2 Sheets—Sheet 1.

E. WILDER.

MACHINE GUNS.

No. 182,729. Patented Sept. 26, 1876.

Fig. 1.

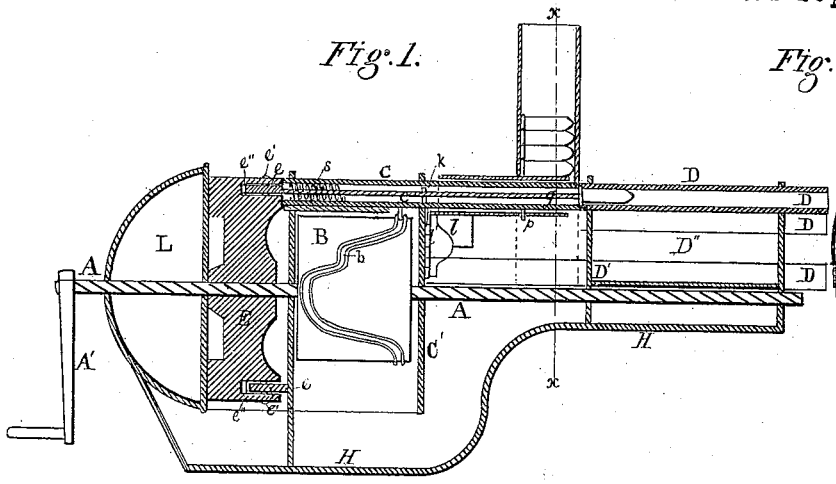

Fig. 9.

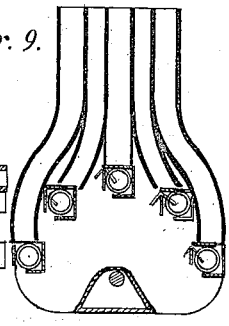

Fig. 2.

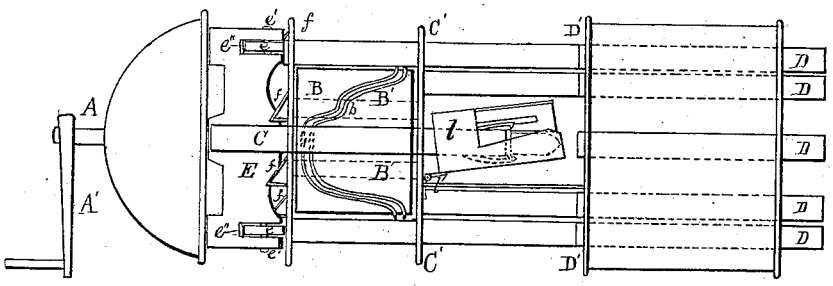

Fig. 5.

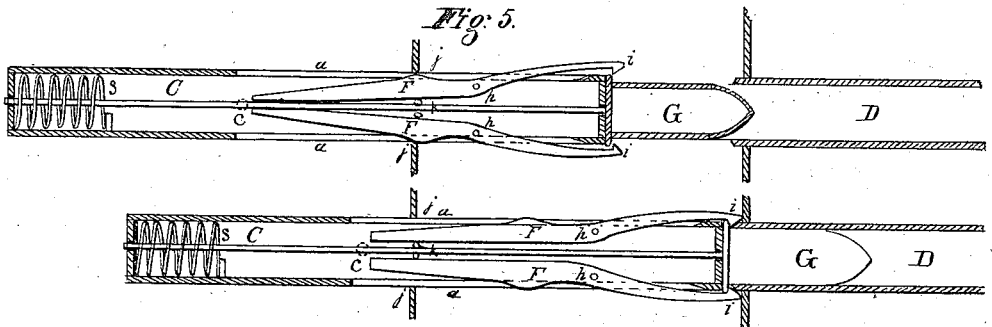

Fig. 6.

WITNESSES:

Thos. C. Fogger.

C. McConnell

Elihu Wilder

INVENTOR.

Per Blanchard & Singleton

ATTORNEYS

2 Sheets—Sheet 2.

E. WILDER.

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Fig. 3.

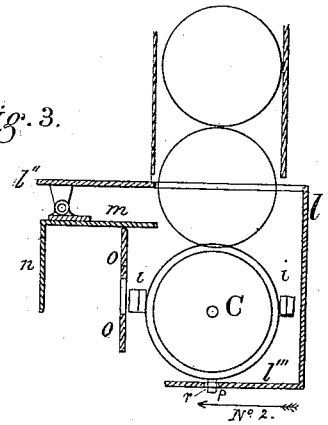


Fig. 7

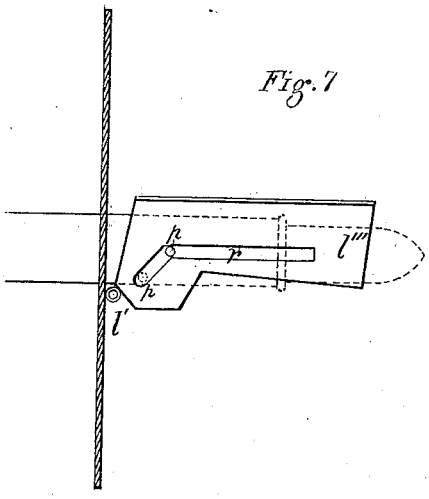


Fig. 4.

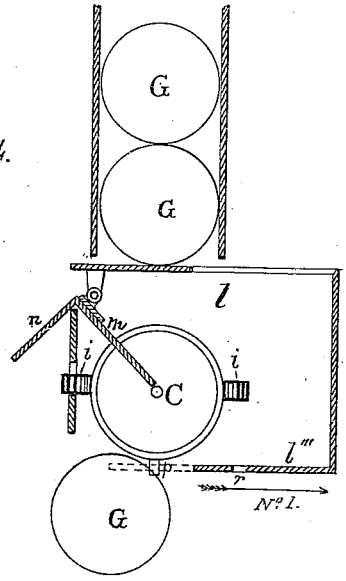
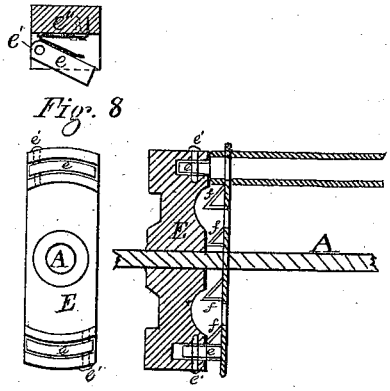


Fig. 8



WITNESSES:

Thos. G. Folger

C. M. Connell

Elihu Wilder

INVENTOR.

Blanchard & Singleton

ATTORNEYS

UNITED STATES PATENT OFFICE.

ELIHU WILDER, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN MACHINE-GUNS.

Specification forming part of Letters Patent No. **182,729**, dated September 26, 1876; application filed March 20, 1876.

To all whom it may concern:

Be it known that I, ELIHU WILDER, of Manchester, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Repeating-Arms; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in fire-arms commonly known as "repeating-arms" or "battery-guns," where the loaded cartridges are supplied from a hopper, and forced into the breeches of separate barrels, and fired from them by a rotary apparatus, as will be more fully described and claimed hereinafter.

Figure 1 is a longitudinal section of the invention. Fig. 2 is a top view of the same. Figs. 3 and 4 are transverse sections of the cartridge-receiver, showing the movements of the expeller and the cut-off from the hopper. Figs. 5, 6, 7, 8, and 9 are separate details of various parts.

A is a main shaft, around which the various parts are secured, and to which certain other parts are fastened and made to revolve with it by use of the crank-handle A′.

B is a cam, arranged in a peculiar manner with its circumferential grooves B′, so that the plungers C C C, (one only being represented in the drawing,) by the pins *c*, are made to move longitudinally toward and from the barrels D in the following manner. The cam-groove B′ is seen in Figs. 1 and 2. In Fig. 1 the pin *c* is at the right-hand end, and the plunger C is hard up against the barrel D at the top, where it has forced the cartridge into it. In Fig. 2 the pin *c* is at the opposite end, the cam having been turned one-quarter around. The grooves are so constructed that the plunger is stationary at these two positions of the cam for a short period—*i. e.*, the grooves are parallel with the ends of the cam. Between the position of pin *c* in Fig. 2, to the left, and that of *c* in Fig. 1, there is also a straight groove, at *b*, for a short distance, which causes a halt in the lateral movement of the plunger C. Thus, at every revolution of the cam with the shaft A, each plunger C C advances to the barrel to force the cartridge into it, and remains there long enough for the cap to be exploded, as will be explained hereinafter. Then the plunger is withdrawn into the other position, as in Fig. 2, and the empty cartridge is dropped. At *b* the lateral movement is checked for the reception of a fresh cartridge, which is carried into the barrel and forced home by the plunger.

In every revolution of the cam each plunger charges and fires twice. There are five barrels D in this arrangement, consequently ten discharges to every revolution of the shaft. These barrels are so arranged that they fire in succession, and no two together.

E is a rotary lock-carrier, having a hammer, *e*, at each end. The lock-carrier E is made secure to the crank-shaft A, and rotates in a separate chamber, on one side of which, at the ends of the plungers C, are brackets or inclined planes *f*, immediately adjoining the plungers.

When the lock-carrier E is rotated, the hammer *e* moves along these planes *f* until they pass them, when they suddenly strike against the end of a needle-rod, *g*, in the plunger C, which is driven against the cartridge, and causes it to explode.

The hammers *e* are pivoted in the lock-carrier E at *e′*, Fig. 8, and are forced outwardly by a spring, *e″*, behind them, and are self-operating by means of the inclined planes *f*.

The plunger-cylinder C is hollow, having within it, centrally located, a rod, *g*, one end of which is made to impinge upon the end of the cartridge to explode it. This rod is kept back by a small spring, *s*.

The plunger C has on each side a slot, *a a*. Inside of the plunger C are two levers, F F, pivoted at *h h*, and which extend through the slots *a a*, beyond the end of the plungers, and are provided with hooked ends *i i*, to hold the end of the cartridge G by the head, which constitute the double extractor. The lever-clamps have a bulge, *j j*, at a particular part, for the purpose of forcing the levers together, as in the sliding of the plunger these bulging surfaces pass into the orifice at *j j*, as seen in

Fig. 5, and thus serve to open the hooked jaws *i i* and release the cartridge, which has been withdrawn from the barrel after having been discharged. The outward movement of the plunger then carries the levers outside of the orifice at *j j*, and there is in the frame C′ at that point a pin, *k*, which is between the two levers, and as they pass the pin *k* the ends are forced open, and consequently the hooked ends *i i* are closed upon the loaded cartridge, which has been dropped into position from the hopper, placed above, which is shown in the drawing, Fig. 9, detached from the frame, and then it is carried forward, as seen in Fig. 6.

There is sufficient elasticity in the ends of the levers F from the fulcrum *h* to the hook *i* to allow the hooks *i i* to spring over the head of the cartridge, if they should have closed before catching it.

The method by which the exploded cartridge is dropped will be seen in Fig. 4. C is the end of the plunger, shown with the hooks *i i* closed on the empty cartridge. A cartridge-receiver, *l*, is provided, as seen in Fig. 4, in section, and on top in Fig. 2. The purpose of this receiver is to hold the cartridges as they are dropped from the hopper, which, as shown in Fig. 9, has a separate chute for each gun, and as each cartridge is dropped into its receiver the motion of the top plate laterally is so timed as to act as a cut-off, to prevent the next following cartridge from dropping down. This receiver is formed by a casing surrounding the plunger, and it is hinged to the inside of the plate, as seen in Fig. 7, at *l′*. Under the top plate, at *l″*, is hinged an ejector, *m n*, which is represented as resting on the section of the slotted cross-brace *o*, which stretches between the barrel-frame D′ and the plunger-frame C′. In Fig. 4, below, will be seen another position of this plate *m n*. This is produced by the movement of the receiver *l* in the direction of arrow No. 1, plate *m* sliding over the top of brace *o* until the part *n* comes in contact with *o*, when the part *m* is forced down, and it knocks the empty cartridge G out of its position down through the opening, as seen in Fig. 4, the hooked jaws *i i* having been opened, as seen in Fig. 5, by the bulging surfaces *j j*.

The movement of the receiver *l* is produced by the means of a pin, *p*, (see Fig. 7,) on the lower side of the plunger C, which moves in a slot, *r*, in the bottom plate *l‴*. As the pin *p* travels in the straight part of the slot, no lateral movement is made, but as it enters the angular slot at *r′*, it causes the receiver *l* suddenly to move with arrow No. 1, and thus tilt, by a sudden blow, the plate *m*, which strikes the cartridge, as before described.

The barrels for the discharge of the cartridges are placed in a reservoir, D″, made of any suitable material, which is water-tight, for the purpose of retaining cold water or other cooling substance, to surround and cool the barrels, which, being subjected to the constant discharge of the cartridges, have no time to get cool otherwise, and, where practicable, a stream of water may be passed through the chamber by inlet and outlet pipes.

The breech L is attached to, or is a part of, the frame-work H, which extends under the other parts, and by which the working parts are firmly held and braced.

In the lock-chamber, between L and the frame supporting the cam-wheel, the lock-carrier E rotates, and as the discharges are made by the rotation of the lock, the stock just fills the space between the breech L and the ends of the plungers C. These plungers C, resting firmly against the ends of the barrels D, are supported at the other end by the lock-carrier E, and it against the breech L. Thus, in firing, the recoil is taken up through the plunger C and lock-carrier E by the heavy breech L, and the cam B and pin C are relieved of the shock.

Where the lock-carrier E impinges upon the face of the breech L, friction-rollers may be used.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A double extractor, in combination with the plunger and pin *k*, for closing the hooks.

2. The combination of a rotary double cam with a series of reciprocating plungers, arranged in the arc of a circle, and a series of stationary barrels, correspondingly arranged on the same arc of a circle, substantially as and for the purpose set forth.

3. A rotating lock, consisting of the middle section of a disk, wide enough only to support one plunger at each end, and having spring-hammers, substantially as and for the purpose set forth.

4. The combination of the ejector-plate, the cartridge-receiver, and the brace *o*, substantially as and for the purpose set forth.

5. The combination of the cartridge-receiver, having a slot in the bottom plate, and the plunger C, having a pin, *r*, to operate substantially as and for the purpose set forth.

6. The combination of the breech L, lock-carrier E, having abutting-shoulders, and plunger C, whereby the recoil of the gun is transferred to the breech and frame, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

ELIHU WILDER.

Witnesses:

ALFRED CLONGHLY,

C. M. CONNELL.