

Mounting device for Firearms

The invention relates to a mounting device for firearms with a clamping device, with which the mounting device can be optionally clamped to the firearm, wherein the clamping device bears a rigid clamping jaw arrangement and, opposite said clamping jaw arrangement, a movable clamping jaw arrangement, and wherein a swiveling lever with an adjustment is provided in order to lock the movable clamping jaw arrangement.

In this connection, under the term "firearm" in general a shooting weapon suitable for use in the infantry is meant, which however is not necessarily a hand firearm, but rather could also be so heavy that it could be fired only from a gun carriage or the like, such as for example a heavy machine gun, a self-loading grenade launcher or the like.

As a rule the mounting device bears a telescopic sight assembly which is fastened to the underside of an optical or electronic target acquisition device.

The simplest known mounting device is the so-called "slide mounting", in which two clamps are fastened to the underside of a telescopic sight, each of which is clamped together by means of a screw or can be moved away from each other and which encompass the lateral edges of a dovetail rail. As a rule they are slid upon this rail in longitudinal direction, however, they can also be removed from the profile in an unscrewed state when the named screws are long enough. Due to the insecure attachment of each clamp on the telescopic sight this mounting in general cannot be reproduced, meaning that after each time the telescopic sight is placed on the weapon, it has to be tested again.

However, a long time ago this disadvantage was already removed by tightly connecting the two clamps to each other and then fastening the telescopic sight on this mounting. In addition, a swiveling lever was mounted on this mounting; by whose the clamping device can be tightened or loosened (telescopic sight of K 43, German semiautomatic rifle in World War II).

Since the swiveling lever was quite long, the clamps could be moved over a considerable distance, so that it was possible to place it on and remove it and it was not necessary to slide on the mounting. The swiveling lever worked like a knee lever, so that the spring deflection of the clamps held the swiveling lever tight in its resting position. In this case, however, an adjustment of the clamps is required, since the tolerances otherwise would not have permitted a reliable clamping tight. For this reason the mounting was rather bulky, which is why it also had to be mounted sideways on the weapon, since otherwise the line of sight of the telescopic sight would have been seated too high. The circumstances were similar with other weapons (e.g. Kalashnikov).

Conversely, however, the great distance of profile rail and line of vision reduces the outer forces which the mounting is able to withstand. However, if one were to drastically reduce the mounting the reliable tolerances would also be reduced, and in addition it would no longer be possible to apply the forces necessary for operating the swiveling lever.

For this reason the invention is based on the object of finding a mounting device which is reduced, but which nevertheless permits the easy operation of the swiveling lever, and at the same time does not require closer tolerances and yet guarantees the perfect seat for example of a telescopic sight or the like on or at the weapon.

Especially important is the simple and rapid detachment of the mounting in order to guarantee that in the case of a rapid change of location the mounted, under circumstances rather sensitive device can be removed prior to the change of location practically without delay.

Hence it follows that the preferred area of application of the invention lies in the military sector.

To solve this problem in accordance with the invention it is proposed that in the case of a mounting device of the initially named type a first spring arrangement loads the swiveling lever in opening direction over the entire unlocking path, and a second spring arrangement, which forms the adjustment, applies a much greater spring tension than the first and loads the swiveling lever via a spring travel in opening direction which is so small that the mounting device does not come away from the firearm in the case of a fully loaded, second spring arrangement.

The first spring arrangement supports the swiveling lever when it is to be swiveled over dead center of the knee lever formation to loosen the mounting device. Thus the tensile force which is required to open the swiveling lever is, when it is seated in its resting position in the structure of the mounting device, less. Handles that project for great distances can be avoided. On the other hand, if the swiveling lever is closed against the force of the first spring arrangement, then while increased force is necessary, it can easily be applied because it is a matter of compressive force which on the basis of the physical circumstances can easily be produced.

The second spring arrangement is extremely hard and is only applied via the last segment of the swiveling movement of the swiveling lever and right before passing dead center.

On the basis of the named physiological conditions this force cannot be applied without further ado, since it is compressive force. In the loosening of the swiveling lever the passing of dead center is alleviated. First and foremost the second spring arrangement however acts as an adjustment; because it powerfully clamps the movable clamping jaw arrangement against one point of application on the weapon and with it the fixed clamping jaw arrangement into reliable counter-engagement with another point of application on the weapon.

The spring travel which the second spring arrangement allows is however in any case so small that the assembly device cannot detach from the weapon even if the second spring arrangement is loaded over its entire spring travel, thus for example if the weapon with a telescopic sight falls down a flight of stairs.

The simple design of the inventive mounting device provides for considerable, unexpected advantages:

- since the swiveling lever can be loaded more in compression than in tension, it and along with it the entire mounting device can be shorter
- since the second spring arrangement loads the swiveling lever in dead center it is more difficult to unintentionally detach said swiveling lever
- since the second spring arrangement loads the movable clamp jaw arrangement no adjustment is necessary and
- since the spring travel of the second spring arrangement is small, a loss of the additional device borne by the mounting device is rendered impossible, even if the weapon falls.

In a preferred embodiment the clamping device is designed in such a way that its clamp jaw arrangements can be clamped to a profile rail undercut on both sides extending in the direction of fire, said profile rail being mounted to the firearm. By “profile rail” not only

is a rail subsequently mounted to the weapon understood, such as for example a Picatinny rail, but rather also a dovetail profile milled into the weapon, two parallel, undercut edges of the weapons case or the like. In this connection the rail extends, generally stated, with its longitudinal edges essentially parallel to the longitudinal plateau of the weapon. The profile rail can thus for example be formed by two parallel case edges on top of one another running in longitudinal direction of the weapon. As a rule however, a Picatinny rail is assumed, which is mounted to the topside of the weapon.

In order to secure the swiveling lever even more in its resting position, thus for example on a telescopic sight placed on a weapon, in accordance with an embodiment of the invention it is proposed that a detachable snap-in locking device for the swiveling lever in its resting position is provided. This has in addition the advantage that the swiveling lever does not have to be placed in such a way that its accidental operation is ruled out, because the snap-in locking device holds it in its resting position reliably, but can of course be detached without further ado.

Countless snap-in locking devices and locking devices are available to the person skilled in the art. However, here it is preferred that the snap-in locking device exhibit a hinged door pivoted in the swiveling lever which detachably fixes the swiveling lever to the mounting device. Thus the swiveling lever does not, as would be obvious with a small mounting device, have to be fixed to a development of the weapon or of the profile rail, but rather is fixed to the mounting device itself, so that the swiveling lever for its part does not need to protrude above the mounting device. Thus the entire mounting device becomes even more compact, so that for example it is also possible to mount two parallel profile rails to one weapon each with their own mounting device.

It would be possible without further ado and advantageous in the case of the smallest possible design to make a hinged door out of a leaf spring which engages a matching element on the mounting device, but which can be detached by the expenditure of force.

However, it is preferred that a spring slider be placed in the mounting device which is spring-loaded from the outside and which acts on a flange of the hinged door so that in the resting position of the swiveling lever the hinged door is pressed into locking engagement. Thus a relatively large spring is placed in the mounting device and although the entire mounting device builds rather small, the elements are not miniaturized so that they withstand considerable force and also considerable soiling.

In accordance with a further embodiment the detachment of the lock is made possible in such a way that the swiveling lever exhibits a continuous actuating opening in which the spring-loaded flange of the hinged door is seated and which can be pressed in from the outside. Thus the unlocking is possible practically without additional expenditure of time with the hand that grasps the swiveling lever without the danger of unlocking due to outside actions, since the actuating opening can be designed so small that an actuation is possible practically only with the finger tip. In the process the remaining fingers of the same hand grasp the swiveling lever and actuate it. Since the swiveling lever has passed dead center right before reaching the resting position, it retains its resting position anyway, whether it is now locked or not locked. The snap-in locking device hence constitutes only a safety.

Since it is necessary to press against the swiveling lever to release the safety, but it must be loaded in the opposite direction to detach the clamp jaw arrangement, an accidental release for example due to the interference of branch movement or the like is practically impossible. A simple, uncomplicated

but highly practical safety is created; due to the large dimensions which are possible for the springs, the load of the material of the mounting device is slight, so that it can be manufactured without further ado out of a light metal alloy.

Especially practical is the fact that the mounting device exhibits an oblong base with two longitudinal edges, the fact that along the one longitudinal edge two rigid clamp jaws are seated at its ends and that in the region of the middle of the opposing longitudinal edge a movable clamp jaw is arranged. In the process the rigid clamp jaws are preferably made out of light metal alloy, but since there are two clamp jaws the surface pressure occurring there is still in the permissible range. The movable clamp jaw on the other hand is centrally located so that sufficient space is available on all sides for the necessary spring arrangement, and in addition only one spring arrangement is required, not two.

In this connection the spring device is preferably constructed in such a way that a spring device is placed at a right angle to the longitudinal edges, said spring device being formed of a center pin, upon which the first and second spring arrangement are seated one above the other and which is connected to the movable clamp jaw. Pin and clamp jaw form, at least after the mounting, one single component. The swiveling lever acts on the bolt and the clamp jaw from the outside. In the process the second spring arrangement is preferably formed by one Belleville spring washer package which furnishes a very hard springiness. Preferably the Belleville spring washer package is seated in a steel sleeve in order to prevent an overloading of the bore hole in the mounting device made of metal.

Preferably the mounting device is penetrated near the longitudinal edge which is closest to the movable clamp jaw by a swivel pin which can be pivoted around a vertical axis and to which the swiveling lever is pivoted.

In this connection the mounting device does not have to be a single piece, but rather can preferably exhibit a steel plate in which the swiveling lever is pivoted and which is laterally screwed onto a light metal contact block for example.

The invention will be explained in greater detail in the attached drawing with the help of an embodiment, wherein this embodiment does not however constitute any kind of restriction at all of the invention.

In the drawing:

Figure 1 is a view of the inventive mounting device, seen in forward oblique picture

Figure 2 is a longitudinal section through the mounting device of Figure 1, in resting position of the swiveling lever and

Figure 3 is a representation of the mounting device in longitudinal section as shown in Figure 2, but with a swiveled swiveling lever.

In the definition of special directions in the figures the normal firing position of the weapon is always assumed, in which the barrel runs along a horizontal axis and the elevation of the lies in a vertical plane, which contains the barrel axis (for simplicity's sake lateral deviations on the basis of the projectile twist are not taken into consideration here).

In Figure 1 the mounting device can be seen in forward oblique picture from the bottom and the front. Said mounting device exhibits a square-shaped contact block 1 made of light metal with two narrow longitudinal edges of which the upper exhibits a dovetail receptacle for the mounting of a riflescope or the like and the lower is set up for the mounting of a Picatinny rail and along the one long lateral edge exhibits two rigid clamp jaws 3,

opposite to which a movable clamp jaw 5 is mounted about in the middle of the lateral edges.

The movable clamp jaw 5 can be moved to the fixed clamp jaws in such a way that the Picatinny rail is clamped between the clamp jaws and can be moved so far away from the fixed clamp jaws that the contact block 1 with the riflescope can be raised up from the Picatinny rail.

The movable clamp jaw 5 made of steel is tightly connected to a piston receptacle 37 made of steel, said piston receptacle being movable guided in the interior of the contact block 1. The rigid clamp jaws 3 are formed in a single piece with the contact block 1 out of light metal.

A cover plate 43 made of steel is screwed tight to the one vertical, large longitudinal surface of the contact block 1 near the movable clamp jaw 5, said plate holding the piston receptacle 37 and further components which will be discussed later, in the contact block 1 and in addition holds a vertical swiveling axis 11 around which a swiveling lever 9 can perform a swivel movement on a horizontal plane.

The cover plate 43 evenly covers about half of the contact block 1, proceeding from its one vertical edge, and exhibits on the other end two protruding flanges on top of each other, between which the swiveling axis 11 extends.

Between the two named flanges the swiveling lever 9, which is penetrated by the swiveling axis 11, forms an angle and in its resting position (Figure 2) is turned toward the center of the contact block 1, where it ends in a locking plane 29 which extends parallel to the swiveling lever 9. At a right angle to the locking plane 29, an opening surface 31 is constructed, forming the end of the swiveling lever 9. The transition between the two surfaces 29 and 31 is rounded off and exhibits a maximum distance to the swiveling axis 11, the distance of

the opening surface 31 to the swiveling axis 11 is the shortest and the distance of the locking plane 29 to the swiveling axis lies in between. The difference of the distances of the two surfaces 29 and 31 from the swiveling axis 11 is a bit greater than the maximum movement path, in transverse direction, in which the movable clamp jaw 5 can travel.

This end of the swiveling lever 9 acts directly on a piston 35 which is arranged in the interior of the contact block 1 and can then be moved vertically to its greatest exterior surfaces when the swiveling lever 9 is moved.

The center axis of the piston 35 essentially vertically intersects the center axis of the swiveling axis 11 and is pushed outward by two spring arrangements 39, 41.

When the swiveling lever 9 projects vertically from the exterior surface of the contact block 1 (Figure 3), then the opening surface 31 is in close contact to the piston 35; when the swiveling lever 9 is placed on the contact block (Figure 2), then the locking plane 29 is in close contact to the piston 35, which is then further pressed into the contact block 1; when the swivel lever 9 is moved, then the edge between the two surfaces 29 and 31 runs over the piston 35 and presses it inward the most.

The piston 35 exhibits a head upon which a Belleville spring washer package 39 is supported. The other end of the Belleville spring washer package 39 rests on the bottom of a bore hole in the piston receptacle 37. The piston 35 runs with its head within the named bore hole and with its shaft penetrates the floor of the piston receptacle 37. A spiral-shaped spring 41 abuts the outer side of this bottom, said spring being much weaker than the Belleville spring washer package 39 and which surrounds the shaft of the piston 35. This spring 41 rests against the bottom of a pocket bore hole which is constructed in the contact block 1 and which holds spring 41 and piston receptacle 37.

Since the piston receptacle 37 is tightly connected to the movable clamp jaw 5 and the spiral-shaped spring 41 rests against the piston receptacle 37, said piston receptacle and with it the movable clamp jaw 5 are moved away from the rigid clamp jaw 3 when the swiveling lever 9 is moved from its resting position (Figure 2) into its opening position (Figure 3).

If in this state the contact block 1 is now placed on a Picatinny rail and the swiveling lever 9 is moved from its opening position to its resting position, then the piston 35 is moved in the direction of the rigid clamp jaw 3 and via the Belleville spring washer package 39 carries the piston receptacle 37 and hence the movable clamp jaw 5 along, until said movable clamp jaw 5 is tightly adjoined to the Picatinny rail. In the process the piston 35 moves further than the movable clamp jaw 5, since dead center (the corner between surfaces 29 and 31 of the swiveling lever 11) must be passed and in addition the movable clamp jaw 5 must be in forced engagement with the Picatinny rail in order to provide for a secure grip. This additional movement path of the piston 35 is made possible by the compression of the Belleville spring washer package 39.

In the process the swiveling lever 9 (in resting position) lies in a groove of the contact block 1, since the steel plate 43 is flush with its outer surface and only the front tip of the swiveling lever 9 projects to the front over the front transverse surface of the contact block 1.

The arm of the swiveling lever 9 lying in the groove exhibits an oblong, rectangular recess 17, which extends over the greatest part of the length of this arm. Near the free end of this arm the horizontally extending recess 17 is penetrated by a vertical hinged door axis 15, which is pounded into the arm. A hinged door 13 is pivoted to this hinged door axis. In the process, formations on the hinged door 13 and the recess permit only a

slight swiveling movement in which the hinged door 13 is either flush with the outer surface of the swiveling lever 9 or is pressed a bit inward (Figure 3).

Close to the free end of the swiveling lever 9 the hinged door 13 exhibits a vertically projecting, horizontal hook 19 which in resting position (Figure 2) engages in a matching hook receptacle 21. In the contact block 1 a horizontal, diagonally running pocket bore hole is constructed in which a slider 23 is arranged near to the open end and through which a vertical pin 27 is held in such a way that a short movement along the axis of the pocket bore hole is made possible. Between the slider 23 and the bottom of the pocket bore hole a spiral spring 25 is seated, which pushes the slider 23 outside as far as the pin 27 permits. In this connection the end of the slider 23 comes out of the pocket bore hole and runs into the receptacle groove for the swiveling lever 9, precisely opposite the main part of the hinged door 13 on the side of the swiveling lever axis 15 which does not bear the hook 19.

It is obvious that when the swiveling lever 9 is in its resting position, the slider 23 pushes the hinged door 13 in its position where it is flush with the exterior of the swiveling lever 9 and in the process engages with the hook 19 in the associated receptacle 21.

Since the hook 19 is beveled, it falls into its resting position when the swiveling lever 9 is pressed, which takes place by the action of both springs 39 and 41, automatically into its receptacle 21 and is held there by the action of the slider 23 on the hinged door 13. If the mounting device is to be removed, then the hinged door 13 is pressed from the outside and the swiveling lever 9 is drawn back. For this purpose the thumb and index finger of one hand will suffice. Once dead center has been passed then the spring 41 slides the swiveling lever 9 completely into its open position of Figure 3.

Patent Claims

1. Mounting device for firearms with a clamping device, with which the mounting device can be optionally clamped to the firearm, wherein the clamping device bears a rigid clamping jaw arrangement (3) and, opposite said clamping jaw arrangement, a movable clamping jaw arrangement (5), and wherein a swiveling lever (9) with an adjustment is provided in order to lock the movable clamping jaw arrangement, characterized by a first spring arrangement (41) which loads the swiveling lever (9) in opening direction over the entire unlocking path, and a second spring arrangement (39), which forms the adjustment, applies a much greater spring tension than the first and loads the swiveling lever (9) via a spring travel in opening direction which is so small that the mounting device does not come away from the firearm in the case of a fully loaded, second spring arrangement (39).
2. Mounting device according to Claim 1, in which the clamping device is designed in such a way that its clamp jaw arrangements (3, 5) can be clamped to a profile rail undercut on both sides extending in the direction of fire, said profile rail being mounted to the firearm.
3. Mounting device according to Claim 1 or Claim 2, in which a detachable snap-in locking device (19, 21) is provided for the swiveling lever (9) in its resting position.
4. Mounting device according to Claim 3, in which the snap-in locking device exhibits a hinged door (13) pivoted in the swiveling lever (9) which detachably fixes the swiveling lever (9) to the mounting device (1).

5. Mounting device according to Claim 4, in which a spring slider (23) is placed in the mounting device which is spring-loaded from the outside and which acts on a flange of the hinged door (13) so that in the resting position of the swiveling lever (9) the hinged door (13) is pressed into locking engagement.

6. Mounting device according to Claim 5, in which the swiveling lever (9) exhibits a continuous actuating opening (17) in which the spring-loaded flange of the hinged door (13) is seated and which can be pressed in from the outside.

7. Mounting device according to any one of the preceding claims, which exhibits an oblong base with two longitudinal edges, wherein along the one longitudinal edge two rigid clamp jaws (3) are seated at its ends and in the region of the middle of the opposing longitudinal edge a movable clamp jaw (5) is arranged.

8. Mounting device according to Claim 7, in which a spring device is placed at a right angle to the longitudinal edges, said spring device being formed of a center pin (37), upon which the first (41) and second (39) spring arrangement are seated one above the other and which is connected to the movable clamp jaw (5).

9. Mounting device according to any one of the preceding claims, which is penetrated near the longitudinal edge which is closest to the movable clamp jaw (5) by a swivel pin (11) which can be pivoted around a vertical axis and to which the swiveling lever (9) is pivoted.