

(No Model.)

3 Sheets—Sheet 1.

J. H. McLEAN.

MACHINE GUN.

No. 282,551.

Patented Aug. 7, 1883.

Fig 1,

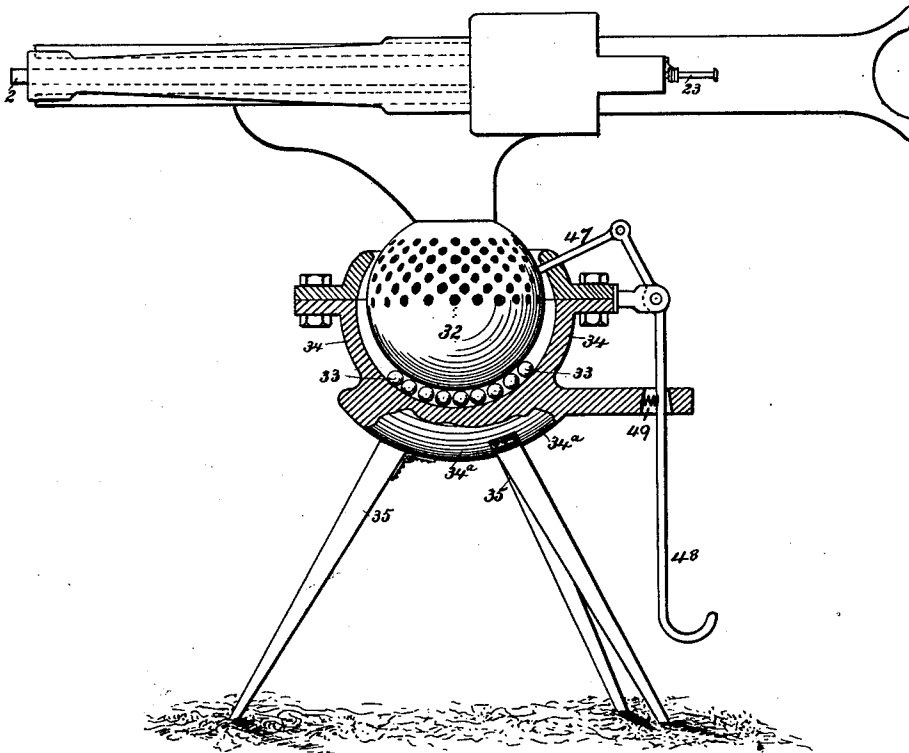
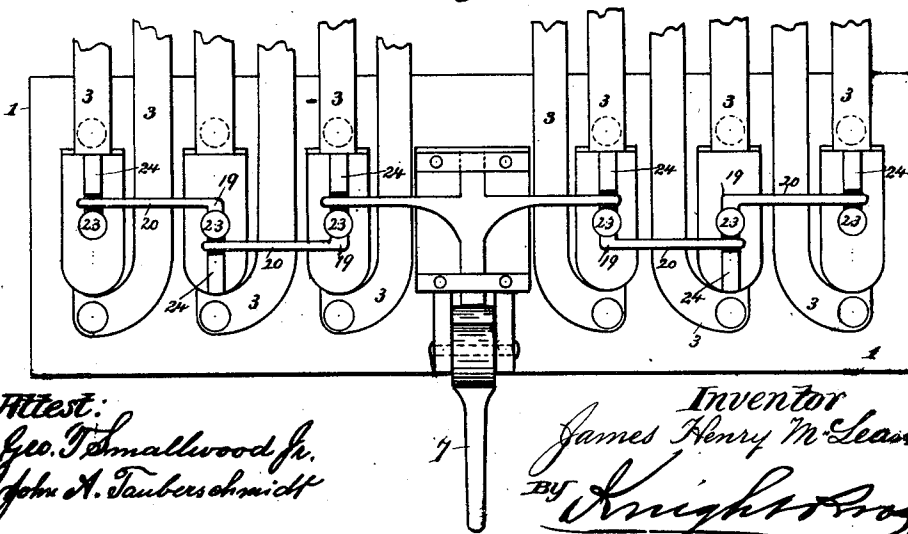


Fig 2,



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Fig 3,

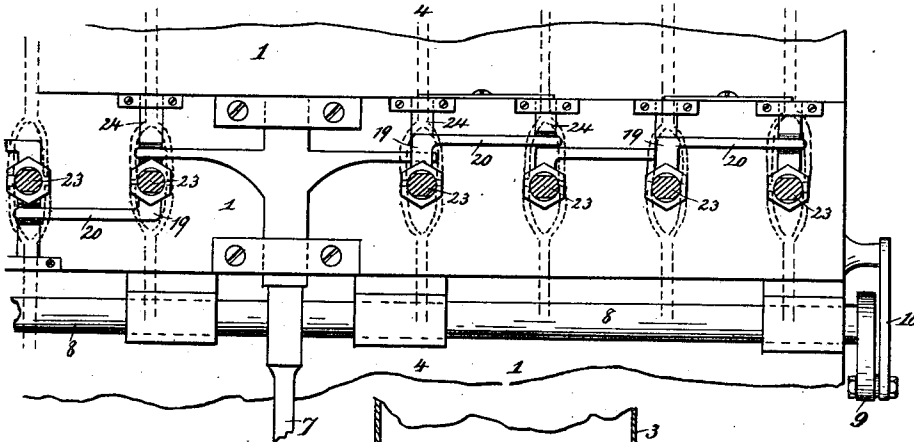


Fig 4

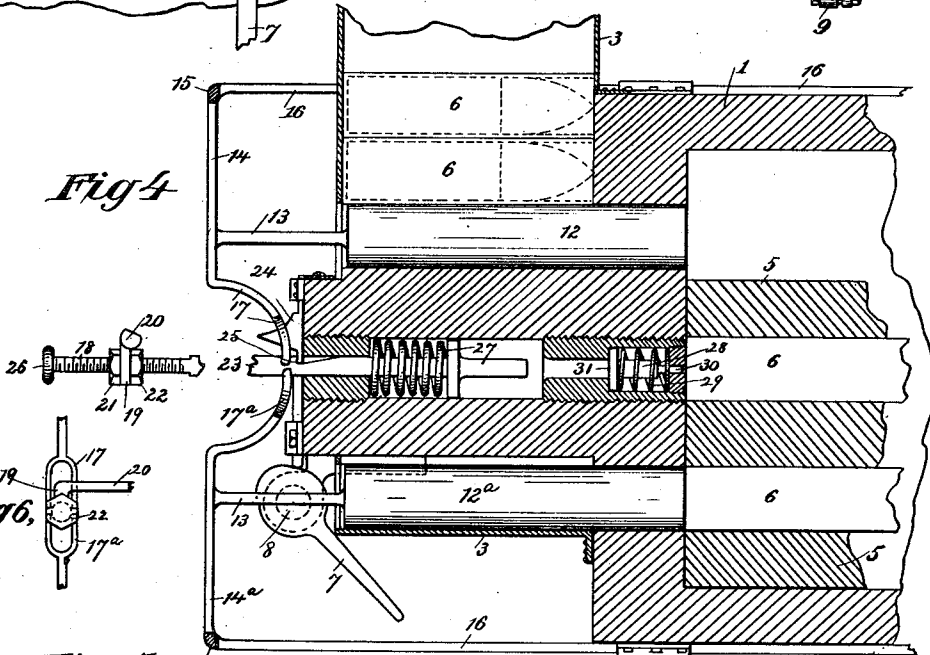


Fig 6,

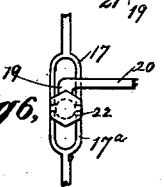
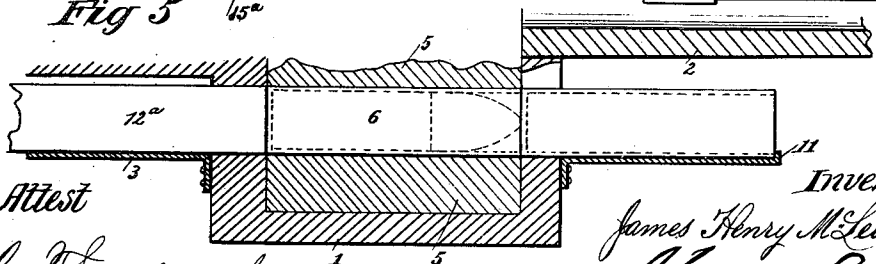


Fig 5



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3 Sheets—Sheet 3.

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Fig 7,

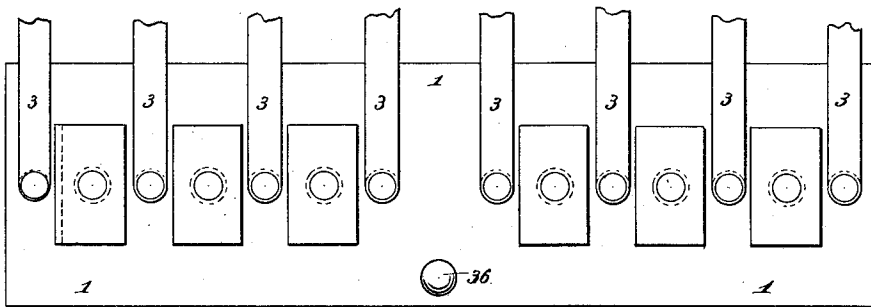


Fig 8,

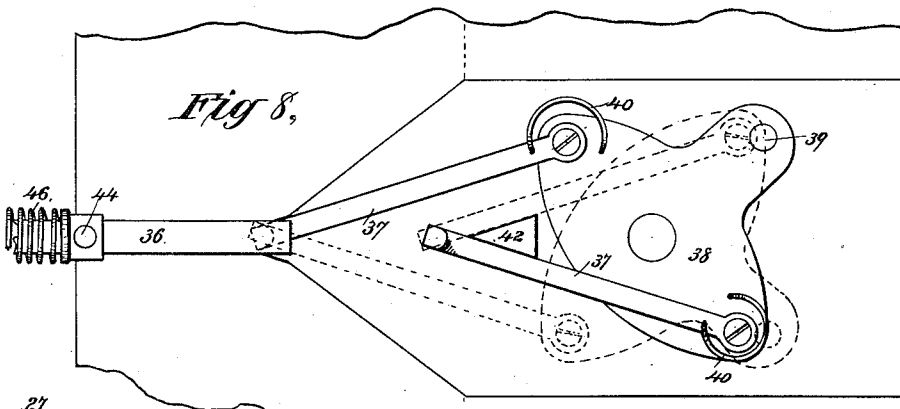
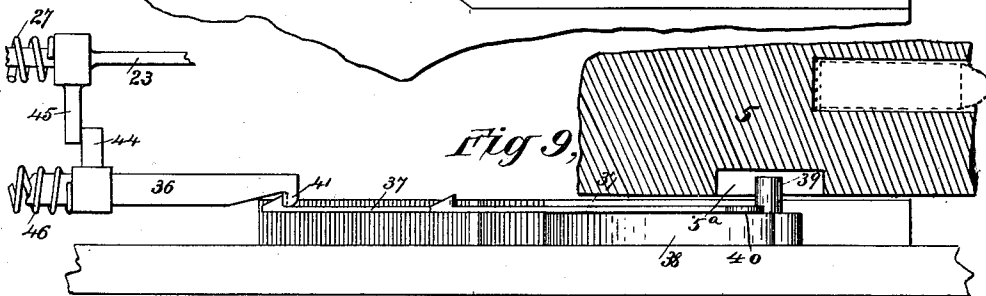


Fig 9,



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UNITED STATES PATENT OFFICE.

JAMES H. McLEAN, OF ST. LOUIS, MISSOURI.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 282,551, dated August 7, 1883.

Application filed March 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES HENRY McLEAN, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented 5 Improvements in Machine-Guns, of which the following is a specification.

The subject of my invention is a machine-gun which may have any desirable number of barrels from two to forty; or parts of the invention are applicable to single or double 10 barreled small-arms. The machine-gun in its complete form is made with a breech-slide reciprocating either vertically, horizontally, or obliquely, and with plungers which take 15 the successive cartridges from magazines or feeders in the rear of the breech and carry them forward into the breech-slide chambers, which are presented alternately above and below the barrels in the case of the vertical slide, or on 20 the side thereof in the case of the horizontal slide; also, with stops or receivers for the cartridge-shells, holding them in front of the breech and causing each to serve as a gage or stop for the introduction of the next cartridge in succession. The gun is also constructed with a simple mechanism for moving 25 the slide, which may or may not effect the firing of the gun, as desired.

The invention also relates to an automatic 30 firing mechanism consisting of horizontal tappet studs or spurs fixed rigidly on the firing-pins, but adjustable toward and from the breech, and acting in the stroke of each pin to retract the sear of the next pin in succession, the adjustment of the tappet-studs on the 35 firing-pins serving to regulate the rapidity of discharge of the successive barrels. The main firing-pin strikes a supplemental firing-pin working in a chamber within the breech, and having a flanged heel and a retracting-spring, causing it to act as a gas-check. The 40 gun is mounted on a ball-and-socket joint, so as to permit universal adjustment for elevation or training, and is held in any position by one or more spring-bolts engaging in holes 45 or notches, a large number of which are provided for the purpose over the upper half of the surface of the sphere. The globe of the ball-and-socket joint rests on small balls, preferably of soft or hard rubber, or other elastic

or semi-elastic material, serving to give a degree of resilience to the connections, and to take up the blow given by the gun in firing. The whole may be mounted on a saddle for use on the back of an animal, or on a tripod, 55 where the arm is of comparatively small size, or on a complete carriage or solid frame in a gun of large size. I hereby reserve to myself the right to make separate application for Letters Patent for the construction of this 60 mounting. The reciprocating breech-slide is moved by a double bell-crank through the medium of hooked rods pivoted to the ends of said bell-crank and engaged alternately by a longitudinally-moving slide or rod, as herein- 65 after described.

In order that the invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which— 70

Figure 1 is a side view of a gun illustrating the invention, the supporting-socket being shown in section. Fig. 2 is a rear view of the breech, the cocking mechanism being omitted. 75 Fig. 3 is a rear view of a portion of the breech, showing the firing-pins in section, and indicating the position of the cocking mechanism in dotted lines. Fig. 4 is a vertical section of the rear portion of the breech on the line 4 4, Fig. 3. Fig. 5 is a vertical section of the lower portion of the breech in front of the part shown in Fig. 4. Fig. 6 is a back view, showing one of the firing-pins and a pair of forks which act alternately to retract the firing-pin, as herein- 85 after described. Fig. 7 is a rear view illustrating the application of the invention to a horizontally-moving breech-slide. Fig. 8 is a top view of the slide-operating bell-crank lever and its accessories. Fig. 9 is a side view of the same. 90

1 represents the frame or breech of the gun; 22, the barrels; 33, feeders or magazines adapted to conduct the cartridges to the required positions above and beneath the barrels in the case of the vertically or obliquely moving breech- 95 slide or on either side thereof in the case of the horizontally-moving slide. The reciprocating breech-slide 5 is constructed with chambers corresponding in distance asunder with the barrels, and arranged in two tiers, one above 100

the other, in the case of the vertically-moving slide, or with double the number of chambers in horizontal range in the case of the horizontally-moving slide.

5 The cartridges are shown at 6 6.

7 represents a hand-lever keyed or otherwise rigidly secured to a rock-shaft, 8, carrying at its extremities crank arms or disks 9, connected by pitman 10 to wrists on the extremities of the vertically-moving slide.

At 11 is shown a narrow support extending forward from the breech, in front of each orifice therein, for the reception of the successive cartridge-shells which are ejected from the slide-chambers by the entrance of new cartridges from the rear, said support thus holding the empty shell, so that it will serve as a stop or gage for the feeding of the new cartridge into the slide-chamber from the rear, on a principle similar to that which I have described in another application in the case of cartridges fed from the front, the cartridges being constructed with a casing extending their whole length—that is to say, as far as the point of the ball.

The feeding apparatus consists of plungers 12 12*, which are preferably made, as shown, of a length equal to the entire length of the cartridge, and the thickness of the rear wall of the breech in addition. Said plungers are connected by rods 13 with rigid arms 14 14*, extending downward and upward, respectively, from hand-bars 15 15*, which are guided by sliding rods 16, having a longitudinal movement on the breech, the operation being to actuate the upper and lower feeders in succession as the breech-slide 5 is thrown up and down. The crank arms or disks 9 are so proportioned as to reach a dead-center at the extremity of their upward stroke, and thus firmly sustain the weight of the breech-slide and hold it rigidly in its upper position. The vertical arms are continued downward and upward in the form of forks 17 17*, to engage with collars 22 on the firing-pins 23, said forks 17 17* being so proportioned that they will pass each other freely, and either will act independently to draw back and cock the firing-pins 22 on the backward movement of either the upper or lower hand-bar. The firing-pins are held in their retracted or cocked position by sears 24, engaging in notches 25 therein. The collars 22 in my present invention take the form of nuts adjustable on mutilated or partial screw-threads 18 on the rear end of the firing-pins, the top and bottom surfaces of said firing-pins at this point being flat in order to guide and rigidly hold against rotation short sleeves 19, which carry tappet studs or spurs 20, projecting rigidly in a horizontal position, said sleeves 19 being firmly clamped between the nuts 22 and supplemental binding-nuts 21, so as to effect the adjustment of the tappet-studs 20 lengthwise of the firing-pins—that is to say, to or from the breech of the gun. The function of the said studs or pins 20 is to en-

gage beneath the inclined rear faces of the sears 24, so that the firing-stroke of each firing-pin will retract the sear of the next firing-pin in succession and release the latter, causing a successive fire of all the barrels. The rapidity of such successive fire is regulated as desired by the adjustment of the tappet-studs 20 on the firing-pins 23, as explained. The rear ends of the firing-pins are provided with buttons 26, for retracting them by hand separately when needful. The firing-springs are shown at 27, acting on rigid collars on the firing-pins 23 within the breech. 28 is a supplemental firing-pin formed with a flanged heel and retracted by a spring, 29, within its chamber in the breech of the gun, the nose 30 of the said supplemental firing-pin being driven through the small aperture in delivering its blow to the primer and instantly retracted within the breech, the flanged heel 31 serving as a gas-check to close the firing-pin aperture at back.

The operation of the horizontally and obliquely moving breech-slide and other details of the loading and firing mechanisms are sufficiently described in other applications made by myself, or made by Myron Coloney and assigned to myself.

The breech is fixed to a solid sphere, 32, of sufficient size, working within a socket, 34, so as to constitute a ball-and-socket joint, the upper half of its surface being provided with a large number of apertures for the reception of one or more stop-bolts, 47, retracted by a foot-lever, 48, and forced in by a spring, 49, to hold the gun in any position to which it may be adjusted for elevation or training, as before stated.

The globe 32 rests on a number of small balls, 33, within the socket 34, said balls being preferably formed of hard rubber in order to afford some degree of elasticity and partially take up the recoil. In the present illustration I have shown the socket-base 34 supported on a tripod, 35; but it may, if preferred, be mounted on a saddle, or, in the case of a large gun, on a carriage or a solid frame.

The various features of my invention are, as already stated, adapted for use with either horizontally or vertically moving slides. For the portable gun shown in Fig. 1, and for shoulder-guns, the horizontally-moving slide is preferable, and may be operated, as shown in Figs. 7, 8, and 9, by a pull-rod, 36, acting alternately on hooks 37 37, pivoted to the respective ends of a double bell-crank lever, 38, the central arm of which has a stud, 39, engaging with a slot, 5*, in the slide 5, as shown in Fig. 9, said slot being longitudinal to the gun and transverse to the slide's line of motion, so as to impart a positive and rectilinear throw to the slide while describing its own circular arc. The hooks 37 37, when released from the concave hook of the pull-rod, are pressed inward by springs 40 40, so as to avoid the hook 41 of the pull-rod 36 in its forward movement; but

each of the pivoted hooks, as the rocking of the bell-crank lever carries it to its forward position, rests against a stop, 42, holding it in central position, so as to be caught by the pull-rod hook 41. The pulling-rod thus draws back the opposite ends of the bell-crank lever alternately at each stroke, and in the case of a single-barreled arm retracts the firing-pin 23 at the same time by a stud, 44, on the said pull-rod engaging with a stud, 45, or with a suitable collar on the pin. A spring, 46, throws the pull-rod 36 forward each time as it is released.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a machine-gun, a reciprocating chambered breech-slide placed within a recess formed in the breech of the gun, and a series of magazines or feeders opening into the rear of said slide, in combination with a series of plungers operating to force the cartridges forward into the chambers of the slide from the feeders or magazines, said plungers being connected with a system of hand-bars having guiding-rods moving longitudinally in bearings on the gun-breech.

2. In a machine-gun, a sliding hammer moving in a channel in the gun-breech, and provided with a collar longitudinally adjustable thereon, in combination with a system of hand-bars having attachments for engaging with the said collar of the sliding hammer.

3. The combination, with a sliding hammer moving in the gun-breech and provided with connections, with a series of hand-bars operating to move said hammer into cocked position, and a sear arranged to hold the hammer in such position, of a hand-lever arranged to engage with the said sear to move it out of engagement with the hammer for releasing the same.

4. The combination of a sliding hammer provided with a longitudinally-adjustable collar upon its outer portion, and a tappet-arm held by said adjustable collar, with a second sliding hammer provided with a sear arranged to hold the hammer in cocked position, and provided with an oblique engagement-face upon which the said tappet-arm engages for releasing said sear from engagement with the hammer.

5. The combination, with a series of sliding hammers, each of which is provided with a sear formed with an oblique engagement-face, and arranged to catch and hold said hammer in cocked position, an adjustable collar, and an adjustable tappet-arm controlled by said collar, and arranged to engage with the oblique engagement-face of the sear of the next contiguous hammer, of a catch arranged to engage with the oblique faces of the two central sears, and a hand-lever for producing the necessary movement of the catch for effecting its action.

6. The combination, with a sliding breech-block formed with an engagement-slot, as described, of a bell-crank pivoted upon the gun-breech, and provided with a series of hooked arms controlled by springs and guided by a stop upon the gun-breech, and also provided with a pin working in the slot of the breech-slide, and a hooked pull-rod for engaging alternately with the bell-crank arms, and provided with an engagement device for effecting a contact with a similar engagement device attached to the sliding hammer of the gun, whereby the sliding hammer is moved into cocked position as the breech-slide is shifted.

JAMES HENRY McLEAN.

Witnesses:

OCTAVIUS KNIGHT,
WALTER ALLEN.