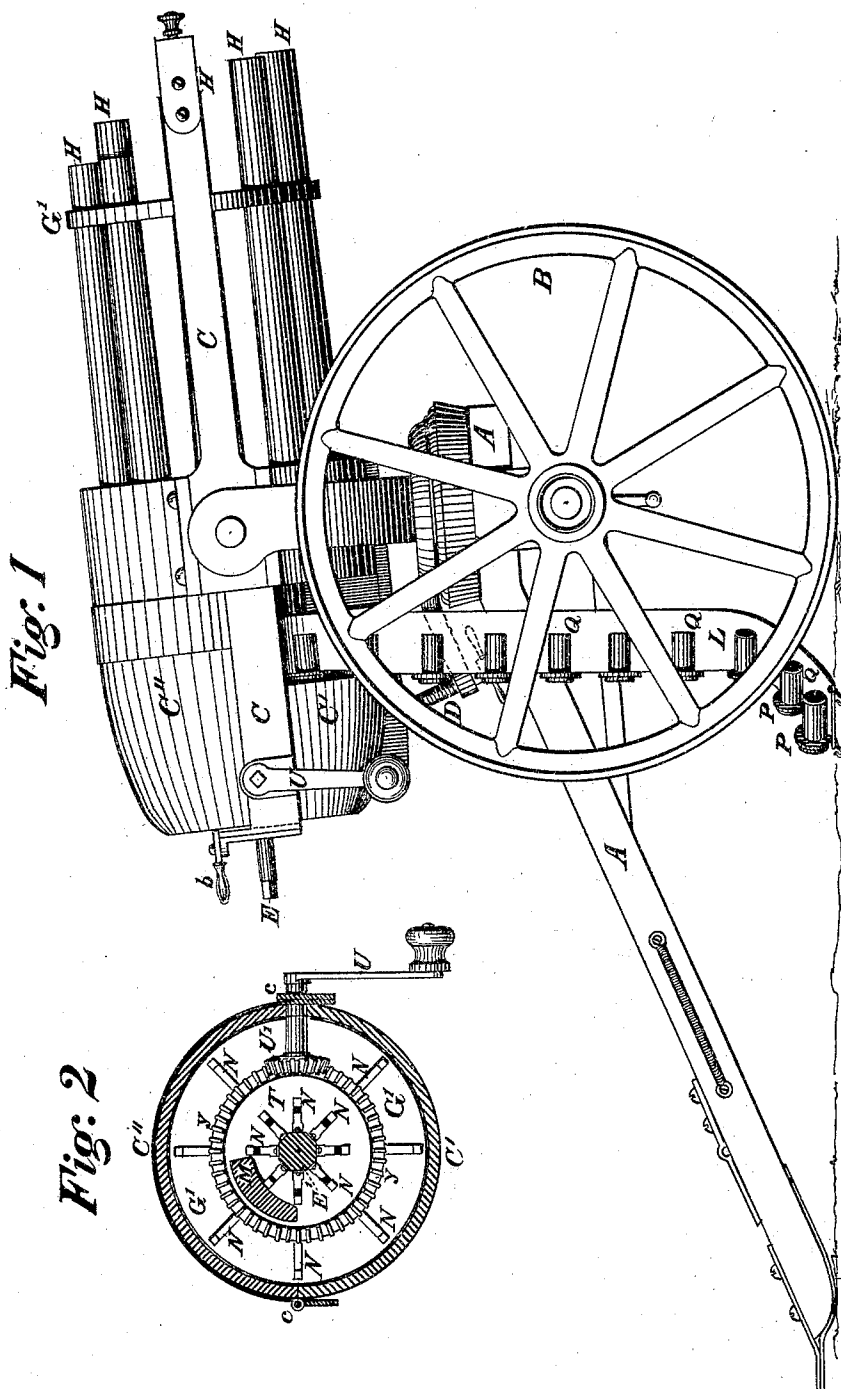


F. L. BAILEY.
MACHINE-GUN.

No. 173,752.

Patented Feb. 22, 1876.



WITNESSES:

John Everding
W. R. Wright

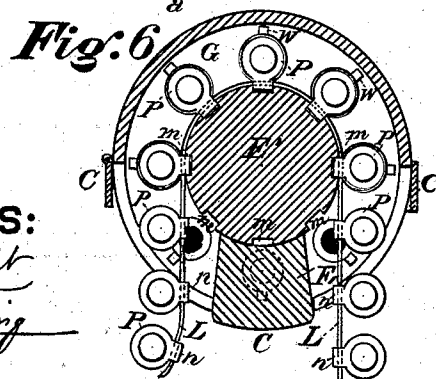
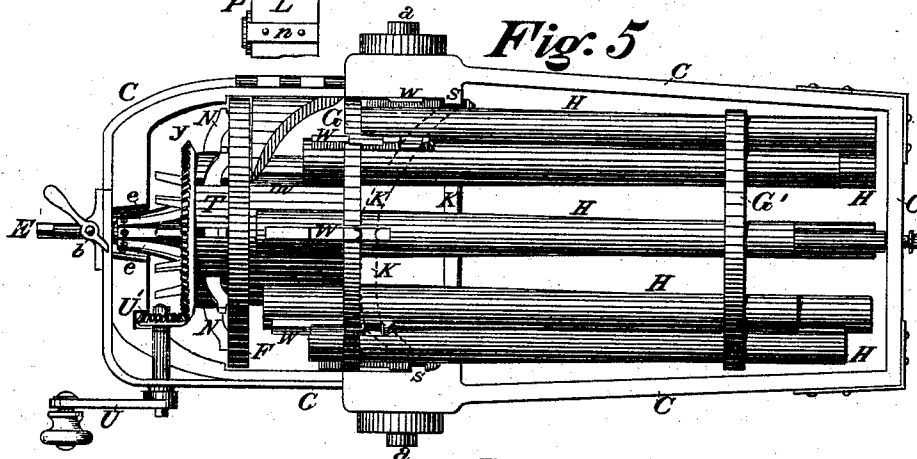
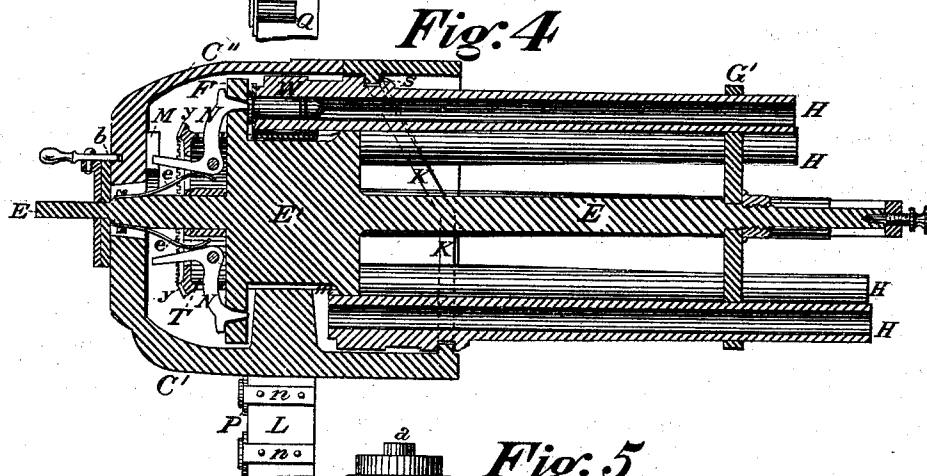
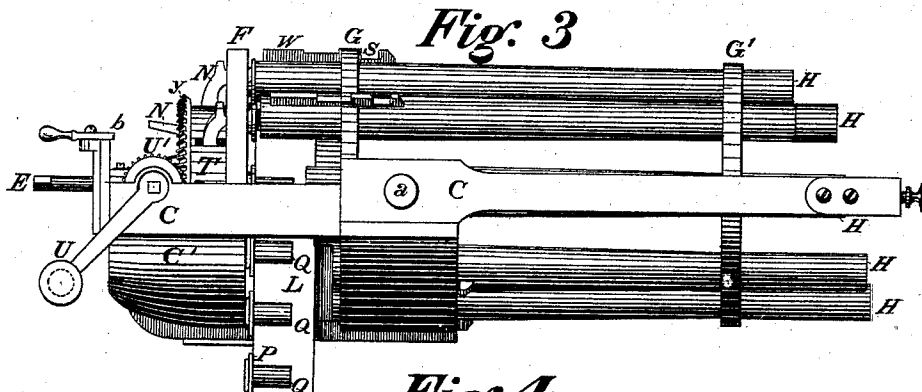
INVENTOR:

Fortune L. Bailey
By David A. Burr
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UNITED STATES PATENT OFFICE.

FORTUNE L. BAILEY, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN MACHINE-GUNS.

Specification forming part of Letters Patent No. **173,752**, dated February 22, 1876; application filed November 29, 1875.

To all whom it may concern:

Be it known that I, FORTUNE L. BAILEY, of Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Machine-Guns, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention consists, first, in the construction of a machine-gun, with barrels moving longitudinally in a revolving frame, and governed in their movements by a fixed guide or cam, so that each, when brought into proper alignment for firing, shall close back over a cartridge, which has been brought into proper position by means of a belt passing over a drum, forming part of the revolving frame, and shall, after being fired and discharged, move forward and be withdrawn from the cartridge-shell, leaving it upon the belt. It consists, second, in the combination, with the base of a revolving breech-block or support, of a series of pivoted spring-actuated hammers, one for each barrel, which shall be cocked and released, each in turn, at the proper moment for striking the cartridge to be fired by means of a fixed cam on the inner face of the casing covering the hammers; and it consists, likewise, in the combination of improved cartridge-holders, with a belt arranged to pass over a drum in the breech of the gun, whereby the cartridges are supplied to the gun and brought into proper position to be covered successively by its barrels, as required for firing.

In the accompanying drawings, Figure 1 is a side elevation of my improved gun mounted upon its carriage; Fig. 2, a transverse vertical section through the cascabel in the rear of the hammers or revolving gear; Fig. 3, a side elevation of the gun, with the casing covering the cartridge-drum and hammer-chamber of the gun removed, with cartridge-belt in position; Fig. 4, a central vertical longitudinal section of the gun, with cartridge-belt in position; Fig. 5, a top view thereof, with the casing covering the rear portions of the gun and the cartridge-belt both removed; and Fig. 6, a vertical transverse section in line

xx of Fig. 5, illustrating the combination of the cartridge-belt with the gun.

A, in the drawings, is the gun-carriage, made after any approved design, and mounted, as usual, upon wheels B. C C is the fixed frame, which carries the trunnions *a a*, (see Figs. 1 and 5,) by which the gun is suspended over the carriage; and D, Fig. 1, the elevating-screw for adjusting the gun vertically in sighting it. To the rear portion of this fixed frame C is secured a casing, C' C'', which covers and incloses the butt-ends of the barrels and the firing mechanism and rotating gear of the gun, and forms its breech and cascabel. (See Figs. 1, 4, and 5.) The upper half, C', of the casing is hinged or made detachable, so that it may be thrown open to uncover the mechanism of the gun for inspection, *b* representing a lock or catch arranged to secure it when closed. E, Fig. 4, is a revolving shaft, extending longitudinally through the center of the fixed frame C C, and whose journals at each end are supported and turn freely in suitable bearings formed therefor in the cross-bars of the frame at front and rear. This shaft is enlarged at a point near its rear end to form a drum, E', to receive the cartridge-belt, and it serves as the axis of a frame revolving with it, which consists of flanges F G, projecting radially from each end of the drum outward to the inner periphery of the casing, and of a third flange or disk, G', secured to the shaft near the front end thereof. The disks or flanges G and G' constitute respectively the supports or bearings for the ends of a series of gun-barrels, H H, arranged in parallel lines at equal distances apart around the shaft, and which pass through apertures pierced in said flanges to receive them, and have free longitudinal play therein. The remaining flange F serves as an abutment or breech-block for the butt-ends of said barrels H H, when they are loaded and ready for firing. The butt-ends of the barrels are left open, and are each bored out to form a suitable chamber for the reception of a metallic cartridge case or shell, made to fit closely therein. Each barrel is prevented from turning upon its axis by means of a feather, *w*, Figs. 3 and 5, on the rear end

thereof, which engages a notch in the flange G, (see Fig. 6,) while a longitudinal reciprocating movement is imparted thereto when the shaft E revolves, by means of a continuous guide-rib or cam, K, (see Fig. 4 and dotted lines in Fig. 5,) formed upon the inner face of the inclosing casing, so as to project therefrom inwardly around its entire circumference and engage a notch, s, (see Fig. 4,) formed in a lug projecting from each barrel. (See Figs. 3, 4, and 5.) This fixed guide-rib or cam K is made to follow such inclined and parallel lines around the inner circumference of the casing, (see positive and dotted lines, Figs. 4 and 5,) as that each barrel in its revolution, being made to engage and follow said cam-rib, is, when approaching its highest central point in line over the axis of the shaft E, carried back, so as to nearly strike the flange F forming its breech-block, and having passed the central point is gradually withdrawn from said flange F, so that in making the next quarter revolution it is carried forward a distance equal to the length of a cartridge, whereupon its longitudinal movement ceases until it commences to pass upward once more, when it is again gradually forced back toward the flange F, as above described. Longitudinal recesses *m m*, (see Figs. 4, 5, and 6,) are formed in the periphery of the drum E' at equal distances apart, measured by radial lines extended from the center of the drum through the center of each barrel.

L, Fig. 1, is a flexible belt, upon the under side of which metallic strips or bars *n n* (see Fig. 4) are secured transversely at regular intervals corresponding to the distances between the longitudinal recesses *m m* in the drum E'. The strips *n n* are of such width and thickness as to fit nicely within said recesses *m m*, and to the end of each strip, along one edge of the belt L and parallel thereto, a metallic ring, or annular plate, P, is secured, whose outer diameter is equal to that of the base of the cartridges Q Q to be used in the gun, and whose inner diameter is such as to embrace closely the body of the cartridge, the distance between the center of the annular disk P and the face of the belt L being slightly greater than the radius of one of the gun-barrels H at its butt-end, so that the same barrel may slip over the cartridge without binding upon the belt. When this cartridge-belt L is laid over the drum E' the under strips *n n* drop into the longitudinal recesses *m m* in the drum, and the cartridges Q Q supported in the annular disks P P are each brought into line with the bore of the gun-barrel, so that the axes of both cartridge and barrel shall exactly coincide. Hence, when the barrels are successively forced back, the rear end of each, as it approaches the highest point, will slip over the cartridge supported in line therewith and force it back closely against the breech-plate or flange F, (see Fig. 4.)

which will afford it firm support, and serve to receive the force of the recoil when the cartridge is exploded.

The belt carrying cartridges is made in sections, and each section is fitted with hooks at one end and eyes at the other, or with other easily-detached fastenings, so that two or more sections may be readily united to pass over the drum practically as one continuous belt. The loaded sections are attached to the end of the belt upon one side, and when unloaded are detached and removed upon the opposite side of the gun, to be reloaded and again attached, the passage of the sections over the drum, and the presentation of cartridges to the barrels, thus continuing without break or intermission so long as the gun is in operation.

The hammers by which the cartridges are exploded at the proper moment consist of right-angled bent levers N N pivoted in a cylindrical case, T, which slips over the end of the shaft E in the rear of the flange F, against which it is firmly secured. These right-angled levers are pivoted at their angle to suitable offsets projecting inwardly either from the rim or the hub of the cylindrical case T, so that each lever shall vibrate in a radial plane, with its outer arm projecting outwardly horizontally, or nearly so, through a slot in the rear or base of the cylindrical case T, and its inner arm through a slot in the periphery of said case, this last arm terminating in a head which projects through an aperture in the flange F, so as to strike the cartridge formed in position on the other side. Springs *e e* are secured to the shaft E so as to bear up one under the outer arm of each hammer, and to carry the hammer-head forcibly against the cartridge.

The number of hammers is made to correspond with the number of barrels in the gun, and being secured to the same shaft, revolve therewith, so that each hammer is always in line with its own barrel. The spring controlling each hammer is depressed, and the hammer thereby cocked, and again released at the moment its appropriate barrel has been brought into proper position for firing, so as to strike and explode the cartridge covered thereby by means of a cam-plate, M, (see Figs. 2 and 4,) fixed on the inner perimeter of the upper casing O', inclosing and covering the hammers and hammer-cylinder, and which forms the breech of the gun.

The revolution of the shaft carrying the hammers, barrels, and drum or carrier for the cartridge-belt, is produced either by means of a crank, U, placed directly upon the end of the shaft projecting rearwardly through the case-cable, or preferably, by means of a crank, O, placed upon one side, as shown in the drawings, from which motion is communicated to the shaft by means of a bevel-spur wheel, U', secured thereto, engaging bevel-

cogs *y y* upon the periphery of the cylindrical hammer-case T.

In operating this gun a cartridge-belt, L, is passed over the drum E', the strips upon the under side of the former being placed in the counterpart recesses in the periphery of the latter, and, the gun is ready for firing. The gun is then loaded and fired automatically by simply turning the crank U.

By the revolution of the shaft E, produced by turning the crank, the gun-barrels are brought successively in a central vertical plane coincident with the longitudinal axis of the gun, and, by means of the fixed cam-guide upon the casing, are, while approaching this position, forced back over a cartridge, which has been brought into proper alignment by the revolution of the drum, and which is supported rearwardly by the flange F. At the same time the hammer for that particular barrel is cocked by means of the fixed cam M upon the casing C'', which bears down the outer arm of the hammer-lever and compresses its spring until, when the barrel has reached the proper central point coincident with the axis of the gun and the line of sight upon which the gun has been aimed, the lever-arm passes from under the end of the cam, and the hammer thus released instantly drops and strikes with the full force of the spring upon the cartridge to explode the same.

Under the continued revolution of the shaft, as the next barrel is brought into line, the barrel just fired is gradually withdrawn from the empty cartridge-shell until the latter is entirely released therefrom, and, being carried by the belt, can be readily removed for reloading. As fast as one length or section of belt passes to the gun, another may be hooked on, and the belt be thus made practically endless, and the supply of cartridges to the gun be continued without interrupting the firing so long as may be required, the sections of emptied cartridges being unhooked and removed from the other side, to be again reloaded. All the movements of the gun in loading, firing, and removal of the discharged cartridges, are thus automatically produced with precision and regularity, and without cessation or interruption, so long as the crank is turned and the sections of loaded cartridges are at-

tached to the belt. As each barrel is fired when in line with the center of the gun-carriage, as well as on the exact line of sight, the utmost precision of aim may be obtained with the gun, and its position when trained to cover any mark will, while the firing continues, remain unchanged, without any extra stays or supports. The combination of the one single cam directly with the hammers obviates the use of all complicated lock mechanism.

It is evident that a continuous groove may be substituted for the continuous guide-rib K, to receive a lug formed on each barrel in place of the notch s, the barrel being guided by an engagement of the lug with the groove. I contemplate also the substitution of a hopper, in combination with the drum E', to supply the cartridges to the barrels in due order in place of the belt L, each cartridge being confined against the abutment-flange F by a suitable device until the barrel is wholly withdrawn therefrom.

I claim as my invention—

1. A series of reciprocating gun-barrels, combined in the construction of a machine-gun, with a revolving shaft and supporting-flanges, and with a fixed camway or guide, substantially as and for the purpose herein set forth.

2. A belt carrying cartridges, combined with the revolving shaft and reciprocating barrels of a machine-gun, substantially as and for the purpose herein set forth.

3. A series of annular plates or disks, P P, combined with a belt, L, each to uphold a cartridge in a transverse position over the belt, apart therefrom, substantially as and for the purpose herein set forth.

4. In combination with the respective barrels of a machine-gun and with a single fixed cam in the casing thereof, a series of spring-actuated hammers pivoted to the revolving shaft, carrying said barrels and successively cocked and released by the cam during the revolution of the shaft, substantially as and for the purpose herein set forth.

FORTUNE L. BAILEY.

In the presence of—

CHARLES P. JACOBS,

WALTER V. LIPPINCOTT.