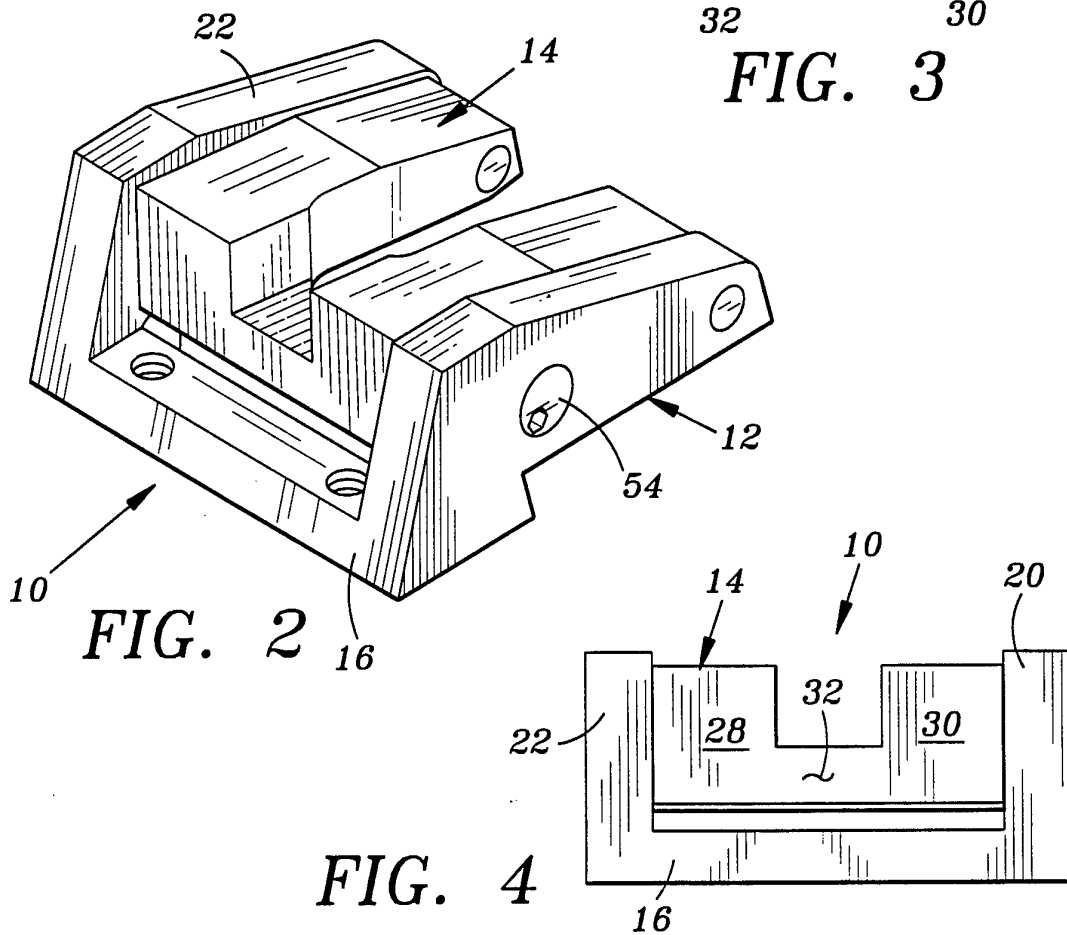
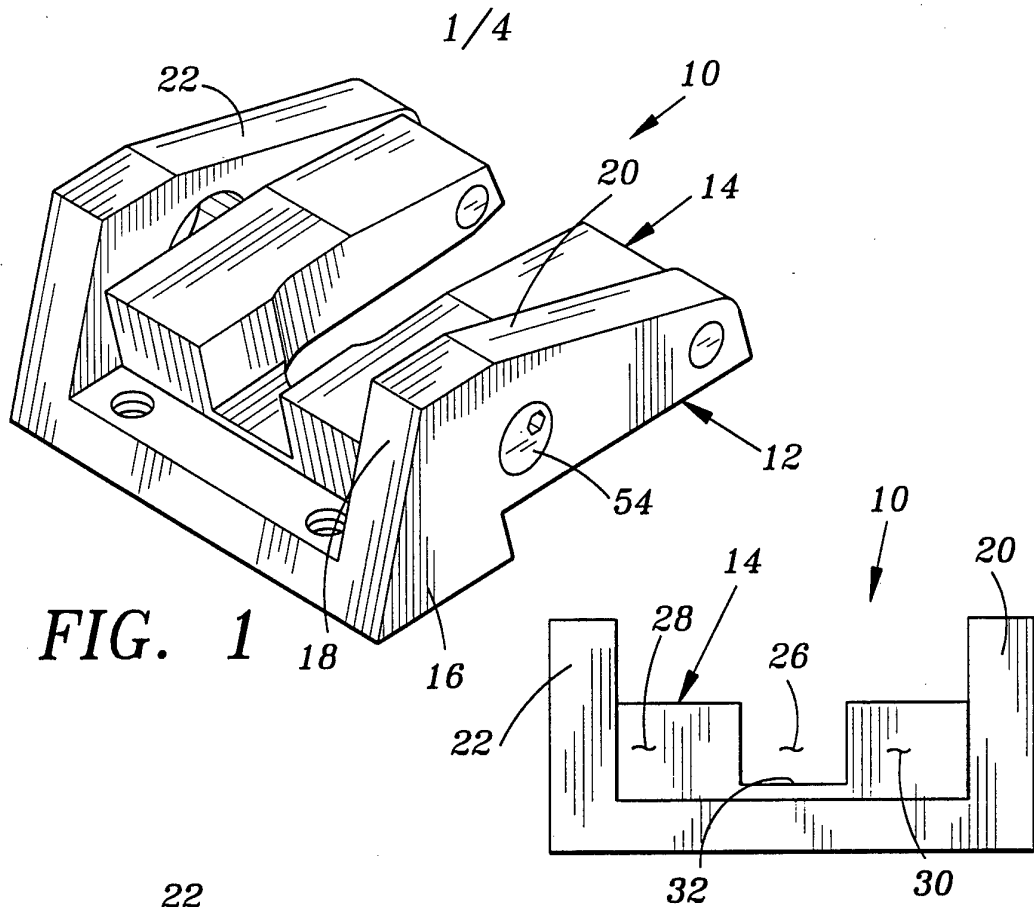
Claim 17. A method relating to the aiming of a firearm, said firearm having a frame with a front and a rear and a longitudinal axis therebetween, and the firearm having a top and right and left sides, and the distance between the right and left sides defining the firearm's width, and the firearm's top having a mounting groove that is designed to receive the base of a rear sight, said mounting groove extending transversely across the firearm, and the firearm having a rear sight with an adjustable sighting element that may be moved up and down during a sighting procedure, said method involving placement of the sighting element with respect to the firearm's top, comprising the steps of:

- a. mounting the rear sight on the firearm at a location where the sighting element will be positioned immediately over the firearm's mounting groove; and
- b. causing the sighting element to descend at least partially into the firearm's mounting groove when the sighting element is lowered to the lowest possible position to which it may be functionally adjusted.

Claim 18. The method as claimed in Claim 17 wherein the sighting element is caused to descend by selectively rotating an eccentric member that is mechanically connected to the sighting element.

Claim 19. The method as claimed in Claim 17 wherein the sighting element is biased to a selected position with respect to the firearm's top by urging a rigid member in a generally radial direction against the periphery of an eccentric member, and the eccentric member being connected to the sighting element.

Claim 20. The method as claimed in Claim 17 and including the further step of accomplishing a windage adjustment by loosening the rear sight so that it may be moved in its entirety in a sideward direction with respect to the firearm's mounting groove, and subsequently anchoring the rear sight at a desired location without affecting its up and down orientation.



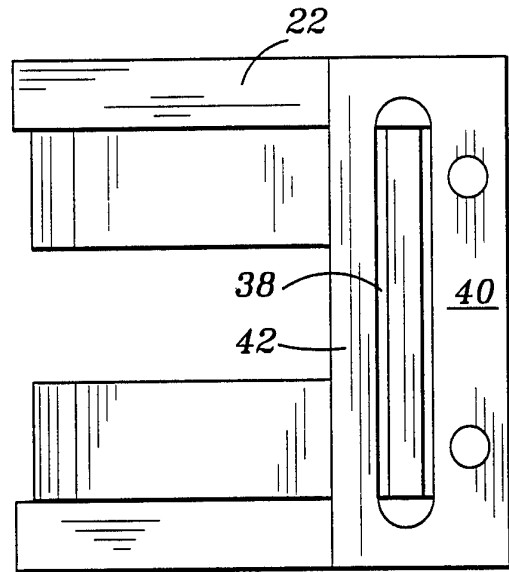
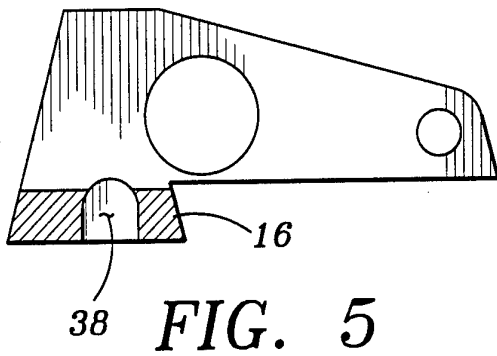


FIG. 6

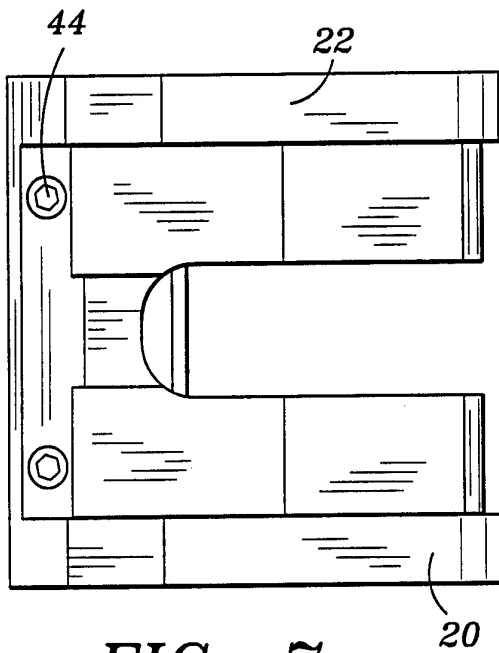


FIG. 7

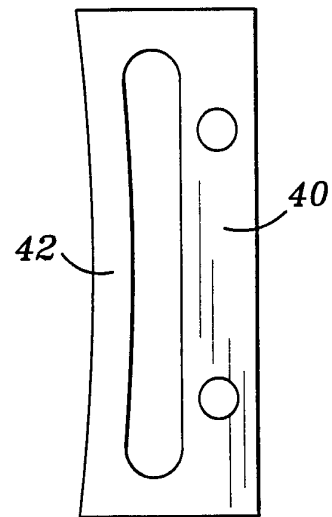
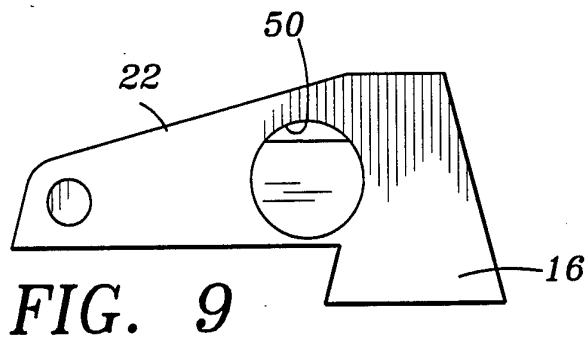


FIG. 8



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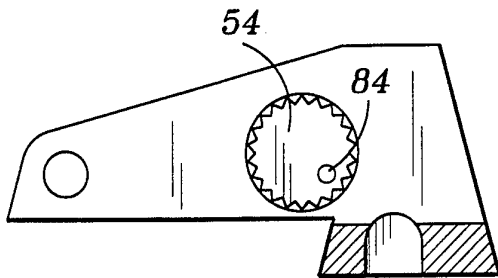


FIG. 10

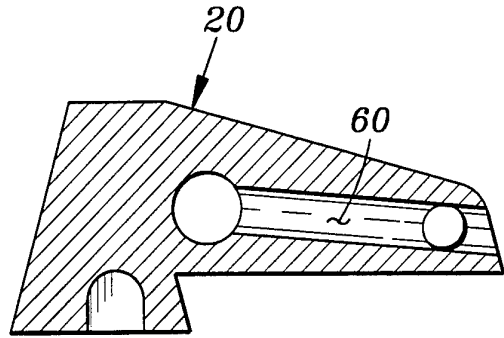


FIG. 11

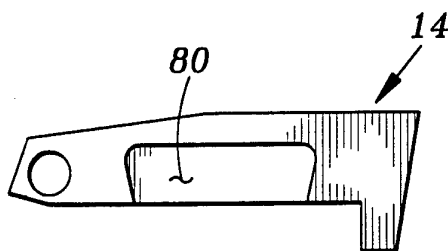


FIG. 12

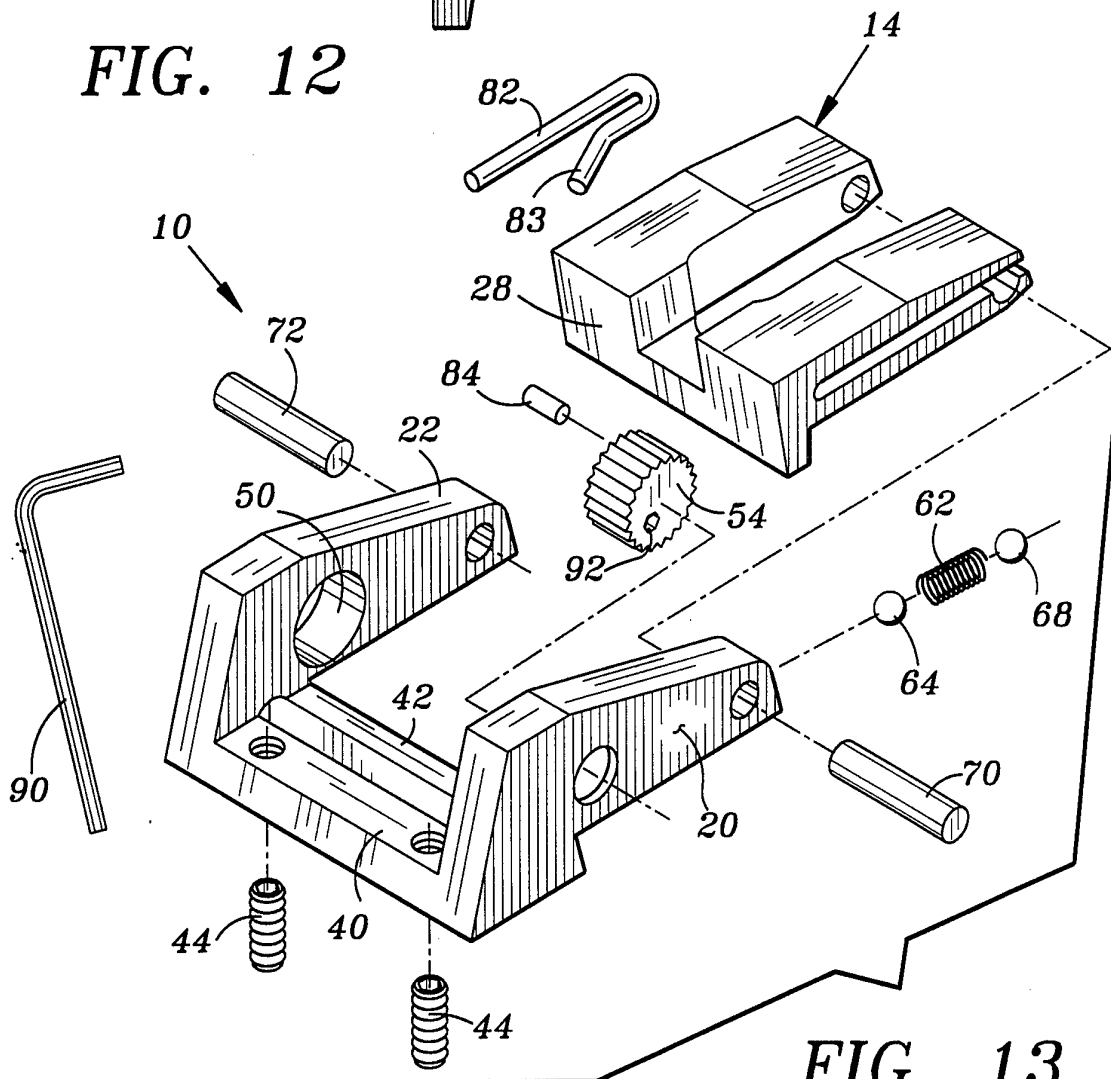
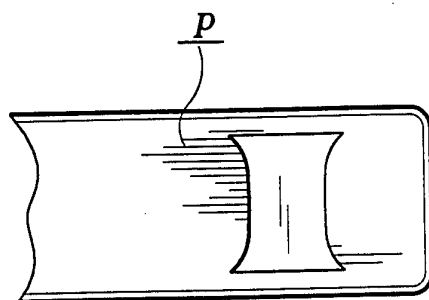
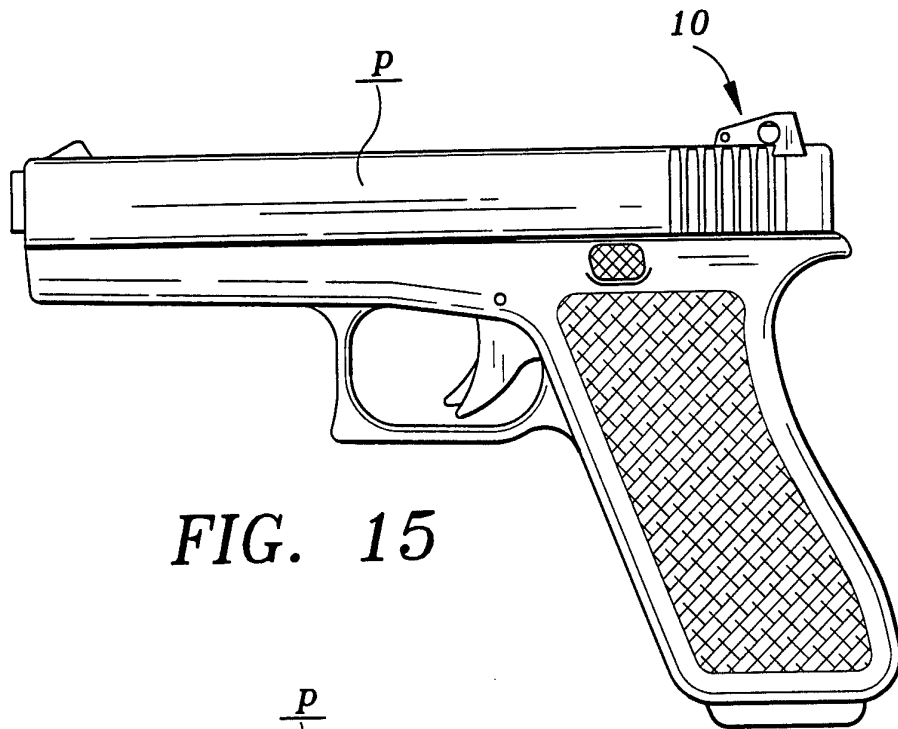
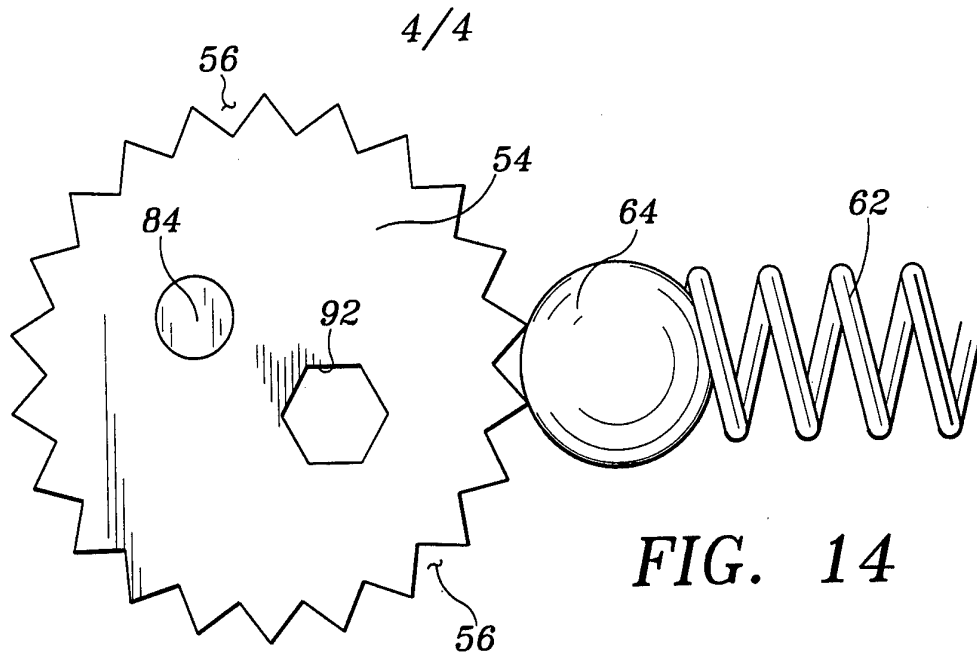


FIG. 13



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/00533

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :F41G 1/28
US CL :42/100

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 42/100
33/241, 252, 253, 254, 259, 260

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4,388,772 (MAES) 21 June 1983, see col. 4, lines 15-30 and Figs. 1-5.	1-2,4-5,7-10,12,14-15, and 17-20
X	US, A, 4,606,131 (DOMIAN) 19 August 1986, see col. 3, lines 40-66 and Figs. 1-9.	1-2,4,9, and 12-20
Y	US, A, 4,893,546 (GLOCK) 16 January 1990, see col. 5, lines 7-16.	3

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be part of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*&* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
18 MAY 1995

Date of mailing of the international search report
08 JUN 1995

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