

F. K. YOUNG.
FIREARM.
APPLICATION FILED JULY 10, 1914.

1,157,750.

Patented Oct. 26, 1915.

Fig.1.

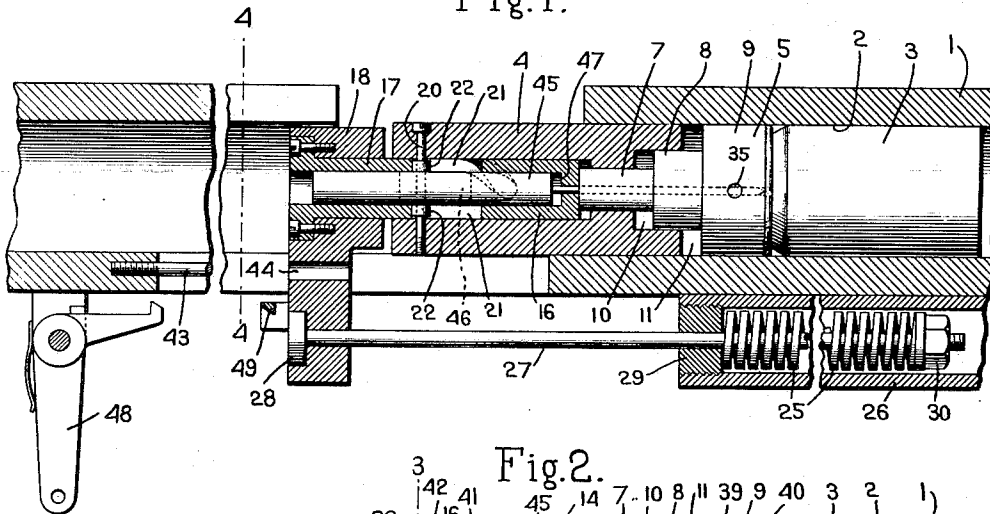


Fig.2.

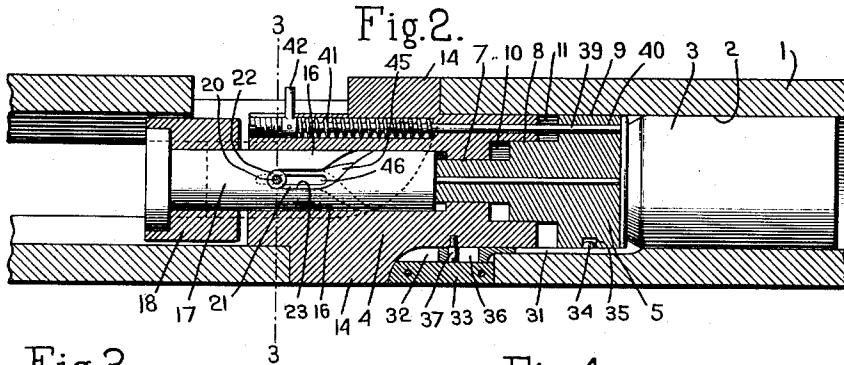


Fig.3.

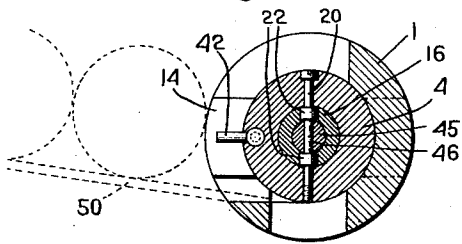


Fig.4.

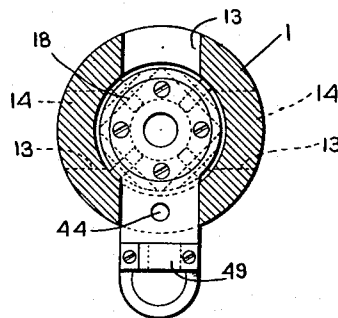
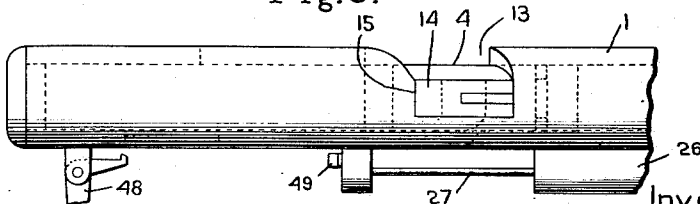


Fig.5.



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UNITED STATES PATENT OFFICE

FRANKLIN K. YOUNG, OF WINTHROP HIGHLANDS, MASSACHUSETTS.

FIREARM.

1,157,750.

Specification of Letters Patent.

Patented Oct. 26, 1915.

Application filed July 10, 1914. Serial No. 850,073.

To all whom it may concern:

Be it known that I, FRANKLIN K. YOUNG, a citizen of the United States, residing at Winthrop Highlands, county of Suffolk, State of Massachusetts, have invented an Improvement in Firearms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to firearms of the type in which the force of the explosion of the cartridge is utilized to cause the removal of the spent case and has for an object to improve the breech mechanism of firearms of this character.

The invention consists in certain novel features of construction and arrangement of parts as will be hereinafter described and then pointed out in the claims.

In the drawing in which I have illustrated a selected embodiment of my invention, Figure 1 is a central longitudinal sectional view of a breech mechanism constructed in accordance with my invention; Fig. 2 is a longitudinal sectional plan view of the same; Fig. 3 is a transverse sectional view taken on the line 3—3 Fig. 2; Fig. 4 is a transverse sectional view taken on the line 4—4 Fig. 1, and Fig. 5 is a view in elevation of the mechanism.

The present invention may be applied to firearms of various types and sizes but is herein illustrated and described particularly as applied to an arm of the type commonly known as field guns for which type certain features of the invention are especially advantageous.

The construction illustrated consists of a firearm comprising a barrel having a firing chamber, a breech-closing member, a yieldable, cushioned bolt head and means for unlocking the breech block and opening the breech, set in operation by the movement of the cushioned bolt head relative to the breech closing member.

The barrel 1 is of usual construction providing a firing chamber 2. A locking sleeve 4 is slidably mounted in the frame behind the firing chamber, a yieldable bolt head 5 being interposed between the cartridge and the locking sleeve 4. In the construction illustrated the bolt head 5 is mounted in the forward end of the locking sleeve 4 and the two parts together may properly be considered as forming the breech block of the arm.

These parts however are herein described and considered as separate elements. In accordance with my invention the bolt head is cushioned with respect to the locking sleeve in order that when the cartridge explodes the rearward movement of the bolt head may be checked somewhat gradually. This is accomplished by providing an air cushion between the bolt head and locking sleeve. In the construction illustrated the bolt head has three portions of different diameters as indicated at 7, 8, 9, and the locking sleeve is correspondingly shaped. The portions 7 and 8 telescope and fit quite closely in the corresponding recesses in the locking sleeve thus providing a substantially air tight annular chamber or air cushion 10. The forward end of the bolt head is preferably arranged to provide the sole recoil-resisting support for the base of the cartridge, the full thrust thereby operating against the bolt head. This portion may also fit rather tightly in the barrel and the annular chamber 11 thus be made to act as an auxiliary air cushion. The locking sleeve is thus provided with an opening through which the neck 7 of the bolt head is adapted to reciprocate and in which it closely fits. The intermediate portion 8 of the bolt head closely and slidably fits in the corresponding recess in the locking sleeve, closing it and thus providing a substantially air-tight chamber or air cushion 10. By this construction upon explosion of the cartridge in the firing chamber the bolt head is given a sudden and forcible rearward movement which is checked more or less gradually in a manner to reduce the hammer effect which would be produced if no cushioning means were provided. The full impulsive force of the recoil is thus transmitted to the movable bolt head 5. The movement of the bolt head is utilized to set in operation mechanism to unlock the locking sleeve and carry it to open position, the mechanism being timed to permit the charge to leave the barrel before the locking sleeve is unlocked and opened. In the construction illustrated the locking sleeve slides longitudinally of the arm toward and from closed position and rotates when in its forward position to permit locking. Slots 13 are provided in the frame to receive lugs 14 projecting from the locking sleeve, the forward end of each slot presenting a locking portion as indicated at 15 in Fig. 5. These slots are preferably curved

toward their forward end as seen in Fig. 5 wherefore the sleeve begins to rotate during its forward movement before it reaches its extreme forward position, thus facilitating rotation into locking position.

Any suitable means may be provided for causing the movements of the locking sleeve. I prefer to provide an intermediate member which is set in motion by the plunger during its rearward movement this intermediate member operating after a predetermined interval to unlock the locking sleeve and then to move it to open position. A spring may be provided to return the parts to initial position. As illustrated the intermediate member consists of a bolt 16 which for convenience may be made in two parts, one part 17 being slidably mounted in a bore in the locking sleeve and the other part 18, rigidly secured to the first part and slidably but non-rotatably mounted in the frame. This bolt it will be obvious is in fact a weight and operates as such during the operation of the gun. The bolt is normally in contact at its forward end with the rear end of the bolt head 5 which is adapted to be driven rearwardly upon discharge of the cartridge. A pin and slot connection is provided between the bolt 16 and locking sleeve 4 comprising a pin 20 secured in the locking sleeve and extending through slots 21 in the bolt. Rollers 22 are mounted on the pin within the slots to reduce the friction in operation. The slots are straight for a portion of their length as indicated at 23 but are curved at their other ends. The bolt 16 cannot rotate wherefore, after a certain initial rearward movement of the bolt during which the pin 20 is in the straight part of the slots 21, the pin and slot connection causes rotation of the locking sleeve and therefore the disengagement of the lugs 14 from the locking portion of the slots 13 and upon further rearward movement of the bolt the pin 20 engages the ends of the slots and the locking sleeve moves rearwardly with the bolt thus opening the breech.

A spring 25 is provided to check the rearward movement of the bolt 16 and ultimately to return it and the other parts of the breech mechanism to initial position. The spring may conveniently be mounted in a casing 26 secured to the barrel or frame and connected to the weight by a rod 27 fast to the projecting portion of the bolt as indicated at 28. The rod extends through a plug 29 screwed into the end of the casing 26 and the spring 25 surrounds the rod bearing at one end against the plug 29 and at its other end against a nut 30 adjustably mounted upon the rod. The tension of the spring may thus be adjusted by varying the position of the nut.

An extractor 31 is provided and operates in the usual manner. This extractor is

mounted in a slot 32 in the locking sleeve the slot being closed by a filling plate 33. This extractor is provided with a projection 34 fitting into a hole 35 in the periphery of the bolt head, so that the extractor always moves with the bolt head. The extractor is provided at its rear portion with a slot 36 into which a screw 37 projects from the locking sleeve the slot being of sufficient length to permit the necessary longitudinal movement of the bolt head relative to the locking sleeve. The extractor operates as usual to engage the rim of the cartridge and extract it from the firing chamber and also performs the additional function of preventing the accidental removal of the bolt head from the locking sleeve.

Any suitable ejector may be provided. I have illustrated an ejector 39 slidably mounted in the locking sleeve and extending through a bore 40 in the bolt head. A spring 41 normally holds the ejector in its rearmost position. A laterally projecting pin 42 is secured to the ejector and is arranged to engage the stop 43 shown most clearly in Fig. 1, when the locking sleeve reaches its rearmost position. It will be noted that the locking bolt during the first part of its rearward movement rotates from the position shown in Fig. 2 through an angle of 90 degrees thus bringing the pin 42 into position to engage the stop 43 causing the ejector to move forward relative to the locking bolt as the locking bolt continues its rearward movement thus effectually ejecting the spent cartridge case from the frame. The slidable weight 18 is bored as indicated at 44 to prevent interference of the parts.

A preferred firing mechanism is illustrated in Fig. 1, and consists of a firing pin 45 mounted in a bore in the bolt 16. The forward end of the firing pin is preferably reduced and extends through a bore in the bolt head to engage the cartridge cap. The firing pin is preferably movable in the bolt and is shown as provided with a slot 46 through which the pin 20 extends thus limiting the relative movement between the firing pin and locking sleeve. Other means are provided to limit the movement of the firing pin relative to the bolt. In the construction illustrated the bolt has an internal shoulder 47 against which a corresponding shoulder of the firing pin may engage. The parts are so proportioned that the firing pin can only move forward sufficiently to explode the cartridge when the bolt is in its forward position and it is to be noted that the bolt can only move to such position after the locking sleeve has been rotated into locked position. There is therefore no possibility that the firing pin may explode the cartridge until the breech is closed and locked. I prefer to make the firing pin of

sufficient weight so that it will be carried forward by its own inertia to explode the cartridge after the forwardly moving locking sleeve and bolt come to rest.

5 A sear 48 is pivoted to the frame, as indicated in Fig. 1, in position to engage a corresponding catch 49 upon the bolt and may be pulled and held retracted to permit full automatic action or may be pulled and
10 released to provide for single shot operation.

Any suitable means may be provided for supplying fresh cartridges. In Fig. 3 I have shown in dotted lines and somewhat
15 diagrammatically an inclined support 50 upon which the fresh cartridges may be carried in position to roll into the breech mechanism under the influence of gravity. This particular mechanism forms no part of the
20 present invention however and need not be more specifically described.

Having fully described my invention, what I claim as new and desire to obtain by Letters Patent, is:

25 1. In a firearm, in combination, a barrel having a firing chamber, a locking sleeve

movable toward and from said firing chamber, a cartridge-engaging bolt head having portions of different diameters fitting closely in corresponding portions in the forward
30 end of the locking sleeve whereby an air chamber is formed to provide a shock absorbing air cushion therebetween.

2. In a firearm, in combination, a barrel having a firing chamber, a locking sleeve
35 movable toward and from said firing chamber, the forward part of said sleeve being recessed, a cartridge-engaging member having portions of different cross-section fitting and telescoping within and corresponding
40 respectively to the sleeve opening and recess whereby an air chamber is formed to provide a shock-absorbing air cushion between said sleeve and said member.

In testimony whereof, I have signed my
45 name to this specification, in the presence of two subscribing witnesses.

FRANKLIN K. YOUNG.

Witnesses:

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THOMAS J. DRUMMOND.