

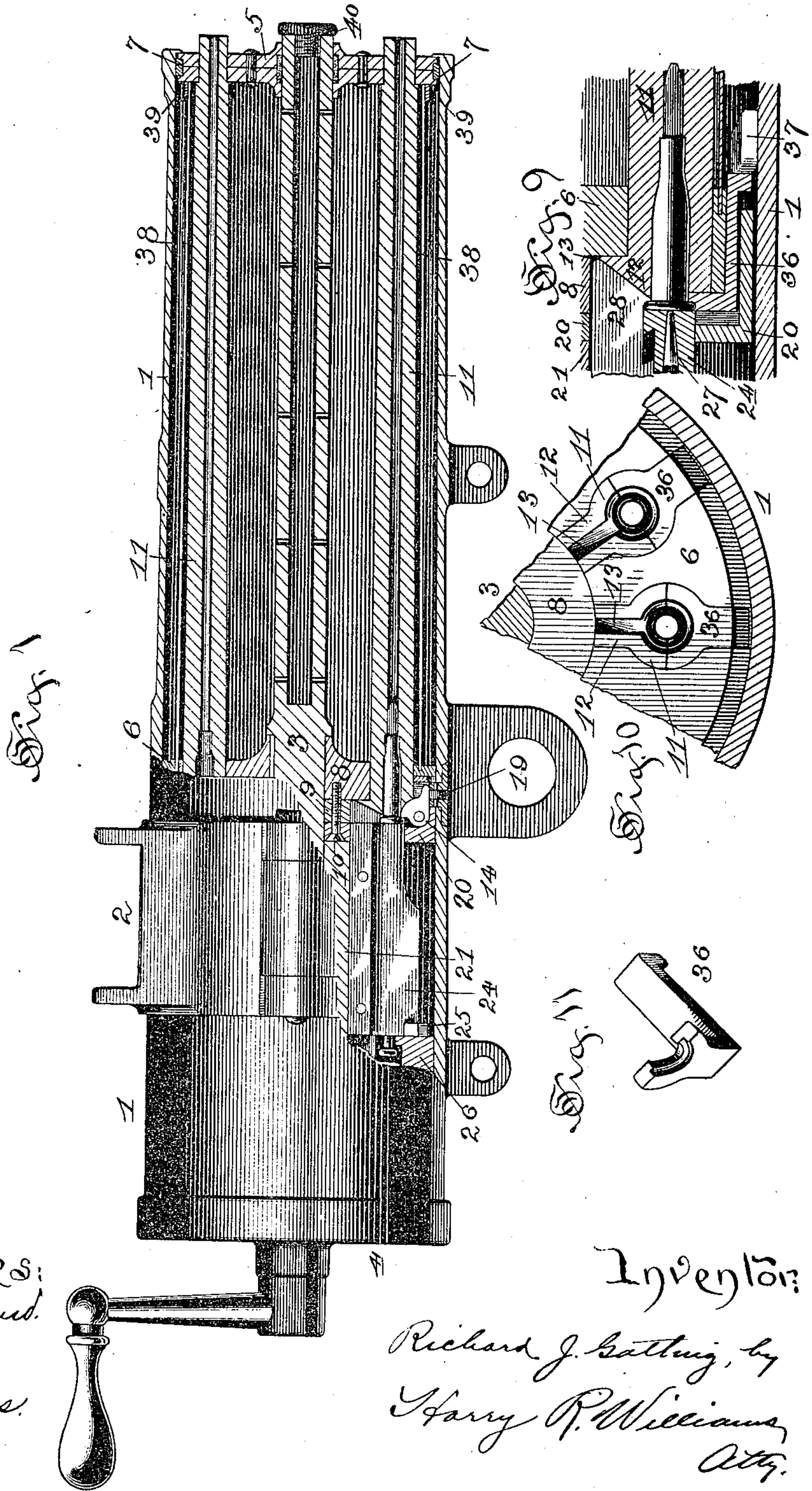
(No Model.)

3 Sheets—Sheet 1

R. J. GATLING
MACHINE GUN.

No. 497,781.

Patented May 23, 1893.



Witnesses:
C. E. Buckland.
D. A. Phelps.

Inventor:
Richard J. Gatling, by
Harry R. Williams
Atty.

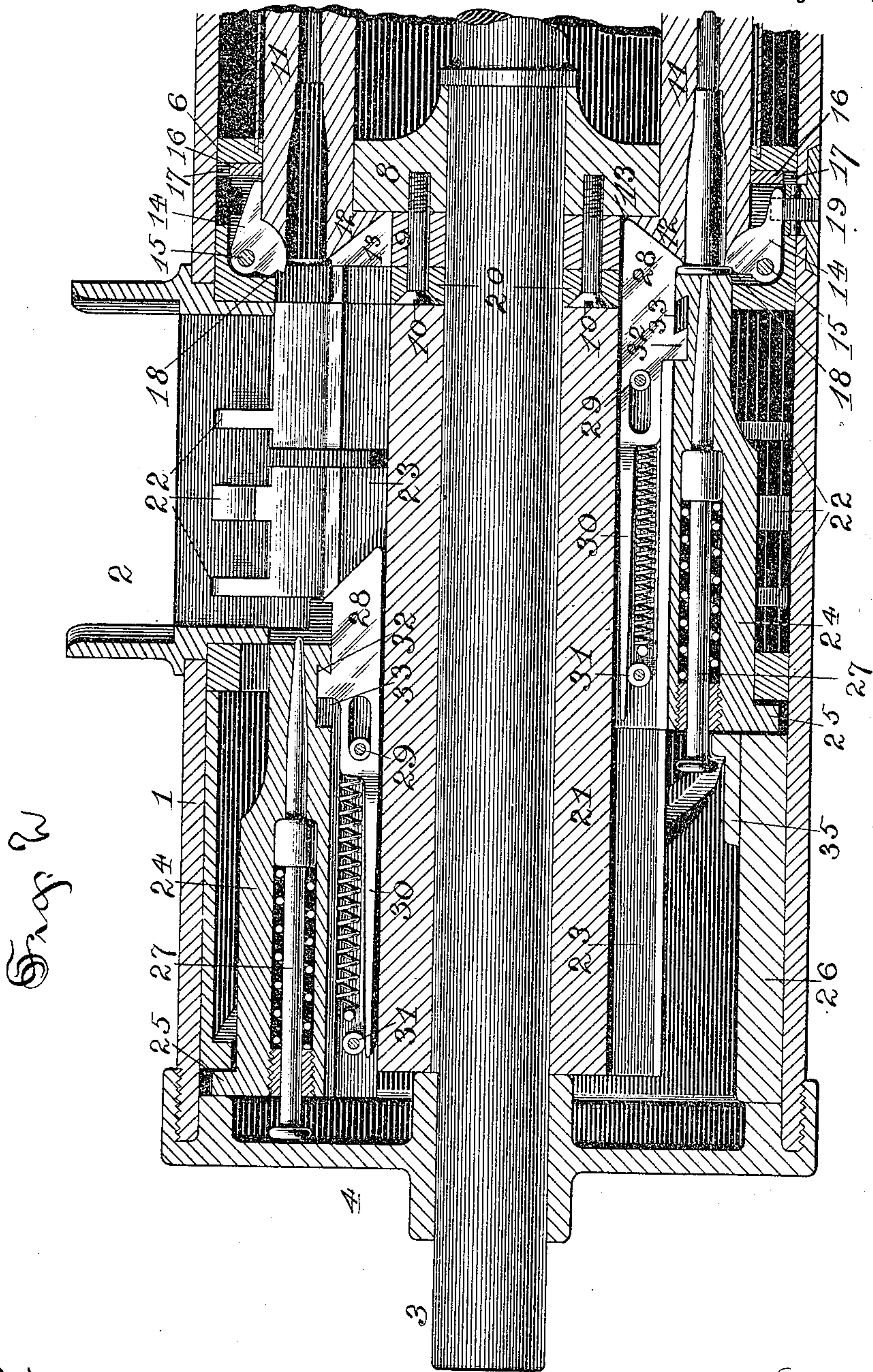
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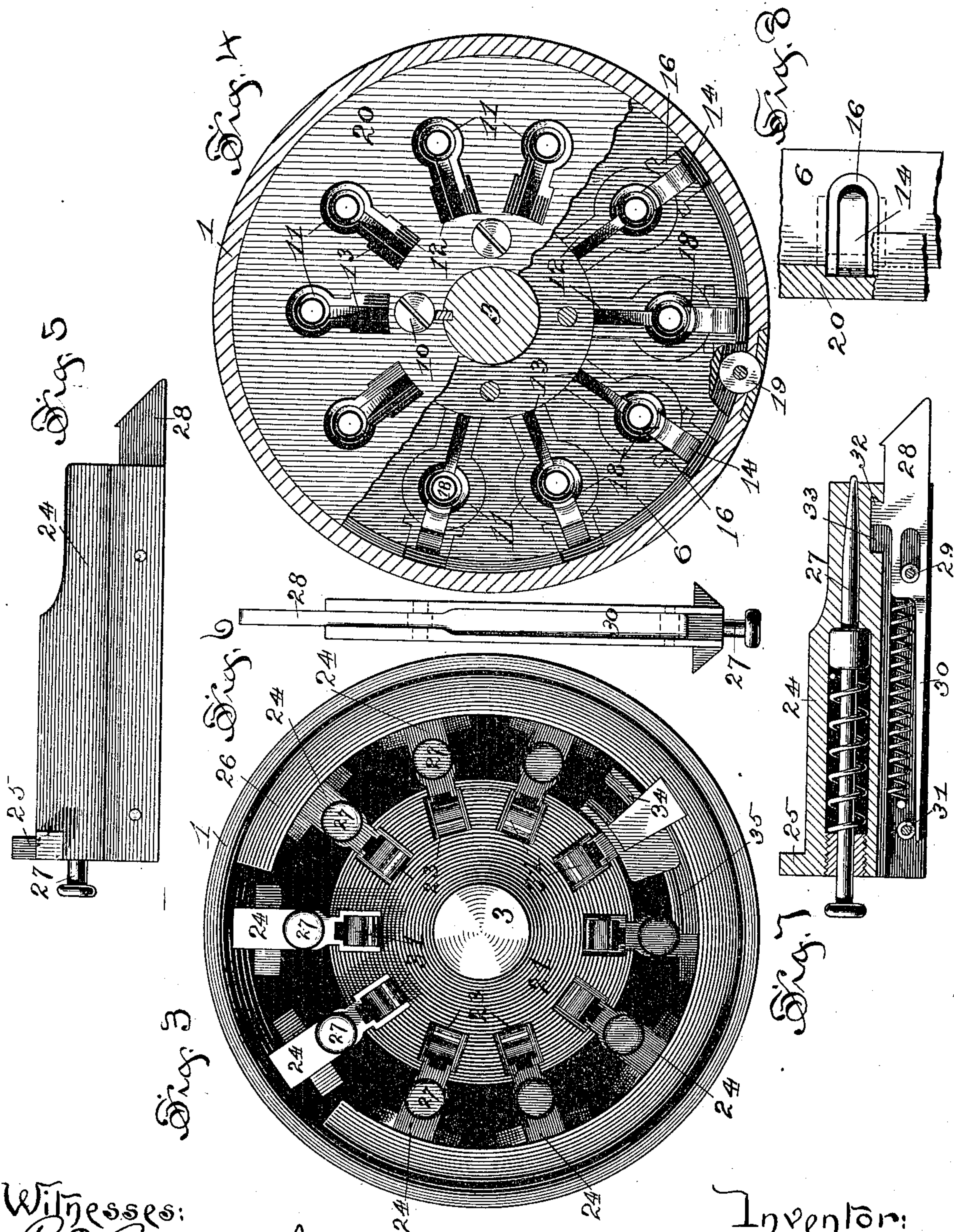
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UNITED STATES PATENT OFFICE.

RICHARD J. GATLING, OF HARTFORD, CONNECTICUT.

MACHINE-GUN

SPECIFICATION forming part of Letters Patent No. 497,781, dated May 23, 1893.

Application filed May 7, 1892. Serial No. 432,146. (No model.)

To all whom it may concern:

Be it known that I, RICHARD J. GATLING, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machine-Guns, of which the following is a full, clear, and exact specification.

The invention relates to the class of machine or battery guns known as Gatling guns, in which the barrels and locks are grouped about a central shaft around which they revolve in loading and firing, the object being to provide such a gun with a simple ejecting mechanism for aiding the extractors in removing the exploded cartridges, insuring a better extraction and increasing the efficiency and durability of the lock and extractor, and also to provide a simple means for admitting and holding a cooling liquid in the casing for preventing overheating of the barrels during action.

Referring to the accompanying drawings, where the invention is illustrated as applied to a gun of this class having ten barrels:— Figure 1 is a side view of the gun with a part cut in central vertical section to show the construction. Fig. 2 is a central vertical longitudinal section on an enlarged scale, of the butt of the gun. Fig. 3 is an end view with the cascabel plate removed. Fig. 4 is a cross-sectional view at the rear barrel plate, with a portion of the flanged disk which covers it, broken away. Fig. 5 is a side view of the lock. Fig. 6 is a top view. Fig. 7 is a sectional view of the same. Fig. 8 is a detail view of a portion of the edge of the rear barrel plate, showing an ejector. Fig. 9 is a detail sectional view of the rear end of a barrel and a portion of the rear plate showing a modified form of ejector. Fig. 10 is a face view of the same; and Fig. 11 is a perspective view of the latter form of ejector.

In the views 1 indicates the casing which is a metallic cylinder having any common means of attaching it to the mount or carriage, and the usual opening 2 for the reception of the ordinary cartridge feed case. A shaft 3 having at the butt the operating crank, passes through the cascabel plate 4, and is keyed to the barrel plates 5 and 6 which rotate freely in the casing. The front

plate 5 is preferably formed of two disks secured together by rivets or screws with a ring 7 placed loosely in a groove in the periphery to reduce friction, while the rear plate is preferably formed of a disk 8, and a steel ring 9 held thereto by screws 10.

The barrels 11 which pass through the front plate and are firmly secured to the rear plate preferably have projecting lugs 12 at the breech back of the rear plate, in which are cut mortises 13 for the entrance of the extractors. The breeches of the barrels are chambered for the reception of the cartridges, and adjacent to these ends of the barrels are placed ejectors 14 which are preferably hung on pivots 15 supported in blocks 16 inserted into mortises 17 cut in the edge of the rear plate. These ejectors have shoulders 18 that project into the cartridge chambers and oscillate in the path of the cartridges so as to lie in front of their heads when the cartridges are loaded in the bore, and attached to the casing near the bottom in the path of these ejectors, so as to make contact with and oscillate them as they revolve with the rear plate, is a pin, wedge, or roll, 19.

The blocks 16 are preferably U-shaped, as shown in Fig. 8, with flanges to prevent them from rising out of the mortises when in motion, while back of them with a flange projecting over the edge of the rear plate, is secured a disk or cap 20.

Keyed to the shaft so as to rotate with it back of the rear plate is the cylinder 21 having the cartridge carriers 22 that revolve beneath the loading opening, and the grooves 23 in which reciprocate the breech plugs and locks 24 formed of blocks of suitable metal having their sides shaped to fit nicely and slide freely in the grooves.

The locks are provided with lugs 25 at one end that project into the groove in the cam cylinder 26 in such manner that the locks are reciprocated by the lugs and cam as they revolve. In perforations through the locks are the firing pins 27 normally thrust forward by coiled main springs, and in mortises along one edge of these locks are the extractors which are slotted and move a short distance independently of the locks upon pins or rollers 29 with their spring tails or rear ends 30 resting upon pins or rollers 31. The front

ends of the extractors are provided with hooks for engaging the rims of the cartridges, and they are thrust forward by springs so that normally the tenons 32 are at the forward ends of the mortises 33 in the lock. When the cam has pushed the locks, during their rotation, way forward, the ends of the extractors pass into and fill up the mortises 13 in the lugs 12, and, abutting against the ends of the barrels, are so pressed backward that the tenons 32 are at the rear ends of the mortises 33, while the ends of the locks which form the breech plugs, fill the openings in the cap 20 at the rear of the barrels and back up the cartridges.

The cam cylinder 26 supports on the interior near the bottom post to which is attached the cocking switch 34 (Fig. 3) the circular groove of which catches and holds for a short time as they revolve, the flanged heads of the firing pins so that the main springs are compressed as the locks move forward to enable them to throw the firing pins violently forward when the heads reach and drop out of the end of the groove of the switch as in the gun in common use. The cam cylinder is made thicker or provided with a recoil plate 35 near the bottom where the cartridges are exploded, to receive the concussion of the locks at the discharge.

When the crank and shaft are rotated and the barrels and locks revolve to fire the gun, the cam thrusts each lock in succession closely against the cartridge as it is being fired, the extractor being forced to the backward limit of its movement in the lock by contact with the end of the barrel, and when the cam commences to pull back the lock after firing, the extractor does not at once move, but is thrust forward by its spring as the lock retreats, until the tenon 32 reaches the front end of the mortise 33. Then of course the extractor retreats with the lock and withdraws the exploded cartridge which has been started from the chamber by the ejector of the barrel in which the cartridge is fired. The roll 19 is so located in its attachment to the casing that after the cartridge is fired, between the time the lock commences its return movement and the time when the extractor begins to retreat, the edge of the ejector 14 in its rotation rides up on the edge of the roll and is oscillated so that it starts the cartridge from its chamber, and then the retreating extractor readily pulls the loosened shell from the chamber so that it may be expelled from the gun.

In the form shown in Figs. 9, 10, and 11 the ejectors 36 are formed to slide in the mortises in the edge of the rear barrel plate, instead of oscillating therein, although the oscillating form is preferred, as the oscillating ejector always fills its opening in the end of the barrel. These ejectors 36 are shaped at one end to conform to about one-half of the end of the barrel, and they are thrown forward to position by the cartridges as they are thrust into the bore and forced backward as they rotate with the rear barrel plate by a

roll, wedge or block 37 secured to one side of the casing, so as to start the cartridges before the extractors begin to pull.

A cylindrical shell 38 is held at one end tightly in a groove in the rear barrel plate, and at the front end by a flange 39 on the front plate so as to surround the barrels and revolve with them, and a portion of the shaft 3 is bored and provided with openings that lead from the bore to the interior of the shell. The front end of the shaft is threaded and provided with a cap or nut 40 which can be removed at any time so that water or any other cooling liquid may be poured into the shell through the shaft to keep down the temperature of the barrels during action.

An ordinary feed case with cartridges is placed above the opening through the casing and as the shaft is rotated the carriers draw the cartridges into the gun. As the barrels and locks revolve the cam at the butt reciprocates the locks causing them to successively and continuously feed, load and fire the live cartridges and extract the ejected exploded shells.

When the gun is provided with the ejectors described, the discharged shells which are usually swollen and expanded by the explosion and tightly fit the chamber in the bore, will be started by the action of a powerful and strong little ejector which can be constructed so wide as to preclude any possibility of pulling or tearing the heads off the shells which stick in the bore, and which ejectors act with but little additional friction. As the extractors do not have to start the cartridges from the bore they may be lighter and will last longer as but little power is required to remove the loosened shells, thus reducing the weight and also the momentum of the reciprocating locks.

With the construction shown for surrounding the barrels with a cooling liquid, the water jacket or shell as it revolves with the barrel plates and barrels may be permanently and tightly fitted in place so that the liquid cannot leak or evaporate, and at the same time the liquid may be readily poured in or drawn out from around the barrels.

I claim as my invention—

1. In combination in a machine gun having a group of barrels, movable ejectors located adjacent to each barrel, locks bearing extractors adapted to reciprocate toward and from each barrel, and a cam for reciprocating the locks, substantially as specified.

2. In combination in a machine gun having revolving barrels, movable ejectors located adjacent to each barrel, a projection attached to the casing in the path of revolution of the ejectors for moving them, and locks bearing extractors adapted to reciprocate toward and from the barrels, substantially as specified.

3. In combination in a machine gun having revolving barrels, locks and extractors, movable ejectors located adjacent to each barrel, and a projection attached to the casing in the

path of revolution of the ejectors for moving them, substantially as specified.

4. In combination in a machine gun, a revolving shaft supporting barrel-plates and a cylinder, barrels supported by the plates, ejectors located in mortises in the plates adjacent to the barrels, and reciprocating locks and extractors supported by the cylinder, substantially as specified.

5. In combination with the revolving barrels of a machine gun of the within described class, oscillating ejectors pivoted in sockets in the barrel plate adjacent to and movable with the breech of each barrel, substantially as specified.

6. In combination with the revolving barrels of a machine gun of the within described class, a lock consisting of a block bearing a spring firing pin, an extractor loosely pivoted to the block so as to have small independent longitudinal and oscillating movements, with a wide hooked portion on one side of the pivot and a narrow elastic portion on the opposite side of the pivot, and a spiral spring

thrusting longitudinally against the extractor, the longitudinal movement of the extractor being controlled by the spiral spring, and the oscillating movement by the integral elastic portion, substantially as specified.

7. In combination with the revolving barrels of a machine gun of the within described class, a lock consisting of a block bearing a spring firing pin, and an extractor having a small reciprocating movement independent of the block supported on rollers journaled in mortises in the block, substantially as specified.

8. In a machine gun having a group of moving barrels, a central shaft for supporting such barrels, said shaft having a longitudinal perforation with openings leading to the interior of the casing, and a cap for closing the end of the perforation, substantially as specified.

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