A quick release weapon mount is provided, the mount comprising a housing member having a base and a means for attaching an accessory, and at least one clamp. The clamp comprising one or more slideably engaged translational members, wherein the translational members are adapted for slideable translational-movement. The means for attaching an accessory can include a lumen, a clamping band, a toggle clamp, a spring clip, a latch or other attachment means. An additional translational clamp can be included to lock an accessory in a fixed axial position on the mount. The mount can further include a supplemental accessory rail for modular construction of several accessories and a safety mechanism for preventing premature release of the mount.
Fig. 8

Fig. 9
QUICK RELEASE WEAPON MOUNT AND ACCESSORIES FOR USE THEREWITH

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a Continuation of U.S. Ser. No. 12/467,954, filed May 18, 2009; which claims benefit of priority of U.S. Provisional Application Ser. No. 61/144,092 titled "QUICK RELEASE WEAPON MOUNT" filed Jan. 12, 2009; the entire contents of which are hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] This invention relates generally to an article of manufacture for releasably mounting various accessories to a support structure. This invention also relates to firearms and more particularly to a quick-release weapon mount for mounting a weapon accessory to a weapon having a Picatinny rail or similar bracket attached thereto. Although the invention can be used as a quick-release weapon mount, the field of the invention includes other uses such as laboratory optical mounts and other accessory mounts.

BACKGROUND OF THE INVENTION

[0003] With the continued advancement in technologies related to combat, specifically weapons combat, the need for specialized accessories has and will continue to increase. Advancements such as the Picatinny rail, also called a "MIL-STD-1913 rail" or "STANAG 2324 rail" have provided somewhat of an international standard for weapon-mountable accessories. The rail was originally for scopes. However, once established, the use of the system was expanded to other accessories, such as tactical lights, night vision devices, laser sight lines, reflex sights, fore grips, bipods, and bayonets. Because they were originally designed and used for telescopic sights, the rails were typically found only on the receivers of larger calibre rifles. But their use has extended to the point that today the combination of Picatinny rails and accessories are displacing the original iron sights in the design of many handheld firearms, and they can now often be found on the undersides of frames and even on grips. Other similar rails are available in the art, such as the Weaver rail among others.

[0004] Because of the increasing popularity of the Picatinny and similar rails, innovative weapon-mountable accessories have been designed to attach thereto. For example, modern white lights and lasers have been developed for mounting to a weapon, these lights generally being mountable to a Picatinny rail using a clamp. Currently available mounts for mounting these and other accessories to a Picatinny rail include a ‘Lug Clamp’, ‘Piston Clamp’, and a ‘Lever Clamp’.

[0005] A ‘Lug Clamp’ is available in several variations, but generally includes two opposing teeth and a threaded connector or screw. As the threaded connector is rotationally engaged or tightened, the opposing teeth move toward each other to a point of engaging a rail and tightly clamping thereto. An example of a Lug Rail is taught by Klump; U.S. Pat. No. 5,086,566, issued Feb. 11, 1992, the entire contents of which is hereby incorporated by reference. One problem with the Lug Clamp includes the inherent requirement for tooling, such as a screwdriver or hex-key, to adjust and remove the clamp. This is especially a problem in combat or other tactical situations where rapid adjustment or release of the clamp is necessary.

[0006] A ‘Piston Clamp’ is also currently available in several variations, but generally includes an elongated slot having a horizontal base and two vertical walls, two opposing teeth are fixed to the slot with one at each vertical wall. The slot can be slideably attached to a rail, and a piston is used to press the rail against the opposing teeth. The Piston Clamp generally comprises a threaded driver such as a screw, or a lever for adjustment of the piston. An example of a Piston Clamp is taught by Solinsky et al.; U.S. Pat. No. 5,574,901, issued Jun. 10, 2003, the entire contents of which are hereby incorporated by reference.

[0007] A ‘Lever Clamp’ is currently available in several variations, but generally includes two opposing teeth and a lever mechanism. The lever mechanism usually incorporates a cam, so as to tighten the opposing teeth as the lever torque the cam. An example of a Lever Clamp is taught by Lame; U.S. Pat. No. 7,272,904, issued Sep. 27, 2007, the entire contents of which are hereby incorporated by reference. Although an improvement over the Lug Clamp, the Lever Clamp has proven to be limiting in combat and tactical situations. One problem of the Lever Clamp is its susceptibility to failure, which can render the clamp useless. This is especially a problem in combat and tactical situations where an operator dives to the ground, hammers through an obstacle using the weapon, or otherwise applies force which directly or indirectly displaces against the lever.

[0008] A ‘Rotational Clamp’ is currently available in several variations, but generally includes a first part, a second part, and a hinge therebetween, where the first part is connected to the second part at the hinge. The hinge further comprises a bump, such that as the two parts are rotated the bump enters a slot to engage a friction fit. An example of a Rotational Clamp is taught by Rogers; U.S. Pat. No. 7,441,364, issued Oct. 28, 2008, the entire contents of which are hereby incorporated by reference.

[0009] There remains a need for an improved quick release weapon mount for mounting a weapon accessory to a weapon having a Picatinny rail or similar bracket attached thereto. The mount will need to include a clamp which is adjustable without the need for a tool, the mount must be rapid-interchangeable and rapid-release, the mount will need to be compatible with standard weapon mounts such as a Picatinny, Weaver, or other rail, the mount will need to function in the presence of sand, the mount will need to include a safety mechanism to prevent premature or undesired removal of the mount, and the mount will need to be versatile for use with a variety of applications including a firearm such as a handgun or a rifle.

SUMMARY OF THE INVENTION

[0010] It is a primary objective of this invention to provide a quick release mount for use in mounting an accessory to a support structure, the mount being versatile for use with a number of available accessories and providing increased axial holding capabilities without damaging the mounted accessory from application of a crush force.

[0011] It is another objective of this invention to provide a quick release mount for use in mounting an accessory to a support structure, the mount including a clamping mechanism which does not require a collateral tool for attachment or removal of the mount.
It is another objective of this invention to provide a quick release mount for use in mounting an accessory to a support structure, the mount including a clamping mechanism functional in the presence of sand and dirt and having no exposed functional members.

It is another objective of this invention to provide a quick release mount having a minimal height, minimal width, minimal depth, for an optimized bulk and minimized weight.

It is another objective of this invention to provide a mount which can be symmetrical, therefore allowing the user to attach the mount without looking, or while looking in another direction.

It is another objective of this invention to provide a quick release mount for use in mounting an accessory to a support structure, the mount being versatile for applications with several firearms including rifles as well as handguns.

It is another objective of this invention to provide a quick release mount having a built-in safety mechanism for preventing unwanted or premature removal of the mount from a support structure.

It is another objective to provide a mount having a short length for attaching to a pistol or handgun.

It is yet another objective of this invention to provide a quick release mount for use in mounting an accessory to a support structure, the mount further including a means for attaching a supplemental accessory for combinatorial use and modular configuration.

In one embodiment, the invention comprises a housing member having a base and a means for attaching an accessory, and at least one clamp. The clamp comprising at least one translational member; wherein the translational member is slideably engaged within the mount. The means for attaching an accessory can include a lumen, a latch, a toggle clamp, a clamping band, a spring clip, however those with ordinary skill in the art will appreciate other variations that the mount can include. The means for attaching an accessory can further include a slot and a penetrating tab. The penetrating tab provides an axial force for maintaining the accessory in a fixed axial position within the mount. The housing member can include one or more rails for attaching a supplemental accessory.

In one embodiment, the housing member substantially surrounds the functional members of the clamp to protect against penetrating elements such as dirt or sand. The housing member is light-weight and can be machined from an aluminum or similar stock, or molded from composites, plastics, rubbers, or other materials. The mount is symmetrical and has no front or back side, therefore allowing the user to attach the mount without looking, or while looking in another direction.

In another embodiment, the invention is applied to a firearm at a bracket or rail and includes one or more accessories and a mount for modular configuration thereof. The accessories can include one or more of: a foregrip, bi-pod system, sling attachment, Global Positioning System, wireless remote receiver, mount rail, pepper spray, audio microphone, long range audio speaker, dye marking canister/dispenser, visible light source, laser pointer, infra red (IR) light sensor, still camera, video camera, knife, forward looking infrared sensor, night vision scope, or spotting scope.

In another embodiment, the mount comprises at least one notch for providing compatible use with firearms having a barrel length of less than 8 inches.

Although the invention is discussed herein particularly with its application to quick-release mounting devices for firearm accessories, it should be borne in mind that it is not intended to limit the spirit or scope of the invention solely to use in conjunction with firearms. This invention clearly has a wide range of application is circumstances where a device is intended to be releasably mounted in stable fashion to a supporting structure. For example, this invention applies to camera and spotting scope mounts that are used in connection with various sporting events and commercial activities, as well as laboratory optical equipment. Many other uses of this invention will become obvious to one having ordinary skill in the art upon acquiring a thorough understanding of this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

So that the manner in which the above recited features, advantages and objects of the present invention are attained and can be understood in detail, a more particular description of the invention, briefly summarized above, may be had by reference to the preferred embodiment thereof which is illustrated in the appended drawings, which drawings are incorporated as a part hereof.

It is to be noted however, that the appended drawings illustrate only a typical embodiment of this invention and are therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

In the Drawings:

FIG. 1 is a perspective view of the invention in a preferred embodiment, the invention including a weapon mount attached to a rail, the mount securing a flashlight and providing a foregrip as a supplemental accessory.

FIG. 2 is a perspective view of a mount attached to a Picatinny rail, the mount securing a flashlight.

FIG. 3 is a perspective view of a mount attached to a rail, the mount includes a clamp and a housing member, the housing member includes a lumen having notches at a proximal and a distal end.

FIG. 4 is a perspective view of a mount attached to a rail, the mount includes a first clamp and a second clamp, the first clamp attached to a Picatinny rail, the second clamp including a tab disposed at a slot within the lumen.

FIG. 5 is a perspective view of a mount, the mount includes a housing member having a base and a lumen, a first clamp is disposed at the base of the housing member, a second clamp is disposed at a slot within the lumen, the second clamp including a tab protruding into the lumen space.

FIG. 6 is a perspective view of a mount including a housing member having a base and a lumen, the housing member has a rail disposed at a side opposite of the base.

FIG. 7 is a perspective view of a mount including a housing member having a base and a lumen, and a first clamp for attaching the mount to a rail, the first clamp having two slideably engaged translational members, wherein the translational members include opposing teeth.

FIG. 8 is a perspective view of a mount, the mount including a rail clamp, a light clamp, a housing member having a base and a lumen, the housing member including a first notch at a proximal end and a second notch at a distal end of the lumen.

FIG. 9 is a perspective view of a mount including a housing member having a base and a lumen, and a rail, the rail disposed parallel to the axial direction of the lumen on a side opposite of the base.
FIGS. 10a-c illustrate a clamp for attaching to the base of a housing member, the clamp includes two translational members which are assembled to be slideably engaged to allow movement in a translational planar direction.

FIG. 11a-b illustrate a mount, the mount includes a toggle clamp for retaining an accessory.

FIGS. 12a-b illustrate a mount, the mount includes a clamping band for retaining an accessory.

FIGS. 13a-b illustrate a mount, the mount includes a spring clip for retaining an accessory.

FIG. 14 is a perspective view of a clamp for attaching an accessory to the base of a housing member, the clamp includes two slideably engaged translational members.

FIGS. 15 a-c illustrate a clamp for attaching an accessory to the mount, the clamp includes two translational members and a spring element.

FIG. 16 is a perspective view of the interior of the mount in a preferred embodiment, the mount including a safety mechanism for preventing premature release of the mount from a support structure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 16a-c illustrate a clamp for attaching to the base of a housing member, the clamp includes two translational members which are assembled to be slideably engaged to allow movement in a translational planar direction.

FIG. 11a-b illustrate a mount, the mount includes a toggle clamp for retaining an accessory.

FIGS. 12a-b illustrate a mount, the mount includes a clamping band for retaining an accessory.

FIGS. 13a-b illustrate a mount, the mount includes a spring clip for retaining an accessory.

FIG. 14 is a perspective view of a clamp for attaching an accessory to the base of a housing member, the clamp includes two slideably engaged translational members.

FIGS. 15 a-c illustrate a clamp for attaching an accessory to the mount, the clamp includes two translational members and a spring element.

FIG. 16 is a perspective view of the interior of the mount in a preferred embodiment, the mount including a safety mechanism for preventing premature release of the mount from a support structure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Although the present invention is discussed herein particularly as it relates to releasable mounts for firearms, particularly tactical rifles and handguns used by military and law enforcement personnel, it is to be understood that this invention has application for support of devices other than optical sighting devices and on other objects.

In a general embodiment, this invention is a quick-release mount for mounting an accessory to a rail or bracket. The mount comprises a housing member having a base and a means for attaching an accessory, and at least one clamp. The clamp comprises one or more translational members, wherein the translational members are slideably engaged.

The mount can comprise one or more clamps, wherein each clamp comprises one or more translational members. The term “translational members” is herein used to describe two or more components which are slideably engaged and configured for movement in a translational direction. One translational member can be slideably engaged with a housing member to achieve a similar translational clamp. Two translational members can be slideably engaged. Translational members generally are restricted to movement within a plane, and are restrained from rotational movement. Translational members may have very little or negligible rotational movement, as their movement is substantially constrained within a translational plane. For purposes of this invention a translational plane is simply a plane in which translational members are moveably confined.

The mount includes a means for attaching an accessory. In a representative embodiment, the means for attaching an accessory comprises a lumen. The lumen is generally an annular shaped hole, or extruded cut, through the housing member; however the lumen can comprise any geometric shape extruded cut through the housing member, for example a square or triangle. A lumen is broadly described as any open pathway molded or etched into a housing member. A lumen is further used to describe a hollowed cylindrical portion, such as a tube-like structure, as is commonly used to describe anatomical tubular structures. In one preferred embodiment, the lumen is generally cylindrical. The lumen is generally contained within the housing member, and has an inner diameter (ID) slightly larger than the accessory for which the mount is applicable. The lumen further defines an axial direction along the length of the lumen.

The mount can comprise a first clamp. The mount can further comprise a second clamp. The first clamp can be used for attaching the mount to a rail, and the second clamp can be used for attaching an accessory to the mount.

The mount can comprise a housing member having a base and a lumen, a first clamp for attaching the mount to a rail, and a second clamp for attaching an accessory to the mount. The first clamp can comprise two or more translational members, the translational members comprising opposing teeth for engaging a rail. The lumen of the mount comprises a slot, the slot being perpendicular to the axial direction of the lumen. The second clamp can comprise two or more translational members, at least one of the translational members comprising a tab, wherein the tab is configured to protrude into the lumen space. The tab can grip the accessory, or in the case where the accessory has a groove—the tab can fit within the groove of the accessory to prevent the accessory from moving in the axial direction. The accessory can be a light source, such as a flashlight.

The mount can comprise one or more clamps having a spring element for providing recoil force to the translational members. In one embodiment, the mount comprises a housing member having a base and a lumen, and a clamp. The clamp is attached to the housing member at the base. The clamp comprises two or more translational members and at least one spring element. The spring element is flexible in the translational direction and provides a recoil force (F_recoil). The translational members comprise opposing teeth having a fixed distance at rest (D_rest), wherein D_rest is less than or equal to the width of a rail (W_rest). Upon the application of force in the translational direction where the force is greater than F_recoil, a user can move the slideably engaged translational members in the translational direction, the opposing teeth thereby moving apart from each other such that the teeth have an expanded distance (D_expanded) greater than D_rest. Upon release of the translational members, the spring element provides a recoil force to return the translational members and opposing teeth such that the opposing teeth again have a distance apart substantially equivalent to the greater of W_rest or D_rest.

The mount can further comprise a rail for attaching a supplemental accessory. The rail can be attached to the mount at a side opposite or adjacent to the base. For example, the mount can comprise a housing member having a base, a lumen and a rail. The rail can be positioned on the outside of the housing member on a side opposite to the base. The rail will generally be aligned parallel to the axial direction of the lumen. Optionally, the rail can be positioned on the outside of the housing member on a side adjacent to the base, the rail being aligned parallel to the axial direction of the lumen.

A supplemental accessory is generally any accessory configured for attachment to the mount at a rail. Examples of supplemental accessories include one or more of: a fore grip, bi-pod system, sling attachment, Global Positioning System, wireless remote receiver, mount rail, pepper spray, long range audio microphone, long range audio speaker, dye marking canister/dispenser, visible light source, laser pointer, infra red (IR) light source, still camera, video camera, knife, forward looking infrared sensor, night vision scope, or spotting scope. One having skill in the art will recognize that other accessories can be used within the scope of this invention.
Referring now to FIG. 1, the invention includes a mount 1 for attaching one or more accessories 2 to a rail 3, such as a Picatinny, Weaver or similar rail. FIG. 1 illustrates a mount 1 comprising a housing member 4 having a base 5 and a means for attaching an accessory. In this embodiment, the means for attaching an accessory is a lumen and the accessory is a flashlight 6. The mount further comprises a first clamp 7 for attaching the mount to a rail, and a second clamp 8 for securing an accessory to the mount. The rail clamp comprises two translational members (not shown) and opposing teeth 9 for engaging a rail. The light clamp comprises two translational members (not shown), at least one translational member further comprising a tab (not shown), wherein the tab is configured to lock the flashlight accessory in a fixed axial position. The housing member includes a supplemental accessory rail 10 for attaching a supplemental accessory 2. Here, the supplemental accessory rail 10 is disposed at a side opposite to the base 5, and is aligned parallel to the axial direction 11, along which the Picatinny rail is also aligned. Optionally, the supplemental accessory rail 10 can be adjacent to the base 5, however even when configured in such an embodiment, the supplemental accessory rail will be disposed parallel to the axial direction 11 of the mount.

In FIG. 1, a fore grip 12 is attached to the supplemental accessory rail 10 using a piston clamp 13. The fore grip 12 can be hollowed for housing spare batteries, or other accessories. The system illustrated in FIG. 1 depicts a system for modular construction of weapons accessories and storage compartments for use in conjunction with a firearm. The supplemental accessory 2 can be any supplemental accessory defined in this application or any other accessory known in the art.

FIG. 2 illustrates a mount 14 for attaching an accessory to a support structure 15. In the embodiment illustrated by FIG. 2, the accessory is a flashlight 16 and the support structure 15 is a Picatinny rail. The mount includes a housing member 17 having a base 18 and a lumen, and a rail clamp 19. The rail clamp is disposed at the base 18 of the housing member 17 and includes two slideably engaged translational members (not shown), each having at least one tooth 20 for engaging the Picatinny rail 15. The mount further includes a light clamp for clamping a flashlight 16 within the lumen of the housing member 17. The light clamp includes at least one translational member (not shown) having a tab (not shown). A user can depress a button 22 or other component extension of a translational member with an amount of force such that the slideably engaged translational member moves relative to a translational plane, thereby releasing the flashlight from the mount. The mount further includes a supplemental accessory rail 23 for attaching a supplemental accessory.

FIG. 3 depicts a mount 24 including a housing member 25 having a base 26 and a lumen 27, and a rail clamp 28 for attaching the mount 24 to a rail 29. The rail clamp 28 includes two slideably engaged translational members (not shown) having opposing teeth 30 for engaging the rail 29. The rail clamp 28 is attached to the housing member 25 at the base 26. The mount 24 further includes a supplemental accessory rail 31 disposed along an external surface of the housing member 25 opposite of the base 26. The rail of the mount is parallel to the axial direction 32 of the lumen 27, and is parallel to the rail 29 of a weapon. The lumen includes a first notch 33 at proximal end of the mount and a second notch 34 at a distal end of the mount. The mount further includes a clamp for securing an accessory to the lumen of the mount.

FIG. 4 is a rotated view of the mount in FIG. 3, illustrating the inside of the clamp for securing an accessory to the lumen of the mount, in this embodiment the clamp is a light clamp. The lumen 27 further including a slot 35 disposed along the inner surface of the lumen, the slot 35 oriented in a direction perpendicular to the axial direction 32 of the lumen space. The light clamp including at least one translational member (not shown); the translational member further comprising a tab 36. The tab 36 configured to at least partially protrude into the lumen space. One having ordinary skill in the art will appreciate that an accessory having a groove can be secured within the lumen of the mount, such that the accessory will be secured in a fixed axial position within the lumen, without the need for a strenuous clamping force which can damage the accessory.

Referring to FIG. 5, the mount comprises opposing teeth 37 for engaging a rail 38, the opposing teeth 37 attached to translational members 39, for expandable translational movement in a plane parallel to the base of the mount, i.e. the translational plane. Each translational member can have one or more opposing teeth 37, thus the rail clamp can comprise two or more opposing teeth. The mount can be configured as illustrated in FIG. 6, such that the light clamp can comprise two tabs 40, 41. In this embodiment, the light clamp comprises a first slideably engaged translational member 42, the first translational member comprising a first tab 40. The light clamp further comprises a second slideably engaged translational member 43, the second translational member comprising a second tab 41. A user can depress the light clamp with an amount of force such that the first translational member 42 and second translational member 43 move in a translational plane towards each other, resulting in the first tab 40 and second tab 41 moving in a translational plane away from each other, thereby releasing an accessory from the lumen 44.

Referring to FIG. 7, the rail clamp can be attached to the base of the mount using a retaining member 45. The retaining member holds the slideably engaged translational members of the rail clamp in a fixed position at the base of the mount. In FIG. 7, the mount comprises a rail clamp for attaching a mount to a rail, the rail clamp comprising two slideably engaged translational members 46, 47, wherein the translational members are fixed in a translational plane and constrained to translational movement. A first slideably engaged translational member 46 comprises a first opposing tooth 47. A second slideably engaged translational member 48 comprises a second opposing tooth 49. The first and second opposing teeth are adapted to engage a rail. It should be recognized in that in the embodiment of FIG. 7, the mount is an optimized minimum height. It has been determined that the mount should be lightweight and compact to be effective in tactical and combat situations, thus the mount should have a minimum height for less bulky application to a weapon. Where the translational members are fixed in a horizontal plane, a minimum size can be achieved. Also, one or more components, such as translational members, can be etched or hollowed such as to minimize weight of the mount. A rail bump 108 is attached to the retaining member. The rail bump fits into a rail slot, thereby preventing the mount from sliding along the rail. The rail bump should have a thickness less than the width of the rail slot. In one aspect of the invention, the mount clamps to a picatinny rail and the rail bump securely positions the mount along the length of the picatinny rail.
FIG. 8 illustrates the side of a mount, the mount comprising a housing member 50 having a base 51 and a lumen 52, and a rail clamp 53. The rail clamp 53 is attached to the housing member 50 at the base 51 and comprises two slideably engaged translational members. The housing member 50 includes a supplemental accessory rail 54 disposed parallel to the axial direction on a side opposite of the base 51. The mount further includes a first notch 55 at a proximal end of the lumen and a second notch 56 at a distal end of the lumen. One utility of a notch is to provide compatibility with a handgun. Most handgun barrels are shorter than 8 inches, and are often less than 3 inches, thus a mount can substantially interfere with the access to a mounted accessory. In the embodiment of FIG. 8, the notches provide access to an accessory even where the mount is applied to a handgun having a relatively short barrel.

FIG. 9 illustrates the light clamp of the mount in FIG. 8. The light clamp comprises a first tab 57 and a second tab 58, wherein the tabs are attached to translational members for slideable engagement. The tabs can burrow into the wall of the lumen.

The slideably engaged translational clamp of this invention minimizes size of the mount, and enables rapid application and release of the mount and accessories. FIG. 10a illustrates the slideably engaged translational clamp 59. The clamp 59 comprises a first translational member 60 depicted in FIG. 10b, and a second translational member 61 depicted in FIG. 10c. The translational members 60, 61 are assembled and configured for slideable engagement along a translational plane. The first translational member 60 includes a first depression portion 62, and a first engagement portion 63. The first engagement portion 63 includes one or more teeth 64 for engaging a rail. The second translational member 61 includes a second depression portion 65, and a second engagement portion 66. The second engagement portion 66 includes one or more teeth 67 for engaging a rail. The first and second engagement portions 63, 66 of the slideably engaged translational members assemble to define opposing teeth. The first and second depression portions 62, 65 are assembled to define a depressing action. A user can apply an amount of force to the depressive action such that the translational members move in a translational plane, the respective depression portions 62, 65 moving toward each other, and the respective engagement portions 63, 66 opposing teeth 64, 67 move away from each other.

FIG. 11(a-b) illustrate a mount comprising a housing member 68 having a base 69 and means for attaching an accessory. The means for attaching an accessory is a toggle clamp 70. The toggle clamp 70 comprises a two-part lumen 71, each part of the lumen is permanently fixed at a hinge 72, and opposite of the hinge 72 is a toggle latch 73 for locking the toggle clamp 70 in a closed configuration. Upon deactivating the toggle latch 73, the toggle clamp 70 can be opened at the hinge 72. The mount further comprises a translational rail clamp 74 for attaching the mount to a rail 75. The rail clamp 74 comprises one slideably engaged translational member 76 having an engagement portion 77 for engaging the rail. The translational member 76 is slideably engaged with the housing member 68 at the base 69 of the housing member 68.

FIGS. 12(a-b) illustrate another embodiment of the invention, the mount comprising a housing member 78 having a base 79 and a means for attaching an accessory to the mount. The means for attaching an accessory is a clamping band 80. The clamping band 80 comprises a two-part lumen 81; each part of the lumen being permanently fixed at a hinge 82, opposite of the hinge 82 is a band latch 83 for locking the clamping band 80. Upon release of the band latch 83, the clamping band 80 can be opened at the hinge 82. The clamping band 80 further comprises a rail clamp 84, the rail clamp including at least one slideably engaged translational member 85. Upon application of force to the slideably engaged translational member, the translational member will move in a translational plane, releasing the mount from the rail.

FIGS. 13(a-c) illustrate yet another embodiment of a quick release mount 86. Here, the mount 86 comprises a housing member 87 having a base 88 and a means for engaging an accessory to the mount. The means for attaching an accessory is one or more spring clips 89. The spring clips 89 are generally pliable such that an accessory can be engaged within the spring clips 89, and released. The mount further comprises a rail mount 90, the rail mount 90 including at least one slideably engaged translational member 91 for quick release of the mount 86 from the rail 92 to which it is attached.

Each mount of the invention includes a rail clamp, the rail clamp comprising at least one slideably engaged translational member for releasing the mount from a rail. The rail clamp can comprise one, two, or more slideably engaged translational members. Similarly, other clamp can comprise one or more slideably engaged translational members, such as an accessory clamp. Where slideably engaged translational members are described herein, the description may be applied to any of a rail clamp or an accessory clamp.

FIG. 14 illustrates one embodiment of an accessory clamp 93. Here, the accessory clamp 93 comprises a first slideably engaged translational member 94, and a second slideably engaged translational member 95. The first translational member 94 comprises a first tab 96, and the second translational member 95 comprises a second tab 97. The tab provides additional retaining force in the axial direction. Where the accessory has a groove, the tab can fit in the groove to lock the accessory in a fixed position. The slideably engaged translational members can further comprise a spring element to provide a recoil force to bias the clamp to a home or initial position. Although two tabs are illustrated in this figure, one having ordinary skill in the art can appreciate that only one tab is required, and that a plurality of tabs is possible to achieve the desired results, i.e., retention of an accessory.

FIGS. 15(a-c) further illustrate the accessory clamp 93 of FIG. 14. Here, FIG. 15a illustrates a first slideably engaged translational member 95 and a first tab 97 attached thereto. FIG. 15b illustrates a second slideably engaged translational member 94 having a second tab 96. The two translational members are combined in the illustration of FIG. 15c. The slideably engaged translational members can further comprise a button 98 for activating the clamp. A user can depress the button 98 to slide the translational members 94, 95 relative to one another in a translational plane, such that the tabs 96, 97 move away from each other and release the accessory. Additionally, one or more spring elements 99 can be included to provide a recoil force, such that the translational members are biased to a home position. Although this embodiment reflects two tabs, one or several tabs can be used to retain an accessory.

The clamps of this invention include improvements over prior art clamps. It has been recognized by the inventors that certain clamps have a propensity to jam or lock up, that especially when used in conjunction with a weapon—a harsh kickback upon firing a gun can lodge an accessory loose, and
that dirt and the elements tend to decompose one or more components of prior art mounts. The invention described herein substantially captivates the translational members, otherwise referred to as functional members, thereby preventing exposure to the elements and the jamming or locking associate therewith. Additionally, the present invention provides a tab for fixing an accessory in an axial position without imposing a tight clamping force which can damage the accessory.

In an exemplary embodiment of this invention, a safety mechanism is incorporated into the mount for preventing premature or unwanted release of the quick release mount from a support structure. Referring to FIG. 16, the mount includes certain components housed inside the housing member for preventing dirt, dust and debris away from the mechanical or functional members of the mount. The rail clamp comprises at least one slideably engaged translational member 100, a safety button 102, a safety latch 103, and a safety tab 104. When the safety button 102 is depressed by a user, the safety latch 103 rotationally moves in a translational plane by pivoting around a post 106. The safety tab 104 rotates upon depression of the safety button, thereby allowing the safety tab to fit into a safety slot 105. The safety slot 105 is designed such that the slideably engaged translational member 100 cannot move or translate unless the safety tab 104 is engaged into the safety slot 105. For Example, when a user has not depressed the safety button 102, the safety latch 103 does not rotate in the translational plane, and the safety tab 104 is not positioned within the safety slot 105, thereby resulting in the safety tab 104 meeting at the inside surface of the slideably engaged translational member. Therefore, the translational members cannot move without the user depressing the safety button of the safety mechanism. The slideably engaged translational members can further include one or more springs 107 for providing a recoil force upon activating the translational members. A safety button spring can be built into the clamp, such that the safety button spring sits behind the safety button 102 to provide a recoil of the safety latch to a predisposed safety orientation such that the safety latch will not move into the safety slot unless the safety button is depressed.

It is intended that the present invention have application to a wide range of devices that are intended to be mounted in quick-release, stable fashion to a support structure. Thus, it is not intended to restrict the spirit and scope of the present invention to use in connection with the accessories of firearms. The discussion here, for purposes of simplicity, is intended only to be representative of preferred embodiments of the present invention. Other embodiments of the present invention will become obvious and inherent to one skilled in the art upon a thorough understanding of the spirit and scope of the present invention.

In view of the foregoing it is evident that the present invention is one well adapted to attain all of the objects and features hereinabove set forth, together with other objects and features which are inherent in the apparatus disclosed herein.

As will be readily apparent to those skilled in the art, the present invention may easily be produced in other specific forms without departing from its spirit or essential characteristics. The present embodiment is, therefore, to be considered as merely illustrative and not restrictive, the scope of the invention being indicated by the claims rather than the foregoing description, and all changes which come within the meaning and range of equivalence of the claims are therefore intended to be embraced therein.

What is claimed is:
1. A quick-release weapon mount, comprising:
a housing member having a base, a means for attaching an accessory, and
a clamp,
said clamp comprising at least one translational member, wherein said translational member is slideably-engaged with one of: said housing member, or a second translational member.
2. The weapon mount of claim 1, wherein said means for attaching an accessory comprises a lumen.
3. The weapon mount of claim 2, wherein said clamp is attached to said housing at said base.
4. The weapon mount of claim 2, wherein said lumen comprises a slot.
5. The weapon mount of claim 4, wherein at least one of said translational members comprises a tab.
6. The weapon mount of claim 5, wherein said tab protrudes into said lumen at said slot.
7. The weapon mount of claim 2, wherein said clamp further comprises a spring element for providing recoil translational movement to said translational members.
8. The weapon mount of claim 2, wherein said housing further comprises an elongated rail for attaching a supplemental accessory.
9. The weapon mount of claim 8, wherein said supplemental accessory is one of: a fore grip, bi-pod system, sling attachment, Global Positioning System, wireless remote receiver, mount rail, pepper spray, long range audio microphone, long range audio speaker, dye marking canister/dispenser, visible light source, laser pointer, infrared (IR) light source, still camera, video camera, knife, forward looking infrared sensor, night vision scope, or spotting scope.
10. The weapon mount of claim 2, wherein said housing comprises a notch, said notch located at one of: a proximal end or a distal end of the lumen.
11. The weapon mount of claim 2, wherein said housing comprises a first notch located at a proximal end of the lumen, and a second notch located at a distal end of the lumen.
12. The weapon mount of claim 2, wherein said clamp further comprises a safety mechanism for preventing the premature release of the mount.
13. The weapon mount of claim 12, wherein said safety mechanism comprises a safety button, a safety latch, and a safety tab.
14. The weapon mount of claim 13, wherein said clamp comprises a safety slot.
15. The weapon mount of claim 14, wherein said clamp comprises a safety spring.
16. A weapon mount, comprising:
a housing member having a base and a lumen, and
at least one clamp,
said clamp comprising two or more translational members and a spring,
wherein said translational members are connected to said spring.
17. A weapon mount, comprising:
a housing member having a base and a lumen, and
at least one clamp adapted to engage a rail,
wherein said clamp is not rotationally-adjustable.