ASSEMBLIES COMPRISING AN AUTOMATIC FIREARM WITH A RETURN SPRING MOUNTED ON A SUPPORT

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ABSTRACT

The firearm is fixed on its support by springs passing through aligned orifices formed in elements rigidly fixed respectively to the firearm, to a brake borne by the support and stops serving as a support for the return springs. The invention is useful for small and medium calibre firearms, particularly for preventing firing until the weapon is correctly secured on its support.

12 Claims, 3 Drawing Figures
ASSEMBLIES COMPRISING AN AUTOMATIC FIREARM WITH A RETURN SPRING MOUNTED ON A SUPPORT

The invention relates to assemblies formed by an automatic weapon mounted on a support and comprising at least one return spring adapted to return the mobile breech-block of the weapon to the closure position. The word “support” is used hereinafter in a very general sense and may mean a cradle, a hood, a gun mounting, a turret, a racers for a firing platform, etc.

The invention applies to cases in which the automatic weapon is fixedly mounted on a support and also to the much commoner case in which the automatic weapon is slidably mounted in relation to its support, with the interposition of a shock-absorbing apparatus.

The invention applies more particularly, but not exclusively, to the case in which the automatic weapon is of small or medium calibre — i.e., a calibre of between 10 and 50 mm and, in the majority of cases, a calibre of between 15 and 35 mm, this being inter alia the case with automatic weapons having a calibre of 20 mm. Amongst small or medium calibre weapons of the kind specified, the invention relates more particularly, but not exclusively, to weapons having two return springs disposed symmetrically on either side of the longitudinal plane of symmetry of the weapon.

In any case, the automatic weapon associated with the assembly according to the invention is an automatic weapon of the open breech type — i.e., a weapon in which, when the firer stops firing, the breech remains attached to a rear in a rear position from which it is returned forward, when firing is resumed, by the action of the or each return spring.

Of course in assemblies of this kind it would be risky if the firer could start firing without taking the precaution of fixing the automatic weapon correctly on its support, the consequence of such omission obviously being a violent recoil of the weapon with all its harmful consequences both for the weapon and its user.

It is an object of the invention so to adapt assemblies of the kind specified that it is impossible to start firing a weapon until it is correctly fixed on its support.

The assembly according to the invention comprises a support and an automatic weapon with an open breech adapted to be mounted on such support and comprising a mobile breech-block subjected to the force of at least one return spring bearing via its rear end against a plug slidably mounted in the rear portion of the weapon breech box, characterized in that the bearing plug is fixed in relation to the weapon breech box and the weapon is fixed on its support by associating with each bearing plug of the return spring a detachable fixing member which, when the bearing plug of the return spring occupies its normal firing position and the weapon occupies its normal position on its support, is adapted to move through aligned apertures with which three separate attaching elements provided to this end are formed — i.e., a first element connected to the bearing plug, a second element connected to the weapon, and a third element connected to that member of the support to which the weapon is to be fixed.

As a result, until the fixing member has been placed in the aforementioned aligned apertures the bearing plug of the return spring will not be fixed on the weapon breech box and the weapon will not be attached to its support.

If an inadvertent attempt is made to start firing in such conditions — i.e., conditions in which it would be particularly dangerous to start firing — the firing cannot start because the return springs, having no fixed rear support, are unable to return the weapon breech-block into the closure position.

On the other hand if the fixing member has been correctly engaged in the aforementioned aligned aperture, the bearing plug of the return spring will be connected to the weapon breech box and the weapon will be correctly mounted on its support, so that firing can then be started without risk to the user, whose adjustment of the stop system will enable the return spring, suitably borne at its rear end, to return the breech into the closure position.

Since the bearing plug of the return spring has to be disposed towards the rear of the weapon, advantageously, to avoid having to make its attaching element too large longitudinally, the two other attaching elements — i.e., the element connected to the weapon and the element connected to the supporting weapon on which the weapon is secured — are also disposed at the level of the rear of the weapon.

When, as is generally the case, the weapon is mounted on its support with the interposition of a shock absorbing apparatus comprising a rearwardly extending mobile fitting, the attaching element associated with the weapon support can advantageously be provided towards the rear end of such mobile fitting.

It will then be possible to group the three attaching elements towards the rear of the weapon, without being obliged to make any of them excessively large, by disposing the attaching element associated with the weapon slightly in front of the bearing plug of the return spring; so arranging the attaching element associated with the weapon support so that it extends rearwards as far as the securing level, and so shaping the three attaching elements that their respective portions disposed at the securing level are so superimposed that they can be formed with aligned fixing apertures through which the fixing member shared by the three attaching elements can be engaged.

The attached element associated with the bearing plug is disposed in the most distant position on the side by which the fixing member is engaged — i.e., below the two other attaching elements — when such member is vertically engaged from top to bottom, thus further increasing the securing of the weapon.

If things were different — i.e., if the attaching element associated with the bearing plug were to occupy a higher or intermediate position — possible wrong handling consisting of partly engaging the fixing member in the succession of superimposed aligned apertures might result in longitudinally connecting the elements for attaching the weapon and the bearing plug of the return spring (this making it possible to start firing) without the weapon having been correctly secured on its support, and this would frustrate the aim in view, namely to prevent firing from being started until the weapon is correctly secured on its support.

To this end advantageously, the attaching element associated with the weapon is formed by a simple perforate lateral foot extending transversely of the weapon
axis, the attaching element associated with the supporting member on which securing is to be carried out, takes the form of a longitudinal clevis with perforate fins adapted to fit over said perforate foot which is thus engaged between such fins, and the attaching element associated with the plug takes the form of a perforate fin connected to the plug and occupying a position beneath the lower fin of said clevis (the fixing member being supposed to be vertical and engage from top to bottom).

Preferably, the angular wedging means are provided for wedging the bearing plug in relation to the weapon breech box, so that the alternating angular stressings to which the bearing plug is subjected during firing are not transmitted to the weapon securing device as a whole during firing.

In a simple embodiment of the invention, said angular wedging means are formed by a protrubence disposed on the periphery of the bearing plug and a recess of corresponding shape with which the periphery of the recess provided for the bearing plug is performed, the protrubence engaging in the recess when the bearing plug occupies its operational position.

A fixing member which is to extend through and connect the various attaching elements can advantageously take the form of a simple spindle having a head at one end and axial retaining means at its other end.

Preferably the axial retaining means are resilient locking means incorporated in the spindle, so as to facilitate things for the user of the gun and avoid the risk of losing some independent axial retaining member (nut, pin, etc.) in often precarious and difficult conditions (battle situation, night exercises, etc.) in which it may be necessary and urgent to secure or remove the weapon.

Preferably, when the automatic weapon comprises two return springs and two members for securing it to its support, disposed on either side of the longitudinal plane of symmetry of the weapon, the system for securing the weapon to its support and locking the two bearing plugs of the two return springs is formed by two symmetrical portions, each constructed as set forth hereinbefore with respect to a single bearing plug, such two portions, associated with the two bearing plugs respectively, being identical and disposed symmetrically in relation to the aforementioned longitudinal plane of symmetry.

In the latter case, to reduce to the minimum the number of independent detachable members used in the system of securing the weapon on its support, the two fixing members (inter alia the two spindles) associated with the two bearing plugs respectively can be borne on a common base, such as, for instance, a fork.

In any case, whatever the embodiment adopted may be, the final result is an assembly of automatic weapon and support in which the operations of locking the or each bearing plug of the return spring and of securing the weapon on its support can be performed in conditions of increased safety for the user of the weapon when he starts firing.

To illustrate the various arrangements set forth hereinbefore, a description will now be given of a preferred but non-limitative embodiment of the invention, with reference to the accompanying drawings, wherein:

FIG. 1 is a diagrammatic perspective view, with portions removed, of the rear portion of an assembly according to the invention formed by an automatic weapon and its support, the weapon being shown to simplify the drawings offset rearwardly in relation to its support, the elements for attaching its securing system being shown moved away from one another.

FIG. 2 is a side elevation, in slightly greater detail, of the same rear portion, in this case the weapon being secured on its support; and

FIG. 3 is a perspective view of a variant embodiment of the two members for fixing the system for securing the weapon on its support.

The assembly as shown diagrammatically in FIG. 1 and in a more detailed manner in FIG. 2 mainly comprises an automatic weapon with an open breech comprising, amongst other elements, a breech box receiving a mobile breech (not shown) and two lateral return springs (only one of which is shown in FIG. 1) adapted to move the mobile breech forward into position when firing starts, the return springs each bearing rearwardly against an individual bearing plug 3 with a cylindrical skirt slidably engaged in a bore in a rear portion of the breech box 1 and engaged by the penetration of a peripheral boss 3a into a recess of corresponding shape with which the guide wall of the skirt of the corresponding bearing plug is formed, the assembly also comprising a support, such as a cradle 4, adapted to receive the automatic weapon with the interposition of a shock absorbing apparatus formed by two identical lateral elements disposed on either side of the weapon and each comprising a brake 5 (for instance, mechanical or hydraulic), whose mobile fitting has a sliding rod 5a extending rearwardly and acting as a member for attaching the weapon to its support.

The resulting system for securing the weapon on a support of the kind specified comprises two identical portions disposed symmetrically on either side of the common longitudinal plane of symmetry of the weapon and its support, each of such portions comprising a transverse lateral foot 6 attached to the rear of a breech box 1 and formed with a cylindrical aperture 6a of vertical axis; a longitudinal clevis 7 extending rearwardly and attached to the rear of the rod 5a of the shock-absorbing apparatus 5, the fins of the clevis 7 each being formed with an aperture 7a identical with the aperture 6a, the clevis being adapted to fit over the lateral foot 6, having its apertures 7a aligned with the aperture 6a in such lateral foot (the position illustrated in FIG. 2); a fin 8, connected to the bearing plug 3 and bent forwardly and formed with an aperture 8a identical with the aperture 6a, 7a and adapted to be aligned with such apertures 6a, 7a at the securing level when the weapon is correctly disposed on its support and the bearing plugs of the return springs occupy their firing position, the bent portion of the fin 8 then taking its place beneath the lower fin of the clevis 7 as clearly shown in FIG. 2; and a fixing spindle 9 with a head 9a adapted to be engaged, by a vertical downward movement, through the apertures 6a-8a, previously aligned, of the attaching elements 6-8, the spindle having at its lower end axial retaining members such as, for instance, locking balls 9b with a spring.

A weapon of the kind specified can be secured on its support therefore in the following manner:

When the weapon arrives from the magazine its breech is closed, its return springs are expanded and the bearing plugs 3 thereof are locked by the spindles 9 engaging through the apertures 6a, 8a in the lateral feet 6 and the fins 8, so that the weapon is not ready to
be fired and cannot be adapted on to its support, since the presence of the fins 9 prevents the lateral feet 6 from engaging between the corresponding fins of the clevis 7 of the shock-absorbing apparatus.

The operator must therefore disengage the spindles 9 (unlocking the plugs 3 and making the weapon temporarily incapable of shooting) and then engages the lateral feet 6 between the corresponding fins of the clevis 7, making sure that the apertures 6a—8a are correctly aligned.

He then fully engages the two spindles 9 in such lines of apertures, the effect of the latter operation being to lock the bearing plugs 3 of the return springs and correctly anchor the weapon on its support, the assembly then being ready for the retention of the return springs and firing, although this would not be the case if the spindles (sic!) of the springs had not been correctly performed.

In a variant illustrated in FIG. 3 the two fixing spindles 9 can be borne by the arms of a common fork 10 having a handle 10a, the fork 10 (including the spindles 9) in that case forming the only detachable member of the securing system.

Clearly, and as results from the foregoing, the invention is not limited to those applications and embodiments thereof which have been more specially considered, but, on the contrary, the invention covers all variants.

We claim:

1. An assembly comprising a support and an automatic weapon of open breech-block type, adapted to be mounted on said support, said weapon comprising a mobile breech-block subjected to the force of at least one return spring bearing via its rear end against a plug slidably mounted in the rear portion of the weapon breech box, characterized in that the bearing plug is fixed in relation to the weapon breech box and the weapon is fixed on its support by associating with each bearing plug of the return spring a detachable fixing member which, when the bearing plug of the return spring occupies its normal firing position and the weapon occupies its normal position on its support, is adapted to move through aligned apertures with which three separate attaching elements provided to this end are formed — i.e., a first element connected to the bearing plug, a second element connected to the weapon, and a third element connected to that member of the support to which the weapon is to be fixed, and further comprising a shock-absorbing apparatus with a mobile fitting interposed between the weapon and its support, characterized in that the attaching element associated with the weapon support is mounted towards the rear of said mobile fitting.

2. An assembly as set forth in claim 1, characterized in that the three attaching elements are disposed at a level situated towards the rear of the weapon.

3. An assembly as set forth in claim 1, characterized in that the weapon is secured on its support by disposing the attaching element associated with the weapon slightly in front of the bearing plug of the return spring; so arranging the attaching element associated with the bearing plug that it extends forwardly as far as the level, forming the securing level of the attaching element associated with the weapon; so arranging the attaching element associated with the weapon support that it extends rearwardly as far as the securing level; and so shaping the three attaching elements that their respective portions disposed at the securing level are so superimposed that they can be formed with aligned fixing apertures through which the fixing member shared by the three attaching elements can be engaged.

4. An assembly as set forth in claim 1, wherein characterized in that the attached element associated with the bearing plug is disposed in the most distant position on the side by which the fixing member is engaged — i.e., below the two other attaching elements — when such member is vertically engaged downwards, thus further increasing the securing of the weapon.

5. An assembly as set forth in claim 4, characterized in that the attaching element associated with the weapon is formed by a simple perforate lateral foot extending transversely of the weapon axis, the attaching element associated with the supporting member on which securing is to be carried out, takes the form of a longitudinal clevis with perforate fins adapted to fit over said perforate foot which is thus engaged between such fins, and the attaching element associated with the plug takes the form of a perforate fin connected to the plug and occupying a position beneath the lower fin of said clevis (the fixing member being supposed to be vertical and engage from top to bottom).

6. An assembly as set forth in claim 1, wherein angular wedging means are provided for wedging the bearing plug in relation to the weapon breech box, so that the alternating angular stressings to which the bearing plug is subjected during firing are not transmitted to the weapon securing device as a whole during firing.

7. An assembly as set forth in claim 6, characterized in that said angular wedging means are formed by a protuberance disposed on the periphery of the bearing plug and a recess of corresponding shape with which the periphery of the recess provided for the bearing plug is performed, the protuberance engaging in the recess when the bearing plug occupies its operative position.

8. An assembly as set forth in claim 1, wherein the fixing member is formed by a simple spindle having a head at one end and axial retaining means at the other end.

9. An assembly as set forth in claim 8, characterized in that the axial retaining means are resilient locking means incorporated in the spindle.

10. An assembly comprising a support and an automatic weapon of open breech-block type, adapted to be mounted on said support, said weapon comprising a mobile breech-block subjected to the force of at least one return spring bearing via its rear end against a plug slidably mounted in the rear portion of the weapon breech box, characterized in that the bearing plug is fixed in relation to the weapon breech box and the weapon is fixed on its support by associating with each bearing plug of the return spring a detachable fixing member which, when the bearing plug of the return spring occupies its normal firing position and the weapon occupies its normal position on its support, is adapted to move through aligned apertures with which three separate attaching elements provided to this end are formed — i.e., a first element connected to the bearing plug, a second element connected to the weapon, and a third element connected to that member of the support to which the weapon is to be fixed, and wherein the attached element associated with the bearing plug is disposed in the most distant position on the side by which the fixing member is engaged — i.e.,
below the two other attaching elements — when such member is vertically engaged downwards, thus further increasing the securing of the weapon, the attaching element associated with the weapon being formed by a simple perforate lateral foot extending transversely of the weapon axis, the attaching element associated with the supporting member on which securing is to be carried out, takes the form of a longitudinal clevis with the perforate fins adapted to fit over said perforate foot which is thus engaged between such fins, and the attaching element associated with the plug takes the form of a perforate fin connected to the plug and occupying a position beneath the lower fin of said clevis (the fixing member being supposed to be vertical and engage from top to bottom).

11. An assembly comprising a support and an automatic weapon of open breech-block type, adapted to be mounted on said support, said weapon comprising a mobile breech-block subjected to the force of at least one return spring bearing via its rear end against a plug slidably mounted in the rear portion of the weapon breech box, characterized in that the bearing plug is fixed in relation to the weapon breech box and the weapon is fixed on its support by associating with each bearing plug of the return spring a detachable fixing member which, when the bearing plug of the return spring occupies its normal firing position and the weapon occupies its normal position on its support, is adapted to move through aligned apertures with which three separate attaching elements provided to this end are formed — i.e., a first element connected to the bearing plug, a second element connected to the weapon, and a third element connected to that member of the support to which the weapon is to be fixed, and wherein angular wedging means are provided for wedging the bearing plug in relation to the weapon breech box, so that the alternating angular stressings to which the bearing plug is subjected during firing are not transmitted to the weapon securing device as a whole during firing.

12. An assembly as set forth in claim 11, characterized in that said angular wedging means are formed by a protuberance disposed on the periphery of the bearing plug and a recess of corresponding shape with which the periphery of the recess provided for the bearing plug is performed, the protuberance engaging in the recess when the bearing plug occupies its operative position.