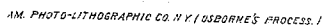


Patented Nov. 28, 1871.



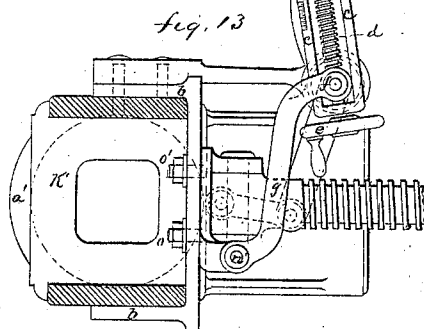
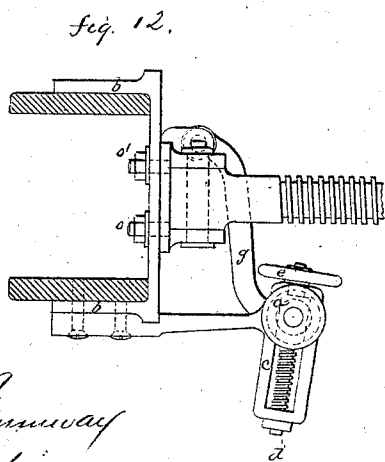
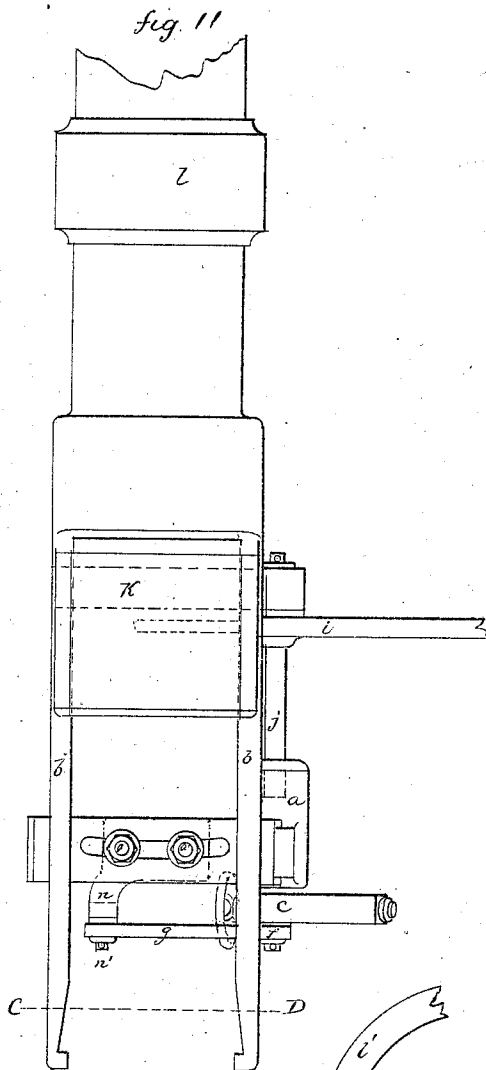
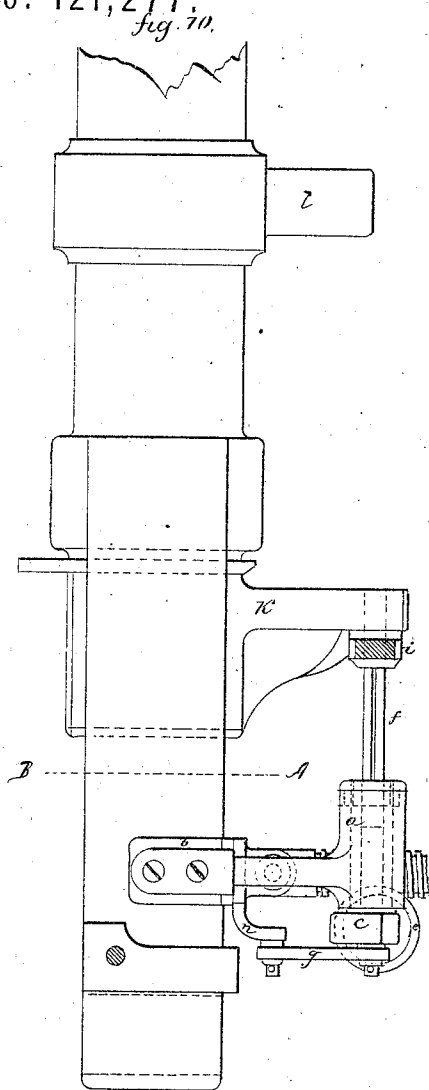
LOUIS CHRISTOPHE & JOSEPH MONTIGNY.

2 Sheets--Sheet 2.

Improvement in Machine Guns.

No. 121,277.

Patented Nov. 28, 1871.



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By Atty.

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UNITED STATES PATENT OFFICE.

LOUIS CHRISTOPHE AND JOSEPH MONTIGNY, OF BRUSSELS, BELGIUM.

IMPROVEMENT IN MACHINE-GUNS.

Specification forming part of Letters Patent No. 121,277, dated November 28, 1871.

To all whom it may concern:

Be it known that we, LOUIS CHRISTOPHE and JOSEPH MONTIGNY, of Brussels, in the Kingdom of Belgium, have invented a certain Improved Tubular Cannon for Firing Volleys or Charges of Grape-Shot, of which the following is a specification:

The grape-shooter (*mitrailleuse*) forming the object of this present application for Letters Patent represents in some measure a kind of small cannon for field artillery; and consists of thirty-seven gun-barrels made of cast-steel or of iron, which barrels, connected into one bundle or set, are incased or embedded within a tube or casing, *a*, of forged iron, or any other suitable metal. All the said barrels, as well as the cylindrical casing or tube *a*, are soldered together with tin solder so as to form one compact and very rigid body. Into the prolongation of the said casing tube (the cylindrical breech or rear part of which is cut with a long thread or screw-worm) the stay-ring *a'* of the parallel brackets *b b* is screwed in, on which latter the action, lock, or discharging mechanism *k* is to work. The said parallel brackets *b b* are, at their ends, connected by two bronze or brass bearings *d*, which sustain the pivots of the butt piece *e* of the bent lever *f*, the main mover of the whole machine. The said lever *f*, by its alternating semicircular motion or range, which is imparted to it by the action of the hand, serves the purpose of putting the lock or discharging apparatus into action—that is to say, either opening or shutting it—in other words, of loading, firing, and discharging all the barrels.

Between and upon the said parallel brackets *b b* moves or works the lock-action or discharging apparatus *k*, made of bronze, brass, or any other suitable metal, and inclosing within itself a cylindrical box, *g*, of the same material, and equally animated with motion, which box, containing thirty-seven percussion-hammers, *h*, receives, in the first place, the impulse or motion imparted through the lifting of the motive-lever, with which it is directly connected, by means of the connecting-rod *j* at the link points or pivots *k' k''*. But in order to force the said box to move or slide in a straight line within the action or lock without ever deviating from the regular position assigned to it, the same is guided in its course by the key or wedge *l* attached to the lock or discharging apparatus.

In front of the discharging apparatus *k*, joining the same at its lateral extremities, and just opposite to the faces of the barrels, are the guide or slide-bars *m m'*, which receive the cartridge extractor-plate *n*. Owing to the arrangement and working of said extractor-plates a whole set or series of cartridges, *Z*, corresponding in number with that of the barrels, may be adapted or applied at once. Now, when the said extractor-plates, supplied with filled or crammed cartridges, are pushed forward by the alternating motion imparted to them through the working of the main or motive-lever *f*—that is to say, by forcing the said lever down to the nethermost point of its range, (an essential point, which is regulated by means of the tie or transom-bolt *o*, and the said position is shown in the annexed drawing,)—the cartridges will, as a matter of course, be fairly lodged within the bottom of the bores or chambers of the barrels, while by the same act or operation the percussion-hammers *h* will be at the same time cocked against the trigger-plate *p*, upon which they will all strike simultaneously. Thus combined working will all be effected by the forward motion of the box *g*, which, on reaching in its turn the bottom of the lock or discharging apparatus, will pull this latter along it until it comes in close contact with the face of the breech. Now supposing the lock or discharging apparatus to have reached the bottom, and consequently the lever to be at the lowest point of its range, the *mitrailleuse* (grape-shooter) will be loaded and ready for shooting or firing. All that is now required is to raise or lift with the hand the trigger-lever *q*, which in its upward motion causes the trigger-plate *p* to descend, thus laying bare the percussion-hammers, and thereby releasing or setting them free to produce their effect, actuated as they are by the constant pressure of buffer-springs, which serve at the same time both the purpose of cocking the said percussion-hammers as well as to produce the sharp and instantaneous blow which, through the instrumentality of the percussors or strikers *i*, causes the cartridges to ignite or explode, and ultimately the successive or simultaneous discharge of all the barrels, at the will of the artillerist or operator.

As soon as one of the plates is fired off, (there are generally from eight to ten plates kept ready supplied for each *mitrailleuse* or grape-shooter,) and if the firing or shooting be desired to con-

tinue, it becomes necessary to withdraw forthwith the said discharged plate in order to extract from it the exploded cartridge-cases, an operation which is performed by promptly raising or lifting the main or motive-lever. This act will in the first place impart a backward motion to the inner box or cylinder *g*, which, meeting on its way the closing plate *s* of the lock or action, will pull along the latter to the very limit assigned to it by the catches or tappets *r r'*, so that the backward range of the lock or action is invariably of the same length, measuring a little more than the total length of a filled cartridge, together with its leaden ball. During the backward motion both of the cylindrical box and the lock or action, the percussion-hammers, being left to themselves, will ultimately start off from this position, and on being moved to their backward position will allow the trigger-plate to rise; when this is effected the extractor-plate must be withdrawn from the guides *m m'*, which extractor-plate will pull along with it all the fired-off or exploded cartridges extracted from the chamber of the barrels, and be immediately replaced by another plate, supplied beforehand with filled cartridges, as hereinbefore explained, and so on according to the urgency of keeping a well-supplied and continuous firing.

The grape-shooter or mitrailleur is placed about a center of gravity upon a pivot, *t*, of which *y* is the collar. This pivot moves upon and within a plumber-block, *u*, fixed upon the gun-carriage. At the side of and underneath the brackets is the pointing or elevating screw, whose sliding-block or bush *w* is in its turn attached to the brackets by means of a movable block or stirrup, *x*, which serves the purpose of keeping the parts invariably at the required distances; and as the elevating or pointing screw performs its circular motion within the box fixed upon the block-trail of the gun-carriage, it follows consequently that the grape-shooter or mitrailleur is allowed freely to move over the whole length of the slides or brackets *X X'* of the block or stirrup *x* in the direction from right to left with regard to the position of the longitudinal axis of the mitrailleur or grape-shooter. This motion, called the lateral motion, is obtained by means of the following arrangement, which the inventors have deemed it necessary to add by way of improvement to their invention, in order the more fully to develop and carry out the advantages or effects of their grape-shooter or mitrailleur. The said lateral motion when combined with the main body of our fire-arm is calculated to render the latter capable of an automatical sweeping or mowing motion, which may be regulated and directed at will to all possible distances in order to reach the enemy. The said sweeping or mowing motion is simply obtained through the sole action imparted to the trigger-lever when the same is lifted in order to operate the firing of the gun. The results obtained at the test or trial-experiment have ascertained the effects realized through the said motion to be prodigious; thus, for instance, at an angle of seven degrees a sweep embracing

from between forty to fifty meters was obtained at a distance or range of nine hundred paces.

This combined motion, having for its end and purpose to obtain a sweeping action or shooting with the view to dispersing or scattering the projectiles, is realized or carried out through the application of a button or stud, 1, fixed upon a setting-screw, 2, which determines or varies the position of the button or stud 1, according to the useful distances at which the arm may be required to do effect. The whole arrangement being located within the trigger-lever, the said button or stud receives the lever 3 attached to a small crank, 4, which is mounted on the grooved spindle 5 working or gearing freely into the pinion 6. The said pinion being mounted upon the yoke-band or stirrup attached to the movable block *x* works or gears into a rack 7, which latter is firmly attached to the fixed part of the bearing *w* of the pointing or elevating screw. The said set or thumb screw may at will be placed either above or below the slide-bar 9, Fig. 9. Whenever, therefore, the execution of the sweeping or mowing action is intended, the mere working of the trigger-lever will cause the whole of this combined arrangement to start into action and impart to the grape-shooter or mitrailleur the automatic horizontal motion, capable of being regulated at will, and of describing a section of a circle commensurate or proportionate to the required distance or range of shot.

If, on the other hand, simple firing, without the mowing-action, be intended, then the small crank 4 has to be thrown out of gear by causing the thumb or setting screw, which screws it upon the grooved spindle, to perform one revolution, and at the same time to slide sideways upon the spindle on which the lever 3 is fixed; this operation being performed the button or stud 1 will find itself released or abandoned, whereby the scattering or sweeping mechanism will be entirely separated or detached; and when finally, by means of the set-pressure or thumb-screw 8, the guide-bar *g* of the movable block *x* has been fixed to the bearing *w*, the grape-shooter or mitrailleur will be invariably kept in the direction of its natural axis.

The above dispersing or scattering mechanism is susceptible of various other arrangements, taking for center of motion or fulcrum either the fixed part of the elevating-screw or the pillow-block *U*.

We wish to have it well understood that the grape-shooter or mitrailleur admits of having the barrels placed in one, two, or more rows or lines, as also of being shaped into either a square, cylindrical, or polygonal form, and of being composed of any given number of barrels; and further, that cartridges with either central or circular fire, and either percussion, needle, and pins, or any other percussion contrivance, as also that any kind or description of lever for working the action or discharging apparatus, may be equally employed.

The grape-shooter or mitrailleur such as above described and set forth is capable of discharg-

ing or firing on an average four hundred and eighty-one balls per minute. The caliber may range from eleven to fourteen millimeters, and even more, if required. The charge may consist of five, six, eight, and ten grammes of powder, or even more or less; and the weight of the projectile may be respectively of thirty, thirty-five, thirty-seven, and forty grammes; and under all these conditions the arm will do execution at a range of from fifteen hundred to two thousand meters.

Lateral motion for the purpose of realizing a sweeping, mowing, or scattering action at any required distance may otherwise be obtained by taking, in the manner hereinbefore described, the fixed block or pillow of the pointing or elevating screw for center of motion or fulcrum, and equally through the action of the trigger-lever. This system of motion is shown by the pink colored parts in the annexed drawing, where it is represented at its dead-point position—that is to say, when out of action.

The combination of this system of motion rests on the same principle as the one previously described. It consists of a cylindrical support or bearing, *a*, the upper part of which is attached to the flange or rim of the yoke-band or stirrup *b*. Within the said bearing *a* works the pivot or journal *c*, fixed in the frame-work, which pivot is destined to receive the thumb or set-screw *d*, whose purpose it is, by means of a small fly-wheel and handle *e*, to give the required position to the articulation-point *f* of the connecting-rod *g* by moving the same to the prearranged division-point on the face *h* of the frame-work; the said point being destined to regulate the useful degree of swing or course to be given to the grape-shooter or mitrailleur in order to sweep over the range of the enemy's front at a known distance.

This articulation-point *f* is a steel guide sliding in the frame, and which, by means of the set-screw, is to be secured at any spot it may be desirable to place it. It is thus from this given point that the required swing or course to be given to the grape-shooter or mitrailleur is to be obtained.

Supposing, now, that a sweeping or scattering action of a determined distance be intended, the play of the lateral-motion system works in the following way: The point of swing of the frame being fixed, when firing, is required by the act of raising the trigger-lever *i*; this latter, being attached to and fixed upon a grooved or furrowed spindle, *j*, will carry along with it the frame wherein the said spindle works freely; the latter

is kept in its position by wedges or keys running in grooves. It may also be pushed to the bottom or made to enter into the said pivot or journal through the backward motion to be performed by lock-action or discharging apparatus *k*, for the purpose of loading the grape-shooter or mitrailleur. The said spindle or tree in its course along with the trigger-lever causes the frame *c* to describe a section of circle, and thereby the mitrailleur or grape-shooter (which is movable in the axis of the pivot *l* and in the slide *m*, contrived within the yoke-band *b*, attached by nuts *o o'* to the support or bearing *n* of the pointing or elevating screw) is compelled to move away from the fixed and invariable point *n'*, to which the other extremity of the connecting-bar or lever *g* is attached; the result of which must be that the grape-shooter or mitrailleur will turn obliquely sidewise in a horizontal direction from right to left while simultaneously sweeping over the useful range for developing the firing action to the intended effect. The discharge being operated and it being required to reload the arm, the only thing necessary for attaining that end will be to lower the trigger-lever, whereupon the grape-shooter will at once resume its natural position in a line with its regular axis.

In the accompanying drawing, Figure 1, Sheet I, is a section at the line A B of Fig. 2; Fig. 2, a plan view; Fig. 3, a section at the line E F of Fig. 1; Fig. 4, cartridge-extractor plate; Fig. 5, a section of the same; Fig. 6, a rear view at *c* of the scattering mechanism; Fig. 7, a view at D of the same; Fig. 8, a section at the line G H of the same; Fig. 9, detached views of parts of the dispersing mechanism. Fig. 10, Sheet II, a side view of a part of a grape-shooter provided with a lateral motion or dispersing mechanism; Fig. 11, a plan view of the same; Fig. 12, a section at the line A B of Fig. 10; and Fig. 13, a section at the line C D of Fig. 11.

I claim—

In combination with the box *g*, within which are arranged the percussion-hammers *h* in proper relative position to the several barrels, the lever *f* for moving the said box, and trigger-plate *p* for discharging the hammers, all arranged and operating substantially in the manner specified

In testimony whereof we have hereunto set our names in presence of two subscribing witnesses.

L. CHRISTOPHE.
JS. MONTIGNY.

Witnesses:

A. L. CHETLAIN,
M. H. BIEBUYCK.

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