(No Model.)

4 Sheets—Sheet 1

J. H. McLEAN.

MACHINE GUN.

No. 282,553. Patented Aug. 7, 1883.

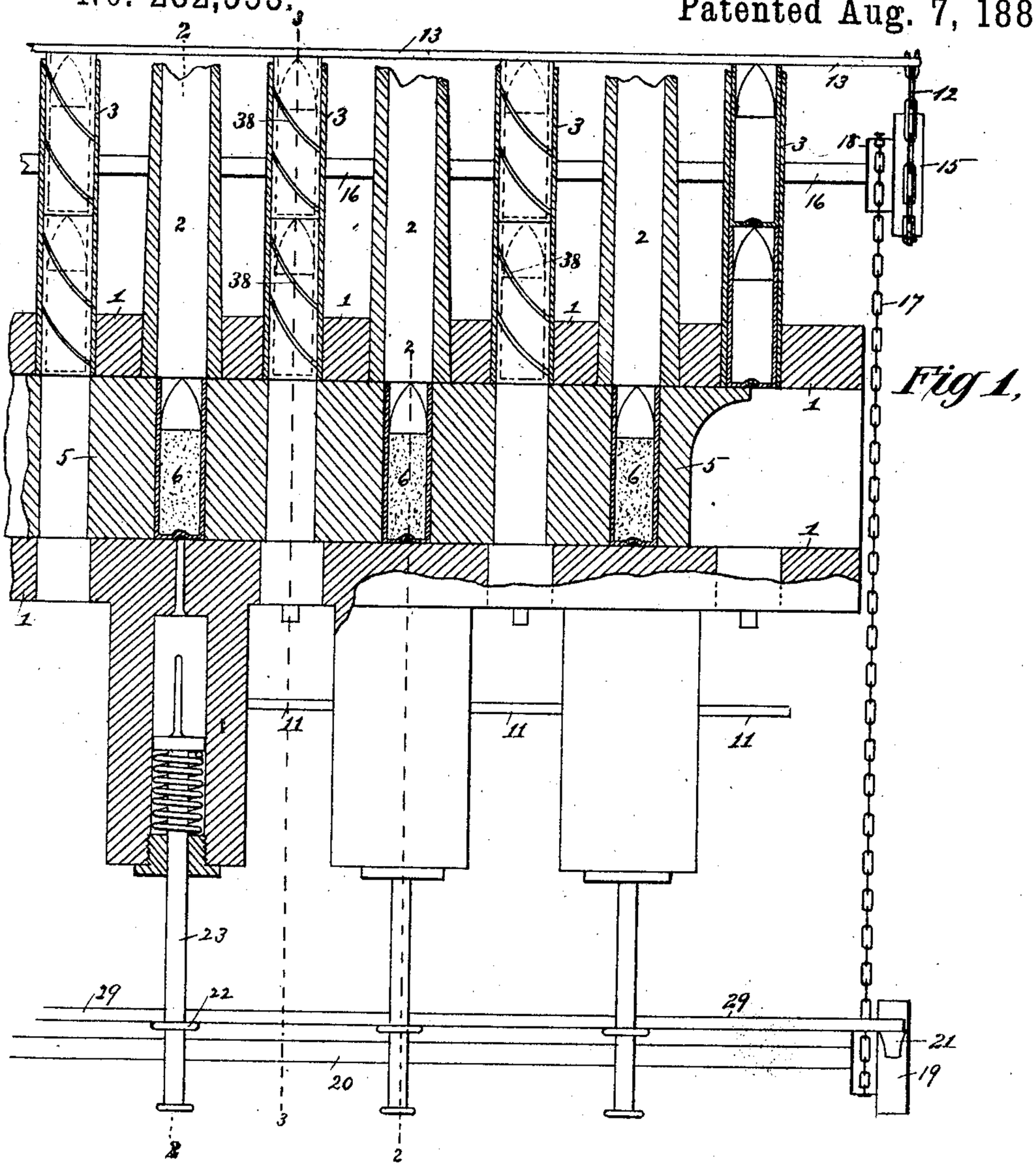

Fig 1.

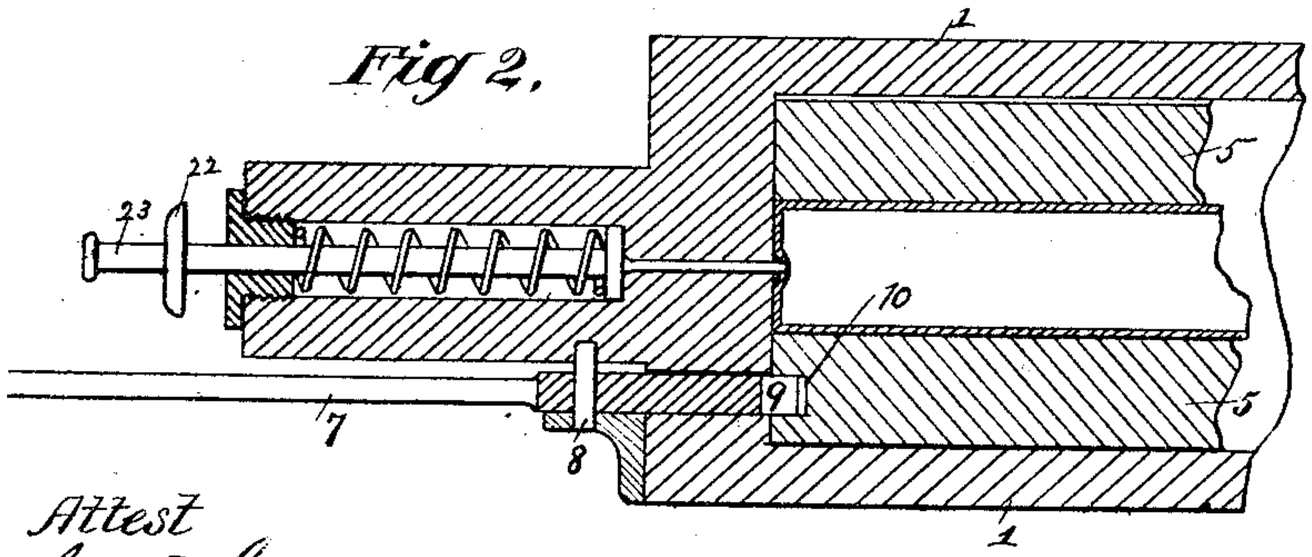

Fig 2.

Attest
Geo. T. Smallwood Jr.
C. N. Smallwood

Inventor:
James Henry McLean.
By Knight Bros
Attys

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Fig 3,

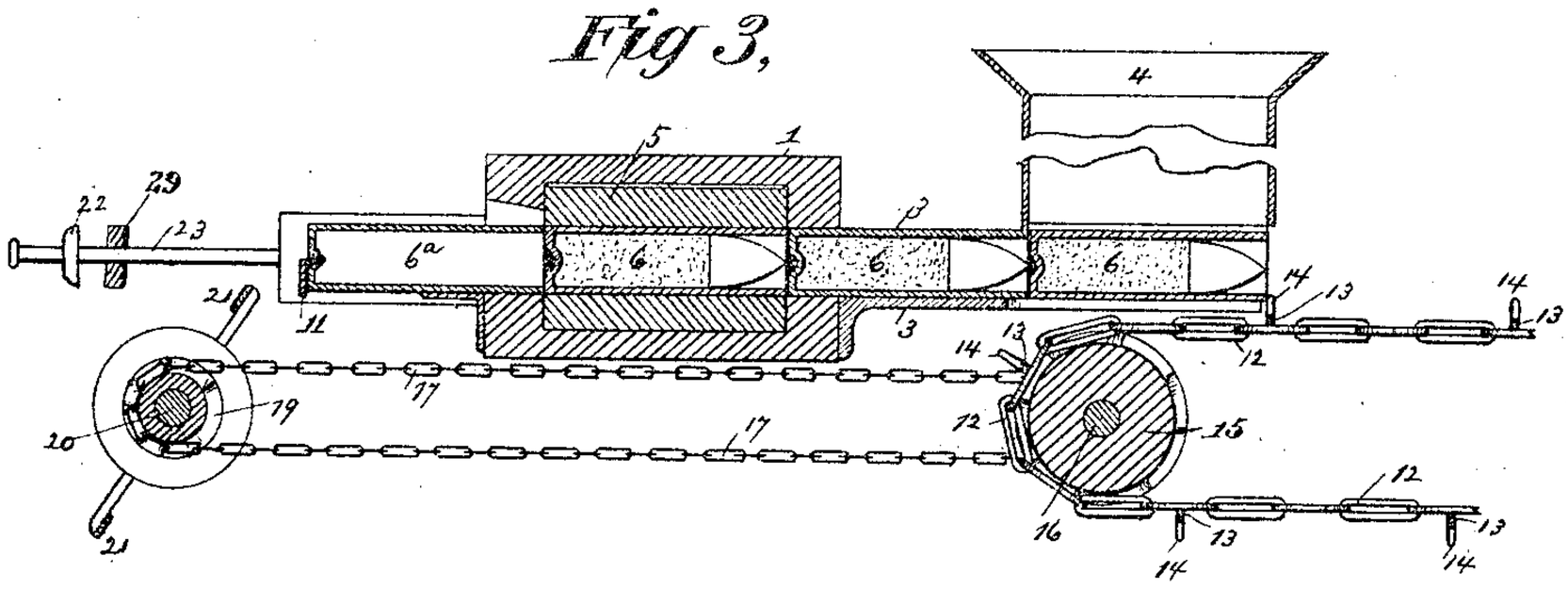
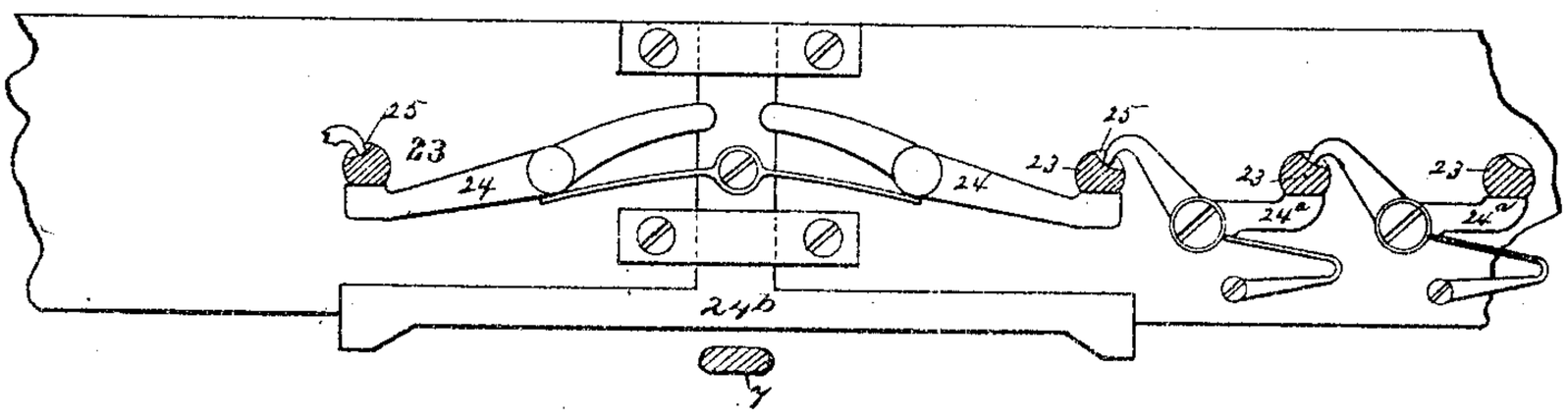


Fig 4,



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J. H. McLEAN.

MACHINE GUN.

No. 282,553.

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Fig 5,

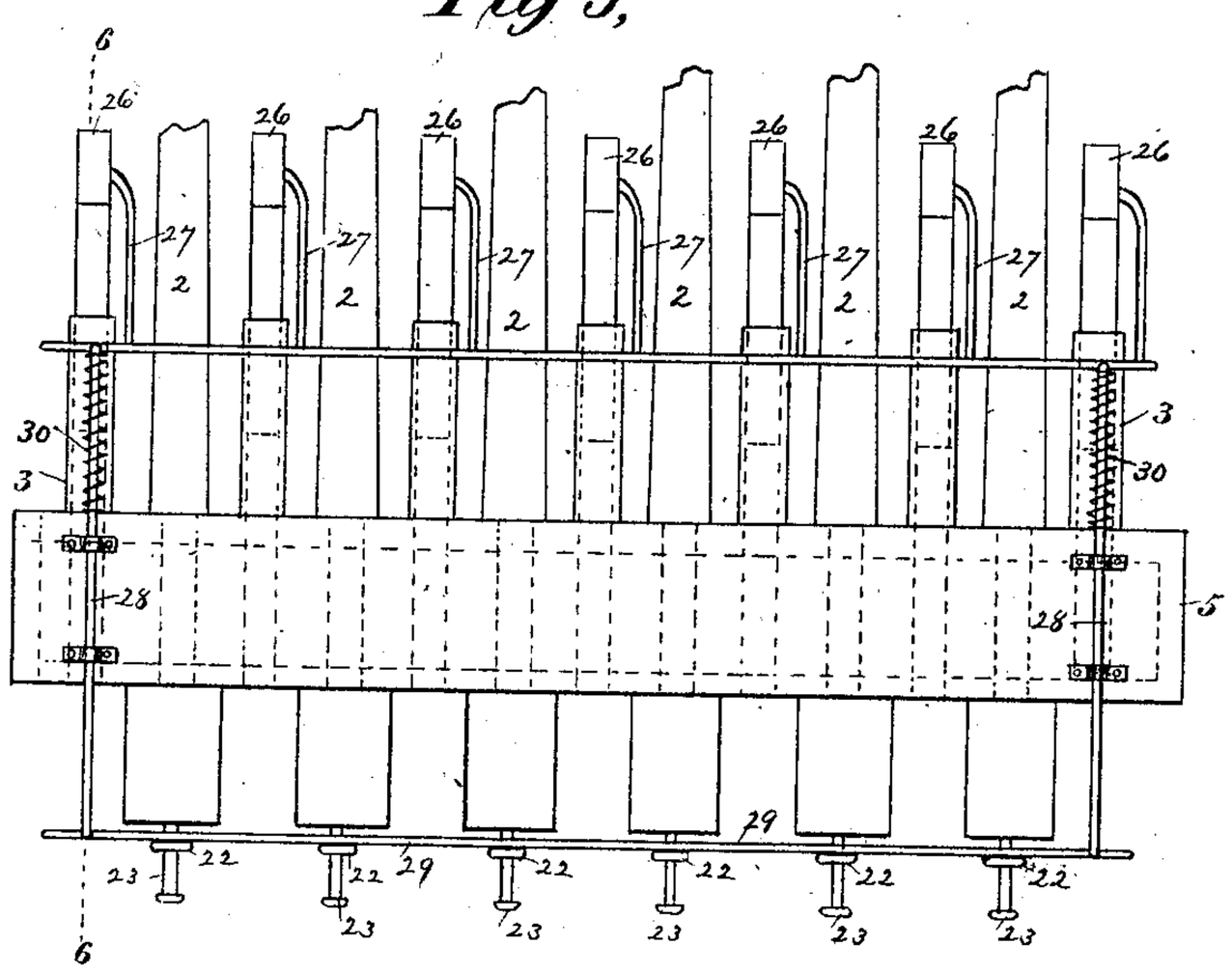
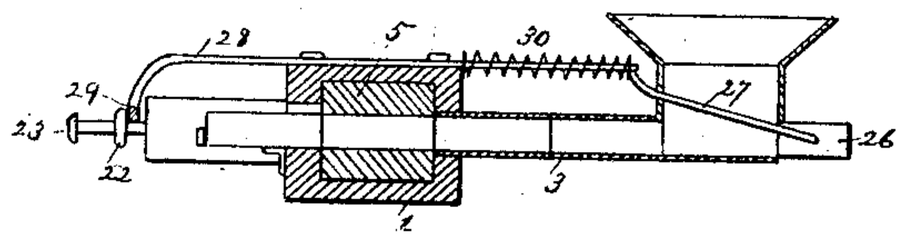


Fig 6,



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J. H. McLEAN.

MACHINE GUN.

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Fig 7

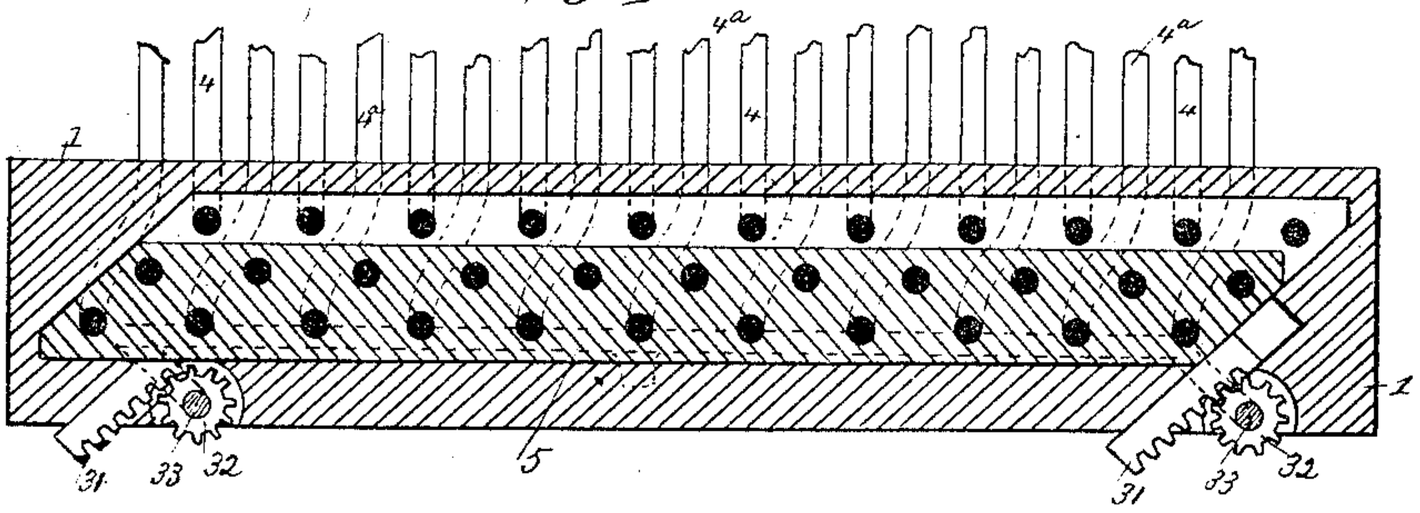


Fig 9,

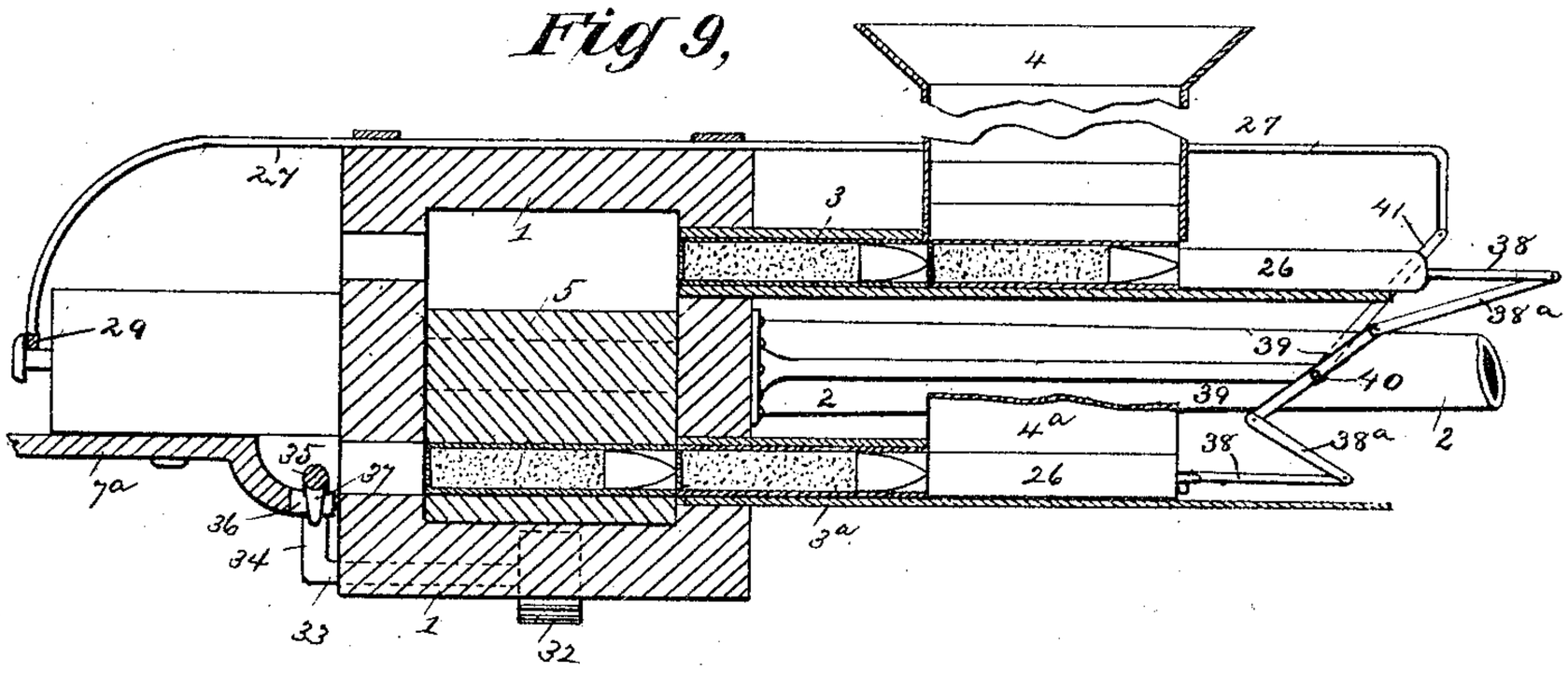
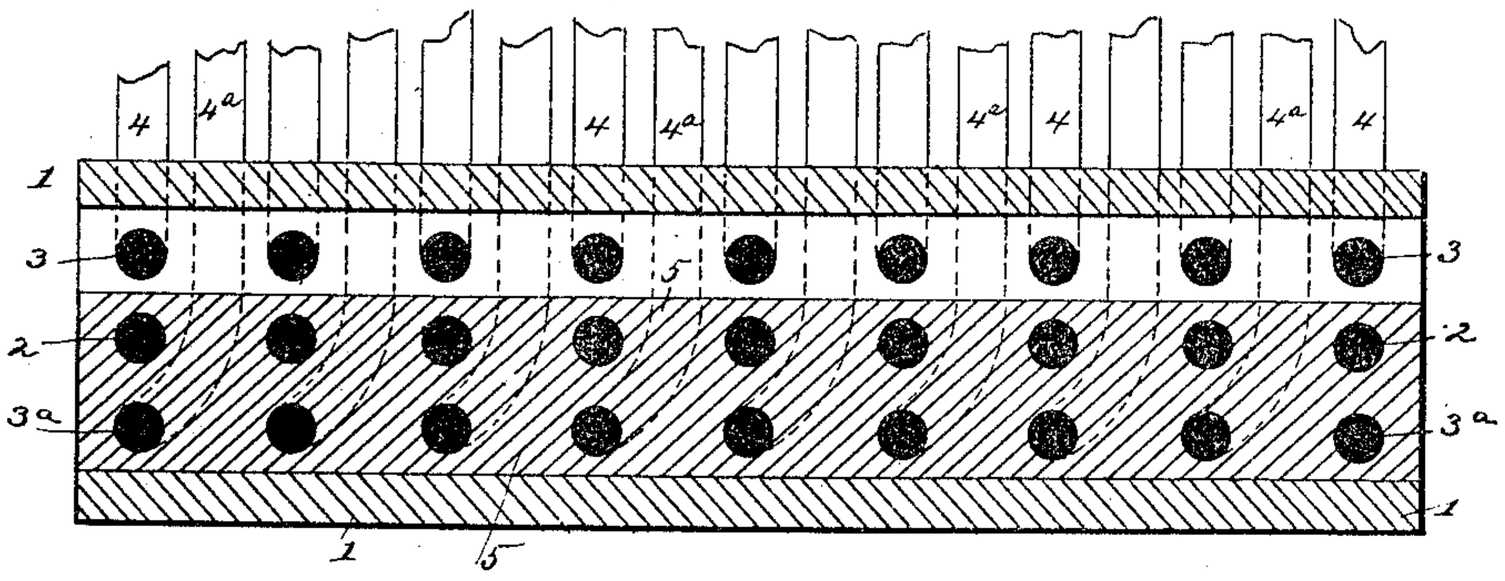


Fig 8.



Attest

Geo. T. Smallwood Jr.

C. N. Smallwood

Inventor:

James Henry McLean

By Knight Bros

Attys.

UNITED STATES PATENT OFFICE.

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

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 282,553, dated August 7, 1883.

Application filed February 28, 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 improvements in Machine-Guns, of which the following is a specification.

My gun, in its preferred form, is constructed with a horizontal range of barrels, interposed magazines or feeding-hoppers, a horizontally-moving chambered breech-slide for receiving cartridges from the feeders and conducting them to firing position in rear of the barrels, rear supports which receive the empty cartridge-shells to gage the entrance of the next cartridges, a positive feeding mechanism, and a cocking mechanism operated simultaneously therewith; or automatic-spring magazines may be used; also with a firing mechanism which may be operated by the device employed to impart the required reciprocating motion to the chambered breech-slide.

The invention further relates to providing the cartridge-shell with a serpentine groove to permit expansion in firing.

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

Figure 1 is a plan, partly in horizontal section, of the loading mechanism of the gun. Fig. 2 is a vertical section of the breech-slide and its accessories, on the line 2 2, Fig. 1. Fig. 3 is a vertical section of the loading mechanism, on a smaller scale, on the line 3 3, Fig. 1. Fig. 4 is a rear view, showing the operation of the firing mechanism. Fig. 5 is a plan illustrating a modification in construction of the loading mechanism. Fig. 6 is a section on the line 6 6, Fig. 5. Fig. 7 is a vertical longitudinal section of the breech, illustrating an oblique-motion slide. Fig. 8 is a vertical section, also in a plane longitudinal to the breech, illustrating a vertically-moving slide. Fig. 9 is a vertical section on a larger scale, in a plane at right angles to that in Figs. 7 and 8—that is to say, transverse to the breech and parallel with the barrels—illustrating a reciprocating loading mechanism adapted for use with either a vertically or an obliquely moving slide.

Parts of the stationary frame or breech of the gun are shown at 1 1. 2 2 are the barrels, and 3 3 feeding troughs or magazines arranged alternately between the same. They may be connected with magazine-tubes extending horizontally in the plane of the barrels or parallel therewith to a sufficient distance to contain the required number of cartridges, or may be provided with vertical feeding-hoppers 4, Fig. 3. The breech-slide 5 is constructed with chambers corresponding in distance asunder with the barrels 2 2, and adapted in its reciprocating movements to receive successive cartridges 6 from the feeders 3 and conduct them to firing position in rear of the barrels. Figs. 3 and 5 show the slide-chambers in loading position in rear of the feeders 3, and Fig. 1 shows them in firing position in rear of the barrels.

The reciprocating movement of the breech-slide may be imparted in various ways. I have shown at 7 a hand-lever fulcrumed at 8, and having a segment, 9, gearing with a rack, 10, on the rear face of the slide 5. 11 is a narrow support extending backward from the rear face of the breech-slide to a length corresponding exactly with that of the cartridges and of the slide-chambers prepared to receive them.

The cartridges are formed, as shown, with a casing, which may be of paper, and with a ball whose point does not extend beyond the front end of the cartridge-case. The empty shell, one of which is shown at 6^a, is thus of precisely the same length as the loaded cartridge, and as each new cartridge is drawn back into the slide it ejects the empty shell 6^a, and the latter, abutting against the rear end of the support 11, serves as an accurate gage or stop for the entering cartridge.

One form of my feeding apparatus is shown in Fig. 3, consisting of an endless chain, 12, carrying bars 13, which are fixed to the said chain at a distance asunder precisely corresponding with the length of the cartridges, and are armed with studs 14, adapted, as shown in Fig. 3, to engage with the front of the cartridge and pass backward through a longitudinal groove in the floor of the feeding-trough 3, and carry the said cartridge back a distance equal to its own length, when it is stopped by the empty

shell 6ª, before referred to, forming a gage for the cartridge which enters the slide, one or more cartridges intervening between that which is acted on directly by the feeder and that which is forced into the slide. In the present illustration I have shown one such intervening cartridge, as this is sufficient to allow for the thickness of the stationary parts of the frame and permit the complete introduction of the cartridge within the slide-chamber, so that the slide may be free to move.

The endless chain 12 is carried by pulleys 15 on a shaft, 16, actuated by an endless driving-chain, 17, which engages with a driving-pulley, 18, Fig. 1, keyed on said shaft 16, the said endless chain 17 being driven by pulley or sprocket-wheel 19, (of equal diameter to the pulley 18,) carried by a shaft, 20, which receives one-half a revolution at each feed movement by means of one of the hand-bars, 21 21, said hand-bars being also adapted to engage with collars 22 on the firing-pins 23, through the medium of a hand-bar, 29, engaging with the said collars 22, and draw them back into cocked position, where they are held by triggers 24 24ª, catching into suitable notches in said firing-pins, after the manner described in an earlier application made by myself and Myron Coloney jointly.

As described in the above-named application, the firing-pins are provided with grooves 25, which taper or shoal backward, so as, in the forward stroke of the firing-pins, to press upward the heel of the next trigger 24ª, which rests in said shoaling-groove 25, and thus releases the next pair of firing-pins and discharges all the barrels in rapid succession.

The middle arms, 24, engage at their inner ends with a trigger-slide, 24ᵇ, which is provided with oblique faces at its lower and outer ends. A hand-lever, 7, for operating the breech-slide, engages at each end of its stroke with the oblique faces of the slide 24ᵇ, and releasing the heels of trigger-arms 24 from the firing-pins 23 starts the operation of firing just described.

A modification of the feeding apparatus is shown in Figs. 5 and 6, in which 5 represents the feeding-slide, as before, and 3 the feeding-trough; but instead of the endless chain 12 and its accessories, I employ reciprocating plungers 26, connected by rods 27 28 with a hand-bar, 29, adapted to engage with the collar 22 on the firing-pins 23, so as to effect the loading and cocking simultaneously, as before described. Springs 30 restore the plungers 26 and their accessories to their forward positions as soon as the hand-bar 29 is released, and carry the latter out of the way of the collars 22 of the firing-pins, leaving said pins in readiness for the discharge.

In Fig. 7 my reciprocating slide 5 is shown as adapted for an oblique motion, by which the charge from a magazine, either above or below a certain barrel, is carried to firing position in rear of a barrel on one or the other side thereof, as the case may be. This oblique motion may be imparted by any adequate mechanism. For illustration, I have shown racks 31 31, rigidly attached to the slide 5 in lines parallel with its motion, and actuated by pinions 32 32 on shafts 33 33, on which are arms 34, (see Fig. 9,) connected by a bar, 35, moved horizontally in alternate directions by a hand-lever, 7ª, connected to the bar 35 by a slot, 36, and stud 37.

In Fig. 8 I have shown the slide 5 having a vertical motion, so as to take cartridges to loading position from feeders directly above and below the respective barrels.

Both Figs. 7 and 8 show magazine-feeders 4 4ª for the respective ranges of magazines 3 3ª, feeders 4ª being conducted between the upper magazines, 3, and the barrels 2 to the lower range of magazines, 3ª.

In Fig. 9 is shown an enlarged vertical section longitudinal to the barrels, and serving to illustrate either form of the invention shown in Figs. 7 and 8, and also illustrating a reciprocating mechanism adapted to load the cartridges above and below the barrels alternately. For this purpose I employ, in connection with the upper and lower plungers, 26, rods 38, connected at their inner ends to said plungers and at their outer ends to links 38ª, which in turn are connected to the extremities of a rock-arm, 39, secured to a rock-shaft, 40. This rock-shaft receives its motion from the hand-bar 29 through the medium of rods 27 and arms 41.

The feeding apparatus and some other parts of my invention are applicable to some of the various forms and styles of machine-guns and shoulder-guns constituting parts of my combined system of arms described in various applications heretofore made and to be made by me and by Myron Coloney, assignor to myself.

At 38 *b*, Fig. 1, I have shown a serpentine crease in the cartridge-shell to impart elasticity to it and render it expansible in the act of firing. I hereby reserve to myself the right to make separate application for Letters Patent for this construction.

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

1. A machine-gun constructed with a horizontal range of barrels and a horizontal range of magazines or feeders, the said magazines being interposed between the said barrels, and extending from the rear line of said barrels to or beyond the front line thereof.

2. The combination, with the pulleys 19 15 18, chains 17 and 12, the latter being provided with stops 4, of the slotted cartridge chambers or magazines 3, the chambered breech-slide 5, and the rear supports, 11, as and for the purposes described.

3. In a machine-gun, the combination of a series of barrels, a series of interposed magazine-chambers, a reciprocating chambered breech-slide, a rear support for receiving the

empty cartridge-shells, and an endless chain provided with stops, and serving as a feed for the cartridges from the magazines to the breech-slide, and thence to the rear support, substantially as set forth.

4. The combination, with shaft 20, carrying pulley 19 and arms 21, the sliding hammers 23, having shoulders or collars 22, and the bar 29, of the pulley 18 and chain 17, as and for the purposes specified.

5. The combination, with a feeding mechanism consisting of plungers or other carrying devices and one or more hand-bars provided with connections to said feeding mechanism for operating the same, of a trigger or series of triggers provided with attachments for engaging with the said hand bar or bars, whereby the operation of the feeding mechanism shall produce a simultaneous cocking of the trigger or triggers.

6. The combination, with the chambered breech-slide 5 and a lever for actuating said slide through the medium of suitable connections, of a trigger-slide having oblique faces, with which the said lever is arranged to engage for actuating the first or central trigger or triggers, for the purposes set forth.

JAMES HENRY McLEAN.

Witnesses:
OCTAVIUS KNIGHT,
HARRY E. KNIGHT.