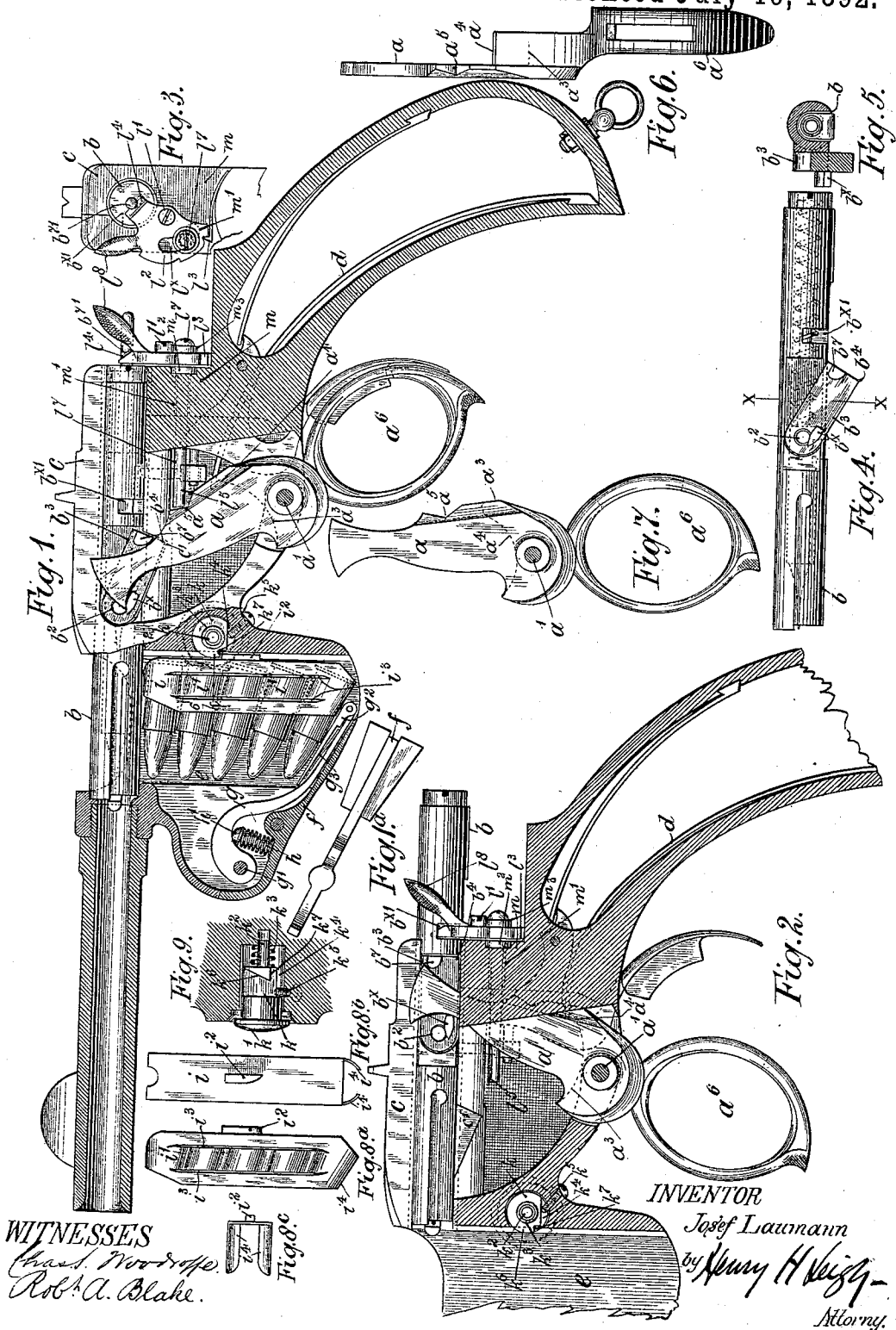


(No Model.)

J. LAUMANN.
REPEATING FIREARM.

No. 479,284.

Patented July 19, 1892.



UNITED STATES PATENT OFFICE.

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REPEATING FIREARM.

SPECIFICATION forming part of Letters Patent No. 479,284, dated July 19, 1892.

Application filed May 12, 1890. Serial No. 351,558. (No model.)

To all whom it may concern:

Be it known that I, JOSEF LAUMANN, a subject of the Emperor of Austria, residing at Vienna, Austria-Hungary, have invented a new and useful Improvement in Repeating Firearms and Ammunition for the Same; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 of reference marked thereon, which form a part of this specification.

The invention relates to improvements in repeating firearms; and its general object is to increase the number of shots which can be fired in a given time. This general object is accomplished by the combination of the following subsidiary improvements, each having its special object: first, improvements in the cartridge-magazine; second, improvements in the cartridge-feeder; third, improved cartridge-stop; fourth, improved trigger and breech-bolt mechanism; fifth, improved safety mechanism.

It is by the mutual co-operation of the above subsidiary improvements that the general object of the invention is attained; and I do hereby declare that the following is a full, clear, and exact description of the invention, and one which will enable others skilled in the art to which it appertains to carry it into practical effect, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional longitudinal elevation showing the arm in the firing position. Fig. 1^a is a plan of the bottom of the magazine-chamber. Fig. 2 is a detail elevation of the trigger, breech-bolt, and safety mechanisms, showing the trigger and breech-bolt in the cocked position. Fig. 3 is an end elevation of the safety mechanism. Fig. 4 is a side elevation of the breech-bolt and locking-bar. Fig. 5 is a section taken on the line xx of Fig. 4. Fig. 6 is a rear elevation of the trigger. Fig. 7 is a side elevation of the trigger. Figs. 8^a, 8^b, and 8^c are respectively side elevation, rear elevation, and plan of a cartridge-magazine.

Fig. 9 is a detail illustrating the construction and operation of the magazine-stop.

I. *The cartridge-magazine.*—This part of the invention is illustrated in Figs. 1, 8^a, 8^b, and 8^c. It resembles the Marmlicher magazine to the extent of being open in front and at both top and bottom, but differs from it in respect to the sides. v^3, v^3 are two vertical (or nearly so) slots formed in each side of the magazine v . Those in one side are respectively opposite those in the other. v', v' are flutes or concave corrugations stamped in the sides of the magazine and these alternate with convex corrugations. They extend from one slot v^3 to its fellow slot in the same side, as illustrated in Figs. 1 and 8^a, and the corrugations in one side are respectively opposite those in the other, the convex corrugations thereby forming seats for the cartridges. The presence of the slot v^3 imparts a degree of resilience to those portions of the two sides, respectively, between them, so that when a cartridge is pushed into the magazine from the top the said portions spring outward and then return, grasping the cartridge by its sides, not tightly, as in a vise, but allowing of a little play. The seat for the bottom cartridges is formed by the incurved bottom edges v^4 of the magazine sides, and the top cartridge is shown as resting upon the top edges of the seat of the second one.

II. *The cartridge-feeder.*—Referring to Fig. 1, e is the magazine-chamber. It is, as heretofore, open at the top for the insertion of a charged magazine. The bottom f has, likewise, an opening in it to allow of the emptied magazine dropping out. g is the feeding-lever, and g' its fulcrum. g^2 is a finger above the lever g and pivoted to its nose. h is the actuating-spring of the lever g . It is of a spiral form and bears upon the bottom f of the magazine-chamber, as illustrated in Fig. 1. h' is a stud fast on the top or operative end of the said spring, and through it the resilient power of the spring bears upon the under side of the lever g . The function of this lever is to raise the column of cartridges to the extent of presenting the top of the rim of the then top cartridge in front of the breech-

bolt *b* when the latter is cocked—*i. e.*, drawn back into its cylinder or casing *c*, (see Fig. 2,) and the strength of the spring *h* is adjusted accordingly. The function of the finger *g*² is to always keep the cartridge-noses tipped up, so that when the breech-bolt engages behind the rim of the top one the nose will head directly for the bore of the breech. To enable it to do this, a small spring *g*³ is fitted between the finger and lever, so as to raise the free end of the finger.

III. *The cartridge-magazine stop.*—This part of my invention is illustrated in Figs. 1, 8^a, 8^b, 8^c, and 9. *i*² is the stop. It is a block or stud fast upon the back of the cartridge-magazine. (See Figs. 1, 8^a, 8^b, and 8^c.) The bottom left-hand corner of the stud is cut away, thereby producing an incline, as illustrated in Fig. 8^b, for a reason to be explained presently. Referring to Fig. 9, *k* is a bolt working in a transverse socket formed for it in the side and back of the magazine-chamber. Its head *k*¹ presents itself on the right-hand side of the arm. *k*³ is a spring surrounding an axial continuation *k*² of the bolt and acting between the end of the socket and the end of the bolt, being thereby adapted to keep the head *k*¹ projecting. *k*⁴ is a groove in the under side of the bolt, extending from the head for a short distance. The nose of the screw *k*⁵ enters this groove for the purpose of preventing the bolt being moved too far outward, the length of the groove being adjusted accordingly. A notch is cut down the front face of the bolt, leaving a projection *k*⁶. One side of this notch, that next to the head *k*¹, is vertical, while the opposite side, belonging to the projection *k*⁶, is inclined to the same hand as the incline on the stud *i*². Consequently the notch is wider at the top than at the bottom. The bottom of the projection *k*⁶ is cut away so as to produce a plane horizontal face *k*⁷. The projection *k*⁶ and face *k*⁷ together form the detent. The projection *k*⁶ is so placed that when it is in its normal position under the resilient action of the spring *k*³, the face *k*⁷ will be immediately over the stop *i*² when the magazine is in the magazine-chamber.

The operation of my improved magazine-stop is as follows: As a magazine *i* is being pushed down into the chamber *e*, the incline on the stop *i*² engages the top of the incline *k*⁶, and the side of the descending stud pushes it inward against the power of the springs *k*³; but as soon as the top face of the stud *i*² is past the face *k*⁷ of the projection *k*⁶, the latter is returned to its normal position by the spring *k*³ over the stud *i*², thereby locking the magazine in the chamber. If, however, it should be desired to at any time unload the magazine-chamber, then the bolt *k* is forced inward by pressing upon its head *k*¹, whereupon the magazine is freed from the detent and may be lifted out of the chamber *e* through the open top thereof.

IV. *The trigger and breech-bolt mechanism.*—This part of my invention is illustrated in Figs. 1, 2, 3, 4, and 7, and its objects are as follows: (a) to

ism.—This part of my invention is illustrated in Figs. 1, 2, 4, 5, 6, and 7. *a* is the trigger, *a*¹ its pivot, and *d* its lever-spring. On the inner face—that is, on the right side of the trigger—two shoulders *a*³ *a*⁴ are formed. The lever-spring bears upon the former to hold the trigger “cocked”—*i. e.*, in the position illustrated in Fig. 2—and upon the latter to hold it in the firing position—*i. e.*, the one illustrated in Fig. 1. *b* is the breech-bolt. It slides to and fro within its cylinder, which is bored through the breech-block *c*. *b*³ is a locking-bar pivoted on a pin *b*², projecting from the left-hand side of the breech-bolt. A suitable slot is cut in the left-hand side of the breech-bolt cylinder, in which the locking-bar can slide to and fro. *b*^x *b*⁷, Fig. 1, are respectively the front and back stud upon the locking-bar *b*³, one on either side of the trigger. It is through these studs alternately that the trigger is placed in operative connection with the breech-bolt. The opposite edges of the trigger are concave, to make contact with the respective studs easy. *c*¹ is a notch cut in the under side of the cylinder of the breech-bolt *b* of a proper position and contour to receive and hold the operative nose *b*⁴ of the breech-bolt locking-bar *b*³ when the bolt is in the firing position. This notch is clearly shown in Fig. 2, while Fig. 1 shows the bolt locked accordingly. The object of this locking is to enable the breech-bolt to resist the explosion of the charge. Assuming that the trigger is cocked—*i. e.*, in the position illustrated in Fig. 2—the rear edge of the top of the trigger is bearing against the back stud *b*⁷. When the trigger-eye is pulled the front edge of the top of the trigger engages with the front stud *b*^x, thereby pushing the breech-bolt forward into the firing position; but by the time the operative nose *b*⁴ of the locking-bolt *b*³ reaches the notch *c*¹ the concave front edge of the trigger top bears upon the top of the stud *b*^x, and as the trigger top is moving downward through an arc of a circle the said nose *b*⁴ is pulled down to the bottom of the notch *c*¹ and held there by the complete contact between the convex top of the stud *b*^x and the respective concave front edge of the trigger top. (See Fig. 1.) At this moment the concave back edge of the trigger top is partly just in front of and partly under the back stud *b*⁷. As soon, therefore, as the trigger-eye is pushed forward, for the purpose of cocking, the concave back edge aforesaid engages the said stud *b*⁷, lifts the nose *b*⁴ of the locking-bar out of the notch *c*¹, causes the back end of the locking-bar to enter the before-mentioned slot in the side of the breech-bolt cylinder, and finishes by completing the cock—*i. e.*, by returning the parts mentioned into the position illustrated in Fig. 2.

V. *The safety mechanism.*—This part of my invention is illustrated in Figs. 1, 2, 3, 4, and 7, and its objects are as follows: (a) to

lock the trigger in the cocked position; (b) to lock the trigger in the firing position; (c) to lock the firing-pin back.

The first object of this part of my invention is attained as follows: l^2 is a lever having its fulcrum in a screw-pin l' , by which it is held in the vertical plane upon and to the end plate m of the arm, into which plate the said screw enters. l^3 is a thumb-bit by means of which the lever can be moved about its fulcrum l' , as may be required for this part of my invention. l^4 is a tooth formed upon the upper arm of the lever. $b^{x'}$ is a notch in the breech-bolt b , and when the latter is drawn back the thumb-bit l^3 is pushed up, causing the tooth l^4 to enter the said slot, and as the trigger and breech-bolt cannot be moved independently of each other this entrance of the tooth into the slot will lock the trigger in the cocked position. This is the position illustrated in Fig. 2.

The second object of this part of my invention is attained as follows: l' is a locking-bolt. It lies in a horizontal position in a slot m' , formed in the end plate m , in which it can work freely. In cross-section this slot is arc-shaped, as indicated by dotted lines in Fig. 3. The front end of the bolt projects forward into the chamber of the breech mechanism, while the rear end projects into and through a slot l^x wide enough to work freely past the bolt l' in the lever l^2 , by means of which projection an operative connection is established between the said bolt and lever. Both the above-mentioned slots l^x and m' are struck from the fulcrum l' of the lever l^2 as a center. m^2 is a collar or shoulder upon the bolt on the front side of the lever l^2 , and m^3 a shouldered screw entering the bolt axially from the rear face of the lever. By means of these two devices the bolt is kept at a right angle with the lever. l^5 is the operative nose of the locking-bolt, and a^5 a notch in the rear edge of the trigger, where the engagement between bolt and trigger takes place. If the thumb-bit l^3 is pushed upward, the bottom of the slot l^x engages the rear end of the locking-bolt and pushes the latter up to the top of the slot m^2 , when the front end of the bolt will stand in the notch a^5 and in the path of the trigger, thereby locking the latter in the firing position. This is the position illustrated in Figs. 1 and 3. The unlocking of the trigger from either of the above-described positions is effected by depressing the thumb-bit l^3 . It should be pointed out that there is a certain amount of idle motion on the part of the lever l^2 —i. e., until the top of the slot l^x bears upon the top of the rear end of the bolt l' , and vice versa with respect to any subsequent locking.

The third object of this part of my invention is attained as follows: $b^{y'}$ is a notch cut in the side of the firing-pin on the side next the lever l^2 and at the proper distance from

the rear end of the pin for such notch to lie in the plane of the travel of the lever when the breech-bolt is in the firing position. (See Fig. 1.) If the thumb-bit l^3 is then pushed upward the tooth l^4 , already described, will enter the said notch and lock the firing-pin back. This position, also, is illustrated in Figs. 1 and 3. l^3 is a spring tooth adapted to automatically engage in notches in the periphery of the lever l^2 , for the purpose of holding it in either of its terminal positions.

I claim—

1. A cartridge-magazine having a pair of vertical or nearly vertical slots in the opposite sides thereof, the slots in one side of the magazine being respectively opposite to those in the other side of the same, and convex corrugations extending from one slot to its fellow slot in the same side, the convex corrugations in one side being respectively opposite to the convex corrugations in the other side, and a convex corrugation with the corresponding one opposite to it forming a seat for one cartridge, as set forth.

2. The combination, with the cartridge-magazine, of a stop on the back thereof, having one of its bottom corners cut away, thereby producing an incline, a bolt working in a transverse socket in the side and back of the magazine-chamber, the head of which bolt projects through the said side and presents itself at the side of the arm, a notch cut in the front face of the said bolt, having one of its sides inclined and adapted in respect of its position to be engaged by the above-mentioned incline on the stop on the back of the magazine, an internal spiral spring adapted to keep the head of the said bolt projected through the said side of the magazine-chamber, and a plane horizontal face in the under side of the said bolt communicating with the inclined side of the said notch in the face of the said bolt and adapted to be locked above the said stop on the back of the magazine-chamber by the resilient action of the said spring, as set forth.

3. The combination of a breech-bolt, a locking-bar pivoted on the side thereof, a notch in the breech-bolt cylinder adapted in respect of contour and position to receive the operative nose of the said locking-bar when the breech-bolt is in the firing position, a front stud on the said locking-bar adapted to be engaged by the forward motion of the trigger top and to pull the operative nose of the locking-bar into the said notch, and a back stud on the said locking-bar adapted to be engaged by the cocking motion of the trigger top and to raise the said nose out of the said notch, as set forth.

4. The combination of a lever in the vertical plane and having its fulcrum in the end plate of the arm, a horizontal locking-bolt within the chamber of the breech mechanism, the rear end of which bolt projects through an arc-shaped slot in the said end plate and

also through a second slot in the said lever, a lateral extension on the internal end of the said bolt adapted to be moved out of the path of the trigger by the engagement of the arc-shaped slot in the lever with the rear end of the locking-bolt when the said lever is moved about its fulcrum in one direction and to stand just in front of the trigger, the latter being in the cocked position and just behind it if in the firing position when the said lever

is moved about its fulcrum in the opposite direction, as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSEF LAUMANN.

Witnesses:

NETTIE S. HARRIS,
RUDOLF VON CLAACK.