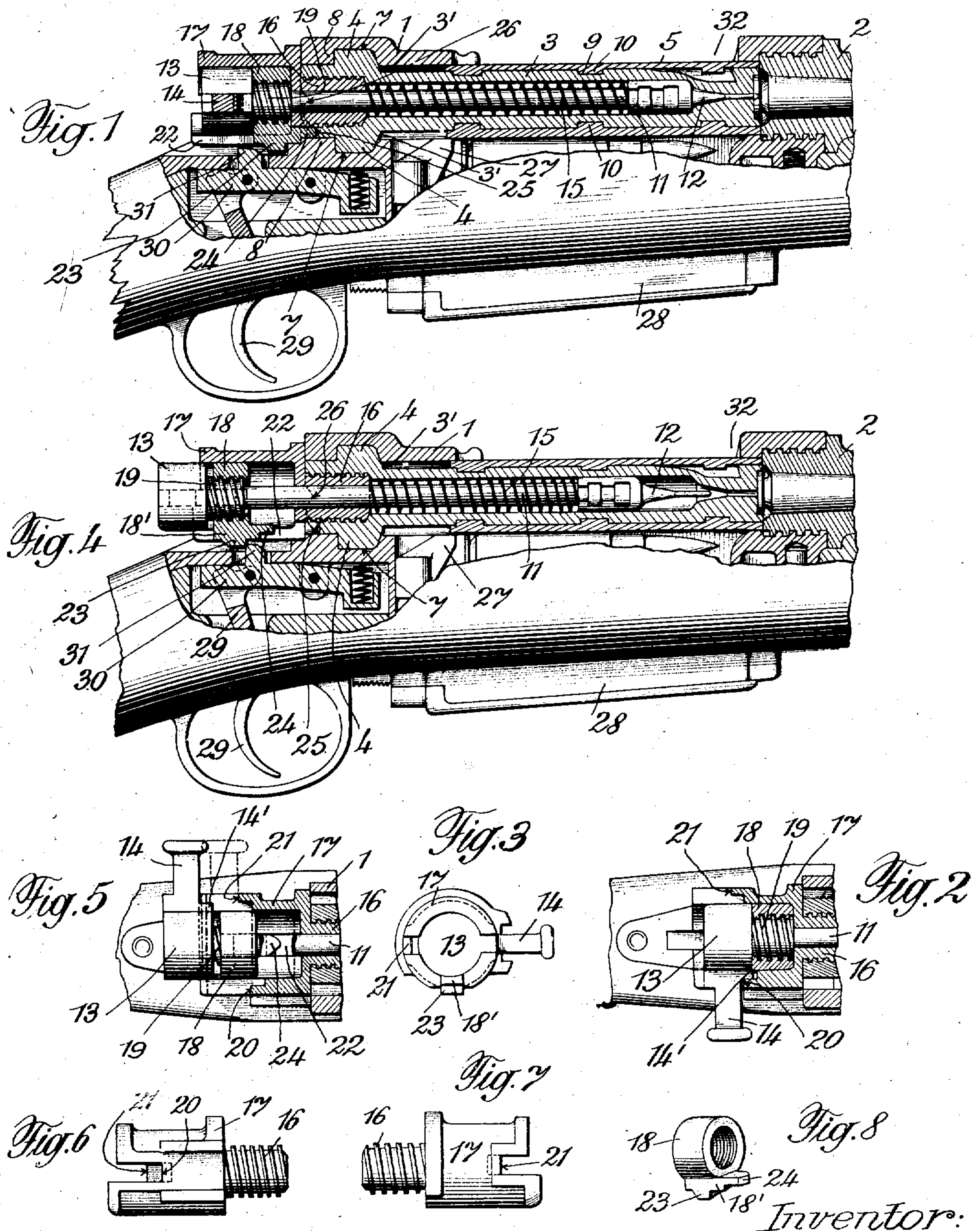


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SAFETY MECHANISM FOR STRAIGHT PULL BREECH ACTIONS OF MILITARY RIFLES.
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Atty.

UNITED STATES PATENT OFFICE.

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SAFETY MECHANISM FOR STRAIGHT-PULL BREECH-ACTIONS OF MILITARY RIFLES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HANS STAMM, a citizen of the Republic of Switzerland, residing at St. Gallen, Switzerland, have invented
5 new and useful Improvements in Safety Mechanisms for Straight-Pull Breech-Actions of Military Rifles; and I do hereby declare the following to be a full, clear, and
10 exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this
15 specification.

In my United States Patent Number 1,124,071, dated January 5, 1914, I have described a safety mechanism for a straight
20 pull breech action with a rotary bolt for military rifles, wherein the striker is capable of rotating relatively to the striker nut which is screwed on it and is formed with the striker lug, so that the striker can be
25 drawn back to "safety" by a partial turn by hand in both the bolted and unbolted positions of the breech action and also when the breech action has been taken out of the breech frame. In that safety mechanism
30 the striker is prevented from rotating in both the "release" and "safety" positions, by means of a spring safety pin which is mounted in the striker nut and is adapted to snap into suitable catches in the head of the
35 striker. In that mechanism the striker nut and the striker head carrying the safety arm, are mounted in an unprotected condition behind the guide sleeve, and therefore the striker is very liable to become shifted
40 by an unintentional turning of the safety arm from the safety position, which might give rise to serious consequences. Further, in that arrangement the cocking of the
45 striker is effected independently of the operation for placing it at "safety", that is to say, the striker must be drawn back by hand for this purpose.

The present invention has now for its object to remedy those drawbacks, and to this
50 end the guide sleeve is formed at its rear with an enlargement having two mutually facing lateral notches into which the striker with the safety arm can be inserted with a
55 turning movement for the purpose of being placed at "safety" and "release" and in which it is held by the tension of the strik-

ing spring. In this operation, owing to the axial movement of the striker the striker lug is caught by the sear and is thereby cocked; and it remains cocked after the mechanism has moved to "release"

A constructional form of this invention is illustrated by way of example in the accompanying drawings in which:—

Figure 1 is a vertical longitudinal section of a straight pull breech action with safety
60 mechanism of a partly shown military rifle with the striker released after a shot has been fired. Fig. 2 is a horizontal section of the rear portion of the breech action as shown in Fig. 1, and Fig. 3 is a rear view of
65 Fig. 2. Fig. 4 is a vertical longitudinal section of the straight pull breech action with the striker cocked and partly at safety. Fig. 5 is a horizontal section of the rear portion of the breech action as shown in Fig. 4.
70 Figs. 6 and 7 illustrate the guiding sleeve, and Fig. 8 is a perspective view of the striker nut.

As shown, the military rifle has a straight
80 pull breech action capable of moving to-and-fro in a straight line in a stationary breech frame 1 which is rigidly fixed to the barrel 2. The breech action comprises the rotary
85 breech bolt 3 formed at its enlarged rear end with two locking nibs 4 provided with transverse inclined surfaces (Figs. 1 and 4); these nibs are made in one piece with the
90 breech bolt. The breech action comprises further the bolt-actuating sleeve 5 which is slipped on the breech bolt from the front end of the latter, and is adapted to slide to-and-fro along the same; it is provided in the
95 usual manner with a handle (not shown) by means of which the said sleeve and with it the entire breech action can be moved to-and-fro in the breech frame for the purpose of opening and closing the breech.

For the reception of the locking nibs 4 in
100 locking the breech action there are provided on the rear end of the breech frame 1 two locking cavities 7 which are limited at the rear by the stops 8 (Figs. 1 and 4).

For the purpose of imparting to the
105 breech bolt the rotary motion required for locking and unlocking, the breech bolt is formed with screw grooves 9 into which the bolt-actuating sleeve 5 projects with corresponding screw pieces 10. The bolt-actuating sleeve 5 is able to move longitudinally to
110 such an extent that its motion on the breech

bolt will cause the latter to make a quarter turn (90 degrees), the nibs 4 being rotated into and out of the cavities 7. The movement of the bolt-actuating sleeve on the breech bolt is limited rearwardly by the stop surface 3' on the breech bolt (Fig. 1), and forwardly by the head of the cartridge case extractor (not shown) which is mounted on the bolt-actuating sleeve.

The striking mechanism is mounted in the breech bolt 3; it consists of the striker 11 which carries on its forward end the removable striker needle 12, and on its rear end a head 13 having a laterally projecting safety arm 14 (Fig. 2). This arm has in front a small nose 14'. The striker is acted upon by the striking spring 15 which bears at one end against the striker needle 12 and at its other end against the guiding sleeve 16 screwed into the breech bolt 3 (Figs. 1-3). This guiding sleeve is formed at its rear end with an enlarged part 17 having a cylindrical bore which receives the striker nut 18 and the head 13, lying behind it, of the striker. The striker 11 has a screw threaded portion 19 on which the striker nut is screwed. The guiding sleeve 16 is formed with lateral notches 20, 21 of different depths, situated diametrically facing each other, that is, 180 degrees apart, into which the safety arm 14 enters in the "safety" and "release" positions of the striker, and in which it can be secured against rotating in an extremely reliable manner by the tension of the striking spring 15 (Figs. 2, 3 and 5, 7). The notches 20 and 21 are furnished in front with recesses for the nose 14' of the safety arm (Fig. 2).

The pitch of the screwthread of the striker nut 18 and of the striker 11 is such that by turning the safety arm 14 the striker is screwed back in the striker nut, and thereby the striker needle in the breech bolt is drawn back and consequently placed at "safety" to a sufficient extent. The striker nut 18 projects with a fillet 18' (Fig. 8) formed on its underside into a longitudinal slot 22 (Figs. 1 and 3) in the guiding sleeve 17. From the underside of this fillet there projects a lug 23, and from the front end of the fillet there projects the safety nose 24 (Fig. 8) which cooperates in the same manner as described in my aforesaid patent, with two notches 25 and 26 (Fig. 4) formed 90 degrees apart in the rear end of the breech bolt for the purpose of moving the breech bolt 3 automatically to "safety."

The notch 25 is deeper than the notch 26 so as to permit the striker with its nut 18, to shoot forward in the discharge of the rifle, whereas the notch 26 in which the nose 24 enters after the unlocking of the breech bolt and which is connected by an inclined surface to the notch 25, serves to

keep the striker drawn back at "safety." The lower half of the part 17 of the guiding sleeve 16 projects beyond the upper half of the part 17 so as to present a support for the striker head 13 when the safety arm is turned.

27 is the spring cartridge case ejector which is mounted below the breech bolt with freedom of vertical movement; it serves to eject the empty cartridge case. 28 is the cartridge magazine with a removable magazine bottom. 29 is the trigger and 30 is the sear which is under spring action and has a lug 31 to engage and hold the striker lug 23. 32 is the loading opening (Figs. 1 and 4).

The manner of using and the operation of the rifle with the improved safety mechanism is as follows:—Fig. 1 shows the breech action in its locked condition after a shot has been fired. The bolt-actuating sleeve 5 is in its forward position on the breech bolt, and the striker nut 18 projects with its nose 24 into the deeper notch 25 in the rear end of the breech bolt, while the safety arm 14 of the striker 11 is engaged in the deeper notch 20 of the guiding sleeve 16, 17 that is to say, it is in its released position. To open the breech action the bolt-actuating sleeve 5 is drawn back. This movement produces at first by means of the screw grooves 9 and screw pieces 10 a rotation of the breech bolt 3, and thus unlocks the breech action, while the discharged empty cartridge case is loosened to a considerable degree by the transverse inclination of the locking nibs 4.

Toward the end of the unlocking movement the rear end of the bolt-actuating sleeve strikes against the stop face 3' of the breech bolt, and the locking nibs 4 pass out of the cavities 7 of the breech frame; and from this instant onward the entire breech action is drawn back behind the loading opening 32. At the same instant the loosened empty cartridge case is ejected by the ejector 27 situated underneath behind the loading opening, and during the backward movement of the bolt-actuating sleeve 5, that is to say, during the unlocking rotation of the breech bolt, the striker 11 is placed automatically at safety by the fact that the nose 24 of the striker nut 18 moves into the less deep notch 26 in the rear end of the breech bolt whereby the breech bolt 3 is prevented at the same time from rotating to any further extent.

In closing the breech, the straight forward pushing of the bolt-actuating sleeve 5 effects by means of the breech bolt head the pushing of a fresh cartridge (which has been pressed up out of the magazine) into the barrel, and at the same time in the forward pushing of the breech action the striker lug 23 on the nut 18 is stopped by the sear lug

31, and the striking spring 15 is compressed. When the breech bolt 3 strikes the rear end of the barrel behind the cartridge, the forward movement of the bolt-actuating sleeve (which alone is now moved) causes through the medium of the screw grooves 9 and screw pieces 10, the breech bolt to turn again and thereby become cocked again. In this movement the nose 24 on the striker nut 18 comes again opposite the deeper notch 25 in the rear end of the breech bolt into which it enters when the rifle is discharged. The rifle is thus again ready to be fired. In addition to this automatic placing of the striker and breech bolt at safety during the opening of the breech action which placing at safety operates in the same manner as described in my aforesaid patent, the striker 11, may, as hereinbefore stated, also be placed at safety by hand, before the shot is fired, that is, before the breech action is opened. For that purpose the safety arm 14 with the striker is drawn back out of the right hand slot 20 (Fig. 2), and turned through 180 degrees over to the left with rotation of the striker, and is then engaged into the left hand slot 21 in the guiding sleeve 16, 17. Since however in withdrawing the striker the striker nut with the striker lug 23 comes behind the lug 31 of the sear, the turned over safety arm 14 with the striker is also able for the present to be inserted for a slight distance, that is, with the nose 14', into the safety slot 21 of the guiding sleeve 16, 17, under the influence of the striking spring 15, because the striker lug abuts against the sear lug and is prevented by the latter from shooting forward, that is to say, it is locked (Figs. 4 and 5). During this first stage of the safety operation the striking mechanism has thus been cocked and at the same time placed at safety while in its cocked state. This is however only a temporary "safety" position during the fighting in the firing line. By drawing the safety arm 14 back for a short distance and turning it over in its cocked state, out of the left hand slot 21 back into the right hand slot 20 of the guiding sleeve (Fig. 2), the rifle is at once restored to its cocked condition ready for firing.

When it is desired to place the rifle at safety for a long period, then, when the safety arm 14 is in the safety notch 21, the trigger 29 is pulled to release the striker lug, and thus allow the safety arm of the striker to enter completely into the notch 21 (dotted position in Fig. 5). But since, as hereinbefore stated, the turning over of the arm 14, that is the rotation of the striker relatively to the striker nut 18, caused a screwing back of the striker in the striker nut (as described in my aforesaid patent) the striker needle is no longer able to come in contact with the detonator of the car-

tridge, and the rifle in this second stage of the safety movement, is placed at safety finally and with an extreme degree of reliability.

The release from safety is effected by drawing the safety arm out of the safety notch 21, turning it over to the right, and then inserting it again into the notch 20 for discharging the rifle. Since however the lug 23 on the striker nut is again stopped by the sear lug 31, the striker 11 can now move only a short distance into the right hand slot whereby the rifle is now released from safety and is again ready for firing.

Thus according to the present invention, in contradistinction to the construction described in my aforesaid patent, the operation of placing the striker 11 at safety effects at the same time the cocking of the striker which remains cocked even after the release until the shot is fired. That is to say, in the present case, it is not necessary after the release, to pull back the striker specially, in order to cock it, as in the construction described in my aforesaid patent.

The two slots 20 and 21 in the guiding sleeve 16, 17 on the left hand for placing at safety, and on the right for cocking and firing, are provided simply for preventing rotation of the striker, and they must have a depth sufficient to allow the safety arm 14, when the striker is cocked, to enter at all times with its nose 14' into the recesses at the ends of the slots 20, 21 in order that the cocking and safety noses of the striker nut shall always be able to be pressed by the striking spring 15 without hindrance either into the deeper notch 25 of the breech bolt for firing the shot, or into the less deep safety notch 26 of the breech bolt, because these two notches in the breech bolt are designed to couple the breech bolt in both its locked and unlocked conditions, always in the correct position relative to the guiding sleeve 16, 17, without being liable to be turned or shifted.

Owing to the simplicity of construction it is a very easy matter to take the breech action apart and put it together again. After removal of the breech action from the breech frame, the guiding sleeve 16, 17 with the striking mechanism can be readily screwed out of the breech bolt 3 from behind, whereupon the striker needle 12 may be disconnected from the striker 11, and can then be removed together with the striking spring. Then the striker 11 by means of its arm 14, is drawn together with the striker nut, out of the guiding sleeve 16, 17 from behind, and the striker is screwed out of the striker nut 18.

The putting together is effected in the reverse order with equal ease and simplicity. The striker 11 with the striker nut 18 is pushed into the guiding sleeve 16, 17 from

behind. Then the striking spring is slipped from the front over the long front portion of the striker, and the striker needle is coupled to the striker 11 in front of the striking spring. The whole is then screwed into the breech bolt 3 from behind by means of the sleeve 16, 17, whereupon the breech action can be readily pushed into the breech frame.

10 The improved safety mechanism according to the present invention has in addition to the hereinbefore stated advantage that the striker is cocked in the securing movement, the further advantage over the safety
15 mechanism described in my aforesaid patent, that the striker nut and the head of the striker with the safety arm, lie in the released and safety positions in the guiding sleeve, protected against external injurious
20 influences and against unintentional turning and shifting.

What I wish to claim is:

1. In a straight pull breech action for military rifles, a breech frame, a rotary
25 breech bolt therein, a striking apparatus in the breech bolt comprising a striker having a safety arm, a striker spring, and a striker nut screwed on the striker and having a lug, said striker capable of rotating relatively to
30 said nut, and a guide sleeve for the striker movably fixed in the back part of the breech bolt and receiving said nut and safety arm, said sleeve being provided with means to hold the striker by the tension of the striker
35 spring at safety and at release.

2. In a straight pull breech action for military rifles, a breech frame, a rotary breech bolt therein, a striking apparatus located in the breech bolt and comprising
40 a striker having a safety arm, a striker spring, and a striker nut screwed on the striker and having a lug, said striker capable of rotating relatively to said nut, a guide sleeve for the striker movably fixed
45 in the back part of the breech bolt and having an enlarged rear part to receive said nut and the safety arm, said sleeve having two lateral diametrically opposite notches into which the safety arm can be inserted by a
50 rotary movement and be held therein by the tension of the striking spring for the purpose of placing the striker at safety and at release.

3. In a straight pull breech action for
55 military rifles, a breech frame, a rotary breech bolt therein, a striking apparatus in the breech bolt comprising a striker having a safety arm, a striker spring, and a striker nut screwed on the striker and having a lug,
60 the striker capable of rotating relatively to said nut, a guide sleeve for the striker movably fixed in the back part of the breech bolt and having an enlarged rear part with a cylindrical bore to receive said nut and the

head of the striker, said sleeve having two
65 lateral diametrically opposite notches of different depth into which the safety arm can be inserted by a rotary movement and be held therein by the tension of the striking
70 spring for the purpose of placing the striker at safety and at release, and means to catch and cock the striker by the axial movement resulting therefrom.

4. In a straight pull breech action for military rifles, a breech frame, a rotary
75 breech bolt therein, a striking apparatus in the breech bolt comprising a striker having a safety arm, a striker spring, a striker nut screwed on the striker and having a lug, said
80 striker capable of rotating relatively to said nut, a guide sleeve for the striker movably fixed in the back part of the breech-bolt and having an enlarged rear part to receive the striker nut and the head of the striker, said sleeve having two lateral diametrically
85 opposite notches into which the safety arm can be inserted by a rotary movement and be held therein by the tension of the striking spring for the purpose of placing the
90 striker at safety and at release, and a sear lug adapted to catch the striker by the striker lug and to cock the striker by the axial movement resulting therefrom to bring the striker in the released and safety
95 position.

5. In a straight pull breech action for military rifles, a breech frame, a rotary
breech bolt therein, a striking apparatus in the breech bolt comprising a striker having
100 a safety arm, a striker spring, a striker nut screwed on the striker and having a lug, said striker capable of rotating relatively to the nut, a guide sleeve for the striker movably fixed in the back part of the breech
105 bolt and having an enlarged rear part to receive the striker nut and the head of the striker, said sleeve having two lateral diametrically opposite notches into which the safety arm can be inserted by a rotary movement and be held therein by the tension of
110 the striking spring for the purpose of placing the striker at safety and at release, means to cock the striker in the securing movement, and means on the safety arm to prevent the cocked striker from rotating
115 while in the safety position and immediately before firing.

6. In a straight pull breech action for military rifles, a breech frame, a rotary
breech bolt therein, a striking apparatus in
120 the breech bolt comprising a striker having a safety arm, a striker spring, a striker nut screwed on the striker and having a lug, said striker capable of rotating relatively to said nut, a guide sleeve for the striker movably fixed in the back part of the breech
125 bolt and having an enlarged rear part to receive the striker nut and the safety arm, the

enlarged part of the sleeve having two lateral-diametrically opposite notches into which the safety arm can be inserted by a rotary movement and be held therein by the tension of the striking spring for the purpose of placing the striker at safety and at release, means to cock the striker in the securing movement, the safety arm of the striker provided with a forwardly directed nose adapted to enter to such a depth into one of two notches in the guiding sleeve that the cocked striker is prevented from rotating while in the safety position and immediately before firing.

7. In a straight pull breech action for military rifles, a breech frame, a rotary breech bolt therein, a striking apparatus in the breech bolt comprising a striker having a safety arm, a striker spring, a striker nut screwed on the striker and having a lug, said striker capable of rotating relatively to said nut, a guide sleeve for the striker movably fixed in the back part of the breech bolt and having an enlarged rear part to receive the striker nut and the head of the striker, said sleeve having two lateral diametrically opposite notches into which the safety arm can be inserted by a rotary movement and be held therein by the tension of the striking spring for the purpose of placing the striker at safety and at release, means to cock the striker in the securing movement, means on the safety arm to prevent the cocked striker from rotating while in the safety position and immediately before firing, and means to prevent

a rotation of the striker nut by axial and rotary movements of the striker.

8. In a straight pull breech action for military rifles, a breech frame, a rotary breech-bolt therein, a striking apparatus in the breech bolt comprising a striker having a safety arm, a striker spring and a striker nut screwed on the striker and having a lug, said striker capable of rotating relatively to said nut, a guide sleeve for the striker movably fixed in the back part of the breech bolt and having an enlarged rear part to receive the striker nut and the head of the striker, said sleeve having two lateral diametrically opposite notches into which the safety arm can be inserted by a rotary movement and be held therein by the tension of the striking spring for the purpose of placing the striker at safety and at release, means to cock the striker in the securing movement, means on the safety arm to prevent the cocked striker from rotating while in the safety position and immediately before firing, the enlarged portion of the guiding sleeve having a longitudinal slot through which a fillet on the striker nut projects, whereby the striker nut is prevented from rotating.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

HANS STAMM.

Witnesses:

FRANK DINNUKE,
EMIL MEILE.