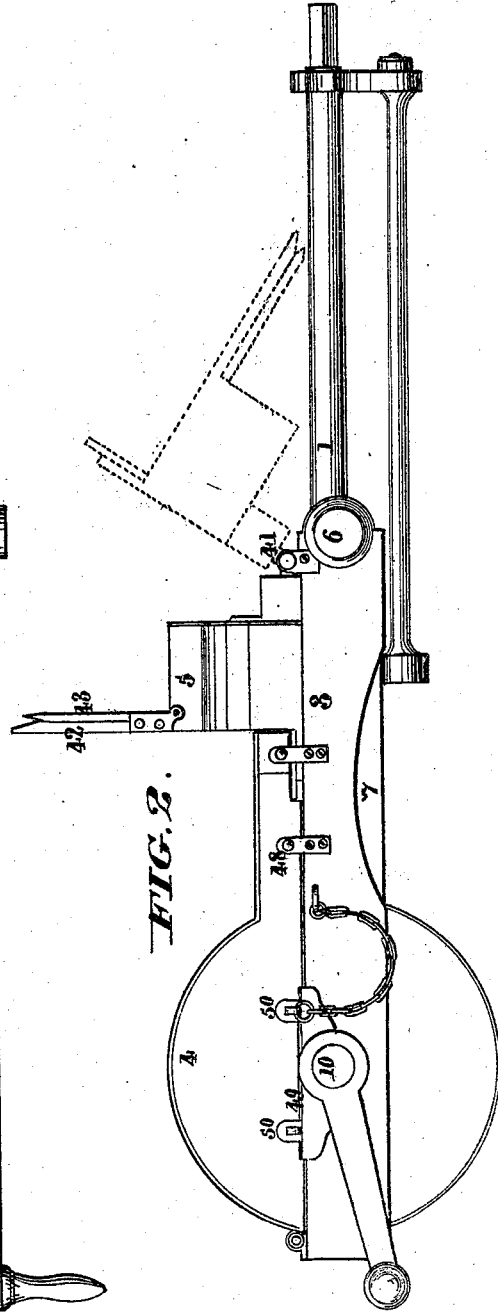
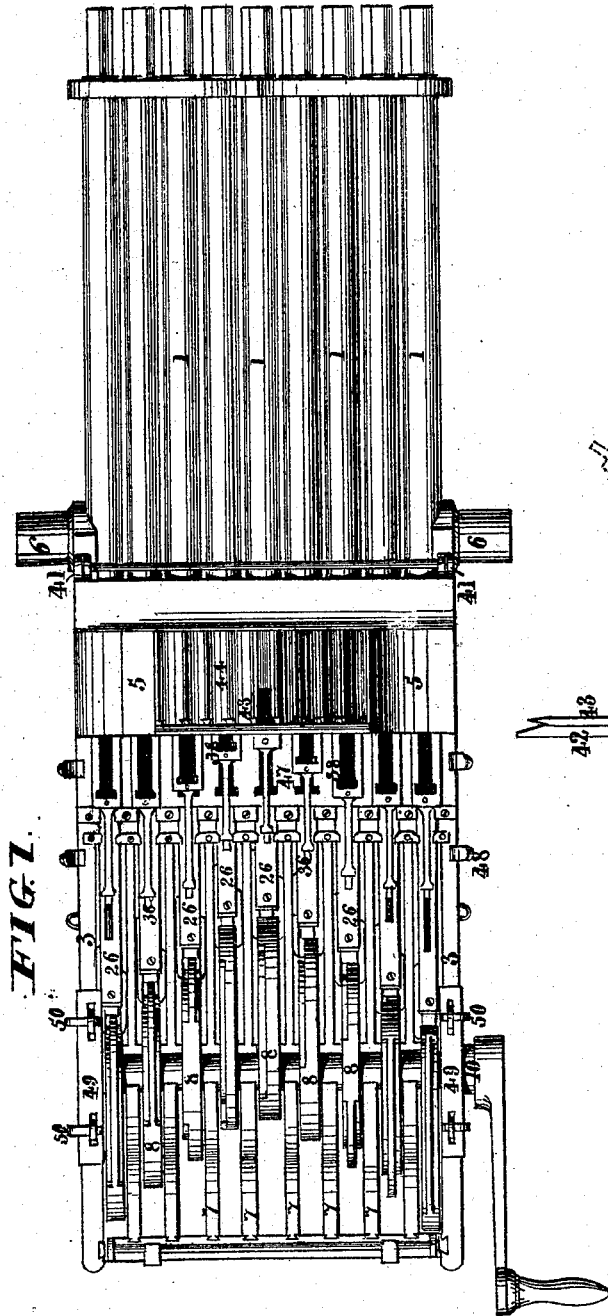


J. P. TAYLOR.
MACHINE-GUN.

No. 190,645.

Patented May 8, 1877.



WITNESSES

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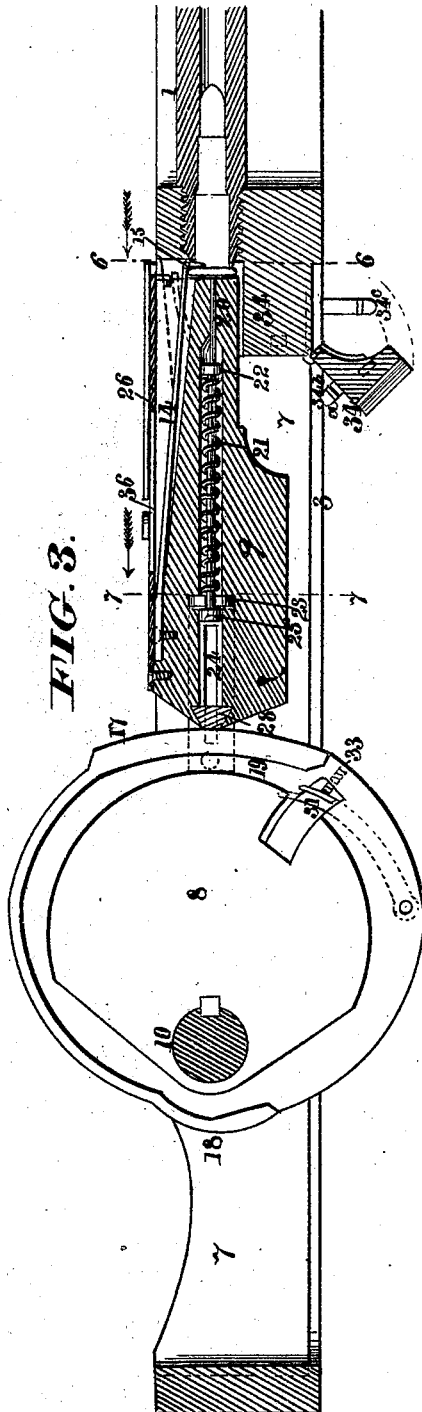


FIG. 3.

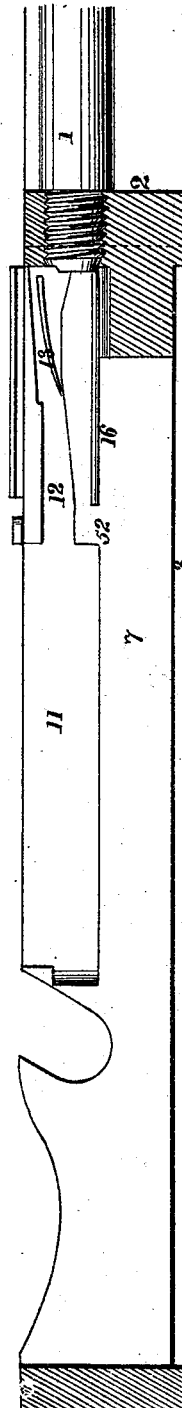


FIG. 4.

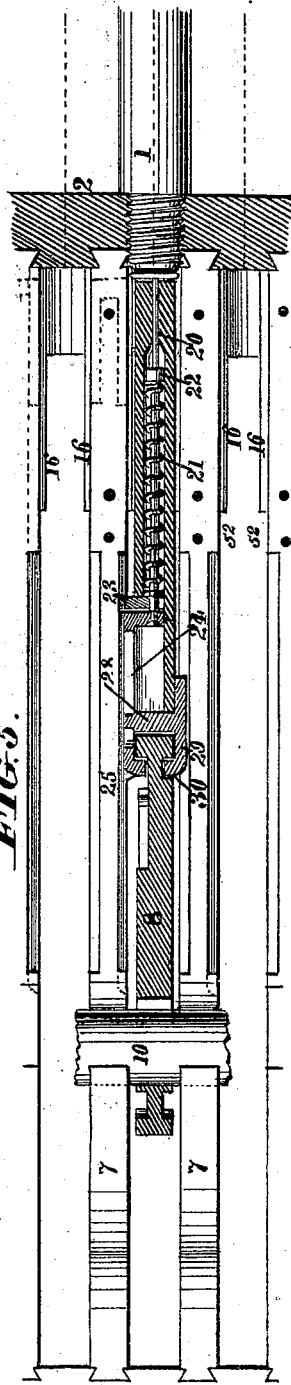


FIG. 5.

WITNESSES

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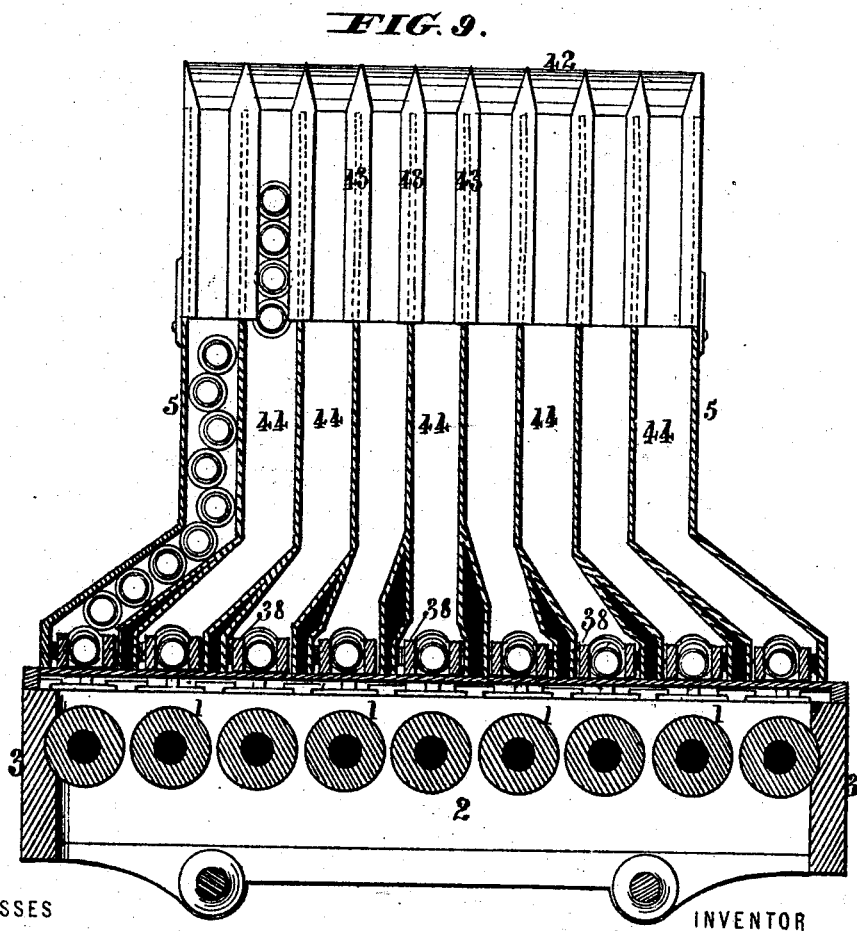
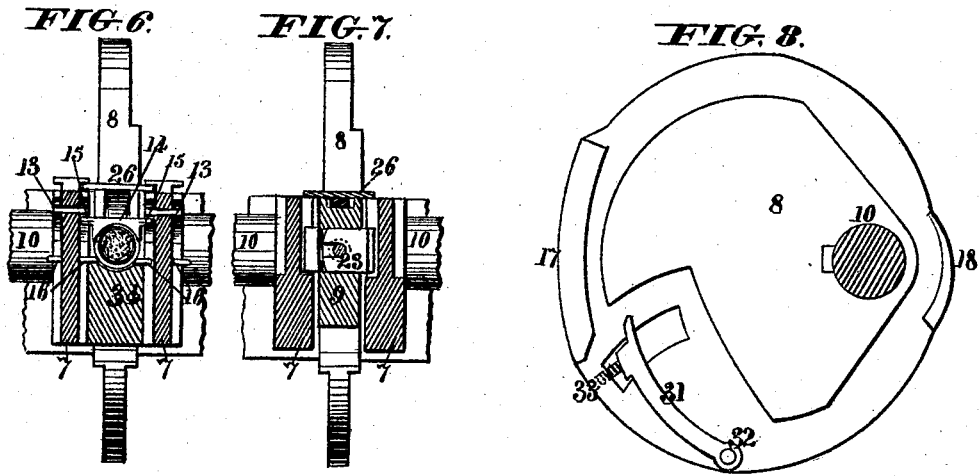
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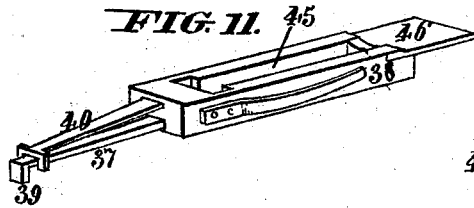
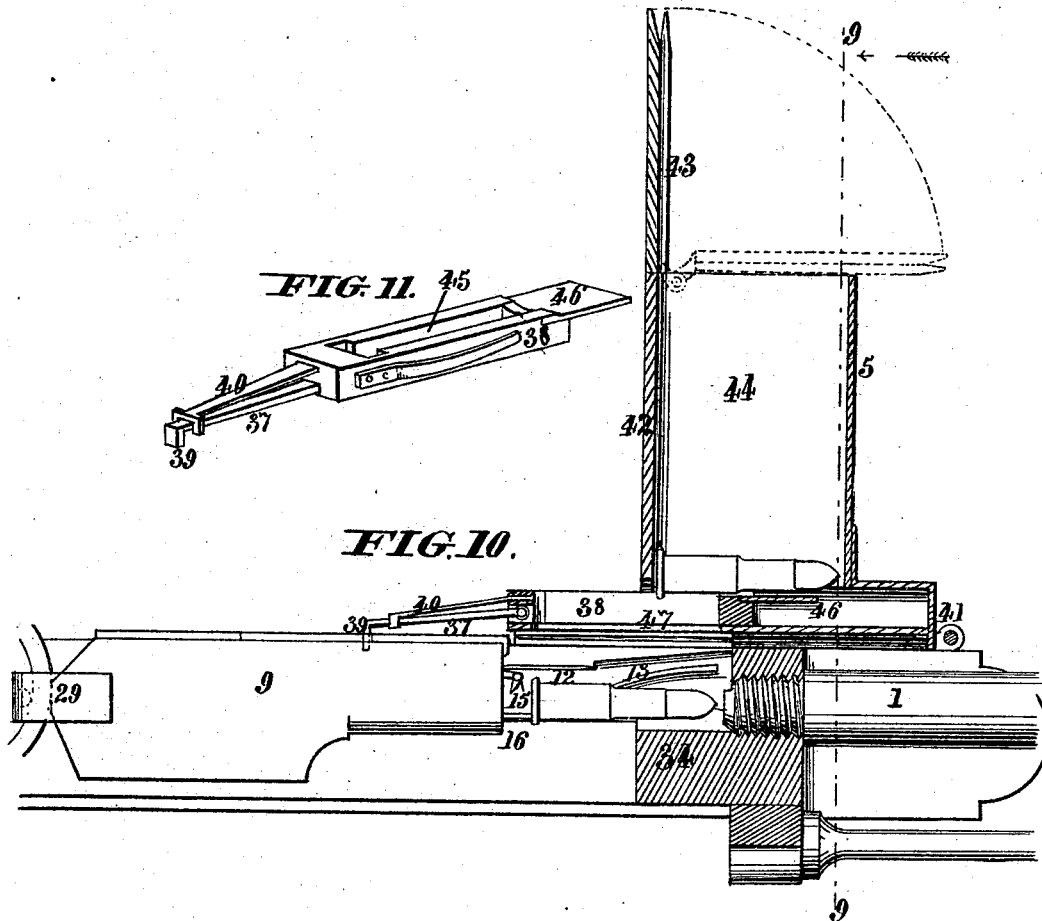


FIG. 10.

FIG. 13.

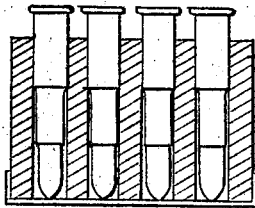


FIG. 14.

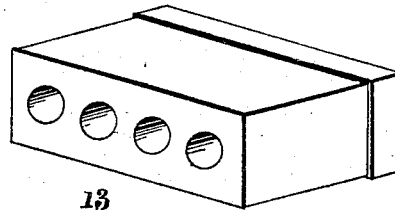
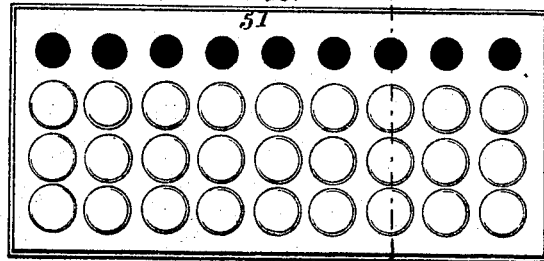


FIG. 12.



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UNITED STATES PATENT OFFICE.

JAMES P. TAYLOR, OF ELIZABETHTON, TENNESSEE.

IMPROVEMENT IN MACHINE-GUNS.

Specification forming part of Letters Patent No. 190,645, dated May 8, 1877; application filed September 10, 1875.

To all whom it may concern:

Be it known that I, JAMES P. TAYLOR, of Elizabethton, in the county of Carter and State of Tennessee, have invented a new and useful Battery-Gun, of which the following is a specification:

The subject of my invention is a battery-gun, or machine-gun, designed for military purposes. It is constructed with any desirable number of barrels—say from five to ten, or even a greater number—the same being arranged side by side in a horizontal breech-block. From the extremities of this breech-block extends to the rear a suitable frame, containing the working parts of the gun. Said working parts consist, mainly, of a series of irregular eccentrics (one for each barrel) fixed upon a counter-shaft, and driving, by contact of their peripheries, a corresponding series of locks or plungers, which serve to load and fire the charges and extract and expel the empty cartridge-hulls.

My invention consists, further, in the employment of a peculiar and novel feeding device or hopper, whereby the cartridges may be fed to the gun directly from the paper boxes in which they are put up at the cartridge-factory for transportation, thus at once avoiding and overcoming one of the essential objections to all machine-guns now in use—viz., the handling of the cartridges, one by one, by the gunners, before they can be made available to the gun.

To this end the hopper is constructed with a back plate, having on its front face a series of flanged fingers, forming between them guiding-grooves to receive the flanges of the cartridges, and conduct them to the throats through which they are delivered to openings above each loading-chamber at the back of the respective barrels. The cartridges are delivered one by one from each throat by reciprocating valves, having T-shaped apertures to receive the cartridges, and serving to draw them backward on the hopper-floor to T-shaped openings in the latter, through which they drop in position in front of reciprocating plungers, by which they are then carried into the chambers of the barrels, and there held while fired by spring-pins, which are retracted

by cam-arms on the eccentric disks before referred to, said arms being adjustable to regulate the length of stroke of the firing-pins.

The eccentric disks are constructed each with two concentric portions to cause the reciprocating plungers to dwell for sufficient periods at the forward and backward extremities of their stroke to hold the cartridges firmly while they are being fired and discharge the empty hulls. The hulls are retracted from the chambers of the barrels by claws, which are operated automatically by switches to conduct them over the cartridge-flanges at the extremity of the forward movement, and to hold them firmly down on said flanges at the beginning of the backward movement. The sliding plungers and the longitudinal bars in which they work are all removable to admit of dismantling the gun and to facilitate repairs.

In the accompanying drawing, Figure 1 is a plan view of the working parts of a gun illustrating the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal section through the center of one of the barrels and locks, omitting the feeding-hopper, and showing the parts in the position occupied when the gun is fired. Fig. 4 is a sectional elevation, omitting the operating-cam and the lock. Fig. 5 is a horizontal section of one of the operating-cams and one of the locks and adjacent parts. Fig. 6 is a vertical transverse section on the line 6, Fig. 3. Fig. 7 is a vertical transverse section on the line 7, Fig. 3. Fig. 8 is a face view of the operating-cam. Fig. 9 is a vertical transverse section on the line 9, Fig. 10. Fig. 10 is a vertical longitudinal section of the breech, showing the lock retracted and a cartridge in position to be driven into the barrel. Fig. 11 is a perspective view of a feeding-valve and a device for connecting it with a reciprocating lock, as hereinafter described. Fig. 12 is a front elevation of a cartridge-case, partly filled. Fig. 13 is a longitudinal section on the line 13, Fig. 12. Fig. 14 is a perspective view of a single cartridge-case.

Like letters of reference represent like parts.

1 represents the barrel; 2, the breech-block; 3, the inclosing-frame; 4, the cylindrical cas-

ing inclosing the eccentrics, and 5 the hopper. 6 are the trunnions, attached to the forward projections of the frame 3, by which the gun is attached to a suitable turn-table or swivel fixed on the gun-carriage. 7 represents a series of flat bars, placed longitudinally in the frame 3, and attached, at their front ends, to the breech-block 2 by means of dovetail tenons, and resting at their rear ends in suitable slots in the back piece of the frame 3. These bars, being arranged parallel to each other, and being separated from each other by a little more than the diameter of the head or flange of the cartridge to be used in the gun, form, by this arrangement, a series of slots in line with the bores of the barrels, said slots extending rearward from the barrels to the back piece of the frame 3. These slots contain the eccentrics 8 and the reciprocating plungers or locks 9, and form at the same time a series of troughs in front of the retracted locks, into which the cartridges are delivered from the hopper above in readiness to be pushed by said locks into the chambers of the barrels.

In the sides of the bar 7, from the cam-shaft 10 to the front, are cut suitable recesses 11 and grooves 12, for the reception, support, and guidance of the locks 9, together with their extractors. Near the forward termini of the grooves 12, and extending to the ends of the bars 7, commence gradual enlargements of the said grooves 12, the angle of enlargement rising upward, leaving the lower edge of the groove level and undisturbed, within which enlargements are fixed inclined spring-bars 13, which serve as switches to cause the extractors 14, by means of the lugs 15 on their heads, to rise and pass over the flanges of the cartridges in their forward motion; but in their backward motion the lugs 15 pass under the switches 13, thus causing the extractors 14 to be firmly held down on the cartridge-shells while in the act of starting the same from the chambers of the barrels.

Beneath, and parallel to, the grooves 12, and on a level with the bottom of the chambers of the barrels, and extending backward from the same by nearly the length of a cartridge, are small ribs or ledges 16, let into the sides of the bars 7, which narrow the bottom of the troughs sufficiently to prevent the flanges of the cartridges from passing through, thus furnishing floors to receive the cartridges as they drop from the hopper into said troughs. The points of the cartridges thus delivered rest upon solid floors, extending a small distance back from the mouths of the barrel-chambers.

The ledges 16 terminate or are notched at 52. When the cartridge is discharged and the empty shell retracted the body of the shell drops freely between the ledges 16 and its flange through the space 52.

The eccentrics 8, which drive and retract the locks, are solid disks of steel or other suitable metal, and are irregular in contour—that is to say, their circumferences are not described

from a single center, but are formed by a combination of arcs of circles or curves having different centers. This form results from the necessities arising in the movement of the locks, which are, that the locks, on each extreme of motion back and forth, must have a pause or rest, the duration of rest on the forward extreme being equal to one-eighth of a revolution of the eccentric, and that on the back extreme one-quarter of a revolution. The front pause or rest is to give time for the inserted cartridge to fire, and the rear pause to give time for the expulsion of the exploded shell, and the delivery from the hopper of a fresh charge. These rest-points on the periphery of the eccentric are formed by arcs 17 and 18, concentric with the counter-shaft 10, on which said eccentrics are fixed. The arcs forming the remainder of the circumferential face of the disks are governed by a center midway between the two rest-points above described. The eccentricity of said disks is just equal to the space through which the locks are desired to move. The eccentrics or disks 8 are provided on one side with the flange 19, for drawing the locks on the backward movement. The locks or plungers 9 each carry an extractor, 14, a firing-pin, 20, spiral spring 21, collar 22, the diaphragm 23, the stem 24, constructed with a lug, 25, the top plate 26, and the yoke, consisting of a dovetailed block, 28, a stem, 29, and a lug, 30, taking over the flange 19 of the cam or eccentric 8.

The cocking-cam consists of a curved arm, 31, pivoted at 32 to the eccentric disk 8, and resting against a set-screw, 33, by the projection or retraction of which the length of the stroke imparted to the firing-pin by the cam-arm 31 is increased or reduced, as required. The bottoms of the troughs formed between the longitudinal breech-bars 7 are produced by ledges 16, on which the flanges of the cartridges rest, short shelves 34 receiving the points of the cartridges in the rear of the barrel-chambers. The top plate 26 of the plunger or sliding lock 9 constitutes a guiding-flange for the said lock or plunger, and is constructed with a slot, 36, which receives the retracting latch or arm 37 of the hopper-valve 38, which retracting-arm is formed with a downwardly-projecting point, 39, and is pressed down by a spring, 40. This construction causes the valve-arm to engage automatically with the sliding lock whenever the hopper is restored to its vertical and operative position after being tipped forward to expose the loading-chambers, or for the inspection or removal of any of the parts of the breech.

The hopper 5 is connected to the frame by hinges 41 at its front lower corner, permitting it to be tipped forward into a horizontal position, as illustrated in dotted lines in Fig. 2, for the purposes named above. The said hopper is constructed with a back plate, 42, which is cut away at its lower part to receive the several hopper-valves. On the face of the

back plate 42 are guiding-fingers 43, the groove formed between each pair of which is adapted to receive the flanges of a number of cartridges, placed one on another, and conducting the same into the throats 44, through which they drop in succession into the hopper-valves 38, when the latter are in their forward position. Each hopper-valve is constructed, as shown, with a T-shaped opening, 45, formed to permit the passage of a cartridge, and a ledge, 46, projecting beyond the forward end of said opening, to receive the cartridge next above when the valve is retracted. The hopper-floor 47 has a similar T-shaped opening, in position to register with that in the valve when the latter is retracted, and to permit the cartridge to fall directly in front of the plunger or sliding lock 9 when the latter is in its rearmost position. The cylindrical casing 4 is hinged at the rear, as shown, and may be fastened in its closed position by hooks 48. The shaft 10 of the eccentric disks 8 rests in suitable bearings in the side bars of the main frame, and in the breech-bars 7, and is secured in position by caps 49 and keys 50, so as to admit of the said shaft, with its attached eccentric disks, being removed from the breech of the gun when required. When these are removed and the hopper 5 tipped forward, the longitudinal breech-bars 7 may be slid out of their seats, so as to completely dismantle the gun in a few seconds. The sliding locks or plungers 9 are separately removable from the grooves formed for them between the longitudinal breech-bars while the latter are in position. The construction of the various parts of the gun to be separated or put together at will greatly facilitates and reduces the cost of construction and repairs. The hopper front and floor are, in practice, made adjustable, to suit blank cartridges, or cartridges of various lengths and sizes, as described in another application.

The gun is mounted on a swivel turn-table or carriage, and traversed by a screw and a crank in the hands of the man who trains the gun.

51 represents a cartridge-case, which may be cheaply made of paper, and is constructed to suit the gun, so that the cartridges may be placed therein at the factory, and transferred from the case to the gun at one operation, thus avoiding the necessity of separate handling. These cases are preferably made so as to contain a large number of cartridges, as illustrated in Fig. 12, and thus feed all the throats at once. If preferred, they can be made singly, as illustrated in Fig. 14, and containing a set of cartridges to be supplied to one throat of the hopper.

Operation: The operating parts of the gun being in their working position, the guiding-fingers and throats of the hoppers 43 44 are filled with cartridges. The cam-shaft 10 is then rotated, moving the eccentrics 8, and causing a successive retraction of the hopper-valves. Each valve, in its foremost position, receives

the lowermost cartridge in the throat to which it belongs, and, as it is retracted, draws the said cartridge off the floor 47 until it comes over the T-shaped opening in said floor, through which it drops in front of the plunger or sliding lock 9. At the next forward movement, the cartridge is carried into the chamber of the barrel, and there securely held by the dwell of the plunger, while the firing-pin in said plunger is retracted by the cocking-cam 31, and released to fire the charge. On the return movement the sliding plungers withdraw the hulls of the exploded cartridges till their flanges reach the notches or extremities 52 of the ledges 16, when they drop through the frame onto the ground.

For firing blank cartridges, the floor 34 is extended backward by a shelf, 34^a, held up in position by a spring-catch, 34^b, and held down, when not in use, by a catch, 34^c. The internal prominence formed by the straight portion of the inner face of the cam-flange (seen in front of the concentric arc 18 in Fig. 3) serves, when the plunger is in its rearmost position, to draw back the firing-pin for an instant, with its point flush with the face of the plunger, so as to permit the free escape of the cartridge-bull.

In another application, filed simultaneously with this, I describe and claim a machine-gun constructed with a set or series of barrels arranged in the arc of a cylinder, and with a corresponding set of valves operated by a cam-cylinder revolving on an axis parallel with the barrels, to feed cartridges from a suitable hopper, and with a recess in the cam-cylinder, to permit the withdrawal and removal of the valves, and with an adjustable hopper-front and hopper-floor, to adapt the gun for firing, at will, either ball or blank cartridges, or cartridges of different lengths.

I claim—

1. The combination of the breech-block 2, the series of barrels 1, arranged in a horizontal plane, the sliding locks or plungers 9, and the cams or eccentrics 8, carried by a shaft, 10, transverse to the barrels, and actuating the locks or plungers in succession, substantially as set forth.

2. The cam 8, constructed with concentric front and rear portions, to cause a dwell of the plunger at each extremity of its stroke, for the purposes set forth.

3. The cocking-cam carried by the eccentric cam 8, and adjustable to regulate the stroke of the firing-pin, as described.

4. The breech-frame constructed with removable longitudinal bars 7, as and for the purposes set forth.

5. The bars 7, formed with recesses 11 and grooves 12, in combination with the switch-bars 13, plungers 9, and extractors 14, substantially as and for the purposes set forth.

6. The combination of the plunger 9, with the lug 30, the firing-pin 20, with the lug 25, and the operating-cam 8, revolved on an axis transverse to the stroke of the plunger, and

carrying eccentric flanges 19 and 31, for operating the said plunger and firing-pin, in the manner explained.

7. The combination, with the sliding lock 9, of the extractor 14, provided with lugs 15, and the switch-bars 13, to elevate and release the said extractor, as described.

8. The top plate 26 of the plunger, constituting a guiding-flange, and formed with a slot, 36, to receive the retracting latch or arm of the hopper-valve, as described.

9. A feed-plate constructed with flanged grooves or guides, adapted to receive and draw the cartridges from the cases in which they are packed, and convey them to a feed opening or openings of suitable character, substantially as set forth.

10. A hopper or feeder constructed with

flanges or grooves for the reception of the cartridges, and divergent throats to conduct them to the breech-chambers, substantially as set forth.

11. The hopper-floor 47, constructed with T-shaped apertures to support the cartridges and drop them when drawn back.

12. The combination, with the hopper-floor 47, perforated as stated, of the valves 38, deriving longitudinal motion from the plungers 9, and operating to transfer the cartridges from the hopper to the troughs in rear of the barrels, as explained.

JAMES PATTON TAYLOR.

Witnesses :

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CHAS. J. GOOCH.