

No. 662,761.

Patented Nov. 27, 1900.

M. H. BOWMAN & W. O. HUGHES.

MACHINE GUN.

(Application filed Apr. 5, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

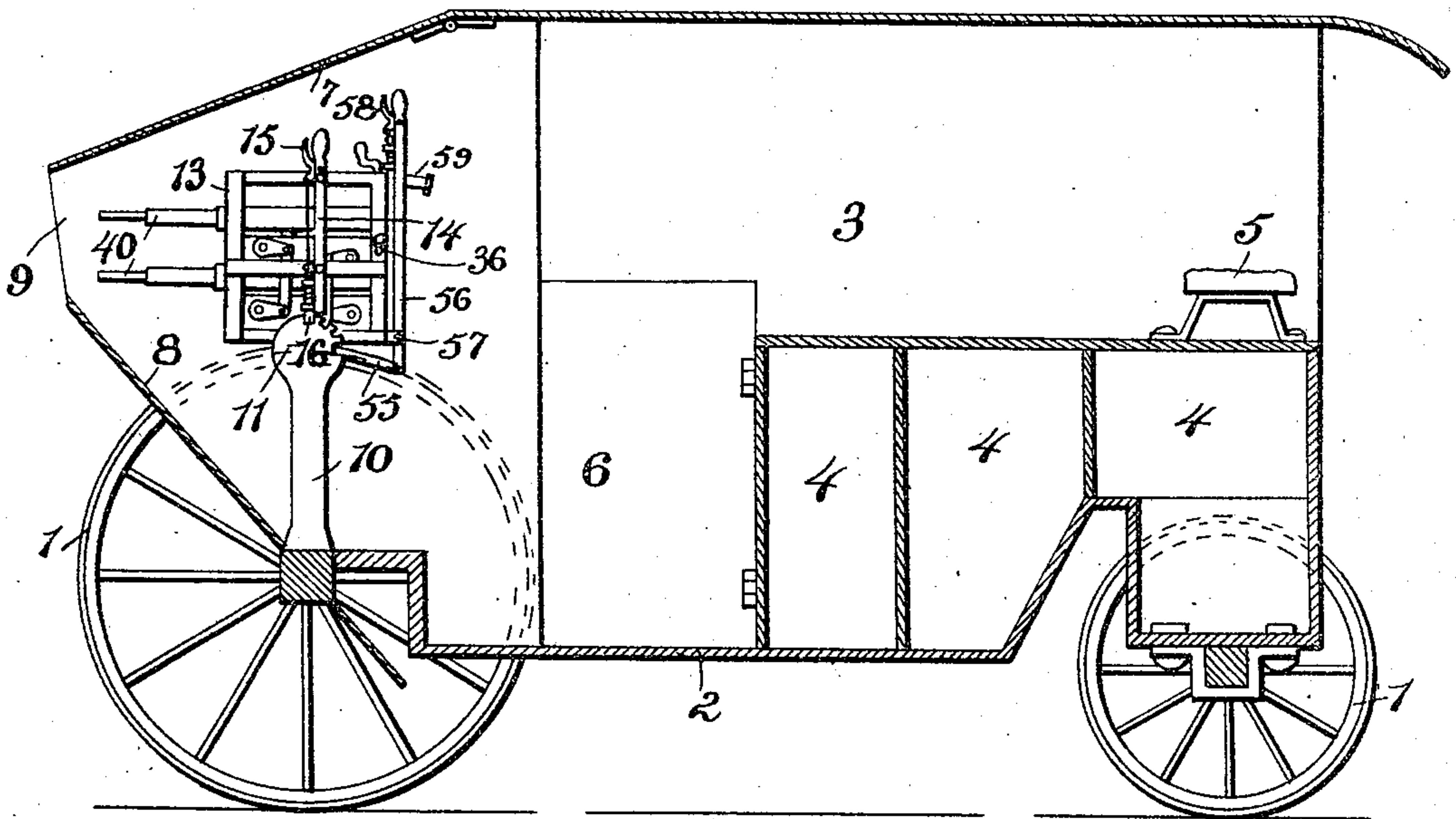
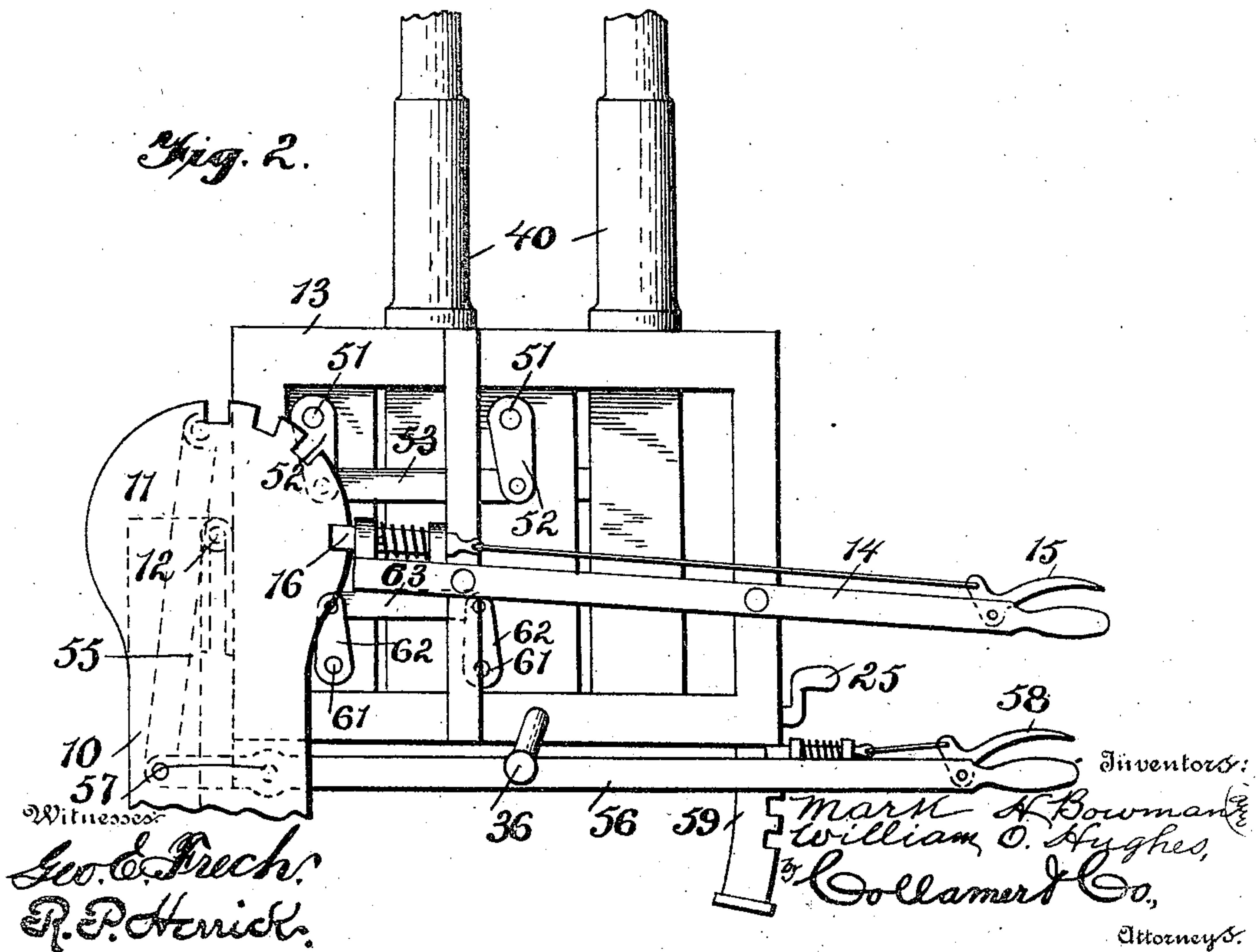


Fig. 2.



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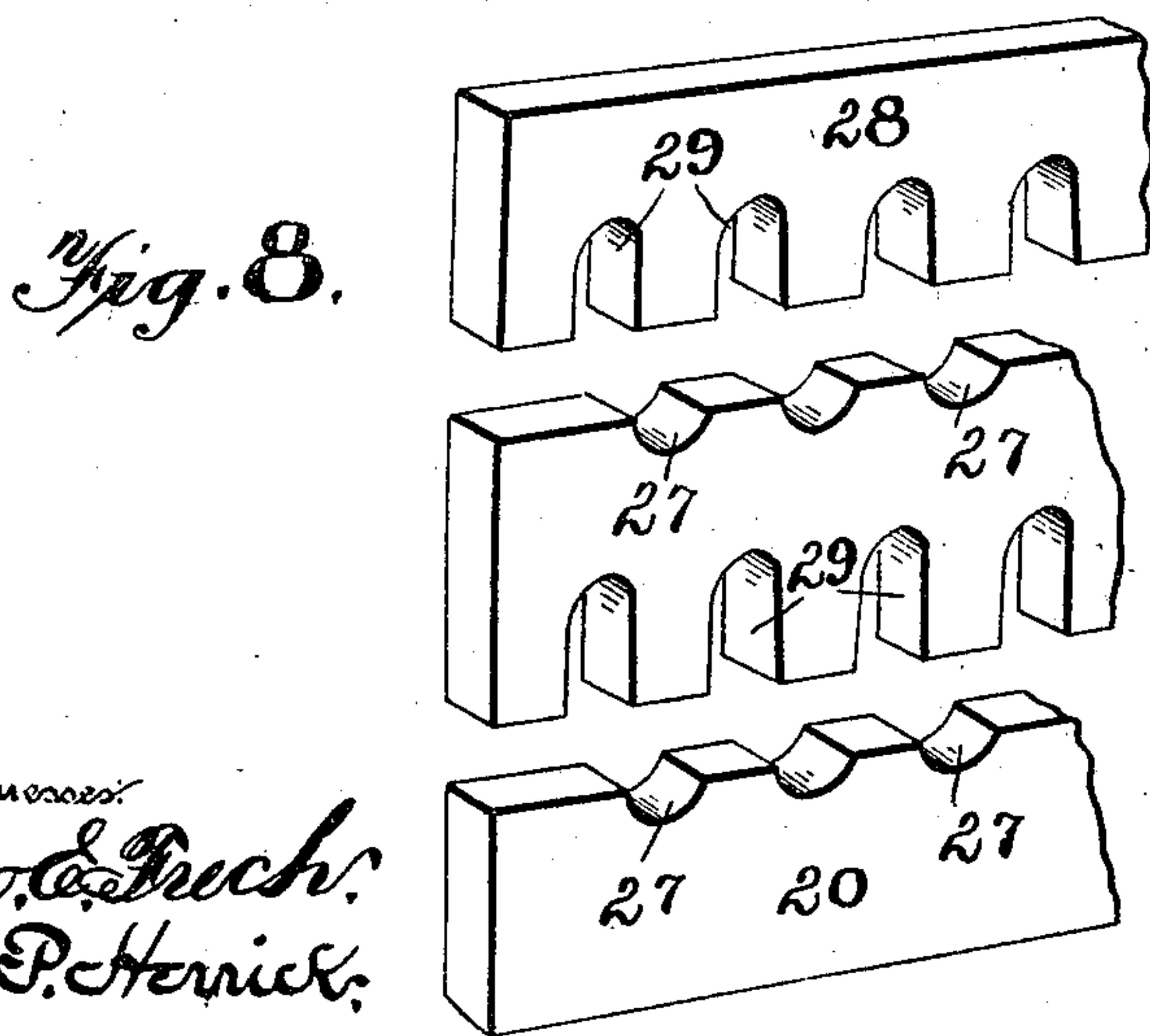
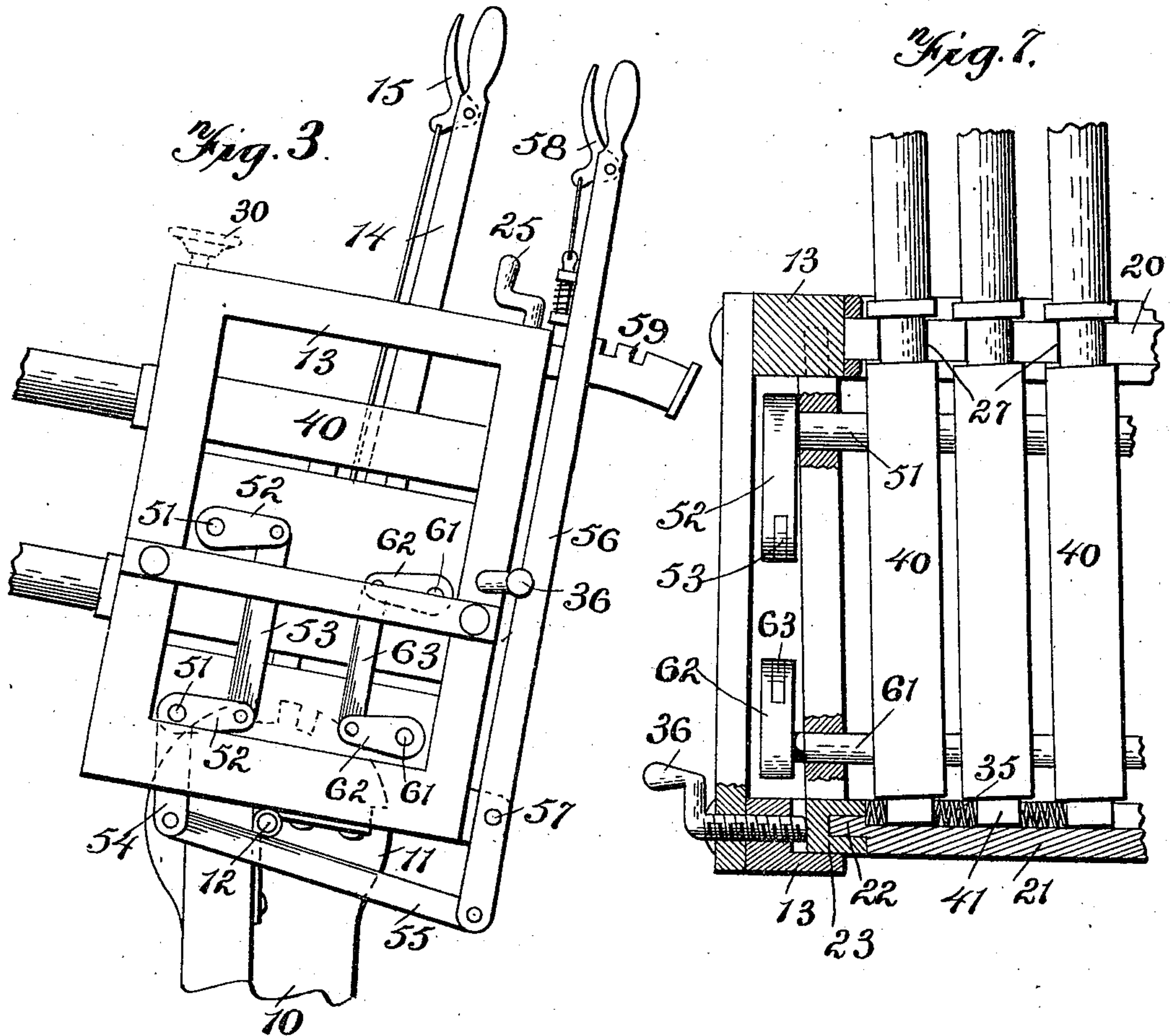
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3 Sheets—Sheet 2.



Witnesses:
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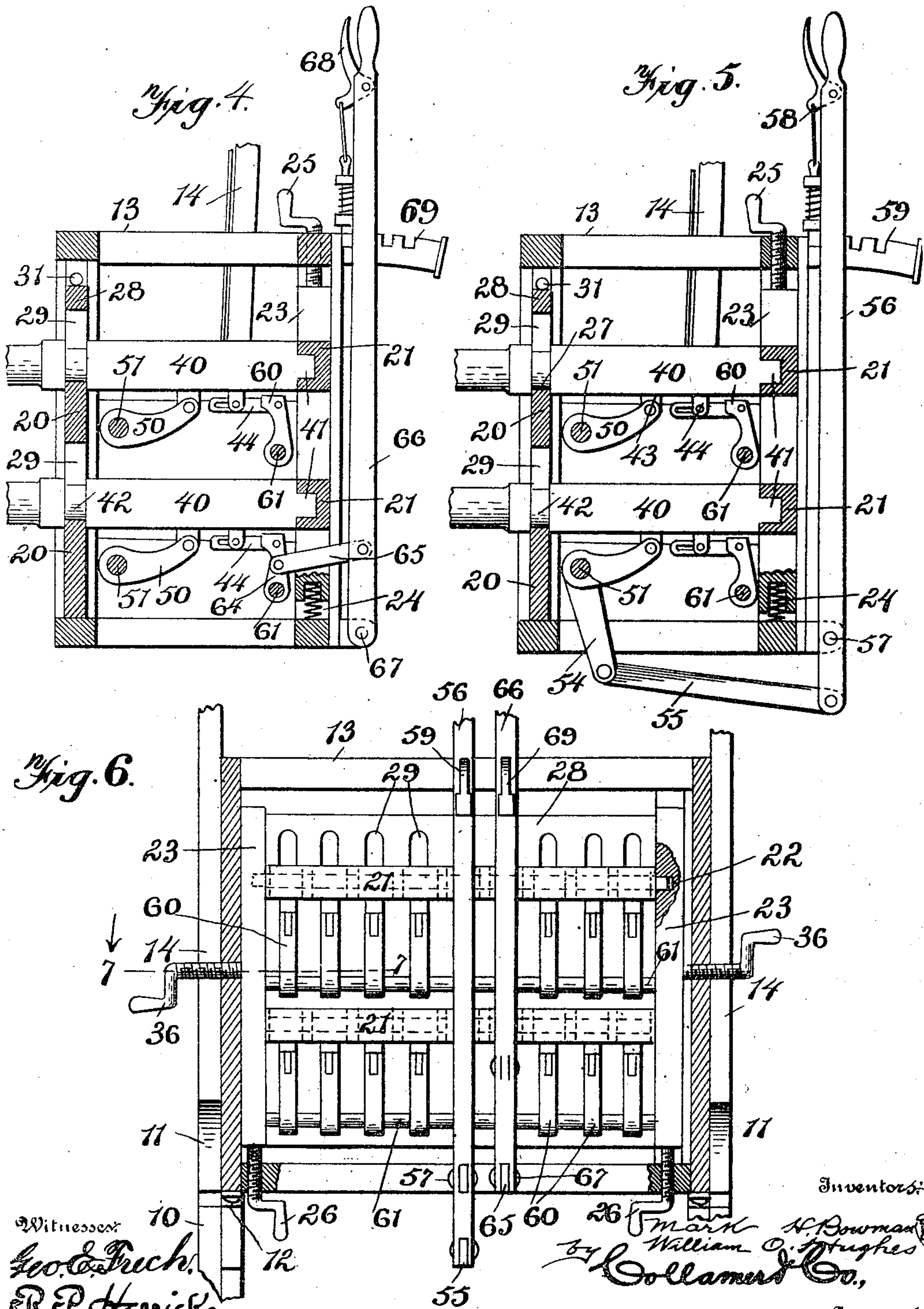
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MACHINE GUN.

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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

MARK H. BOWMAN AND WILLIAM O. HUGHES, OF PINKSTAFF, ILLINOIS

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 662,761, dated November 27, 1900.

Application filed April 5, 1900. Serial No. 11,686. (No model.)

To all whom it may concern:

Be it known that we, MARK H. BOWMAN and WILLIAM O. HUGHES, citizens of the United States, residing at Pinkstaff, in the county of Lawrence and State of Illinois, have invented certain new and useful Improvements in Machine-Guns; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to ordnance, and more especially to machine-guns; and the objects of the same are to construct an improved form of gun-mount located within an armored carriage, to arrange the mount so that it can be tilted to adjust the trajectory, to provide means for increasing or diminishing the area covered by the various guns, and to employ mechanism whereby the guns can be fired in banks.

To these ends the invention consists in the details hereinafter set forth, and illustrated in the accompanying drawings, wherein—

Figure 1 is a section through the complete carriage and mount. Fig. 2 is an end view of the mount tilted to its rearward position. Fig. 3 is a similar view of the mount slightly tilted and with the tilting-lever removed and the nearer bearing in dotted lines. Fig. 4 is a section showing the lever and mechanism for firing. Fig. 5 is a section showing the lever and mechanism for moving the breech-block. Fig. 6 is a rear elevation, partly broken away to show the adjustments. Fig. 7 is a horizontal section on the line 7-7 of Fig. 6. Fig. 8 is a detail of a portion of the fulcrum-bars and keeper.

In the said drawings, 11 designate wheels supporting a running-gear 2, of any suitable character, upon which is mounted a housing 3, of armor, and within the latter are preferably arranged compartments, such as 4, for ammunition, feed, &c. At the forward end may be a seat 5, and doors 6 may permit entrance to the interior of the structure surrounded by armor. The latter is made in converging plates 7 and 8 at the rear end, their adjacent edges being separated by an opening 9; through which firing is done, and the gun-mount proper is suitably supported by the running-gear within the housing in

about the position indicated, in Fig. 1. It is clear that the entire structure is drawn to the point of use and reversed and unlimbered, after which it is ready for operation.

Rising from the running-gear are uprights 10, carrying toothed segments 11, between whose centers is hinged at 12 the gun-mount proper. The latter consists of an open framework 13, to which are secured tilting-levers 14, having thumb-levers 15, that control bolts 16, which take into the teeth of the segments, as will be clearly understood. There are preferably two of the levers 14, one at each end of the mount, and if the latter is small a single operator can manipulate both levers, while if it is large and heavy the strength of two operators may be required. In Fig. 1 the mount is shown in its usual position, in Fig. 2 it is tilted completely to the rear, so that access to the muzzles of the guns can be had from the interior of the housing, and in Fig. 3 the mount is slightly tilted, as when the range is long.

In the present instance we have shown the guns arranged in two series or banks, one above the other; but it will be clear that there could be more or less without departing from the principle of our invention. As seen in Figs. 4 and 5, each gun 40 is supported at the rear end of its barrel proper on a fulcrum-bar 20, extending across and forming part of the mount, while the breech of the gun extends to the rear and is supported in a grooved bar 21, also forming part of the mount. The two bars 21 herein shown have tenons 22 at their extremities, loosely engaging horizontal sockets in the inner faces of uprights 23, the latter forming movable parts of the rear corners of the frame. These uprights may be raised normally by springs 24 at their lower ends and depressed against the tension of said springs by hand-screws 25, the springs and screws engaging fixed parts of the framework 13; or, as shown in Fig. 6, screws 26 may be used at the bottom in place of the springs, and it may be possible with this construction to omit the screws 25 and allow the bars 21 to descend under the weight of the breeches. The mechanism thus far described permits the tilting of the guns quickly to any degree and with great accuracy and nicety. Roughly, they are tilted by means of the levers 14, after

which finer adjustments are effected by raising and lowering the bars 21 and rocking the guns over the fulcrum 20.

Each fulcrum-bar 20 is notched, as at 27, 5 for the reception of the gun-barrels, and above the bar stands a keeper 28, having deep notches 29, alining with the others and standing astride the gun-barrels, so as to permit sighting. The fulcrum-bars and keepers are 10 preferably mounted removably at their ends within the framework 13 and held therein by any suitable means, such as the screw 30 (shown in dotted lines in Fig. 3) or the plug 31, (shown in Fig. 5,) either means being a 15 chuck for holding the fulcrum-bars and keepers rigidly in place. The rear ends of the guns may have stubs 41, fitting in the groove of the bar 21, and just forward of the breech each gun may be grooved, as at 42, whereby 20 it is prevented by the notches 27 and the notches 29 from forward movement, which would disengage its stub from the grooved bar 21, and whereby, also, the rear end of the barrel forward of the groove 42 assists the 25 grooved bar 21 in resisting the force of recoil. By this arrangement when it is desired to remove or replace any individual gun after the loading and firing mechanism described below has been detached it is only necessary 30 to loosen the chucks, raise the proper keeper off the fulcrum-bar, so as to disengage its notch 29 from the groove 42 in the gun, and then lift the latter out of the notch 27 and draw it forward, so as to move its stub 41 out 35 of the grooved bar 21.

As perhaps best seen in Fig. 7, the rear ends of the guns or the stubs 41 are separated by expansive springs 35, of which the endmost 40 in the series stand between the outer guns and the uprights 23. Screws 36 take inward through the end bars of the framework 13 and bear against the outer faces of the uprights, and by adjusting these screws the various springs 35 are compressed slightly and 45 the rear ends of the guns approximated. Rocking laterally over the fulcrum-bar as a support, their front ends will therefore spread a little, so as to cause the machine to cover a 50 greater area, whose size is dependent to an extent upon the range. When these screws are retracted, the springs again separate the rear ends of the guns until their bodies are brought into parallelism or are even made to converge slightly.

55 The construction of the gun 40 and its loading and firing mechanism is not essential to the present invention; but by preference we employ some type of underloading mechanism—such, for instance, as that shown in Patent No. 359,917—although we do not desire 60 to be limited thereto. If this construction is employed, 43 designates the breech-block to each gun, and 44 the trigger mechanism, beyond which it is not considered necessary to describe or illustrate further details of the 65 gun itself.

In connection with guns of this type the

breech-blocks of the guns in each bank are raised and lowered by a series of levers 50, fixed upon a rock-shaft 51, and the shafts of 70 the several banks are caused to move in unison by levers 52, connected by links 53, as best seen in Fig. 3. Projecting from one shaft 51 is an arm 54, connected by a rod 55 with a lever 56, pivoted at 57 to the frame- 75 work 13, and having a thumb-lever 58 actuating a bolt moving over a toothed rack 59; all as best seen in Fig. 5. By drawing the lever 56 to the rear the breech-blocks are lowered and the shells are ejected, as de- 80 scribed in said patent. By tripping the thumb-lever and moving the hand-lever 56 forward the breech-blocks are raised and the firing-pin brought into position for use. In a very much similar manner the triggers 85 44 are connected with levers 60, fast on rock-shafts 61. The latter have end levers 62, connected by a link 63. An arm 64 is connected by a rod 65 with a second lever 66, pivoted at 67, and this lever has a thumb-lever 68, 90 controlling a bolt, moved over a toothed rack 69, all as best seen in Fig. 4. When the firing-lever 66 is moved forward, the triggers are released from the hammers so that the gun can be loaded, and when the firing-lever is 95 drawn to the rear the triggers are moved to release the hammers and the guns are fired.

It will not be necessary to further elaborate upon details, such as the exact sizes, shapes, proportions, and materials of parts, nor to 100 specify that the whole is, preferably about balanced over its pivots 12, so that the loading and firing levers may be light, which is desirable, because they turn bodily with the framework when it is tilted; nor will it be 105 necessary to give the uses and advantages of the machine nor to explain more in detail the interior construction of each gun and of its loading and firing mechanism, all these things being well known to those skilled in gun- 110 nery.

What is claimed as new is—

1. In a machine-gun, the combination with a suitable support; of a gun-mount comprising 115 uprights rising from the support and having toothed segments, a framework hinged to the uprights on a line through the centers of said segments and carrying the guns proper, a tilting-lever secured to each end of the framework, a thumb-lever and bolt therefor 120 which latter engages the teeth of the segment as the framework is tilted, and means for adjusting the inclination of the guns within the framework, as and for the purpose set forth.

2. In a machine-gun, the combination with 125 a gun-mount comprising uprights having toothed segments, a framework hinged to the uprights on a line through the centers of said segments, a tilting-lever secured to the framework, and a thumb-lever and bolt therefor 130 which latter engages the teeth of the segment as the framework is tilted; of the guns proper mounted in said framework, and independent means for adjusting them vertically and

horizontally therein, substantially as and for the purpose set forth.

3. In a machine-gun, the combination with a gun-mount comprising uprights having toothed segments, a framework hinged to the uprights on a line through the centers of said segments, a tilting-lever secured to the framework, and a thumb-lever and bolt therefor which latter engages the teeth of the segment as the framework is tilted; of the guns proper mounted in said framework with their rear ends held in a movable bar thereof, screws for adjusting this bar vertically, and means for adjusting the guns horizontally within said bar, as and for the purpose set forth.

4. In a machine-gun, the combination with the gun-mount comprising an open framework, a fulcrum-bar across its front, and the guns proper resting intermediate their lengths on said fulcrum-bar and having stubs at their rear ends; of a grooved bar at the rear of the framework in whose groove said stubs are seated, uprights at the ends of this bar, springs supporting the uprights, and screws in the framework bearing downward upon them, as and for the purpose set forth.

5. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum-bar across its front and having notches, and the guns proper having grooves intermediate their lengths, resting in the notches of said fulcrum-bar; of a grooved bar at the rear of the framework loosely supporting said rear ends, uprights at the ends of this bar, springs supporting the uprights, and screws in the framework bearing downward upon them, all as and for the purpose set forth.

6. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum-bar across its front and having notches, and the guns proper having grooves intermediate their lengths resting in the notches of said fulcrum-bar and having stubs at their rear ends; of a grooved bar at the rear of the framework in whose groove said stubs are seated, uprights at the ends of this bar, springs supporting the uprights, and screws in the framework bearing downward upon them, as and for the purpose set forth.

7. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum-bar across its front, and the guns proper resting intermediate their lengths on said fulcrum-bar and having stubs at their rear ends; of a grooved bar at the rear of the framework in whose groove said stubs are seated, uprights at the ends of this bar, the latter having tenons loosely fitting sockets in the uprights, expansive springs between the rear ends of the guns and between the outermost guns and the uprights, and screws through the framework against the uprights, as and for the purpose set forth.

8. In a machine-gun, the combination with a gun-mount comprising an open framework,

a fulcrum-bar across its front and having notches, and the guns proper having grooves intermediate their lengths resting in the notches of said fulcrum-bar; of a grooved bar at the rear of the framework loosely supporting said rear ends, uprights at the ends of this bar, the latter having tenons loosely fitting sockets in the uprights, expansive springs between the rear ends of the guns and between the outermost guns and the uprights, and screws through the framework against the uprights, substantially as and for the purpose set forth.

9. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum-bar across its front and having notches, and the guns proper having grooves intermediate their lengths resting in the notches of said fulcrum-bar and having stubs at their rear ends; of a grooved bar at the rear of the framework in whose groove said stubs are seated, uprights at the ends of this bar, the latter having tenons loosely fitting sockets in the uprights, expansive springs between the stubs at the rear ends of the guns and between the outermost guns and the uprights, and screws through the framework against the uprights, as and for the purpose set forth.

10. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum-bar across its front, a keeper-bar in the framework above the fulcrum-bar, and the guns proper resting intermediate their lengths on said fulcrum-bar and having stubs at their rear ends; of a grooved bar at the rear of the framework in whose groove said stubs are seated, uprights at the ends of this bar, means for adjusting the height of the uprights and with them that of the bar, and means for adjusting the position of the rear ends of the guns within said groove, substantially as described.

11. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum-bar across its front and having notches, a keeper-bar in the framework above the fulcrum-bar and having notches registering with those therein, and the guns proper having grooves intermediate their lengths resting in the notches of said fulcrum-bar; of a grooved bar at the rear of the framework loosely connecting said rear ends, uprights at the ends of this bar, means for adjusting the height of these uprights and with them that of the bar, and means for adjusting the position of the rear ends of the guns within said groove, substantially as and for the purpose set forth.

12. In a machine-gun, the combination with a gun-mount comprising an open framework, a fulcrum across its front and having notches, a keeper-bar in the framework above the fulcrum-bar and having notches registering with those therein, and the guns proper having grooves intermediate their lengths resting in

the notches of said fulcrum-bar and keeper and having stubs at their rear ends; of a grooved bar at the rear of the framework in whose groove said stubs are seated, uprights
 5 at the ends of this bar, means for adjusting the height of the uprights and with them that of the bar, and means for adjusting the position of the stubs at the rear ends of the guns within said groove, substantially as described.

10 13. In a machine-gun, the combination with a gun-mount, and means for supporting it and permitting it to be tilted bodily; of a series of guns arranged in a plurality of banks, beneath each bank a rock-shaft, levers thereon
 15 connected with the breech-blocks, levers on all the shafts connected by a link, an arm on one shaft, a loading-lever connected with said arm and having a thumb-lever operating a bolt moving over a toothed rack, and means
 20 for firing the guns, as and for the purpose set forth.

14. In a machine-gun, the combination with the gun-mount and means for supporting it; of a series of guns arranged in a plurality of
 25 banks, beneath each bank a rock-shaft, levers thereon connected with the breech-blocks, levers on all the shafts connected by a link, an arm on one shaft, a loading-lever connected with said arm and having a thumb-
 30 lever operating a bolt moving over a toothed rack, means for adjusting the inclination of the banks of guns within the framework, and means for firing the guns, as and for the purpose set forth.

35 15. In a machine-gun, the combination with the gun-mount and means for supporting it; of a series of guns arranged in a plurality of banks, beneath each bank a rock-shaft, levers thereon connected with the triggers, levers
 40 on all the shafts connected by a link, an arm on one shaft, a firing-lever connected with said arm and having a thumb-lever operating a bolt moving over a toothed rack, means for adjusting the inclination of the banks of
 45 guns within the framework, and means for

loading the guns, as and for the purpose set forth.

16. In a machine-gun, the combination with the gun-mount and means for supporting it and permitting it to be tilted bodily; of a se- 50
 ries of guns arranged in a plurality of banks, beneath each bank a rock-shaft, levers thereon connected with the triggers, levers on all the shafts connected by a link, an arm on one shaft, a firing-lever connected with said arm 55
 and having a thumb-lever operating a bolt moving over a toothed rack, and means for loading the guns, as and for the purpose set forth.

17. In a machine-gun, the combination with 60
 the gun-mount framework, a series of fulcrum-bars therein having notches in their upper edges; a series of keeper-bars also therein having notches registering with those in the fulcrum-bars, and chucks in the frame- 65
 work for holding said series removably in place; of a series of guns whose bodies rest in said notches, bars to which their rear ends are removably attached, and means for ad-
 justing the position of said rear ends, as and 70
 for the purpose set forth.

18. In a machine-gun, the combination with the gun-mount framework, a series of fulcrum-bars therein having notches in their upper edges, a series of keeper-bars also 75
 therein, and chucks in the framework for holding said series removably in place; of a series of guns whose bodies have grooves which rest in said notches, bars to which their rear ends are removably attached, and means 80
 for adjusting the position of said rear ends, as and for the purpose set forth.

In testimony whereof we have affixed our signatures in presence of two witnesses.

MARK H. BOWMAN.
 WILLIAM O. HUGHES.

Witnesses:

RICHARD S. STEFFY,
 GEORGE W. STEVESON.