

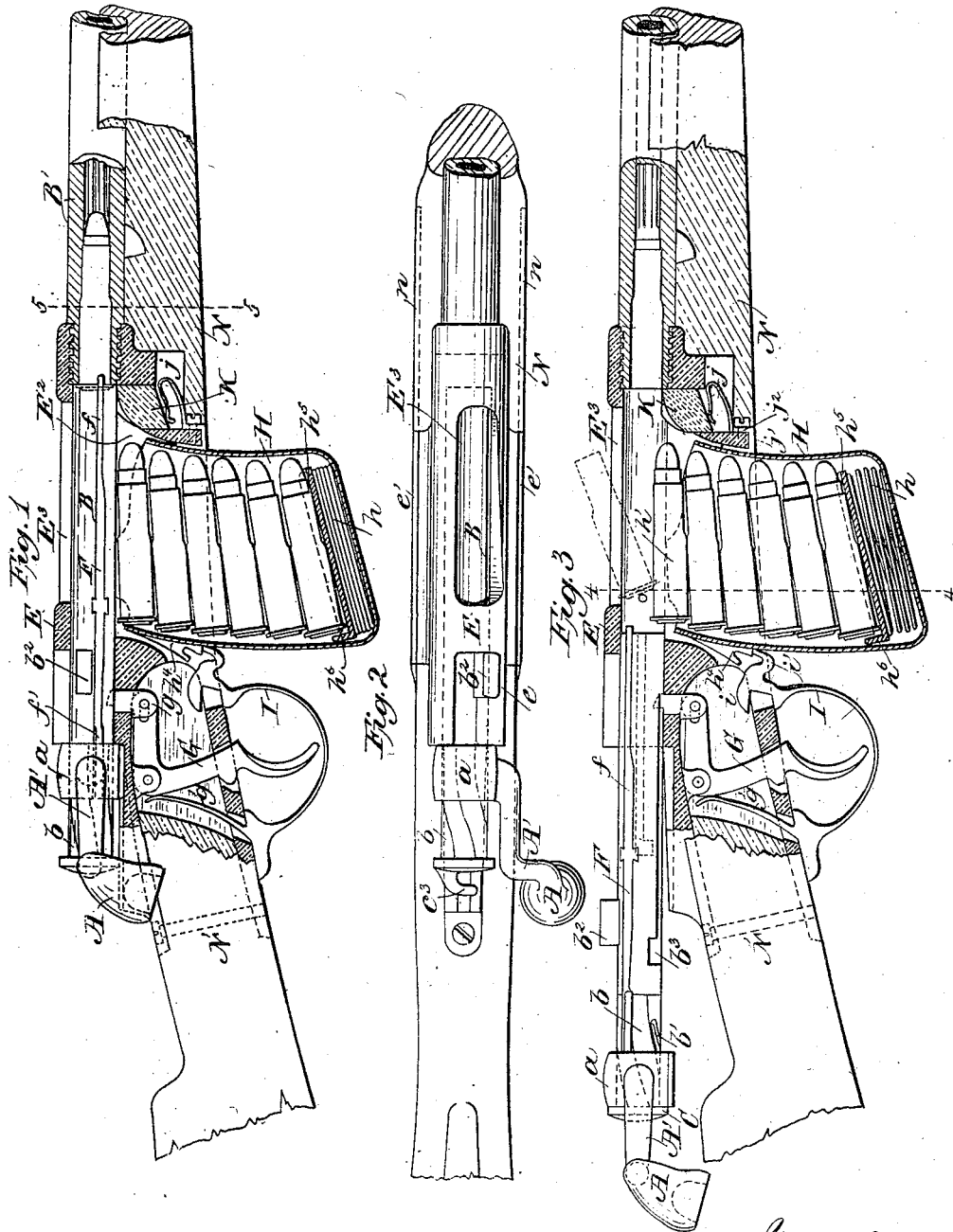
(No Model.)

3 Sheets—Sheet 1.

S. & K. KRNKA.  
MAGAZINE FIRE ARM.

No. 386,638

Patented July 24, 1888.



Witnesses:  
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C. M. Hallahan

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by  
their attorney

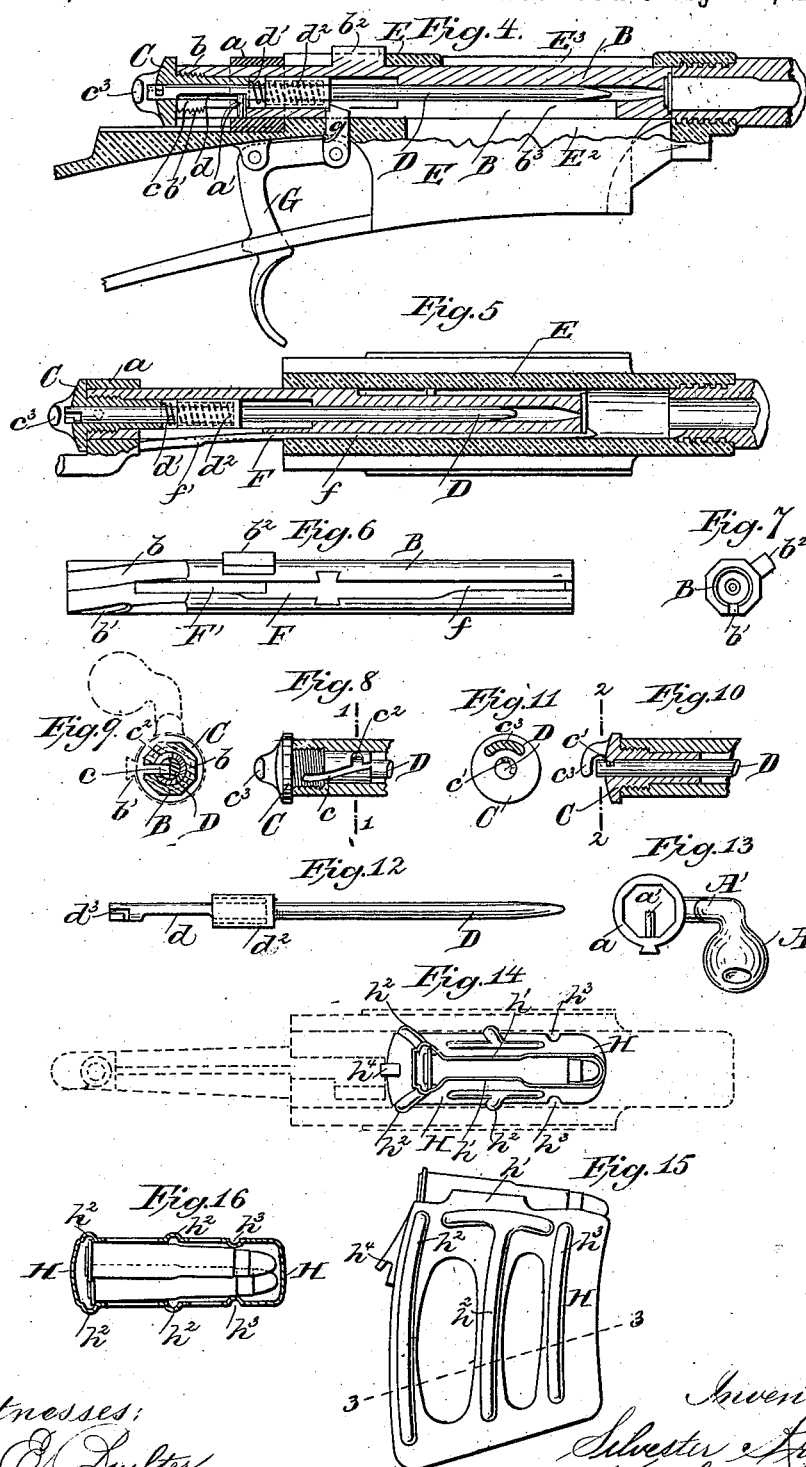
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3 Sheets—Sheet 2.

S. & K. KRNKA.  
MAGAZINE FIRE ARM.

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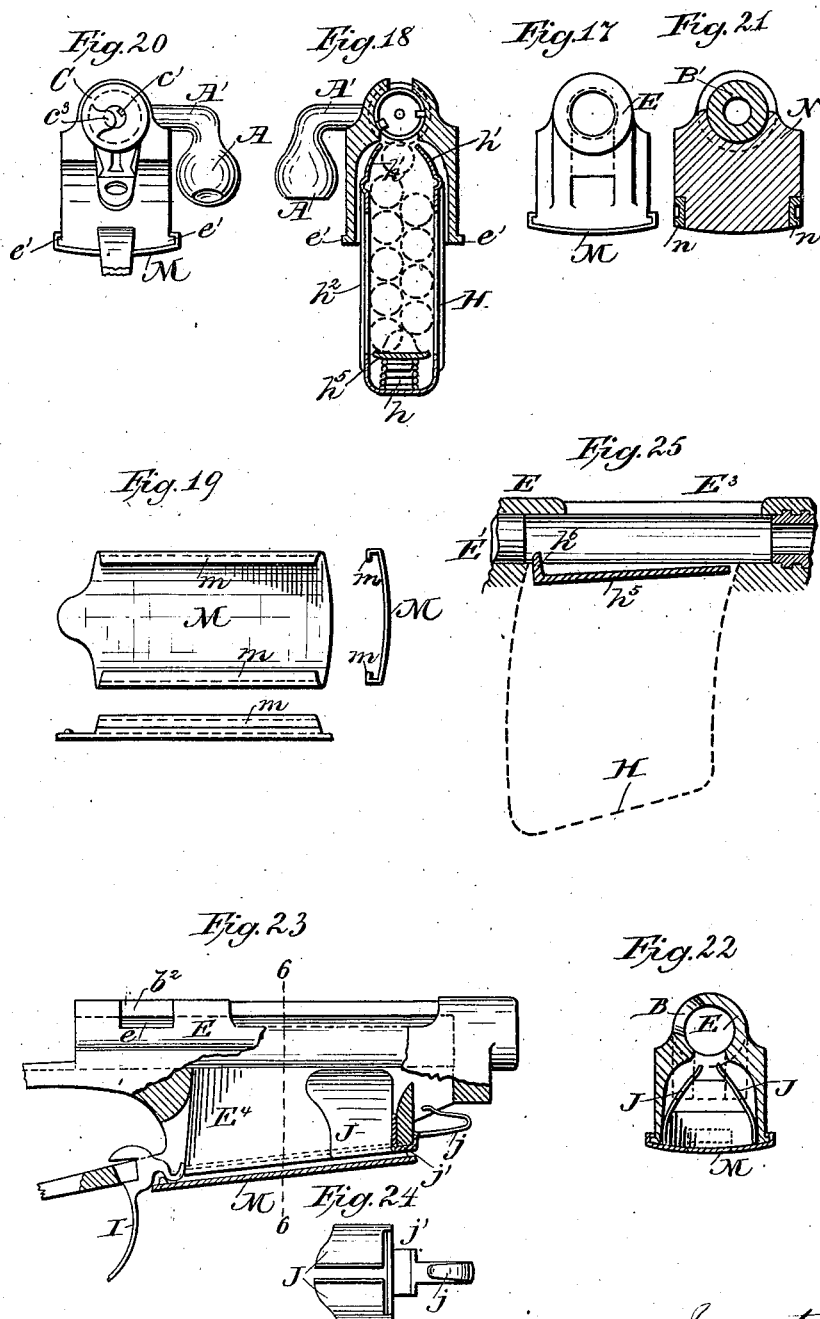
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3 Sheets—Sheet 3.

S. & K. KRINKA.  
MAGAZINE FIRE ARM.

No. 386,638.

Patented July 24, 1888.



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# UNITED STATES PATENT OFFICE.

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## MAGAZINE FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 386,638, dated July 24, 1888.

Application filed November 10, 1887. Serial No. 254,802. (No model.) Patented in England May 9, 1887, No. 6,800; in Austria-Hungary August 21, 1887, No. 13,223 and No. 34,833, and October 21, 1887, No. 27,598 and No. 49,655; in France September 29, 1887, No. 186,121; in Belgium September 29, 1887, No. 79,044, and in Italy November 12, 1887, XXI, 22,401, XLIV, 188.

*To all whom it may concern:*

Be it known that we, SILVESTER KRKA and KARL KRKA, subjects of the Emperor of Austria, residing at Ober-Michle, near Prague, in the Province of Bohemia, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Magazine Fire-Arms, (for which we have obtained Letters Patent in Austria-Hungary, dated August 21, 1887, No. 13,223/34,833, and by Letters Patent of the same country, dated October 21, 1887, No. 27,598/49,655; in England, dated May 9, 1887, No. 6,800; in France, dated September 29, 1887, No. 186,121; in Belgium, dated September 29, 1887, No. 79,044, and in Italy, dated November 12, 1887, Vol. XXI, No. 22,401, and Vol. XLIV, No. 188;) and we do hereby declare the following to be a full, clear, and exact description of the invention, such as 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 or figures of reference marked thereon, which form a part of this specification.

Referring to the drawings, Figure 1 is a longitudinal section, partly in elevation, of so much of a fire-arm as is necessary to illustrate our invention. Fig. 2 is a top plan view of the breech portion thereof. Fig. 3 is a view similar to Fig. 1, the butt being partly broken away, showing the receiver open for the reception of a cartridge. Fig. 4 is a like view showing the mechanism in position for firing. Fig. 5 is a longitudinal transverse section showing the bolt-cylinder withdrawn from the receiver and the firing-pin or bolt cocked or ready for firing. Fig. 6 is a side elevation of the bolt-cylinder detached. Fig. 7 is a rear end elevation thereof. Fig. 8 is a longitudinal vertical section of the rear end of the bolt-cylinder, showing the screw-plug in elevation. Fig. 9 is a section taken on the line 1 1 of Fig. 8. Fig. 10 is a view similar to Fig. 8, the screw-plug being shown in section. Fig. 11 is a section taken on the line 2 2 of Fig. 10. Fig. 12 is a side elevation of the bolt or firing-pin. Fig. 13 is a rear end elevation of the handle-sleeve. Fig. 14 is a top plan view of our im-

proved magazine; Fig. 15, a side elevation, and Fig. 16 a section thereof taken on line 3 3 of Fig. 15. Fig. 17 is a front elevation of the receiver, the magazine being removed and the housing for the upper end thereof closed by a slide shown in section. Fig. 18 is a vertical transverse section of the receiver and magazine, taken on or about on the line 4 4 of Fig. 3. Fig. 19 shows the slide or gate for the housing by a top plan view, a side elevation, and a transverse section, respectively. Fig. 20 is a rear elevation of the receiver, the magazine being removed and the housing therefor closed by a gate, which latter is shown in section. Fig. 21 is a cross-section taken on or about on the line 5 5 of Fig. 1. Fig. 22 is a cross-section taken on the line 6 6 of Fig. 23, which latter shows in side elevation the breech-frame and receiver and the spring-supports for the cartridges when the gun is used as a single-loader. Fig. 24 is a top plan view of said spring-support detached, and Fig. 25 shows by a longitudinal section a portion of the receiver and of the upper end of the spring-follower for the magazine provided with a projection extending into the receiver when the magazine is empty.

This invention relates to that class of bolt and magazine guns which are adapted for use as single-loaders, and has for its object to perfect the loading and firing mechanism and provide suitable safeguards against accidental or premature explosion of the cartridges, and also to improve the construction of the magazine.

To these ends the invention consists in the construction of the bolt-cylinder and the mechanism for manipulating or operating the same in loading and firing; in the construction and combination of safety devices with the bolt-cylinder and bolt; in the construction of a combined trigger-guard and mainspring; in the construction of the trigger-guard and its combination with the magazine, whereby said trigger-guard performs the functions of a lock to lock the magazine in the housing of the breech-frame for use with the receiver; in the construction of the magazine and the cartridge-feeding de-

vices and the combination of the latter with the receiver; and, lastly, in certain other details of construction and combinations of parts, substantially as hereinafter fully described, and as set forth in the claims.

We will first describe the construction of the firing mechanism and the mechanism for manipulating or positioning the same in loading and firing.

As shown in Figs. 1, 2, 3, and 4 of the drawings, N indicates the gun-stock, of suitable construction to receive the barrel and breech mechanism. B' indicates the barrel; E', the breech-frame, and E the receiver proper, which has two longitudinal openings or slots diametrically opposite each other, one, E<sup>2</sup>, through which the cartridges are introduced from a magazine secured in a housing, E<sup>1</sup>, formed by the breech-frame, and one, E<sup>3</sup>, through which the empty shells are ejected, and through which the cartridges are introduced when the gun is used as a single-loader, as shown in Figs. 1 to 6. In the cylindrical bore of the receiver is fitted the bolt-cylinder B, that contains the bolt or firing-pin D. The rear end b of the bolt-cylinder is in outline polygonal in cross-section. (In the drawings we have shown it as octagonal, though it may have a greater or less number of faces, said faces being arranged spirally relatively to the axis of the cylinder.) On said rear end, b, of the bolt-cylinder B is mounted a sleeve, a, that is also polygonal in cross-section interiorly, the faces or sides corresponding as to their spirality with the like faces of the cylinder.

It is obvious that when the sleeve a is moved in a rectilinear direction either way a partial rotation will be imparted to the bolt-cylinder in one or the other direction on its axis. The sleeve is, to this end, provided with a handle, A, that projects therefrom laterally and downwardly. Heretofore in all guns of this class the handle for manipulating the bolt-cylinder consisted of an arm projecting at right angles or radially from the cylinder. It is obvious that in rapid firing, however, where the gun is not brought from the position of aim, a straight handle or lever is not as conveniently manipulated. To facilitate the manipulation we form the handle portion A at right angles to the handle-arm A', and so as to project downwardly in order to permit a rectilinear push or pull, and to lighten the handle A we make it hollow, as more plainly shown in Figs. 13 and 20.

The bolt-cylinder B has at its rear end, b, a helical slot, b', and is provided, as usual, with a locking shoulder or projection, b<sup>2</sup>. In a longitudinal recess formed in the outer face of the cylinder is fitted the cartridge-extractor F, which consists of a flat bar, f, hooked at its outer end to engage the rim of the cartridge and provided with a spring arm, f', at its rear end. The bolt-cylinder is closed at its rear end by means of a hollow screw-plug, C, in which is also formed a helical slot, c, provided with a radial or lateral branch, c<sup>2</sup>, and with a

thumb-piece, c<sup>3</sup>, that projects from the head thereof in such a manner as to cover or nearly cover the axial opening in said head of the screw, to protect the marksman from gases that may escape along the firing-pin or bolt D. As shown in Figs. 4 and 10, a pin or lug, c', projects into the axial opening in the head of the screw-plug and engages a right-angular groove, d<sup>3</sup>, at the rear end of the bolt D, Fig. 12, said bolt being also recessed at that end, as shown at d, and carries a socket, d<sup>2</sup>, that serves as a housing for the actuating-spring d'. 7c 75

When the bolt is properly placed in its bolt-cylinder B and the latter in the receiver portion of the breech-frame, with the sliding handle a on its rear end, the pin a' in the sleeve of said handle projects through the radial slot b' of the bolt-cylinder into the corresponding slot, c, of the screw-plug and into the recessed portion d of the bolt D, said pin, when the parts are in the position shown in Fig. 1, lying in the forward end of the slots and recess referred to, the locking-block b<sup>2</sup> being then engaged in the usual recess, e, of the breech-frame to lock the bolt-cylinder in position for firing, as shown in Fig. 2. 8c 85 90

It is obvious that by pulling on the handle A in a straight line the sleeve or nut a will impart to the bolt-cylinder a partial revolution from right to left, thereby disengaging the block b<sup>2</sup> from recess e and unlocking the bolt-cylinder. This partial revolution of the bolt-cylinder is, however, not communicated to the bolt D, for the reason that the upper flat face of the pin a' bears upon the corresponding face of the recess d in the bolt, and thus prevents the latter from partaking of such motion. 95 100

G is the trigger, and g the sear, the upper end of which latter projects through a longitudinal slot, b<sup>3</sup>, formed in the bolt-cylinder, which slot at its rear end has a lateral branch, so as to permit the necessary revolving and longitudinal motion of the bolt-cylinder. 105 110

On moving the bolt-cylinder back, as described, the pin a' of the sliding sleeve or nut a carries the bolt D along, and the rear end of the spring d', coming against the end of the screw-plug C, will be compressed, the bolt being cocked or ready for firing. When the bolt-cylinder has reached the limit of its rearward motion, the spring-arm F' of the ejector F springs out of its groove in front of the sliding nut a, as shown in Fig. 5, to prevent the forward motion of the bolt-cylinder, thus keeping the bolt-spring d' compressed. When the breech-cylinder is pushed forward and has reached a point where the spring-arm F' fully enters its recess or groove in the bolt-cylinder, the forward end of the housing d<sup>2</sup> for the actuating-spring d' will be in a position to be engaged by the sear g, thus maintaining the said spring compressed. 115 120 125

To prevent the accidental discharge of the gun, the screw-plug C is slightly turned by means of the handle c<sup>3</sup> to bring the lug or pin c' into the lateral branch of the groove d<sup>3</sup> in the rear end of the bolt D, thus locking the 130

latter against forward motion. To admit of this partial revolution of the screw-plug, the slot *c* thereof has the lateral branch *c'*, Fig. 8, above referred to.

5 It will readily be seen that by means of the described arrangement of the pin *a'* and the slots *b'* and *c* in the bolt-cylinder and screw-plug the locking and unlocking of the bolt-cylinder may be effected by means of the handle A, in the usual manner, and the peculiar construction of the rear end of the said cylinder and the handle sleeve for imparting such partial rotation to said cylinder may be dispensed with. Of course in this case the pin

15 *a'* will have to be made sufficiently strong. In a gun constructed as described the explosion of the cartridge cannot take place until the bolt-cylinder is fully locked to the breech-frame, for the reason that the pin *a'* has not then reached the end of the helical slots *b'* *c* in the bolt-cylinder and plug. Consequently, should the trigger be manipulated, the spring *d'* would also have to carry said pin to the end of its slot, besides projecting

25 the bolt, or, in other words, complete the rotation of the bolt-cylinder to fully lock it to the breech-frame. It follows that if the bolt is moved at all it is moved but very slowly and gradually in contact with the cartridge. I is the trigger-guard, which, to simplify the gun-lock, is combined with the trigger-spring *g'*. At its rear end the guard is secured to the lower tang by means of a screw, *N'*, that also secures the upper tang to the stock N. At its forward end the guard may also be secured

35 to the tang by a screw when the gun is constructed for use as a single loader. When, however, the gun is constructed for use both as a single-loader and a repeater, then the forward end of the guard I has a hooked bearing, *i*, that passes through a slot in and hooks upon the tang, as more plainly shown in Figs. 1 and 2, and on the said bearing is formed a second hook, *i'*, that engages a notch, *h'*, formed in a lip or projection at one end of the magazine H, to support the same in the housing E'. Within the housing E' is arranged a support for the cartridges when the gun is used as a single-loader. This support consists of two

50 metallic spring-plates, J J, Figs. 22, 23, and 24, secured to a supporting-plate, *j'*, provided with a spring-arm, *j*, that lies in a recess or chamber formed in the stock N, said supporting-plate being secured to the breech-frame by a screw, *j''*. The spring-arm *j* supports the guide-block K, that guides the cartridge from the receiver into the breech of the barrel B', as more plainly shown in Figs. 1 and 3. The spring-plates J, when a magazine is inserted into the housing E', are pushed laterally against the side walls of said housing, and then perform the functions of a clamp and assist in holding the magazine in position, and they act as an ejector for the magazine as soon

65 as it is released from the trigger-guard, as will be readily understood.

When the gun is used as a single-loader, the open lower end of the housing is closed by a sliding gate, M, Figs. 17, 20, and 22, the edges of which are bent inwardly, so as to form a groove that fits upon a rib, *e'*, formed on the lateral walls of the housing E' of the breech-frame. The stock N of the gun in front of the housing has two grooved bars, *n*, secured, as shown in Fig. 21, in its cheeks, into which fit the bent edges of the slide or gate M.

The magazine H consists of a rectangular casing of the form in cross-section substantially as shown in Fig. 16. The diameter of the casing is slightly less than twice the diameter of the cartridges and their rims, so that two tiers of cartridges can be inserted and closely packed, the cartridges of one tier lying tangentially between the cartridges of the other tier, as shown in Figs. 16 and 18. This admits of the feeding of the cartridges to the receiver alternately from both tiers through the medium of the spring *h*.

The magazine has open-work sides, and is preferably made of thin sheet metal to make it as light as possible, and in order to give the lateral walls greater strength we form corrugations *h'* *h''* *h'''* in the metal, thus providing strengthening-ribs, those *h''* projecting outwardly, while those *h'* project inwardly and serve to guide the cartridges, thereby reducing the frictional resistance to the motion of the cartridges to a minimum. As stated hereinbefore, the magazine is supported from the trigger-guard and by the spring-plates J at the rear and forward end, respectively, and when empty may be readily withdrawn by simply pressing back the trigger-guard, which may be made sufficiently elastic for the purpose to disengage the hook *i'* from the notch *h'*. The lateral walls of the magazine for a portion of their length are bent inwardly to form spring-jaws, that prevent the cartridges being ejected from the magazine by the spring *h*. The upper cartridge, when lying between the spring-jaws *h'*, will be in a position in which its rim will project into the path of the bolt-cylinder B, so that when the latter is moved forward it will remove the cartridge forcibly from between the jaws *h'* and carry it along into the breech.

A great inconvenience in repeaters of this class, especially when used for military purposes, is encountered by the lack of means for ascertaining when the magazine is empty, and in rapid, file, platoon, or general firing the soldier is hardly able to tell whether his magazine is empty or not. This we avoid by forming on the spring *h*, that feeds the cartridges, or on the follower or cartridge spoon *h''*, a projection or heel, *h''*, at that end nearest the rear end of the receiver. When the magazine is empty, this heel *h''* projects into the receiver when the bolt-cylinder is drawn back, and the latter can, therefore, not be pushed forward, thus indicating to the marksman that the magazine is empty.

Inasmuch as we have hereinbefore fully described the operation of the several parts of the gun, it will not be necessary to repeat the same, as this will be readily understood by those conversant with this class of fire-arms.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a gun of the class described, the combination, with the breech-frame and the bolt-cylinder having spiral bearing-faces at its rear end, of an operating handle or lever and a sleeve or nut connected therewith, having corresponding bearing-faces and adapted to slide freely on the rear end of the bolt cylinder, substantially as and for the purpose specified.

2. In a gun of the class described, the combination, with the breech-frame, the bolt-cylinder provided with a spiral slot at its rear end, and the bolt or firing-pin provided with a longitudinal recess at the rear end thereof, of a lever or handle provided with a sleeve bearing mounted and sliding longitudinally on the rear end of the bolt-cylinder, and a pin projecting from said bearing through the spiral slot of said cylinder into the recess of the firing-pin, substantially as and for the purpose specified.

3. In a gun of the class described, the combination, with the breech-frame, the bolt-cylinder provided at its rear end with a spiral slot and a spring-abutment, the bolt or firing-pin provided at the corresponding end with a longitudinal recess, and an actuating-spring connected at the forward end with the bolt, of a lever or handle provided with a sleeve-bearing mounted and sliding longitudinally on the rear end of the cylinder, and a pin projecting through the spiral slot of said cylinder into the recess of the bolt, whereby the spring is compressed on moving the bolt rearward, substantially as and for the purpose specified.

4. In a gun of the class described, the combination, with the breech-frame, the bolt-cylinder provided at its rear end with a spiral slot and a spring-abutment, the bolt or firing-pin provided at the corresponding end with a longitudinal recess, and an actuating-spring connected at its forward end with the bolt, of a lever or handle provided with a sleeve-bearing mounted and sliding longitudinally on the rear end of said cylinder, a pin projecting through the spiral slot in the cylinder into the recess of the bolt, and a locking device to lock the spring against expansion, substantially as and for the purpose specified.

5. In a gun of the class described, the combination, with the breech-frame, the bolt-cylinder provided at its rear end with a spiral slot and a spring abutment, the bolt or firing-pin provided at the corresponding end with a longitudinal recess, and an actuating-spring connected at its forward end with the bolt, of a lever or handle provided with a sleeve-bearing mounted and sliding longitudinally on the rear end of the cylinder, a pin projecting

through the spiral slot of said cylinder into the recess of the bolt, and a stop operating on the sleeve-bearing to hold it against forward movement on the cylinder, whereby the spring is compressed on moving the bolt rearward and locked against expansion, substantially as and for the purpose specified.

6. The combination, substantially as hereinbefore described, with the breech-frame, the bolt-cylinder B, provided at its rear end with a spiral groove,  $b'$ , and an interior abutment, the shell-extractor fitted in a groove in the periphery of the cylinder, and having a spring-extension,  $f'$ , the bolt or firing-pin, recessed as at  $d$ , arranged within the cylinder, and an actuating-spring connected at its forward end with said bolt, of a lever or handle, a bearing-sleeve therefor adapted to slide longitudinally on the bolt-cylinder, and a pin,  $a'$ , projecting from said sleeve through the slot  $b'$  in the cylinder and into the recess  $d$  of the bolt, for the purposes specified.

7. The combination, substantially as herein described, with the breech-frame, the bolt-cylinder and its screw plug C, both provided with a spiral groove,  $b'$   $c$ , respectively, the latter groove having a lateral branch,  $c^2$ , a lug,  $c'$ , projecting into the opening at the rear end of the plug C, the bolt or firing-pin, recessed as at  $d$ , and provided at its rear end with an angular groove or slot,  $d'$ , the actuating-spring secured at its forward end to the bolt, and abutting, when compressed, against the abutment in the cylinder, of the trigger and sear, the latter projecting into the receiver and adapted to engage the forward end of the spring, whereby the bolt may be locked against forward motion by a partial rotation of the screw-plug, for the purpose specified.

8. In a gun of the class described, the combination, with the breech-frame open below the receiver, and a magazine adapted to be applied to the frame below said receiver, and provided with a notched projection on its rear wall, of a trigger-guard having a yielding bearing adapted to engage the notch in the magazine projection to support the same at that end, substantially as described.

9. In a gun of the class described, the combination, with the breech-frame open below the receiver, and a magazine adapted to be applied to the frame below said receiver, and provided with a notched projection, of a trigger-guard and trigger-spring combined, and a bearing on said trigger-guard to engage the notched magazine projection, whereby said parts are held in engagement by the stress of the trigger-spring, substantially as described.

10. In a gun of the class described, the combination, with the breech-frame open below the receiver, for the attachment of a magazine, and the block K, for guiding the cartridges to the breech, of the spring-arm  $j'$ , provided with a spring,  $j$ , operating on the block, and two converging spring-plates operating to support the cartridges when the magazine is re-

moved and the gun used as a single-loader, substantially as described.

11. The combination, with the breech-frame open below the receiver, the bolt-cylinder, and  
5 a magazine applied below said receiver, of an upwardly-extending stop, *h*<sup>6</sup>, secured to one end of the spring-actuated follower, for feeding the cartridges to the mouth of the magazine, substantially as and for the purposes specified.  
10

In testimony whereof we affix our signatures in presence of two witnesses.

SILVESTER KRKA.  
KARL KRKA.

Witnesses:

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