

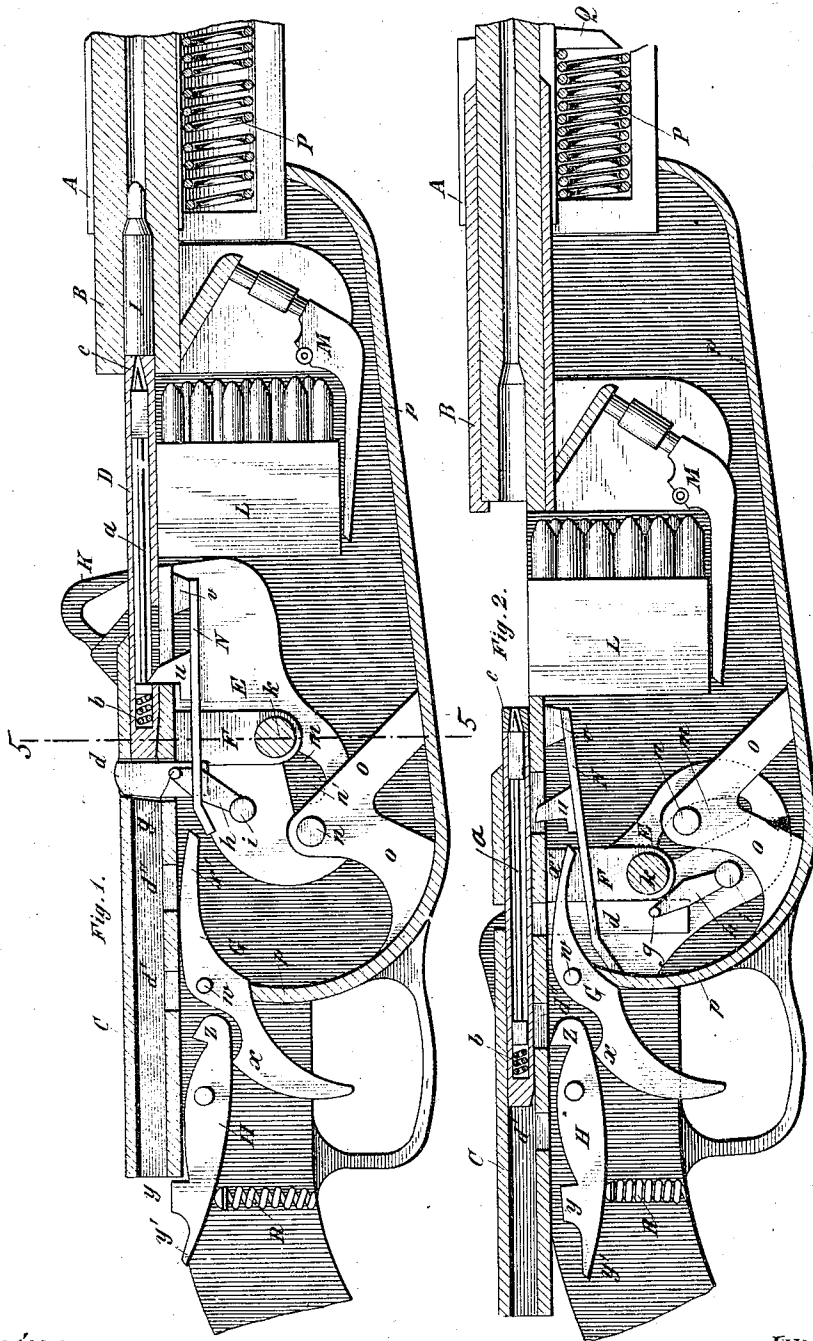
(No Model.)

3 Sheets—Sheet 1.

A. HAUFF.
RECOIL OPERATED FIREARM.

No. 545,496.

Patented Sept. 3, 1895.



WITNESSES:
Jesse C. Allen
George H. Jauch.

INVENTOR:
Albert Hauff
by George H. Jauch
his Attorney

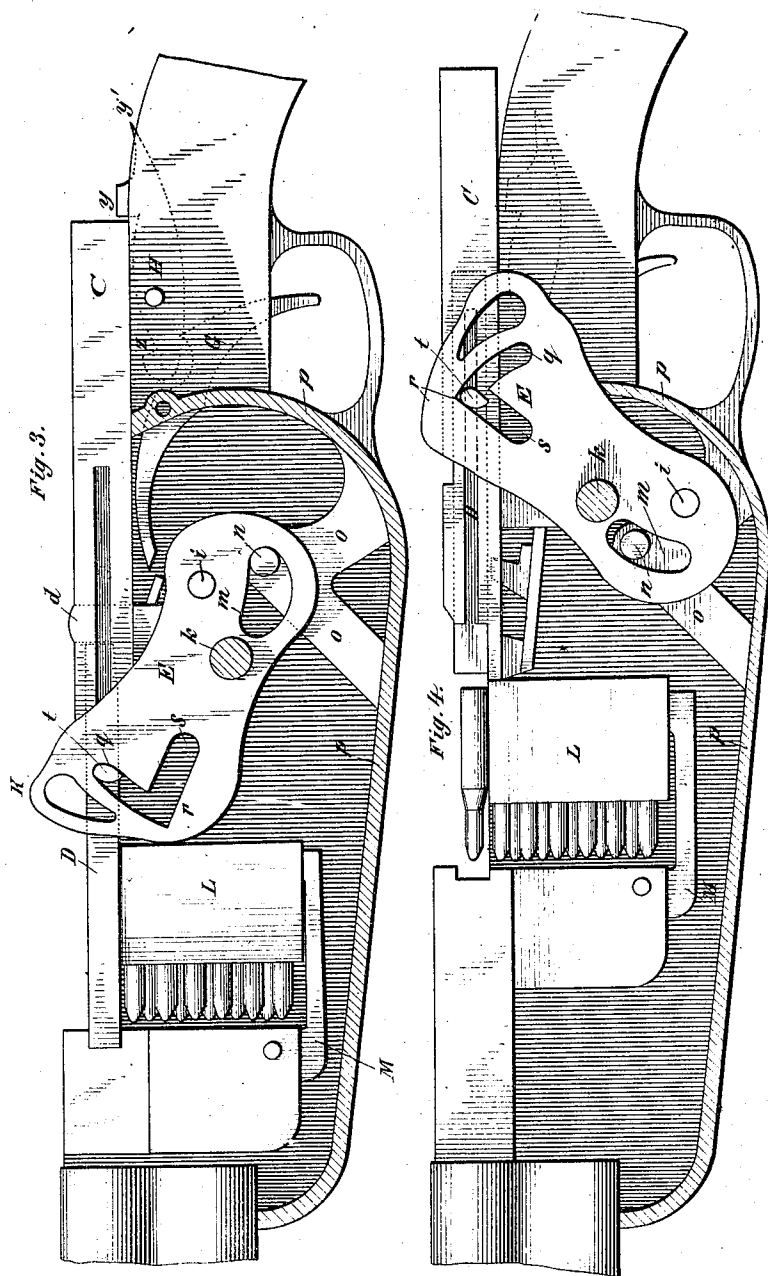
(No Model.)

3 Sheets—Sheet 2.

A. HAUFF.
RECOIL OPERATED FIREARM.

No. 545,496.

Patented Sept. 3, 1895.



WITNESSES:

Juan C. Abel
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INVENTOR

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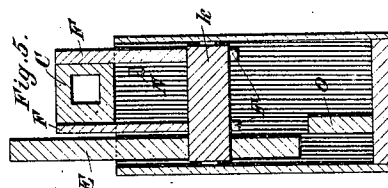
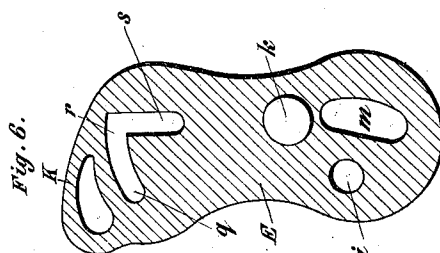
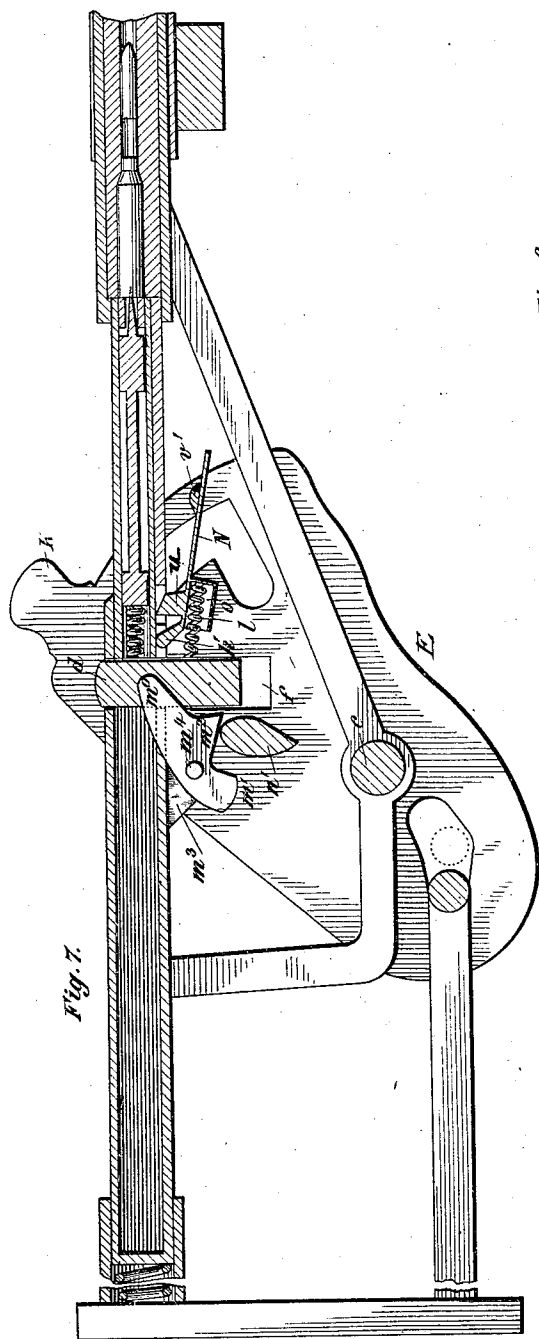
(No Model.)

3 Sheets—Sheet 3.

A. HAUFF.
RECOIL OPERATED FIREARM.

No. 545,496.

Patented Sept. 3, 1895.



WITNESSES:

Gray C. Abel
George W. Jackson.

INVENTOR

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UNITED STATES PATENT OFFICE.

ALBERT HAUFF, OF BERLIN, GERMANY

RECOIL-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 545,496, dated September 3, 1895.

Application filed August 25, 1894. Serial No. 521,271. (No model.) Patented in England September 12, 1893, No. 17,114; in Belgium August 20, 1894, No. 111,454; in Hungary September 21, 1894, No. 1,159, and in Austria November 23, 1894, No. 44/6,062.

To all whom it may concern:

Be it known that I, ALBERT HAUFF, a subject of the King of Württemberg, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Self-Loading Firearms, (for which I have obtained Letters Patent in Great Britain, No. 17,114, dated September 12, 1893; in Austria, No. 44/6,062, dated November 23, 1894; in Hungary, No. 1,159, dated September 21, 1894, and in Belgium, No. 111,454, dated August 20, 1894,) of which the following is a specification.

The present invention relates to certain improvements in self-loading firearms by which the opening and closing of the breech and even the firing off of the arm may be automatically accomplished as the breech-bolt is thrown back by the recoil after the discharge of the cartridge, a new cartridge fed to the breech, and the same automatically closed again, so that the rifleman has only to insert from time to time a full magazine and to start the firing, so as to be enabled to produce quick firing of the arm.

My invention consists of a self loading and discharging firearm, the operative parts and constructive details of which will be fully described hereinafter and finally defined in the claims.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved firearm, showing a cartridge in the barrel and the parts in position for firing. Fig. 2 is a like section showing the parts in position immediately after firing, the barrel, breech-bolt, and the parts connected thereto being in their most rearward positions. Fig. 3 is a vertical longitudinal section of the firearm, showing the parts in position before firing, but seen from the opposite side. Fig. 4 is a similar section showing the position immediately after firing with a new cartridge located in line with the breech, ready for insertion into the barrel. Fig. 5 is a vertical transverse section on line *x x*, Fig. 1. Fig. 6 is a detail side view of the oscillating cam-piece, and Fig. 7 is a sectional side elevation of the firearm ready for firing and connected with an automatic firing device.

Similar letters of reference indicate corresponding parts.

In my improved firearm the barrel consists of an outer shell A and of the barrel B proper, which latter slides in the former in line with the axis of the barrel. At the rear of the barrel B and rigidly connected therewith is arranged the guide-sleeve C for the breech-bolt D. In this guide-sleeve slides the breech-bolt D, which has a rectangular shape, so as not to turn in the sleeve. The breech-bolt D is provided with the usual firing-pin *a*, main-spring *b*, head *c*, and a cartridge extractor and ejector. The breech-bolt D is made slightly tapering at its rear end, so as to permit it to pass more easily over the locking-block *d*. This block *d* locks the breech-bolt D at its rear end and takes up the recoil. The locking-block *d* has a vertical movement in a recess *f*, formed by the parallel arms F, adjacent thereto, as shown in Fig. 1. The locking-block *d* is connected with the oscillating cam-piece E by means of pin *g*, arm *h*, and pivot *i*. The cam-piece E forms the connection between the barrel and stock.

On the under side of the guide-sleeve of the breech-bolt and rigidly attached to the former are two parallel arms F, which carry the pivot *k* of the oscillating cam-piece E. The cam-piece E is guided by a slot *m* around a pin *n*, which is connected by the supporting-pieces and casing *p* with the stock, and thereby with the guide-shell A of the barrel B. The oscillating cam-piece E is further provided with an angular slot *q r s*, Fig. 2, which serves to engage a stud *t* of the guide-sleeve D.

The discharging device consists of two parts—the trigger G and the sear N, with its catch *u*. The sear N is rigidly attached at one end to the guide-sleeve by the stud *v*. The trigger G is made in the form of a double lever, and is pivoted at *w* to the casing *p*, and is in this manner connected with the stock. The longer arm of the trigger G is provided on its upper side with a projection *x*, which serves to release the detent H, which is likewise constructed as a double-armed lever and provided with catches *y* and *z*, of which the catch *y* serves to retain the sleeve

C of the breech-piece and the barrel before the discharge, while catch *z* keeps the guide-sleeve C in position during the introduction of a new magazine and as a safeguard for the parts. The detent H is also connected with the stock by a transverse pivot-pin.

The working of the various parts is as follows: When the parts of the firearm are in the position shown in Fig. 1—that is, charged and ready for firing—the barrel B is in the guide-shell A, a cartridge I is in the breech of the barrel, and the breech-bolt D closes the breech by its head *c*. The releasing-catch *u* retains the firing-pin *a* in the breech-bolt D and sets the spring *b* of the firing-pin to tension. The oscillating cam-piece E is located with its handle K toward the front, and the locking-block is moved up through the guide-sleeve C into its uppermost position, so that the breech-bolt abuts against the block *d*. The catch *y* on the detent H engages the rear end of the sleeve C of the breech-bolt D and retains the sleeve C and barrel B firmly in position. When the trigger G is now drawn back, the projection *x* on the same presses against the forward arm of the detent H and causes the catch *y* to release the guide-sleeve C. This must be effected before the discharge of the cartridge, in order that the barrel and guide-sleeve can respond to the recoil. The arm *x'* of the trigger G next depresses the free end of the sear N and withdraws the retaining-catch *u*, whereby the firing-pin *a* is released and moved forward by its spring *b*, so that the cartridge is fired. On the discharge of the arm the barrel B, with the guide-sleeve C, the breech-bolt D, with its firing-pin and spring, the oscillating cam-piece E, with the locking-block *d*, the sear N, magazine L, and feeder M are moved in backward direction, without, however, changing the relative positions of the parts toward each other. As soon as the pin *n* arrives in the position *n'*, (shown in dotted lines in Fig. 1,) then the oscillating cam-piece E is tilted in backward direction, which causes the downward motion of the locking-block in the groove by the action of the pin *i* and link *h*, so that the breech-bolt D can pass by its tapered or beveled rear end over the rounded-off upper end of the block *d*. As soon as the oscillating cam-piece begins its tilting motion, the stud *t* on the breech-bolt D, Figs. 3 and 4, commences to move in the angular slot *q r s* from *q* to *r*, and the cam-piece then draws the breech-bolt back for the required distance (about eight to ten centimeters) by moving by its slot *q r s* downward along the stud *t* and upward again, while the pivot *k* follows the movement of the arms F and the guide-sleeve C. The rearward movement of cam-piece E is arrested when the stud *t* arrives at the apex *r* of the angular slot *q r s*, as shown in Fig. 4. The empty cartridge-shell has been thrown out by the ejector and a new cartridge is brought before the barrel by the feeder M, Fig. 4. A helical spring P, Figs. 1 and 2, which is located in a keeper be-

low the barrel and which was compressed by the recoil of the parts before mentioned, is expanded and thereby the barrel B and the parts connected therewith moved forward by means of the arm Q. The oscillating cam-piece E is tilted in forward direction and carries the breech-bolt D along with it by the stud *t*, the breech-bolt pushing the cartridge into the breech of the barrel. The locking-block *d* slides upward again behind the breech-bolt, and the spring *b* of the firing-pin *a* is compressed by the retaining-catch *u*. A helical spring R, below the detent H, causes the catch *y* of the same to re-engage the guide-sleeve C of the breech-bolt, so that the firearm is ready for the next discharge. When the last cartridge is placed in the breech of the barrel, the rifleman on firing depresses the rear end *y'* of the detent H by the thumb of his right hand, so that catch *z* is placed close to the under surface of the guide-sleeve C, and the recoil-catch *z* is pressed into the opening *d'* of the guide-sleeve C and holds the same in position until a new magazine has been introduced. When this is accomplished, the catch *z* is released again and the various parts return into the positions shown in Fig. 1, so that the firearm is again ready for firing. For reliably and safely carrying out this operation it is necessary to move back the oscillating cam-piece E slightly by means of its handle K, while at the same time depressing the detent H by the right hand until the catch *z* has engaged the opening *d'* in the guide-sleeve C.

When the firearm is to be used for automatic firing, the breech and firing mechanisms are arranged as shown in Fig. 7. In this case the locking-block *d* is actuated by the oscillating lever *m'*, the fulcrum *m''* of which is supported in brackets *m''*, which are rigidly secured to the guide-sleeve of the breech-bolt. On the oscillating cam-piece E is arranged a stud *n*, which, when the cam-piece is tilted in backward direction, abuts against the lower end of the lever *m'*, so that the upper end *m''* of said lever is lowered, which in its turn effects the downward movement of the locking-block *d*. When the cam-piece E is tilted in forward direction, the stud *n* strikes against the nose *m''* of the lever *m'* and raises the locking-block *d*, which moves up behind the breech-bolt and locks the same in position to the breech. The sear N is arranged to turn in this construction around a pivot-pin *k'* and is held in position by a helical spring *l*, which is located in a keeper *o* so that the catch *u* is located in front of the firing-pin and retains the same in its drawn-back position. A boss *v'* is arranged on the cam-piece E, which, when the cam-piece moves forward, strikes against the sear N, depresses it, and at the same time releases the catch *u* from the firing-pin, which is quickly moved forward by its spring, so as to discharge the cartridge. After the discharge, the recoil and the movements of the parts take place, as be-

fore described. For the first discharge the cam-piece E is turned forward and downward by the handle K, so that the boss *v'* withdraws the catch *u* from the firing-pin and produces by the action of the latter the discharge of the firearm.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, or a barrel, guided in a shell connected with the stock, a breech-bolt, a guide-sleeve for said breech-bolt, connected with the barrel, an oscillating cam-piece, a locking block for the breech-bolt actuated by said cam-piece and a resetting spring on the guide-shell of the barrel, adapted to return the parts automatically into locked position for firing after the breech-bolt has been moved back by the recoil and tilting of the cam-piece, substantially as set forth.

2. The combination, with a barrel guided in a shell connected with the stock, the breech-bolt and the guide-sleeve for the same, of a spring-actuated locking detent provided with catches for locking the guide-sleeve when the breech-bolt is in the breech, and for retaining

the same in drawn back position when a new magazine is to be inserted, substantially as set forth.

3. The combination, with the guide-shell of the barrel, and the barrel of a breech-piece, a guide-sleeve for said breech-piece, connected with the barrel, an oscillating cam-piece, a locking block for the breech-piece actuated by said cam-piece, a resetting spring on the guide-shell of the barrel, and a pivoted sear and a boss on the cam-piece, adapted to engage the sear and release it from the firing-pin at the forward limit of the closing movement of the parts whereby after the first discharge the parts are automatically opened and locked by the recoil action of the arm and the latter automatically actuated until all the cartridges in the magazine are discharged, substantially as set forth.

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

ALBERT HAUFF.

Witnesses:

PAUL FISCHER,
HANS BAUERLEIN.