

THE

GATLING GUN



Paul Wahl & Don Toppel

FOUR: 1870-1880

A TIME FOR WAR

BY 1870, sabers that had rattled in the preceding decade began to be drawn. Compared with the American Civil War and World Wars I and II, the conflicts of the late nineteenth century may seem minor, yet most of these "little wars" significantly affected world history.

The first major European power to adopt the Gatling Gun was Russia, in 1867, a year after the weapon's adoption by the United States. Quite a number of other countries soon followed in equipping their armed forces with Gatlings; England, however, waited until 1874. Ten years later, there were few nations without Gatling guns in their armament. Until superseded by the automatic machine gun, the Gatling was the most widely used weapon of its type. It saw action in nearly every war of that era.

FRANCE'S SECRET WEAPON

The resounding defeat of Austria by the Prussians in the Seven Weeks War of 1866 was credited to a great extent to the effectiveness of the Dreyse *Zündnadelgewehr* (needle gun) in the hands of well-trained German infantrymen, who had been using this bolt-action breechloader since 1842. With the needle gun, a soldier could deliver five or more aimed shots per minute, giving considerable superiority of fire over an enemy equipped with muzzle-loading muskets. Publicity given the conspicuous successes of this rifle in combat had served to damage the morale of French troops, who expected to have to face it soon.

France did have a counterweapon in the similar *Chassepot*, adopted in 1866, but it had not been produced in sufficient quantity for general issue. Napoleon III, feverishly preparing France for the inevitable and seemingly imminent war with Prus-

sia, began to look about for an "equalizer" in a multifiring weapon and seized upon the Mitrailleuse, a kind of volley gun. As far back as 1863, the Emperor had displayed interest in the Gatling but, by the time he saw and tested it during the fall of 1867, the Mitrailleuse had already been adopted. By imperial order, manufacture of this gun was begun, with highest priority, at Meudon Arsenal under the direction of Commandant de Reffye.

Production of the French Mitrailleuse was cloaked in darkest official secrecy. Only those actually concerned with its manufacture were allowed to see the gun. When a finished piece left the factory, it was enveloped in tarpaulins and heavily guarded. As France's secret weapon, the Mitrailleuse was the subject of a good deal of propaganda designed to demoralize the enemy (who probably were laughing over their intelligence reports) and to bolster the flagging fighting spirit of French armed forces. Stories that the French had a terrible new weapon that would decimate her enemies appeared with regularity in the Gallic press. The gun was never described or even mentioned by name.

Subject of all this secrecy was the twenty-five-year-old Fafschamps-Montigny Mitrailleuse, warmed over by De Reffye. This weapon was invented in 1851, ten years before the advent of the Gatling Gun, by Captain Fafschamps of the Belgian Army. Some years after its invention, two Belgian ordnance engineers, Joseph Montigny and Louis Christophe, improved the Mitrailleuse and the former subsequently produced several such guns at his plant at Fontaine l'Evêque; these were employed in arming Belgian forts. The Mitrailleuse manufactured in France after 1867 incorporated some changes made in its design by De Reffye, but was essentially the same as the Montigny version. The De Reffye Mitrailleuse had 25 barrels instead of 37, employed the Metford system of rifling, and was chambered for the standard Chassepot cartridge.



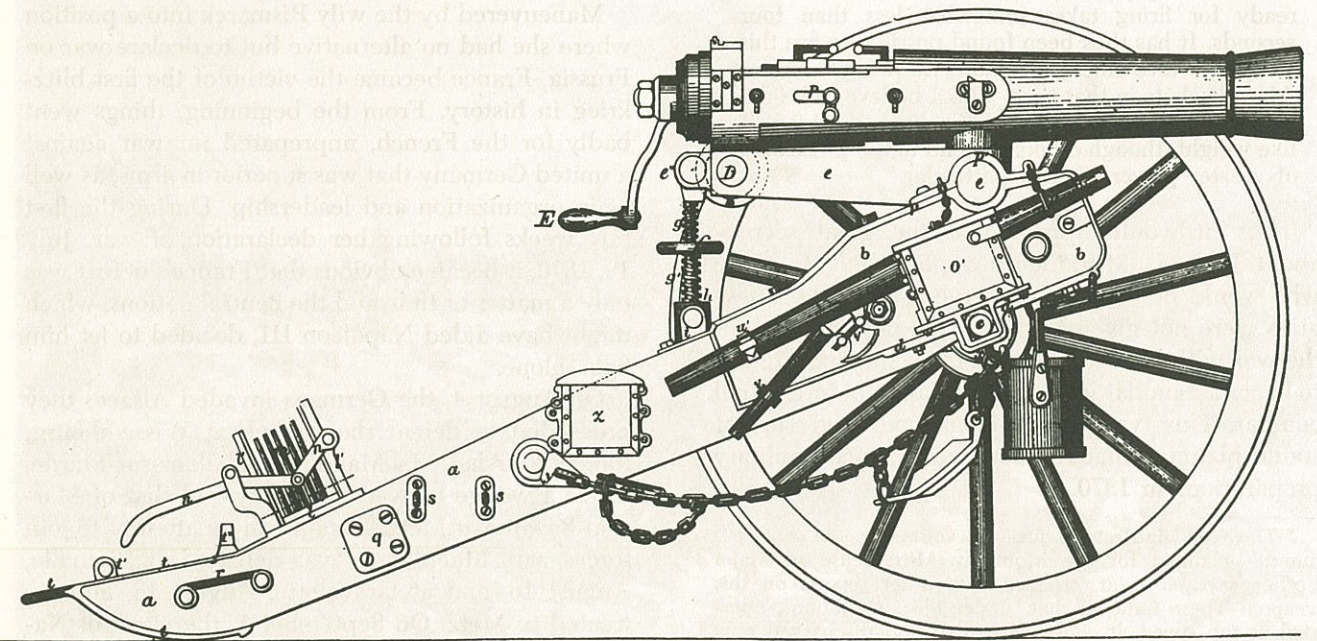
While France jealously guarded her "great military secret," any ordnance man who was not already familiar with the Mitrailleuse could read all about it in the *British Journal of the Royal United Service Institution* which, in 1869, published a paper, "On Mitrailleurs, and Their Place in the Wars of the Future," by Maj. G. V. Fosbery. In it, the Montigny Mitrailleuse, almost identical to France's De Reffye gun, was illustrated and described in detail:

The Montigny mitrailleur consists of an assemblage of barrels contained in a wrought-iron tube, mounted much on the same principle as an ordinary field gun, which, indeed, it somewhat resembles in form. To this a massive breech action is attached sliding between heavy iron plates. This is controlled by a jointed lever, and contains a simple contrivance for the separate and successive ignition of the cartridges. The cartridges are carried in steel plates perforated with holes, corresponding in number and position to the chambers of the barrel, of which, indeed, these holes form portions, being bored and finished with the same tools, and at the same time as the chambers themselves. These plates are about eleven millimetres in thickness, and when the cartridges (which are central fire) are dropped into

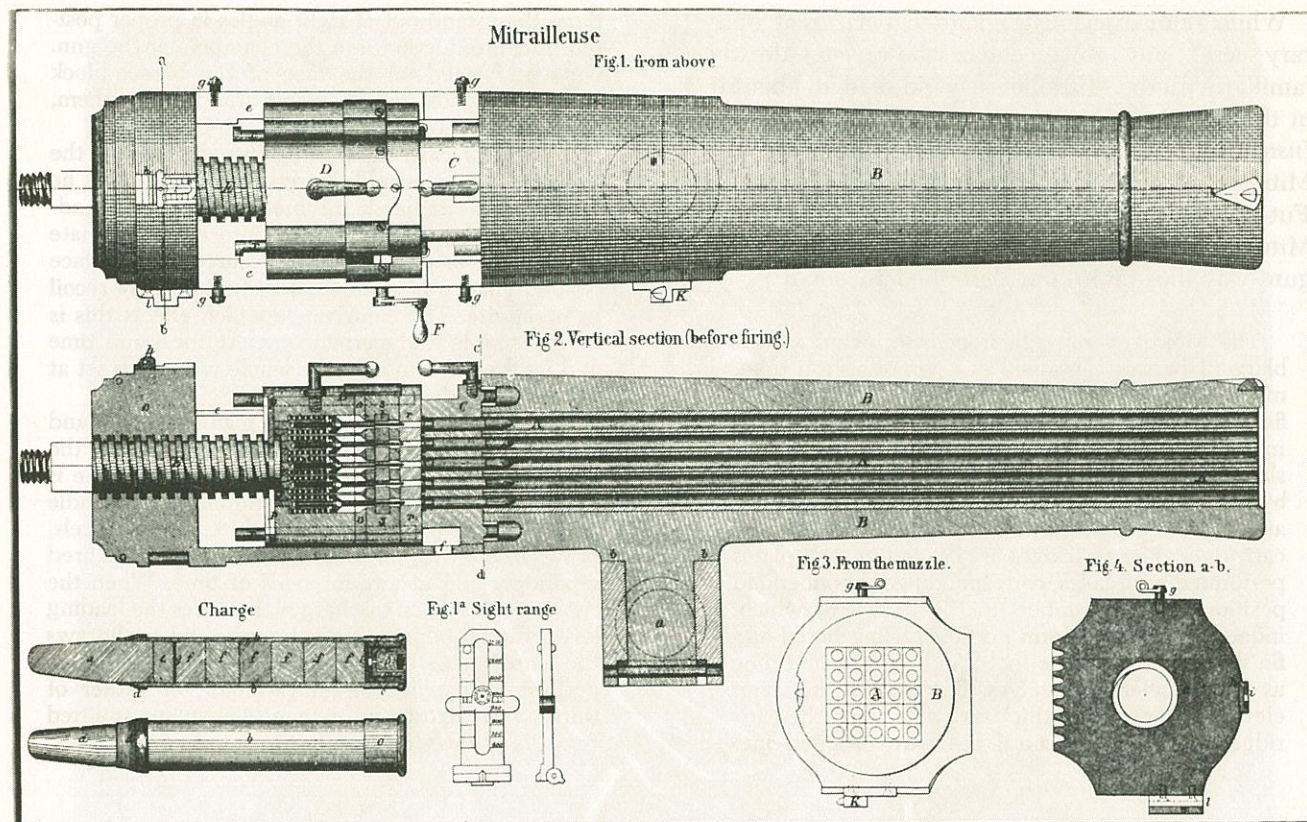
them they stand out at right angles in proper position for introduction into the chambers of the gun. Grooves formed on the face of the breech-block receive the plate, which, being dropped into them, advances or retires with the breech-block itself.

A plate of cartridges being introduced into the gun, the gunner would depress the lever, which he holds in his left hand, the breech-block would advance, pushing each cartridge into its appropriate barrel, and finally becoming secured in its place beyond chance of accidental disturbance by recoil or otherwise. The contrivance which effects this is a very simple and perfect one. At the same time and by the same motion the whole weapon is set at full cock, ready for firing.

The gunner now quits the loading lever, and grasping the firing handle at the right side of the gun awaits the order to fire. One second of time is sufficient to give a complete revolution of the handle and discharge the whole of the thirty-seven barrels, of which the weapon consists, but each may be fired separately and at any intervals of time. When the last barrel has been discharged, he raises the loading lever, thereby opening the breech, and withdraws the empty cases by means of the plate, which now performs the office of an extractor, or rather of thirty-seven extractors in one. The plate is lifted from its groove, carrying with it the empty cases,



French Mitrailleuse of 1870, 25 barrels, caliber 13mm.



Mechanism of 1870 Mitrailleuse.

and replaced by one filled with loaded cartridges, and the operation is repeated. To open the gun, remove the empty plate, insert a full one, and reclose ready for firing takes somewhat less than four seconds. It has thus been found possible to fire this weapon twelve times per minute, throwing therefore 444 rifle shots in that time. This I believe to be the largest number ever yet thrown by a machine of like weight, though others pretend to the possession of greater powers in this particular.*

Thus, it would appear that the great secrecy about France's Mitrailleuse applied only to those who would be expected to serve it in battle. These guns were not given to the troops until the eve of the war with Prussia, denying them the opportunity to become familiar with a new weapon before actual combat. This typified the inefficiency and lack of sound planning that characterized France's military preparations in 1870.

* The very high rate of fire—12 volleys or 444 shots per minute—claimed for the Montigny Mitrailleuse in Major Fosbery's paper is at variance with other reports on this weapon. These indicate that, under ideal conditions, operated at top speed, it could be loaded and discharged only five times per minute at the most, giving a volley fire of 175 rounds. In the 1870 British trials, a Montigny Mitrailleuse, fired at maximum speed for two minutes, delivered eight volleys or 296 shots.

FRANCO-PRUSSIAN WAR

Maneuvered by the wily Bismarck into a position where she had no alternative but to declare war on Prussia, France became the victim of the first blitzkrieg in history. From the beginning, things went badly for the French, unprepared for war against a united Germany that was superior in arms, as well as in organization and leadership. During the first few weeks following her declaration of war, July 19, 1870, it became obvious that France's defeat was only a matter of time and the neutral nations, which might have aided Napoleon III, decided to let him fight alone.

On August 4, the Germans invaded Alsace; they proceeded to defeat the French at Wissembourg, forced Marshal MacMahon to Châlons-sur-Marne, drove a wedge between his army and that of Marshal Bazaine at Metz. Bazaine, in an attempt to join forces with MacMahon, was defeated at Vionville, August 16, and at Gravelotte, August 18, and retreated to Metz. On September 1, the effort of Napoleon and MacMahon to relieve Bazaine resulted in the disaster of Sedan, in which the Emperor and 100,000 French troops were captured. When news

of Napoleon's capitulation reached Paris, there was a bloodless revolution and, the Emperor deposed, a provisional government formed under Favre, Gambetta, and Trochu. The new republic continued the fight against the invaders, but the German victory was a *fait accompli* at Sedan. On September 19, the German troops began the siege of Paris, which lasted until the armistice of January 28, 1871.

Defeat of the French, pioneers in the use of the machine gun in this war, constituted in the eyes of many military men a defeat for this type of weapon. To the contrary, Lieut. John H. Parker, U.S.A., in his book *Tactical Organization and Uses of Machine Guns in the Field* (1899) states:

Summing up the use of machine guns in the Franco-Prussian War, it may be said that the French were defeated in the campaign, not because they used machine guns, but because they blundered in every other possible way. Their artillery was inefficient, their cavalry worthless, and their generalship conspicuous by its absence. Powerful as the imperfect mitrailleuse was, it was unable to rescue the doomed nation from the fate it had prepared for itself by gross military incompetence in every other part of the war.

The ineffectiveness of the Mitrailleuse in this conflict was due chiefly to the way in which it was employed by the French. Since it looked like a field gun, the Mitrailleuse was organized into batteries as artillery and used against enemy field guns at the effective range of the latter. While the Mitrailleuse was not really effective at more than 400 yards, the range of opposing Krupp guns was 4,000 yards. Knocking out the Mitrailleuse at long and safe range became a favorite sport of German gunners, who repeatedly put the French guns out of action. On a few occasions, the Mitrailleuse was used intelligently and with good effect in support of infantry, instead of being put in line with field guns and exposed to long-range shelling. In these instances, it scored impressively, although not decisively, in enemy casualties.

In *Colburn's United Service Magazine*, October 1894, Lieutenant Pratt, R.A., says: "At Gravelotte, when taking the offensive, 94 per cent of the German killed and wounded were due to mitrailleuse and small-arm fire, and but 5 per cent to artillery fire."

The official German account of the action of the



Effect of the Mitrailleuse, Battle of Gravelotte.

38th Prussian Infantry Brigade in the bloody battle at Mars-la-Tour says:

The brave battalions are forced to fall back into the valley beneath, and the fire of the adversaries from mitrailleuses advancing to the crest increases the losses almost to annihilation. Cavalry were then pushed forward by the Prussians to protect the shattered remnant, but in consequence of the violent mitrailleuse fire the leader was unable to deliver home his attack.

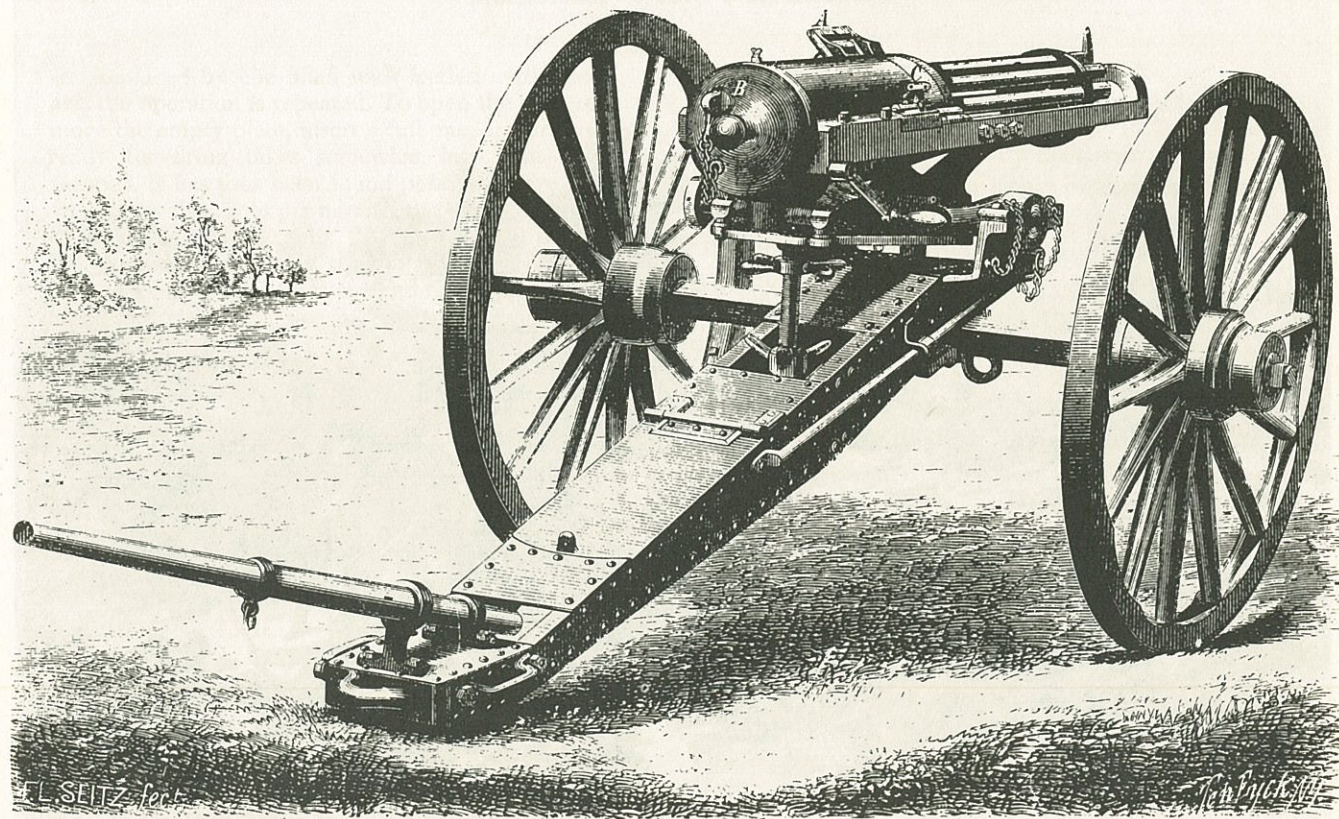
According to *Colburn's United Service Magazine*, October 1881, German losses here were 72 officers, 2,542 men, killed, wounded, and missing, of 95 officers and 4,546 men engaged; proportion of killed to wounded was 3 to 4.

After Sedan, where many of their Mitrailleuses were captured, the rest being bottled up in Metz with Bazaine's army, the French obtained a few Gatlings as replacements. In January, 1871, at Le Mans, Gatling batteries successfully defended the plateau of Anvours and the crossings of the River Huisne. Kept out of sight in trenches, the Gatlings served to check the advance of German infantry with unexpected bursts of fire. In *The Gatling Guns, For Service Ashore and Afloat*, a Gatling Gun Com-

pany promotional booklet published (undated) in England by Sheppard & St. John, London, the following incident is cited:

In the late Prussian war, the Gatling Gun was used by the French, conjointly with the mitrailleuse. From the *London Journal* we clip a correspondent's description of its efficacious use in action:—

"Up to this time we had not seen any Prussians, beyond a few skirmishers in the plain, though our battery of Gatlings had kept blazing away at nothing in particular all the while; but now an opportunity of its being in use occurred. A column of troops appeared in the valley below us, coming from the right—a mere dark streak upon the white snow; but no one in the battery could tell whether they were friends or foes, and the commander hesitated about opening fire. But now an aide-de-camp came dashing down the hill with orders for us to pound at them at once—a French journalist having, it seems, discovered them to be enemies, when the general and all his staff were as puzzled as ourselves. *Rr-rr-a* go our Gatlings, the deadly hail of bullets crashes into the thick of them, and slowly back into the woods the dark mass retires, leaving, however, a trace of black dots upon the white snow behind it. This, their famous and historical four o'clock effort, and its failure, has decided the day. That one discharge was enough."



Model 1871 Gatling on all-metal Broadwell carriage.

GATLING MODELS OF 1871-1873

Frequently, despite exhaustive testing in prototype, it is only after a weapon has been in actual service for some time that certain of its shortcomings are revealed. This was the case with the Model 1865 Gatling and, as a result, Gatling redesigned his gun, incorporating a number of improvements, which he patented February 28, 1871. The improved gun—Model 1871—looked much like its predecessors, but was quite superior to them.

Model 1865 breech bolts, cylindrical in cross section, were smaller in diameter at the front section, which was unsupported. In the Model 1871, the bolts were more heavily constructed and uniform in diameter throughout the length, with a supporting rib on the bottom.

To remove the breech bolts of the earlier Gatlings, it was necessary to disassemble completely the rear breech housing and remove a number of parts, including much of the geared driving mechanism. This really was a job for a skilled armorer and, when attempted by troops in the field, often resulted in extensive damage, costly to repair. In the Model 1871, a port, fitted with a latched plug closure, was provided in the cascabel plate (rear cover of the breech housing). Through this port, bolts could be removed easily and without tools. Since the need for removal of bolts for cleaning or repair was not infrequent, this was an important improvement and, with minor variations, was incorporated in all succeeding models.

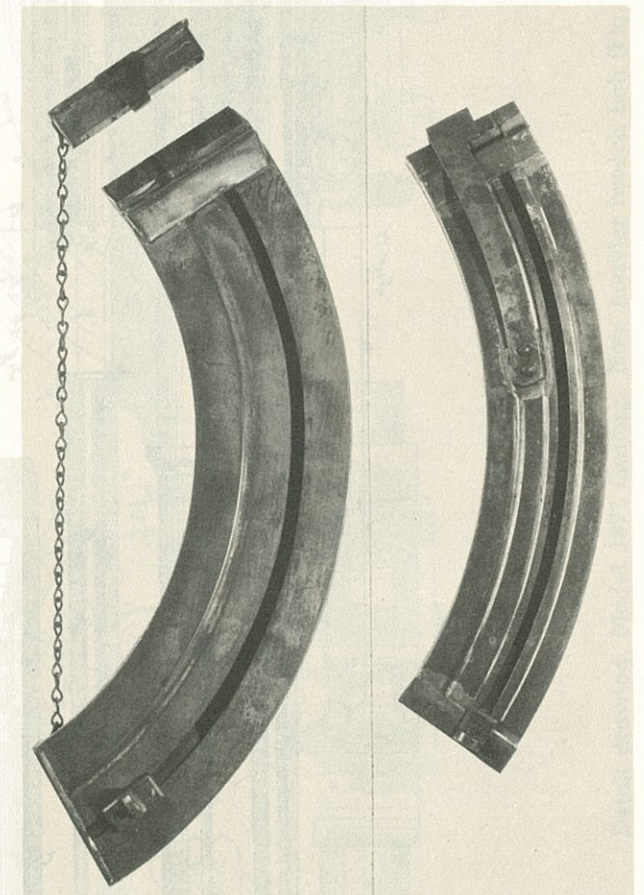
In the Model 1871 Gatling, the simple tin box used to hold cartridges in the Model 1865 was replaced by a curved magazine, better suited to handling the broad-rimmed cartridges used, and fitted with a heavy brass weight to help feed the column of rounds into the gun.

Additional improvements, patented April 9, 1872, included a new type of hopper to accept a drum feed. This unusual magazine, known as the Broadwell drum—after L. M. Broadwell, a Gatling Gun Company employee, who evidently devised it, consisted of a circular cluster of twenty vertical magazines, each containing twenty cartridges. In use, it was attached to the top of a special hopper on the gun. As each magazine was exhausted, the gunner manually rotated the drum to the next position, bringing a full magazine over the mouth of the hopper, until all twenty magazines were emptied—a total of 400 rounds.

Another of the improvements covered by this patent was the automatic oscillating device. Actuated by a rotating multitracked cam at the end of the crank shaft, the oscillator, when engaged into

the cam, caused the gun to swing from side to side automatically. Traverse could be adjusted by the gunner to give a sweep of up to 12°; at 1,200 yards, a target area 62 feet wide was covered. A U.S. Board of Officers reported (*Ordnance Memorandum No. 17*) after testing the oscillator:

Although the advantages, for target practice, where hits cannot be seen even with a glass, of an automatic oscillator adjustable at pleasure for any sector from zero to 10 or 12 degrees are plainly obvious, it does not follow that such a mechanism is equally necessary under all circumstances, when operating against troops, for the reason that in the latter case the points reached by the projectiles (unless the firing is very bad) and the effects produced can generally be observed from the gun, and the direction and elevation of the piece adjusted and varied, from time to time, as circumstances require. But in order to leave as little as possible to the judgement of the enlisted men, by whom in actual service the gun will be served, and thereby secure the best results, an adjustable automatic oscillator is considered desirable.

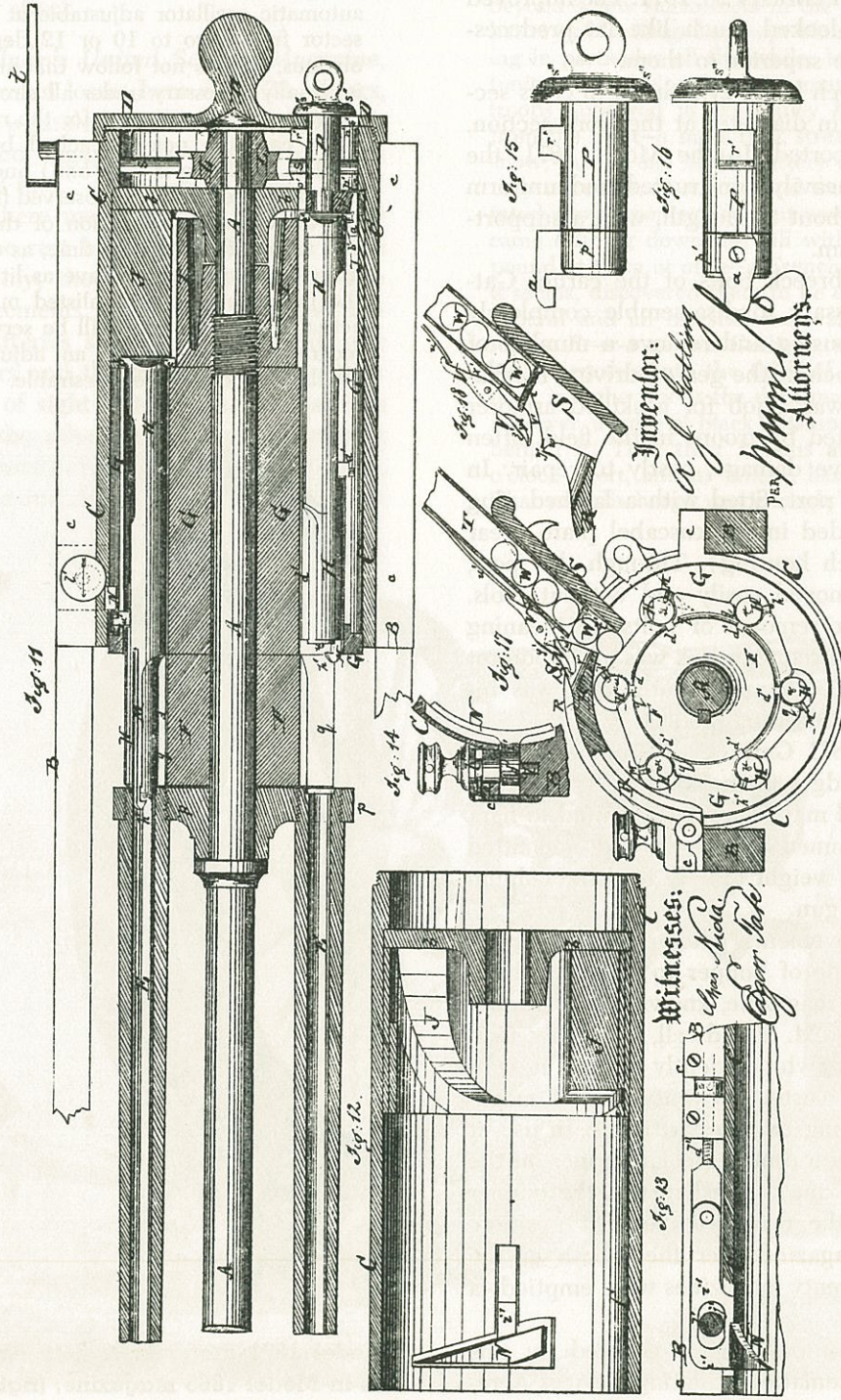


Model 1871 magazines: (left) early type with lid as in Model 1865 magazine; (right) magazine with spring catch, manually released, to retain cartridges.

R. J. GATLING.
REVOLVING BATTERY GUN.

No. 112,138.

Patented Feb. 28, 1871.

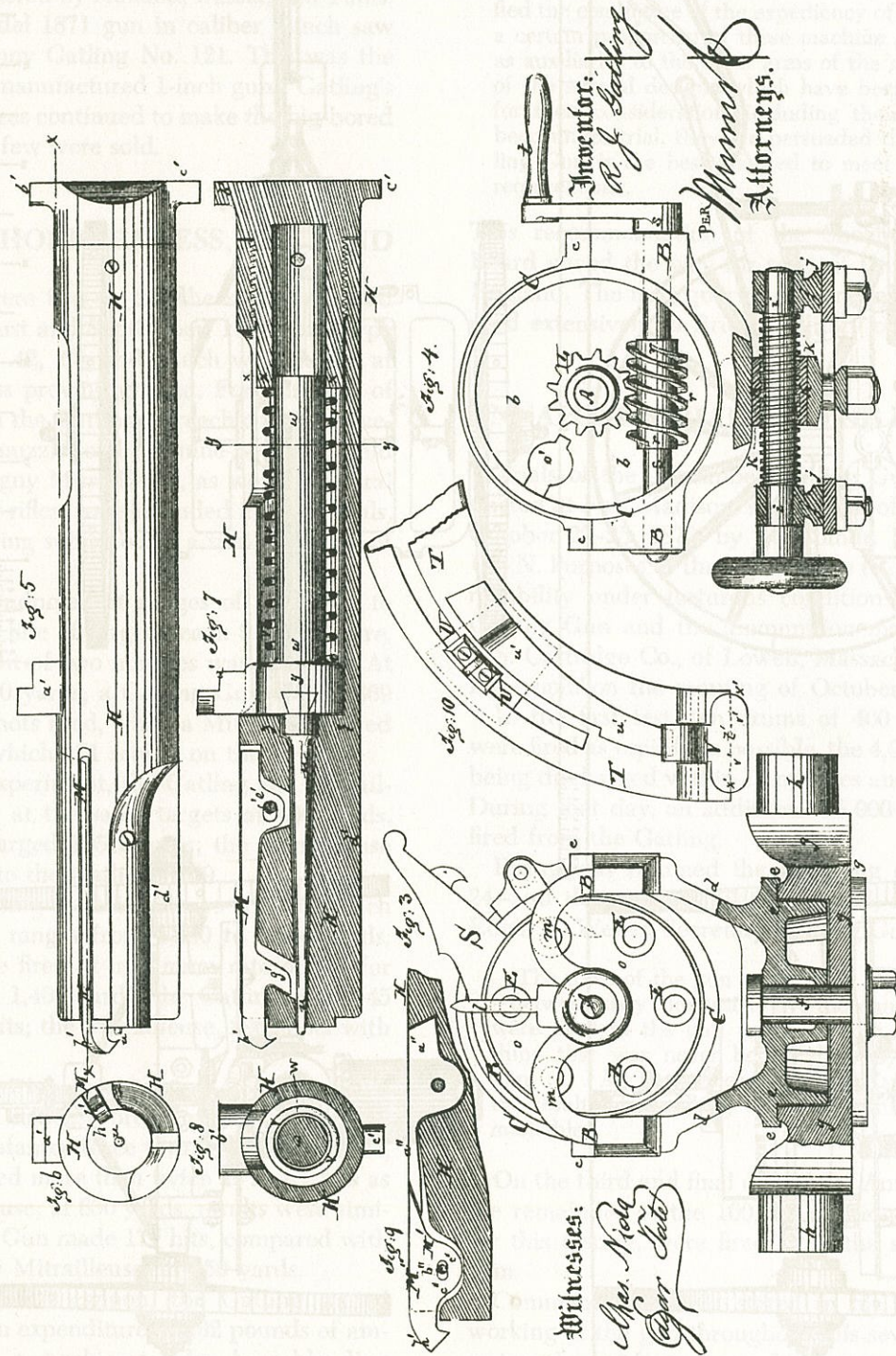


Detail drawing, Model 1871 Gatling. Note access port in cascabel plate through which breech bolts were removed (Fig. 11); plug (Fig. 11, 15, 16), was provided to close port.

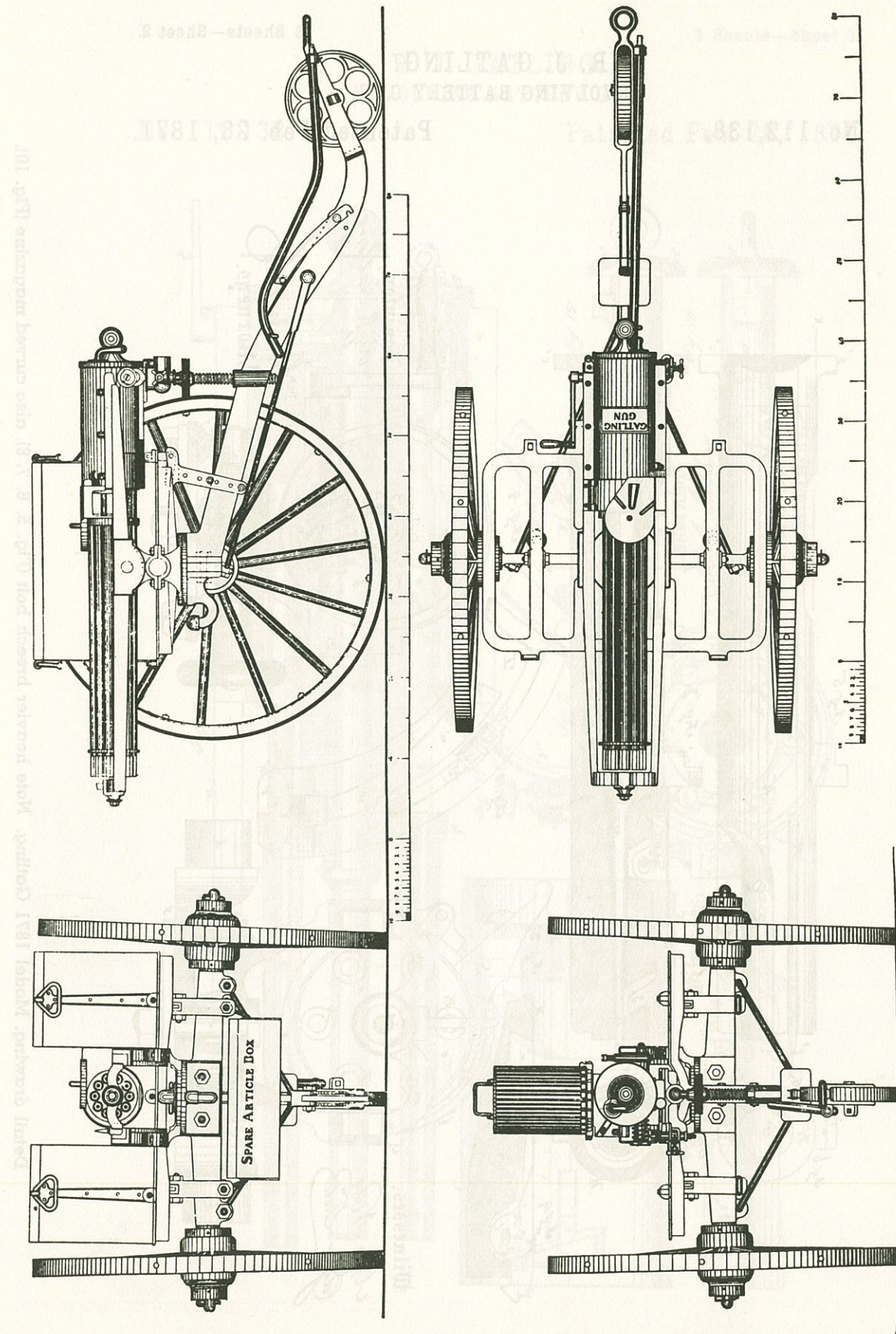
R. J. GATLING.
REVOLVING BATTERY GUN.

No. 112,138.

Patented Feb. 28, 1871.



Detail drawing, Model 1871 Gatling. Note heavier breech bolt (Fig. 5, 6, 7, 8), also curved magazine (Fig. 10).



Model 1871 Long Gatling Gun, caliber .50, on U.S. Navy landing carriage. 400-round Broodwell drum feed. Automatic oscillating device. Ammunition chests, hinged to axle, could be tilted forward and out of the way during firing.

Aside from the aforementioned improvements, specifications of the 1871-1873 Gatlings were similar to those of the Model 1865 type. Standard Model 1871 guns had ten barrels, but could be ordered with five or six barrels, at the customer's option. The U.S. Army purchased nine of the Model 1871 Gatlings in caliber .50, serial numbers 100-108. A few were bought by the U.S. Navy, and quantities of this model, in various calibers and numbers of barrels, were ordered by Holland, Russia, and Tunis.

Only one Model 1871 gun in caliber 1-inch saw service: U.S. Army Gatling No. 121. This was the last of the Colt-manufactured 1-inch guns. Gatling's European licensees continued to make the big-bored model, but very few were sold.

TRIALS AT SHOEBURYNESSE, ENGLAND

The British were first to test the new, improved Gatling. In August and September, 1870, prototype guns in calibers .42, .65, and 1-inch were tested at the Shoeburyness proving ground. For purposes of comparison with the Gatlings, breechloader twelve-pounder and muzzle-loading nine-pounder field guns, the Montigny Mitrailleuse, as well as several types of military rifles, were included in these trials, each weapon being subjected to a similar course of testing.

Firing was conducted at ranges of from 300 to 1,200 yards at a line of targets, each 9 feet square. A firing time limit of two minutes was imposed. At a distance of 300 yards, a Gatling Gun scored 369 hits out of 616 shots fired, while a Mitrailleuse fired 185 rounds, of which 171 scored on the target.

In a second experiment, the Gatling and Mitrailleuse were fired at the same targets at 400 yards. Each gun discharged 185 rounds; the Mitrailleuse scored 177 hits to the Gatling's 169.

The third Gatling vs. Mitrailleuse trial had each weapon fired at ranges from 1,200 to 1,400 yards. Guns were to be fired at maximum rate of fire for two minutes. At 1,400 yards, the Gatling fired 545 shots with 104 hits; the Mitrailleuse, 296 shots with 68 hits.

In the fourth trial, targets were 134 man-sized dummies placed in loose order on uneven ground to simulate an infantry force retiring. At 300 yards, the Gatling scored more than twice as many hits as did the Mitrailleuse; at 650 yards, results were similar. The Gatling Gun made 177 hits, compared with only nine by the Mitrailleuse, at 950 yards.

Competing against cannon, the Gatling scored 2,803 hits with an expenditure of 492 pounds of ammunition, while a twelve-pounder breechloading

field gun required 1,232 pounds of ammunition to score 2,286 hits on the targets. As a control, picked companies of riflemen, armed with Martini-Henry and Snider rifles, fired volleys at the same targets and ranges; at 450 yards, less than half the rifle bullets found their marks.

Summing up its report, the committee for the Shoeburyness tests stated:

The results of the recent inquiry have fully satisfied the committee of the expediency of introducing a certain proportion of these machine guns, to act as auxiliaries to the other arms of the service, and, of the several designs which have been submitted for their consideration, including those that have been under trial, they are persuaded that the Gatling Gun is the best adapted to meet all military requirements.

This recommendation of the Shoeburyness Trial Board paved the way for sales of Gatling Guns to England. The next quarter century saw the Gatling used extensively in British military operations.

ANNAPOLIS TRIALS BY THE U. S. NAVY

Trials of the .50 caliber Gatling Gun were conducted at Fort Madison, near Annapolis, Maryland, October 23-25, 1873, by Lt. Comdr. J. D. Marvin, U.S.N. Purposes of these tests were to determine the reliability under torturous conditions of both the Gatling Gun and the ammunition made for it by U.S. Cartridge Co., of Lowell, Massachusetts. Testing began on the morning of October 23.

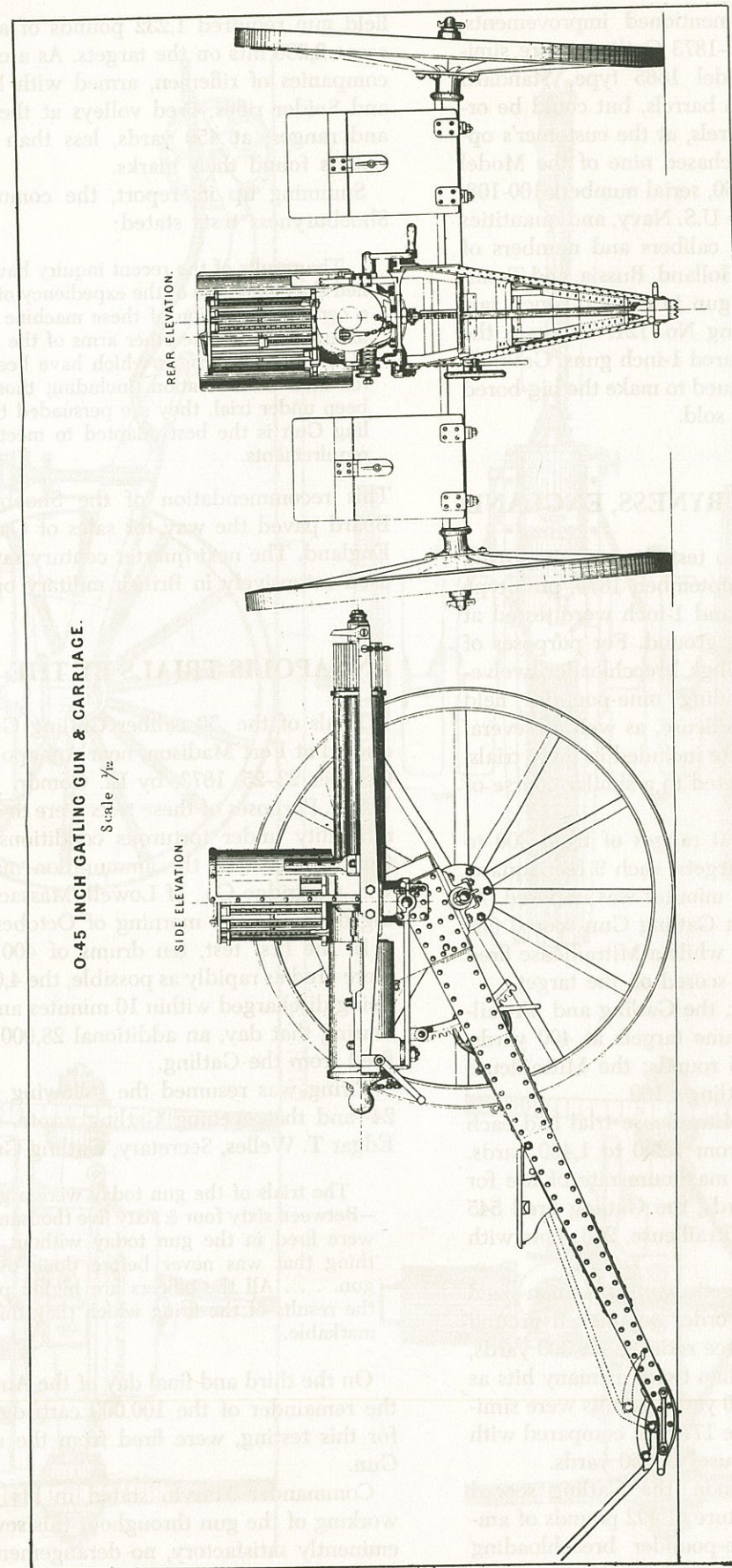
In the first test, ten drums of 400 rounds each were fired as rapidly as possible, the 4,000 cartridges being discharged within 10 minutes and 48 seconds. During that day, an additional 28,000 rounds were fired from the Gatling.

Firing was resumed the following day—October 24—and that evening Gatling wrote, in a letter to Edgar T. Welles, Secretary, Gatling Gun Company:

The trials of the gun today were a great success—Between sixty four & sixty five thousand cartridges were fired in the gun today without cleaning,—a thing that was never before done by any other gun. . . . All the officers are highly pleased with the results of the firing which they think most remarkable.

On the third and final day of the Annapolis trials, the remainder of the 100,000 cartridges, furnished for this testing, were fired from the same Gatling Gun.

Commander Marvin stated in his report: "The working of the gun throughout this severe trial was eminently satisfactory, no derangement of any im-



British Gatling Gun, 1871 type, manufactured by Sir William Armstrong & Co. Rack-and-pinion elevating system was more flexible and quicker adjusting than jack screw of contemporary Colt-made Gatlings. Steel shield protected Broadwell drum—a unique feature.

portance whatever occurring." The U.S. Cartridge Co. ammunition, too, seems to have come through the Navy's torture tests with flying colors.

As an indication of just how "severe" Commander Marvin's tests were: it was found that, after the rapid-firing of 4,000 rounds in ten minutes, barrel temperatures, as shown by color test, exceeded 500° F. Fearing that this heat might cause premature discharge of cartridges in the feed system of the weapon, the testing gun crew threw buckets of cold water on the glowing barrels to cool them. Even such treatment had no adverse effect on the performance of the Gatling Gun.

FORTRESS MONROE TRIALS

Because of the major changes made in the Gatling design during the early 1870's, a series of trials to evaluate these improvements was held by the U.S. Army Ordnance Department at Fortress Monroe, Virginia, October–December 1873. The favorable findings of this test board firmed the status of the Gatling Gun as an important component of the United States' armament.

Guns chosen for trial were 1-inch and .42 caliber. The latter, chambered for the .42 Berdan cartridge standard for Russian military rifles, actually was one of the Gatlings produced, under contract, for Russia and incorporated design improvements made by General Gorloff. When subsequently furnished to the U.S. Government, guns of this Model 1874 pattern were, of course, chambered for the U.S. caliber .45 cartridge.

The Gatling Guns were tried in competition with two issue artillery pieces: the 8-inch siege howitzer and the 12-pounder Napoleon. As an added control, forty picked marksmen fired Springfield rifles at the same type of targets as those presented the larger guns.

Targets used were varied. One test employed ten targets made of 1-inch thick yellow pine boards, each 6 feet high by 50 feet wide, representing columns of infantry, maneuvering by companies on the field. The nearest "wooden company" was 1,000 yards from the gun; the others were placed in file, 50 feet apart. To test dispersion of fire, canvas targets 9 feet high by 45 feet wide were used. Penetration was judged by the number of 1-inch thick yellow pine boards, spaced 1-inch apart, that different types of projectile pierced.

Firing at the 9 by 35 foot canvas target at 200 yards, the .42 caliber Gatling Gun scored 618 hits out of 637 shots fired. In marked contrast, the 1-inch Gatling, firing canister shot, fired 213 rounds con-

taining a total of 3,834 balls, of which only 846 struck the target. The cannon made scores almost as poor as that of the 1-inch Gatling: of 1,452 canister balls discharged from the 12-pounder Napoleon, 379 found their mark; the 8-inch howitzer firing service canister scored 52 hits out of 192 balls. Springfield-armed riflemen did a little better: they fired a total of 601 rounds, of which 320 were hits. It seems safe to assume that, had these marksmen been firing in battle rather than on a target range, their effectiveness would have been considerably less.

In penetration tests, bullets fired from the .42 caliber Gatling went through six to seven of the one-inch thick yellow pine boards. Canister shot from the 1-inch Gatling penetrated only one board, while the Napoleon and howitzer produced an average penetration of two to three boards.

The .42 caliber Gatling Gun came through all thirty-four tests, to which the different weapons were subjected, with the top record. In the official report, published in 1874 as *Ordnance Memorandum No. 17*, it was stated:

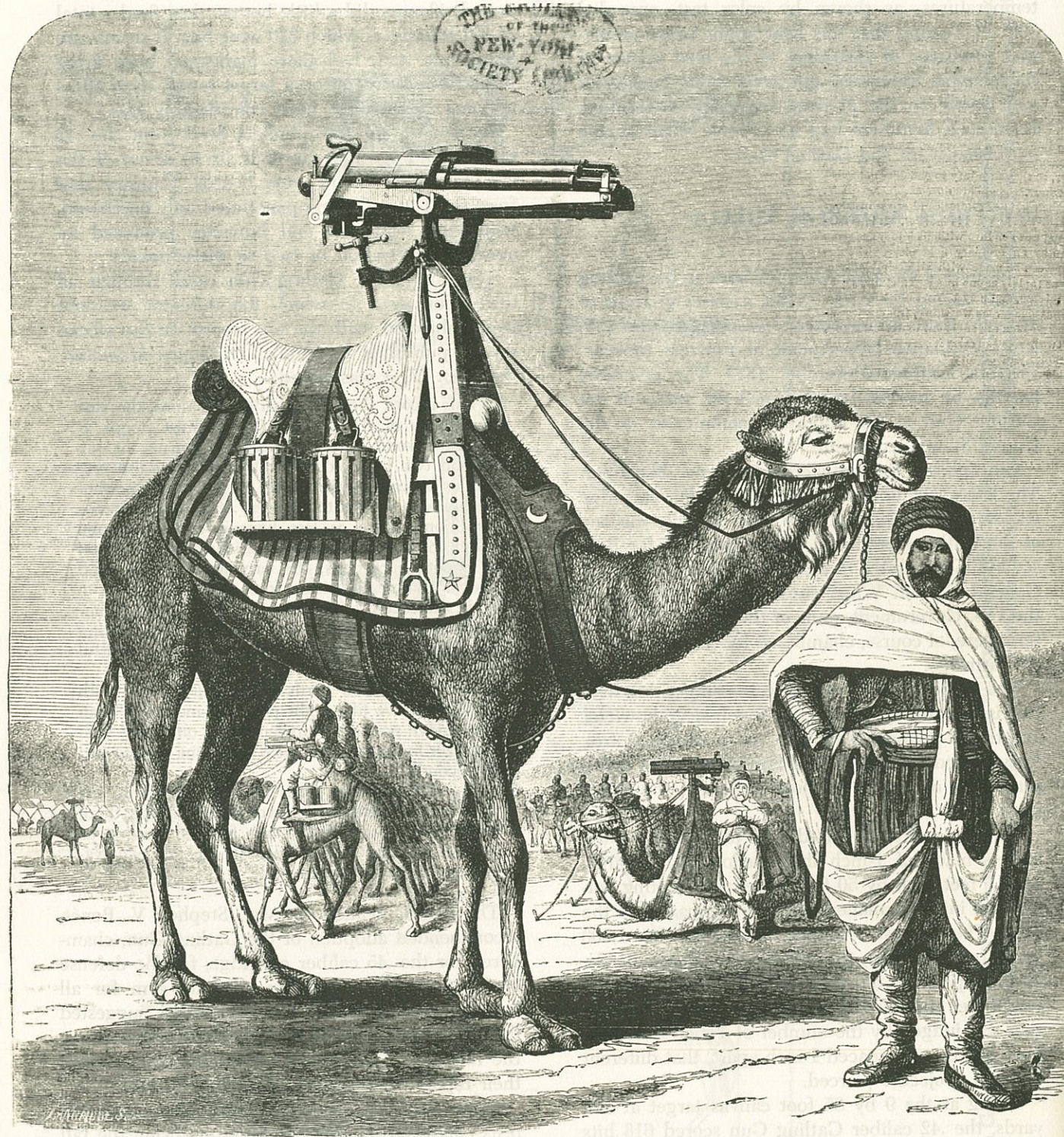
This record shows in a striking manner the vast superiority of the Gatling Gun against troops at ranges beyond effective reach of canister or say beyond two hundred and fifty yards, for the projectiles in competition with it, whether case-shot or shell, are subject to a variety of disadvantageous conditions, more or less beyond control, among which may be enumerated the inaccuracy common to smooth bore guns; the varying effects of wind due to changes in either force or direction, or to both; the eccentricity of the projectiles, and the imperfection of fuses, the latter having been, during the trials of the board, a conspicuous and fruitful cause of the very poor results obtained.

At five hundred yards one Gatling, fired with oscillator, gave fifty-eight per cent more hits than two twelve pounder Napoleons and one eight inch howitzer firing together, each firing one minute and 30 seconds.

At eight hundred yards the proportions of hits were largely increased in favor of the Gatling, there being an average of 320 hits for one Gatling as against an aggregate of only 38 hits for two Napoleons and one howitzer.

The board, headed by Maj. Stephen V. Benét, recommended adoption of the Gatling Gun, chambered for the .45 caliber cartridge, for the defense of fortifications, and as an auxiliary arm for all branches of the service. It was further suggested that a board of officers be appointed to determine the number of Gatlings required for military use, their report to be submitted by July 1, 1874.

More than any previous trials, the exhaustive tests conducted at Fortress Monroe during the fall of 1873 established the Gatling Gun, hitherto regarded as essentially a flank defense weapon, as a



Gatling-equipped camel corps.

truly versatile arm of greater effectiveness in general use than the conventional field guns and rifles with which it was compared. The subsequent, almost universal, adoption of the Gatling Gun by the world's armies and navies came largely as a result of the conclusive Fortress Monroe Trials.

GATLING MODELS OF 1874-1877

The musket-caliber Gatling Gun that performed so outstandingly in the 1873 trials was a forerunner of the Model 1874, first of the "Classic Gatlings." Smaller and lighter than any of its predecessors, with hopper and breech housing of bronze, this model was far handsomer too.

In 1873, Colt produced a few of these guns in .50/70 caliber. Early the following year, the weapon was standardized as Model 1874, chambered for the .45/70 Government cartridge.

Reduction of size and weight in the Model 1874 gun resulted chiefly from the adoption of a newly developed, smaller breech bolt, permitting the breech housing to be made shorter and more slender, as well as lighter in weight.

Among the features of the Model 1874 were an improved oscillator, headspace adjusting system, insulated barrel shaft, feed hopper, and magazine.

More compact and sturdier than the complicated oscillator of 1871, the new type (Gatling's patent No. 145,563) could be set for automatic traverse of the target area or, alternatively, the oscillating device could be used as a manually adjusted windage control.

Headspace—distance from bolt face to head of chambered round—always had been a problem in Gatling Guns: if set before firing, it soon became too tight as the barrel unit heated and expanded. The Model 1874 had an adjustable set screw, passing through the center of the frame and bearing on the front end of the axle on which the cluster of barrels revolved. By adjustment of this screw, the barrels could be brought closer to or farther away from the breech bolts, setting headspace to the proper tolerance. Often, it was necessary to make this adjustment during lulls in firing and, necessarily, the man performing this operation had to stand in front of the gun muzzles. After several casualties, guns were fitted with a crank lock to prevent accidental firing and later instruction manuals directed that this safety device be engaged before any member of the crew stepped in front of the business end of the Gatling.

The barrel shaft or axle, between the front and rear

barrel-supporting disks, was covered by a leather tube, intended to insulate the axle against the heat radiated from the barrels and, thus, prevented excessive expansion of this critical component. Since nearly all of the major operating parts of the gun were suspended from this central shaft, any change in its dimensions would derange the normal working tolerances (quite close) of these parts and bind the gun.

An improved feed hopper was incorporated in the Model 1874 Gatling. It was designed to accept a new type of magazine. With the exception of the drum feed, all previous magazines were inserted into the gun at a 45° angle, the hopper being designed in such a way that view of the centrally located sights was not obscured by the magazine. In the Model 1874, sights were mounted on the right side of the arm, and the hopper mouth, located to the left of center on top of the piece, accepted vertical insertion of the magazine.

The magazine was a tin-plated box, trapezoidal in cross section, with a brass top and bottom; it was fitted with a heavy brass follower, the weight of which forced the cartridges downward into the hopper. Bottom end of the magazine, open to permit the rounds to feed into the gun, had a spring catch to keep cartridges from falling out; this catch automatically disengaged when the magazine was inserted into the hopper mouth. This gravity-fed box magazine held 40 rounds of ammunition.

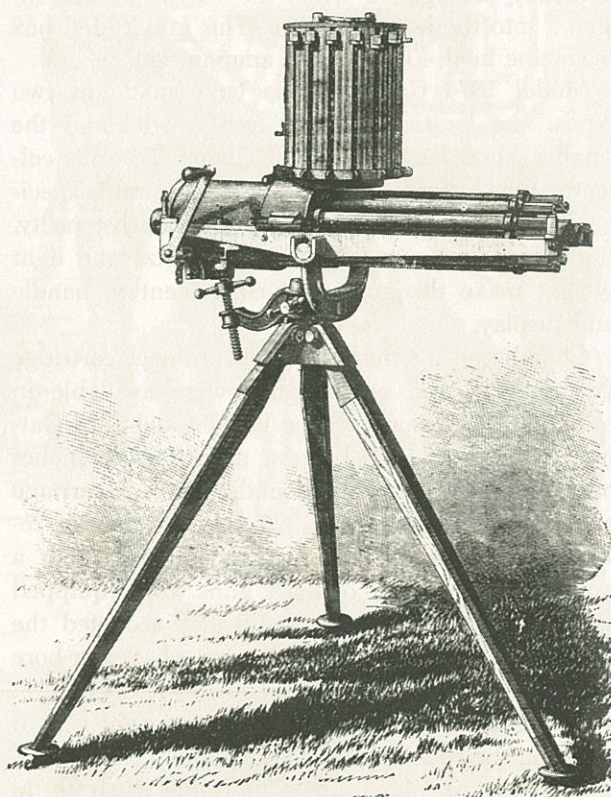
Model 1874 Gatling Guns were made in two types: the long, "musket length" model and the smaller, short-barreled "Camel Gun." To arms collectors, the latter is one of the more desirable specimens—not only because of its comparative rarity, but also because its relatively small size and light weight make the gun more convenient to handle and display.

Chambered for the .45/70 Government cartridge (commercial and export guns were available in other calibers to order), the long Model 1874 Gatling had ten 32-inch barrels, measured 49 inches overall, and weighed 200 pounds (without carriage and limber, which added 326 and 387 pounds respectively). Ammunition was gravity-fed from a box magazine; a few of these guns were equipped with Broadwell drum feed and also accepted the standard magazine. The bronze breech casing bore a legend plate of the same material with both Colt and Gatling markings. Located on the right side of the gun, the rear sight was adjustable for elevation, the front sight folded along the frame when not in use (a feature found only in this model). Mounted on a wheeled artillery carriage, the gun was tra-

versed, automatically or manually at the gunner's option, by an improved oscillating device; elevation was obtained through a jackscrew in the trail. Model 1874 guns purchased by the U.S. Army bore serial numbers 57 through 63, and 105.

While small, short-barreled Gatling Guns were produced as early as 1871, it was the improvements incorporated in the Model 1874 that made possible the development of the true Camel Gun, most of which were manufactured in 1874, although a few were produced in 1875 and 1876. Essentially, the Camel Gun specifications were like those of the long Model 1874 gun, with these exceptions: barrel length, 18 inches; over-all length of gun, 35½ inches; weight of gun, 135 pounds; mounted on its cavalry cart, total weight of gun and implements, 925 pounds. In addition to the cavalry cart, mounts for the Model 1874 Camel Gun included tripod and camel saddle type. Camel Guns No. 1-56 were bought by the U.S. Army.

Gatling and his associates, ever cognizant of the value of publicity, adopted the exotic name, "Camel Gun," to designate the short model Gatling and the use of bizarre camel corps pictures for the attention these were sure to attract. The Camel Gun possessed



Model 1874 Gatling Camel Gun. Prototype circa 1872.

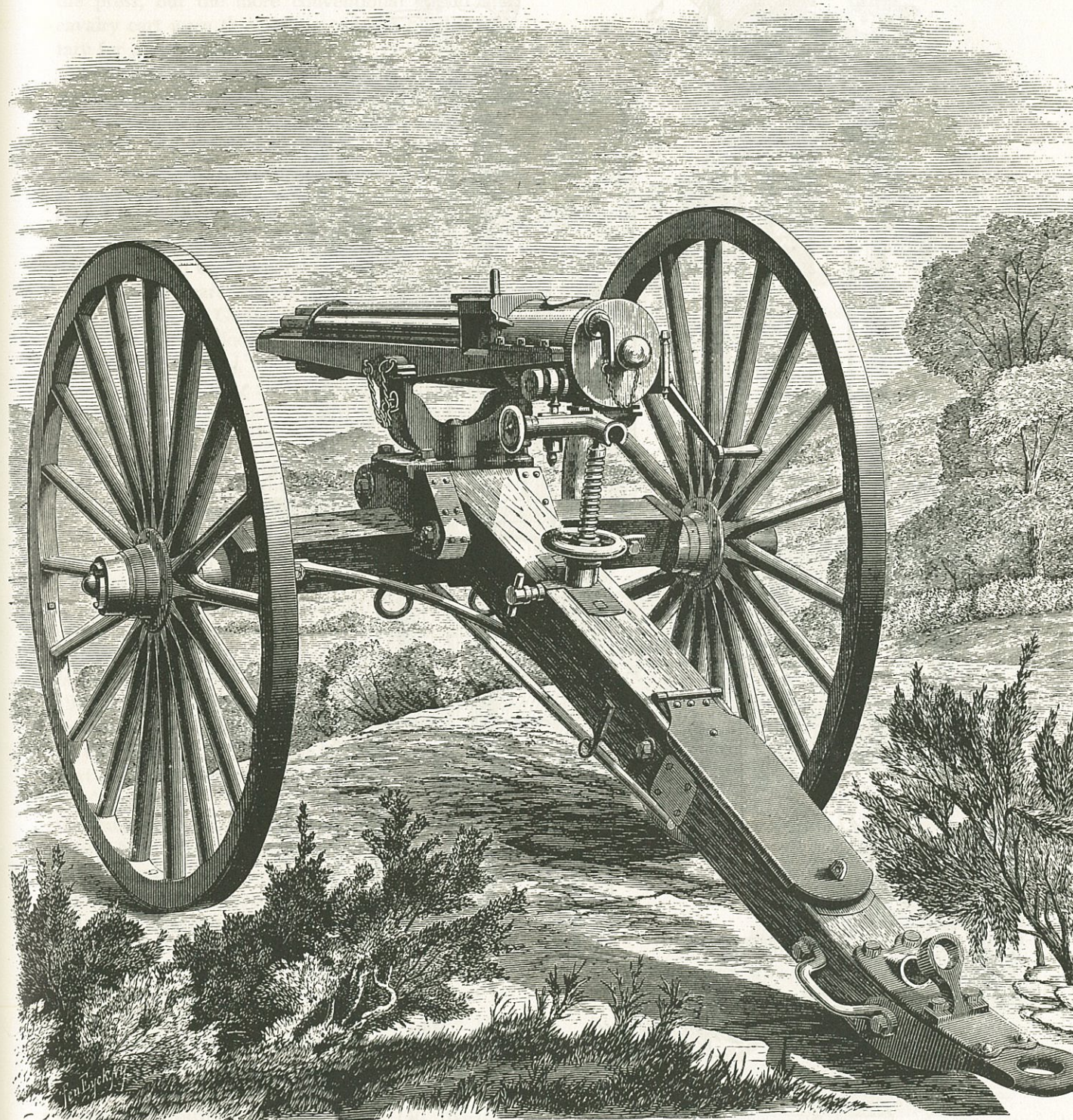
great utility as a weapon and mounting on a camel probably was the least of its possibilities for military service. While some camel mounts were made—portions are extant—there is no evidence that there ever was a Gatling-equipped camel corps.

Frequently, it has been suggested that England's Col. Maxwell had much to do with the development of the Gatling Gun, particularly the Camel Gun type. *Army & Navy Journal*, March 9, 1872, commented on this:

... the suggestion of this gun [Camel Gatling] may be due to arguments of Col. Maxwell, of the East Indian service, who has been an earnest advocate of the use of camels to bear small guns in war. Col. Maxwell, as superintendent of the Cossipore gun foundry in India, and more recently we believe, as member of one or more ordnance commissions in England, has gained a deservedly high reputation in the ordnance and engineering circles; yet we fancy he is entitled to no greater credit in the construction of this Camel Gatling than may belong to any shrewd applicator of the possibilities of the Gatling system. Two years since, at least, we remember talking to the inventor about the adaptability of his guns, with weight and proportions properly reduced, to similar service. . . . We have yet to find in our English files any intimation that Col. Maxwell is entitled to any credit for the Camel Gatling Gun, except the credit of being the first to appreciate its value.

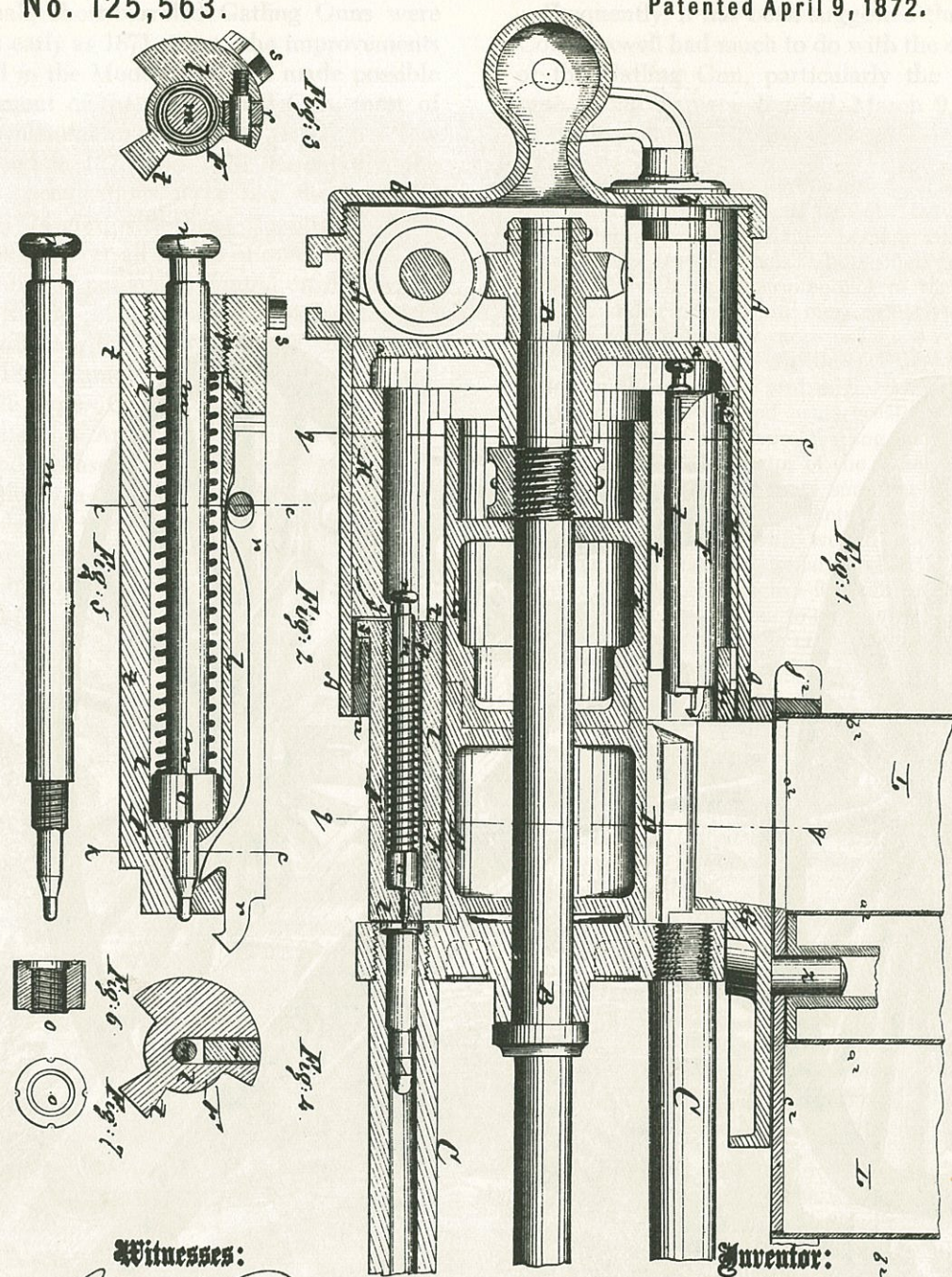
Capt. E. Rogers suggested the possible source of the artist's inspiration for the picture of the Gatling-equipped camel corps in a paper, "The Gatling Gun; Its Place in Tactics," published in the *Journal of the Royal United Service Institution* (Vol. XIX, 1876, pp. 427-428):

More than 150 years ago, an Afghan Chief crossed the deserts of Kerman with an army, for the most part mounted on camels, a number of the latter bearing, in addition to their riders, a swivel gun. Approaching Ispahan, they encountered a Persian Army nearly three times their number and provided in addition with 24 formidable pieces of ordnance. On the Persian Army's approach, the left wing of the Afghans gave away; the former immediately pursued with vigour, but soon their enemies' ranks opened and disclosed a line of 100 camels kneeling down, each with a gun on its back. The fire knocked over the leading ranks of the Persians, and a charge of cavalry completed their discomfiture. Colonel Maxwell, R.A., who recounted this story some years ago to an audience at Woolwich, became, no doubt, unknowingly responsible for the hint as magnified by an American Artist, who has depicted an army of camels with short-barrelled Gatlings duly mounted, deployed for action on a vast plain in double ranks, front rank kneeling. The terrible effects of such a volume of volleys is, in fact, the only thing left to the imagination in the picture! But it was, I believe, at the



Model 1874 Gatling on full field carriage.

R. J. GATLING.
Improvement in Revolving Battery Guns.
 No. 125,563. Patented April 9, 1872.



Witnesses:
Chas. Nida
Francis McDade

Inventor:
R. J. Gatling.
 P. M. *Munn & Co.*
 Attorneys.

Cross section of Gatling Gun, illustrating improvements patented April 9, 1872. Note short breech bolts, used from 1874, and that gun shown is fitted with Broadwell drum.

serious suggestion of this same artillery officer, that Dr. Gatling planned the camel gun, weighing 135 pounds only, and capable of being worked from a fixed tripod, or from the back of a camel or elephant!

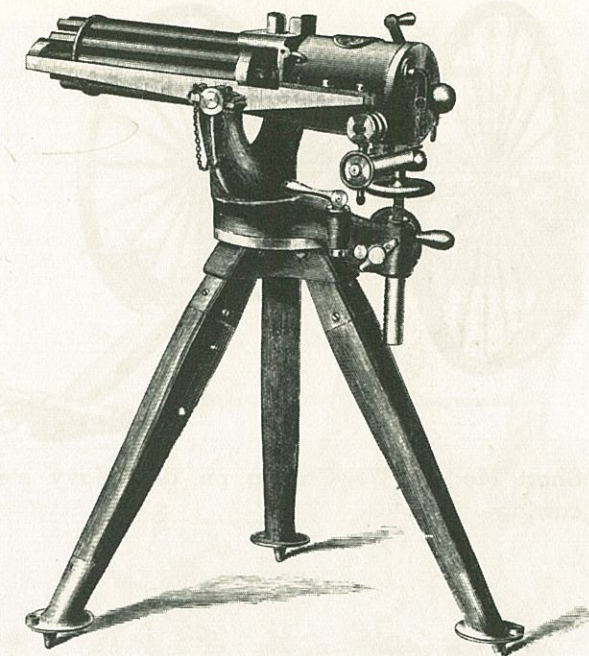
The camel-saddle mount attracted the attention of the press, but the more conventional tripod and cavalry cart were the mounts ordered by the military for general service use.

A Gatling tripod consisted of a steel turntable on which the tripod head, with gun-supporting yoke and containing the windage and elevation controls, revolved. On the bottom of the turntable were three iron fittings to receive the wooden legs. Some tripods had chains connecting the legs to prevent them from spreading too far apart. From the collector's standpoint, the tripod is the rarest and most desirable of all Gatling Gun mounts.

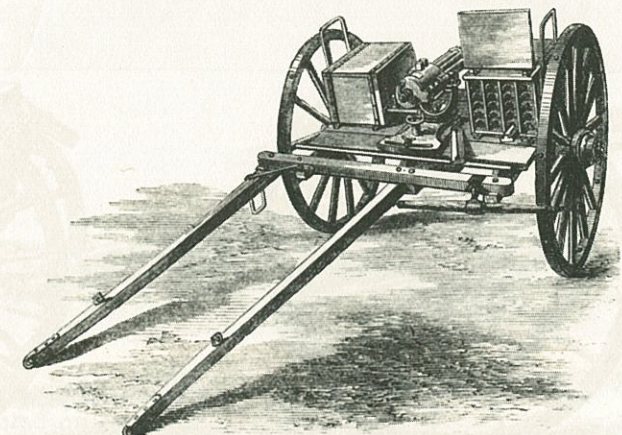
The cavalry cart was the lightest artillery mount ever used with a Gatling Gun. Yoke assembly was mounted on the floor of a two-wheeled cart; on each side of the gun, there was a wooden ammunition chest containing 24 forty-round magazines; a third chest, slung under the cart's axle, carried an additional 2,000 cartridges in their original packing boxes, as well as the gunner's implements. There was a pair of shafts for the off-horse and a singletree for the driver's horse (original instruction book advises the use of "one horse for good roads, two horses for bad"); the shafts doubled as a trail or rear brace.

With the inception of Model 1874, Colt began using a system of consecutive serial numbering starting with Camel Gun No. 1, which was maintained until the end of Gatling Gun production in 1911. All Gatlings, from 1874 on, bore two sets of numbers: the serial number stamped or engraved on the right side of the frame at the trunnion; every part of the weapon bore an assembly number, each year's production beginning with No. 1, indicating the number of the particular weapon within its series. Navy Gatlings had a U.S.N. Bureau of Ordnance number engraved on top of the barrel housing ahead of the hopper.

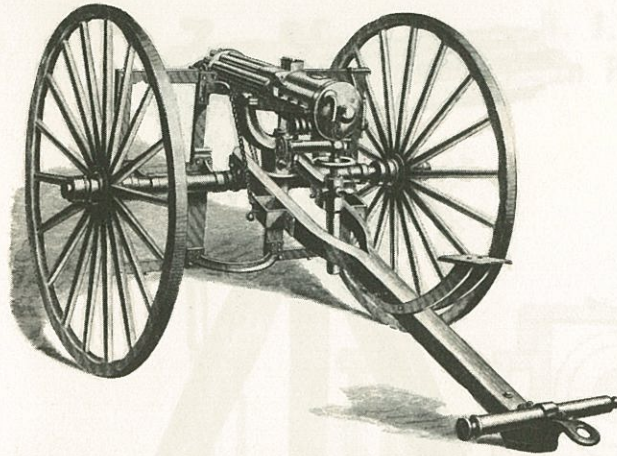
In 1875, the gun was improved in several ways. The rather vulnerable folding front sight was replaced with a fixed one. To provide better support for the sides of the magazine, the hopper was redesigned with higher walls on the port. Some jamming was experienced with Model 1874; to correct this, bolt faces were beveled on one edge for smoother feeding. The U.S. Army bought 44 long Model 1875 Gatlings (serial Nos. 107-146, 163-166) and four Camel Guns (Nos. 159-162). A number of 1874-1875 Gatlings of a special U.S. Navy



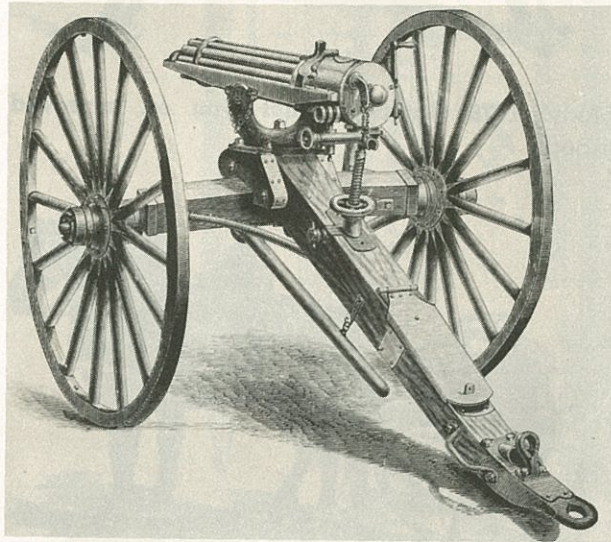
Model 1876 Gatling Camel Gun on improved tripod.



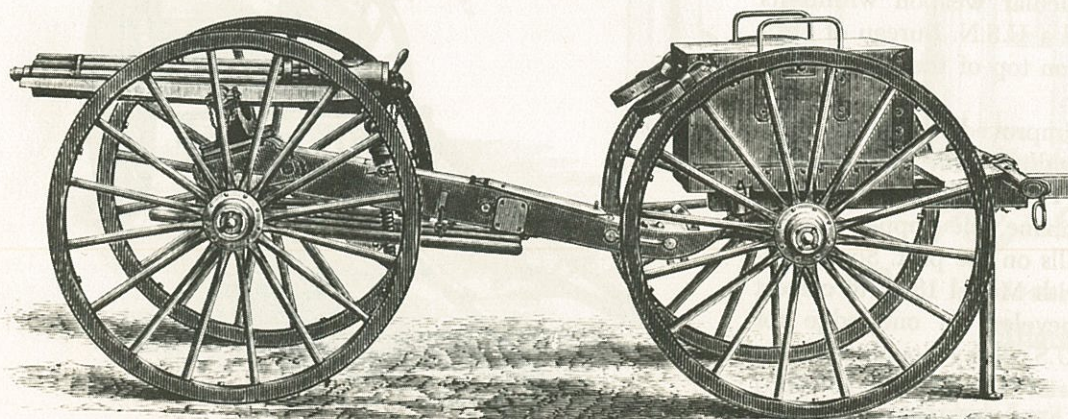
Cavalry cart for short model Gatlings.



Short Model 1875 Gatling on U.S. Navy steel carriage.



Model 1877 Gatling on full field carriage.



Model 1877 with limber.

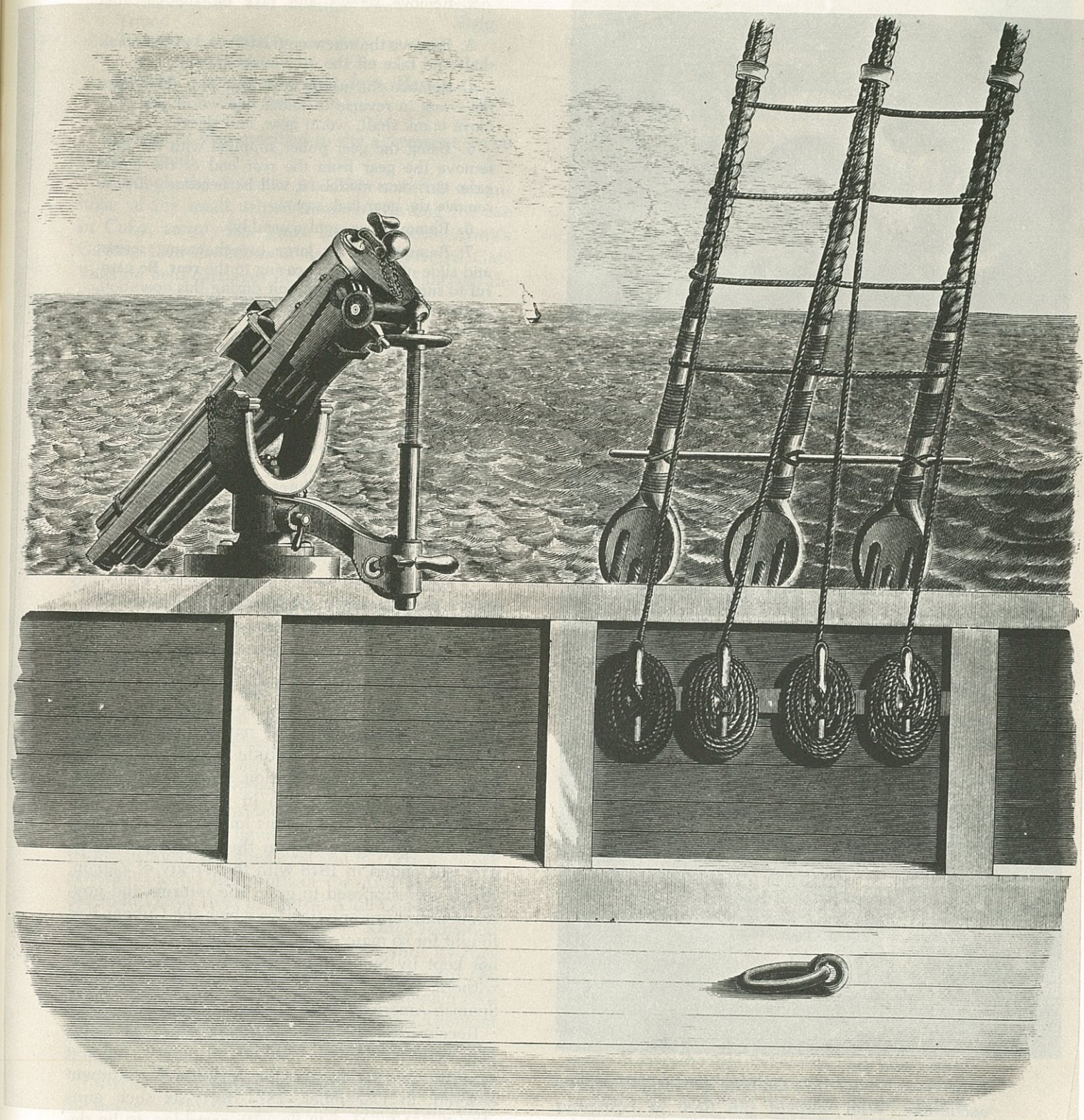
model also were produced. These differed in having barrel length midway between those of the standard long model and the Camel Gun, and in that the entire gun was encased in a bronze jacket. Navy Gatlings were furnished with a very light wheeled carriage, designed for deck and landing use.

The Model 1876 Gatling, while much like the previous year's model, incorporated several improvements. The mouth of the hopper was relocated from the left side to the center of the gun. Front and rear cartridge guides were introduced into the hopper to facilitate passage of cartridges into the barrel chambers. Additional screws were used in assembly of the interior parts of the breech casing to provide better support for the breech bolts. Bevel of the breech bolt edge was altered again for smoother feeding. The headspace adjusting screw washer was fitted with a new type of lock to minimize slippage in this critical setting. Eighteen Model 1876 musket-length Gatlings were purchased by the U.S. Army (serial Nos. 170-188).

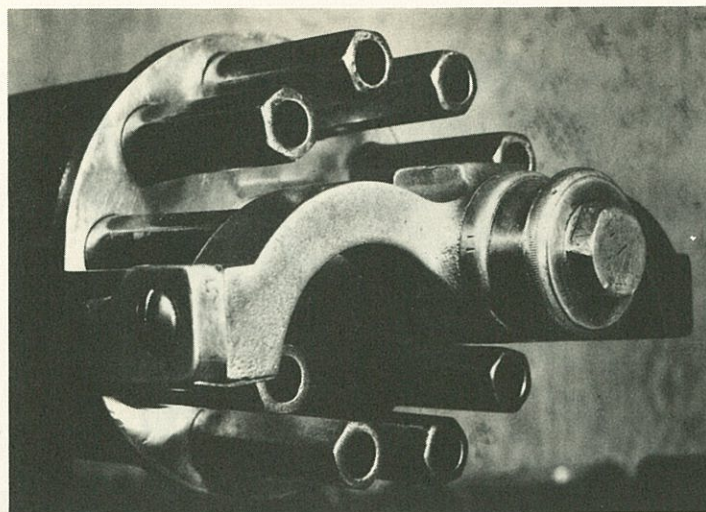
Further changes were made in the Model 1877 gun. The long type had an entirely new feed hopper, more open in design for easier ejection of fired cases and with a small, fluted drum that rotated to control passage of cartridges so that only one round could fall into position in front of each breech bolt. Gears were changed to a faster pitch for a higher rate of fire. This was the last model to use the cam-operated oscillator introduced in 1874. Eleven guns of the 1877 model were sold to the U.S. Army (serial Nos. 191-193, 196-201, 225, 226).

Disassembly procedure for Gatling Models of 1874-1877:

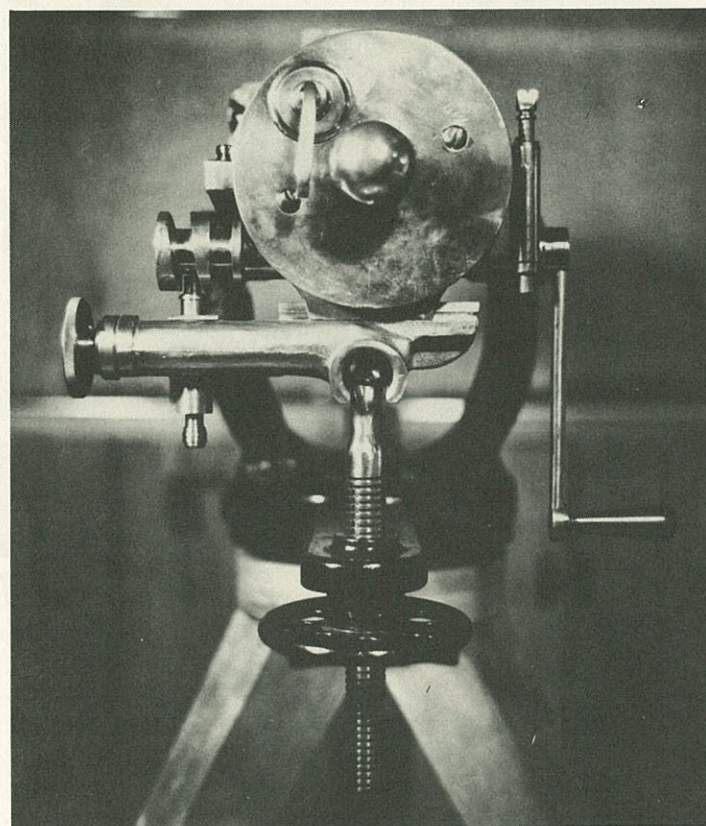
1. Turn the crank and, as each mark on the rear barrel plate comes opposite the arrow on the front of the hopper, remove the breech bolt—this is accomplished by turning the handle of the lock plug



Short Model 1874 Gatling mounted on gunwale of a ship.



Close-up of muzzle end, Model 1874 Gatling. Folding front sight is found only on guns made in 1874. Cap at center covers headspace adjusting screw.



Rear view, Model 1874 Gatling, showing improved oscillator. With vertical pin (left) in camming groove, gun would swing from side to side. When pin rode in straight groove, oscillator functioned just as lateral adjustment, manually controlled by hand wheel.

and, with it, drawing the bolt out through the port in the cascabel plate.

2. Remove screws and take off the cascabel plate.

3. Remove the screw on the left end of the crank shaft and take off the oscillating drum.

4. Remove the worm gear lock pin; then, turn the crank in reverse to loosen the worm gear. Remove crank shaft, worm gear, and sleeve.

5. Using the gear puller supplied with the gun, remove the gear from the rear end of the barrel axle. On some models, it will be necessary first to remove the gear lock screw.

6. Remove rear sight assembly.

7. Remove the six large breech casing screws and slide off the breech casing to the rear. Be careful to support the barrel unit during this operation, so that it does not fall and damage the frame of the gun.

8. Remove the screws that secure the lock camming sleeve or cylinder to the inside of the breech casing. Remove the sleeve and take out the cocking cam piston and spring.

9. Remove the cover on the front of the frame to expose the headspace adjusting screw. Use special wrench furnished with gun.

The foregoing procedures are all that is necessary to disassemble the Gatling Gun for cleaning or overhaul. It is inadvisable to unscrew the barrels from the barrel unit, except for replacement.

GATLING GUNS FOR CUBA

In 1868, Cuban patriots, under the leadership of Manuel de Céspedes, began their fight for independence from Spain, the so-called "Ten Years War." The discontent of the native Cuban population stemmed from a multitude of grievances, chief among these: excessive taxation, restrictions on trade, and lack of representation in government. There were no major battles in this long war, just endless guerrilla fighting, mainly in the eastern provinces. The war ended in 1878 with the Treaty of Zanjón, which was supposed to grant the reforms and governmental representation for which the Cubans had fought for so many years. Since these promises were not kept by Spain, the Ten Years War really was without result, except that it foreshadowed the Spanish-American War of two decades later.

Recognizing the value of easily transported, tripod-mounted Camel Gatlings in jungle fighting against guerrilla bands, the Spanish Government ordered, in December, 1873, forty-six such guns chambered for the .43 Spanish cartridge, to be delivered to the Captain General of the Island of Cuba. Prices quoted by the Gatling Gun Company were as follows:

Camel Gun, Caliber .43, with spare parts, implements, three feed drums, limber chest, and elevating screw	\$920.
Tripod	80.
Traversing, oscillating part, fitted to the gun and tripod	40.
Packing, boxes, and freight from Hartford to vessel in New York	20.

Payment, it was specified in the agreement, to be made in gold.

Although the Spanish, in 1873, saw the advantages of the small, tripod-mounted Gatling for use in Cuba, twenty-five years later, the U.S. Army's Gatling Gun Detachment used long-barreled Gatlings on field carriages in the Battle of Santiago de Cuba, during the Spanish-American War.

THE KHIVAN CAMPAIGN

Once a great kingdom—in ancient and medieval times, Khiva latterly has fallen upon evil days, physiographically and politically. The land has become increasingly more desiccated because of the eastward shift of the Amu Darya river and the deterioration of irrigation facilities. Since 1924, Khiva has been divided between two Soviet Socialist Republics of Asiatic Russia, Uzbek and Turkmen.

The ancients knew Khiva as Chorasmia; it is mentioned in the *History* of Herodotus (fifth century B.C.), in whose day it was a satrapy of Persia, under Darius the Great, *et al.* Formerly, the Oxus (Amu Darya) flowed to the Caspian Sea, providing a waterway linking the oasis kingdom of Khiva with the western world. Over the centuries, the river has changed its course and now has its outlet in the Aral Sea. In early times, its position commanding the Oxus gave considerable strategic importance to Khiva. This river figured prominently in the campaigns of Alexander the Great and in Persian history generally. Khiva lies south of the Aral Sea and of the Amu Darya river in central Asia. Conquered by the Uzbeks in 1515, the khanate of Khiva remained an independent Moslem Uzbek state until its conquest by Russia in 1873. From that date until the Russian Revolution, the khanate was a Russian protectorate; from 1920 to 1924, it formed the Khorezm Soviet People's Republic until partitioned between Uzbek and Turkmen.

Russian attention was drawn to Khiva as early as the seventeenth century, during which Yaik Cossack bands made forays into Khivan territory. Peter the Great, learning that gold had been found in the sands of the Oxus, in 1717, sent an expedition to Khiva, ostensibly to open trade and secure the re-

lease of Russian subjects held captive there. While the Russian invasion initially was successful, decisively defeating the forces of the khan, the Khivans, through trickery, subsequently succeeded in annihilating the invaders. The Perovsky expedition of 1839 similarly met with disaster.

In 1873, a large-scale campaign against Khiva was organized by Russia, with an army of 10,000 men under Gen. Kaufmann. Converging on Khiva from three directions—previously established bases at Krasnovosk on the east shore of the Caspian, Chkalov on the right bank of the Ural river, and Tashkent in the oasis of that name—the Russians met little opposition in their occupation of the country. All of the Khivan territory on the right bank of the Amu Darya was annexed to Russia. A heavy war indemnity was imposed upon the khanate with disastrous economic and political effects on the nation.

While history indicates that there was not much action involved in the Khivan expedition of 1873, a report by Captain A. Litvinoff, in the *Russian Artillery Journal*, January, 1874, tells interestingly of an incident involving the use by the Russians of Gatling guns in this campaign.

Action of Battery Guns in Khivean Expedition

... We left Zmukshir on the 13-25th of June, and after a march of twelve verstes [about 8 miles], stopped near the village of Chandir, close to the gardens which stretch without interruption from Chandir to Illiale. About 3 P.M. parties of horsemen commenced to make their appearance from different sides; they approached us nearer and nearer, and behind them we could descry larger masses. They commenced to engage our picket lines with great determination and daring. One of these pickets, composed of one officer (Ensign Kamentzky) and five Cossacks, swords in hand, threw themselves forward against an approaching mass of Toorkomans, and were completely cut to pieces. Two companies of the third battalion of sharpshooters, two of the eighth battalion of the line, and two battery guns (Gatlings), were ordered forward to drive away these bands of Toorkomans. The road we had to follow was very difficult, even for infantry and cavalry, as at every step we had to cross wide ditches dug for irrigation, which had abrupt sides; for artillery the road would have been impassable. Our light battery guns went on this road with perfect ease, the ammunition pack-horses alone giving some trouble. When we stopped, a line of sharpshooters and battery guns was formed along one of these ditches.

First I had to find out the range; for this purpose I fired three cartridges, changing each time the height of the sight. The distance found was between the limits of 1,050 and 1,170 yards. Then I laid down both guns, aiming one at a large band of Toorkomans, and the other at another band formed not far from the first. Opening at the first band, I

fired rapidly twenty-five rounds; the band immediately dispersed, part of the men joining the second band. Opening from the second gun I fired fifty rounds without interruption; the second band dispersed at once, the men betook themselves to the broken ground, and disappeared behind some hills and in the irrigation ditches. Several times the enemy, collecting in masses of some strength, moved against us, but was each time driven back by our fire; thus I had several opportunities of firing a succession of twenty-five or fifty rounds, the directions of guns and their elevations varying somewhat, according to the circumstances. In the whole, the battery guns fired that day 408 cartridges. The guns were permitted a very slight side motion. The ground was of clay, covered with scant vegetation, and the fall of the bullets on such ground and their ricochets were easily seen from the battery, even at a distance of 1,170 yards.

. . . June 15-27th a general order was given to move forward early next morning, leaving all trains and baggage behind. As to this train and baggage, they received the order to remain on the same spot (Illiale), and at the break of the next day to form a wagenburg (a large square made of wagons), under the guard of two companies of the fourth battalion of sharpshooters, two battery guns, and a few men of each command sent back to take care of their respective baggage wagons.

At nightfall it was ascertained that in the vicinity of our camp the enemy had congregated in large numbers. Soon after midnight there was an alarm, when all the troops took up arms, but it proved to be without consequence. Apprehending a night attack, and considering that the wagons were much scattered about, it was ordered to collect all the wagons at once, without waiting for the breaking of day. These being collected, the formation of the wagenburg began. The left side and part of the front side of the square were well lined with wagons put close to one another. A company of sharpshooters of the fourth battalion occupied that line, the men either getting on top of the wagons or sitting under them on the ground. The enemy being expected chiefly from the right, I put my two guns in the corner formed by the front and right sides of the square. The right side and rear having as yet no wagons in line, and being somewhat protected by shallow ditches, were guarded, first by miscellaneous men of different commands taking charge of their wagons, officers' servants, sutlers, etc., all armed with pistols, revolvers, sporting-guns, etc., second by a platoon of sharpshooters lying on the ground. At 3 o'clock the attack of Toorkomans commenced.

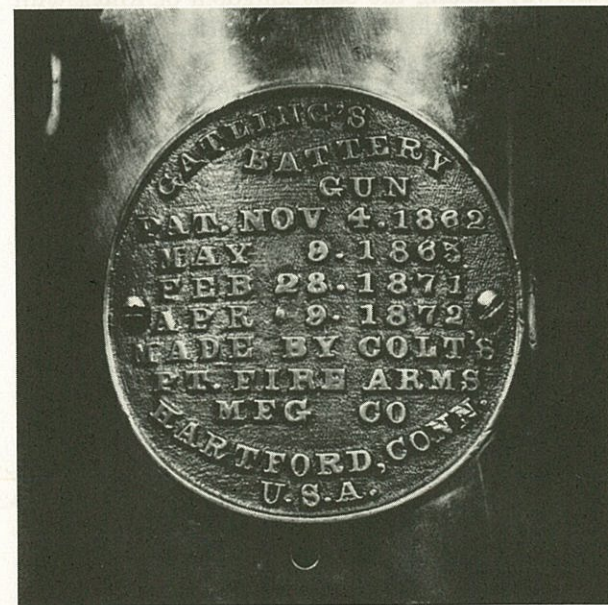
[Here follows the description of the fight of the other troops.]

At the first howls of the attacking enemy I hastened to form a cover for my guns. I put on the right wing ten privates of Soonja and Daguстан, who were with the train guarding their wagons; on the left, fifteen sharpshooters and twelve men of my battery guns command, with whom I could dispense for the present; these men were also armed with rifles. Leaving thus with the battery guns only the most indispensable men to assist in firing, I took

myself the crankhandle of the first gun, invited Capt. Cachourin (Cossack) to take the handle of the other gun, and enjoined on all my group not to commence the fire before the word of command was given.

The guns formed an obtuse angle one with another, as it was necessary to direct them to the precise spot where the shoutings of the enemy were heard, and whence they were approaching us. We had not long to wait. The cries of the Toorkomans who had succeeded in breaking through the lines of our detachment and turning their flanks, suddenly rose from all sides and became deafening. Though it was dark, we perceived in front of us the galloping masses of the enemy with uplifted glittering swords. When they approached us to within about twenty paces, I shouted the command "Fire." This was followed by a salvo of all the men forming the cover, and a continuous simultaneous rattle of the two battery guns. In this roar, the cries of the enemy at once became weak, and then ceased altogether, vanishing as rapidly as they rose. The firing at once stopped, and as no enemy was visible before us, I ventured to get a look at the surrounding grounds, availing myself of the first lights of dawn. About 200 paces to the right of our square stood the eighth battalion of the line. Between it and us no enemy was to be seen, but at every step lay prostrated the dead bodies of the Yonoods, their hats being pushed up to their eyes. I saw no wounded—they were probably all carried away according to the usual Toorkoman warfare.

This account is of particular interest since it describes the effectiveness of machine guns, skillfully emplaced, against attacking forces virtually invisible in the dark of night.



Nameplate found on breech casing of 1874-78 Gatlings.

THE ASHANTI WAR

Prior to its annexation by the British in 1902, Ashanti was a powerful native kingdom of western Africa. It was, until 1957, when the independent state of Ghana was formed, a principal district of the British colony of the Gold Coast on the Gulf of Guinea. Modern Ashanti, with approximately the same boundaries as the former kingdom, has an area of 24,379 square miles. The country is bisected, northwest to southeast, by the Kwahu scarp; south of the slope is a plateau covered by a dense forest, to the north lies a vast, undulating savanna. Seat of the kingdom was Kumasi, located about in the center of the forest.

While the coastal peoples were friendly and traded peacefully with the whites, the warlike Ashantis resented the British dominance of the Gold Coast area, not only because it interfered with their plans for expansion of the Ashanti union, but also since Britain's abolition of the slave trade had ruined the market for their principal export. Faced with a superabundance of slaves, the Ashantis increased their practice of human sacrifice to take care of the surplus. By 1863, there was open hostility between the British and Ashantis; however, there was no serious conflict until 1873, when the *Asantehene* (king of the Ashantis) Kofi Karikari launched a full-scale attack on the coastal tribes; the Denkera and Fanti, who were under the protection of Great Britain, were soon defeated. As the Ashanti warriors ravaged the surrounding area, the neighboring tribes lived in terror, having intimate knowledge of the Ashantis' extreme cruelty to enslaved captives, as well as their especially fearsome witchcraft.

During the summer of 1873, Britain recognized the fact that it was faced with the choice of abandoning its interests on the Gold Coast or taking punitive action against "King Koffee", as they called Kofi Karikari. An expedition, officially designated "Special Service on the West Coast of Africa," was organized under the command of Maj.-Gen. Sir Garnet Wolseley.

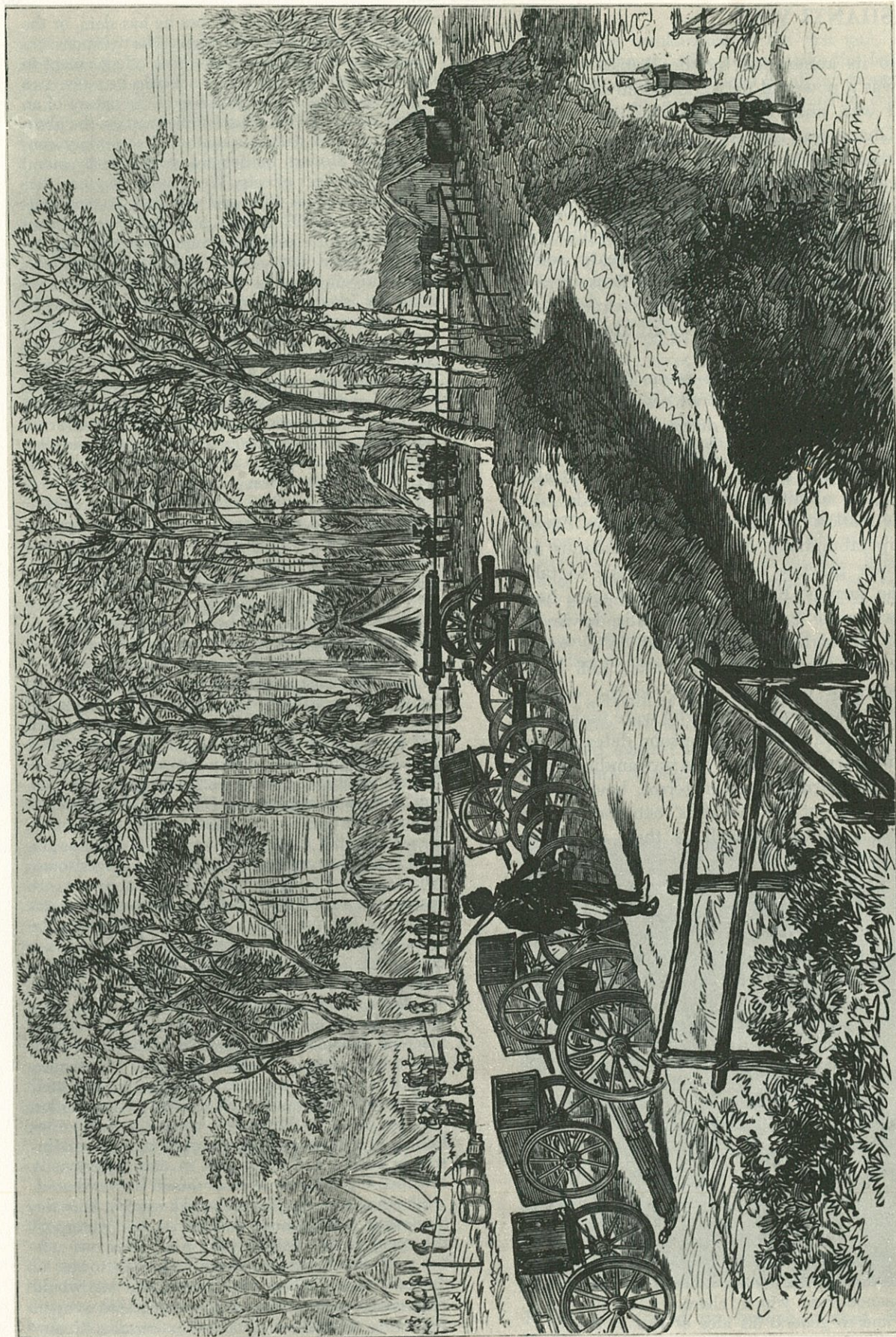
On October 6, 1873, *The London Times* published the following commentary by its military correspondent:

Preparations for the Ashantee War

History teaches us that warfare with a semi-savage nation is marked by certain peculiar characteristics, which require to be fully recognized and provided for. The savage does not fight by the rules of modern tactics. He knows nothing of those intricate manoeuvres which characterize civilized warfare, and in general his idea of victory is con-

nected with the number of foes he has slain, or the number of scalps he has taken. His weapons are comparatively rude, and have little effect except in hand-to-hand fighting. Thus a battle between two opposing savage forces partakes of the nature of an indiscriminate melee. In scientific warfare the absolute number of slain is a matter of secondary consideration. Modern battles are won more by moral than by physical effects. We employ engines that terrify as well as kill, and we find it more advantageous to kill a few, provided the rest run away, than to slaughter a number while the remainder stand fast. Thus, a flight of rockets—a comparatively harmless warlike engine—might cause a regular "skedaddle" among a set of savages without the loss of a single life.

The country of Ashantee, according to all accounts, mainly consists of thick jungle, with narrow paths for roads. Horse or bullock draught is unknown, and locomotion depends upon manual labour. The question, therefore, of Sir Garnet Wolseley's artillery was decided by the peculiar nature of the country in which he is going to operate. It would have been manifestly absurd to send out 9-pounder or 16-pounder field guns, which could not move up country without some species of four-footed traction, but it was desirable that the expeditionary force should be supplied with some description of artillery. In mountainous countries or in those inaccessible to ordinary artillery carriages it has always been found necessary to employ very light guns and equipment, which are usually transported either on the backs of mules or on specially constructed carriages designed for man draught. The artillery which Sir Garnet Wolseley will take into the field is of this nature. He will first have one or two batteries of 7-pounder rifled guns, four guns per battery. He will also have a battery of little smooth-bore howitzers, a few Gatling guns, and some 9 lb. Hale rockets. This will comprise his artillery. . . . The Gatling guns which accompany the Expedition are those known as the 0.45 inch. They will be mounted on carriages somewhat similar to the guns, and, we presume, are mainly intended for the defence of stockaded positions. For fighting in the bush a Gatling would be of as much use as a fire engine, but if by any lucky chance Sir Garnet Wolseley manages to catch a good mob of savages in the open, and at a moderate distance, he cannot do better than treat them to a little Gatling music. When well served, the machine gun is terribly effective at distances from 400 to 600 yards. . . . a perfect rain of bullets may issue from the ten muzzles. The gun is also fitted with an arrangement by which a traversing motion may be given to the barrels while the firing continues. It is obvious that it would be absurd constantly to fire a Gatling gun in one direction. A few men immediately in front would be perforated, while those on the flanks would escape. But the traversing arrangement enables us to "waterpot" the enemy with a leaden rain. Altogether, we cannot wish the Ashantees worse luck than to get in the way of a Gatling well served, but we would impress upon those who use this formidable weapon the utter uselessness of it under certain circum-



Artillery park in camp at Prahsu, scene of Captain Rait's impressive demonstration. Gatling Gun is behind and to right of row of small cannon.

stances. If the enemy takes to the bush he must be shelled out of his cover, and for this purpose resort must be had to guns and not to Gatlings. . . .

On July 30, 1873, two Gatling Guns, with 10,000 rounds of ammunition for each, were shipped to West Africa by mail packet. Capt. Rait and the headquarters of Rait's Artillery marched from Cape Coast on the Gulf of Guinea, November 28, 1873, taking with them the two Gatlings, as well as a 7-pounder and a 4-2/5 howitzer. Mounted as they were on wheeled carriages of the type used for artillery, it soon became apparent that these Gatling Guns were unsuited for movement over the narrow trails of the West African bush country. To facilitate transport, one of the Gatlings was fitted with an extemporized carriage of narrower track; this, of course, made the piece top-heavy and it tipped over many times enroute. They did, however, manage to get the Gatling to the base at Prahsu, where it figured in a much-publicized incident of the war.

A group of Ashanti envoys, bearing peace proposals from Kofi Karikari, arrived at Prahsu, where Sir Garnet Wolseley had established his headquarters. This was on January 2, 1874.

. . . On the following day [January 3, 1874] a little practice with the Gatling was held for the benefit of the Ashanti envoys, Captain Rait firing a drum of ammunition up the stream where the accuracy and force with which the bullets struck the water, at a range of some 500 yards, was shown by the fountain of spray that was thrown up. The well-bred native envoys looked coolly on and seemed but little surprised. But the view of the Gatling was destined yet to bear fruit.

At 1 o'clock on the morning of the 5th, we were awakened by a shot fired in the hut where the Ashantis were under guard, and on visiting the hut it was found that one of the scouts had put the muzzle of his gun to his throat and, pulling the trigger with his toe, had blown his brains out. It was a strange and ghastly sight, the dead man lying on the guard bed with his brains scattered on the side wall, shown by the lantern light. At first the other messengers expressed ignorance as to the cause of the act, but a court of inquiry was held on the 5th and witnesses were examined. One of the Ashantis said that the dead man, Quamina Owoosoo by name, had expressed his opinion that all the scouts were going to be killed, and only the messenger allowed to return, and had consequently blown out his brains. Sein Quaku, the messenger, spoke to the same effect, and it appeared that they had all been more or less surprised and astonished at the firing of the Gatling; and that this man, being of rather a cowardly nature, had determined to destroy himself. . . .

—Brackenbury, Capt. Henry, R.A. *The Ashanti War*. Edinburgh and London. Wilkes Blackwood and Sons. 1874.

This incident made quite an impression not only on the Ashanti envoys but also on the gentlemen of the press.

Envoys from King Koffee to General Wolseley had arrived with overtures of peace, and had been shown over the extemporized encampment of the British brigade. The tables were about to be turned, and the invasion of Ashantee was succeeding to the Ashantee invasion. The Prah had been crossed—the Adansie Hills occupied and the surrounding country successfully reconnoitered—the Envoys gazed amazedly on the awful preparations, the steadily increasing resources of the British into their territory. They witnessed the performance of Gatlingeers with their hydra-barrelled field-piece, and according to the evidence of a Court of Inquiry, one of the frightened Envoys made away with himself in sheer horror of the situation—his king's best general forced to quit the Protectorate, the army disbanded and utterly demoralized, and the white faces sternly advancing to the attack armed with such man-slaying guns!

—*United Service Magazine*

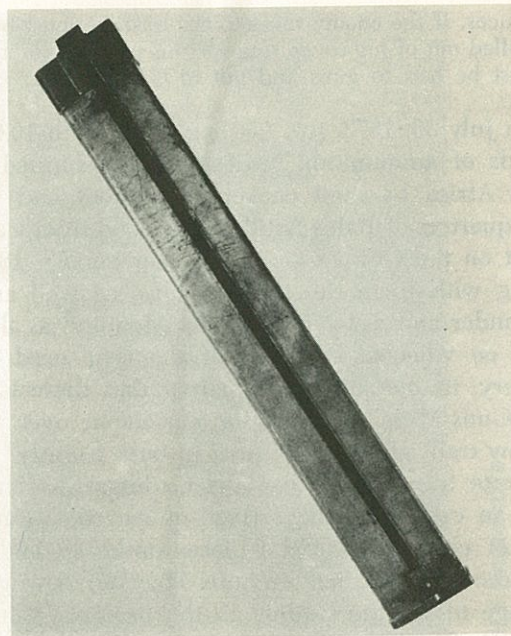
We are not surprised that the Ashantees were awe-struck before the power of the Gatling gun. It is easy to understand that it is a weapon which is specially adapted to terrify a barbarous or semi-civilized foe. The Ashantee correspondent of the *New York Herald* says that the reputation of the Gatling is now spread throughout Ashantee. "It is a terrible gun which shoots all day. Nothing could stand before it; the water of the Prah ran back affrighted." "The effect of this," remarks the writer, "combined with many other things, has been to induce the King and his Council to deliberate and reflect on the possibility of peace."

—*Army and Navy Journal*

The Ashanti War ended after British troops invaded Ashanti, captured and destroyed the capital, Kumasi, on February 4, 1874. Subsequently, the Treaty of Fomena was signed; under the terms of this agreement, the Ashantis relinquished all claims to Denkera, Akim, Assin, Adansi, and the coastal forest, and promised to give up their practices of slavery and human sacrifice, and to pay indemnities. His people were rankled by this humiliation and, later in 1874, Kofi Karikari was dethroned—i.e., deposed as ruler.

From all accounts of the Ashanti War consulted, it appears that, while two Gatling Guns were sent out from England, only one saw use, and this piece was taken no further than the banks of the frontier river Prah, where—aside from the effective demonstration for the benefit of the Ashanti envoys—it was employed to guard a bridge against possible attack, which never came. Even though the Gatling fired no shots in battle during the Ashanti War, it seems to have served well, in camp, as a weapon of psychological warfare.

Presence of Gatling Guns among the artillery of the Ashanti Expedition of 1873-1874 is noteworthy since, at the time, the gun had not as yet been adopted officially by the British Army. The Gatlings sent to West Africa in 1873 had been purchased during the winter of 1870-1871 for trial. Their non-use in this campaign pointed up the need for more portable machine guns, suitable for colonial warfare where, frequently, the only means by which artillery could be transported was manpower (on the Gold Coast, native women were used as "beasts of burden"). In 1875, Artilleryman Rait, who had served with distinction in the Ashanti War and was then a major, suggested the development of a "Pistol Gatling", as he called it, presumably to be of smaller caliber and weigh about 100 pounds. Undoubtedly, Maj. Rait's trying experience in struggling over West African bush country trails to bring a Gatling to Prahsu in 1873 suggested a lighter, more easily transported gun. Actually, he was anticipated by Gatling, who introduced his famous "Camel Gun" early in 1872. Weighing only 135 pounds, and available with tripod mount, the Camel Gun would have been ideally suited to the needs of the Ashanti campaign.

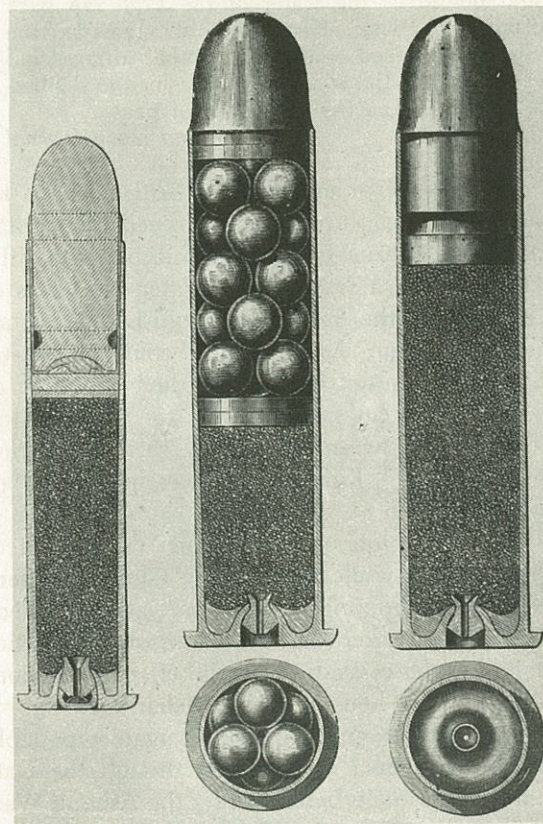


Standard magazine used with most .45-70 Gatlings. Trapezoidal in cross section; it was made of sheet iron, tin-plated, with bronze fittings. Heavy bronze follower weight aided in forcing cartridges into gun. Spring catch at lower end kept cartridges from falling out; upon insertion of magazine into hopper, this catch disengaged automatically.

"KEEP UP THE PRICES OF THE GUNS"

Writing to Edgar T. Welles, Secretary of the Gatling Gun Company, on October 30, 1874, Gatling advised: "Tell Broadwell our best policy will be to keep up the prices of the guns & give liberal commissions." In another letter, dated October 8, 1875, he informs Welles: "McClure & Jones apparently major stockholders in the Gatling Gun Company think we ought to give 10 per cent commission on the guns—Such a commission will make agents & gun men, consuls, &c whom we can enlist in our interest work energetically in getting orders." As will be seen, the Gatling Gun Company easily could afford to pay such commissions on the sales of their guns.

The Gatling Gun, in its heyday, was a very profitable item for both the Gatling Gun Company and the manufacturer, Colt's Patent Fire Arms Mfg. Co. Just how profitable is shown by the following tabulation, based upon a study of the records of the two firms for the 1874-1876 period. Actually, the prices paid and received by Gatling varied somewhat; however, these figures are close to average (Colt's costs are taken from an estimate prepared March 27, 1875).

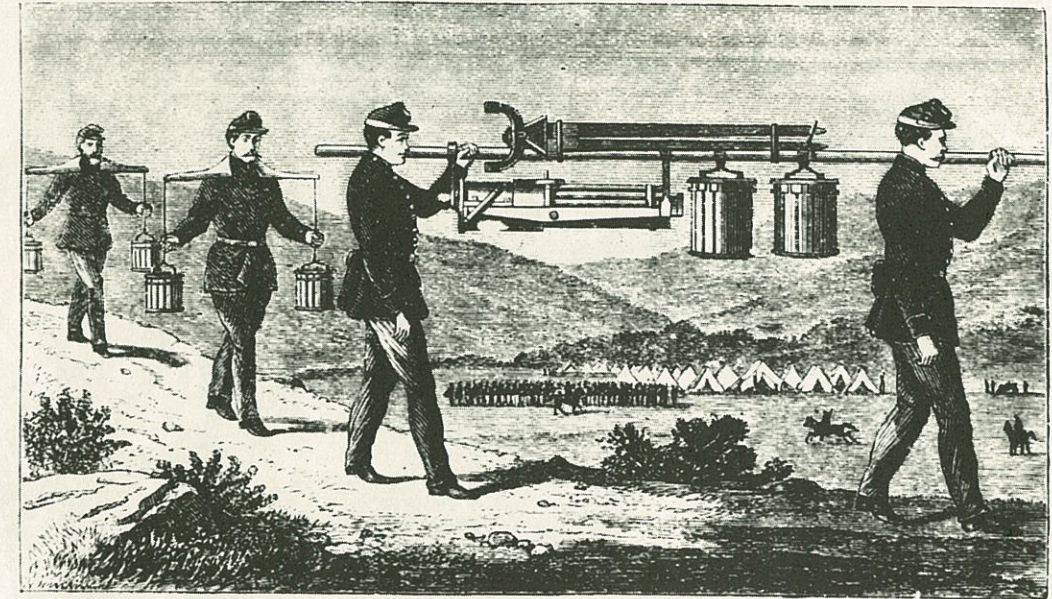


Early types of Gatling cartridges.

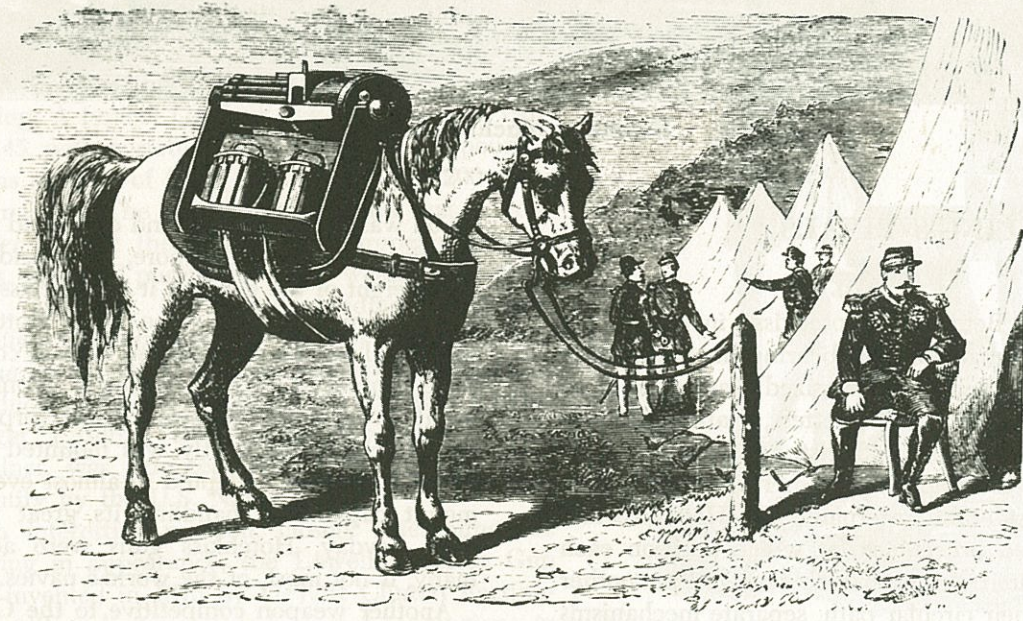
GATLING GUN COMPANY

COLT'S PAT. F. A. MFG. CO.

MODEL	Selling Price	Cost	Profit	Cost	Profit
1-inch caliber, 10 barrels	\$1,800.00	\$1,100.00	\$700.00	\$627.60	\$472.40
Musket caliber, 10 long barrels	1,000.00	490.00	510.00	230.56	260.44
Musket caliber, 10 short barrels	850.00	445.00	405.00	206.38	238.62



Proposed methods of transporting Gatling Gun, tripod, and Broadwell drums.



Gatling Camel Gun and Broadwell drums carried in special pack saddle.