SPECIFICATION

Breech Mechanism for Automatic Firearm

The invention relates to a breech mechanism for an automatic firearm, in particular of the type having a breech casing, a breech body which is displaceable longitudinally of the firearm in the breech casing and comprises a breech head and a control component slidable in the breech head, and at least one bolt to control the movement of the breech head and the control component, the or each bolt being designed as a one-arm lever, pivotably mounted in the breech head and having a locking surface as well as a support surface, the locking surface engaging, in the front-most firing position of the breech body, with a detent surface in the breech casing and the control component being positioned below the support surface in the firing position to prevent pivoting of the bolts.

A breech mechanism of this type is described and shown in Swiss Patent Specification No. 432 298.

It is an object of the invention to provide a breech mechanism which makes it possible to increase the rate of firing and to reduce the weight of the weapon.

According to the invention, this object is achieved when the front part of the bolt contains the pivot axis of the bolt and has the locking surface formed thereon, the support surface is formed on a rear extension of the bolt, the rear edge of the locking surface is located in front of the rear end of the support surface, and the front part of the bolt is wider than the rear extension.

In a weapon in which cartridges are introduced laterally into the breech casing and are pushed forward into the barrel of the weapon by the breech body, the breech casing advantageously has a shoulder which is aligned perpendicular to the vertical longitudinal central plane and the rear shoulder surface of which delimits the front of the aperture for introducing the cartridges. For reasons of strength, the detent surface in the breech casing for locking the breech head must be located at a certain distance in front of the rear shoulder surface. The distance of the shoulder surface from the rear end of the barrel of the weapon is accordingly given by the distance of the rear edge of the detent surface from this end of the barrel of the weapon, increased by the additional amount which depends of the strength. In addition to the length of the cartridge, the magnitude of the distance of the shoulder surface from the rear end of the barrel of the weapon is decisive for the length of travel which must be covered by a cartridge moved by the breech body on introduction into the barrel. The magnitude of the breech travel is in turn decisive for the rate of firing which can be achieved and for the length and hence also the weight of the weapon.

The necessary breech travel can be reduced by the breech mechanism according to the invention, as a result of which the increase in the rate of firing and the reduction in the weight of the weapon are achieved.

An illustrative embodiment of the breech mechanism according to the invention is represented in the drawing and described in more detail in the following text. In the drawing:

Figure 1 shows a horizontal longitudinal section through a part of the firearm, with a breech body which is in a firing position or locking position;

Figure 2 shows a section along line II—II in Figure 1; and

Figure 3 shows a perspective representation of the bolt.

Referring to Figure 1, a breech body 23 consisting of a breech head 2 and a control component 3 is displaceably mounted in a breech casing 1 of an automatic firearm. The control component 3 is inserted in a recess 4 of the breech head 2 and is displaceable in the latter. A percussion needle 5 is fixed in the control component 3. In a manner which is in itself known, the control component 3 is subject to the pressure of a closing spring which is not shown. A locking body 6 and a barrel 7 of the weapon are inserted in the breech casing 1 in a manner which is in itself known. The rear end face 8 of the barrel 7 of the weapon is here in contact with a shoulder 9 of the locking body 6. In the front-most firing position of the breech body 23, as shown, the front end face 10 of the breech head 2 is virtually in contact with the rear end face 8 of the barrel 7 of the weapon. A cartridge 11 present in the barrel 7 of the weapon is ignited in this position by the percussion needle 5.

As is known in itself and not shown here in more detail, two bolts 13 which are designed as one-arm levers are pivotably mounted in the breech head 2, detent surfaces 14 for supporting the bolts being provided in the locking body 6. Of course, if the locking body 6 is omitted, the detent surfaces 14 can also be directly formed in the breech casing 1. The bolts 13 (compare also Figure 3) each comprise a front part 13*a* containing the pivot axis of the bolt and a rear extension 13*b*. As can be seen from Figure 3, the more highly stressed front part 13*a* of the bolt 13 has a greater width than the rear extension 13*b*. The front part 13*a* of each bolt 13, is provided with a locking surface 15 which, in the locking position or firing position corresponding to Figure 1, engages with the corresponding detent surface 14 in the locking body 6 of the breech casing 1. In Figure 1, the rear-most edge of the detent surface 14 is designated as 24, and the rear edge 24*a* of the locking surface 15 on the bolt 13 can be seen from Figure 3.

In addition, the bolts 13 have support surfaces 16 and abutting surfaces 17, which interact with the control component 3. The control component 3 is provided with corresponding support surfaces 18 and abutting surfaces 19. Whereas the interaction, which is known in itself, of the abutting surfaces 17, 19 is not shown in more detail in the drawing, Figure 1 shows that, in the locking position or firing position, the support surface 18 of the control component 3 are

positioned below the support surfaces 16 of the bolts 13. The rear edge 24*a* of the locking surface 15 is located at a distance in front of the rear end of the support surface 16, closer to the pivot axis of the bolt.

The breech casing 1 is provided with a shoulder 1*a* which is aligned perpendicular to the axis of the weapon and the rear shoulder surface 21 of which has a distance "a" from the rear end face 8 of the barrel 7 of the weapon, inserted in the breech casing 1. The rear-most edge 24 of the detent surface 14 is at distance "b" from this shoulder surface 21, an oblique guide surface 25 for cartidges 11*a* being formed in the locking body 6 and in the breech casing 1 between this edge 24 and the shoulder surface 21.

According to Figure 2, there are two lateral, mutually opposite apertures 26 in the casing 1 of the weapon. One feed device 27 for ammunition, diagrammatically shown in Figure 2, is located in each case to the right and to the left of the casing 1 of the weapon. One feed device 27 is always in a feed position (compare the right-hand half of Figure 2), and the other is in a waiting position. The breech body 23 is diagrammatically shown in dots and dashes in Figure 2, and the cartridges are marked by reference numerals 11*a* to 11*n*.

The corresponding cartridge 11*a* is also shown in Figure 1. The apertures 26 are delimited at the front by the shoulder 1*a*. In the position shown in Figure 1, there is a distance "c", corresponding to the recoil of the weapon, between the shoulder surface 21 and the front end of the cartridge 11*a* which is still in the feed device 27 (Figure 2) which is arranged so that it cannot rock.

The construction which has been described results in the following mode of action; when the breech body 23 runs forward, the cartridge 11*a* entering the aperture 26 is gripped by the former and is pushed forward into the barrel 7 of the weapon, the surfaces 25 assisting in directing the cartridges into the central position. The breech body 23 which pushes the cartridge 11*a*, must here cover a distance relative to the casing 1 of the weapon, which is given by the distance "a" of the rear shoulder surface 21 from the rear end face 8 of the barrel 7 of the weapon. Since the bolts 13 each have a rear extension 13*b* which is provided with the support surface 16, but the locking surfaces 15 are each located on the front part 13*a* of the bolt 13 and are thus located in front of the support surfaces 16, it is possible—with unchanged dimensions for the breech head 2 and the control component 3, and for the relative displacement thereof—to reduce this distance "a" and thus the necessary travel of the breech body 23. Taking into account the distance "b", necessary for reasons of strength, between the rear edge 24 of the detent surface 14 and the shoulder surface 21, the distance "a" is reduced by the fact that the detent surface 14 can be formed more closely to the rear end of the barrel 7 of the weapon since the locking surface 15 on the bolt 13 is also located more closely to the front end face 10 of the breech head 2. The shortening of travel of the breech results in a higher firing rate of the weapon. The total length of the weapon and hence also the weight of the weapon can likewise be reduced.

A further advantage compared with the state of the art results from the changed lever conditions on the bolts 13. As is known, the gas pressure forces generated after firing are transmitted via the breech head 2 and the bolts 13 to the detent surfaces 14 of the breech casing 1 or of the locking body 6. The angle enclosed by the detent surfaces 14 with the axis of the weapon is selected in a known manner in such a way that the detent surfaces 14 do not have a self-inhibiting action on the bolts 13. For this reason, the bolts 13 are pressed inwards under the action of the force to which they are subjected, and are supported on the support surfaces 18 of the control component 3. The lever arm and the moment of this force which tends to pivot the bolts 13 inwards, are smaller in the case of the bolts designed according to the invention as a result of the forward displacement of the locking surface 15 more closely to the pivot axis of the bolt, so that the supporting force transmitted to the bolts 13 by the control component 3 also becomes smaller. As a result, the wear of the support surfaces 16, 18 of the bolts 13, which glide on one another, and of the control component 3 is reduced.

Claims

1. A breech mechanism for an automatic firearm, having a breech casing, a breech body which is displaceable longitudinally of the firearm in the breech casing and comprises a breech head and a control component slidable within the breech head, and at least one bolt to control the movement of the breech head and the control component, the or each bolt being designed as a one-arm lever, pivotably mounted in the breech head and having a locking surface and a support surface, the locking surface engaging, in the front-most firing position of the breech body, with a detent surface in the breech casing, and the control component being positioned below the support surface in the firing position to prevent pivoting of the bolts, wherein the front part of the bolt contains the pivot axis of the bolt and has the locking surface formed thereon, the support surface is formed on a rear extension of the bolt, the rear edge of the locking surface is located in front of the rear end of the support surface, and the front part of the bolt is wider than the rear extension.

2. A breech mechanism for an automatic firearm, substantially as described herein with reference to the drawings.

3. An automatic firearm, having a breech mechanism according to Claim 1 or Claim 2.

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