

UNITED STATES PATENT OFFICE.

WILLIAM H. ELLIOT, OF NEW YORK, N. Y.

IMPROVEMENT IN CARTRIDGE-MAGAZINES.

Specification forming part of Letters Patent No. 118,916, dated September 12, 1871.

To all whom it may concern:

Be it known that I, WILLIAM H. ELLIOT, of the city, county, and State of New York, have invented a new and Improved Magazine for Fire-Arms; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Similar letters of reference indicate the same devices in all the figures.

To enable others skilled in the arts to comprehend, make, and use my invention, I will proceed to describe its nature, construction, and operation.

The nature of my invention consists in so constructing the circular passages or chambers of the magazine that the cartridges will stand radially in relation to some point in its axis; in so proportioning the angle at which the cartridges are arranged with the axis or center line of the magazine that the cartridges, in lying side by side, will all touch each other at their small ends, and that the heads of each alternate cartridge will touch the body of each other alternate cartridge at their large ends; in the jointed arm for driving the cartridges along the circular chambers, and in the arrangement of the joint of said arm so that its axial line will stand radially to some point in the axial line of the magazine; in the said jointed arm with double circular chambers or passages; in providing said arm with a stop to the movements of the joint, and in providing it with a curved follower; in a jointed stop-lip at the outer end of the circular chambers to facilitate charging the magazine; and in inclosing the cartridge space or circular chambers between a convex and a concave plate which conform to the shape and arrangement of the circular chambers.

Reference being had to the drawing, Figure 1 represents a section of my improved magazine at dotted line *x*. Fig. 2 represents a section parallel with the axis of the magazine. Fig. 3 represents the outer case and spring in section and the double arm in elevation. Fig. 4 represents the mouth of the magazine in elevation.

a, outer wall of the magazine; *a'*, outer convex plate; *a''*, outer concave plate; *b*, cartridges; *b'* and *b''*, cartridges, showing their arrangement in the passages; *b'''*, cartridge in the mouth of the magazine; *c*, partitions between the two circles of cartridges; *c'*, partition within the inner circle of cartridges; *c''*, offset in partitions conducting the cartridges from the inner circle to

the outer one; *d*, center-pin, upon which the double arm *ef* swings; *e'*, joint between the two parts of the double arm; *g*, curved follower attached to the outer end of the double arm; *h*, hinged lip closing the mouth of the magazine; *h'*, position of lip when open; *i* and *i'*, spring and hinge of same; *k*, stop; *k'*, hinge of same; *l*, spring of stop; *m*, center or axial line of magazine and axis of double arm; *n*, center or axial line of the inner circle of cartridges; *n'*, same of outer circle of cartridges; *o*, point in the axial line of magazine from which the axial lines of the cartridges radiate; *p*, axis of joint *e'*; *r*, stop on the outer portion *f* of the double arm, which comes in contact with bar *s* and thus limits the movement of joint *e'*; *t*, fastening of mainspring *u* to center-pin *d*; *v*, curve in the free end of lip *h* to stop the forward movement of the cartridges; *w*, section of fire-arm; *x*, point of section; *y*, joint which attaches the magazine to the arm.

My invention relates to magazines which may be detached from the arm and used as a cartridge-box when most convenient to do so; and its object is to simplify as much as possible the magazine patented by me on the 14th of February, 1871, both in construction and operation.

The operation of my improved magazine is as follows: Premising that the magazine is empty and that the follower *g* is pushed around to the mouth, to charge the magazine the curved lip *h* is turned up to the position represented by the dotted lines *h'*, and one cartridge after the other is pushed into the mouth, forcing the follower *g* back through the circular chambers, thereby winding up the spring and bringing the double arm *ef* and the curved follower *g* to the position represented in Fig. 1. The curved lip is then turned down, as represented in Figs. 1 and 4, and is held there by spring *i*, which has a flat bearing on the under side of point *i'*. The curve of the outer end of the circular chamber, formed partly by the lip *h*, is such that the power of the mainspring forces the cartridge *b'''* against the curve *v*, but would not expel it from the mouth of the magazine whether the stop *k* be used or not. To prevent the cartridge in the mouth of the magazine from being displaced by accident I employ a stop, *k*, similar to the one employed in my former patent of February 14, 1871. This acts as a brace, holding the cartridge in its place, as seen in Fig. 1. The curved lip *h* is cut away over the middle of the cartridge, as seen in Fig. 4, to facilitate its removal. In doing this the

cartridge is grasped by the thumb and finger; the finger, resting upon the upper side of the cartridge, forces it downward, while the thumb pushes back the brace or stop *k*. When the magazine is attached to the arm the cartridge drops into the loading-chamber and has only to be pushed into the chamber of the barrel to complete the operation of loading, as described in my former patent. When the outer cartridge has been removed the mainspring, by means of the double arm *e f* and follower *g*, forces all the cartridges along the circular chambers till the outer cartridge strikes curve *v* and arrests the movement of all behind it, when it in turn may be removed by the thumb and finger. I have shown the lip *h* held in position by a spring; it may be held by a positive lock, which, on some accounts, might be better than a spring. The mainspring *u* is attached at its inner end to the center-pin *d* at *t*, and at its outer end to cross-bar *s* in the first part *e* of the double arm. The follower *g* is curved to conform to the shape of the cartridge, and thereby adjusts itself upon the cartridge so as not at any time to come in contact with the partition which separates the circles of cartridges. The joint *e'* in the double arm enables the follower to pass through the offset *e''* to the outer circle. When the stop *r* on the second part *f* of the arm comes in contact with the bar *s*, the joint *e'* becomes rigid. The circular chambers are so constructed and proportioned that the axial or center lines *n* and *n'* of the cartridges radiate from the point *o* in or near the axial line of the magazine. By axial line of the magazine I mean a line passing vertically through the plane of the circle of cartridge at the center, and the angle at which the axis of the cartridges stands from the axis of the magazine is such in relation to the form or taper of the cartridges that they touch each other at their small ends, and that the heads of each alternate cartridge touch the body of each other alternate cartridge, as represented at *b'* and *b''*, Fig. 2, and at the same time preserve their positions in relation to the axis of the magazine. The axis of the joint *e'* stands, like that of the cartridges, radially to some point in the axis of the magazine. The partitions *c* and *c'*, which divide the cartridge space into circular chambers and support the cartridges, are double, one set being attached to the convex side of the magazine and the other set to the concave side, being separated, as seen in Fig. 3, so as to provide room for the double arm to pass between them.

It may be seen, by reference to Fig. 1, that the direction of the movement of the spring in discharging the magazine and the arrangement of the circular chambers are such that when the axis of the magazine is in a horizontal position or parallel with the barrel of the arm, the cartridges which are approaching the mouth and are about to pass out are rising instead of falling, as they are represented to do in my former patent, whereby the spring is relieved by gravitation of a large part of its load—for instance, when there are three-fourths of a circle of cartridges yet remaining in the magazine, the cart-

ridges on the side of the magazine opposite to the mouth more than balance those on the side the mouth is on. And in any case, while the axis of the magazine remains in a horizontal position, the spring is considerably relieved by this arrangement of parts. By the construction of the circular chambers so that the cartridges shall stand, as herein shown, in relation to the axis of the magazine, that side of the chambers next to the concave plate *a''* becomes smaller in diameter in proportion to the taper of the cartridges, so that the cartridges touch each other at both ends and support each other in an upright position, whereas if the circular chambers were of equal diameter at both sides the cartridges would only touch each other at their large ends, and therefore would not support each other in an upright position, but would require to be supported by revolving partitions, as shown in my former patent. Thus, by suiting the form of the cartridge space to the taper of the cartridges, I am able to move them all along the circular chambers by a single follower, which supports the cartridge next to it, and therefore all the cartridges, in an upright position. By giving to the plate *a'* a convex form, and to the plate *a''* a concave form, they not only agree with the partitions and outer wall of the magazine, thereby making the cartridge space conform more perfectly to the shape of the cartridge, but they add very much to the strength of the magazine, making it much less liable to being injured by accident.

I construct the circular chambers or cartridge space a little deeper than the length of the cartridge, and so proportion its diameter that the head of each alternate cartridge may rest against the body of each other alternate cartridge and still support each other in an upright position, as seen at *b'* and *b''*, Fig. 2. If the depth of the cartridge space were exactly the length of the cartridges the heads would then all rest against each other, but any variation in the length of the cartridges would allow the heads to partly slip off from each other and so create friction that the spring might not overcome. I construct the arm *e f* in two parts and join them together at *e'*, to facilitate the lengthening and shortening of it, as the follower passes from one circular chamber to the other. And I arrange the joint *e'* radially to some point in the axis of the magazine, so that the follower, as it passes from one circular chamber to the other, may correspond in position, as nearly as possible, with the varying position of the cartridge against which it rests, and still hold the cartridges in an upright position. Between the two parts of the arm I employ the stop *r*, so that when the follower reaches the outer circle of cartridges the arm becomes rigid and ceases to act upon the cartridges in a radial direction, and thus prevents friction, which, without the stop, would be caused by forcing the cartridge next to the follower against the outer wall of the magazine. I curve the follower *g* as nearly as possible to suit the shape of the cartridge both longitudinally and transversely, so that it may adjust itself upon the cartridge while moving along the inner cir-

cle, and, when used with stop *r*, it may carry the cartridge along the outer circle independent both of the partition *c* and of the outer wall of the magazine, and thus save friction. By dividing the partitions *c* and *c'* into two parts, attaching one part to convex plate *a'* and the other part to concave plate *a''*, and placing the jointed arm between them, as shown in Fig. 3, I obtain simplicity of construction, strength, and less liability to get out of order. I charge my improved magazine by passing the cartridges into it through the mouth, and to facilitate this operation I hinge the curved stop-lip *h* at *i'* so that it may be turned up to the position represented by dotted lines *h'*.

Another arrangement of the cartridges in relation to each other may be adopted, instead of the one described, without altering the form or arrangement of the circular chambers. The head of each cartridge may be arranged to rest against the body of the cartridge in the rear of it. This would require a slight inclination of the follower so as to carry the small or ball end of the cartridge a little forward of the large end. The follower may be provided at each end with a roller to run against the partitions or outer wall of the magazine, and so prevent friction that might be produced by the tendency of the double arm to force the follower outward or in a radial direction.

Having described my invention, I desire to have secured to me, as my invention, by Letters Patent of the United States, the following claims:

1. The form and arrangement of the circular

chambers, whereby the cartridges are held radially in relation to some point in the axis of the magazine, substantially as specified.

2. The arrangement and proportion of the circular chambers in such relation to the form of the cartridges that, as they lie side by side, they shall touch each other at both ends, in the manner shown and described.

3. The jointed arm *ef*, when constructed substantially as described.

4. The arrangement of the axis of the joint *e'*, substantially as and for the purpose set forth.

5. The combination and arrangement of the jointed arm with the double circular partition, substantially as set forth.

6. The double arm *ef*, with its stop *r* and follower *g*, in combination with two or more circular chambers, when operating substantially as and for the purpose specified.

7. The curved follower, in combination with the jointed arm *ef* with its stop *r*, when constructed and operating substantially as specified.

8. The jointed stop-lip, when constructed and operating substantially as and for the purpose described.

9. The combination of the convex plate *a'* and concave plate *a''* with the outer wall *a*, double partition *c* and *c'*, substantially as and for the purpose specified.

W. H. ELLIOT.

Witnesses:

D. LEWIS,

C. L. OSGOOD.

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