2 Sheets—Sheet 1.

D. KIRKWOOD.

BREECH-LOADING FIRE-ARM.

No. 191,862. Patented June 12, 1877.

Fig. 1.

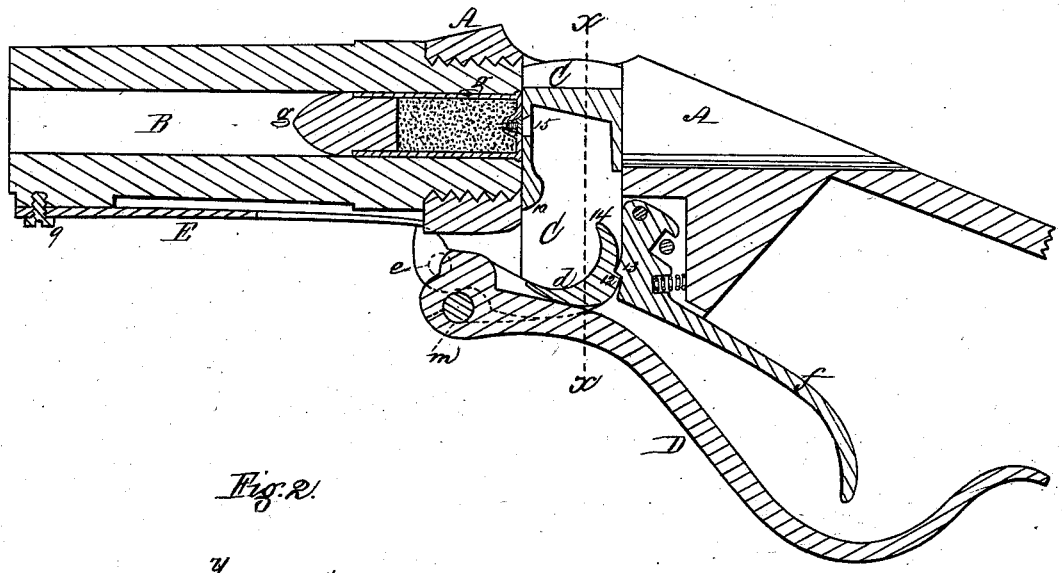


Fig. 2.

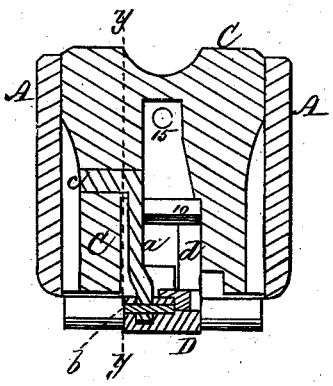
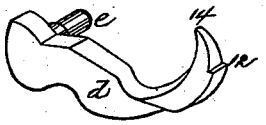


Fig. 6.



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2 Sheets—Sheet 2.

D. KIRKWOOD.

BREECH-LOADING FIRE-ARM.

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Fig. 3.

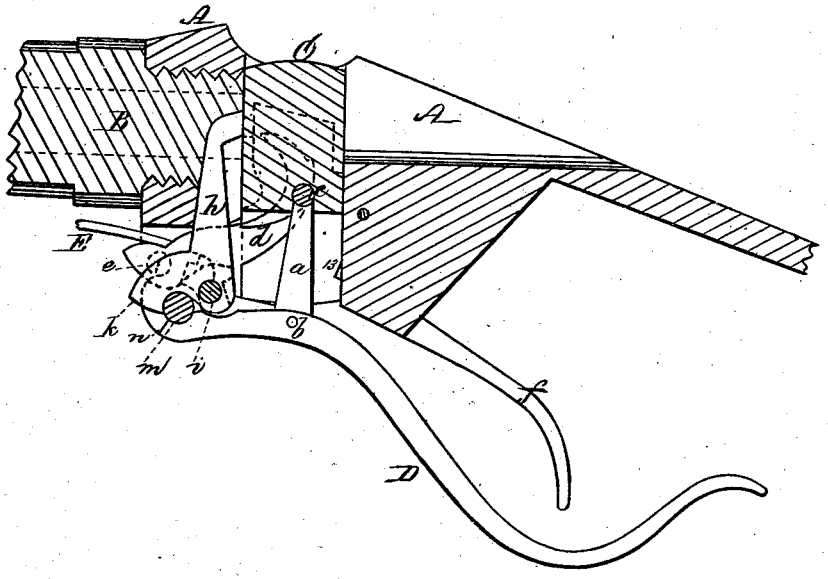


Fig. 4.

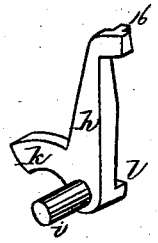
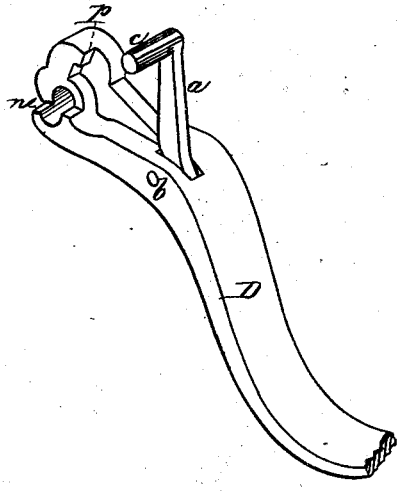


Fig. 5.



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UNITED STATES PATENT OFFICE.

DAVID KIRKWOOD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **191,862**, dated June 12, 1877; application filed March 12, 1877.

To all whom it may concern:

Be it known that I, DAVID KIRKWOOD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Breech-Loading Fire-Arms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a longitudinal vertical section through a fire-arm, having my improvements applied thereto. Fig. 2 is a transverse vertical section through the same on the line *x x* of Fig. 1. Fig. 3 is a longitudinal vertical section through the same on the line *y y* of Fig. 2. Fig. 4 is a perspective view of the ejector for throwing out the empty cartridge-shell. Fig. 5 is a perspective view of the guard-lever and its connecting-link. Fig. 6 is a perspective view of the hammer.

My invention has for its object to simplify the construction of self-cocking breech-loading fire-arms, and thereby render them capable of being more easily manipulated, and, consequently, fired with greater rapidity than heretofore; and my invention consists in a cartridge-shell ejector or extractor, which is successively acted upon on different sides of its working center, and with varying leverage, by which construction the ejector is caused to first move slowly and exert a very powerful pressure on the cartridge-shell to start it, the motion of the ejector being afterward accelerated in order to insure the throwing out of the shell under all contingencies to which fire-arms of this description intended for rapid firing are liable.

My invention also consists in connecting the guard-lever and vertically-sliding breech-block by means of a link pivoted at one end to the guard-lever, and provided at its opposite end with a stud, which enters a hole in the block, which construction greatly facilitates the operation of putting together and detaching the parts.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the breech-piece, to the front of which is screwed the barrel B. C is the breech-block, which slides vertically within the breech-piece A, and is operated by the guard-lever D, with which it is connected by a link, *a*, one end of which is pivoted to the lever at *b*, the opposite end being provided with a stud, *c*, Figs. 2, 3, and 5, which enters a hole in the block, and, by thus pivoting this link on a stud instead of on a pin passing transversely through the block, as heretofore, the operation of connecting and disconnecting the parts for cleaning or other purposes is greatly facilitated. The central portion of the sliding breech-block is cut away to allow of the passage up through it of the hammer *d*, which is of curved form, as seen in Figs. 1 and 6, and is provided with a stud, *e*, which fits into a hole in the breech-piece made for its reception, the stud *e* serving as a center on which the hammer works. This hammer is operated by a single flat spring, E, which lies along the under side of the barrel in front of the hammer, one end of the spring being secured to the barrel by a screw, 9, and, by thus locating the mainspring in front of the hammer, the cutting away of the stock, as has heretofore been necessary for its reception, when placed in the rear of the breech-block, is avoided, and the strength of the stock at this point is thus left unimpaired.

When the breech-block is drawn down its rounded edge, 10, bears against the inner curved or inclined surface of the hammer *d*, and forces it back against the resistance of the spring E, until a shoulder, 12, near the point of the hammer, catches under a projection or sear-nose, 13, on the trigger *f*, which thus holds it cocked, as desired. The cartridge *g* is then inserted in the ordinary manner, after which the breech-block is thrown up by the guard-lever, and the piece is ready for firing.

When the hammer is released by pulling the trigger *f*, it is thrown forward by the spring E, its point, 14, passing through a small circular opening, 15, in the breech-block, which allows it to come into contact with the cartridge to explode it, the spring being so applied to the hammer as to cause it to rebound after striking the cartridge, by which means the point of the hammer is prevented from adher-

ing to the cartridge, and thus interfering with the free downward movement of the breech-block.

By thus catching and holding the hammer at a point near the end which strikes the cartridge, instead of at a point near the center, on which it works, as heretofore, the friction and wear of the parts is greatly reduced, while the hammer is more easily held against the resistance of its spring E; and, furthermore, the trigger can be placed farther back in a more convenient and accessible position than heretofore, and the tumbler or enlarged portion of the hammer around its pivot, which occupies considerable space, can be dispensed with.

h is the cartridge-shell ejector or extractor which is of the form seen in Figs. 3 and 4, and fits into a narrow slit or recess made for its reception, a small projection, 16, at the upper end of the ejector acting upon the shoulder of the cartridge-shell to eject it from the barrel after the discharge.

The ejector vibrates on a center-pin or stud, *i*, which fits into a corresponding aperture in the breech-piece A, and is provided on one side of this center with a short arm or projection, *k*, and on the opposite side with a projection or shoulder, *l*, which latter is located much nearer to the center-pin than the end of the projection *k*, the projection *l* being on that surface of the ejector which is opposite to that from which the stud *i* projects.

The center-pin *m*, on which the guard-lever swings, is placed in close proximity to the center-pin or stud *i* of the ejector, and this guard-lever is provided with two projections or shoulders, *n p*, which act consecutively on the projections *k l* of the ejector in the following manner:

After the breech-block has been drawn down by the guard-lever sufficiently to expose the base of the shell, the shoulder *n* of the guard-lever, which is close to the center-pin *m*, comes into contact with the end of the projection *k*, and imparts a slow movement to the ejector, at the same time exerting a very powerful leverage on the latter, which causes it to loosen and start the cartridge-shell. As soon as this takes place, the other projection or shoulder *p* on the guard-lever (which is located much farther from the center-pin *m* than the projection *n*) comes into contact with the projection *l* located close to the stud *i*, and, consequently, as the guard-lever continues to be depressed, the movement of the ejector is greatly accelerated, which causes the empty shell to be thrown out with certainty under all conditions of the gun, an advantage which will be readily appreciated after the barrel has become foul from continued use.

In order to produce the best results, and reduce the friction to a minimum, the shoulder *n* and the end of the projection *k*, which is struck thereby, should be at the instant of contact in the prolongation of a straight line passing through the working centers of the ejector and guard-lever; and the shoulder *p* and the projection *l* should also at the instant of their contact occupy the same relative position with respect to these centers.

The varying leverage for producing the slow and fast movements of the ejector may be effected by varying the distance of the projections or shoulders on both the ejector and guard-lever from the centers on which they work, as shown, or by varying the distance of the projections or shoulders on either the ejector or guard-lever from its working-center. A very important advantage is, however, gained by having the ejector acted upon on different sides of its working-center, as by this construction the ejector can be made to exert a much more powerful pressure upon the cartridge-shell than has heretofore been attainable.

Instead of both the slow and fast movements being imparted to the ejector by shoulders or projections on the guard-lever, one of these movements may be produced by a shoulder or projection on the guard-lever, and the other movement by the contact of the breech-block or a projection thereon with the ejector, the method first described is, however, that which I prefer.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The ejector *h*, so constructed and arranged as to be successively acted upon at points on different sides of the center on which it works, and with varying leverage, substantially as and for the purpose set forth.

2. The guard-lever D and breech-block C, connected by a link, *a*, pivoted at one end to the guard-lever, and provided at its opposite end with a stud, *c*, entering a hole in the block, substantially as and for the purpose described.

Witness my hand this 8th day of March, A. D. 1877.

DAVID KIRKWOOD.

In presence of—

P. E. TESCHEMACHER,

N. W. STEARNS.