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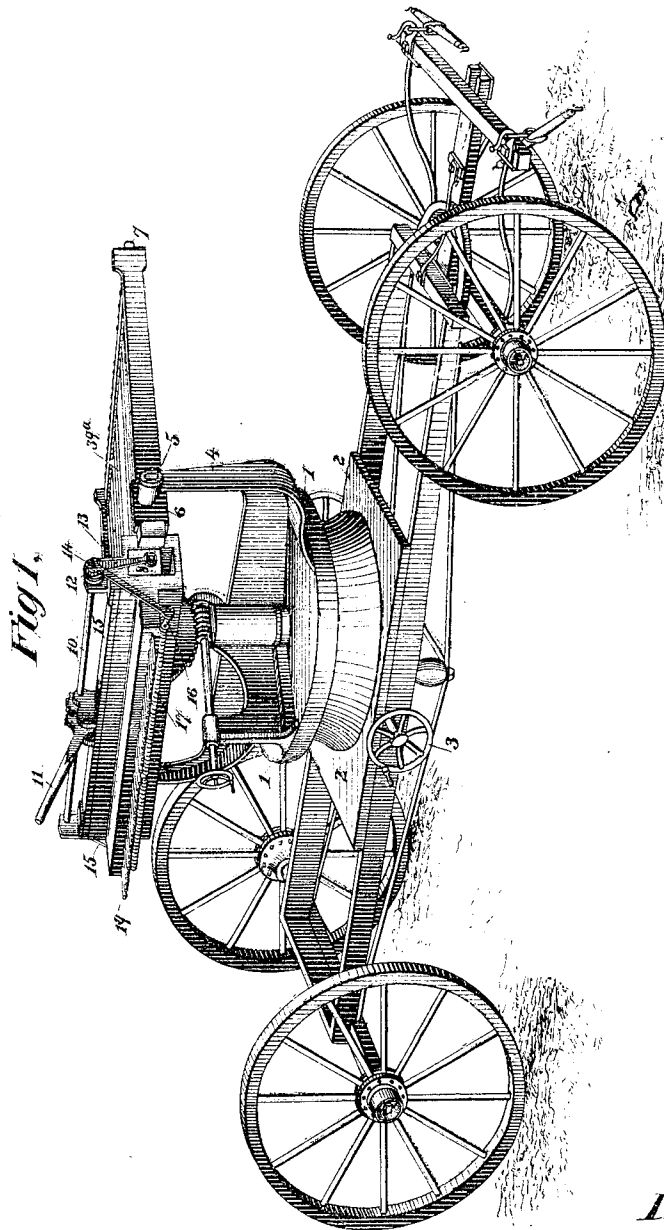
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J. H. McLEAN & M. COLONEY.

MACHINE GUN.

No. 282,549.

Patented Aug. 7, 1883.



Attest:
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Inventors:
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(No Model.)

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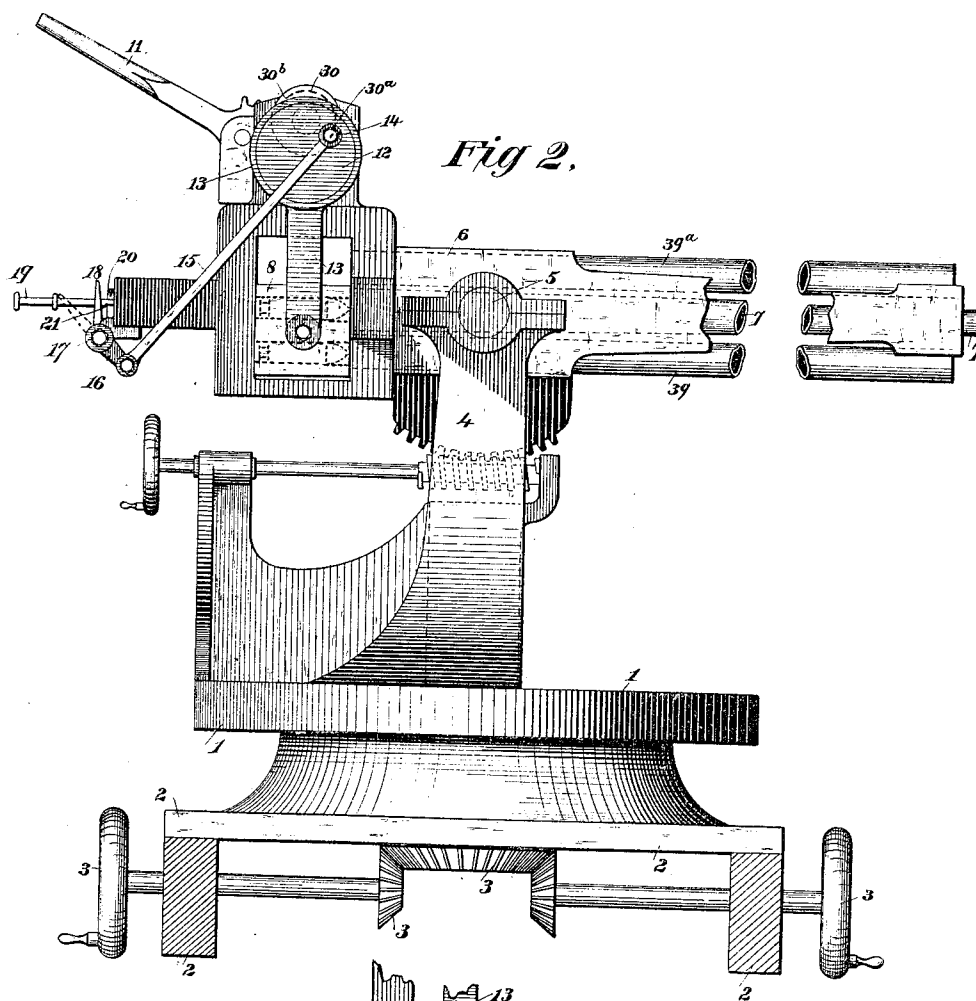


Fig 2.

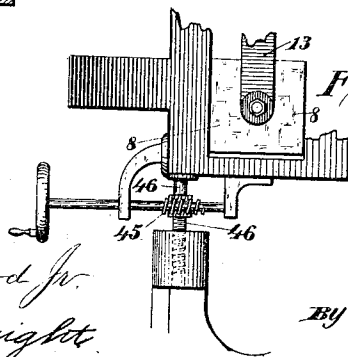


Fig 2^a.

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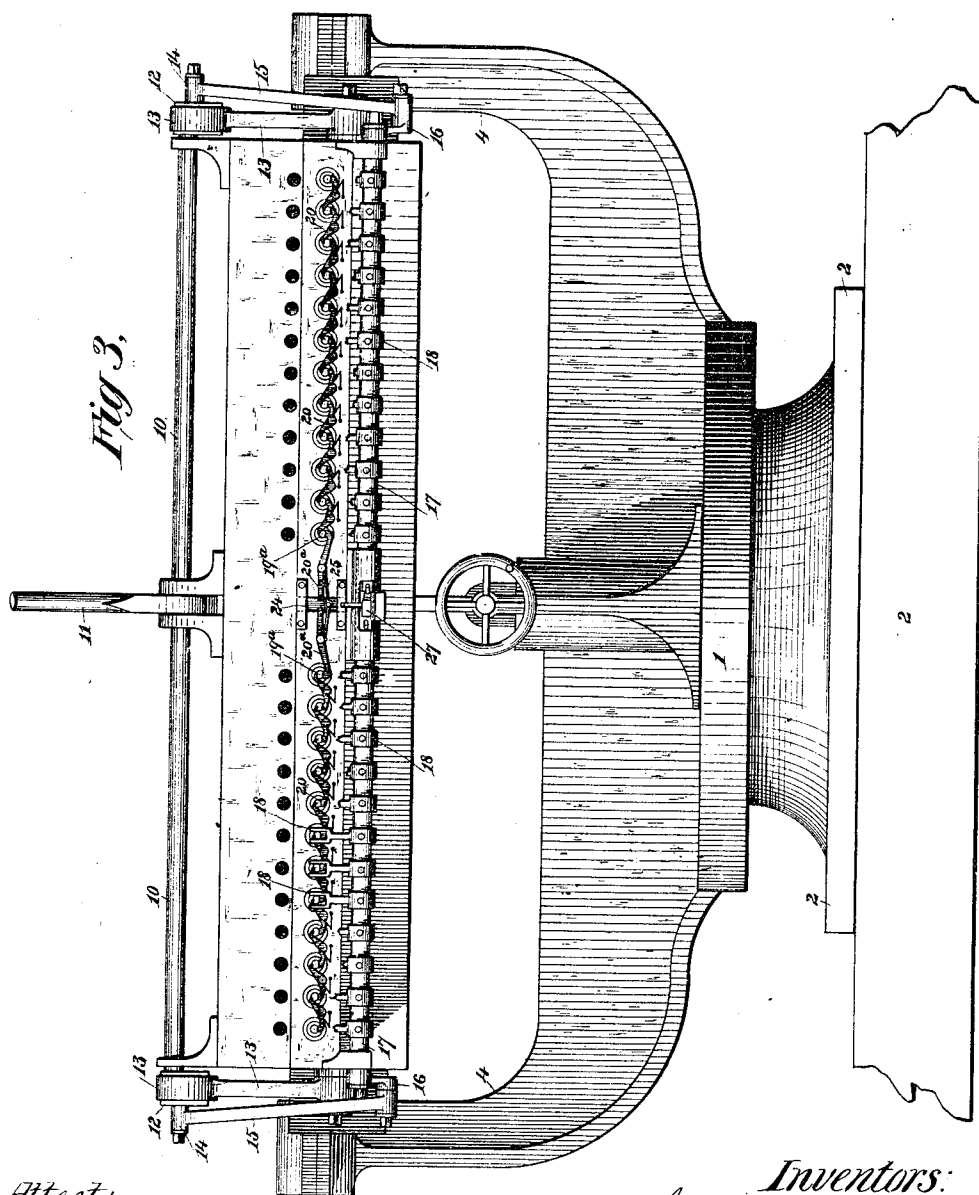
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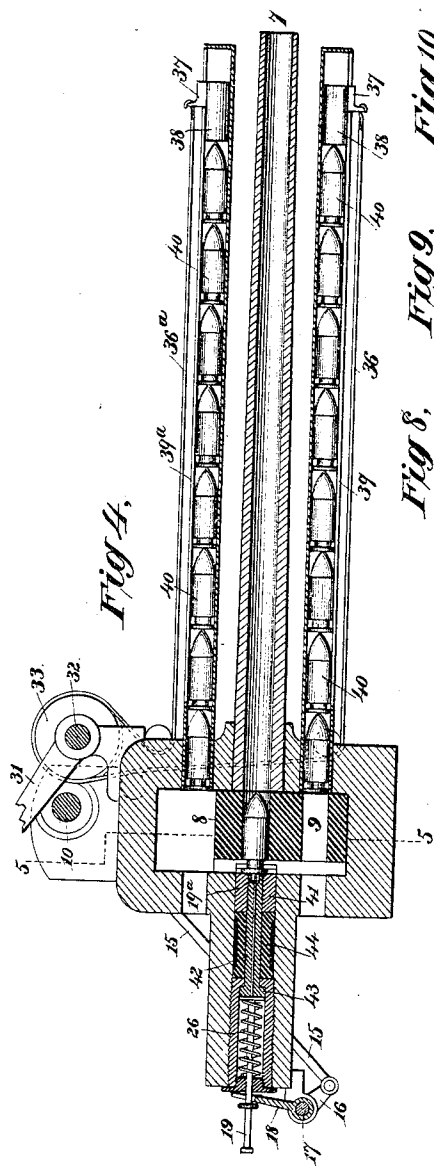


Fig. 4.

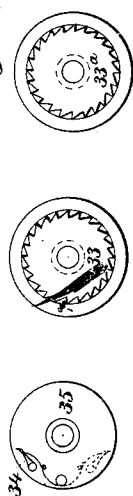


Fig. 8, Fig. 9, Fig. 10.

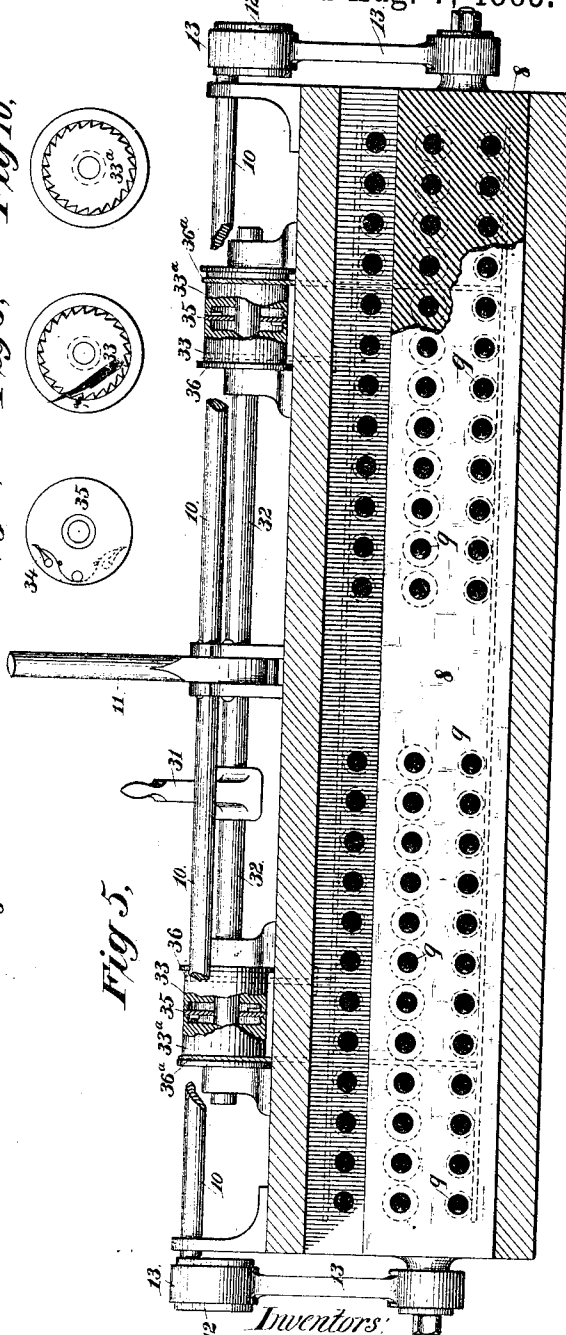


Fig. 5.

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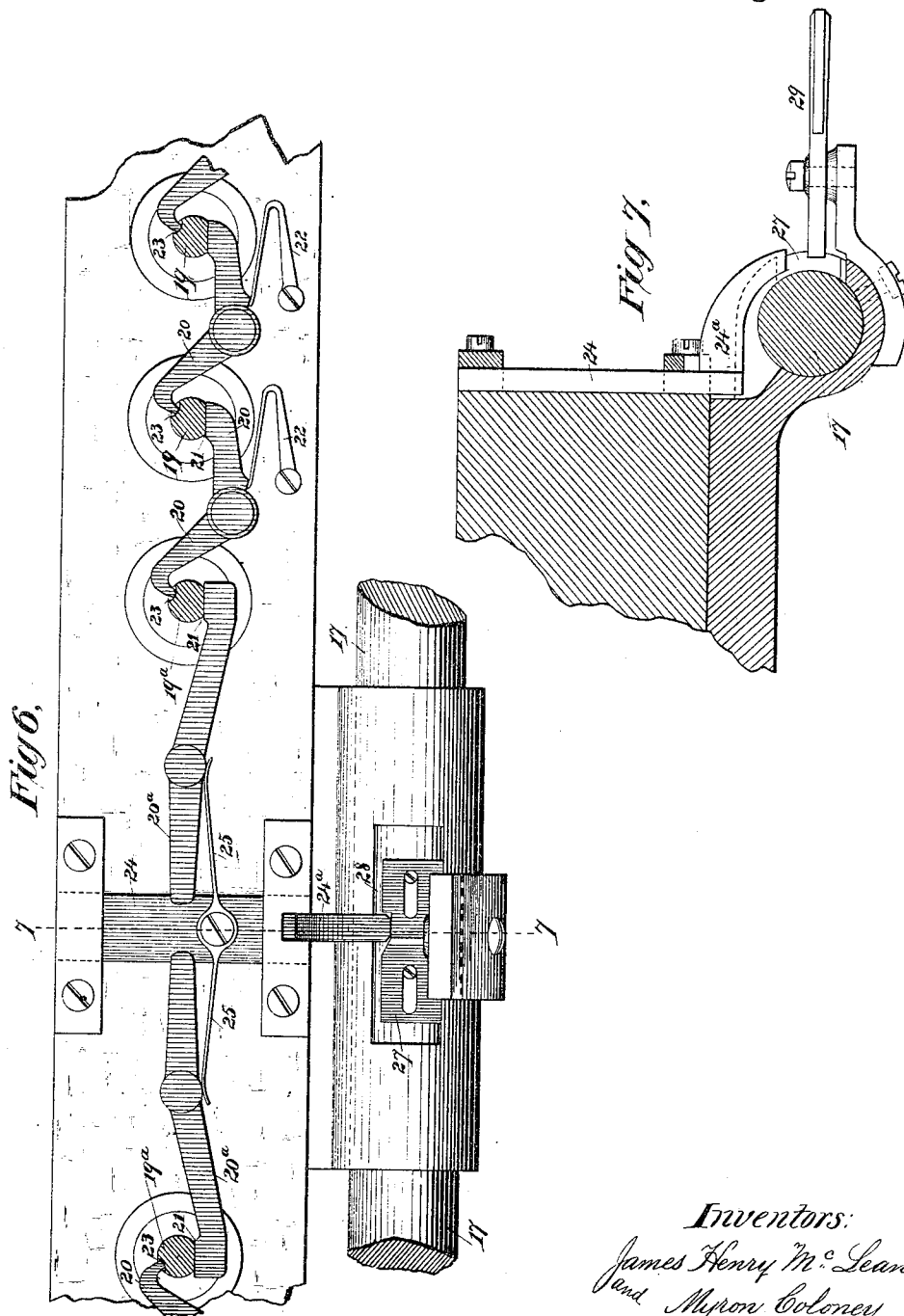
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UNITED STATES PATENT OFFICE.

JAMES H. McLEAN, OF ST. LOUIS, MISSOURI, AND MYRON COLONEY, OF NEW HAVEN, CONNECTICUT; SAID COLONEY ASSIGNOR TO SAID McLEAN.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 282,549, dated August 7, 1883.

Application filed December 29, 1880. (No model.)

To all whom it may concern.

Be it known that we, JAMES HENRY McLEAN and MYRON COLONEY, both citizens of the United States, residing, respectively, at St. Louis, Missouri, and New Haven, New Haven county, Connecticut, have invented Improvements in Machine-Guns, of which the following is a specification.

The subject of this invention is a machine-gun constructed with a horizontal range of any desirable number of barrels, and a breech-slide in the rear thereof, having a vertical reciprocating movement, and provided with one or, preferably, two sets of load-chambers, each corresponding in number with the barrels, so that when the slide is elevated one set of chambers will be in firing position and when the slide is depressed the other set. A corresponding range of magazines is placed above or below the barrels, or, preferably, similar ranges of magazines both above and below the barrels, so that when the slide is raised, bringing its lower range of chambers in position for firing, the upper range of chambers will be in position for loading, and vice versa. This part of the invention may be carried out by the use of ordinary spring-followers in the magazine for the automatic charging of the slide-chambers; but another part of the invention consists in the provision of a positive feed movement for loading the charge-chambers by followers sliding in the magazines and connected together by a bar, so as to be moved simultaneously, as hereinafter described.

The invention further relates to a firing mechanism consisting of a rock-shaft operating on a slide or lever, and a system or series of levers or triggers communicating from one to another of a series of spring pins or hammers by which the charges in the range of barrels are fired, so that the firing movement of one pin or hammer may release the next, and so on, and the barrels may thus be discharged in rapid succession from one end to the other of the series or from the center to each end, the latter arrangement having the advantage of avoiding any deflecting action which is liable to occur when the force of the discharge and consequent recoil are heavier on one side of the longitudinal center of the gun than on the

other, and also doubling the rapidity of discharge, because it requires only half as long to fire the barrels from the center to each end as from one end to the other.

The invention further relates to a combination of rock-shafts, connecting-rods, and cams, or their equivalents, for imparting and communicating the required relative motion to the loading-slide and firing mechanism; also, to a device for throwing the trigger mechanism in and out, so that the discharge of the barrels or a part of them may be prevented at will.

In order that the invention and the mode of carrying it into effect may be fully understood, 65 it will now be described with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a machine-gun illustrating the invention. Fig. 2 is a side elevation of the same. Fig. 2^a is a view, partly in section, but mostly in elevation, of a modified form of training mechanism for our improved gun. Fig. 3 is a rear view thereof without the carriage. Fig. 4 is a vertical longitudinal section of the loading and firing mechanism. Fig. 5 is a vertical transverse section on the line 5 5, Fig. 4. Fig. 6 is an elevation of a portion of the firing mechanism on a larger scale. Fig. 7 is a vertical section on the line 7 7, Fig. 6. Fig. 8 is a face view of a ratchet-wheel keyed on a rock-shaft and employed to impart intermittent motion alternately in opposite directions to winding-pulleys connected with the magazine-followers, as hereinafter described. Figs. 9 and 10 are views of the 85 toothed faces of the said winding-pulleys.

The bed or frame 1 is swiveled upon a carriage, 2, and is rotated by gearing 3, for training the gun. The said swiveled bed is constructed with rigid check-plates or standards 4, forming bearings for trunnions 5 5, projecting from the extremities of a plate, 6, in the front of which the barrels 7 are secured in a horizontal range in any usual or suitable manner. In the rear of the barrels 7 is a slide, 8, guided within a chamber formed to receive it, and having a vertical reciprocating movement. The said slide is shown in elevation in Fig. 5. It has two horizontal ranges of charge-chambers, 9 9, the chambers in each range corresponding in 100

number and distance asunder with the barrels 7, and serving at each movement to take a set of cartridges from the magazines 39 39', as hereinafter described, to firing position in rear of the barrels.

The vertical reciprocating movement of the slide is imparted by a rock-shaft, 10, operated by hand-lever 11, and carrying upon its ends eccentrics 12 12, connected by bands and rods 13 with the slide 8, so as to impart alternate upward and downward movement to the slide by the backward and forward motion of the hand-lever 11. On the outer faces of the eccentrics 12 are wrists 14, connected by rods 15 with arms 16 of a second rock-shaft, 17, which carries a series of upwardly-projecting forked arms, 18, embracing the firing-pins or sliding hammers 19, for the purpose of engaging the collars on said hammers and drawing them backward into cocked position, in which position they are caught by triggers 20, engaging in notches 21 in the under side of the firing-pins. The triggers 20 form levers of the first order, being fulcrumed at the center and pressed upward to hold the pins by means of springs 22.

The heels of the trigger-levers 20 rest in grooves 23 on the upper surface of the firing-pins, the said grooves decreasing in depth backward, so that the forward movement of the firing-pin will elevate the tail of the trigger-lever 20, which rests in the groove 23 of said firing-pin, and withdraw the nose of the said trigger from the notch 21 in the next firing-pin of the series. The central pair of trigger-levers, 20', are operated by a vertical slide, 24, in which their heels are held, said slide being pressed downward by a spring, 25, to hold the noses of the said central pair of trigger-levers, 20', in the notches 21 of the central pair of firing-pins, 19'.

It will thus appear that the throwing up of the slide 24 will release the central pair of firing-pins, 19', so that they are thrown forward by their firing-springs 26, thus discharging the two central barrels.

The slide 24 is moved upward by an adjustable tappet-plate, 27, on the rock-shaft 17, engaging with an arm or lug, 24', forming part of the vertical slide 24, or rigidly connected therewith. The tappet-plate 27 is formed with a notch, 28, and is adjusted horizontally by a lever, 29, for the purpose of placing the firing mechanism in or out of gear when required. When the said slide is thrown to the right, as illustrated in Figs. 3 and 6, the tappet-plate 27, coming in contact with the lug 24' of slide 24 at the termination of the forward movement of the rock-shaft 17, will move the slide 24 upward, drawing the central pair of triggers 20', as already described; but if the tappet-plate 27 be moved to the left, the firing will not take place. By this means the gun can be loaded without firing, and afterward discharged at any required moment; or it can be discharged automatically directly after the loading movement.

By the above description it will appear that every backward movement of the hand-lever 11 by elevating the slide 8, brings a set of cartridges from the lower range of magazines, 39, into firing position in rear of the barrels, and the same movement, acting through the medium of the wrists 14 on the arms 16 and rock-shaft 17, cocks all the sliding hammers by the elevation of said arms 16, and again, by the depression of said arms, restores the forked arms 18 to their forward position, and at the termination of the same movement of the slide acts on the trigger-slide 24, so as to discharge all the barrels in rapid succession from the center to each end, if the tappet-plate 27 be set for this purpose. In like manner the backward movement of the hand-lever 11 moves the slide down, taking a fresh set of cartridges from the upper range of magazines, 39', to firing position, and imparting at the same time a double movement to the rock-shaft arms 16, as before, so as to cock and fire the gun. The semicircular dotted line 30 in Fig. 2 indicates the path of the wrist 14, by which this double movement of the rock-shaft arms 17 is produced, said wrist 14 being moved from 30° to 30° on the upward movement of the slide 8, and back again from 30° to 30° on the downward movement of the slide, a double movement of the rock-shaft 17 being thus produced by each backward or forward movement of the hand-lever 11.

The magazine-followers 38 may be actuated by springs in customary manner when shouldered cartridges are used, so as to carry one such cartridge into each load-chamber in the slide as the latter is moved into position to receive them; but another part of this invention consists in a positive feeding mechanism in which the follower-springs are dispensed with, said followers being moved at each stroke the length of one cartridge, so as to force a set of cartridges into the slide-chambers, the entrance of which cartridges ejects the empty shells or any unexploded cartridges at the rear of the slide. This positive feeding mechanism may be described as follows:

31 represents a lever operating a rock-shaft, 32, near the extremities of which are paired pulleys 33 33', running loosely on the shaft and actuated alternately by the engagement with their toothed inner faces of pawls 34 on the respective faces of disks 35, which are keyed to the rock-shaft 32 between the respective pairs of pulleys 33 33', so that when the rock-shaft is moved in one direction the pulleys 33 will be turned, and when the rock-shaft is moved in the other direction the pulleys 33', suitable detaining-pawls serving to hold the pulleys in each case against reverse movement. On the peripheries of the respective pulleys are coiled bands 36 36', each connected to one of the transverse bars 37, to which the followers 38, within the magazines 39 39', are attached.

The ratchet-pulleys 33 33' may, if preferred,

be mounted on the same rock-shaft, 10, which operates the slide and firing mechanism. The load-chambers of the slide extend completely through from front to back. The cartridges 40 are introduced into the slide-chambers 9 from the front, and when fed by the positive movement described may be made without shoulders, as shown in Fig. 4. If shouldered cartridges be used, as illustrated in Fig. 2, they rest by their shoulders against corresponding shoulders within the chambers 9. When moved into firing position by the vertical movement of the slide 8, the cartridges are held between the jaws of a recoil-block, 41. This block is furnished with a recoil-pin, 42, and follower 43, acting upon a recoil-spring, 44, and may be made to carry back the firing-pins 19 to cocked position. The said firing-pins are made in two parts—that is to say, with separate nose-pieces 19^a, which, on the retirement of the firing-pins proper or sliding hammers 19, are moved back within the breech-plate of the gun, and when the said sliding hammers 19 are released receive the impact thereof and deliver the firing-stroke to the cartridges.

The angular elevation for range is controlled by worm-gearing 45, acting on the elevating-screw 46, as in Fig. 2^a, or by the screw and cogged segment shown in Fig. 2.

The following is what is claimed as new in the above-described invention:

1. In a machine-gun, the combination, with a horizontal range of barrels and one or more horizontal range or ranges of magazines, of a breech-slide, a horizontal rock-shaft, and connections between said slide and rock-shaft, the said parts being so arranged that the rotation or partial rotation of the rock-shaft shall produce a vertical reciprocatory movement of the breech-slide.

2. A positive feeding mechanism consisting of a range of magazines, followers sliding therein, a bar connecting said followers, and suitable connections for moving the connecting-bar and followers, substantially as described. 45

3. The combination of the levers 31, ratchet-pulleys 33 33^a, connections 36 36^a, bar 37, and followers 38, for loading the cartridges by a positive movement, substantially in the manner described. 50

4. The combination, with a vertically-moving breech-slide, a series of trigger-levers, and a series of sliding hammers with which the said trigger-levers engage, substantially as described, of a rock-shaft and connections with said slide, and a second rock-shaft and connections between said shaft and the first rock-shaft, for producing a double movement of the second rock-shaft for each movement of the first rock-shaft, and attachments to the second rock-shaft for producing a disengagement of the trigger-levers from the sliding hammers, substantially as and for the purposes set forth. 55

5. The combination of the rock-shaft 10, wrists 14, rods 15, crank-arms 16, second rock-shaft, 17, forked arms 18, and firing pins or hammers 19, substantially as and for the purposes set forth. 65

6. The combination of rock-shaft 17, adjustable tappet-plate 27, slide 24, triggers 20^a 20, and hammers 19^a 19, substantially as and for the purpose set forth. 70

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SAM'L. C. GOODSELL.