

(No Model.)

2 Sheets—Sheet 1.

J. L. MURPHY.
MACHINE GUN.

No. 427,239.

Patented May 6, 1890.

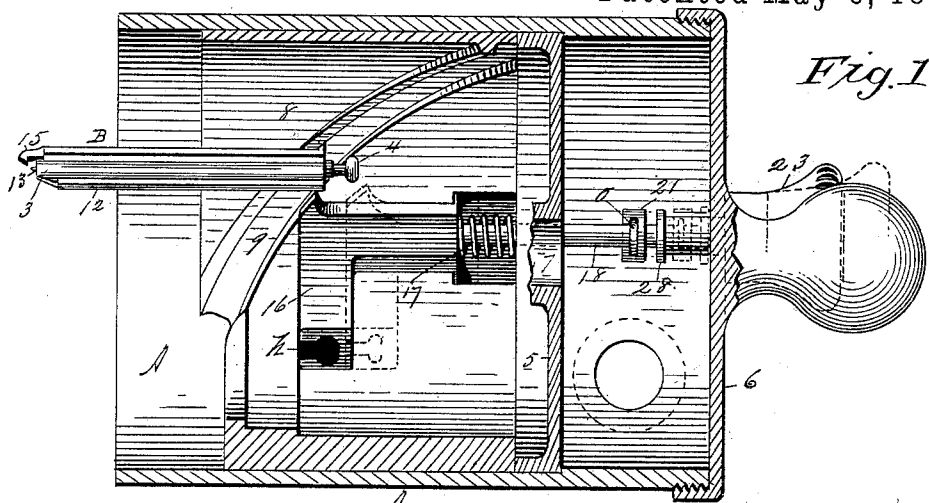


Fig. 1.

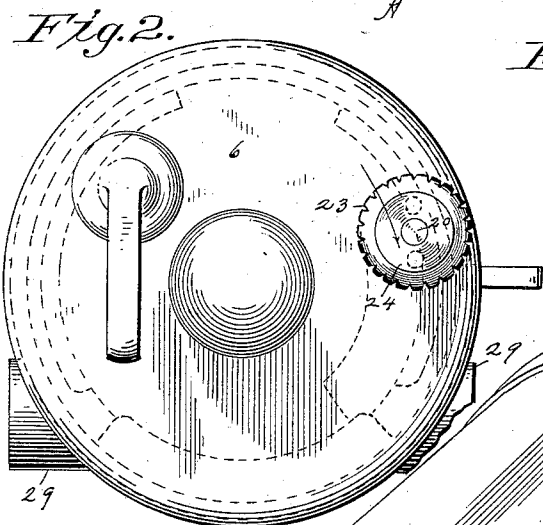


Fig. 2.

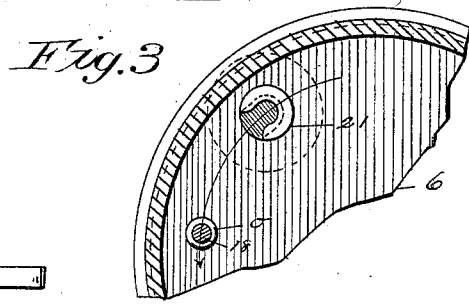


Fig. 3.

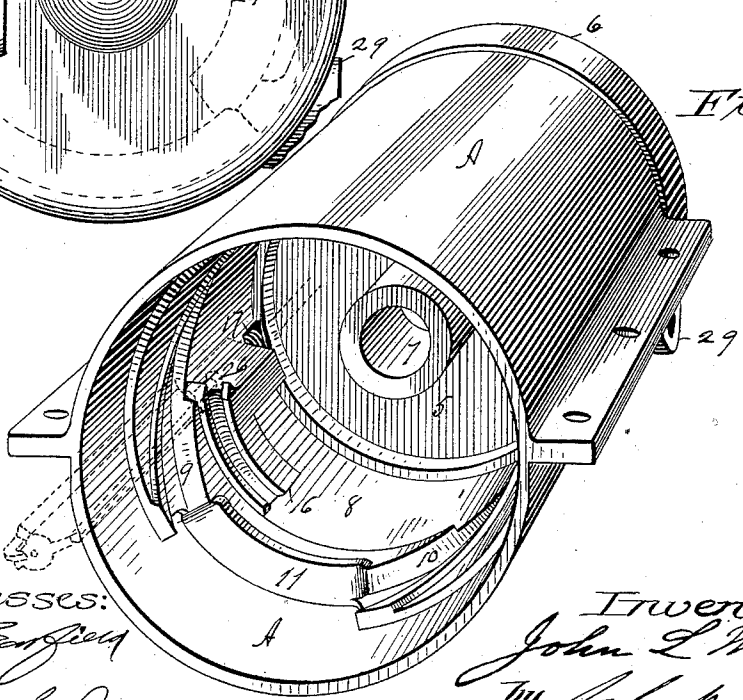


Fig. 4.

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(No Model.)

2 Sheets—Sheet 2.

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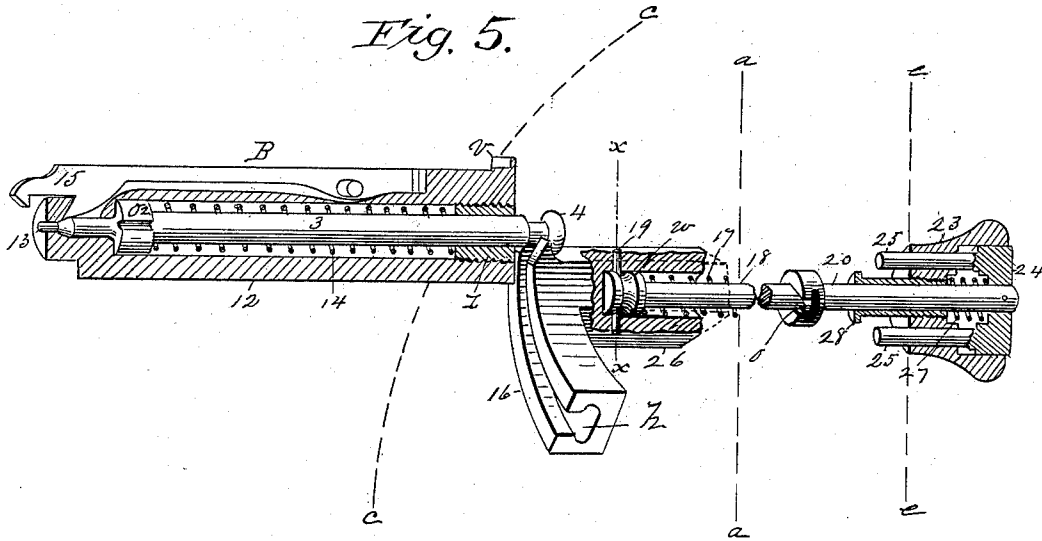


Fig. 9.

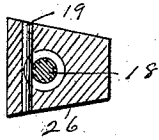


Fig. 6.

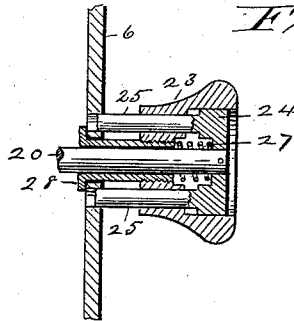


Fig. 8.

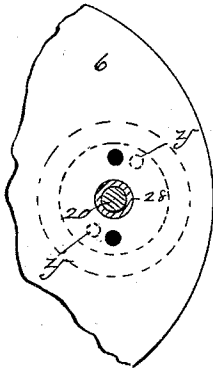
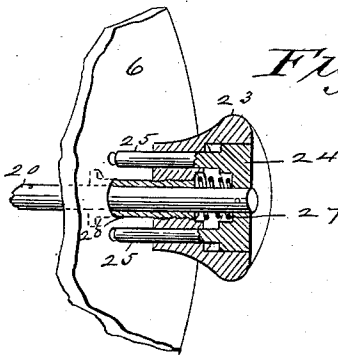


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN L. MURPHY, OF SPRINGFIELD, MASSACHUSETTS.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 427,239, dated May 6, 1890.

Application filed February 19, 1890. Serial No. 340,999. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. MURPHY, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machine-Guns, of which the following is a specification.

This invention relates to machine-guns, and has for its object certain improvements in the gun of this class known as the "Gatling gun," whereby provision is made for moving the cocking-ring from and back to its normal position, thus preventing its usual action, whereby the gun is discharged, or permitting it to perform its proper function, at the pleasure of the operator, thereby providing means for preventing the gun from being fired inadvertently, although the crank and its connected firing devices be operated in the usual manner.

In the drawings forming part of this specification, Figure 1 is a longitudinal section of the breech-case A of the ordinary Gatling gun and a vertical section of the cascabel-plate and of the diaphragm between the latter and the forward end of said case, this figure showing one of the locks of the gun and the cocking-ring in side elevation in operative relation and my improvements in connection with said ring. Fig. 2 is a rear elevation of said breech-case. Fig. 3 is a segment of said cascabel-plate, showing detail parts of my improvements in connection therewith, hereinafter fully described. Fig. 4 is a perspective view of said breech-case and of the cocking-ring therein. Fig. 5 is a perspective view of one of the locks of the gun and of the cocking-ring, partly in section, and of detail parts, fully described below. Fig. 6 is a sectional view of a portion of the cascabel-plate and of detail parts, below described. Fig. 7 is a perspective view of the parts shown in Fig. 6. Fig. 8 is a rear view of a segment of the cascabel-plate. Fig. 9 is a sectional view of a part of the cocking-ring on the line *xx*, Fig. 5.

A in the drawings represents the cylindrical breech-case of the gun, which is adapted to be mounted in a suitable manner either upon a gun-carriage, tripod, or other suitable support. In this breech-case is the diaphragm 5.

The cascabel-plate 6 is screwed upon the rear end of said case, between which plate and diaphragm certain operating mechanism of the gun is located, which having no especial relation to this invention is not shown in the drawings, said operating mechanism being actuated, as is well known, by a crank-shaft rotating in the bearings 29, near the lower side of the case A, as shown in Figs. 2 and 4.

Within the breech-case are arranged the stationary spiral or inclined cams 9 and 10 for forcing the lock B forward and back. The lock is forced forward by the cam or track 9. Its front end is, by a non-spiral portion 11, joined to the front end of the retracting-cam 10.

Directly behind the junction of cams 9 and 10 is arranged the cocking or detaining ring 16. The same is a curved plate having a dovetailed shank 26, (see Fig. 9,) which enters a corresponding groove in the cam-cylinder 8, which is fixed in the case A. A spring 17 is placed between the diaphragm 5 and said cocking-ring shank 26, and serves to force the detaining-cam or cocking-ring forward, so that the upper end of its curved face will come against the cam 9. The face of the cocking-ring 16 has a countersunk groove *h* of such cross-section as most conveniently to receive the knob 4 at the end of the lock-hammer 3, as indicated in Fig. 5.

Each lock B consists of a shell 12 and lock-hammer 3 as principal parts. The lock-hammer or firing-pin has the firing-pin formed at its front end, (indicated by 13,) as clearly shown in the last-named figure, said knob 4 being at its rear end and intended to fit said countersunk groove *h* of the cocking-ring 16. A spiral spring 14 is placed within the shell 12 and around the lock-hammer or firing-pin, between a shoulder or head *o*² on the latter and a screw-plug *z* at the back end of the shell. The said lock-hammer or firing-pin is held by the spiral spring 14 against the front end of the chamber in the shell. If the knob 4 is taken hold of and drawn back, the spring 14 will be contracted to violently propel the firing-pin forward whenever the knob is released.

The cartridge-shell extractor 15 is applied to the lock, and *v* is the projecting lug on the

lock that moves along the cams 9 and 10, and thereby causes the forward and backward motion of the lock.

The locks B of the gun, of which there are ordinarily ten, are fitted into grooves in the lock-cylinder and carrier-block of the gun, (said cylinder and block not being shown in the drawings,) as shown in Patent No. 125,563, dated April 9, 1872, said cylinder and carrier-block being given the requisite rotary-motion by suitable connection with the above-referred-to crank-shaft. The locks, when held as aforesaid, have their projecting lugs *v* in such contact with the cams or tracks 9 and 10, respectively, that they will, when revolved by the rotation of said lock-cylinder, be also moved forward and backward in the requisite manner to push the cartridges into the barrels, explode the charges, and withdraw the shells, substantially as specified in the Letters Patent to Gatling, Nos. 47,631 and 112,138, dated, respectively, May 19, 1865, and February 28, 1871.

When a lock approaches (along cam 9) its foremost position, the knob 4 of its hammer or firing-pin 3 enters the upper end of the groove in the cocking-ring 16. This ring is held against the cam 9 and beveled at its upper end, that the knob may conveniently enter its groove. As the lock continues to advance, the cocking-ring 16, however, detaining the knob 4 in the same vertical plane, it is evident that the firing-pin will be automatically held while the lock moves forward and the spring 14 around the firing-pin will be contracted. As soon as the lock arrives in line with the inner or lower end of the cocking-ring 16, the knob 4 is released by the latter, and the hammer or firing-pin is propelled forward to explode the charge. In this manner the charges of the barrels while the cocking-ring 16 remains in position against the cam 9 are successively fired with precision and regularity.

It is found in practice that by permitting the cocking-ring 16 of the gun to occupy unchangingly the position above described, whereby when the locks B of the gun are rotated the knobs of the firing-pins invariably engage with said ring, oftentimes the gun is fired inadvertently, for with the cocking-ring in said position the firing-pins of the locks are operated successively whenever the locks are rotated, and if any cartridges are left in the gun they may be inadvertently discharged and result in serious accidents, and to obviate all danger from such cause the below-described improvements are constructed and are connected with the cocking-ring of the gun, said improvements providing convenient means for drawing the cocking-ring away from the path of motion of the heads of the firing-pins of the locks, so that however much the latter may be rotated when said ring is drawn backward, as stated, the gun cannot be fired.

A spindle 18 is inserted in a socket in the

shank 26 of the cocking-ring, and is there secured by a pin 19, which passes through said shank and engages with an annular groove in the head *w* of said spindle. (See Fig. 5.) The above-mentioned spring 17 has one end abutting against the head of said spindle and the other end thereof against a part of the said diaphragm 5, said spring being normally sufficiently compressed to hold the cocking-ring in the position against the cam 9, as aforesaid. The said spindle extends rearwardly through the diaphragm 5 and has on its end a flanged head *o*.

A draw-spindle 20, connected to the cascabel-plate 6, as below described, has a clutch-head 21 on the end thereof adjoining the said head *o* of the spindle 18, which clutch-head is recessed, as shown, to engage with said head *o* by a movement of the head 21 toward the side of said head *o*, thereby bringing the two heads to the positions shown in Figs. 1 and 5. This manner of engaging the spindles 18 and 21 is made necessary from the fact that the cascabel-plate 6 is required to be removable from the case A; otherwise the spindle 18 might be continuous from its point of connection with the cocking-ring through the diaphragm 5 and the cascabel-plate 6. The outer end of the spindle 20 projects outside of the cascabel-plate 6, as shown by Figs. 6 and 7 and by the dotted line *e* in Fig. 5, which indicates the outer side of the cascabel-plate or its relation to the parts shown in said figure. To the outer extremity of said spindle 20 is secured the pin-plug 24, the latter having rigidly fixed thereto two pins 25, which, when the cocking-ring is in position against the cam 9, enter perforations in the cascabel-plate 6, as shown in Fig. 6. The said pin-plug 24 is fitted into the main operating-knob 23, as shown, said pins thereon passing through suitable perforations in said knob, said main knob 23 being suitably chambered, as shown, to permit of placing between the inner side of said plug 24 and the base of said chamber a spring 27, whose office it is to maintain a degree of pressure against said plug 24 to force it outwardly, or to resist the movement of said plug inwardly into the knob 23. A stop-sleeve 28 is screwed into the inner end of the knob 23, and has a flanged head thereon, as shown, which engages with the inner side of the cascabel-plate 6 when the knob 23 is drawn outward and limits the outward movement thereof.

In operating the cocking-ring to draw it away from the path of movement of the heads of the firing-pins, as below described, the knob 23 and its contained pin-plug 24 are drawn sufficiently far away from the cascabel-plate 6 to retire the pins 25 from the perforations which they are shown to penetrate in Fig. 6 (in which the pin-plug 24 is shown as retired more or less into said knob by reason of a resistance acting upon the spindle 20, as hereinafter described) to a po-

sition substantially that shown in Fig. 7, and said knot and plug, together with the spindle 20, are then slightly rotated and the ends of the pins 25 are allowed to return toward
 5 and rest against the side of the cascabel-plate about at the dotted-line circles $y y$, Fig. 8, or at any place on said plate where they will be secure from inadvertently engaging with
 10 or dropping through said perforations. It is preferable that the places on said plate where the ends of said withdrawn pins shall rest, as aforesaid, should be slightly countersunk
 15 or indented, in order to more securely cause the engagement of the pins with the plate, so that they shall be held against any accidental displacement.

The details of the operation of the within-described improvements, in connection with the manipulation of the cocking-ring, as and
 20 for the purpose above referred to, is as follows: It oftentimes occurs that when an attempt is made to withdraw the cocking-ring from its normal position against the cam 9, as shown in Fig. 1 and illustrated in Fig. 5, that
 25 one or more of the heads of the hammer or firing-pin 3 are found to be engaged with the groove h in the cocking-ring, and under those circumstances the effort to draw the knob 23 away from the cascabel-plate results in the
 30 retirement of the pin-plug 24 more or less into the knob, as shown in Fig. 6, and such action of the pin-plug indicates the aforesaid engagement of the cocking-ring with one or more of the heads of the firing-pins. This having
 35 been ascertained to be the case, the part of the gun carrying the locks is, as it is termed, "turned backward," or in the reverse direction from that in which it is turned for firing the gun, and thereby the said firing-pin head
 40 or heads are "backed out" of the cocking-ring, leaving the latter free to be drawn away from the cam 9 to the position indicated by dotted lines in Fig. 1. In so retiring the cocking-ring, the knob 23 is drawn outward to the
 45 position shown in Fig. 7, and said knob is then, with the spindle 20, turned about a quarter of a turn and then freed to let the ends of the pins 25 rest against the outer side of the cascabel-plate 6, and in so doing the
 50 spring 17 on the spindle 18 is compressed against the resistance of the spring 27 under the pin-plug 24; but said spring 27 is the stiffer one and does not yield. The firing-pin spring 14 and said spring 17 are, however,
 55 unitedly stronger than said spring 27, and therefore the pin-plug 24 is caused to recede into the knob 23 when an attempt is made, as above described, to pull back the cocking-ring when it is engaged with one of the heads
 60 of the firing-pins. To return the cocking-ring from its above-described rearward position to its normal one at the side of the cam 9, the knob 23 is turned to let the pins 25 enter their perforations in the cascabel-plate, and then the springs 14 and 17 operate to return the
 65 cocking-ring to its said normal position.

Fig. 3 is a view of the inner side of a segment of the cascabel-plate, and shows an end view of the said clutch-head 21 on the inner
 70 end of the spindle 20, and indicates its position in the cascabel-plate. By reference to said figure it is seen that an arrow is shown drawn through said clutch-head and through
 75 a section of the spindle 18, the position of the latter relative to said clutch-head and the flanged head o thereof being shown in said Fig. 3 in order to illustrate the means for engaging said clutch-head with the head on the
 80 spindle 18 when the cascabel-plate is screwed onto the case A, said engagement being effected by the last rotary movement of the cascabel-plate when it is screwed onto the case, said rotary movement of the plate causing
 85 said clutch-head to be carried in the direction of said arrow and caused to hook over the said head o . Unscrewing the cascabel-plate from the case A disengages said two heads.

It will be observed that an arrow is shown on the end of the pin-plug 24 in Fig. 2. This
 90 arrow points toward the open side of the recess in the clutch-head 21 on spindle 20, and indicates the position that the knob 23 should be turned to when the cascabel-plate is about
 95 to be screwed onto the case A to cause the proper engagement of said clutch-head with the head o on the spindle 18.

What I claim as my invention is—

1. In a machine-gun of the class described, the combination, with the cocking-ring there-
 100 of, of a spindle-connection, substantially as described, engaging with said ring and extending rearwardly through the cascabel-plate of the gun-case, a knob, substantially as described, attached to the outer end of said
 105 connection, whereby said ring is drawn rearwardly and locked in such position, and a spring acting on said ring to move it forward, substantially as set forth.

2. The combination, with the cocking-ring of
 110 a machine-gun of the class described, of a spindle-connection, substantially as described, engaging with said ring and extending rearwardly through the cascabel-plate of the gun-case, a plug having pins thereon engaging
 115 with said plate secured to the outer end of said spindle-connection, a knob into which said plug is fitted, a spring interposed between said plug and knob, and a spring to move said ring rearwardly, substantially as
 120 set forth.

3. In a machine-gun of the class described, the combination, with the knob 23, the stop-sleeve 28, attached thereto, the pin-plug 24, having pins thereon engaging with the cas-
 125 cabel-plate of the gun, a spring interposed between said plug and knob, the cocking-ring, a spring 17, to move said ring forward, and a spindle-connection, substantially as described, between said ring and knob, substan-
 130 tially as set forth.

4. In a machine-gun of the class described,

the combination, with the cocking-ring there-
of, of a spring to move said ring forward, a
knob outside of the cascabel-plate of the gun,
a pin-plug in said knob, a spring interposed
5 between said knob and plug, a spindle 20,
connected to said plug and extending in-
wardly through said plate, and a spindle 18,
connected to said cocking-ring, said spindles
having interlocking heads at their adjoining
ends, substantially as set forth.

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