(No Model.) 2 Sheets—Sheet 1.

L. SCHMEISSER.

RECOIL OPERATED FIREARM.

No. 547,454. Patented Oct. 8, 1895.

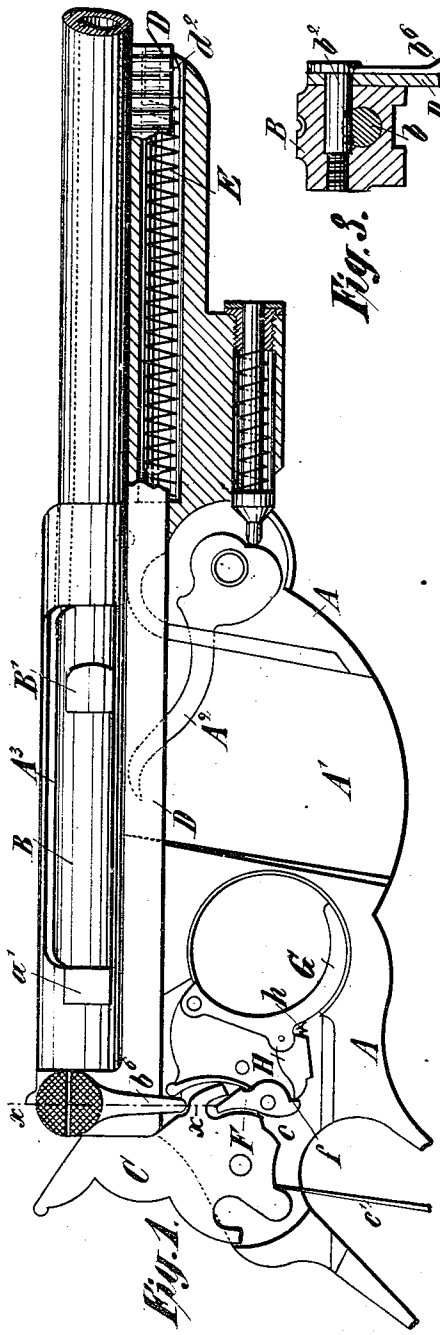

Fig. 1.

Fig. 3.

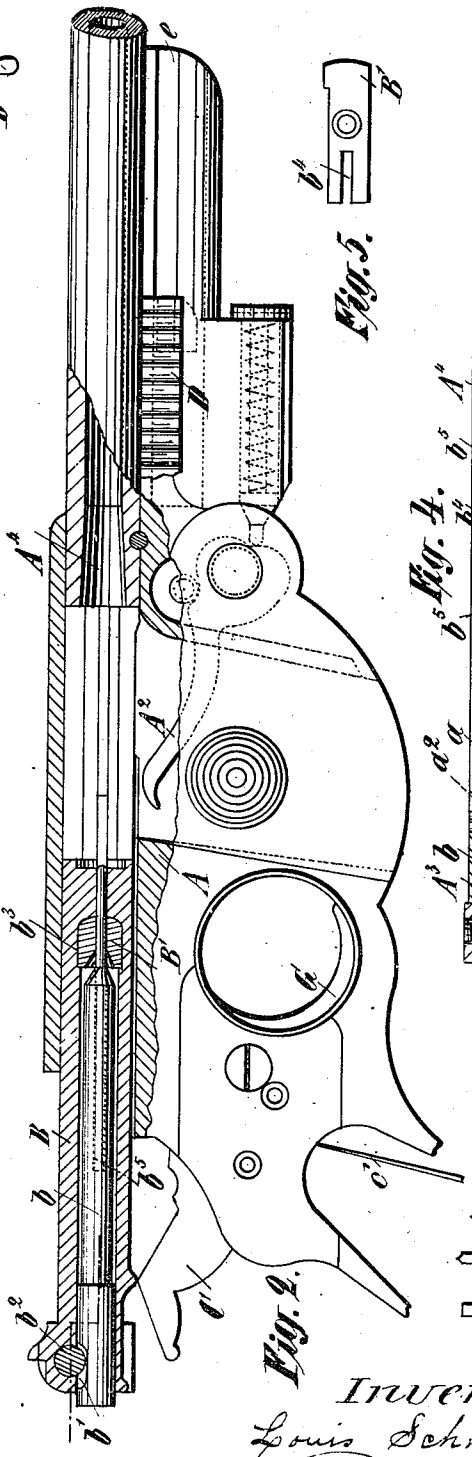

Fig. 2.

Fig. 5.

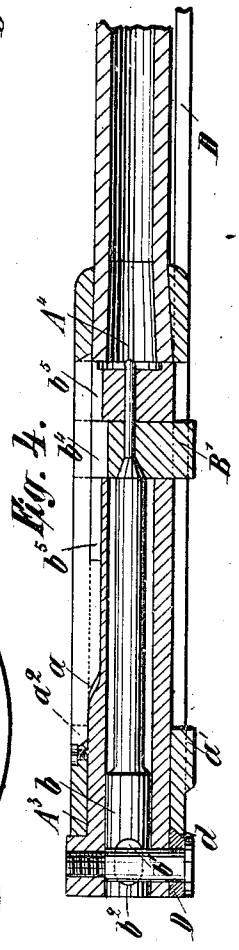

Fig. 4.

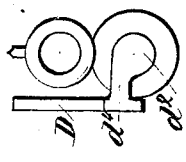

Fig. 6.

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Louis Schmeisser
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(No Model.) 2 Sheets—Sheet 2.

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No. 547,454. Patented Oct. 8, 1895.

Fig. 7.

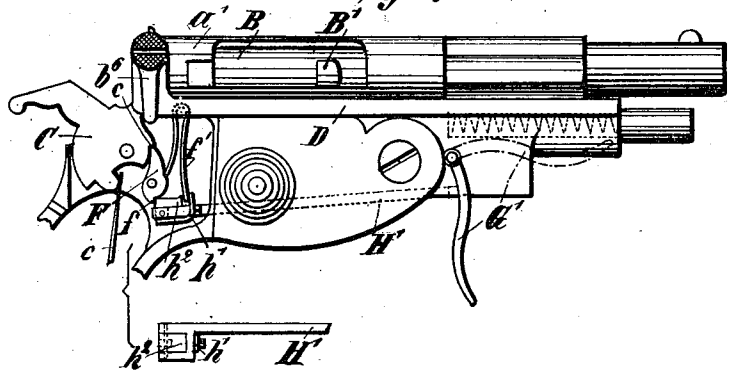


Fig. 8.

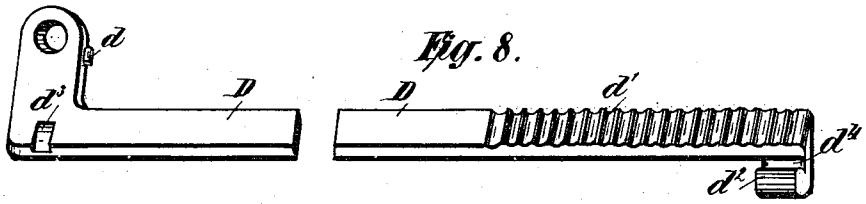


Fig. 9.

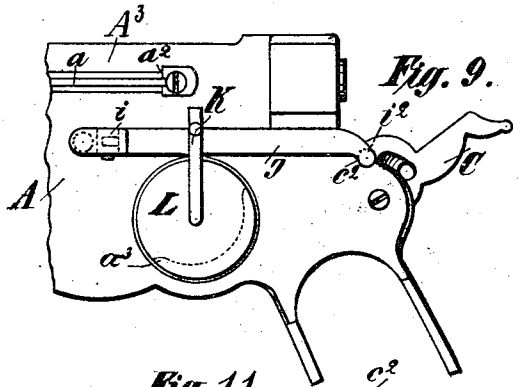


Fig. 10.

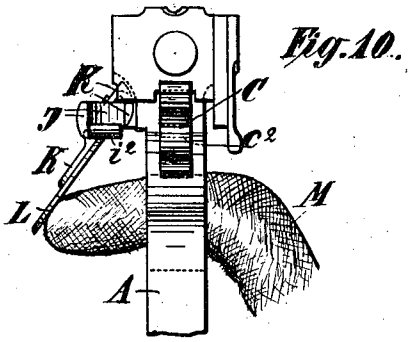
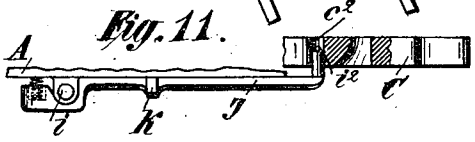


Fig. 11.



Witnesses:

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A. S. Büsing

Inventor:

Louis Schmeisser

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his Attorneys.

UNITED STATES PATENT OFFICE.

LOUIS SCHMEISSER, OF MANNHEIM, ASSIGNOR TO THEODOR BERGMANN, OF GAGGENAU, GERMANY.

RECOIL-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 547,454, dated October 8, 1895.

Application filed January 20, 1894. Serial No. 497,523. (No model.) Patented in France June 8, 1893, No. 230,689; in Germany June 10, 1893, No. 78,500, and February 13, 1894, No. 78,881; in England June 12, 1893, No. 11,509; in Italy June 30, 1893, No. 34,238; in Belgium October 31, 1893, No. 106,826, and May 15, 1894, No. 109,829; in Switzerland December 6, 1893, No. 7,201; in Austria May 31, 1894, No. 44/2,000, and in Hungary June 26, 1894, No. 678.

To all whom it may concern:

Be it known that I, LOUIS SCHMEISSER, gunmaker, a citizen of Germany, residing at Mannheim, in the Grand Duchy of Baden, Empire of Germany, have invented certain new and useful Improvements in Breech-Loading Firearms, of which the following is a specification.

The invention has been patented in Germany, No. 78,500, dated June 10, 1893, and No. 78,881, dated February 13, 1894; in Austria, No. 44/2,000, dated May 31, 1894; in Hungary, No. 678, dated June 26, 1894; in Switzerland, No. 7,201, dated December 6, 1895; in France, No. 230,689, dated June 8, 1893; in England, No. 11,509, dated June 12, 1893; in Belgium, No. 106,826, dated October 31, 1893, and No. 109,829, dated May 15, 1894, and in Italy, No. 34,238, dated June 30, 1893.

My invention relates to a firearm in which the closing of the breech, the loading, and the cocking of the hammer is effected by the gas-pressure resulting from the explosion. It has been usual heretofore to oppose a resistance as strong as possible to the pressure of the gases from the rear or closing parts, so that said gas, after having yielded all its usefulness, could only escape through the front part. If the resistance is very great the breech is opened either by hand or mechanically after each shot, and if slight, as in this class of arms, it is opened or loosened by the pressure of the gas and bolted or closed again by hand by a special mechanism or automatically. In the improved system of breech-closing this resistance is made away with entirely, as the same is based upon an entirely different principle, to wit: the principle of the power of resistance of bodies. The explosion of the powder produces a pressure of gas in the cartridge or shell which works uniformly against all sides. According to the laws governing the power of resistance the smallest movable part that is exposed to that pressure will be put in motion the first. A breech-bolt bearing against the rear end of the barrel, the weight of which is a certain multiple of that of the projectile, is given a motion by the gas-pressure which is correspondingly slower than the lighter projectile. If now the proportion between the weight of the breech-bolt and that of the projectile is such that up to the time that said projectile leaves the barrel the breech-bolt has been driven back only a short way, there will be no loss of the driving power of the gas, as the slowly backward moving breech-bolt, in combination with the shell pressed against its bearing, will produce a perfectly gas-tight closure at the rear. The further backward motion of the cylinder serves for reloading of the firearm and for the compression of a spring, which brings the breech-bolt again in the closing position after it has reached its utmost rear point, and the arm is ready to be used again.

In the annexed drawings two forms of construction of the auto-loading arm with the new breech-loading device are shown.

Figure 1 is a side view of the arm, partly in section, with the breech closed. Fig. 2 is a side view with the breech-bolt and adjacent parts in section, said breech-bolt being drawn back. Fig. 3 is a sectional view on the line X X of Fig. 1. Fig. 4 shows a horizontal section through the breech-bolt and frame. Figs. 5 and 8 are details of the same. Fig. 6 is a detail view of the muzzle of the barrel and of the frame of the spring. Fig. 7 is a side view of a small hand-arm. Figs. 9, 10, and 11 are detail views of a safety-trigger.

In the frame A, to which the barrel is fastened and upon which the cartridge-magazine A′ is disposed, the breech-bolt B can move in a straight line within certain limits. The frame A is cut out vertically and to the right, so that the cartridges can be carried directly into the barrel and that the shells can be thrown out. The cartridges can be put into the magazine A′ one by one or by means of a loading-box. A spring-lever A^2 presses the cartridges against the breech-bolt frame A^3, so that each time the breech-bolt B advances one cartridge is pressed into the cartridge-seat A^4. The firing-pin b, it will be noticed, is not worked by a spring. It is located within the breech-bolt. For central percussion-cartridges it is located in the center, and for cartridges having the percussion at the edge it

is located at the edge. The pin b can slightly move axially in the bolt B, but its dropping out is prevented by a pin b^2, Figs. 2, 3, and 4, engaging a cut b' of the pin b and screwed in the rear extremity of the breech-bolt. Near its forward extremity the breech-bolt B has a cross-bore b^3, in which the striking-peg B', Figs. 1, 2, 4, and 5, is arranged loosely. The pin b passes through the striking-peg B', so that the latter is prevented from moving in the cylinder B. The stop-pin has a groove b^4, through which the ejection-bar a, Figs. 2 and 4, located at the rear wall of the frame, passes. The breech-bolt B is provided with a similar groove, in which the forward part of the bar a moves. The shell, which is driven back with the breech-bolt B by the gas resulting from the explosion, hits the nose of the ejection-bar a and is ejected in the well-known manner. When the bolt B moves backward, the extremity of the pin B', that projects to one side of the bolt, strikes the frame A^3 at a' and limits the backward motion of the bolt. The breech-bolt B, that by its backward motion has cocked the hammer C again, is connected loosely with a spring E, located under the barrel in the body of the pistol, by means of an outside rod D, Figs. 1, 2, 3, 4, 6, and 8, which spring carries back the breech-bolt to the closing position of Fig. 1. As the hammer C, as well as the spring E, increases the resisting power of the breech-bolt, the weight of the latter can be somewhat reduced. The screw-bolt b^2, with its leaf b^6, serves for connecting the rod D with the bolt B. Therefore, in order to remove the breech-bolt it is only necessary to loosen the screw b^2, whereby the firing-pin b becomes free also. In order to retain the closing-spring rod D in the right position where the breech-bolt is removed, the same is provided with a cam that engages in a corresponding groove of the cylinder-frame A^3.

d' is a roughened surface disposed upon the rod D, which gives a better hold for the hand when it is required to keep the cylinder in the open position, Fig. 2.

d^2 is a calk disposed at the side of the rod D, upon which the spring E works, and d^3 is a rest for the leaf b^6 of the screw b^2. The frame of the spring E has a side slot e, in which the stay d^4, between the rod D and the calk d^2, Figs. 6 and 8, can slide.

The firearm is provided with a spring or cock-lock which differs only as far as the trigger apparatus is concerned from the usual construction.

It is a well-known fact that in auto-loading firearms the hammer is cocked so soon after the explosion that the finger cannot let the trigger go back quickly enough and that the disengaged sear F cannot catch in time into the top notch c of the hammer to hold it cocked. In order to insure engagement of the sear F in the top notch c, even if the finger still rests upon the trigger, an intermediate piece H, worked by a spring, is placed between the sear F and the trigger G in such a manner that the connection between F and G can be interrupted for a moment. When the hammer C is cocked, the sear F engages in the top notch c. If now the trigger G is pulled the intermediate piece H, that is revolubly connected therewith, presses upon the tooth f of the sear F and lifts the latter from the top notch c, so that the hammer C, in consequence of the working of the spring c' upon the same, drives the firing-pin forward. As the cocking of the hammer follows immediately after the explosion and before the finger can release the trigger, the construction is such that as soon as the sear F is disengaged the intermediate piece slides over the tooth f and the hammer can be cocked without working the trigger. When now the finger releases the trigger, the piece H returns to its original position by means of the spring h, after which the trigger is ready for another shot.

In small firearms the trigger may be arranged to be pushed forward, as shown in Fig. 7. In this case the intermediate piece is changed into a rail H', upon the head of which the trigger G' presses. The latter can be put in position (shown by dotted lines in Fig. 7) for the sake of carrying the arm conveniently. At the rear end of the rail H' a presser h^2 is pivotally disposed, which is kept in its normal position, as shown in Fig. 7, by the spring h'. After the presser h^2 has disengaged the sear F it glides over the tooth of the same, so that the sear F can at once catch again into the top notch of the cock. After the finger has released the trigger the rod-spring h' brings the rail H' back again in its original position. As soon as the presser h^2 has passed under the cam f, a spring h' carries it back again to its normal position, and the arm is ready to be shot off again.

In order to prevent the hammer C from operating prematurely, the firearm is provided with a trigger-safety, Figs. 9 to 11. A lever I, that can revolve around a hinge i, is placed upon the back wall of the frame A. A spiral spring i', that works upon the smaller arm of this lever, tends to push it away from the frame A. The longer arm of the lever I carries a tooth i^2, to catch into an opening c^2 in the hammer C, so that it can hold the same in its cocked position. In the lever I another lever K is pivotally arranged, which carries a disk L, which rests upon the opening a^3 of the frame in the position of rest. When the finger is brought into the trigger-guard, the disk L is pushed aside and the lever K is pressed against the frame A. The consequence of this is that the longer arm of the lever I is pushed away from the frame and the tooth i^2 is released from the slot c^2 of the cock C, Fig. 10. The safety device is thus thrown out of action and the hammer can fall when the trigger is pressed. As soon as the finger is removed from the trigger-opening a^3, the spring i' carries the lever I and the disk L again to

the original position, Figs. 9 and 11, thus causing the tooth i^2 to engage and hold the hammer cocked.

The firearm works as follows: At the moment that the firing-pin strikes the cartridge the powder that it contains explodes. The tension of the generated gas works forward upon the projectile and backward upon the bottom of the shell and through this upon the heavy breech-bolt, the resisting power of which is increased by the power of the closing-spring. The counter-pressure opposed to those gases in front is therefore considerably less than the counter-pressure opposed at the rear. For this reason the backward motion is so slow that the projectile will already have left the barrel before the shell, resting against its bearing in the breech-bolt, has been driven back so far that the gas can escape. There is thus no loss of the driving power for the projectile on account of the gas escaping at the rear. The empty shell is thrown out by the ejector when the cylinder moves backward and the arm is cocked again. During the movement of the breech-bolt, which is influenced by the spring E and the rod D, a new cartridge is taken from the magazine and pushed into the barrel. The arm is ready to be fired again.

The advantage of the present construction compared with the firearms now in existence is its simplicity, which makes it very appropriate for military purposes. Besides the certainty of hitting the mark is increased, as the last injurious recoil is reduced to a minimum.

I claim—

1. In combination in a fire arm, the reciprocating breech bolt, the firing pin and the stop pin B′ arranged in a lateral opening in the breech bolt and held by the firing pin, said stop pin being arranged to limit the movement of the breech bolt, substantially as described.

2. In combination in an automatic fire arm the sliding breech bolt, the spring for limiting the movement thereof and to place the same under tension and the rod D extending along the outside of the arm to connect the breech bolt with the spring, substantially as described.

3. In combination in a fire arm, the breech bolt arranged to be pressed back by the gas resulting from the explosion, the spring for returning the breech bolt forward, the rod for connecting the breech bolt and spring, the firing pin and the screw b^2 for connecting the rod and firing pin with the breech bolt, said pin passing through an elongated cut in the firing pin, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

LOUIS SCHMEISSER.

Witnesses:

JOHANN SCHILPP, Jr.,

A. B. BEYREUTHER.