

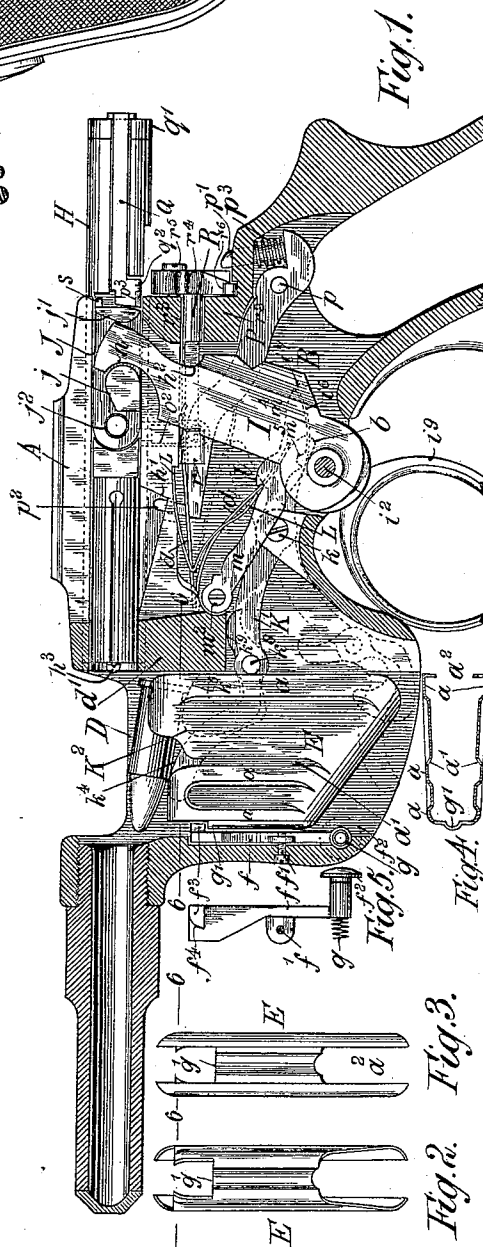
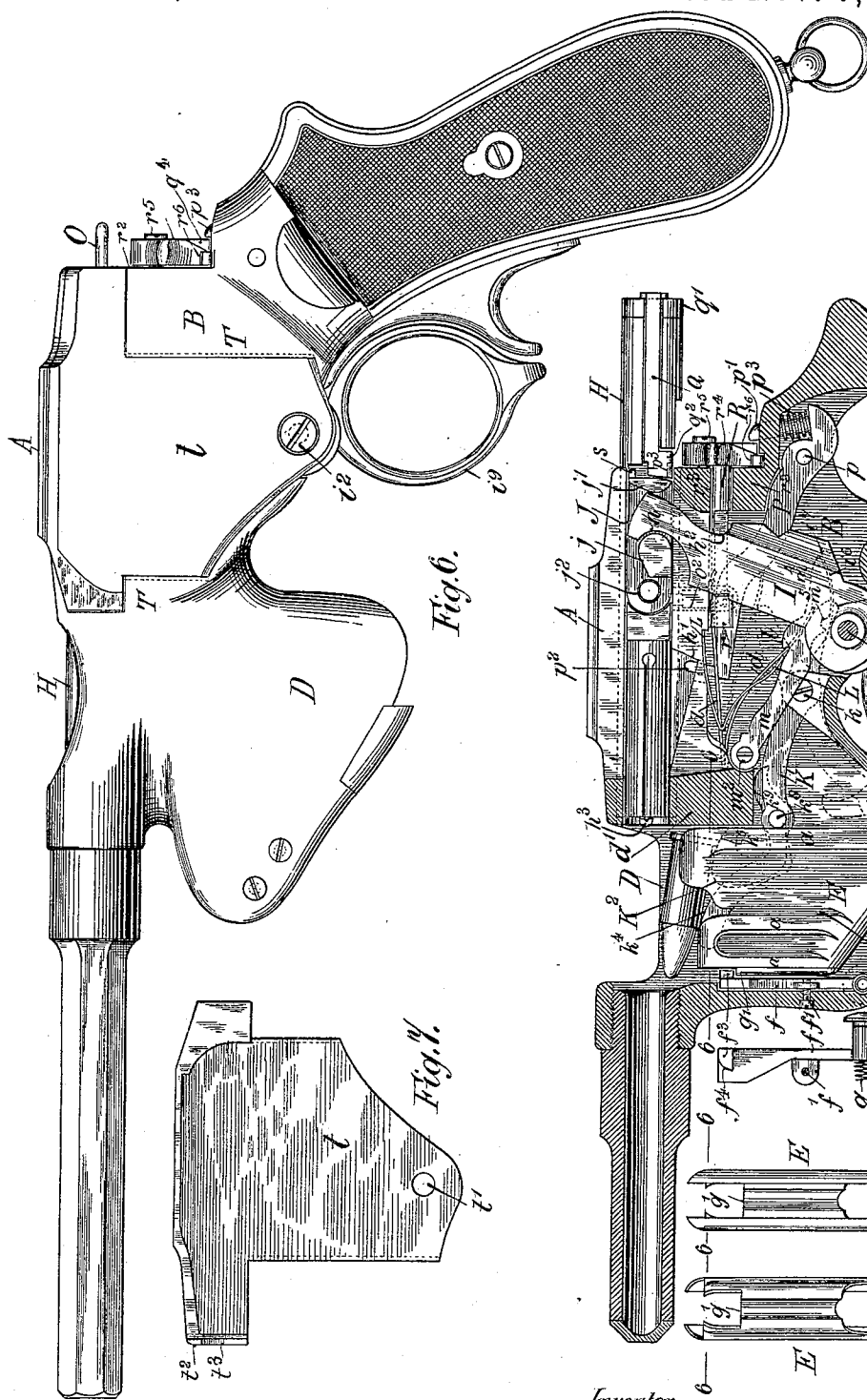
(No Model.)

3 Sheets—Sheet 1.

J. LAUMANN.
REPEATING SMALL ARM.

No. 508,228.

Patented Nov. 7, 1893.



Inventor ⁶ Josef Laumann
by Henry H. Keitz-
Attorney.

Witnesses:
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Robt. A. Blake

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WASHINGTON, D. C.

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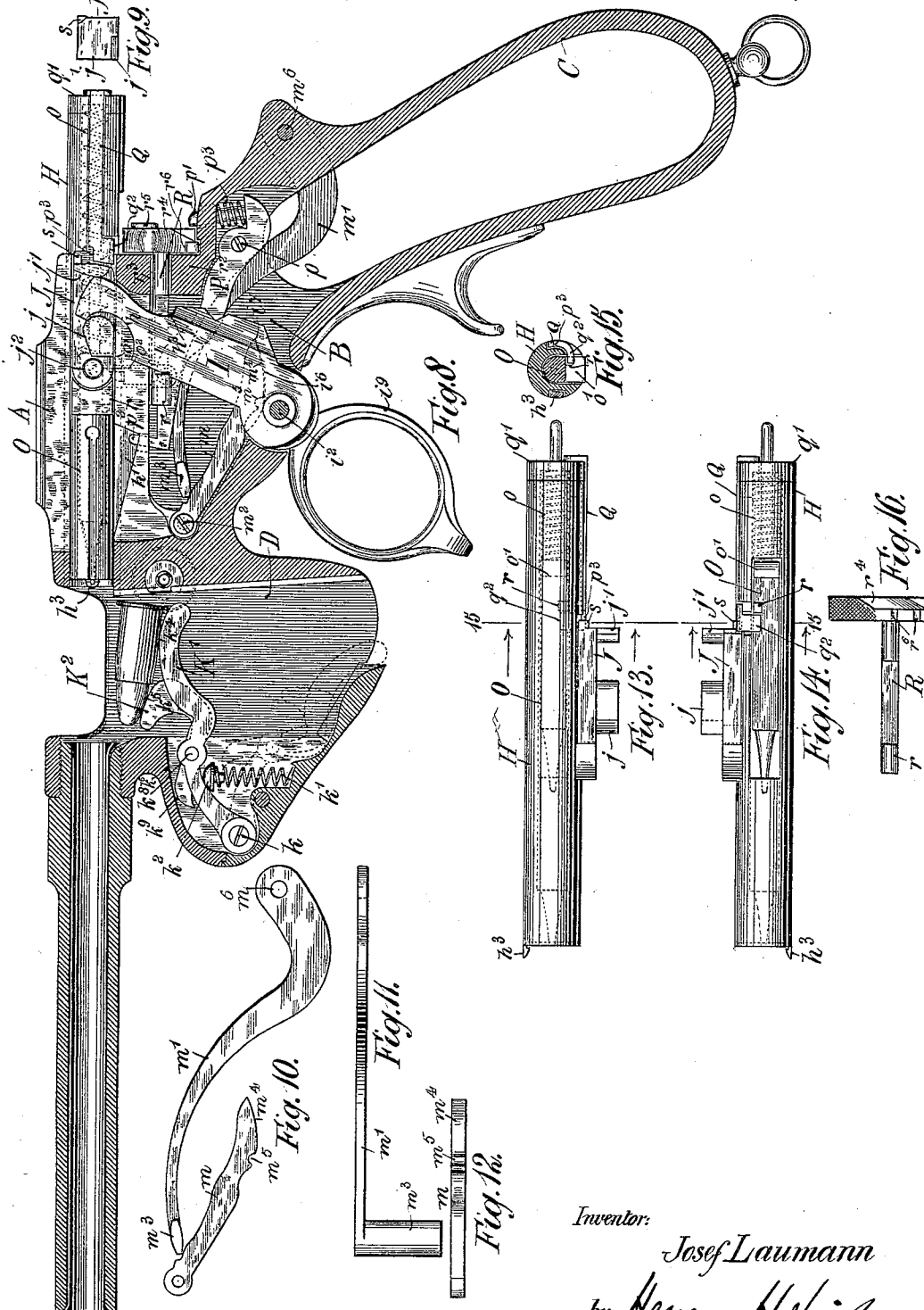
(No Model.)

3 Sheets—Sheet 2.

J. LAUMANN.
REPEATING SMALL ARM.

No. 508,228.

Patented Nov. 7, 1893.



Witnesses
Charles Woodroffe.
Robert A. Blake

Inventor:

Josef Laumann
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(No Model.)

3 Sheets—Sheet 3.

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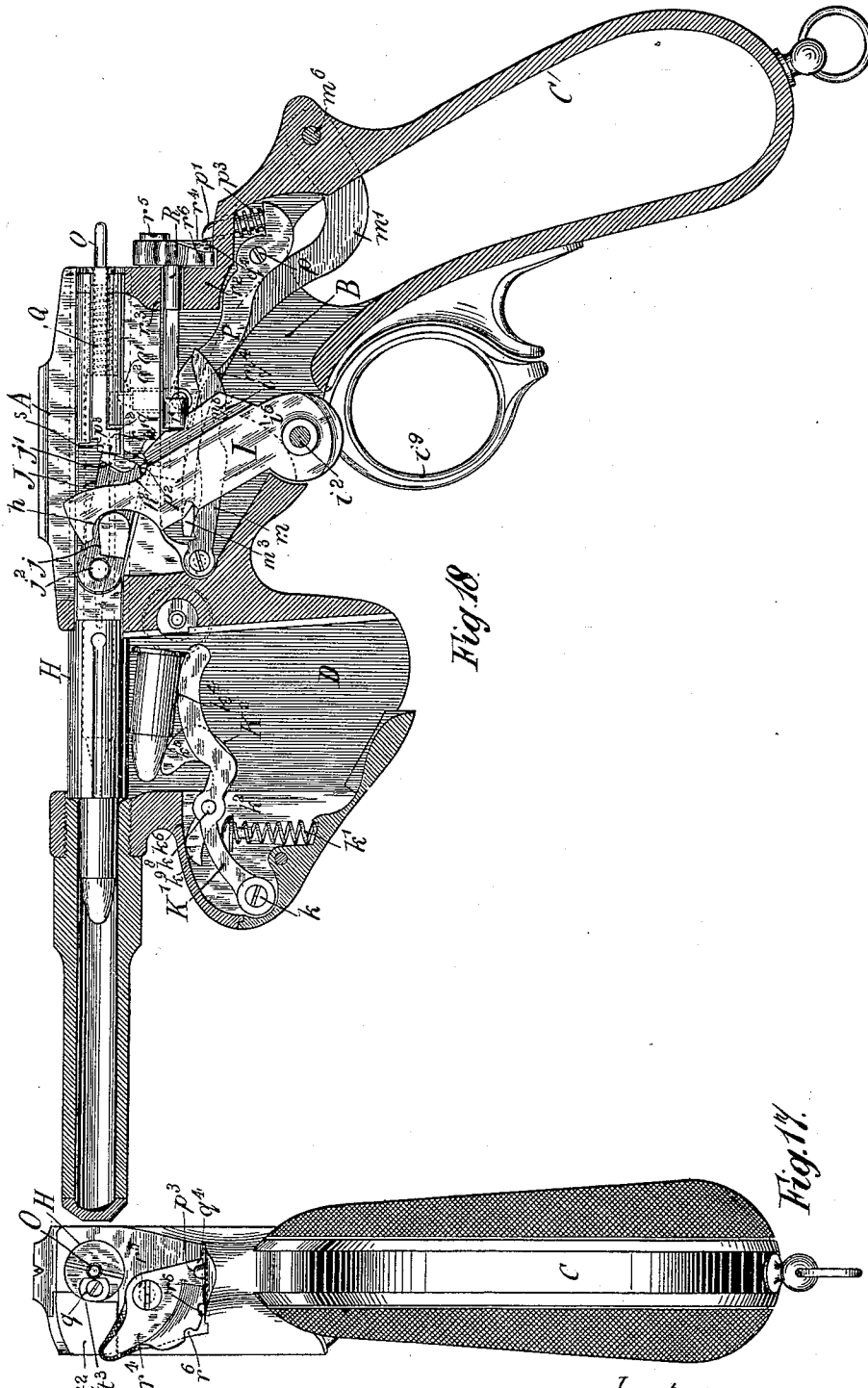


Fig. 18.

Fig. 17.

Witnesses:
Chas. Woodruffe.
Robt. A. Blake

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UNITED STATES PATENT OFFICE.

JOSEF LAUMANN, OF VIENNA, AUSTRIA-HUNGARY, ASSIGNOR TO GEBRÜDER
SCHÖNBERGER, OF SAME PLACE.

REPEATING SMALL-ARM.

SPECIFICATION forming part of Letters Patent No. 508,228, dated November 7, 1893.

Application filed May 23, 1891. Serial No. 393,872. (No model.) Patented in England February 18, 1891, No. 2,984; in Germany February 21, 1891, No. 25,827; in France March 3, 1891, No. 198,666; in Belgium March 5, 1891, No. 70,783, and in Austria-Hungary March 18, 1891, No. 51,910 and No. 1,632, and June 22, 1891, No. 6,083 and No. 22,882.

To all whom it may concern:

Be it known that I, JOSEF LAUMANN, gun-
maker, a subject of the Emperor of Austria-
Hungary, residing at No. VIII Kaiserstrasse,
No. 80, Vienna, in the Empire of Austria-Hun-
gary, have invented Improvements in Repeat-
ing Small-Arms, (for which I have filed appli-
cations for Letters Patent in the following
countries: Austria-Hungary November 17,
1890, and January 27, 1891, and which were is-
sued, respectively, March 18, 1891, No. 51,910
and No. 1,632, and June 22, 1891, No. 6,083 and
No. 22,882; Belgium March 5, 1891, No. 70,783;
France March 3, 1891, No. 198,666; Germany
February 21, 1891, No. 25,827, and Great Brit-
ain February 18, 1891, No. 2,984,) of which the
following is a specification.

My invention relates to improvements in
repeating fire arms and has more particular
reference to improvements upon the inven-
tion described in Letters Patent of the United
States No. 479,284, dated July 19, 1892.

The particular parts of the arm to which
the present improvements are applied are as
follows: first, the cartridge magazine; sec-
ond, the cartridge feeder; third, the magazine
detent; fourth, the breech bolt and breech bolt
lever mechanism; fifth, the firing mechanism;
sixth, the firing pin locking mechanism; sev-
enth, the safety mechanism; eighth, the cover
of the action body. It is by the mutual co-
operation of these subsidiary improvements
that the general object of the invention is
attained; and in order that it and the means
by which it is to be carried into practical
effect may be thoroughly understood, I will
now describe them in detail, referring in so do-
ing to the accompanying figures which are to
be taken as part of this specification and read
therewith. Throughout it, the expression
"cocked" refers to the position of the parts
immediately preceding the act of firing and
"uncocked" to that immediately preceding
the cocked position. The terms "left," "right,"
"front" and "rear," are to be understood as
if the reader were the marksman with the
weapon in front of him and at the "present."

Figure 1 is a sectional longitudinal eleva-
tion from the left side illustrating the posi-
tions of the several parts when the arm is un-

cocked, and the breech open. Figs. 2 and 3
are, respectively, front and rear elevations of
a cartridge magazine. Fig. 4 is a horizontal
section taken on the line 6—6 of Figs. 1, 2 and
3. Fig. 5 is a rear elevation of the magazine
detent. Fig. 6 is a longitudinal elevation
from the left side of a pistol made according
to my invention, cocked and ready for being
fired. Fig. 7 is an elevation of the inside face
of the action body cover plate. Fig. 8 is a
sectional longitudinal elevation from the left
side, illustrating the positions of the several
parts when the arm is uncocked and the
breech open but omitting the cartridge maga-
zine. Fig. 9 is a rear elevation of the breech
bolt locking bar. Fig. 10 is a detail side ele-
vation from the left side of the main spring
and main spring lever. Fig. 11 is a plan of
the main spring. Fig. 12 is an inverted plan
of the main spring lever. Fig. 13 is a plan
of the breech bolt illustrated in Figs. 3, 8, 17
and 18. Fig. 14 is an inverted plan corre-
sponding therewith. Fig. 15 is a transverse
section taken on the line 15—15 of Figs. 13
and 14. Fig. 16 is a side elevation, from the
left side, of the locking bolt of the breech
bolt lever. Fig. 17 is a rear elevation show-
ing the safety mechanism locked. Fig. 18 is
a sectional longitudinal elevation from the
left side, illustrating the positions of the sev-
eral parts when the arm is cocked.

1. *The cartridge magazine.*—This is the
detachable case or magazine in which the
cartridges are held. My improvements in it
are illustrated in Figs. 1, 2, 3 and 4. The
sides of the magazine E are strengthened by
the formation thereon of outwardly project-
ing ridges *a*. *a'* is a slot in each side. The
two slots are opposite each other, and are
formed in the described position for the pur-
pose of imparting the necessary resilience to
the sides. Both the top and bottom edges of
the latter are bent over inwardly in the well
known manner, leaving the magazine open at
both top and bottom, as usual, and in addi-
tion thereto, down the back at *a*² to allow of
the upward motion of the cartridge lifter and
also of the empty magazine dropping past
the latter.

2. *The cartridge lifter.*—This is the auto-

matic device by which the cartridges in the magazine E are gradually lifted so as to keep the top one aligned with the barrel. It consists of a principal lever pivoted at one of its ends to the fire arm and having combined with it an S shaped lever pivoted at its center to the side of the principal lever, and working in a plane or planes parallel with it. This part of the invention is illustrated in Figs. 1, 8 and 18.

K' is the principal lever and k , its pivot. When the cartridge magazines are open down the back, as described in the preceding section, the pivot k must be in the action body B so that the lifter may project forward into the magazine chamber D. If, on the contrary, the cartridge magazines are open down the front, the pivot is in the front of the magazine chamber, as illustrated in Figs. 6, 8 and 18. The position and shape of the actuating spring depend upon the position of this pivot. When the latter is in the action body B, I use a V spring d —see Fig. 1. This is held fast in a block d' situated between the magazine chamber and the action body. It works between the top of the latter and a rearward extension b of the lever K'. When the pivot is in the front of the magazine chamber, the actuating spring is a spiral one, k' , which has its base in a suitable seating in the bottom of the said chamber—see Figs. 8 and 18.

k^2 is a convex stud carried by the top of the spring to facilitate the contact between the latter and the under side of the lever K'. k^4 is the operative edge of the latter and is arched or convex. This edge is struck from a center situated at such a point below the lever that, no matter whereabouts in the magazine the bottom cartridge may be, the said edge k^4 presses exactly against the middle third of the under side of the said cartridge, and slides smoothly along the latter as it is being lifted. When the pivot k is in front of the magazine chamber D, the action is as follows: The more closely the cartridge approaches the barrel, the farther the line of contact between the lever and it shifts to the rear from the bullet end.

K² is the S shaped lever and k^3 the pivot by which it is pivoted through its center to the side of the lever K'. The operative surfaces of the lever K² are the shoulder k^9 on its shorter and lighter arm and the convex edge k^5 of its longer and heavier arm. Figs. 8 and 18 show the lifter as supporting the last cartridge in the loading position. As the lifter is raised by its spring, the shoulder k^9 contacts with the opposite internal surface k^6 of the top of the front part of the magazine chamber, and slides forward over the same, but, at the same time and *pari passu*, raises the convex edge k^5 and moves it at once upward and forward, so that the bullet ends of the respective cartridges are tilted toward the bore of the barrel the nearer they get opposite to it with the result that the nose of the

top bullet will, as it were, be looking into the bore.

When the pivot of the lever K' is in the action body B as illustrated in Fig. 1, the action of the two surfaces k^4 , k^5 is modified accordingly. When the cartridge magazine is full, the lifter is in the position indicated by the dotted lines. As the spring d forces the surface k^4 upward, the surface k^5 follows behind it. When the surface k^9 comes into contact with the block d' , the surface k^5 is pushed upward, being, however, still at a lower level than the surface k^5 .

The improved cartridge lifter is especially adapted for long cartridges, *e. g.*, those that are used in infantry rifles.

I may use two levers K², counterparts of each other, one on each side of the lever K' and both on the same pivot k^3 . Such an arrangement has the advantage of completely closing the charging hole of the empty magazine chamber.

3. *The magazine detent.*—This is a controllable device adapted to prevent a charged magazine being raised by the cartridge lever, and, at the same time, to permit of the arm being unloaded at any time, and is illustrated in Figs. 1 and 5 which illustrate its adaptation to cartridge magazines which are closed down the front.

f is the detent lever, having its fulcrum upon a pin f' which is fixed at a point in front of the magazine chamber. The lever itself is situated to the right hand side of the chamber, but in front of the magazine in the chamber.

f^2 is a push piece connected to and projecting from the bottom of the lever f out through the right hand side of the magazine chamber.

f^3 is a stud upon the inside face of the top end of the lever. The left hand end of this stud is beveled downward toward the left hand, producing a decline f^4 as illustrated in Fig. 5. The under face of the stud is a horizontal plane, and it is this portion of the device which is the detent.

g is a returning spring adapted to hold the said detent directly over the stop g' on the front of the magazine when the latter is in the magazine chamber. The stop g' is a projecting corrugation stamped in the front of the magazine, and extends from the bottom to nearly the top thereof.

The operation of this part of my invention is as follows: When a magazine is pushed into the magazine chamber from the top, the bottom of the stop g' engages the decline f^4 , and pushes the stud f^3 and detent lever f to the right hand side about the pivot pin f' . As the magazine is being pushed down into the chamber, the side of the stop keeps the detent back until it has passed it, when the returning spring g locks the detent above the stop. To unload the arm, *i. e.*, to remove a charged magazine from the magazine cham-

ber, a push piece f^2 is pressed inward, with the result that the detent is moved away from over the stop g , whereupon the feeder will throw the magazine out of the chamber.

5 The magazine chamber is itself of the usual construction, as far as regards its being open at the top to receive a charged magazine, and at the bottom to allow of an empty one to drop out.

10 4. *The breech bolt and breech bolt lever mechanism*—This part of my invention is illustrated in Figs. 1, 8 to 15, 17 and 18.

H is the breech bolt. The standing breech A is bored out to receive it as heretofore, and 15 the bolt slides backward and forward therein according to the motion of the breech bolt lever described farther on. The bore of the standing breech is axially aligned with that of the barrel. The bolt itself is tubular to receive the firing pin and its spring, and to allow 20 them to work therein. The front end is closed, but is perforated in the center to allow of the nose of the firing pin passing through it. There is a longitudinal slot in the bottom of the breech bolt to allow of the protrusion through it, as well as the to-and-fro motion along it, of a stud o' depending 25 from the firing pin.

30 h^3 is the automatic cartridge extractor. It may be dispensed with, and an extractor, detached from the breech bolt, be used to extract a cartridge that has missed fire.

I is the breech bolt lever, and i^2 its fulcrum. i^3 is the external eye by which this lever is 35 cocked and uncocked.

J is the breech bolt locking bar having a locking nose thereon; and j^2 , its pivot.

40 h' is a notch in the standing breech A. It is adapted in respect both of position and shape, to receive the said nose as the breech bolt is pulled forward into the cocked position. As the rear end of the bar J is rectangular in elevation, the rear face of the notch slopes upward and backward. When the bar 45 J is so engaged in the said notch, its bottom side rests upon the adjacent face of the notch, while its operative nose bears against the said upwardly sloping rear face for the purpose of preventing the explosion in the barrel driving 50 the breech bolt back prematurely.

The connection between the breech bolt and its lever is as follows: j, j' are two enlargements or blocks upon the left side of the locking bar J. These blocks are adapted, in 55 respect of both position and shape, to engage alternately with two circular recesses in the respective edges of the lever I. The block j projects from the bar close to its bottom edge and presents a convex end to the front edge 60 of the lever I about halfway along the length of the said bar. The second block j' is close to the rear end of the bar J, and presents a convex face to the lever. It is the rear end that is its operative nose. The upper end of 65 the lever I works between the blocks, engaging first one and then the other by one of the recesses next described.

h is a circular recess in the front edge of the lever. As soon as the latter is pulled by its eye, the top of the recess engages the block j , and as the bar J is moved forward 70 with the breech bolt, the said recess, in virtue of its concavity which slides smoothly over the adjacent and concave face of the block j , pulls the said bar into the notch h' 75 which is cut in the under side of the standing breech. This is the position illustrated in Fig. 18. When the eye of the lever I is pushed forward to uncock the arm, the recess h^2 in the rear edge of the lever engages the 80 convex face of the block j' , and riding smoothly under and against it, lifts the bar J out of the notch, retracts the breech bolt and completes the opening of the breech.

The main spring which I make use of may 85 be either a V spring or a bar spring, but whichever type is adopted, it is always used in combination with a lever interposed between it and the breech bolt lever and upon which the main spring bears. The combination 90 of V spring and lever is illustrated in Fig. 1, and that of bar spring and lever in Figs. 8, 10 to 12 and 18. Referring to Fig. 1 in this respect, L is the V main spring. It has its base of action in a notch cut in the top of the action body B, and into which one of its 95 legs projects, while the other one bears upon the top of the lever m and against a shoulder l formed upon its top edge. It is through this lever that the power of the main spring is brought to bear upon the lever I. It has its 100 fulcrum upon a pin m^2 which stands transversely as far in front of the fulcrum of the lever I as the chamber B allows, and always above the said fulcrum. It is between these 105 two points—notch and shoulder—that the spring exerts its energy, always tending to force the lever downward. The notch and shoulder may be replaced by suitable equivalents provided that the resilience of the spring 110 is always being exerted in the direction indicated. Referring in the same respect to Figs. 8 to 12 and 18, m' is a bar main spring. Its rear end is held in a suitable seating in the frame C of the stock by a screw pin m^6 . m^3 115 is a lateral enlargement of the end of the spring on the left hand side of it. It is elliptical in shape for the purpose of maintaining a smooth contact between the main spring and the lever. 120

The connection between the lever m and the lever I is as follows:— m^4 is a convex contour on the bottom edge of the lever, extending from its nose and terminating in a notch m^5 . i^6 is a concave ledge on the right hand side of 125 the lever I, terminating rearward in a shoulder i^7 , the counterpart in contour of the notch m^5 . When the lever is in the position indicated in Fig. 8, the lever eye having been pushed forward, the convex m^4 is forced 130 against the concave i^6 on the right hand side of the lever; and, as the area of contact is to the rear of the fulcrum i^2 of the lever, the latter is locked as illustrated in Figs. 1 and 8.

When, on the other hand, the eye is pulled, the shoulder i^7 rides under the convex m^4 until the breech bolt H has attained the firing position, at which moment the notch m^5 will engage the shoulder i^7 under the action of the main spring, and lock the lever in the cocked position, as shown in Fig. 18.

5. *The firing mechanism.*—O is the firing pin; and o, its actuating spring. The latter exerts its resilience between the notched head screw q' , by which the rear end of the breech bolt is closed, and the rear end of the pin. The latter is free to be moved to and fro within the bore of the breech bolt. The front end of the latter is bored centrally to permit of the protrusion through it of the nose of the firing pin.

o' is a stud fast to the under side of the firing pin. It has been already referred to in the previous section.

P is the firing lever, and p its fulcrum. p^3 is its returning spring. It is represented as a spiral one operating in a downward direction between the frame of the stock C and the lever and behind the fulcrum p . The front end of the lever P terminates in an upward extension p^2 adapted, in respect of both height and position, to be engaged by the lower end of the locking bar J as the latter is pulled down into the notch h' . Fig. 18 shows this engagement as just beginning.

o^2 is a detent which is pivoted upon the lever P and projects up from it, standing normally in front of the stud o' . The continuation of the pull at the lever eye i^3 , begins to draw the detent down from before the stud o' . By the time that the operative nose of the locking bar J is down to the bottom of the notch h' , the detent o^2 is out of the way of the stud o' , and the firing pin spring o is free to act, subject however to the operation of the safety mechanism described in the next section.

6. *The mechanism for locking the firing pin.*—The object of this part of my invention is the prevention of premature firing, and it accomplishes that object by locking the firing pin so that it cannot be released before the nose of the locking bar J is down in its notch h' .

Referring to Figs. 1, 8, 9 and 13 to 15, Q is a spring bar. It lies normally within the periphery of the breech bolt. Its rear end is made fast to the rear end of the breech bolt, as by a screw q entering the head of the breech-bolt closing screw q' through the returned end of the spring bar. The operative nose q^2 of the said spring bar is bent at a right angle with it, and passes through a hole made for that purpose in the side of the breech bolt, extending thereinto far enough to stand in front of a stud r on the firing pin. s is a beveled stud or incline upon the rear face of the locking bar. It is beveled on one side as shown in Fig. 9, and is adapted, in respect of position and contour, to engage behind the angle q^3 at the

moment that the locking bar engages with the projection p^2 —see Fig. 18. As the locking bar J is pulled to the bottom of the notch h' (releasing the detent o^2 *pari passu*), or, in other words, as the breech-bolt is cocked, the stud s is pulled downward behind the angle q^3 , with the result that the stud r is released from the nose q^2 at the same moment in which the stud o' is released from the said detent.

7. *The safety mechanism.*—The objects of this part of the invention are as follows:—(a.) to lock the breech bolt and firing mechanism in the uncocked position that the act of loading the magazine chamber may be effected without risk of accidents, and (b.) to lock the breech bolt and firing mechanism in the cocked position so that unintentional firing may be impossible.

Referring to Figs. 1, 6, 8, 16, 17 and 18, R is the locking bolt. It lies in a horizontal position in an arc-shaped slot r^3 in the end plate r^2 of the arm. Its outer end is made fast to the lever r^4 which has its fulcrum upon a screw pin r^5 which enters the end plate.

q^4 is the operative nose of the lever r^4 .

r is the operative nose of the locking bolt and is a lateral extension of its front end.

r^6, r^6 are two notches in the periphery of the lever r^4 , corresponding with its two terminal positions. p^3 is a pin fast upon the rear end of the firing lever and projecting upward through the stock of the arm.

The operation of the mechanism is as follows:—When the lever r^4 is in the position illustrated in Figs. 1, 6, 8 and 18, it is in the unlocked position. Consequently the firing lever may be pulled, or the breech bolt be cocked or uncocked. If, however, the lever r^4 be moved by pressing the left hand or checkered portion of it upward, its nose q^4 will be brought down immediately in front of the pin p^3 , and as the motion of this is circular about the pin p as a center, the firing lever will be locked. The same motion of the lever r^4 will bring the nose r of the locking bolt either immediately in front of, or immediately behind the lever I, according to its then position, thereby locking it.

8. *The cover of the action body.*—Referring to Figs. 6, 7 and 17, T, T are the adjacent portions of the left hand side plates of the arm.

t is the detachable cover plate. The side edges of the plate t are chamfered, and the corresponding side edges of the plates T, T are grooved to receive the said chamfered edges, as indicated by the dotted lines in Fig. 6. The plate t is fixed to the arm by a single screw i^2 , the shank of which, passing through the hole t' , serves as the fulcrum of the lever I. The inner face of the plate t presses against the lever, and so far, assists in keeping the several members of the breech-mechanism in their respective positions. The rearward extension t^2 is bent inward at right angles with the plate t , and is concaved on its edge as shown at t^3 , Figs. 7 and 17, to corre-

spond with the contour of the breech-bolt, for the purpose of closing the breech chamber against the entrance of dust.

A weapon constructed as above described with reference to Figs. 1 to 18 is loaded and cocked by pulling the eye i^9 of the lever I until the locking bar J and the main spring lever m are in the position illustrated in Fig. 18; fired by pulling the eye until the notch m^5 in the said lever engages the shoulder i^7 by which time the locking bar J has released the firing pin, and uncocked by pushing the eye i^9 forward.

I claim—

1. A cartridge feeder consisting of a lever pivoted near the front of the magazine chamber, an actuating spring operating between the bottom of the magazine chamber and the under sides of the lever near the pivot of the latter, the top or operative edge of the rear half of the lever being arch-shaped or convex, and an S-shaped lever having its fulcrum in the said lever, the lighter half of such S-shaped lever adapted to engage with the adjacent surface of the magazine chamber thereby raising the heavier end and causing it to engage under the bullet of the bottom cartridge, as set forth.

2. The combination with the breech bolt and its lever, of a locking bar pivoted on the bolt, a stud carried by the firing-lever and adapted by contact with the said locking bar to counteract the normal action of the spring of the said lever and to disengage a detent carried by the said firing lever from the firing pin as the continued motion of the breech bolt lever forces the said locking bar down into its notch in the standing breech, as set forth.

3. The combination of a main spring, lever interposed between the main spring and the breech bolt lever and depressed by the said spring, a convex contour upon the lower edge of the said lever extending from its nose backward, a concave upon one side of the breech bolt lever adapted to receive the said convex contour in the uncocked position, a shoulder on the same side of the breech bolt lever as the said concave and a notch in the lower edge of the said lever adapted, in respect of position, to embrace the said shoulder in the firing position, as set forth.

4. The combination of trigger, V-shaped

main spring within the chamber of the breech mechanism and in front of the breech bolt lever, a lever interposed between the said main spring and breech bolt lever, a convex contour upon the lower edge of the said intermediate lever extending from its nose backward, a concave upon one side of the said breech bolt lever adapted to receive the said convex contour in the uncocked position, a shoulder on the same side of the breech bolt lever as the said concave and a notch in the lower edge of the said intermediate lever adapted, in respect of position, to embrace the said shoulder in the firing position, as set forth.

5. The combination of a spring bar upon the breech bolt and normally locking a stud upon the firing pin, with an incline upon the locking bar adapted, at the moment the breech bolt is pulled into firing position, to disengage the said spring bar from the said stud upon the firing pin, as set forth.

6. The combination of firing lever, a pin projecting up from the rear end of said lever through the stock of the arm, a lever having its fulcrum upon the rear end of the arm and adapted by its motion thereabout to lock or release the firing lever, and a spiral returning spring about the said pin, as set forth.

7. The combination of lever having its fulcrum on the rear end of the arm, locking bolt fast thereto, arc shaped slot in the end plate of the arm, and a projection from the firing lever within reach of the operative nose of the said lever, as set forth.

8. The combination with the side plates, the opposite side edges of which are grooved, of a detachable cover plate adapted, by being chamfered along its side edges, to slide in the grooved edges of the said side plates, to be held in place by the screw which provides the fulcrum of the breech bolt lever and, by having a rearward extension concaved on its inner edge, to completely close up the rear part of the chamber of the breech mechanism, as set forth.

In testimony whereof I have hereunto affixed my signature, in presence of two witnesses, this 14th day of April, 1891.

JOSEF LAUMANN.

Witnesses:

VICTOR VON SCHÖNBERGER,
LEOPOLD LANGER.