July 14, 1953 C. W. GILLIGAN 2,645,160

HEADSPACING ADJUSTING DEVICE FOR FIREARMS

Filed March 10, 1948

Fig. 1.

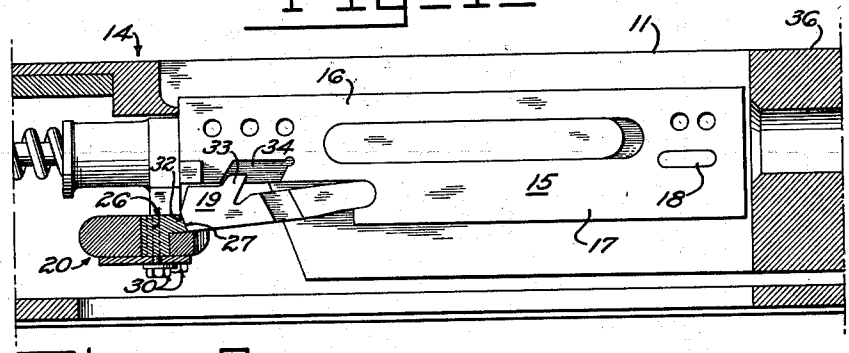


Fig. 2.

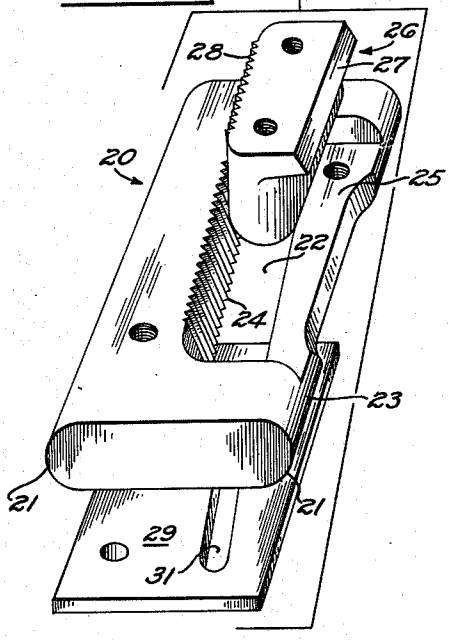
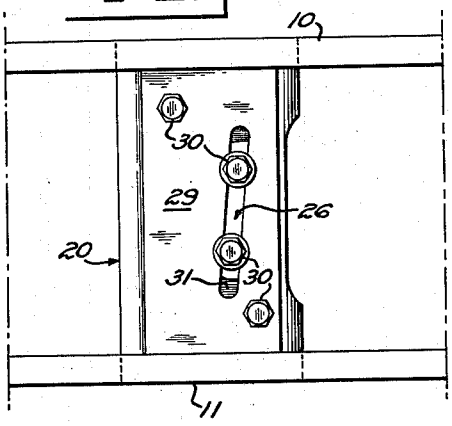


Fig. 3.



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HEADSPACING ADJUSTING DEVICE FOR FIREARMS

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5 Claims. (Cl. 89—180)

(Granted under Title 35, U. S. Code (1952), sec. 266)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to a device whereby the headspace of the bolt of a firearm may be readily adjusted so that such bolt will properly support a cartridge.

In firearms a properly headspaced bolt is one which will adequately support a cartridge when the bolt is in the locked battery position, that is, the base of the cartridge or some other reference point thereon must be a certain prescribed distance from the face of the bolt and obviously such distance must be held to close tolerances in view of the enormous breech pressures encountered. If the headspace is not properly maintained, rupture of the cartridge case with consequent damage to the firearm is inevitable.

A common fault of nearly all firearms is the inconvenience in adjusting the headspace of such firearms. Heretofore substantially all firearms have been provided with fixed locking lugs and correspondingly fixed locking shoulders so that no adjustment of the headspace of the bolt was possible and accordingly the related components of a firearm had to be manufactured to within exceedingly fine tolerance dimensions in order to properly assemble the breech mechanism so that the correct headspace could be obtained.

Accordingly it is an object of this invention to provide a device whereby the headspace of a firearm can be readily adjusted to obtain the optimum headspace setting without the necessity of selective assembly and hand fitting of the related breech elements affecting the headspace.

A particular object of this invention is to provide a headspace adjusting device for a firearm such as disclosed in U. S. Patent No. 2,199,872 to Birkigt.

Another object of this invention is to provide means for adjustably changing the headspace setting of a firearm which is positively locked when so set.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Fig. 1 is a fragmentary longitudinal sectional view of a firearm embodying this invention showing the locking element of the firearm in engagement with the locking shoulder of this invention.

Fig. 2 is an enlarged detail perspective view of

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the elements of this invention shown in exploded relationship.

Fig. 3 is an enlarged bottom view of the key member embodying this invention showing the manner of securing the elements thereof to the firearm.

This invention to be described in more detail later briefly comprises a key member which is transversely supported in the receiver of a firearm. Such key member has a vertically disposed slot therein one side of which is angularly disposed with respect to the front face of such key member and a plurality of serrations are provided along such side angularly disposed. A lock member is insertable in such slot and the lock member is provided with corresponding serrations thereon engageable with the aforementioned serrations. The lock member is likewise provided with a locking surface on the front face thereof which is engageable by the locking element of the firearm. By changing the position of the lock member within the key member, the longitudinal distance from the forward face of such lock member with respect to the locking element may be substantially varied and by this means the headspace of the bolt is correspondingly changed.

A preferred application of this invention is shown in Fig. 1 wherein such device is incorporated in a firearm of the type as disclosed in U. S. Patent No. 2,199,872 to Birkigt. While not limited thereto, the device of this invention is particularly adapted for use in such firearm. The firearm shown in such figure comprises a pair of spaced-apart parallel side plates 10 and 11 which are separated at the rear end by a buffer mechanism housing and by a front spacer (neither of which is shown). Side plates 10 and 11 and such buffer housing and front spacer form a receiver 14. A bolt 15 is slidably supported within receiver 14 and such bolt is arranged to be unlocked by a gas actuated operating rod (not shown). Bolt 15 essentially comprises a body 16, a pair of parallel slides 17 slidably mounted on opposite sides of such bolt. Slides 17 are connected at the forward end thereof to bolt 15 by a transverse key 18. Bolt 15 is arranged to be locked to receiver 14 by a locking element 19. Such locking element is pivotally mounted on the bottom of bolt 15 as shown in Fig. 1 and is arranged to be raised out of locked relationship with such receiver by parallel slides 17. Locking element 19 cooperates with a transverse key member 20 to lock bolt 15 to receiver 14.

Key member 20 is a substantially rectangular

member having rounded sides as shown at 21. Such key member is transversely supported in receiver 14 by press fitting into suitable openings in side plates 10 and 11. Key member 20 is provided with a vertically disposed slot 22 approximately in the center thereof. Such slot, however, is angularly disposed with respect to the forwardly facing surface 23 of such key member. The rearwardly facing surface of slot 22 is provided with a plurality of serrations 24. The front portion of key member 20 is milled as shown at 25 to accommodate a lock member 26.

Lock member 26 is substantially rectangular in configuration. The forward face 27 thereof is sloped and defines the locking surface with which locking element 19 cooperates to lock bolt 15 to receiver 14. The rear surface of lock member 26 is provided with the same slope as slot 22 and is likewise provided with a plurality of serrations 28 which correspond to serrations 24. The length of serrations 28, however, is substantially smaller in order to provide adjustment thereof as will be later described. That portion of lock member 26 being provided with sloped locking surface 27 is of reduced thickness in order that such portion may fit into the milled portion 25 of key member 20.

Lock member 26 is readily assembled to key member 20 by insertion thereof into the slot 22, serrations 28 engaging serrations 24 and the forward portion of lock member 26 engaging the milled section 25 of key 20. Cooperation of serrations 24 with serrations 28 secures lock member 26 against sideways displacement. A plate 29 of rectangular shape is bolted to the bottom of each of the members 20 and 26 to hold such members together as shown in Fig. 3. Bolts 30 are utilized for such purpose. Plate 29 is provided with a slot 31 therein which is inclined with respect to the forward edge of such plate to conform to the slope provided on both slot 22 and lock 26. Inclined slot 31 is necessary when changing the position of lock 26 for adjustment of the headspace so that the bolts 30 securing lock 26 to plate 29 can be traversed along slot 31. The length of plate 29 is adjusted so that it will fit between side plates 10 and 11 thereby eliminating any possible sideways movement of transverse key member 20.

When key member 20 is assembled to the firearm as shown in Fig. 1, the locking surface 27 is disposed forwardly as shown. A corresponding locking surface 32 is provided on the end of pivotally mounted locking element 19 and in the breeched position of the bolt, the locking surface 32 cooperates with locking surface 27 to securely lock the bolt in such position. A transversely disposed projection 33 is provided on locking element 19 which projects upwardly into a recess 34 provided in each of slides 17. The forward edge of projection 33 is sloped as shown in Fig. 1 while a corresponding slope is provided on the forward edge of recesses 34, such recesses cooperate with projection 33 to raise locking element 19 out of engagement with transverse key member 20 to unlock bolt 15 therefrom. Such is effected by the rearward movement of slides 17 upon actuation thereof by the gas operating mechanism (not shown).

When bolt 15 is in the breeched position, as shown in Fig. 1, with locking element 19 engaging locking member 26, the forward face of bolt 15 should properly support a cartridge 35 contained in the chamber of a barrel 36 which is slidably supported in the forward portion of receiver 14. If there is too much space between the face of the bolt and the base of the cartridge as may be readily determined by a feeler gage, the position of locking member 26 is moved to correct this deficiency. Locking member 26 is readily disassembled by removal of bolts 30 and such element is then raised to bring serrations 28 out of engagement with serrations 24 whereupon locking member 26 may be moved to a new position and again secured to key member 20 as previously described.

Due to the wedge construction of locking member 26, movement thereof in a transverse direction will accordingly change the longitudinal distance of the forwardly facing locking surface 27 thereof with respect to a fixed point on the receiver. By proper selection of the number of serrations, the width of such serrations, and knowing the angle of inclination of the slot 22 and locking member 26 with respect to the centerline of the respective members, the amount the front locking surface 27 moves in a longitudinal direction may be readily determined for each serration. This would of course make it much simpler for the individual in the field to know exactly how much the locking member is advanced for each serration and knowing the headspace requirements as determined by a feeler gage the proper amount of advancement of surface 27 can be readily determined. Conversely, if the bolt will not close, that is, if the locking element 19 can not be lowered into engagement with surface 27, the position of locking member 26 may be changed to move such element rearwardly so that locking element 19 can properly engage surface 27.

It is therefore apparent from the foregoing that there is here provided a simple means for accurately adjusting the headspace of a firearm and a means which will remain positively set when once adjusted. Such a device has wide application in many types of firearms and will eliminate costly fabricating processes due to the fact that no longer are various related breech elements required to be made to the exacting dimensions formerly found necessary. It is further desired to point out that when adjustment of the headspace is necessary such adjustment can be quickly and readily made without the use of complicated tools or costly gages.

I claim:

1. In a firearm of the automatic type having a receiver, a bolt reciprocable between a locked breeched position and a recoil position within the receiver, a locking element pivotally mounted on the bolt, the improvement comprising a key member mounted in the receiver, and adjustable means in said key member adapted to cooperate with the locking element whereby the bolt is positioned for optimum headspace.

2. In a firearm of the automatic type having a receiver, a bolt reciprocable between a locked breeched position and a recoil position within the receiver, a locking element pivotally mounted on the bolt, the improvement comprising a key member mounted in the receiver, said key member having a slot therein, a lock member insertable in said slot, means for adjustably securing said lock member in said slot, said lock member being constructed and arranged to cooperate with said locking element to longitudinally position the bolt for headspace adjustment.

3. In a firearm of the automatic type having a receiver, a bolt reciprocable between a locked breeched position and a recoil position within the receiver, a locking element pivotally mounted

on the bolt, the improvement comprising a key member mounted in the receiver, said key member having a vertical slot therein disposed angularly with respect to the forward face thereof, a lock member adapted to be inserted within said slot, said lock member being narrower than said slot for limited lateral movement therein, and means for securing said lock member within said slot in any one of a plurality of positions, said lock member cooperating with the locking element to reposition the bolt for headspace adjustment when said lock member is moved laterally.

4. The combination defined in claim 3 wherein said means comprises a plurality of serrations on said lock member engageable with corresponding serrations in said slot.

5. A headspace adjusting device for a firearm of the automatic type having a receiver, a bolt reciprocable between a locked breech position and a recoil position within the receiver, and a locking element pivotally mounted on the bolt,

comprising a key member transversely mounted in the receiver, said key member having a slot therein disposed at an acute angle to the forward face thereof, a plurality of serrations on the rear surface of said slot, a lock member insertable in said slot having a lesser width than the length of said slot, said lock member having a plurality of serrations engageable with said first mentioned serrations whereby said lock member may be selectively positioned within said slot, a locking face on said lock member adapted to cooperate with the locking element to lock the bolt to the receiver in the breeched position of the bolt, said angularly disposed slot permitting longitudinal displacement of said locking face of said lock member for headspace adjustment, and means for securing said lock member to said key member.

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No references cited.