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(54) FRONT INTERFACING DETACHABLE SCOPE MOUNT

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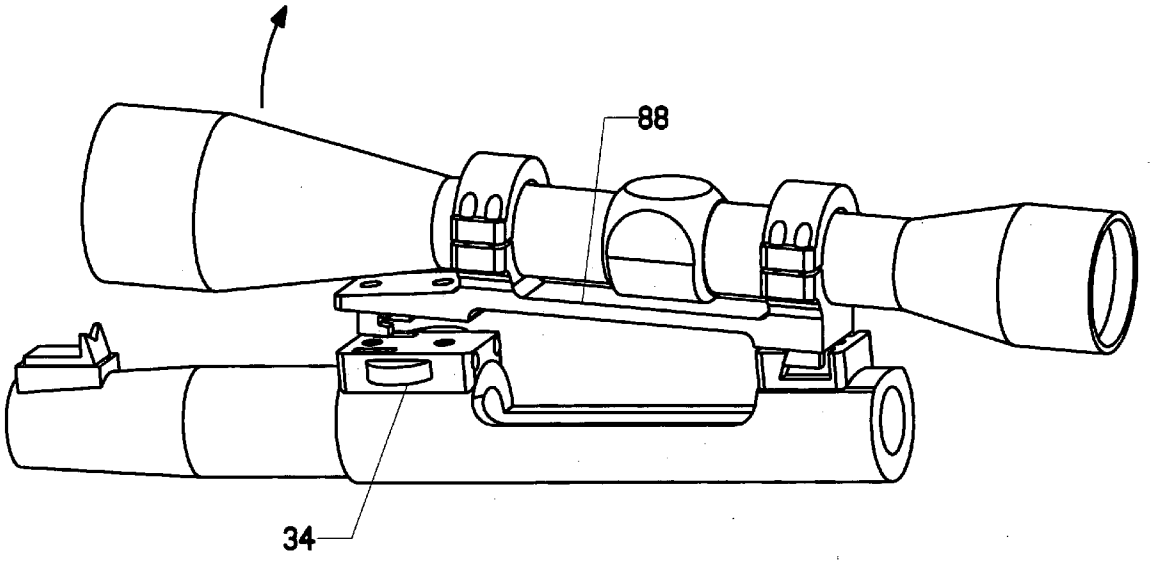
Publication Classification

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F41G 1/38 (2006.01)

(52) **U.S. Cl.** **42/127**

(57) **ABSTRACT**

A detachable mount for a telescopic sight which can be operated using only one latching mechanism. The mount uses a front base attached to the ring of a rifle receiver and a rear base attached to the bridge of a rifle receiver. The upper surfaces of both the front and rear bases preferably open into a pair of slots. A separate scope mount is attached to a scope sight by conventional means. One or more sets of lugs descend from the lower surfaces of this scope mount. These sets of descending lugs are configured to fit securely within the slots in the front and rear bases when the scope mount is placed over the bases. The forward facing surfaces of the rear set of descending lugs mate with a corresponding set of rearward facing surfaces in the slots within the rear base. The rearward facing surfaces of the front set of descending lugs open into tapered notches. The front base incorporates a transverse slider having a tapered surface which fits within the tapered notches in the front descending lugs. The interaction of this slider with the front lugs pushes the front of the scope mount forward while simultaneously pulling it down. The forward motion also serves to pull the rear of the scope mount down as described previously.



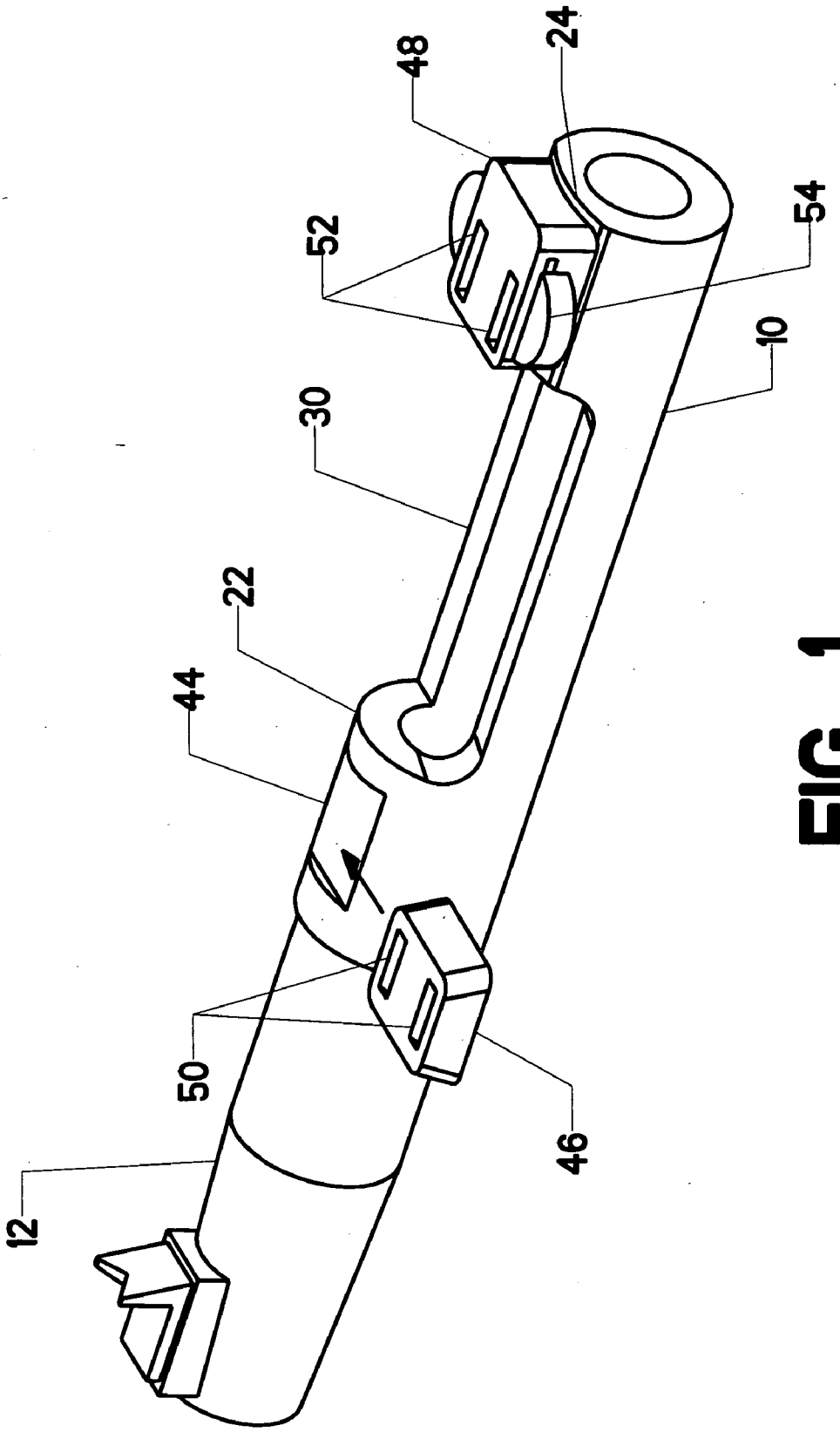


FIG. 1
(PRIOR ART)

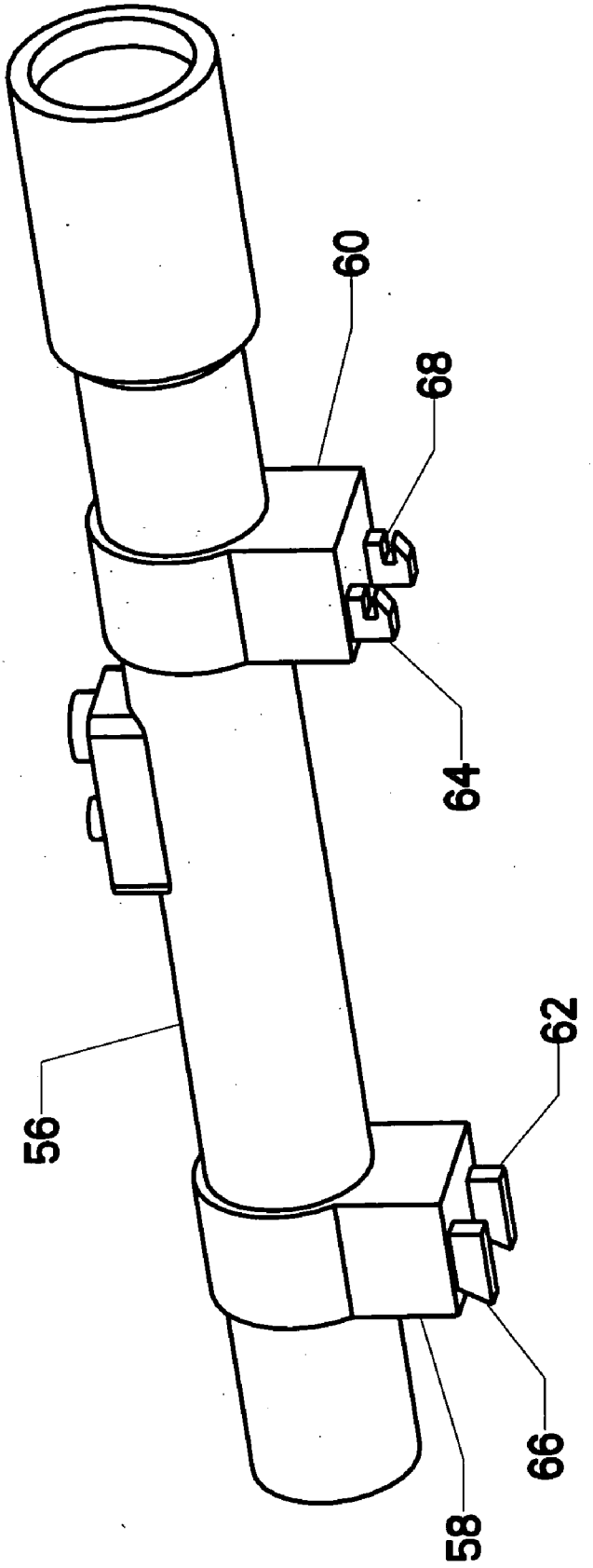


FIG. 2
(PRIOR ART)

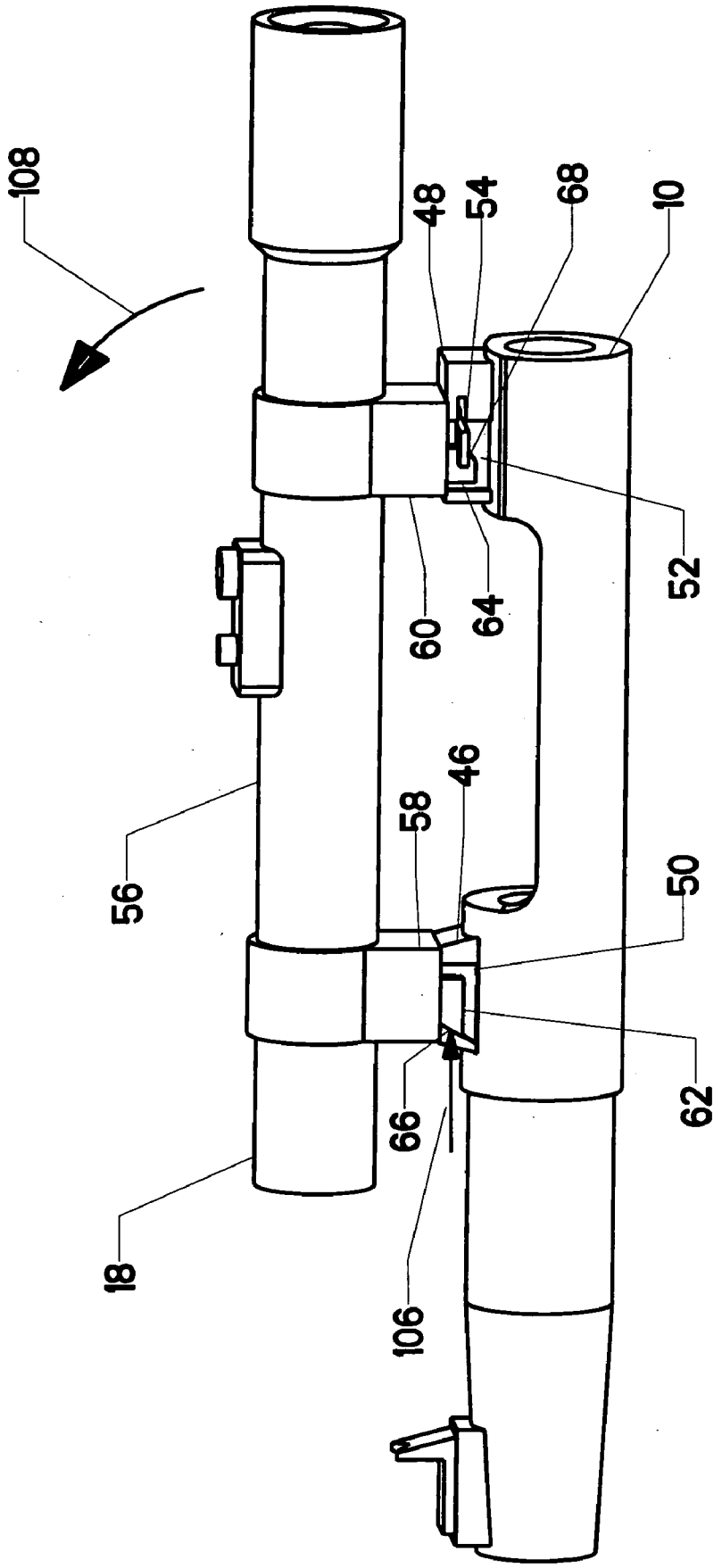


FIG. 3
(PRIOR ART)

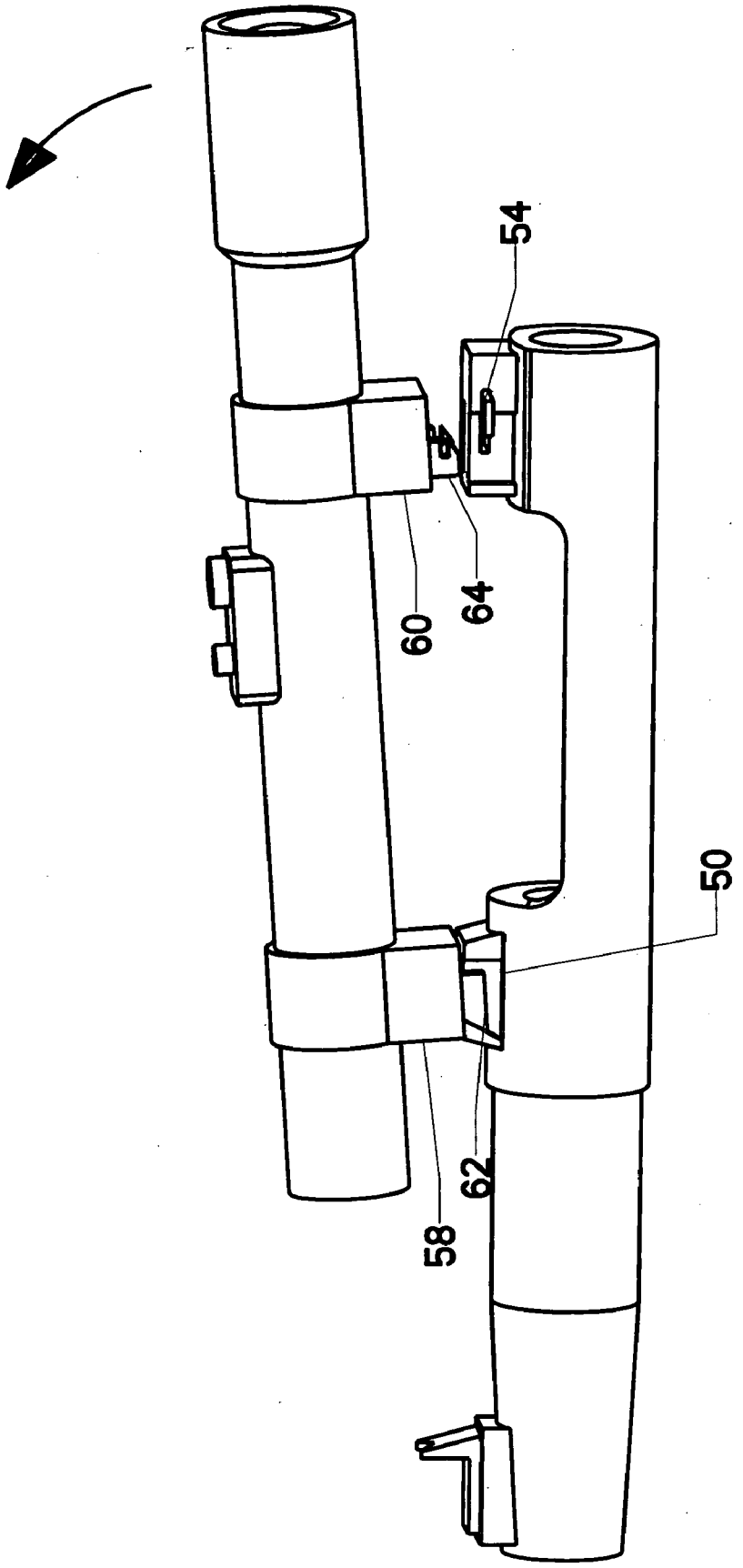


FIG. 4
(PRIOR ART)

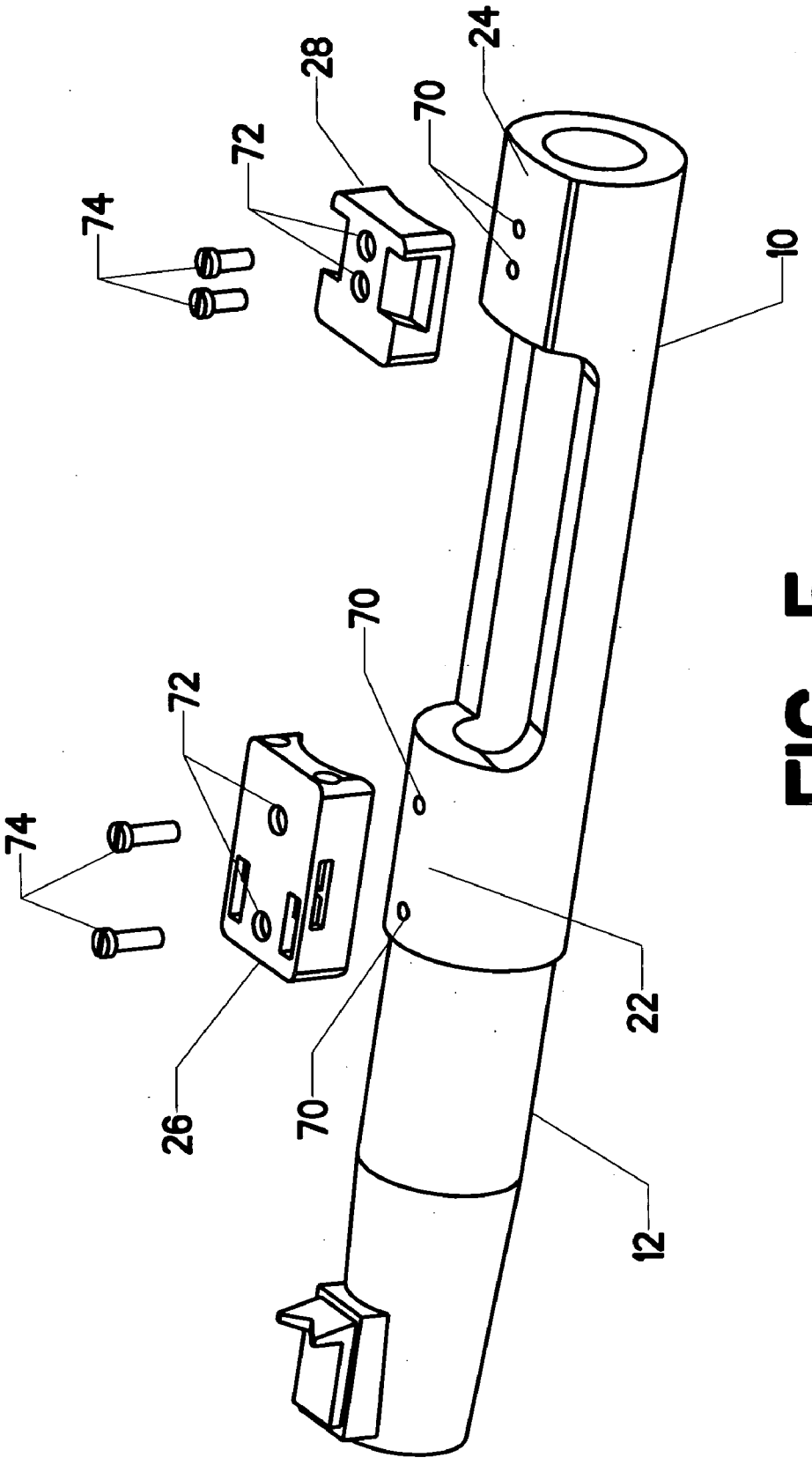


FIG. 5

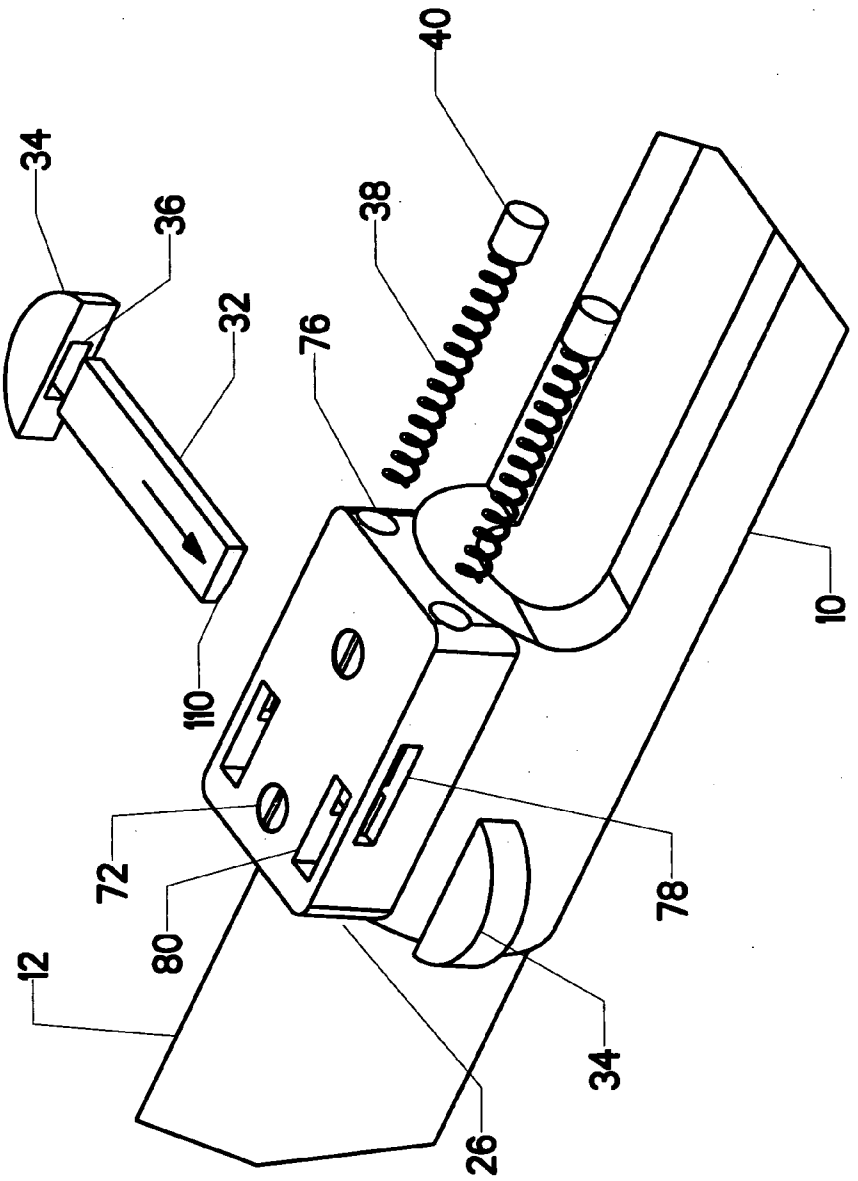


FIG. 6

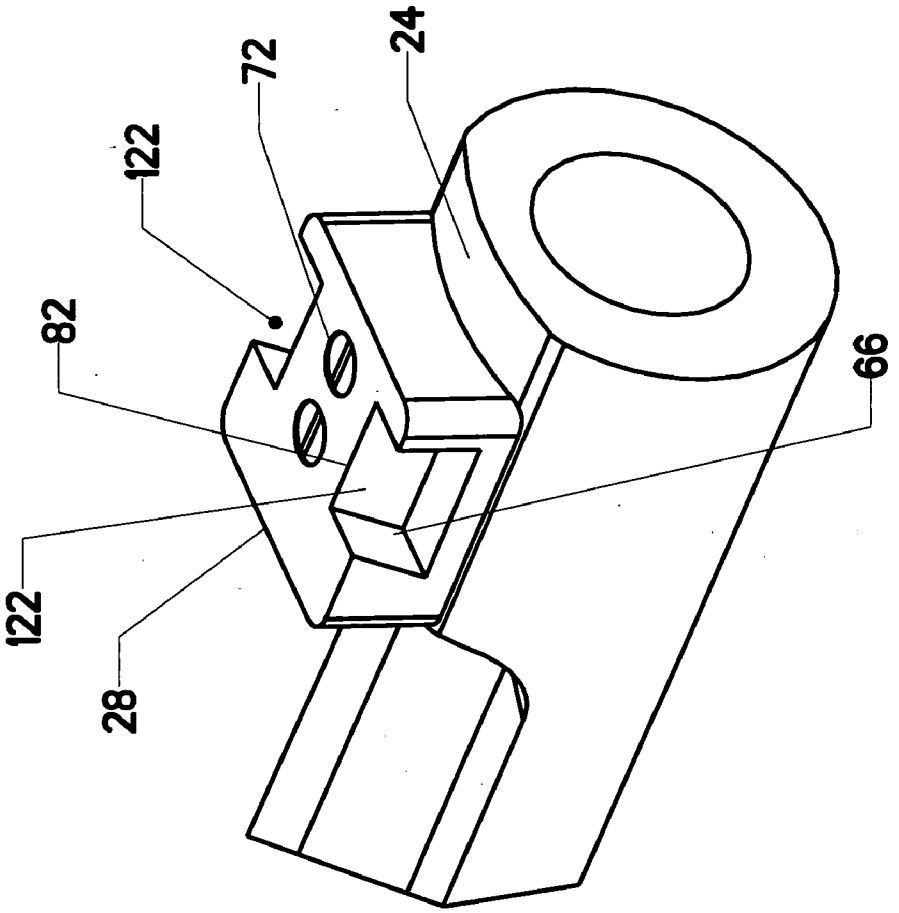


FIG. 7

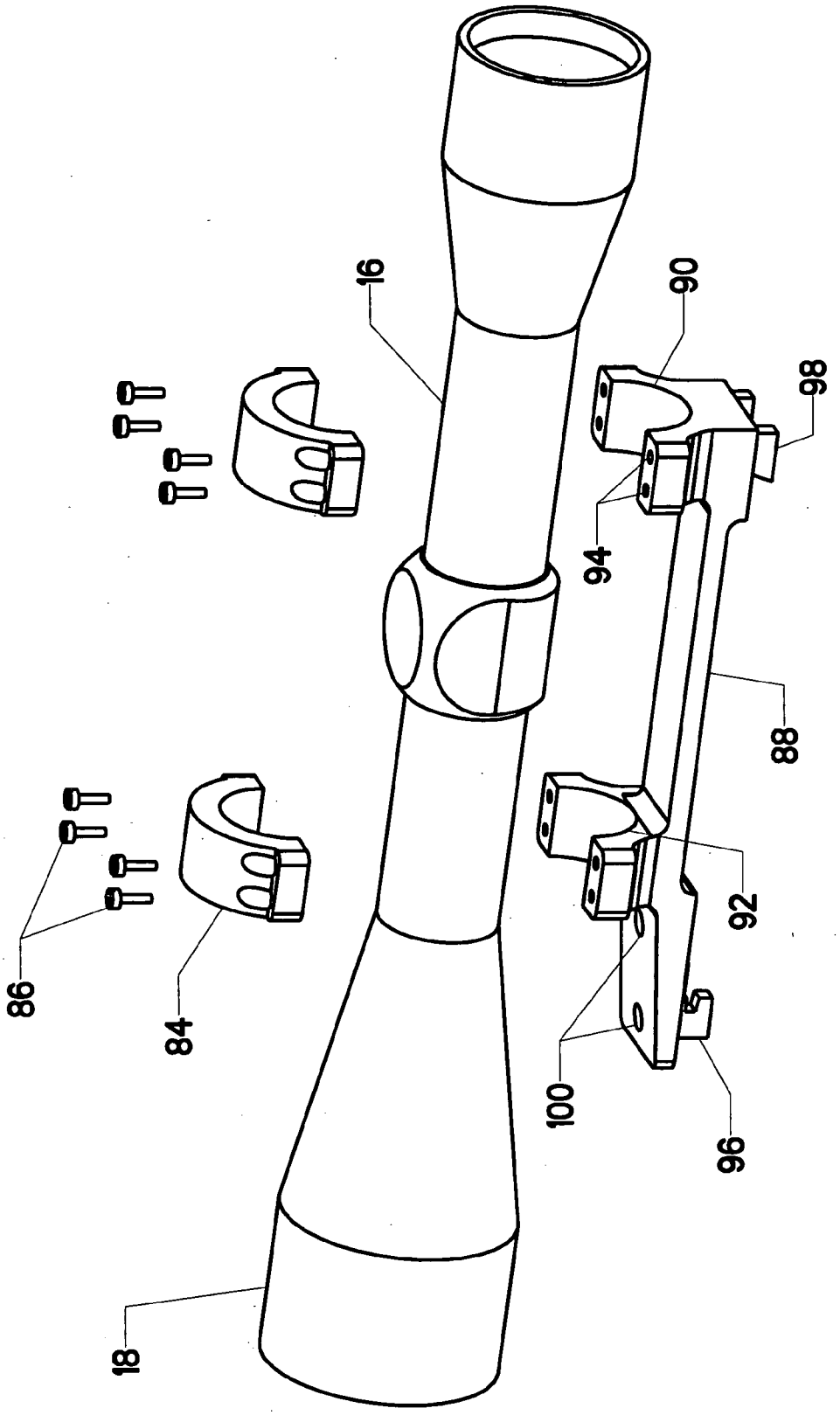


FIG. 8

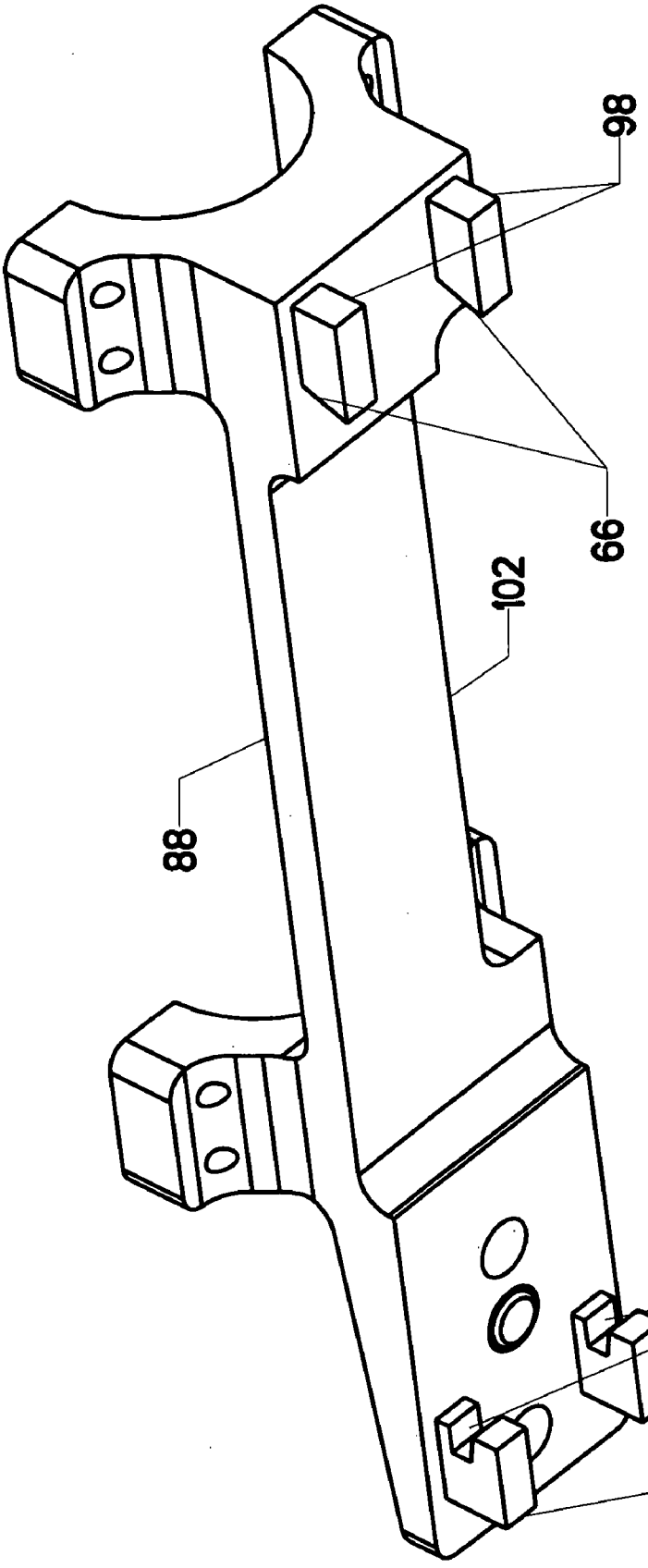


FIG. 9

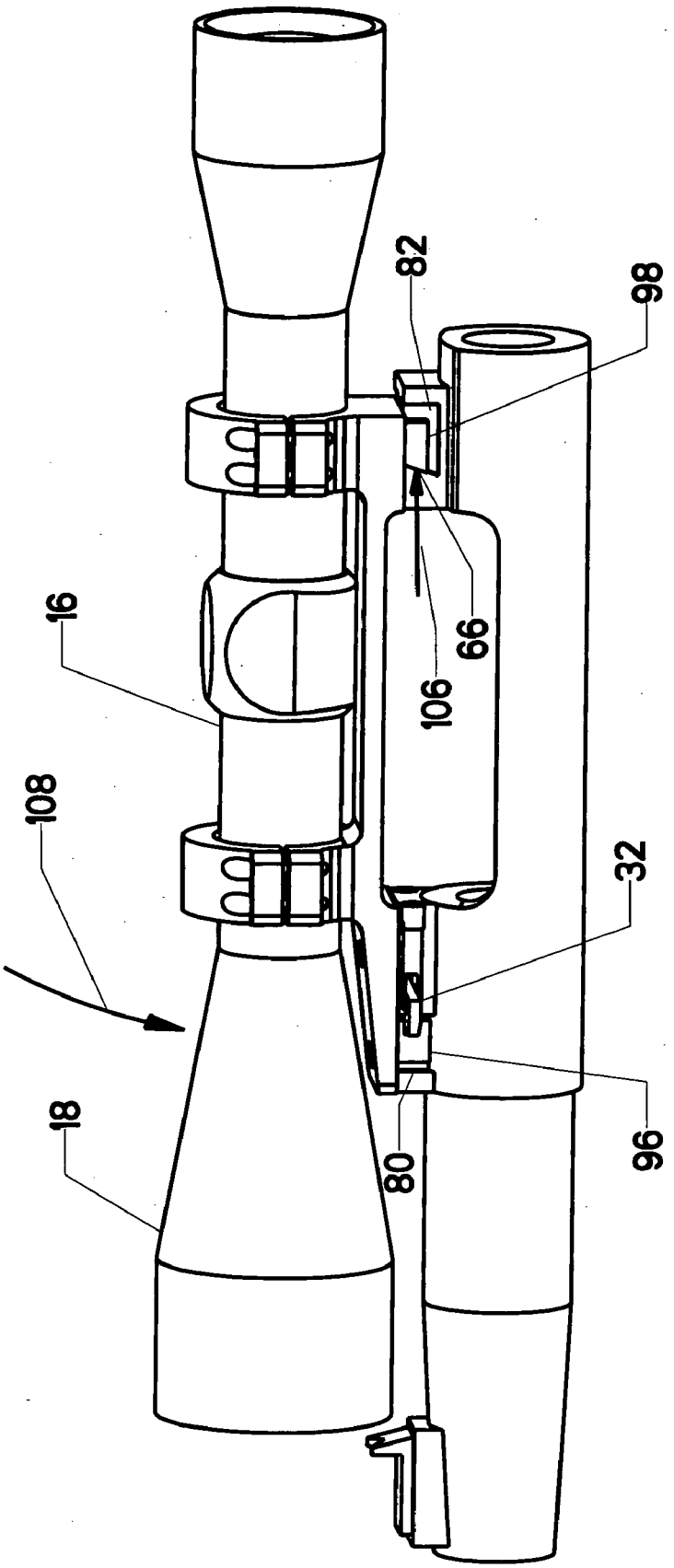


FIG. 10

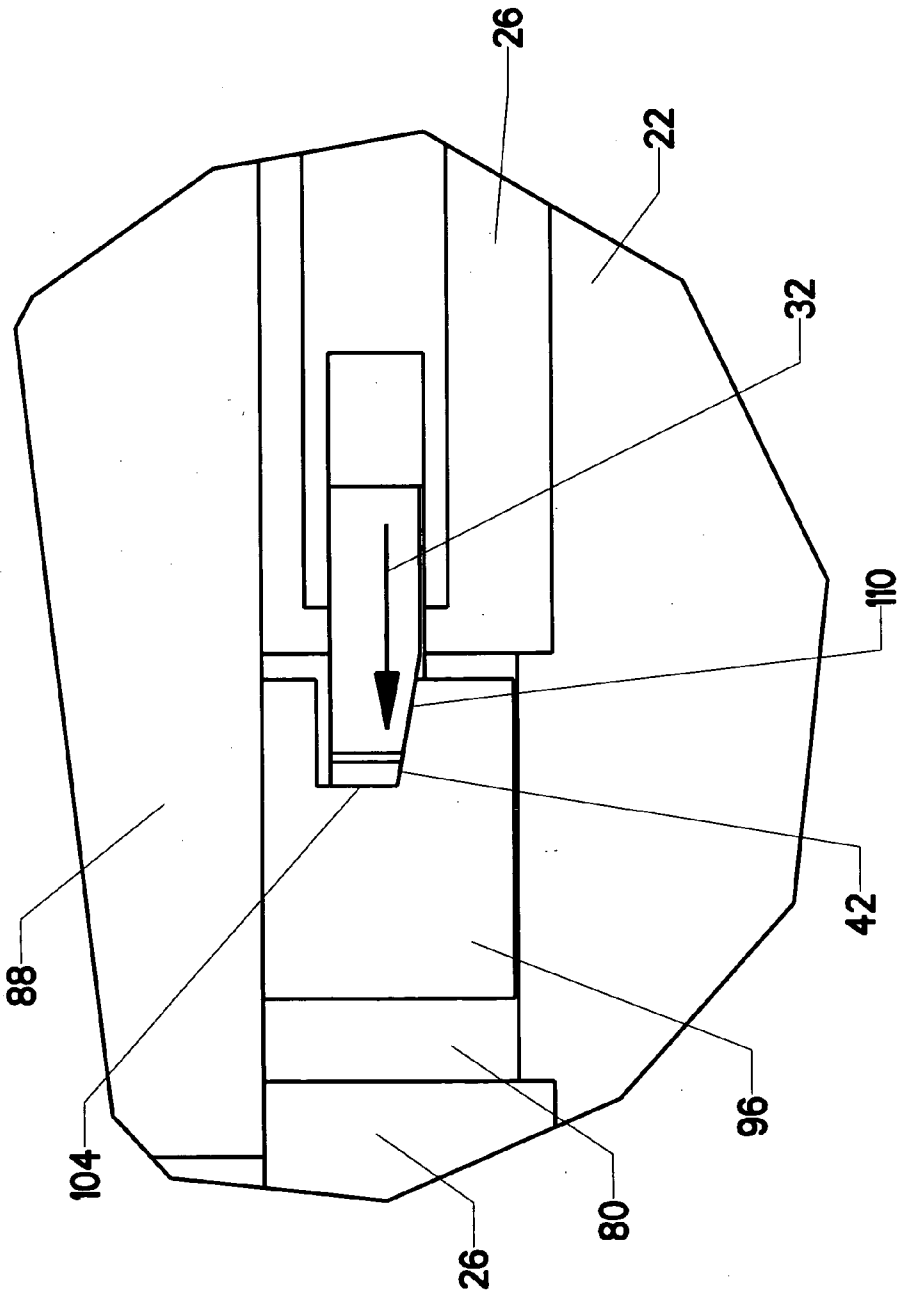


FIG. 10B

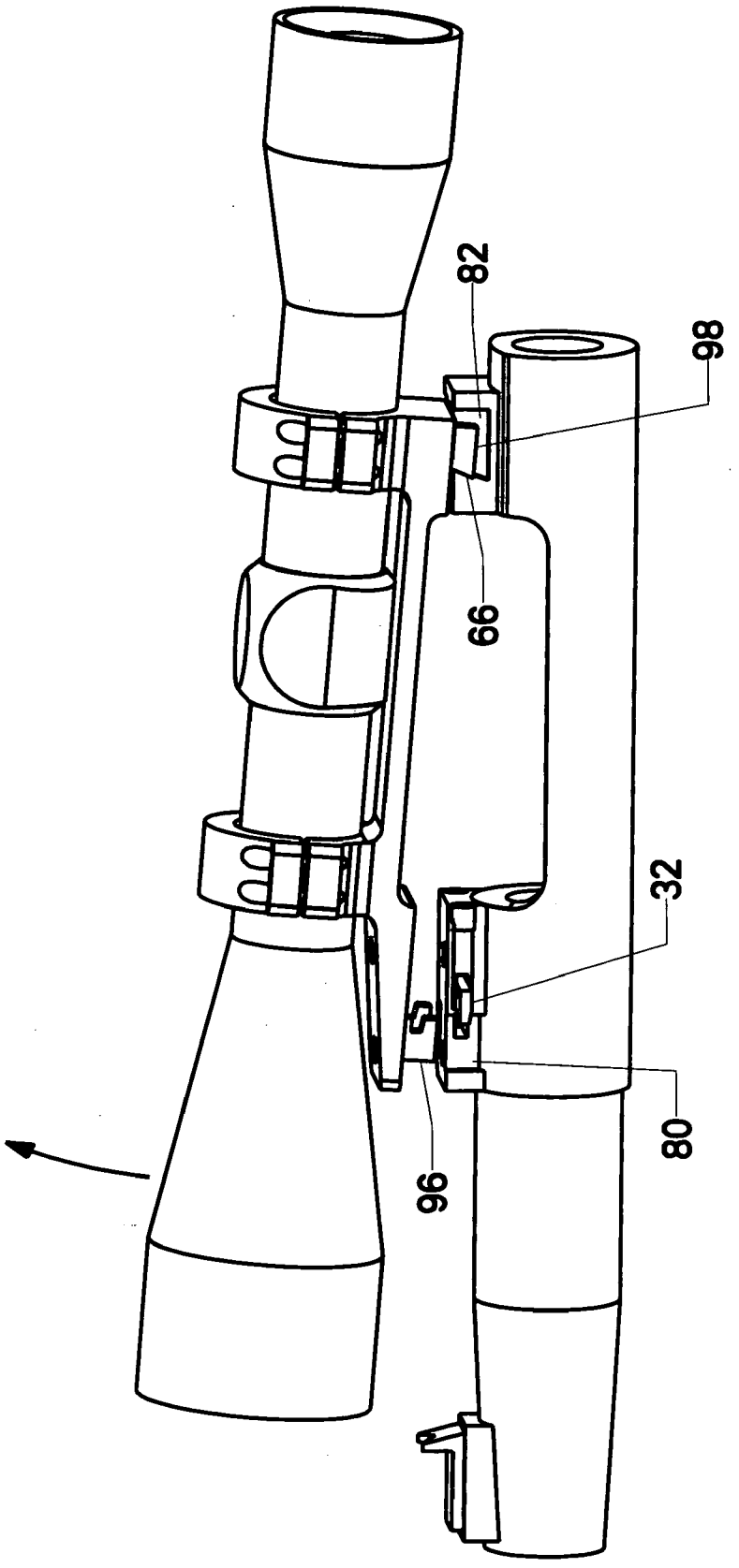


FIG. 11

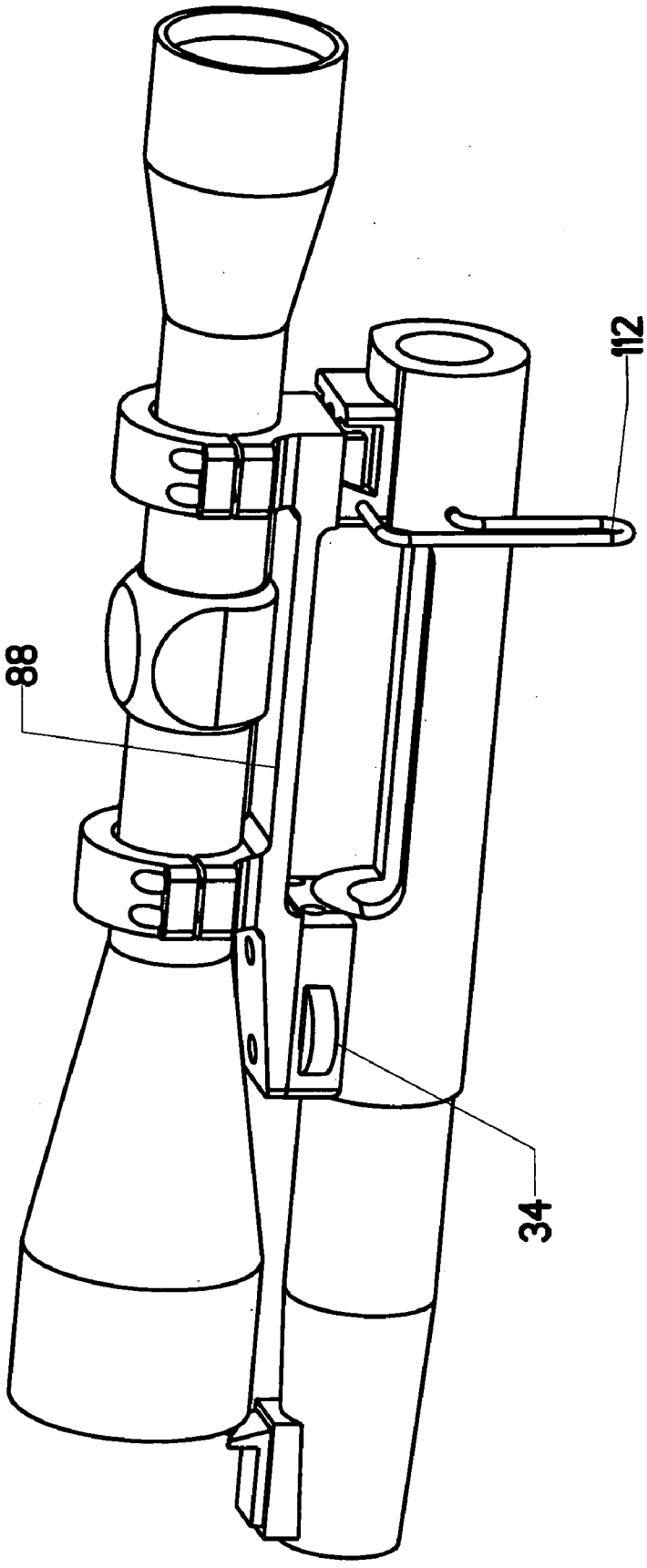


FIG. 12

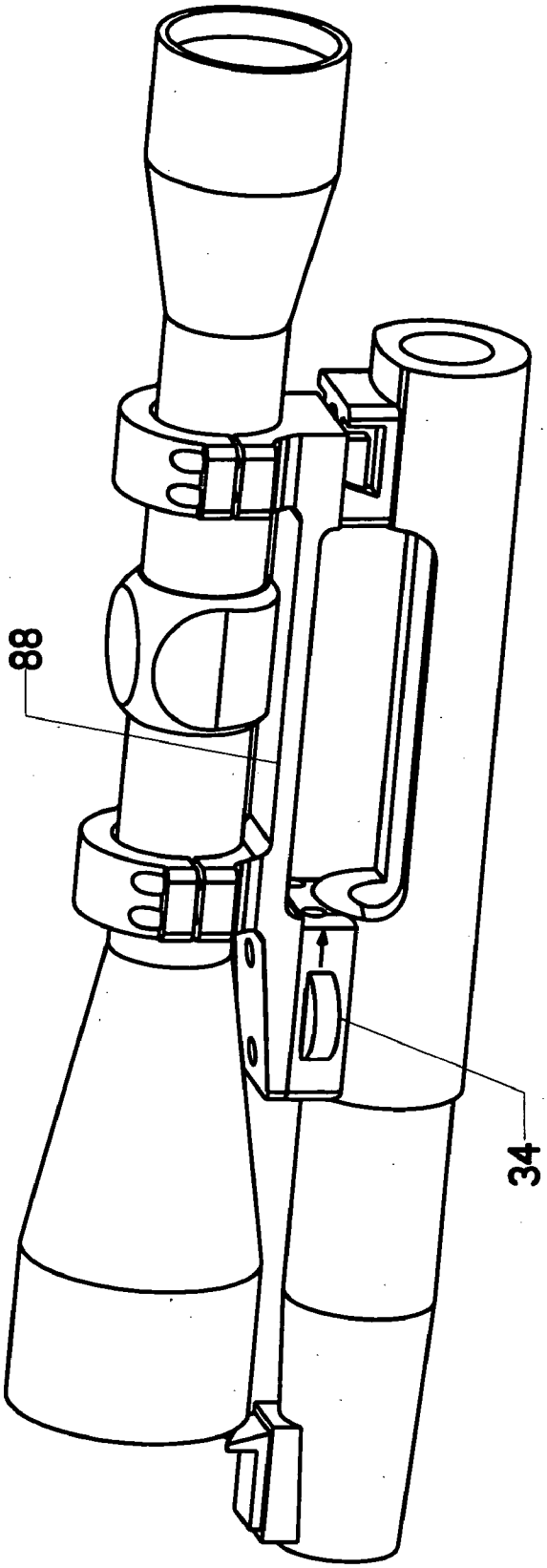


FIG. 13

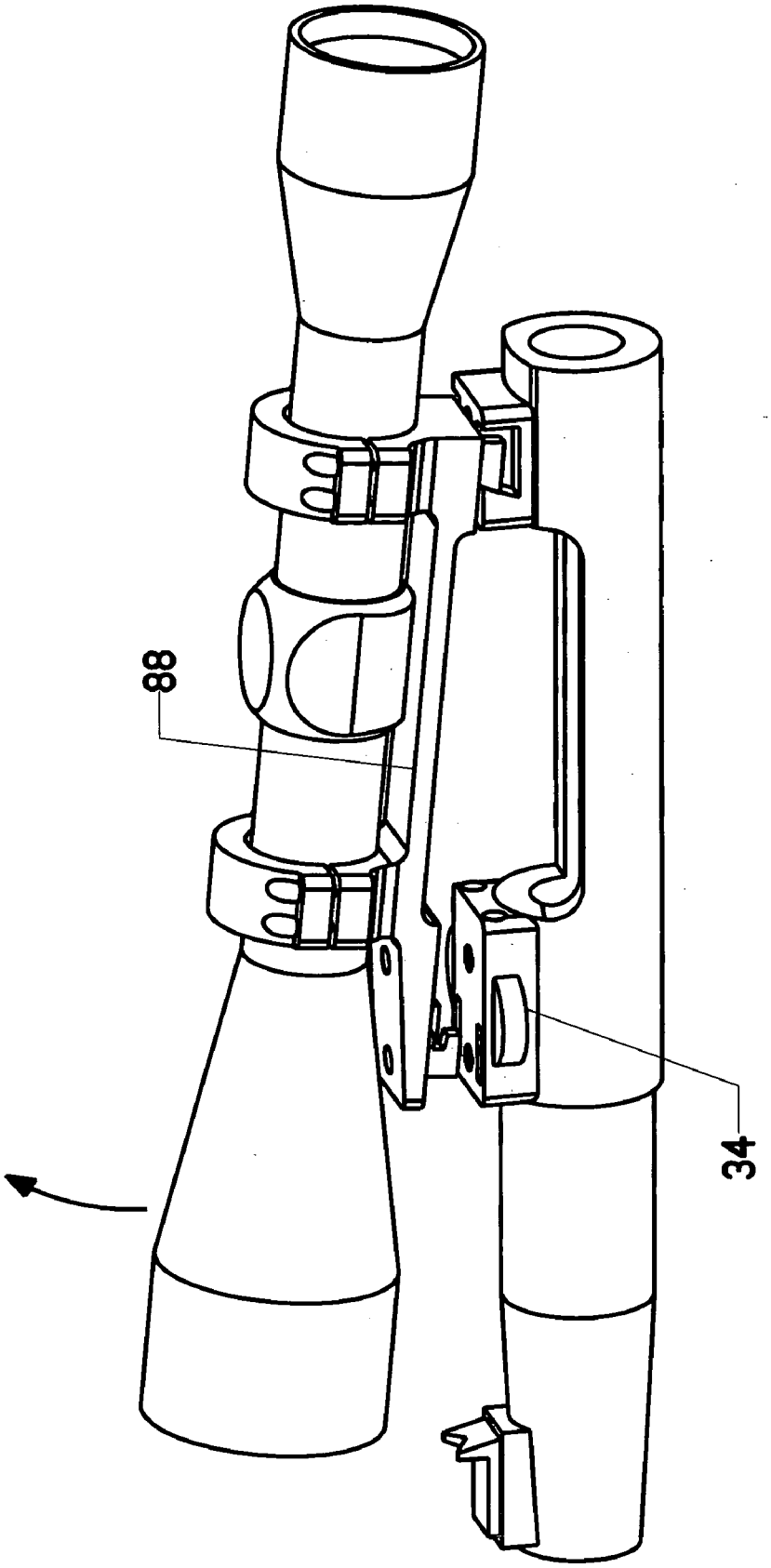


FIG. 14

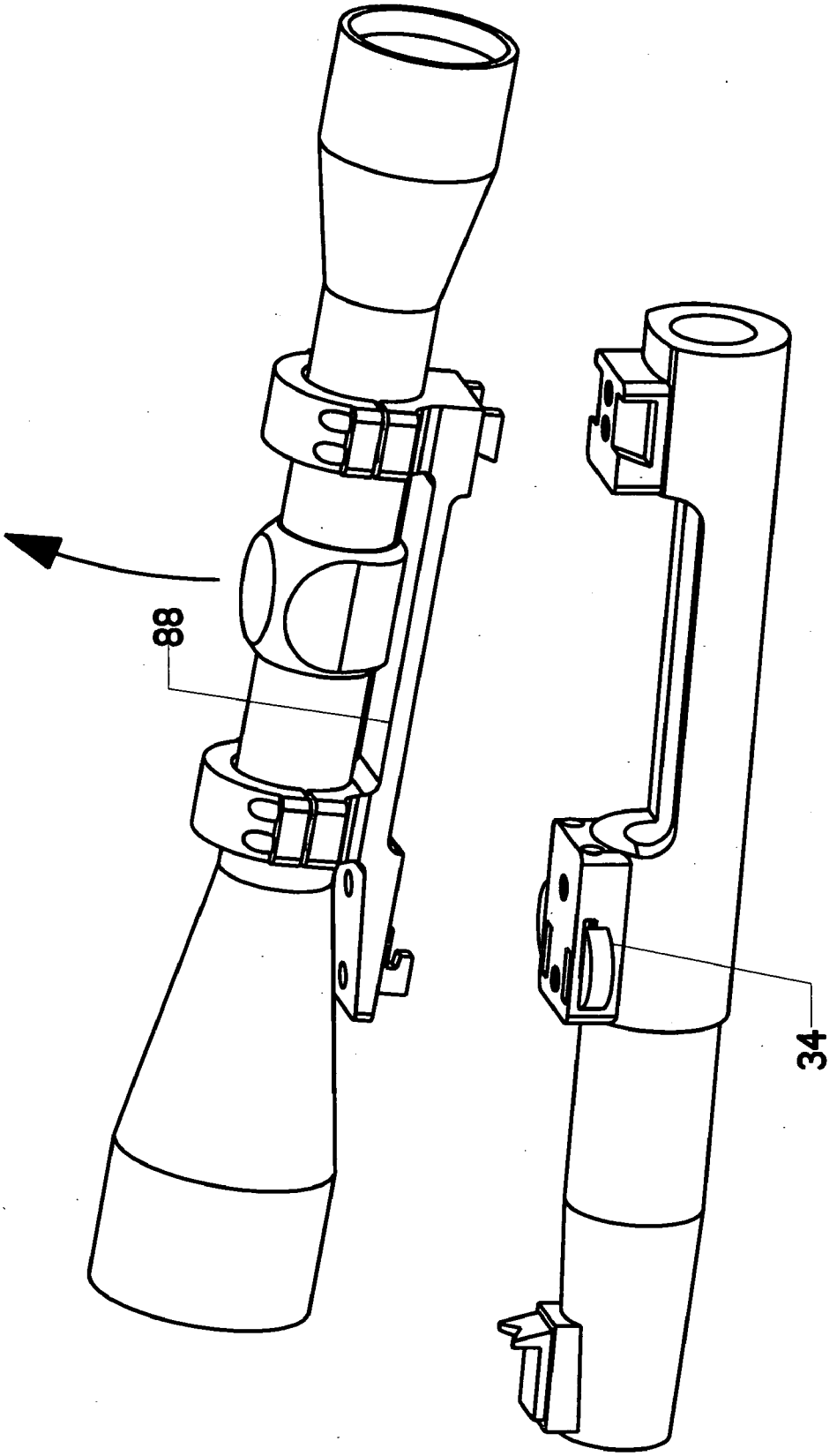


FIG. 15

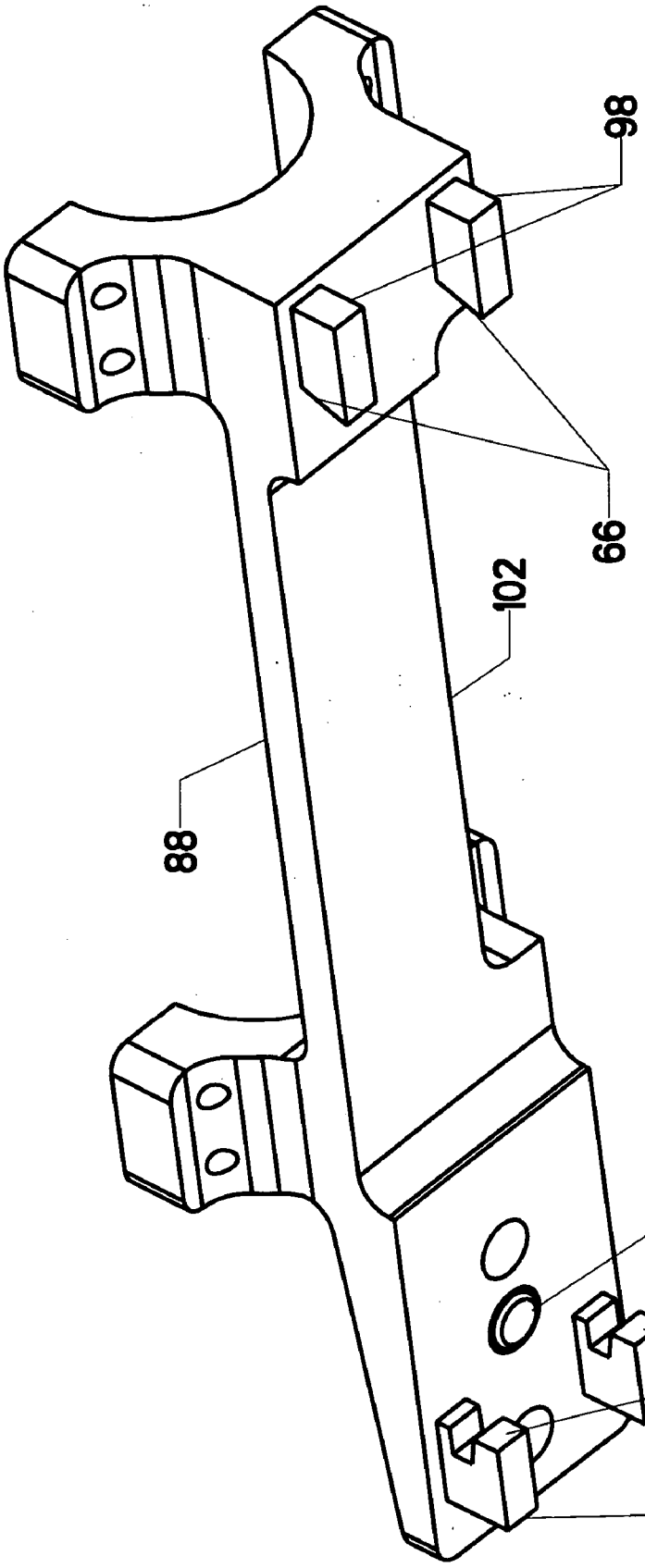


FIG. 16

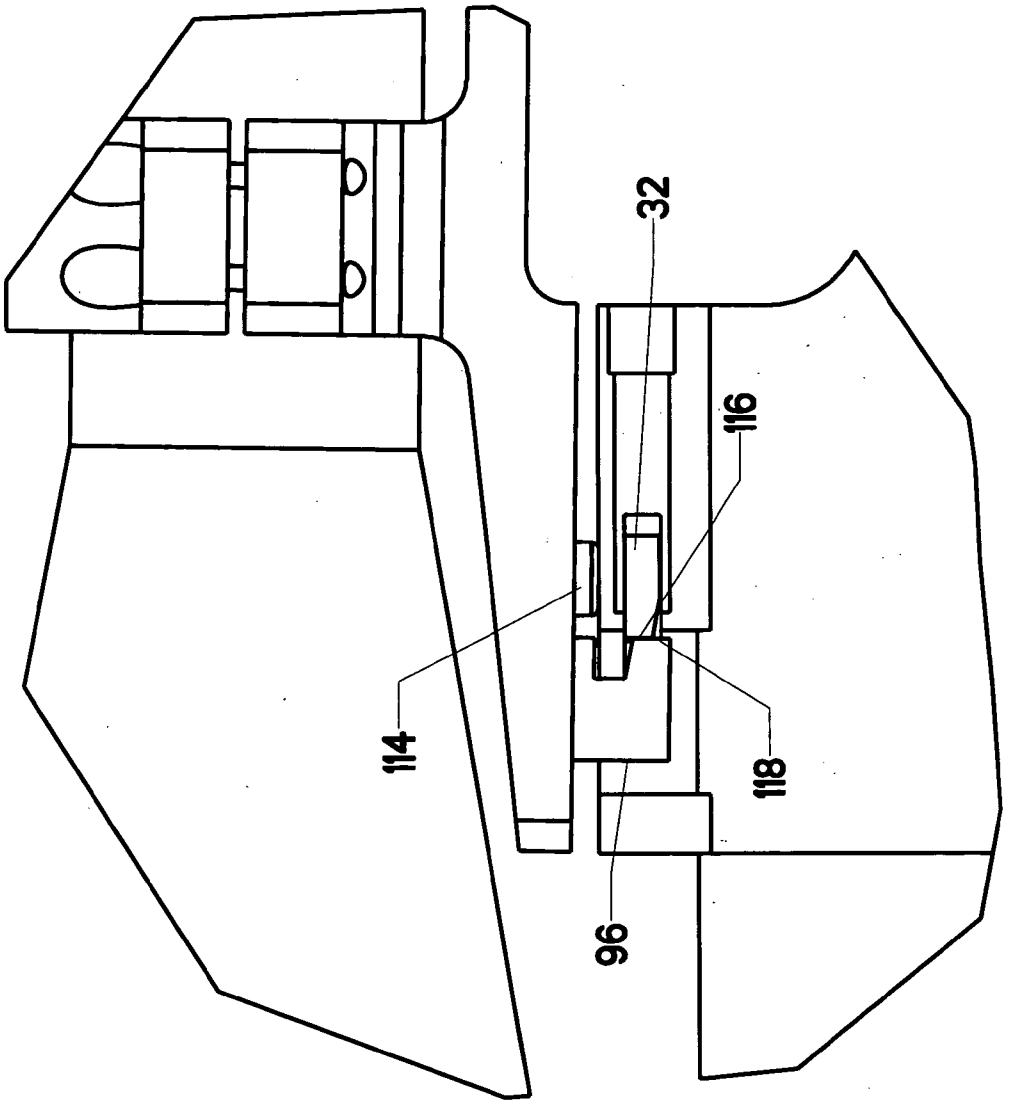


FIG. 17

FRONT INTERFACING DETACHABLE SCOPE MOUNT

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

MICROFICHE APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] 1. Field of the Invention

[0005] This invention relates to the field of telescopic sights for firearms. More specifically, the invention comprises a detachable mount for a telescopic sight that can be detached using one hand without adjusting the customary grip on the firearm.

[0006] 2. Description of the Related Art

[0007] Detachable mounts for telescopic sights have been in use for approximately one century, owing to a long-recognized need. Firearms, particularly sporting rifles, are relatively durable items capable of withstanding wide variations in atmospheric conditions and substantial physical shock. Telescopic sights, in contrast, are relatively delicate optical instruments. Although their design has been advanced considerably in recent decades, telescopic sights remain vulnerable to variations in atmospheric conditions and to physical shock. A sharp blow to a telescopic sight will often shift its point of aim. Worse, there is no visual indicator of this shift, meaning that the user is often unaware of the shift until a shot is fired and missed.

[0008] As a result of these factors, hunting rifles with permanently attached telescopic sights must be treated delicately. It has therefore long been recognized that the ability to detach the telescopic sight until it is needed is highly desirable. One such type of detachable mount is disclosed in U.S. Pat. No. 5,035,487 to Herz (1991). While effective, the Herz type of device is slow to operate. The user must hold the rifle securely while using his or her free hand to rotate the small levers employed to engage the scope mounts. These levers do not provide much mechanical advantage. Both must be rotated independently to the correct position. The telescopic sight must then be lifted off without tilting—or the device tends to become stuck.

[0009] In hunting situations, the telescopic sight must often be removed rapidly. This is particularly true when following up wounded game. In such close range work, the use of the open (sometimes called "iron") sights on the rifle is generally preferred. Thus, a scope which could be removed quickly using a single latching device is preferable.

[0010] The Herz device also incorporates the interaction of camming surfaces generating high surface friction. There is no accommodation for wear compensation. Thus, as the device is used over time, the interlocking surfaces tend to wear loose—eventually rendering the device inoperable.

[0011] One type of detachable mount using a single latching device is known as the "European claw." This type of mount dates back to approximately World War 1. Printed sources within the art sometimes refer to this type of mount as a "Suhler" mount. Though the Applicant is unable to verify the origins of this name, one would assume that "Suhler" refers to the individual who originally created the design.

[0012] The Suhler mount is relevant to the consideration of the present invention. As the Applicant is unable to discover a prior patent disclosing the details of the Suhler design, the Applicant is submitting the details herewith. FIG. **1** illustrates the prior art Suhler mount. Rifle receiver **10** is of the common bolt-action type. Barrel **12** is threaded into rifle receiver **10**. Rifle receiver **10** has a forward cylindrical portion referred to as receiver ring **22**, and a rear portion referred to as receiver bridge **24**. The particular receiver illustrated is of the Mauser type, which is the rifle type most closely associated with the Suhler mount.

[0013] In preparation to installing the Suhler mounts, dovetail cut **44** is milled into receiver ring **22**. Front Suhler base **46** is then press-fit laterally into front dovetail cut **44**. In some instances, it may also be soldered in place. The reader will observe that the upper planar surface of front Suhler base **46** opens into two front Suhler slots **50**.

[0014] Rear Suhler base **48** is installed on receiver bridge **24** in one of two ways. Some receiver bridges have an upstanding lug into which a lateral dovetail cut can be made. If this is the case, then rear Suhler base **48** is press fit into place (and possibly soldered) in the same fashion as for front Suhler base **46**. Other receiver bridges have only a rounded cylindrical surface that is too thin to accommodate a dovetail cut. In that case, rear Suhler base **48** is soldered onto the top of the receiver bridge in an operation obviously requiring considerable skill and precision. Rear Suhler base **48** has a pair of rear Suhler slots **52**.

[0015] At the time the Suhler design was created the object was to mount old scope sight **56**. FIG. **2** shows such a telescopic sight. Old scope sight **56** is a type of telescopic sight which is now rarely seen, but was once quite common. The reader will note that it consists primarily of a long featureless cylinder having a relatively small diameter (typically one inch or 30 mm). Only the eyepiece has a larger diameter. Modem scopes have a much larger objective lens (the forward lens) diameter. The significance of this difference will become apparent subsequently.

[0016] Still referring to FIG. **2**, the reader will note that rear ring **60** and front ring **58** are attached to old scope sight **56**. These are typically positioned on old scope sight **56** and soldered in place. Rear ring **60** has two descending rear Suhler lugs **64**. The rearward facing surfaces of these two lugs are each cut by Suhler mating notches **68**.

[0017] Front ring **58** has two descending front Suhler lugs **62**. The forward facing surfaces of these two lugs are angled to form mating surfaces **66**. FIG. **3** shows rifle receiver **10** with old scope sight **56** in place. The figure incorporates a cutaway through both the front and rear Suhler bases to show the internal features of the nearest set of Suhler slots. The reader will observe that front Suhler lug **62** rests within front Suhler slot **50**, and rear Suhler lug **64** fits within rear Suhler slot **52**.

[0018] Suhler slider **54** is biased—typically by springs—to move forward (right to left in the view as shown). Returning briefly to FIG. **1**, the ends of Suhler slider **54** actually extend out beyond the sides of rear Suhler base **52**. A tab is attached to each exposed end to facilitate grasping by the user. These tabs are actually identified as Suhler slider **54** in FIG. **1**.

[0019] Returning now to FIG. **3**, the operation of the devie will be described. When the user releases the tabs, Suhler slider **54** is pushed forward where it engages mating notch **68**. This interface prevents any vertical motion of rear ring **60**, and also pushes the entire assembly of the scope and rings forward. That forward motion brings mating surfaces **66** on front Suhler lugs **62** in contact with corresponding surfaces on front Suhler slots **50** (the rearward facing surfaces). The reader will observe that these mating surfaces are inclined from the vertical. The result is a wedge interaction—with front ring **58** being pulled firmly down as it is forced forward. When the mating surfaces are fully engaged, any further forward movement is stopped.

[0020] The spring bias forcing Suhler slider **54** forward therefore locates the device securely along the axis of the rifle's barrel. The interaction of Suhler slider **54** and mating notches **68** limits the vertical motion of rear ring **60**. The interaction of mating surfaces **66** with corresponding surfaces in front Suhler base **46** limits the vertical motion of front ring **58**. The lateral fit between the four descending lugs and the four slots in the Suhler bases limit any lateral motion. Thus, the telescopic sight is locked securely in place.

[0021] FIG. **4** illustrates the removal of the device, also using a cutaway through the bases. When the user wishes to remove old scope sight **56**, he or she grabs Suhler slider **54** (using the attached tabs) and pulls it rearward. Suhler slider **54** then travels free of mating notches **68** in rear Suhler lugs **64**. At this point, the user grasps the rear portion of old scope mount **56** and rotates it upward as shown. Once rear Suhler lugs **64** are clear, the user may pull front Suhler lugs **62** free of front Suhler base **46** as well. He entire assembly is then removed.

[0022] Installation of the device is basically the reverse of the process just described. The user starts by placing front Suhler lugs **62** in front Suhler base **46**. The user then pulls back on Suhler slider **54** (using the tabs), which allows rear Suhler lugs **64** to drop into rear Suhler base **48**. The user then releases the tabs, allowing the device to engage and lock. It should be noted that some rear Suhler lugs **64** incorporate a beveled lower surface which automatically moves Suhler slider **54** rearward when the rear of old scope mount **56** is pressed down firmly (thereby eliminating the need for the user to grasp the tabs to attach the scope). This variation is actually the one illustrated.

[0023] FIGS. **3** and **4** also serve to illustrate a significant limitation of the Suhler design. The forward portion of old scope sight **56** is labeled in FIG. **3** as scope bell **18**. This term is now in common use because modem scope sights have an objective lens which is much larger in diameter than the central tube. Thus, the forward portion of the scope is bell-shaped—the diameter grows larger toward the forward end. This phenomenon is obviously not seen on old scope sight **56**. Nevertheless, for purposes of consistency, the forward portion will be referred to as scope bell **18**.

[0024] In FIG. **4**, the reader will observe that the scope must be tilted forward to remove it from the prior art Suhler mounting system. This results in scope bell **18** very nearly contacting barrel **12** or rear sight **14**. There is barely sufficient clearance for old scope sight **56** to be removed. Turning briefly to FIG. **8**, the reader may observe modem scope sight **16**. Scope bell **18** on modem scope sight **16** is both longer and larger than the one found on old scope sight **56**. Returning now to FIGS. **3** and **4**, those skilled in the art will readily appreciate that a modem scope sight cannot be used on the prior art device illustrated, since it cannot be removed due to the mechanical interference between scope bell **18** and the rifle.

[0025] The Suhler mount suffers from a second inherent drawback. Not only have modern scope sights grown larger, they are also considerably heavier than old scope sight **56**. The inertial forces generated under rifle recoil are therefore more significant. The front interface between bases and lugs in the Suhler mount is a pure metal-to-metal contact. The rear interface, in contrast, depends on the spring loading of Suhler lug **54**.

[0026] Returning now to FIG. **3**, when the rifle is fired, rifle receiver **10** undergoes a sharp rearward impulse. This movement is imparted to front ring **58** as recoil impulse **106** (the geometry prohibits any significant transfer through rear ring **60**). Because recoil impulse **106** is applied well below and in front of the center of gravity of old scope sight **56**, it generates recoil torque **108**. Recoil torque **108** tends to force old scope sight **56** to rotate in a counterclockwise direction (in the view as shown). This, in turn, tends to lift rear ring **60** out of rear Suhler base **48**. Thus, substantial recoil tends to loosen the device.

[0027] Those skilled in the art will also realize that the mechanical interface between Suhler slider **54** and mating notch **68** must be fitted very carefully in order for the device to work. This fitting is typically done by hand, using the Prussian blue or "thickness of smoke" process of scraping away the high spots to produce a perfect fit. As the device wears over time, this mechanical fit often tends to become loose.

[0028] My own prior invention—Front Interfacing Detachable Scope Mount—was created to solve these prior problems. That invention issued as U.S. Pat. No. 6,594,938 on Jul. 22, 2003. The present invention is an improvement over U.S. Pat. No. 6,594,938, but is quite similar in design and operation. U.S. Pat. No. 6,594,938 is hereby incorporated by reference.

BRIEF SUMMARY OF THE INVENTION

[0029] The present invention comprises a detachable mount for a telescopic sight which can be operated using only one latching mechanism. The mount uses a front base attached to the ring of a rifle receiver and a rear base attached to the bridge of a rifle receiver. The upper surfaces of both the front and rear bases open into a pair of slots. A separate scope mount is attached to a scope sight by conventional means. Two sets of lugs descend from the lower surfaces of this scope mount. These sets of descending lugs are configured to fit securely within the slots in the front and rear bases when the scope mount is placed over the bases.

[0030] The forward facing surfaces of the rear set of descending lugs mate with a corresponding set of rearward

facing surfaces in the slots within the rear base. These sets of mating surfaces are preferably offset from the vertical to create a wedging effect that pulls the rear of the scope mount down when it is pushed forward relative to the rifle receiver. The weight of the scope and scope mount also tends to force the rear of the scope mount downward.

[0031] The rearward facing surfaces of the front set of descending lugs open into tapered notches. The front base incorporates a transverse slider having a tapered surface which fits within the tapered notches in the front descending lugs. The interaction of this slider with the front lugs pushes the front of the scope mount forward while simultaneously pulling it down. The forward motion also serves to pull the rear of the scope mount down as described previously. Thus, the forward motion of this transverse slider tends to seat the scope mount firmly on the two bases.

[0032] When the user wishes to remove the device, the user pulls the transverse slider rearward and lifts the front of the scope mount up until the front lugs clear the front base. The user then pulls the rear lugs free from the rear base, thereby completely detaching the scope. Installation is the reverse of this procedure.

[0033] The geometry of the device employs the recoil impulse to actually promote engagement—rather than loosening it. The geometry also incorporates wear-compensating features. Finally, the geometry provides removal clearance for very large scope sights since the front of the scope is lifted for removal, rather than the back.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0034] FIG. **1** is an isometric view, showing the bases used in the prior art Suhler mount.

[0035] FIG. **2** is an isometric view, showing the scope rings used in the Suhler mount.

[0036] FIG. **3** is an isometric view with cutaways, showing the engagement of the Suhler mount.

[0037] FIG. **4** is an isometric view with cutaways, showing the removal of the Suhler mount.

[0038] FIG. **5** is an isometric view, showing the bases used in the present invention.

[0039] FIG. **6** is an isometric view, showing the front base.

[0040] FIG. **7** is an isometric view with a cutaway, showing the rear base.

[0041] FIG. **8** is an isometric view, showing the attachment of a modem scope sight to the scope mount.

[0042] FIG. **9** is an isometric view, showing details of the scope mount.

[0043] FIG. **10** is an isometric view with cutaways, showing the engagement of the mount.

[0044] FIG. **10**B is a detail view, showing the engagement of the slider in the tapered notch.

[0045] FIG. **11** is an isometric view with cutaways, showing the removal of the mount.

[0046] FIG. **12** is an isometric view, showing the mount in its installed position.

[0047] FIG. **13** is an isometric view, showing how the user pulls the slider out of the engaged position.

[0048] FIG. **14** is an isometric view, showing how the user rotates the front portion of the scope sight up to remove it.

[0049] FIG. **15** is an isometric view showing how the user completes the removal process.

[0050] FIG. **16** is an isometric view, showing the addition of a ball plunger to the underside of the scope mount.

[0051] FIG. **17** is an elevation view with cutaways, demonstrating the affect of the ball plunger.

REFERENCE NUMERALS IN THE DRAWINGS

10	rifle receiver
12	barrel
14	rear sight
16	modern scope sight
18	scope bell
20	scope eyepiece
22	receiver ring
24	receiver bridge
26	front base
28	rear base
30	loading/ejection port
32	slider
34	tab
36	tab slot
38	spring
40	plug
42	lower notch surface
44	front dovetail cut
46	front Suhler base
48	rear Suhler base
50	front Suhler slot
52	rear Suhler slot
54	Suhler slider
56	old scope sight
58	front ring
60	rear ring
62	front Suhler lug
64	rear Suhler lug
66	mating surface
68	Suhler mating notch
70	threaded hole
72	mounting hole
74	base screw
76	spring bore
78	lateral slot
80	front slot
82	rear slot
84	scope clamp
86	scope screw
88	scope mount
90	rear cradle
92	front cradle
94	threaded hole
96	front lug
98	rear lug
100	access hole
102	ejection relief
104	tapered notch
106	recoil impulse
108	recoil torque
110	tapered surface
112	lanyard
114	plunger
116	slider forward surface
118	lug rearward surface
120	lateral-facing surface
122	open side

DETAILED DESCRIPTION OF THE INVENTION

[0052] FIG. **5** shows rifle receiver **10**, which is similar in general configuration to the one illustrated with the prior art Suhler device. Barrel **12** is mated to the forward portion of rifle receiver **10**, known as receiver ring **22**. Rifle receiver **10** has a longitudinal axis which is concentric with the bore of barrel **12**; i.e., it runs generally front to rear, with receiver ring **22** being located at the-front of rifle receiver **10** and receiver bridge **24** being located at the rear of rifle receiver **10**. Receiver ring **22** is separated from receiver bridge **24** by loading/ejection port **30**. Rifle cartridges are loaded—and the spent shell casings are ejected—through loading ejection port **30**. It is therefore important to keep this area clear of obstructions.

[0053] As shown in FIG. **5**, rifle receiver **22** includes four threaded holes **70**. These holes, which are intended to accommodate fixed scope sight mounts, are commonly found on modem rifles. For older rifles, they must often be added.

[0054] Front base **26** is designed to fit on top of receiver ring **22**. The reader will observe that the underside of front base **26** is shaped to mate with the cylindrical surface of receiver ring **22**. The use of a cylindrical surface conforms to the cylindrical receiver ring on the particular rifle illustrated. Other rifles have other shapes—such as a dovetail shape—and the bottom of the front base should be shaped accordingly.

[0055] Two mounting holes **72** are provided in front base **26**. A pair of base screws **74** are inserted into mounting holes **72** and threaded into threaded holes **70** in receiver ring **22**. Base screws **74** are typically socket head cap screws. Mounting holes **72** are through-holes incorporating an upper counterbore to accommodate the socket heads of base screws **74**. When base screws **74** are tightened, front base **26** is pulled tightly against receiver ring **22** and the upper extremes of base screws **74** preferably lie just below the upper surface of front base **26**.

[0056] Rear base **28** is designed to fit on top of receiver bridge **24**. Rear base **28** also includes a pair of counterbored mounting holes **72**. A second pair of base screws **74** are used to mount it in the same fashion as that described for front base **26**.

[0057] FIG. **6** shows front base **26** in place on receiver ring **22**. The upper surface of front base **26** opens into two front slots **80**. These slots pass vertically though front base **26**. The bounding walls of both front slots **80** are purely vertical. Lateral slot **78** passes through front base **26** in a direction which is parallel to the upper surface of front base **26** and transverse to the longitudinal axis of rifle receiver **10**.

[0058] Slider **32** is placed within lateral slot **78**, where it is free to translate forward (toward barrel **12**) and rearward (toward receiver bridge **24**). It is important for the user to be able to grasp and move slider **32**. Thus, it is made long enough so that a portion sticks out each side of front base **26**. In order to make slider **32** easier to grasp, a tab **34** is secured on each end. Each tab **34** is secured by placing its tab slot **36** over the exposed end of slider **32**. It is then fixed in place using a screw, dowel, solder, or other conventional means. The outer surfaces of tab **34** may be textured in order to aid the user's grip. Tabs **34** serve the additional purpose of preventing slider **32** from sliding out one side or the other of front base **26**. Those skilled in the art will realize that the slider and the tabs could be made as one integral unit. The use of a three-piece assembly is a matter of engineering convenience.

[0059] It is important in the device's operation that slider **32** be biased forward. This bias could be accomplished using many prior art methods, but spring loading has been found particularly effective. Thus, spring bores **76** are provided in front base **26**. They run from the rear surface of front base **26** forward to intersect internally with lateral slot **78**. Springs **38** are placed within spring bores **76**. They are held in position by a pair of plugs **40**, which can be threaded or press fit into position. Those skilled in the art will realize that with these elements in place, slider **32** will be biased toward a forward position, with its forward surfaces coming to rest against the forward surfaces of lateral slot **78**.

[0060] FIG. **7** illustrates rear base **28** in position on receiver bridge **24**. The upper surface of rear base **28** opens into a pair of rear slots **82**. A cutaway is included in this view to illustrate the internal nature of rear slots **82**. Each rear slot **82** is preferably bounded by at least two surfaces—a rear-facing one and a lateral-facing one. The rear-facing surface is preferably inclined from the vertical. This surface is designated in the view as mating surface **66**. The reader will observe that it is inclined, with its upper extreme being further away from barrel **12** than its lower extreme. The lateral-facing surface is designated as **120** in the view. It runs substantially parallel to the receiver's central axis.

[0061] Each slot preferably has an open side **122**, and may in fact have two open sides (such as by omitting the rear surface on the embodiment shown in the view). The inclusion of an open side, while not necessary, assists in lubricating and cleaning the device, and may in some instances make it easier to manufacture.

[0062] FIG. **8** illustrates the third major component of the invention—scope mount **88**. Scope mount **88** includes rear cradle **90** and front cradle **92**. Each of these cradles include four threaded holes **94** in their upper surfaces. Modern scope sight **16** fits within the two cradles. A pair of scope clamps **84** are placed over modem scope sight **16** and locked in placed by threading scope screws **86** through clearance holes provided in scope clamps **84** and into threaded holes **94**. Thus, modern scope sight **16** is securely locked to scope mount **88**.

[0063] A pair of front lugs **96** descend from the forward portion of scope mount **88**. Likewise, a pair of rear lugs **98** descend from the rear portion of scope mount **88**. FIG. **9** better illustrates these lugs. The reader will observe that front lugs **96** incorporate a transverse tapered notch **104** in their rearward facing surfaces. The reader will also observe that the forward facing surfaces of rear lugs **98** are inclined from the vertical, with their lower extremes being closer to the front lugs than their upper extremes. Ejection relief **102** is provided to allow clearance for loading and ejection over loading/ejection port **30**. This relief can be provided on both sides, since rifles are now commonly made in right-handed and left-handed variants.

[0064] Front lugs **96** are designed to fit securely within front slots **80** in front base **26**. The side walls produce a close sliding fit. The forward facing walls and rearward facing

walls, however, have some clearance. Rear lugs **98** are designed to fit securely within rear slots **82** on rear base **28**. The lateral-facing walls again produce a close sliding fit. The result of this clearance is that when scope mount **88** is placed on front base **26** and rear base **28** by inserting the respective lugs into the respective slots, it is still free to move forward and backward to some degree. It cannot, however, move laterally.

[**0065**] Comparing FIGS. **7** and **9**, those skilled in the art will realize that mating surface **66** on scope mount **88** (which is inclined) will come into contact with mating surface **66** on rear mount **28** when scope mount **88** is moved forward with respect to the bases. Those skilled in the art will also realize that the interaction of these two inclined surfaces will produce a wedging effect tending to hold the rear of the scope mount down. This feature is not strictly necessary, since the weight of the scope and mount will tend to hold the rear down. It is therefore possible for an embodiment of the present invention to have a purely vertical engagement between the rear lugs and rear slots. However, the use of an inclined mating surface is preferred.

[**0066**] FIG. **10**—which incorporates cutaways in the two bases to show the internal features of the slots—illustrates the wedging phenomenon in the preferred embodiment. The reader will observe that the nearest front lug **96** rests within the nearest front slot **80** with clearance in front and behind. This clearance allows scope mount **88** to move forward and backward with respect to front base **26**. As mentioned previously, the close fit between the vertical side walls of the front slots and the vertical side walls of the front lugs prevents any lateral movement.

[**0067**] The nearest rear lug **98** also rests within the nearest rear slot **82**. There is clearance behind rear lug **98**, but in the position shown there is no clearance in front of rear lug **98**. In the position shown, scope mount **88** has been pushed forward until mating surface **66** on rear lug **98** has come into contact with mating surface **66** on rear base **28**. Those skilled in the art will readily appreciate that the interaction of these mating surfaces produces two results: (1) rear lug **98** is pulled down until the rear of scope mount **88** rests firmly against the upper surface of rear base **28**; and (2) all further forward progress of scope mount **88** relative to the two bases is stopped. The rear of scope mount **88** is thereby firmly seated with respect to rear base **28**.

[**0068**] Scope mount **88** is pushed forward by the interaction of slider **32** with tapered notch **104** in front lug **96**. The reader will recall that slider **32** is biased forward by springs. FIG. **10**B illustrates the nature of slider **32** and tapered notch **104** in greater detail. The reader will observe that the forward portion of slider **32** encompasses tapered surface **110**. Tapered notch **104** encompasses a correspondingly tapered lower notch surface **42**. The interaction of these two surfaces produces a second wedging effect. As slider **32** pushes forward, it produces two results: (1) front lug **96** is pulled down until the front of scope mount **88** rests firmly against the upper surface of front base **26**; and (2)scope mount **88** is forced forward. The fact that scope mount **88** is forced forward produces the seating of rear lug **98** described previously. Thus, the motion of slider **32** creates the mechanical lock-up in both bases.

[**0069**] It is important to understand how recoil is transmitted within the device. Returning now to FIG. **10**, those skilled in the art will understand that recoil impulse **106** will be transmitted through mating surfaces **66** in rear base **28**. Because this point is well to the rear of the center of gravity of scope mount **88** and modern scope sight **16**, counter-clockwise recoil torque **108** will be produced. Owing to the geometry of the device, recoil torque **108** actually tends to promote the firm seating of front lugs **96** within front base **26**. The wedging effect of mating surfaces **66** also tends to promote the firm seating of rear lugs **98** within rear base **28**.

[**0070**] The recoil phenomenon produces another effect which should be explained. Recoil actually produces two impulses: First, there is a sharp impulse to the rear. Second, there is a milder forward impulse as the rifle's rearward motion is checked by the user's shoulder. In looking at FIG. **10**, those skilled in the art will realize that if the user grasps modem scope sight **16** and pulls it firmly toward the rear, it will move rearward through the compression of the springs holding slider **32** in position. If the user then releases modern scope sight **16** (or manually pushes it back forward), modern scope sight **16** and scope mount **88** will be pushed back forward by the springs and the device will re-seat itself as explained previously. This action of pulling back and releasing or pushing forward is actually very effective in returning scope mount **88** to exactly the same seated position with respect to the two bases (which is, of course, the key to maintaining the accuracy of the sighting device).

[**0071**] Those skilled in the art will realize that the double-impulse recoil phenomenon produces the same result. The first impulse accelerates the two bases and scope mount **88** rearward. The two bases then experience a deceleration (since they are mechanically locked to the rifle) when the user's shoulder decelerates the rifle. Scope mount **88** (with the other components attached) will travel further rearward, with the energy being expended to compress the springs biasing slider **32** into its forward position (springs **38**). Springs **38** will eventually arrest scope mount **88**'s rearward travel with respect to the two bases. They will then propel it back forward—firmly reseating the device. Thus, by carefully selecting the stiffness of springs **38**, the device actually uses the recoil to its advantage. The recoil is used to re-seat—and therefore re-zero the device—every time the rifle is fired.

[**0072**] If modern scope sight **16** has received a sharp blow in the field—causing the user to suspect that the zero of the device may have shifted—the user can simulate the above-described recoil effect by pulling modem scope sight **16** rearward and allowing the device to snap back into the seated position (optionally including the step of assisting the springs by manually pushing the device forward). This is actually a recommended procedure.

[**0073**] All the components of the invention are preferably made of steel. However, as it is commercially advantageous to produce the parts via investment casting, the steel employed need not be particularly hard. Some wear between the mating surfaces is preferably accommodated. Those skilled in the art will realize by looking at FIG. **10**B that the design of slider **32** and tapered notch **104** allows for substantial wear compensation. As these surfaces wear, slider **32** will simply advance further and further into tapered notch **104**. The same is true for mating surfaces **66** on rear lug **98** and rear base **28**. As these wear, scope mount **88** will move slightly forward with respect to the two bases. The geometry

of the device allows for this relative motion without weakening the mechanical lock-up.

[0074] FIG. **11** illustrates the removal of the device (incorporating the same cutaways). In this view, the user has pulled slider **32** rearward, so that it is completely free of tapered notch **104**. The user then pulls up on scope mount **88** so that front lug **96** rotates clear of front slot **80**. Slider **32** is then release and rear lug **98** is pulled free of rear slot **82**. The reader will readily appreciate that scope bell **18** has plenty of clearance with respect to rear sight **14** and barrel **12** during this procedure. Returning briefly to FIG. **4**, the reader will also appreciate that if modem scope **16** is applied to the prior art Suhler mount (incorporating scope bell **18**), it will be impossible to remove the device as scope bell **18** will hit rear sight **14** or barrel **12** before rear Suhler lug **64** can clear.

[0075] Installation of the present device is the reverse of the procedure just described. Returning to FIG. **11**, the user first places rear lugs **98** in rear slots **82** (with the forward portion of modem scope sight **16** inclined upward to keep front lugs **96** above front slots **80**). The user then pulls back on slider **32** and rotates front lugs **96** down into place. The user then releases slider **32** and allows it to snap forward. A recommended additional step—as discussed previously—is to then pull modem scope sight **16** rearward and allow the device to slide forward and firmly seat.

[0076] FIGS. **12** through **15** illustrate the removal process as it would actually be experienced by the user. In FIG. **12**, the device is resting in its attached state. In FIG. **13**, the user pulls rearward on the two tabs **34**. The reader will recall that these are connected to slider **32**. Thus, slider **32** is pulled rearward to the disengaged position. In FIG. **14**, the forward portion of scope mount **88** is rotated free. In FIG. **15**, the rearward portion of scope mount **88** is lifted free.

[0077] Installation is again the reverse. The user would start with the position shown in FIG. **15**. The user would place rear lugs **98** within rear slots **82** as shown in FIG. **14**. The user would then pull tabs **34** to the rear and rotate the forward portion of scope mount **88** down into position. Tabs **34** would then be released.

[0078] FIG. **12** also serves to disclose another element of the invention—lanyard **112**. One of the primary advantages of the invention is the fact that it can be removed very quickly. A skilled operator can completely detach scope mount **88** in less than three seconds. Testing has revealed that it takes much more time to stow the removed telescopic sight than to remove it. In a situation involving wounded dangerous game, this loss of time could be crucial. Accordingly, lanyard **112** can be optionally installed between scope mount **88** and rear base **28** (or in any other convenient position—so long as it links scope mount **88** to the rifle in some fashion). With this embodiment installed, the user can simply drop the removed telescopic sight and allow it to dangle by lanyard **112**. The user will obviously want to detach lanyard **112** and safely stow the telescopic sight once time permits. Thus, lanyard **112** is designed to detach when no longer needed.

[0079] It is helpful to understand some details of how the device is initially installed on a rifle. Returning to FIG. **5**, front base **26** and rear base **28** are placed on rifle receiver **10** and base screws **74** are threaded into threaded holes **70**, but not tightened. Both bases are therefore free to wobble a bit. The key is that when they are tightened, the slots are preferably aligned in order for the device to work.

[0080] While the bases are still loose, scope mount **88** (without modem scope sight **16**) is put in place, with its lugs seated within the slots in the bases. This action ensures the alignment of the slots. While the user holds rear base **28** in place, scope mount **88** is then removed. While rear base **28** is still held, its two base screws **74** are tightened. This will likely cause rear base **28** to shift slightly. The user then reinstalls scope mount **88**, wiggling front mount **26** so that all lugs firmly seat.

[0081] The reader will observe in FIG. **8** that access holes **100** are provided in the forward portion of scope mount **88**. These are through-holes which align with mounting holes **72** in front base **26**. With scope mount **88** in position, the user is therefore able to insert a tool through access holes **100** and tighten base screws **74** securing front base **26**. Alignment of the slots in the two bases is thereby ensured. The reader should appreciate that additional access holes **100** could be provided in the rear of scope mount **88** so that this process could be carried out in a single step.

[0082] Those skilled in the art will appreciate that the alignment issue could be eliminated by making front base **26** and rear base **28** as a single integral piece. This option would increase the cost of the device, however. It also tends to disfigure the relatively clean appearance of the rifle when the scope sight is removed.

[0083] It is also possible to make scope mount **88** as two separate pieces—one incorporating front lugs **96** and front cradle **92**, and one incorporating rear lugs **98** and rear cradle **90**. This approach effectively uses the tube structure of modem scope sight **16** as a structural element. It therefore places considerable stress on modem scope sight **16**, which is generally undesirable. It also makes the device more difficult to align and install. Accordingly, the embodiment illustrated in FIGS. **5** through **15**, employing the one piece scope mount, is preferable.

[0084] During experimentation, the inventor has discovered that some users occasionally experience difficulty in executing the removal process illustrated in FIGS. **12** through **15**. This difficulty centers on the stage shown in FIG. **14**. Some users—especially those with smaller hands—find it difficult to pull the tabs rearward while also lifting up on the front of the telescopic sight. A modification was made to the invention to address this concern. As this modification assists all users—even those finding no difficulty previously—it is deemed the preferred embodiment.

[0085] FIG. **16** illustrates again scope mount **88**. The reader will observe, however, that in this preferred embodiment plunger **114** has been added to the underside of scope mount **88**. Plunger **114** is a conventional piece of prior art hardware. It contains a moving body which is spring loaded. The particular version shown is cylindrical, with a flat surface on the end of the cylinder facing downward. The spring sits on top of the cylinder and forces it downward against a stop collar which ultimately limits its downward motion. In its unloaded state, the cylinder protrudes approximately 0.040-0.060 inches downward from the underside of scope mount **88**. It can be depressed so that its lowermost extremity is flush with the surface of the underside of scope mount **88**. This action compresses the spring.

[0086] When scope mount **88** in installed on the two bases, plunger **114** is pushed up so that its lowermost extremity is flush with the surface of the underside of scope mount **88**. Those skilled in the art will realize that once slider **32** is disengaged from front lugs **96**, the compressed spring within plunger **114** will extend the plunger and lift the front portion of scope mount **88**. FIG. **17** illustrates this action. The reader will observe that slider **32** has been pulled clear of the notch within front lug **96**. The spring within plunger **114** has then raised the forward portion of scope mount **88**, resulting in the plunger again protruding beyond the lower surface of scope mount **88**.

[0087] At this point, the user has two options. If the user simultaneously pulls up on the forward portion of the scope or scope mount **88**, then scope mount **88** can be removed in one continuous motion. If the user prefers, however, the user can simply release slider **32** and allow it to slide back forward. If this option is taken, springs **38** (which tend to bias slider **32** forward) will push slider forward surface **116** tightly against lug rearward surface **118**. This frictional engagement will hold scope mount **88** in the elevation position shown. However, the user need only grasp the front of the scope or scope mount **88** and lift it free (without any need to manipulate the slider again). It is easy for the user to overcome the purely frictional engagement between slider forward surface **116** and lug rearward surface **118**.

[0088] Thus, the second option allows the user to remove scope mount **88** as follows: (1) The user grasps tabs **34** and pulls them back to the rearward extreme of travel (which action carries slider **32** to its rearward extreme and allows the forward portion of scope mount **88** to pop up); (2) The user releases tabs **34** (which causes scope mount **88** to be frictionally secured in its popped up position); and (3) The user, at his or her convenience, then grasps the forward portion of the scope or scope mount **88** and pulls it free.

[0089] Although a plunger has been illustrated, those skilled in the art will realize that many types of mechanisms could be employed to cause the front portion of scope mount **88** to pop up when slider **32** is pulled rearward. As one example, camming surfaces could be incorporated in the rearward portions of slider **32**. These camming surfaces could act against additional lugs descending from scope mount **88**, so that as slider **32** is pulled rearward these camming surfaces would engage the additional lugs on scope mount **88** causing the forward portion of scope mount **88** to move upward.

[0090] Although the preceding description contains significant detail, it should not be construed as limiting the scope of the invention but rather as providing illustrations of the preferred embodiment of the invention. As an example, those skilled in the art will know that the same mechanism could be created using only a single front lug, single front slot, single rear lug, and single rear slot. The operation would be the same, with the use of dual slots and lugs being a matter of engineering choice. Thus, the scope of the invention should be fixed by the following claims, rather than by the examples given.

Having described my invention, I claim:

1. A detachable mount for removably attaching a scope sight to a rifle, wherein said rifle includes a barrel and a receiver, and wherein said receiver has a longitudinal axis approximately aligned with said barrel, and wherein said receiver has a receiver ring in a front position proximate said barrel and a receiver bridge in a rear position distal to said barrel, comprising:

a. a front base, having an upper surface, attached atop said receiver ring by any conventional means, wherein said upper surface opens into a front slot, and wherein said front base opens into a lateral slot oriented in a direction approximately parallel to said upper surface and approximately transverse to said longitudinal axis of said rifle receiver;

b. a rear base, having an upper surface, attached atop said receiver bridge by any conventional means, wherein said upper surface opens into a rear slot, wherein said rear slot is bounded by at least a rearward facing wall and a lateral facing wall, and wherein said rearward facing wall is inclined so that said upper extreme of said rearward facing wall is further from said rifle barrel than said lower extreme of said rearward facing wall;

c. a slider, slidably mounted within said lateral slot in said front base;

d. a scope mount, fixedly attached to said scope sight by any conventional means, and having a front lug and a rear lug descending therefrom;

e. wherein said front lug is sized to slidably fit within said front slot and said rear lug is sized to slidably fit within said rear slot;

f. wherein said rear lug has a forward facing surface having an upper extreme and a lower extreme, and wherein said forward facing surface is inclined so that said lower extreme is closer to said front lug than said upper extreme;

g. wherein said front lug has a rearward facing surface which opens into a notch sized to accommodate said slider, so that when said front and rear lugs are placed within said front and rear slots, and when said slider is moved forward toward said barrel, said slider engages said notch, thereby locking said front lug within said front base, and said slider pushes said scope mount forward toward said barrel, thereby pushing said forward facing surface on said rear lug against said rearward facing surface on said rear slot, thereby locking said rear lug within said rear base; and

h. biasing means for biasing said slider forward toward said barrel.

2. A detachable mount as recited in claim 1, wherein said front base further comprises a right side surface and a left side surface, and wherein said slider is longer than said transverse slot so that a portion of said slider protrudes beyond said right side surface and a portion of said slider protrudes beyond said left side surface, so that said user may grasp said protruding portions of said slider and pull said slider rearward against said bias of said at least one spring.

3. A detachable mount as recited in claim 2, wherein said protruding portions further comprise grip enhancing surfaces allowing said user to more easily grasp said protruding portions.

4. A detachable mount for removably attaching a scope sight to a rifle, wherein said rifle includes a barrel and a receiver, and wherein said receiver has a longitudinal axis

approximately aligned with said barrel, and wherein said receiver has a receiver ring in a front position proximate said barrel and a receiver bridge in a rear position distal to said barrel, comprising:

a. a front base, having an upper surface, attached atop said receiver ring by any conventional means, wherein said upper surface opens into a front slot, and wherein said front base opens into a lateral slot oriented in a direction approximately parallel to said upper surface and approximately transverse to said longitudinal axis of said rifle receiver;

b. a rear base, having an upper surface, attached atop said receiver bridge by any conventional means, wherein said upper surface opens into a rear slot, wherein said rear slot is bounded by at least a rearward facing wall and a lateral facing wall;

c. a slider, slidably mounted within said lateral slot in said front base;

d. a scope mount, fixedly attached to said scope sight by any conventional means, and having a front lug and a rear lug descending therefrom;

e. wherein said front lug is sized to slidably fit within said front slot and said rear lug is sized to slidably fit within said rear slot;

f. wherein said rear lug has a forward facing surface;

g. wherein said front lug has a rearward facing surface which opens into a notch sized to accommodate said slider, so that when said front and rear lugs are placed within said front and rear slots, and when said slider is moved forward toward said barrel, said slider engages said notch, thereby locking said front lug within said front base, and said slider pushes said scope mount forward toward said barrel, thereby pushing said forward facing surface on said rear lug against said rearward facing surface on said rear slot; and

h. biasing means for biasing said slider forward toward said barrel.

5. A detachable mount as recited in claim 1, wherein:

a. said notch comprises a downward facing surface, a rearward facing surface, and an upward facing surface, wherein said upward facing surface comprises a forward extreme and a rearward extreme, and wherein said upward facing surface is inclined from the horizontal so that said rearward extreme is lower than said forward extreme; and

b. said slider has a forward portion and a rearward portion, and wherein said slider comprises a tapered surface located proximate said forward portion and facing generally downward, and wherein said tapered surface has a forward extreme and a rearward extreme, with said tapered surface being inclined from the horizontal so that said rearward extreme is lower than said forward extreme, so that when said slider is moved forward to engage said notch, said engagement is produced by said tapered surface on said slider bearing against said upward facing surface on said notch.

6. A detachable mount as recited in claim 1, wherein said front base and said rear base are made as one integral unit.

7. A detachable mount as recited in claim 1, wherein said scope mount is comprised of a front piece incorporating said front lug and a rear piece incorporating said rear lug.

8. A detachable mount as recited in claim 1, wherein said front lug within said front slot and said rear lug within said rear slot are free to move to a limited extent in a forward direction and a rearward direction with respect to said front base and said rear base, but are prevented from moving in a lateral direction, so that said scope mount moves forward and rearward with respect to said front mount and said rear mount as a result of recoil of said rifle, thereby reseating said detachable mount.

9. A detachable mount as recited in claim 5, wherein said front lug within said front slot and said rear lug within said rear slot are free to move to a limited extent in a forward direction and a rearward direction with respect to said front base and said rear base, but are prevented from moving in a lateral direction, so that said scope mount moves forward and rearward with respect to said front mount and said rear mount as a result of said user grasping said scope mount and pulling said scope mount rearward and forward, thereby reseating said detachable mount.

10. A detachable mount as recited in claim 1, wherein:

a. said upper surface in said front base opens into a second front slot;

b. said upper surface in said rear base opens into a second rear slot having a rectangular shape, wherein said second rear slot is bounded by a rearward facing wall, a forward facing wall, and two lateral walls, with each of said walls having an upper and lower extreme, and wherein said rearward facing wall is inclined so that said upper extreme of said rearward facing wall is further from said rifle barrel than said lower extreme of said rearward facing wall;

c. said scope mount further comprises a second front lug and a second rear lug descending therefrom;

d. wherein said second front lug is sized to slidably fit within said second front slot and said second rear lug is sized to slidably fit within said second rear slot;

e. wherein said second rear lug has a forward facing surface having an upper extreme and a lower extreme, and wherein said forward facing surface is inclined so that said lower extreme is closer to said second front lug than said upper extreme; and

f. wherein said second front lug has a rearward facing surface which opens into a notch sized to accommodate said slider, so that when said second front and second rear lugs are placed within said second front and second rear slots, and when said slider is moved forward toward said barrel, said slider engages said notch, thereby locking said second front lug within said front base, and said slider pushes said scope mount forward toward said barrel, thereby pushing said forward facing surface on said second rear lug against said rearward facing surface on said second rear slot, thereby locking said second rear lug within said rear base.

11. A detachable mount as recited in claim 1, further comprising a lanyard connecting said scope mount to said rifle by any conventional means.

12. A detachable mount as recited in claim 11, wherein said lanyard is detachable from said scope mount.

13. A detachable mount as recited in claim 11, wherein said lanyard is detachable from said rifle.

14. A detachable mount as recited in claim 1, further comprising spring means disposed between said front base and said scope mount, so that when said slider is moved away from said barrel, thereby disengaging from said notch in said front lug, said spring means biases said scope mount upward with respect to said front base so as to assist said user in removing said scope mount.

15. A detachable mount as recited in claim 14, wherein said front lug further comprises a lug rearward surface, and wherein said slider further comprises a slider forward surface, so that after said spring means biases said scope mount upward with respect to said front base, and after said user releases said slider, said at least one spring biasing said slider forward biases said slider forward, bringing said slider forward surface in firm contact with said lug rearward surface, thereby holding said scope mount in position until said user removes said scope mount.

16. A detachable mount as recited in claim 4, wherein said front base further comprises a right side surface and a left side surface, and wherein said slider is longer than said transverse slot so that a portion of said slider protrudes beyond said right side surface and a portion of said slider protrudes beyond said left side surface, so that said user may grasp said protruding portions of said slider and pull said slider rearward against said bias of said at least one spring.

17. A detachable mount as recited in claim 4, wherein said protruding portions further comprise grip enhancing surfaces allowing said user to more easily grasp said protruding portions.

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