

W. B. FARWELL.
Machine-Guns.

No. 137,428.

Patented April 1, 1873.

Fig. 1.

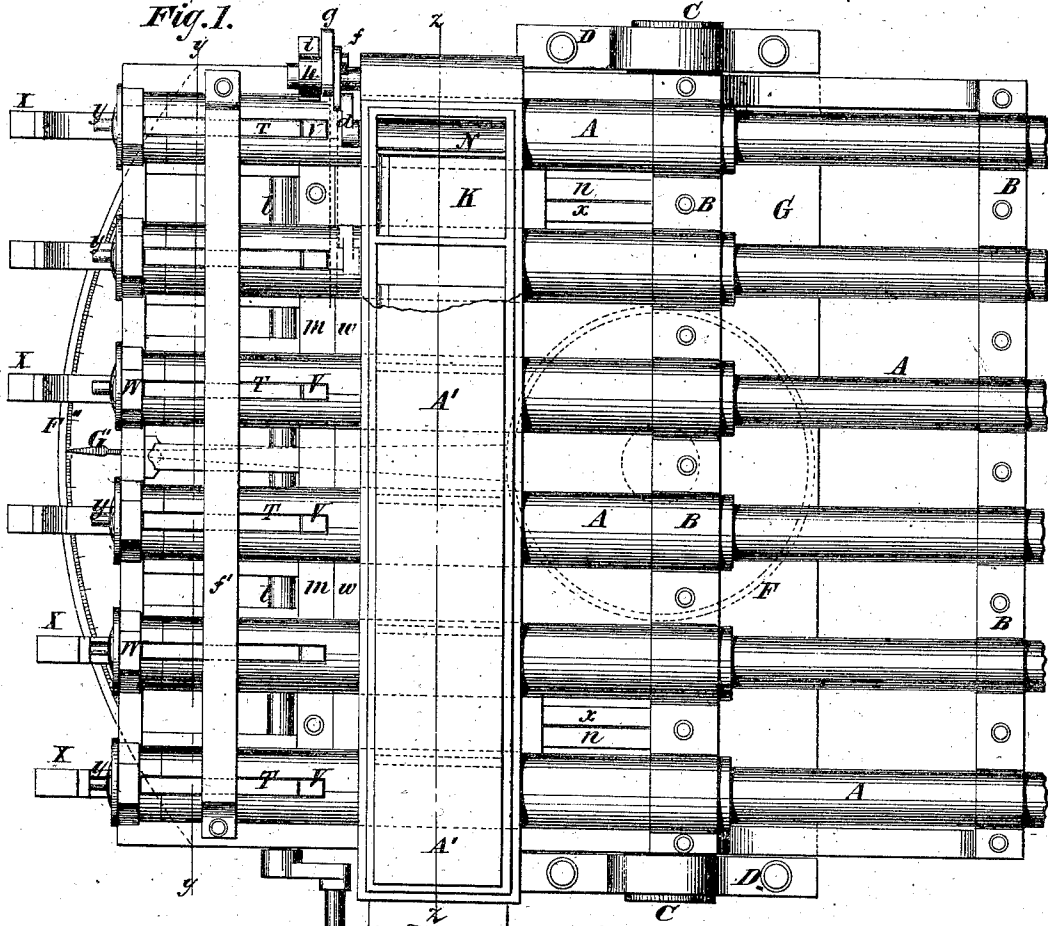
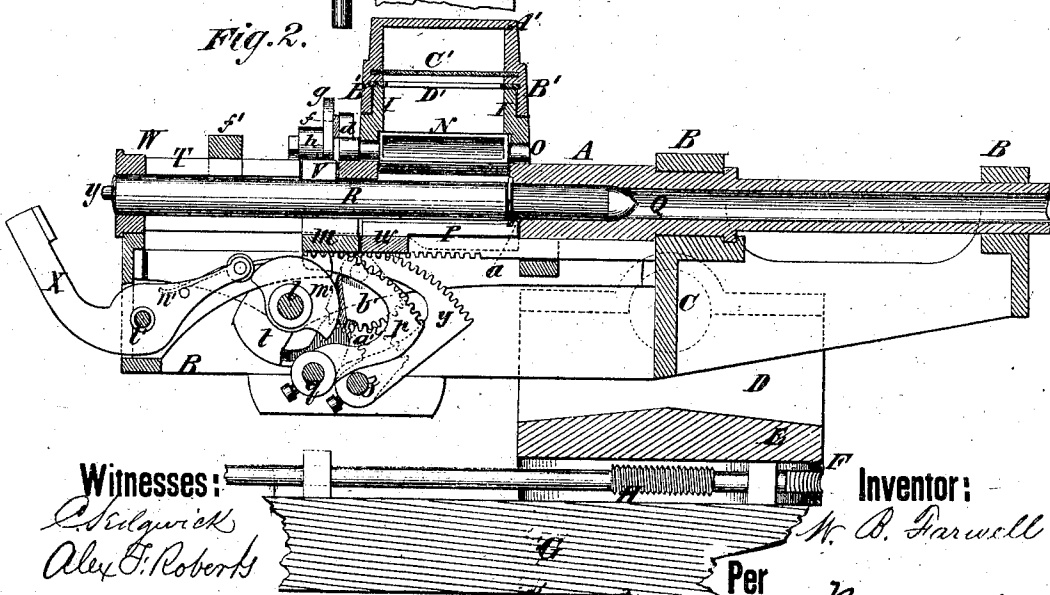


Fig. 2.



Witnesses:

Edgwick
Alex. F. Roberts

Inventor:

W. B. Farwell

Per

Wm. H. [Signature]
Attorneys

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Fig. 3.

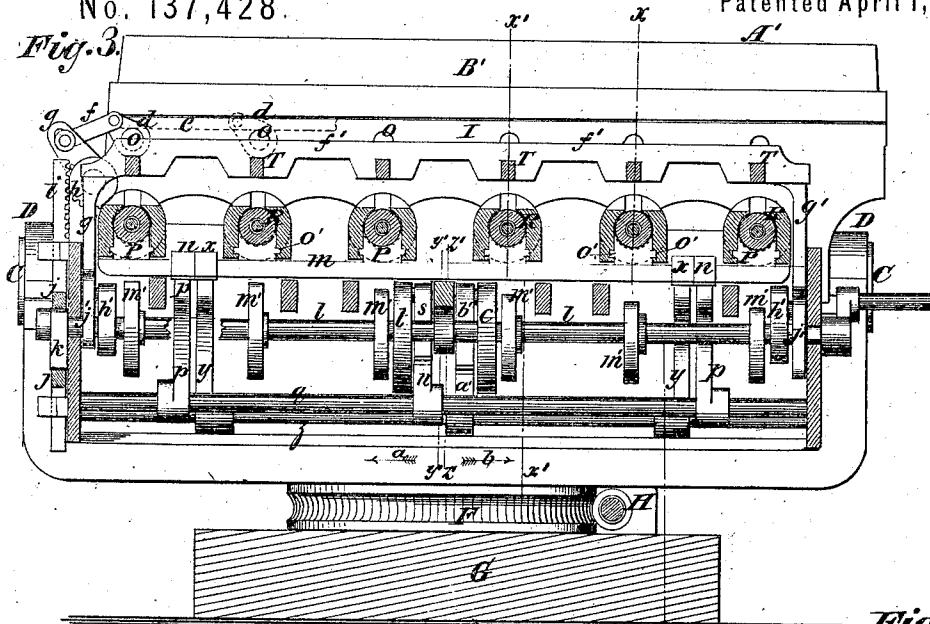


Fig. 4.

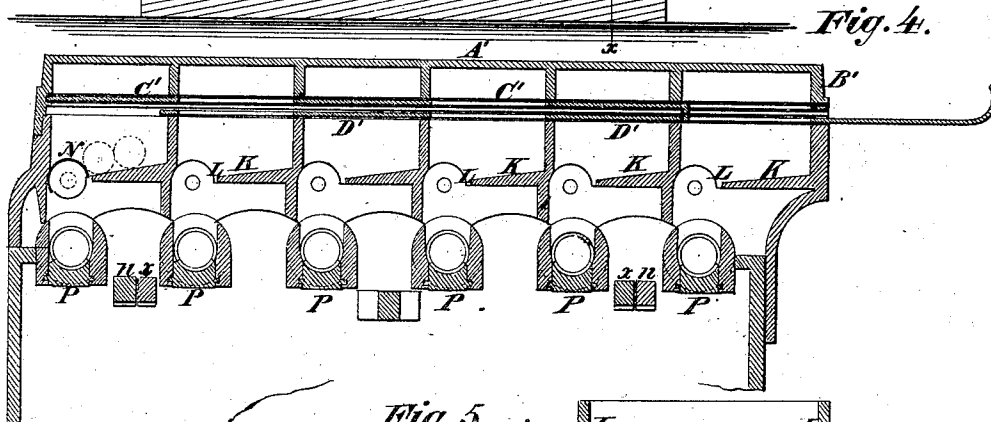
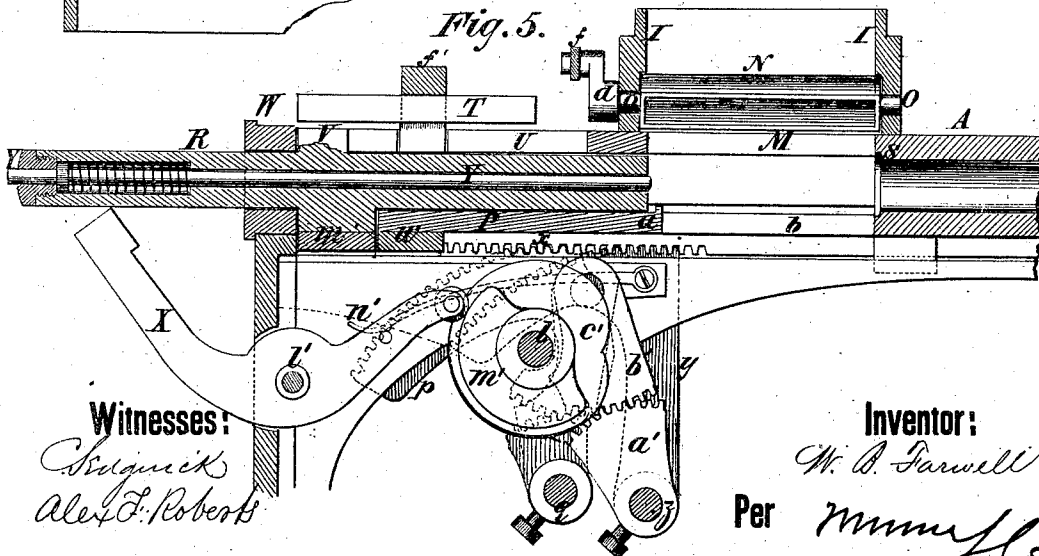


Fig. 5.



Witnesses:

Edgwick
Alex. L. Roberts

Inventor:

W. B. Farwell

Per

Attorneys.

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Fig. 6.

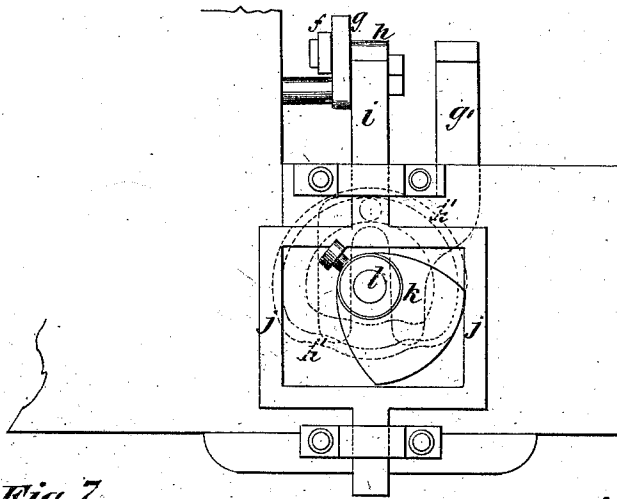


Fig. 7.

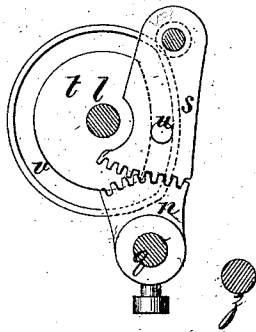


Fig. 8.

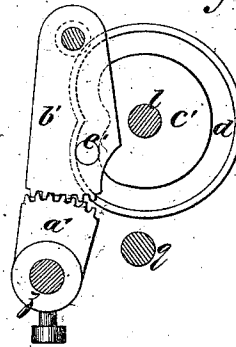
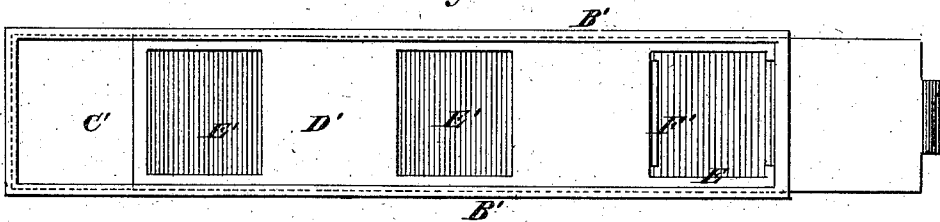


Fig. 9.



Witnesses:

C. Sedgwick
Alex. F. Roberts

Inventor:

W. B. Farwell

Per

Munnell
Attorneys.

UNITED STATES PATENT OFFICE.

WILLARD B. FARWELL, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINE-GUNS.

Specification forming part of Letters Patent No. 137,428, dated April 1, 1873; application filed March 8, 1873.

To all whom it may concern:

Be it known that I, WILLARD B. FARWELL, of the city, county, and State of New York, have invented a new and useful Improvement in Machine-Guns, of which the following is a specification:

My invention consists of a series of stationary breech-loading barrels, arranged side by side in a frame which swings on trunnions for the vertical adjustment, the trunnion-bearings being arranged on a horizontal turning-table, for the lateral adjustment. The cartridges are placed in hoppers over the barrels, one for each, having inclined bottoms, with an opening at the lower end, in which is a trough-shaped backward-and-forward revolving dropper, into which a cartridge falls when the hollow side is up, and is dropped from it into a slot in the barrel behind the breech by the turning of the trough upside down, so that it closes the passage through the bottom of the hopper, at the same time preventing the escape of the other cartridges. The cartridge falls into a trough-shaped receiver in the slot of the barrel, which holds it coincident with the bore of the barrel, and a cylindrical breech-closer behind the cartridge pushes it forward into the barrel and closes the breech. The breech-closer is then locked, to withstand the shock of the discharge, by a locking-bar on a strong cross-bar, which comes down into a narrow slot in the top of the barrel (which is extended behind the slot for receiving the cartridges) behind a strong stud rising up from the breech-closer. The hammer is then tripped and forced against a firing-pin which works in a central longitudinal hole in the breech-closer, and projects from the rear end to be struck by the hammer. The hammer is then forced back; the locking-bar rises; the breech-closers withdraw; the receiver also withdraws, and pulls the cartridge-shell back by a flange on its upper side at the front end, at the same time opening a passage through the lower side of the barrel, through which the cartridge-shell falls. The receiver then goes forward again, closes said passage, and receives another cartridge from the hopper above, and the operations above described are repeated. They are the same for all the barrels simultaneously, except the hammers,

which work in quick succession along the series of barrels. They are all effected by a cranked cam-shaft and intermediate devices, which will presently be described. The invention also consists of a trough or box shaped magazine, for charging the hoppers with cartridges, which corresponds in form with the series of hoppers, and, being filled with as many cartridges as the hoppers are capable of holding, and placed temporarily on the hoppers, is emptied into them by a peculiarly-constructed double slide, which, when one part is pulled a certain distance, discharges into every alternate hopper, and then, being pulled another distance, causes the other part to discharge into every other hopper in such a manner that all the hoppers can be very quickly charged without the necessity of pulling the slide the whole length of the series of hoppers, which would be the case if a single slide were used, thus simplifying and expediting the charging, which must of necessity be done by drawing the slide in the lengthwise direction of the charger, so that the cartridges will roll off the slide sideways, by which they fall into the hopper without being disarranged, as they would be if discharged from the slide endwise. A scale is provided with the gun, to show by a pointer the amount it is necessary to turn the gun laterally to shift the range at the object fired upon the extent of its breadth.

Figure 1 is a plan view of my improved gun. Fig. 2 is a longitudinal elevation taken on the line $x x$ of Fig. 3, showing the gun loaded and ready for firing. Fig. 3 is a transverse sectional elevation taken on the line $y y$ of Fig. 1. Fig. 4 is a transverse sectional elevation taken on the line $z z$, Fig. 1. Fig. 5 is a longitudinal sectional elevation taken on the line $x' x'$, Fig. 3. Fig. 6 is a partial elevation of the left-hand side. Fig. 7 is a detail section of Fig. 3 on the line $y' y'$ of Fig. 3, the parts represented being those seen when looking in the direction indicated by arrow a . Fig. 8 is a detail section on the line $z' z'$, the parts represented being those seen when looking in the direction indicated by arrow b ; and Fig. 9 is a plan of the under side of the charger.

A represents the barrels, which are arranged side by side and mounted on a frame, B, which is mounted on trunnions C supported by a

frame, D, which rests on a turn-table, E, which is pivoted on a platform, G, on which it is turned for adjusting the guns laterally by the worm-wheel or disk F and the worm H. I represents the hoppers in which the cartridges are placed to be delivered to the loading devices. They are arranged in a continuous series across the barrels behind the same, and have a bottom, K, descending to an opening, L, at one side directly over a wide slot, M, in the upper side of the barrel. N is a trough-shaped cartridge-dropper arranged in journals O in the sides of the hopper, so that when turned right side up a cartridge will roll into it, and when turned bottom side up it will close the opening through the bottom of the hopper, and at the same time drop the cartridge contained in it into the slot M of the gun-barrel, where it falls upon the receiver P, resting there to receive and hold it directly in line with the bore Q of the barrel and in front of the breech-closer R, which slides forward and back in the barrel behind the breech S, and at the time the cartridge falls is in the position represented in Fig. 5. This breech-closer then moves forward and pushes the cartridge into the barrel, as shown in Fig. 2, at the same time closing the breech. Then the locking-bar T descends into the narrow slot U of the barrel, with the front end behind the stud V and the rear end in front of the shoulder W at the rear end of the barrel, and locks the breech-closer, so that it will withstand the shock of the discharge. Then the hammer X is thrown forward against the firing-pin Y, reaching through the hollow axis of the breech-closer to the cartridge, so as to be forced against the center of it and explode the fulminate. The locking-bar T then rises, the breech-closer goes back, and is immediately followed by the receiver P, which withdraws the shell by its flange *a* and drops it through the slot *b*. The receiver immediately goes forward again ready for receiving another cartridge, which, as before described, is dropped into it by the dropper N, which in the meantime has been turned right side up to get it. This dropper has a crank, *d*, which is connected, by a bar, *e*, and link *f*, with a crank, *g*, which is geared by a pinion, *h*, with a vertically-reciprocating bar, *i*, having a yoke, *j*, in which a cam, *k*, on the cranked cam-shaft *l* works. The breech-closer R is connected to a cross-bar, *m*, which rests on the slides *n*, which have teeth on the under sides, and gear with the segmental wheels *p* on the rock-shaft *q*, which is worked by the segmental wheels *r* *s* and the grooved cam *t*, the latter being on the cranked cam-shaft *l*, and operating the segment *s* by the pin *u* and groove *v*. The receivers P slide in ways *o'* in the lower part of the barrel, and are connected to the cross-bar *w*, which is mounted on the slide *x*, which are toothed on their under sides, and gear with the segmental wheels *y* on the rock-shaft *z*, which is worked by the segmental wheels *a'* and *b'* and the grooved cam *c'* on the cranked cam-

shaft *l*, which works wheel *b'* by its groove *d'* and the pin *e'* in the wheel. The locking-bars T are connected to the cross-bar *f'*, which is mounted at the ends on the uprights *g'*, which are worked by the grooved cams *h'*, in which are pins on the yokes *j'*, on which the uprights rest. The form of these cams and the yokes is represented in dotted lines in Fig. 6. X represents a hammer. These are pivoted to the frame at *l'*. They are moved back by cams *m'* on the cam-shaft, and thrown forward by springs *n'*. These cams are arranged so that the hammers follow each other in quick succession in their operation; but the cartridge-droppers, breech-closers, cartridge-receivers, and the locking-bars for all the barrels work together in the order in which they are described. The charger consists of the long box A', which, when charged and inverted, fits in the top of the hoppers by the rabbit-joints B'. It has two slides, C' and D', each having openings E', which, in their aggregate length, are equal to half the length of the charger; and they have spaces between equal to them in length. The spaces in one close the openings in the other, so that both make a complete cover.

When one is pulled out the length of the openings and spaces the openings through both will coincide, and half of the cartridges in the charger will fall out. Then, by pulling both covers out together the length of the openings, the other half of the cartridges will fall out through the openings. After the first opening movement of the slide D' the slide C' will be caused to move with it by the flange F', which engages slide D' by the wall of one of the openings through it.

A number of chargers will be employed with each gun. They will contain about four cartridges for each barrel. The empty ones will be taken off and full ones put on as often as required during the progress of the firing; but they may be greatly increased in capacity by increasing the depth and dividing them into several chambers by slides C' D', so as to discharge from one chamber to another as the lower one is emptied.

F'' is a scale, and G' a pointer, which I propose to combine with the turn-table E or disk F and the platform G, by placing one on the turn-table and the other on the platform, and which will be adjusted so as to show the amount it will be necessary to turn the table for shifting the gun after each discharge to cover a new space or breadth at the distance of the objects fired upon.

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

1. The combination of a series of droppers, N, with a series of gun-barrels receiving the cartridges in slots in the tops, and a series of hoppers having inclined and slotted bottoms, substantially as specified.

2. In a machine-gun, the combination of the reciprocating receivers P and breech-closers

R, operated intermittently by positive force, substantially as and for the purpose described.

3. In a machine-gun, the combination of a series of locking-bars, T, with a series of breech-closers, R, and automatic mechanism for operating the same, substantially as and for the purpose described.

4. The combination of the cranks *d*, rod *e*, link *f*, crank *g*, pinion *h*, bar *i*, yoke *j*, and cam *k* with the crank-shaft and the droppers, substantially as specified.

5. The combination of the bar *m*, toothed steel bars *n*, segmental wheels *p*, and rock-shaft

q with the breech-closers, substantially as specified.

6. The combination of the bar *w*, toothed sliding bars *x*, segmental wheels *y*, and the rock-shaft *z* with the receivers P, substantially as specified.

7. The charger A', with slides C' and D', combined and arranged substantially as specified.

WILLARD B. FARWELL.

Witnesses:

A. P. THAYER,
T. B. MOSHER.