

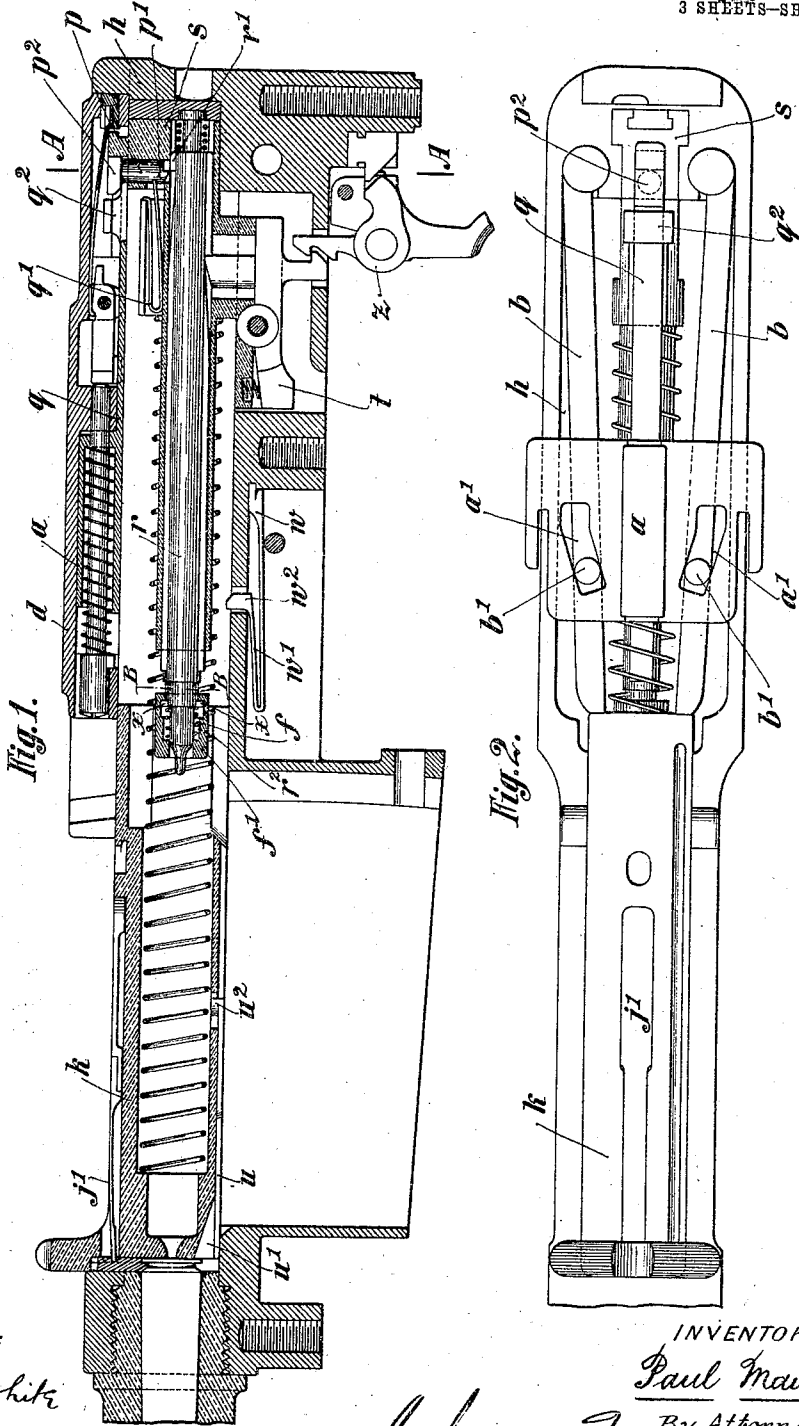
P. MAUSER.  
SMALL ARM.

APPLICATION FILED AUG. 27, 1909.

987,584.

Patented Mar. 21, 1911.

3 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR:

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3 SHEETS—SHEET 2.

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Fig. 9.

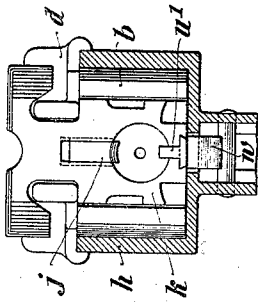


Fig. 3.

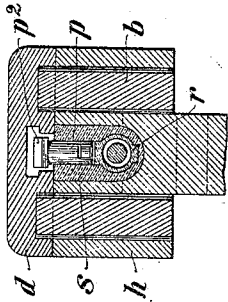


Fig. 4.

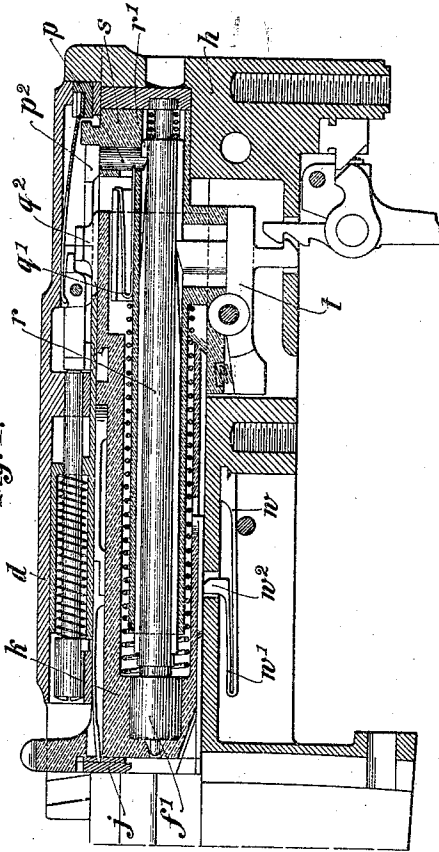


Fig. 8.

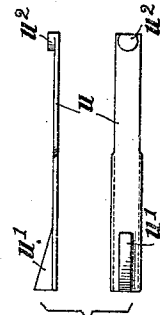
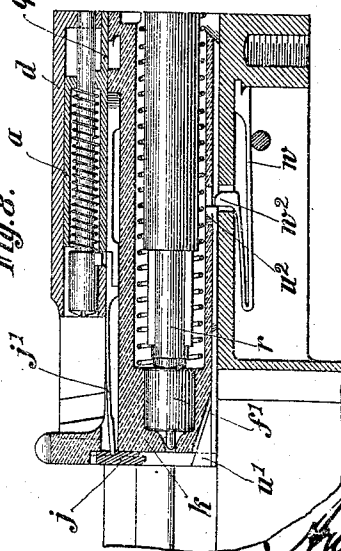


Fig. 10.

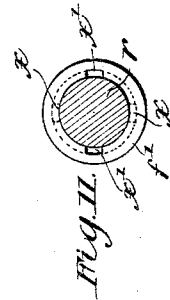


Fig. 11.

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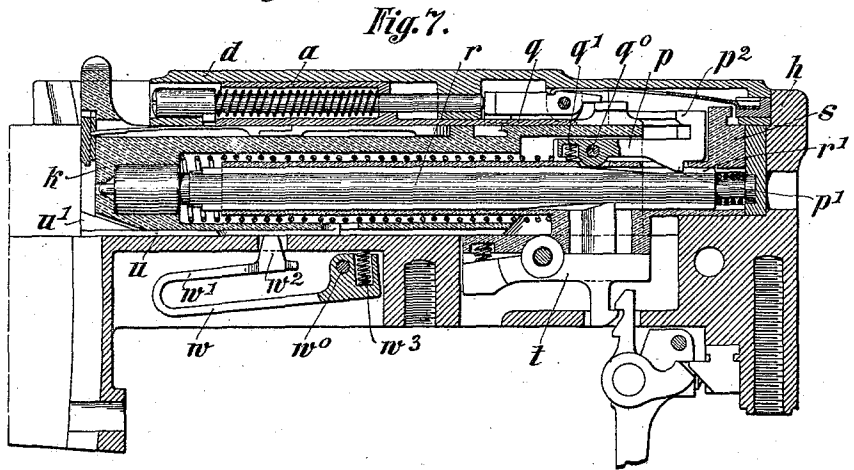
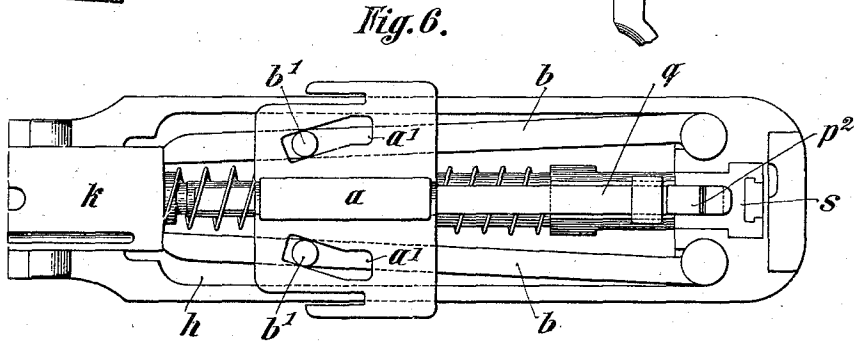
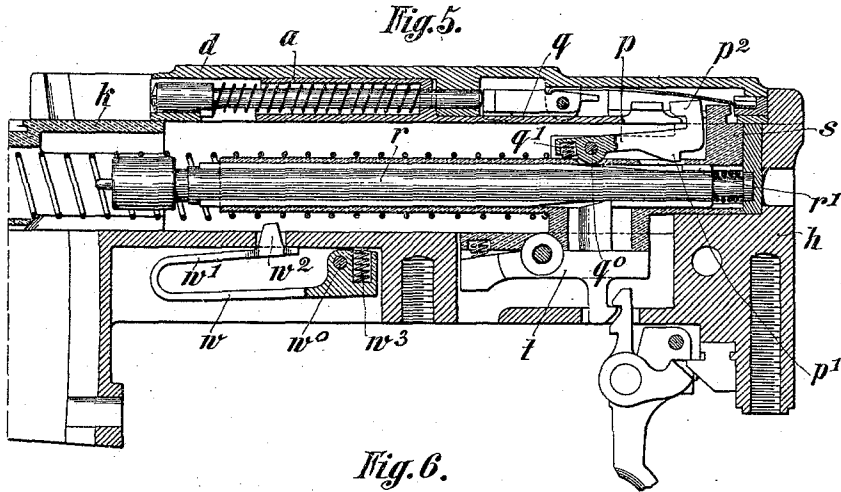
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3 SHEETS—SHEET 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

PAUL MAUSER, OF OBERNDORF-ON-THE-NECKAR, GERMANY.

SMALL-ARM.

987,584.

Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed August 27, 1909. Serial No. 514,894.

*To all whom it may concern:*

Be it known that I, PAUL MAUSER, Privy Councilor of Commerce, a subject of the King of Württemberg, residing at Oberndorf-on-the-Neckar, in the Kingdom of Württemberg, Germany, have invented certain new and useful Improvements in Small-Arms, of which the following is a full, clear, and exact description.

10 This invention refers to a recoil loader with fixed barrel of that kind in which the breech mechanism is actuated by the displacement of a slide-like movable part, as is the case with the latest recoil loader, upon the Mauser system the subject matter of application No. 461670 filed on the 9th November 1908. As is known with this recoil loader, a reciprocating part or cam is arranged in direct cooperation with the locking levers which are preferably one armed supporting levers or arms and located in the receiver, which reciprocating part is provided with means such as cam grooves for controlling the locking levers and which 20 part is freely movable so that owing to the action of the recoil, it can be displaced thereby moving the locking levers into the unlocking position.

Now the present invention refers more particularly to providing a recoil loader of such construction with a safety device, which prevents the percussion bolt or pin flying forward into the firing position before the cam slide has adjusted the supporting or 30 locking levers in the locking position, thus rendering it impossible to discharge the weapon before the breech has been closed.

With this object in view the arrangement is such that the percussion bolt, while the breech is open, is prevented from flying forward by means of a catch movably arranged in the receiver, the release of which, after the breech has been closed, is occasioned by the action of the cam slide, or of a part dependent on the same. Now besides this catch locking the percussion bolt or pin, according to the present invention still further improvements are provided, one of which refers to the percussion bolt while the other has to do with a more suitable arrangement of the ejector and of the extractor.

Now with reference to the improvement relating to the percussion bolt, this consists in that an inclosing cap leaving the extreme

point of the bolt free and held for simplicity sake by a bayonet joint, is arranged on the front part of the percussion bolt which cap receives the coiled spring situated on the corresponding end of the percussion bolt, and which holds the point of the percussion bolt behind the front face of the breech-bolt, and at the same time serves as a buffer on the recoil of the breech-bolt. 60

The improvements with reference to the ejector and extractor are for the purpose of obtaining a very simple construction as well as a sure method of working of these parts so important for the prompt action of the weapon, the details of which will be understood from the following description as well as from the drawing. 70

The invention will now be described with reference to the accompanying drawings in which: 75

Figure 1 is a vertical longitudinal section of the breech end of the weapon showing the breech closed, the supporting levers in the locking position and consequently the catch for the percussion bolt disengaged and the percussion bolt free to fly forward when discharging the weapon. Fig. 2 is a plan view of Fig. 1 with the cover of the receiver removed. Fig. 3 is a vertical section on the line A—A of Fig. 1. Fig. 4 is a similar view to Fig. 1 but showing the position of the parts after discharging the weapon, with unlocked breech and the breech-bolt drawn back, the catch for the percussion bolt being in its working position and consequently preventing any accidental flying forward of the percussion bolt. Figs. 5, 6 and 7 are similar views to Figs. 1, 2 and 4 illustrating a modification of the locking catch for the percussion bolt, and in which the position of the parts in Fig. 5 corresponds to that of Fig. 1, that in Fig. 6 to that of Fig. 2 and that in Fig. 7 to that of Fig. 4. Fig. 8 is a similar view to part of Fig. 7 but showing the ejector in the working position as well as the extractor. Fig. 9 is a front view of the breech-bolt with the extractor. Fig. 10 illustrates the ejector in side and plan view. Fig. 11 illustrates the bayonet-joint of the spring cap with the percussion-bolt on an enlarged scale and in section on the line B—B, Fig. 1. 80 85 90 95 100 105

With regard to the general arrangement of the breech system, to which the invention is applied, two positively geared locking 110

levers or arms  $b$   $b$  symmetrically supporting the movable breech bolt  $k$  on both sides are provided, which locking levers extend along the inside of the receiver  $h$  and are arranged with their pivotal ends in the back wall of this receiver so that they move like arms turning inward when the breech is closed and thus effect the symmetrical supporting and locking of the movable breech bolt, but after discharging the weapon, move outward thereby unlocking the movable breech bolt and allowing it to pass backward between them. The displacement of the locking levers  $b$   $b$  effected by the cam slide  $a$  guided in the cover  $d$  and provided with cam slots  $a^1$   $a^1$  in which engage the pins  $b^1$   $b^1$  of the levers  $b$   $b$ . When the breech is closed (Figs. 1 and 2) the slide  $a$  is situated in its backward position, the pins  $b^1$   $b^1$  are situated at the front end of the slots  $a^1$   $a^1$  and force the levers  $b$   $b$  inward with their front ends resting against the back end of the movable breech-bolt, thus maintaining them firmly in the supporting position. When the breech is unlocked, the slide  $a$  is in its forward position with the pins  $b^1$   $b^1$  at the back ends of the slots  $a^1$   $a^1$  so that the levers  $b$   $b$  are turned outward and are held in corresponding recesses formed in the side walls of the receiver  $h$ . Now according to the present invention in the form of construction shown in Figs. 1 to 4, a vertically movable catch  $p$  is inserted as a locking device in the back portion of the false breech  $s$  containing the percussion bolt, which catch  $p$  with its lower tooth-like or stepped end  $p^1$  engages with a corresponding nose or shoulder  $r^1$  of the percussion bolt  $r$  and is provided at its upper end with a projecting lug  $p^2$ . The cam slide  $a$  has a prolongation at the back in the form of a spring tongue  $q$ , which is provided at its rear end with a projection or nose  $q^2$  corresponding to the lug  $p^2$  and which at the same time serves for guiding the tongue in corresponding grooves of an inner shoulder of the cover. The coöperation of the catch  $p$  with the prolongation or tongue  $q$  of the cam slide is such that the tongue in the backward position of the cam slide, that is to say with closed breech (Figs. 1 and 2) engages by its free end, which is situated behind the nose  $q^2$  beneath the lug  $p^2$  of the catch  $p$  and thus maintains the catch in its raised position so that its lower end  $p^1$  is held out of engagement with the nose  $r^1$  of the percussion bolt. If, however, the cam slide  $a$  is in its forward position, which is the case when the breech is unlocked (Fig. 4), the tongue  $q$  will release the lug  $p^2$  of the catch  $p$ , so that the catch  $p$  under the action of a spring  $q^1$ , inserted in a recess formed in the casing of the false breech, is pressed downward and engages by its lower tooth-like end  $p^1$  with the nose  $r^1$  of the percussion bolt. Whereas

in the first case (the parts being in the position shown in Figs. 1 and 2) the percussion bolt is free to be discharged by merely pressing on the trigger  $t$ ; in the position shown in Fig. 4, however, that is to say as long as the locking is not effected, the flying forward of the percussion bolt is prevented in any circumstances, even if the trigger is accidentally pulled. Thus while the breech is unlocked it is absolutely impossible for the percussion bolt to fly accidentally forward, and the percussion bolt can only fly forward into the firing position after the breech has been duly closed and locked.

In the form of construction shown at Figs. 5 to 7 the locking part consists of a bell-crank lever  $p$ , on the horizontal arm of which the nose or tooth  $p^1$  projects downward and coöperates with a corresponding nose  $r^1$  of the percussion bolt  $r$  while the vertical arm is provided at its upper end with a nose  $p^2$  coöperating with the end of the tongue  $q$ . The bell-crank lever  $p$  is pivotally mounted upon a pin  $q^0$  and is acted upon by a spiral spring  $q^1$ , which is situated in a recess at the front of the arm and tends, when the breech is unlocked, to hold the arm in the engaging or locking position as shown at Fig. 7. Only after the breech has been duly locked, that is to say when the cam slide is situated in its backward position shown in Figs. 5 and 6 in which it holds the supporting levers or arms in their locking or inward position is the bell-crank lever held in the raised position against the pressure of the spring  $q^1$ , in which position it releases the nose  $r^1$  of the percussion bolt  $r$  and thus permits the latter to fly forward.

With the present arrangement of the percussion bolt the small coiled spring  $f$ , (referring to Figs. 1 to 4 and 11) already used in previous arrangements, is placed on the front end of the percussion bolt, which spring serves the purpose on the one hand of holding or retracting the percussion bolt after firing behind the face of the head of the movable breech and at the same time acts as a buffer on the recoil of the movable breech bolt. Now for securing the spring in its position the following improvement has been made, that is to say the spring is arranged in a special cylindrical cap or sleeve. For this purpose a cap  $f^1$  is placed on the end of the percussion bolt  $r$ . It is retained by two catches  $w$ , which enter the cap through notches  $w^1$  (Fig. 11). The cap  $f^1$  is turned so as to place it in such a position that the notches  $w^1$  come out of the path of the catches  $w$  (drawn in dotted lines in Fig. 11). Inside the cap  $f^1$  is an annular space  $w^2$  (Fig. 1) which allows of displacing the cap  $f^1$  against the pressure of the spring  $f$ . The purpose of this arrangement is the following. When the parts are in the position shown in Fig. 4 the spring  $f$  forces the

bolt  $r$  back against the pressure of the spring  $y$  of the percussion bolt into such a position that the point of the bolt does not project from the front surface of the breech-bolt  $k$ . This point of the percussion bolt only projects from the front of the breech-bolt at the moment when the percussion bolt, under the influence of the spring  $y$ , is thrown forward and the cartridge is fired. The cap  $f^1$  by means of its spring  $f$  forms a kind of cushion when the percussion bolt under the pressure of the spring  $y$  is thrown forward. The spring  $f$  is thus situated within this cap so that it is impossible to lose or injure it as might possibly happen were such a cap not provided.

A practical improvement has also been made with respect to the ejector in the present weapon. This ejector  $u$  is in the form of a longitudinal bar movably arranged on the bottom of the breech-bolt and carrying at its front end an inclined impact shoulder  $w^1$  (Fig. 10), which shoulder  $w^1$  can project outwardly beyond the face of the breech-bolt through a corresponding groove in the head thereof as shown at Fig. 8. For actuating the ejector in the form of construction shown in Figs. 1 to 4, there is provided a spring  $w$  situated beneath the bottom of the receiver, the upper arm  $w^1$  of which carries a stop  $w^2$  for the back end of the ejector and which projects into the path of the movable breech bolt, whereas the longer arm for the purpose of fastening the spring is at its extremity held in a corresponding recess in the bottom of the receiver of the lock. On the flying back of the movable breech bolt, the back end  $w^2$  of the ejector, engaging in the usual manner with a catch or shoulder in the movable breech bolt, strikes against the stop  $w^2$ , thus bringing the ejector into action so that the cartridge is thrown out backward. Stop  $w^2$  being yieldably mounted, after actuating the ejector, yields under the force of the breech-bolt and permits further movement of the breech-bolt in a rearward direction. Upon the return movement of the breech-bolt, to close the breech, stop  $w^2$  by frictional engagement with the under side of the ejector slide  $u$ , causes relative movement between the latter and the breech-bolt, thereby restoring the ejector to its original position on the breech-bolt, behind the cartridge seat.

In the construction of ejector illustrated at Figs. 5 to 7 the bell-crank lever  $w$  provided on its upper arm with the stop  $w^2$  actuating the longitudinally displaceable ejector  $u$ , is made in the form of a loop or stirrup and is arranged in a lower recess of the lock so as to pivot around a pin  $w^0$ . The bell crank lever  $w$  inherently possesses a certain degree of elasticity owing to its loop like formation and this is increased by the action of a spiral spring  $w^3$  inserted

at the back end of the said lever and tending to maintain the lever with its stop  $w^2$  in the working position.

The essential feature of the present ejector is above all the mutual coöperation of the ejector bar  $u$  and the bell crank lever or spring  $w$ ; so that the ejection of the extracted cartridge case can be effected immediately after leaving the chamber and a considerable time before the movable breech-bolt has reached its rearmost position; as the ejection is effected before the movable breech-bolt has reached its rearmost position there is no danger of the fresh cartridge  $m$  rising up and striking against the empty cartridge case being ejected and thus being pressed downward again, which frequently occasions a failure of the cartridge to rise up at the proper moment and to be seized by the movable breech-bolt. It is advisable so to regulate the precise moment of the ejection of the empty cartridge case that it is effected at about ten millimeters before the rearmost position of the movable breech-bolt; in this position the movable breech-bolt will still be situated over a considerable portion of the magazine and consequently above the rear part of the ascending cartridge so that the latter is protected and cannot strike against the empty cartridge case being ejected.

In the present weapon also the extractor  $j$  has been more suitably constructed, inasmuch as the catch or claw of the same is guided, independently of the back portion  $j^1$  which acts as a spring and is arranged vertically movable in a recess in the head of the breech-bolt beneath the gripping projection or knob and the spring portion passing through an opening in the latter acts to a certain extent as a shaft and engages the catch from the rear with its front end.

What I claim as my invention, and desire to secure by patent is:

1. In a recoil loading firearm with fixed barrel, the combination of a breech bolt, means for locking the same, a sliding cam for actuating said means, a percussion bolt, and a catch device for locking said percussion bolt, said catch device being controlled by the movements of said cam.

2. In a recoil loading firearm with fixed barrel, the combination of a breech bolt, means for locking the same, a sliding cam for actuating said means, a percussion bolt, and a catch device for locking said bolt, said catch device comprising a pivoted lever having a locking nose adapted to engage said percussion bolt and having a part engaged by said cam whereby said lever is controlled.

3. In a recoil loading firearm with fixed barrel, the combination of a breech bolt, means for locking the same, a sliding cam for actuating said means, said cam having a tongue extending rearwardly therefrom,

a percussion bolt, a pivoted lever adapted to lock said bolt, said lever having a locking nose engaging said percussion bolt and having a part coöperating with said tongue, 5  
 5 whereby when said cam is in its locking position, said tongue engages said lever and moves it out of the path of said percussion bolt so that the arm can be fired.

4. In a recoil loading firearm with fixed 10  
 10 barrel, the combination of a breech bolt and an ejecting device, said ejecting device being arranged in the bottom part of said breech bolt and being adapted to be moved forwardly and backwardly therein, and a stop 15  
 15 lying in the path of said ejecting device, said stop being adapted to engage said device before said breech bolt has reached its rearmost position whereby the empty cartridge case is ejected as soon as possible to 20  
 20 prevent said cartridge case from striking against a fresh cartridge rising into position.

5. In a recoil loading firearm with fixed 25  
 25 barrel, the combination of a breech bolt and an ejecting device, said ejecting device being arranged in the bottom part of said breech bolt and being adapted to be moved forwardly and backwardly therein, and a stop 30  
 30 lying in the path of said ejecting device, said stop being adapted to engage said device before said breech bolt has reached its rear-

most position whereby the empty cartridge case is ejected as soon as possible to prevent said cartridge case from striking against a 35  
 35 fresh cartridge rising into position, and said stop comprising a bell crank loop-shaped lever pivoted to the lock casing and a spring at the rear of said lever.

6. In a recoil loading firearm with fixed 40  
 40 barrel, the combination of a percussion bolt, a cap connected to the end of said percussion bolt at such point as to permit the extreme end of the bolt to pass through said cap, and a coiled spring in said cap holding the latter 45  
 45 beyond the point of said bolt, said spring serving also as a buffer upon recoil of the bolt.

7. In a recoil loader with fixed barrel, the combination of the percussion bolt with a 50  
 50 cap held thereon by catches, and a spring within the cap, said spring pressing the percussion bolt backward after firing, so that its point does not project from the front of the breech-bolt.

In witness whereof, I have hereunto 55  
 55 signed my name in the presence of two subscribing witnesses.

PAUL MAUSER.

Witnesses:

ERNST L. ENTENMANN,  
 FRIDA KLOIBER.