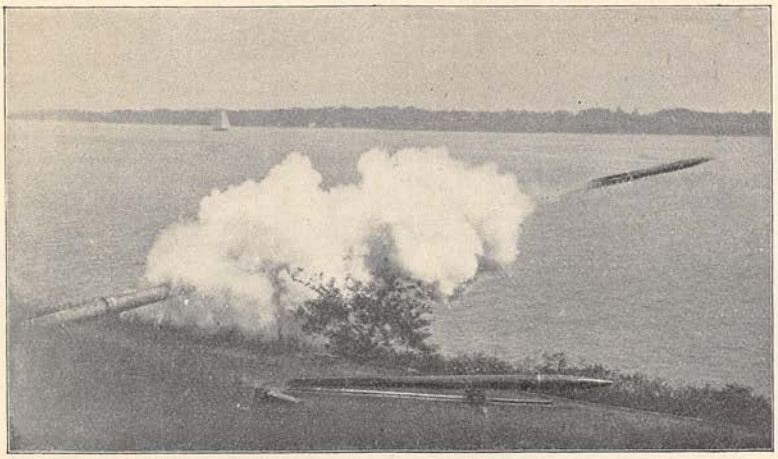
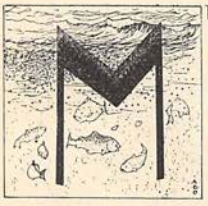


ERICSSON AËRIAL SUBAQUATIC PROJECTILE IN FLIGHT.

NEW WEAPONS OF THE UNITED STATES ARMY.



UCH has been written of late relative to the regeneration which has been taking place in the navy, of which we are justly proud; but scarcely anything has been said of the strides that have been taken by the army in offensive and defensive implements and engines of war, covering almost everything from the huge guns of 12-inch caliber for sea-coast defense down to the infantry rifle, the bore of which now measures but three-tenths of an inch. The muzzle-loading cast-iron smooth-bore guns and mortars have been superseded by the breech-loading rifled steel guns and mortars, which are marvels of power, endurance, and accuracy; the single-loading infantry rifle has been succeeded by a magazine small-arm of smaller bore, giving higher velocity and consequently greater range and penetration; powders producing dense clouds of smoke are shortly to be supplanted entirely by the smokeless variety of superior ballistics; the untrustworthy method of guessing ranges is soon to give way to delicate and accurate devices for locating the exact position of the enemy on land or sea; machine-guns have been improved until they are capable of delivering 1800 shots per minute by electrical power; rapid-fire guns have been developed; a high explosive has been discovered which can be safely fired from powder-guns,—in fact, the changes that have been wrought in the *matériel* of war since the Civil War, and especially during the last decade, have been as revolutionizing in their effect as they are marvelous in their conception. As in other nations, the system of artillery in the United States has only just emerged from the experimental state. But the most gratifying part of these experiments and tests lies in the fact that the United States has not only provided her army with material that is equal to any produced abroad, but in almost every instance has outstripped the older European countries in the most improved engines of modern warfare.

Guns may be divided into two general classes: those using fixed or metallic ammunition, wherein the projectile and powder-charge are simultaneously loaded, and those in which the shell and charge are loaded separately.

Under the first subdivision may be included the infantry rifle, the carbine and revolver, and machine, rapid-fire, and mountain guns; and under the second, field, siege, and heavy cannon (guns, howitzers, and mortars). They are described by their weight, their caliber, and the weight of the projectile, or by all three. Thus, we speak of the 110-ton guns (the English high-power cannon of 16.25 inches caliber, which proved such failures), the 3.2-inch gun, the 8-inch gun, or the 12-inch mortar; the 3-pounder (1.85 inches caliber) or the 6-pounder (2.244 inches); or we may say the 12-centimeter, 45-pounder quick-fire gun.

THE NEW INFANTRY RIFLE.

THE old small-arm now in the hands of the army (the Springfield rifle) is .45 of an inch in caliber, and is a "single-loader"—that is, is

capable of firing but one round without reloading. We have been very much behind other countries in taking the necessary steps leading to the adoption of a modern infantry rifle; in fact, almost every foreign army had adopted a small-caliber, high-velocity magazine-arm before this country began the serious consideration of that all-important subject; and to within a very recent period the same statement applies with equal force to the other modern munitions of war.

The new rifle selected for the army is of smaller caliber than that now in use, being only .30 of an inch; and is what is termed a "magazine-gun," or a rifle in which the magazine can be charged and then held in reserve while single fire is delivered, magazine fire being, however, available at any moment. The magazine has a capacity for five additional rounds.

On December 16, 1890, a board of army officers, consisting of men who were known to be experts in their knowledge of small-arms, was convened for the purpose of testing all small-arms of either American or foreign invention with a view to the selection of the best for our service. This board sat for nearly two years, and tested during that time fifty-three guns, including, besides the product of different private inventions both American and foreign, the small-arms adopted for the armies of Austria, Belgium, Denmark, England, France, Germany, Egypt, Portugal, Russia, Roumania, and Switzerland. Two of the guns submitted were inventions of officers of the United States army, one of these being General J. C. Kelton, the recently retired adjutant-general. After a most thorough, exhaustive, and impartial test of all the devices presented to it, the board recommended the Krag-Jorgensen gun as being the most suitable for the United States army. As soon as the announcement was made that a weapon of foreign invention had been selected, an outcry was raised by the inventors of this country that a fair trial had not been given them, and that there had not been sufficient opportunity for all to compete.

In order, therefore, to satisfy American inventors, Congress in January, 1893, deferred for six months the time for the final selection of an infantry rifle, and directed that another board of army officers be appointed to test during this period all small-arms of American invention which might be presented to it. This board tested nineteen different guns, but found none fulfilling the conditions deemed necessary for the requirements of our military service, and the decision of the first board therefore remained unchanged, which was that the Krag-Jorgensen rifle "was vastly superior for use in the United States service to any weapon adapted to single fire only."

The gun, as its name indicates, is the joint invention of Captain O. Krag, director of the Royal Manufactory of Arms, Kongsberg, Norway, and Mr. E. Jorgensen of the same country. The Krag-Jorgensen rifle of .315-inch caliber is that adopted by the Danish government; but the weapon of this name selected for the United States army differs in many particulars from the one in use in Denmark, having been modified in important details to meet the objections found by the board on magazine small-arms in this country.

Instead of lamenting over the result of these tests, that the rifle adopted for the use of our army is of foreign design, it would seem to be far better that we should take pride in the fact that, after a most impartial, exhaustive, and thorough test of the products of the inventive genius of the United States and most of the civilized countries of Europe, the United States army is to be equipped with an infantry rifle that is without an equal in the world.

1. PENETRATION IN OAK (3.3 INCHES) OF THE .45-CALIBER LEAD BULLET. 2. PENETRATION IN OAK (5.3 INCHES) OF THE .45-CALIBER GERMAN-SILVERED BULLET. 3. PENETRATION IN OAK (24.2 INCHES) OF THE .30-CALIBER BULLET WITH NICKEL-STEEL JACKET.

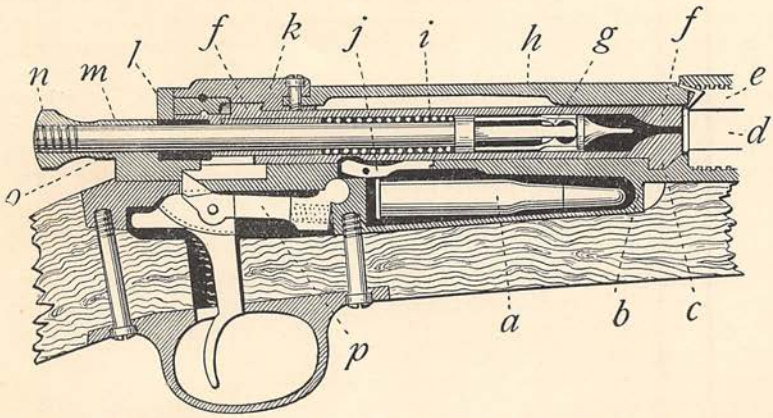
The following table gives the names and calibers of modern guns which have been adopted for the services of European countries and

Japan, all of which were tested in competition with the Krag-Jorgensen:

COUNTRY.	NAME OF GUN.	CALIBER.
		Inch.
England	Lee-Speed	.303
Denmark	Krag-Jorgensen	.315
Austria	Mannlicher	.315
Belgium	Mauser	.301
Germany	Mark V, Model 1888,	.311
Portugal	Kropatschek	.315
Japan	Murata	.315
Switzerland	Schmidt	.295
Roumania	Mannlicher	.256
France	Berthier (Cavalry)	.30

This universal reduction in the caliber of small-arms is due to the fact that the smaller bullet gives greater velocity, and consequently is liable to disable more men. While it is undoubtedly true that the nature of the wounds caused by the smaller-caliber guns is not so severe at the ordinary ranges as with the large .45-inch caliber, the reduced cartridge accomplishes its object in a more humane manner, in that it disables the soldier equally well for the time being without shattering in an unnecessary and brutal manner the bone which it may happen to strike. It answers every purpose if the man struck is compelled to leave the line of battle, and nothing is gained by excessive maiming.

Outside of this humane consideration is the fact, above mentioned, of the greater penetrative power of the smaller caliber, which is capable of disabling two, three, or even more men instead of one; and also, as both the gun and cartridge are lighter than the old, the soldier is now able to carry 175 rounds of ammunition instead of only 100 as heretofore.



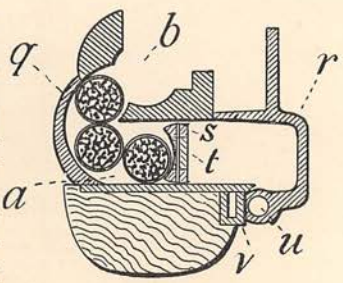
U. S. MAGAZINE-RIFLE, MODEL 1892. BREECH MECHANISM IN LONGITUDINAL SECTION.

a — magazine; *b* — receiver; *c* — locking lug; *d* — chamber; *e* — barrel; *f* — bolt; *g* — striker; *h* — extractor; *i* — mainspring; *j* — ejector; *k* — sleeve; *l* — safety lock; *m* — cocking-piece; *n* — thumb-piece; *o* — firing-pin; *p* — sear.

The drawing on page 571, taken from the report of the chief of ordnance, United States army, 1893, illustrates the relative penetration in oak of the .30- and .45-caliber bullets. The former was propelled by 37 grains of Wetterin smokeless powder, and consisted of a lead core with cupro-nickeled steel jacket, and gave a penetration in dry, well-seasoned oak of 24.2 inches; whereas the latter all-lead bullet, propelled by 69 grains of black powder, gave but 3.3 inches penetration in oak not well seasoned, and 5.3 inches penetration when the bullet was covered with a German-silver jacket. The .45-caliber bullets were in both instances badly deformed, while the .30-caliber was recovered undeformed.

In addition to the changes which have taken place in the small-arm proper, the old form of triangular rod-bayonet has been superseded by the knife-bayonet of the general design used in all the European services. The carbine has been changed to the same mechanism as the rifle, and differs from the latter only in being 22 instead of 30 inches long.

The only important modification which has taken place in reference to the army revolver has been the reduction of the bore to .38 of an inch. The reason for this unequal reduction in caliber between the rifle and the revolver is that as the latter will invariably be employed at shorter ranges (from 50 to 100 yards), the shock produced upon the soldier struck must be greater in order to prevent his reaching the line of attack. Some of our officers are of opinion that even this diameter (.38 of an inch) is not large enough for that purpose. The army revolver adopted for our military service is the Colt double-acting six-shooter.



U. S. MAGAZINE-RIFLE, MODEL 1892. THE MAGAZINE IN CROSS-SECTION.

a — magazine; *b* — receiver; *q* — side-plate; *r* — gate; *s* — follower; *t* — carrier; *u* — hinge-bar; *v* — magazine-spring.

MACHINE-GUNS.

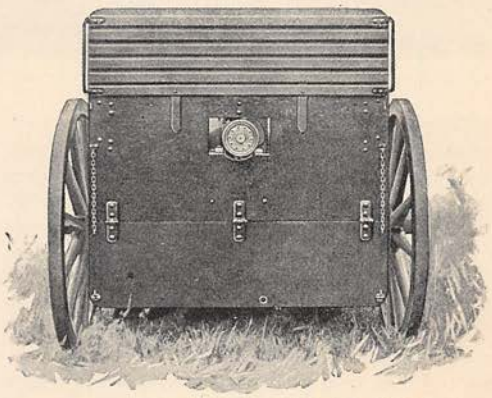
CLOSELY allied to the infantry rifle, and used in connection with it, is the machine-gun or mitrailleuse. Machine-guns are those guns using metallic ammunition which are loaded by the action of the mechanism, the gun being automatically fed by means of belt, hopper, or otherwise. The pioneer in the development of this important and destructive weapon was Dr. R. J. Gatling, an American, whose name has become a household word throughout the world. His original inventions were presented to this government during the early part of the War of the Rebellion, but were at that time too crude and undeveloped to warrant their use. The first practical attempt to use a machine-gun in the field was made with the French mitrailleuse during the French-Prussian war. France expected great results from this weapon, but was doomed to bitter disappointment. The gun had a number of fixed barrels, and could fire from 30 to 50 rounds per barrel a minute, but was poorly constructed and possessed the serious fault of employing paper cartridges.

Following close upon the Gatling and the French mitrailleuse came the inventions of Gardner, Nordenfelt, and Maxim, the latter, an American by birth and parentage but English by adoption, being the designer of the famous Maxim automatic machine-gun, a one-barreled gun which, after the first discharge, is entirely automatic, the energy of recoil being so utilized as to eject the fired cartridge, insert a new one in its place, raise the hammer, and fire again, with an average rapidity of about 650 shots per minute.

The greatest objection which has heretofore been made to the Gatling gun is that the mechanism is dependent upon gravity entirely for its supply of ammunition. This was a serious fault, especially at great angles of depression or elevation. The difficulty has now been satisfactorily overcome in a new "positive feed" which supplies the cartridges by means of a belt. The Gatling 10-barrel .30-caliber gun, adapted for either positive or gravity feed, in use in the United States military service, is designed also to be operated by an electric motor, by means of which a rapidity of fire is secured that "would seem to have no limit but the endurance of the parts," being capable of delivering no less than 1800 shots per minute.

RAPID-FIRE GUNS FOR COAST DEFENSE.

ONE of the latest additions to modern engines of warfare, and at the same time one of the most important, has been the introduction of the so-called rapid-fire or quick-fire guns. Rapid-fire guns are those guns employing metallic cartridges which are loaded by hand for each round, and are used solely in the military service as auxiliary agents in sea-coast defense. (Rapid-fire field-guns are not, therefore, here included.) Experimentation with guns of this class was begun as late as 1880, when Hotchkiss, at the request of the French government, constructed a single-barreled 47-millimeter-caliber continuous-fire gun, throwing a 2½-pound shell; although Nordenfelt claims to have been the pioneer in producing rapid-fire guns, having introduced in 1877 a 1-pounder, worked with



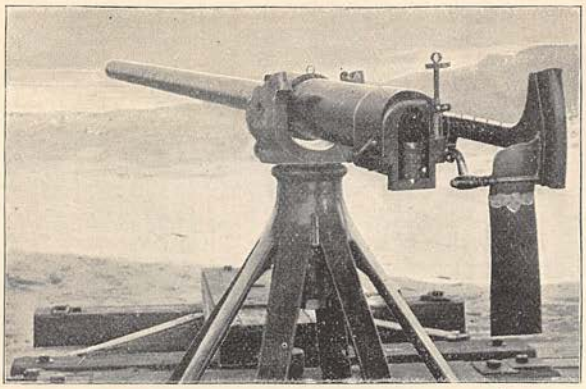
GATLING 10-BARREL GUN READY FOR ACTION.

breech mechanism and lever, capable of firing 216 rounds per minute, which was to be employed as an "antidote to torpedo-boats."

The particular object for which the first guns of this class were built was to stop the new torpedo-boats of that time,— the requirements being mobility both as regards laying the gun — *i. e.*, aiming — and fire, coupled with accuracy, the heavier guns mounted on shipboard being too cumbersome to cope instantly and effectually with the attack of torpedo-boats. From their use on shipboard has grown the demand for their employment on land.

These guns are termed "quick-fire" abroad and "rapid-fire" in this country, but there appears to have been a tendency of late, especially in the United States, to apply these terms separately to two different types of this general class, the term "rapid-fire" being given to those auxiliary sea-coast defense guns, not exceeding 6-pounders (caliber 2.244 inches), which will be used for the general and local flanking of the approaches to batteries. They are adapted to simultaneous loading, and mobility is their essential characteristic. All other guns of this class (exclusive, of course, of rapid-fire field-cannon) exceeding 6-pounders may be termed "quick-fire." They are devised for a different purpose which is explained further on.

The tests with rapid-fire guns with a view to the selection of a type for the United States



DRIGGS-SCHROEDER RAPID-FIRE GUN. 2.244 INCHES CALIBER, 6-POUNDER.

military service has been in progress at the ordnance-proving ground at Sandy Hook during the past summer, and designs of 6-pounders have been submitted by the leading manufacturers of these guns in the United States and Europe, including the Hotchkiss, Skoda, Seabury, Driggs-Schroeder, and Sponsel.

Some very remarkable results (38 rounds per minute from one gun) have been obtained; and so excellent indeed have been the types submitted that an eminent officer who was present at the test was overheard to say that "any one of them could be selected for our army with safety."

Quick-fire guns (those using metallic ammunition exceeding 6-pounders), while possessing greater range, have less rapidity of fire, and are designed for a different purpose. "They are to be used for the protection of the mine fields, and coöperation with the smaller guns (machine and rapid-fire) in repelling parties approaching the land; and will contend against small unarmored boats, or against boats protected with light armor, engaged perhaps at considerable distances, by night or by day." The term "mine field" is applied to a water area in which are anchored submarine torpedoes for the defense of the approaches to rivers and harbors. These mines are operated by means of electrical connections with the shore, under the control of an officer, and form a necessary part of the protection of our seaports, and our inland cities on navigable rivers.

The caliber of quick-fire guns which are now undergoing test at Sandy Hook is 4.724 inches (12-centimeter). In the navy, however, guns as high as 6 inches in caliber are also included under the head of "quick-fire guns," being designed for metallic ammunition. The types of quick-fire guns which are being tested are those submitted by Armstrong, Hotchkiss, Canet, Schneider (Creusot), and the Seabury Gun Company. The rapidity of aimed fire of these guns is about 10 rounds per minute, and their weight of projectile is 45 pounds.

MOUNTAIN ARTILLERY.

THE conditions governing fighting in mountainous and rough country districts render the use of field-pieces and horse artillery impracticable. Absence of roads and precipitous footpaths have necessitated the devising of special guns the primary feature of which is lightness; but it is a general rule of military science that the most powerful gun that can be transported should be used, and for mountainous districts weights not exceeding those that can be carried by pack-mules have to be employed. Guns of this class are termed "mountain artillery."

The mountain artillery of the United States consists, in addition to machine-guns, of the 1.65-inch (2-pounder) and 3-inch (12-pounder) Hotchkiss guns. The weight of the former is a little over 100 pounds, with a carriage of about twice that weight. The gun and the carriage are transported separately by mules, as is also the ammunition. The 2-pounder and the 12-pounder Hotchkiss mountain guns are designed to fire metallic ammunition, the latter being also adapted to fire shrapnel.

FIELD ARTILLERY.

FIELD artillery may be divided into horse artillery, light artillery, and heavy field artillery. The gun employed for horse artillery is very light in order to accompany cavalry, the cannoneers being mounted; and the cannon adopted for this purpose in the United States is the new 3.2-inch steel breech-loading field-gun, weighing 829 pounds, and firing a projectile of 13½ pounds with a charge of 3½ pounds.

The function of light field artillery is to accompany infantry, and the field-piece adopted for this purpose is the steel 3.6-inch cannon weighing 1181 pounds. Its charge is 4 pounds 8 ounces with a 20-pound projectile.

These two guns are also termed "rapid-fire field-guns," from the fact that an attempt is now being made to adapt them to fire metallic cartridges. In order, therefore, that they may be rapid-fire field-guns it has become necessary to devise carriages which shall not permit any recoil upon the ground. For this purpose the rapid-fire field-carriages are now being fitted with recoil cylinders attached to and forming part of the top carriage, the lower carriage being checked by wheel-brakes.

Heavy field artillery is intended to form batteries for engaging at long ranges, and delivering vertical fire against troops sheltered by temporary defenses. For this purpose the 3.6-

inch steel rifled field-mortar is used, weighing 244 pounds, and firing the same weight of projectile as the 3.6-inch field-gun (20 pounds), with a charge of one pound. Its range is about two miles, and in the test of the type of its class it has demonstrated its superiority to any similar piece in use by foreign services.

In addition to the artillery in use for mountain, field, and siege purposes (the latter being briefly touched upon below), should be mentioned the Hotchkiss 1.5-inch-caliber revolving cannon. It may be regarded as being midway between the machine and rapid-fire gun types, and is used principally in defending caponieres. The gun is not without its place also in the field in defending ditches, and in service of a like nature where the character of the fire is rapid, continuous, and powerful.

SIEGE-GUNS.

SIEGE-CANNON are intended for attacking and defending inland fortifications and the land fronts of sea-coast fortifications. The term "siege" is usually applied to pieces which, although too heavy for field operations, are yet light enough to be transported over common roads upon the carriage from which they are fired.

The siege artillery of the United States consists of the 5-inch siege-gun, the 7-inch siege-howitzer, and the 7-inch siege-mortar. The difference between howitzers and mortars, it should be remarked, is very slight. Howitzers are short cannon possessing the caliber of the mortar and yet approaching the accuracy of the gun. Mortars, on the other hand, may be defined simply as "very short cannon," and are used chiefly for high-angle firing. Howitzers are employed for the demolition of earthworks, and field-mortars for the destruction of life behind earthworks. The range of the service 7-inch howitzer with a 100-pound shell is about three miles, and its rapidity of fire is nearly at the rate of one round per minute.

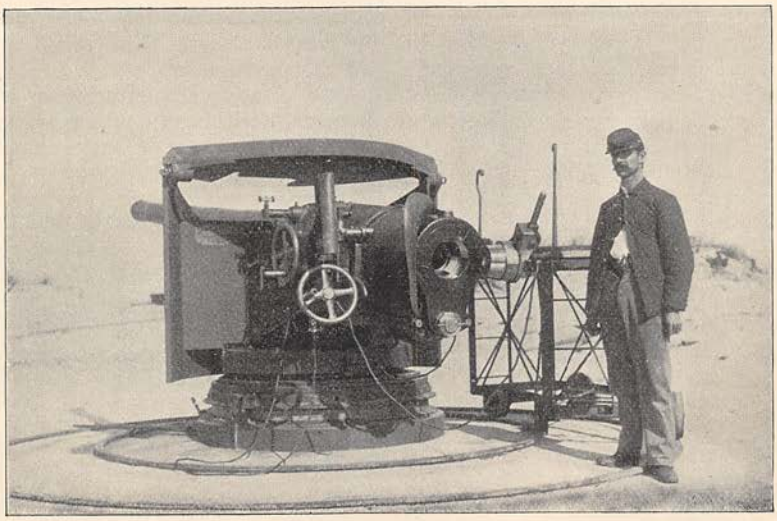
HEAVY GUNS FOR COAST DEFENSE.

THE sea-coast guns of the Civil War were cast-iron smooth-bore muzzle-loaders made in a single piece. The present sea-coast cannon of the United States and Europe are composed entirely of steel, and are constructed on what is termed the "built-up" system, which in general may be said to consist "of a series of concentric simple cylinders or layers in which the principle of initial tension is secured by the method of assemblage, whether by shrinkage as applied in the use of cylinders of a determinate size, or by tension of winding, as in the wire-wound gun."[1]

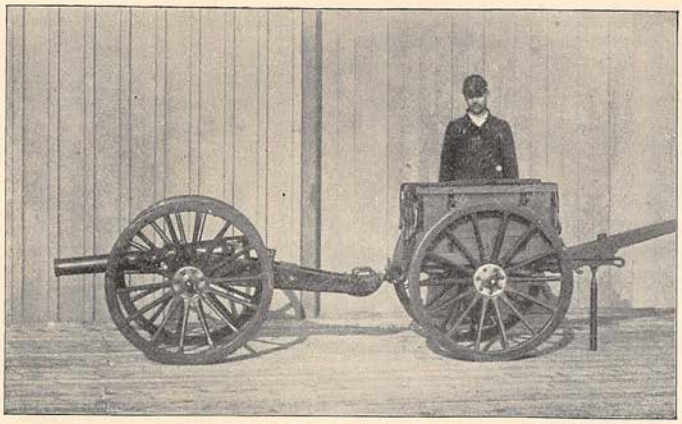
To Krupp of Germany belongs the credit of first making steel in large masses (1854), but Sir W. G. Armstrong, Mitchell & Co. of England were the pioneers in the method of building up guns. The attempt to forge steel in sufficient masses for high-power sea-coast guns was not made in this country until within the last five years.

The sea-coast artillery employed in the United States for the armament of our fortifications consists of the 8-, 10-, and 12-inch breech-loading steel rifles, and the two types of 12-inch breech-loading mortars — the cast-iron steel-hooped and the all-steel mortars. Too much credit cannot be given to the ordnance department of the army for the development of our

[1] Captain R. Birnie, "Modern Gun Construction."



4.724-INCH ARMSTRONG QUICK-FIRE GUN AND MOUNTING. LOADING POSITION.



3-INCH HOTCHKISS MOUNTAIN GUN AND LIMBER.

comment of the chief of ordnance as expressed in his annual report for 1892, page 14 (referring to the 8-inch gun, which has been fully tested):

Range	mile	1
Mean vertical deviation from center of impact	foot	.56
Mean horizontal deviation from center of impact	foot	.56
Range	yards	3,000
Mean vertical deviation from center of impact	foot	1
Mean horizontal deviation from center of impact	feet	1.75

modern high-power sea-coast guns. These cannon have been constructed in accordance with the plans of that department, and the tests of the type 8-, 10-, and 12-inch guns have demonstrated their marked superiority in accuracy, endurance, power, and symmetry over any other guns of like caliber and weight the world has ever seen.

A fair conception of the size and cost of these massive pieces of ordnance may best be realized when it is stated that the 12-inch breech-loading rifle weighs 127,680 pounds; that the cost of its forgings before machining and assembling is about $42,000; and that the expense of machining is about $10,000,—making a total cost of about $52,000 for a gun which, it is estimated, can be fired only about 300 rounds before an additional expense is necessitated by the insertion of a new liner. (In England the estimated life of their 12-inch gun, which weighs over ten tons more than that of like caliber in this country, is but 105 rounds.) So carefully constructed are these modern high-power cannon that a variation from the prescribed diameter of more than $\frac{3}{1000}$ of an inch in the bore or the shrinkage surfaces cannot be allowed. In fact, they are more accurately and delicately constructed than a watch.

The charge of the 12-inch breech-loading rifle is 450 pounds of powder and a projectile of 1000 pounds; the required muzzle velocity is 2100 feet per second; and the penetration in Creusot steel is 25 inches at the muzzle, and 21 inches at 3500 yards (two miles). With 20 degrees elevation the range is a little less than 8 miles, and the cost of a full service charge is about $400. With such ponderous weights and huge charges of powder, the question naturally arises, What is the accuracy? The answer is best given by quoting the following table and

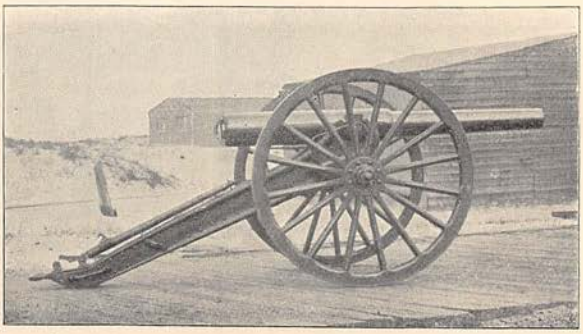
"This extreme accuracy of fire is better illustrated by the statement that in a target of five shots, at a range of one mile, *four out of the five shots struck within an area of 20 by 21 inches;* and in a target of eight shots, at a range of 3000 yards (about 1¾ miles), six shots struck within an area of 1½ by 4 feet. The targets with the 10-inch breech-loading rifle have shown about the same degree of accuracy."

So far as I am aware, no other guns in the world of this class have exhibited such a high coefficient of accuracy under similar conditions.

SEA-COAST MORTARS.

NOT less important in the defense of the United States nor less successful in the results obtained are the modern high-power sea-coast 12-inch breech-loading mortars. Sea-coast mortars are used for the destruction of ships of war threatening our coasts, and fire projectiles designed to strike the deck—the most vulnerable part of a ship. These missiles are termed "deck-piercing shell."

One of the most interesting series of experiments that have been in progress during the past few years has been the keen competition be-



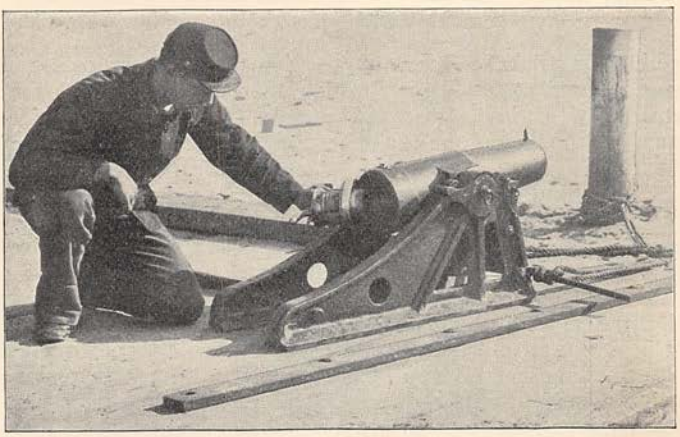
3.6-INCH BREECH-LOADING RIFLE FOR LIGHT FIELD ARTILLERY.

tween the armor-piercing shells and armor-plate. While the army has devoted its energies to the fabrication of a projectile which shall pierce any plate, the navy has aspired to produce an armor which shall withstand any projectile. No sooner does the navy manufacture what is thought to be an impenetrable plate, than the army brings forth a projectile that shatters it. The projectile at present undoubtedly has the advantage, which it is likely to maintain.

There are two kinds of 12-inch breech-loading mortars in the United States service — the cast-iron steel-hooped and the all-steel. But cast-iron as a material for guns has been weighed in the balance of military experience, and found wanting. The numerous casualties of the Civil War, and the bursting at Sandy Hook in 1889 of the 12-inch cast-iron breech-loading mortar constructed by the South Boston Iron Works, after the firing of only 20 rounds, have caused it to be looked upon as unsuitable for guns in any form. For this reason, therefore, although primarily a cheaper method of construction, the adoption of the cast-iron steel-hooped mortar is not necessarily regarded as final. In addition to the element of danger in the employment of cast-iron, the 12-inch cast-iron breech-loading mortar has shown itself to be inferior in velocity and range and power to the all-steel mortar of like caliber, and it is believed that its inferiority in endurance will prove to be equally great.

For the defense of our coast sixteen mortars capable of simultaneous fire will be grouped in sunken batteries or pits united under the control of one officer. By means of delicate instruments for ascertaining the range and position of the enemy with reference to the battery (which devices will be located on the parapet of the mortar-pits), the commanding officer will be enabled to give directions for the proper laying (aiming) of the mortars. They will be fired in volley, or otherwise.

The knowledge of the extreme accuracy of fire of which these new mortars are capable will render it very hazardous indeed for a vessel to approach within range (six miles), especially when it is known that the shells are designed to carry not less than one hundred pounds of high explosive, as will be the case in time of war.



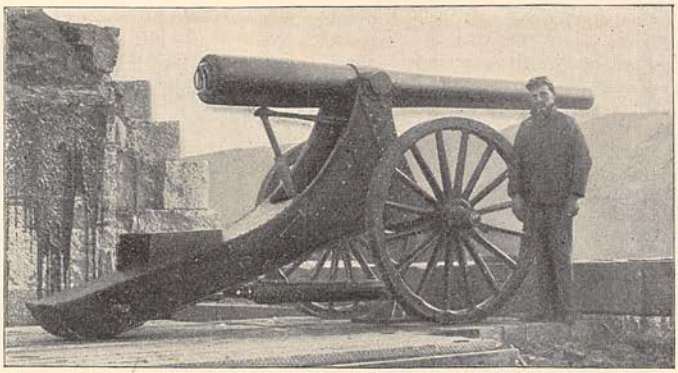
3.6-INCH BREECH-LOADING STEEL RIFLED MORTAR FOR HEAVY FIELD ARTILLERY.

WIRE-WOUND AND MULTICHARGE GUNS.

Of the many experimental guns that have been tested in this country might be mentioned the so-called wire-wound and the multicharge guns. Dr. W. E. Woodbridge, an American, was the pioneer in wire-wound gun construction; and although all of the cannon built in accordance with his methods have proved failures, it is said that England has adopted for her service wire-wound guns which are being constructed after the system proposed by Mr. J. A. Longridge of that country. Other types of wire-wound guns constructed in this country are those of Mr. J. H. Brown, and of Captain William Crozier of the ordnance department. So far, the latter's design is the only successful type tested. The essential feature of artillery of this class consists in winding wire under great tension around a tube of steel which is either in a single piece or composed of segments. The Brown 5-inch segmental wire gun failed after the firing of 192 rounds, but withstood some abnormally high pressures during its test.

On the whole, it may be said that the method of wire-wound gun construction does not give promise of producing as good results as the built-up system; the former, however, possesses one very important advantage over the latter, and that is as regards cost: the wire-wound method requires a much less expenditure of both time and money than the built-up system.

The Haskell multicharge gun (experimental) is probably the most unique piece of ordnance ever constructed. The object of this invention is to secure the greatest velocities with a minimum of pressure, and to accomplish this purpose a series of powder-chambers are so arranged that each adds to the velocity of the projectile as it passes along the bore. The



5-INCH SIEGE BREECH-LOADING RIFLE AND CARRIAGE.

picture on page 580 illustrates the original design, dubbed the "old sow," which was constructed of cast-iron. It was unsuccessful. This gun, like the second one of similar design, is of 8-inch caliber.

The second Haskell gun, made of steel, has a reduction in the number of its additional powder-chambers, and was constructed, as was also the first one, by direction of Congress.

It is hardly probable that any further guns of this type will be built, for the reason that the same results are obtained, by means of the new slow-burning smokeless powders, in a more efficient manner from the high-power steel breech-loading rifles; and, moreover, the weight of the Haskell 8-inch multicharge gun exceeds that of the 10-inch built-up gun, and its cost is nearly twice as great.

THE PNEUMATIC GUN.

ANOTHER type of experimental guns which has attracted no little attention at home and abroad is the pneumatic dynamite gun invented by Mr. D. M. Mefford, and modified by Captain E. L. Zalinski, U. S. A. These guns are especially designed for firing high explosives, the propelling charge being compressed air. Three pneumatic dynamite guns—one 8-inch and two 15-inch—have been constructed and tested during the past summer at the Sandy Hook proving-ground. They were designed at a time when it had not been demonstrated that high explosives could be safely fired from powder-guns. The maximum range with 50 pounds of explosive gelatin is but 3 miles, and only 1 mile with the greatest charge (500 pounds).

As the object for which these guns were designed can be accomplished in a far more effectual manner by the high-power sea-coast guns, their place in the armament of our fortifications is of doubtful value. Then again, the flight of the projectile from the pneumatic guns is so slow that it can be traced with the unaided eye throughout its entire trajectory; and it is not improbable that a torpedo-boat could dodge the large projectiles by simply watching the course of their flight.

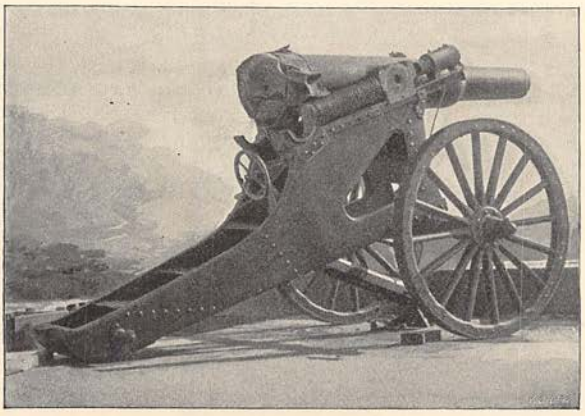
METHOD OF MOUNTING SEA-COAST GUNS.

A QUESTION of paramount importance, and one to which the best talent of European countries has been devoted without a satisfactory solution ever since the arrival of the modern high-power sea-coast cannon, is that of securing suitable carriages for them.

The 8-, 10-, and 12-inch guns weigh respectively 32,480, 67,200, and 127,680 pounds, and it must necessarily be an extremely strong device which can support these ponderous weights when fired, and allow of easy and speedy manipulation of the cannon. And the question is not only one of properly supporting and manœuvering the gun, but involves the more important problem of so mounting it as to afford a maximum protection with a minimum cost.

Three methods are in vogue for mounting modern high-power sea-coast guns: mounting *en barbette* behind earthworks; protecting the gun by heavy armored turrets or cupolas; and mounting on disappearing carriages. The first is adapted only to certain localities where the natural conditions of the coast afford high elevation, and the second is extremely expensive. The last-named method has received the most favor in this country.

The system of disappearing carriages has



7-INCH SIEGE BREECH-LOADING HOWITZER AND CARRIAGE.

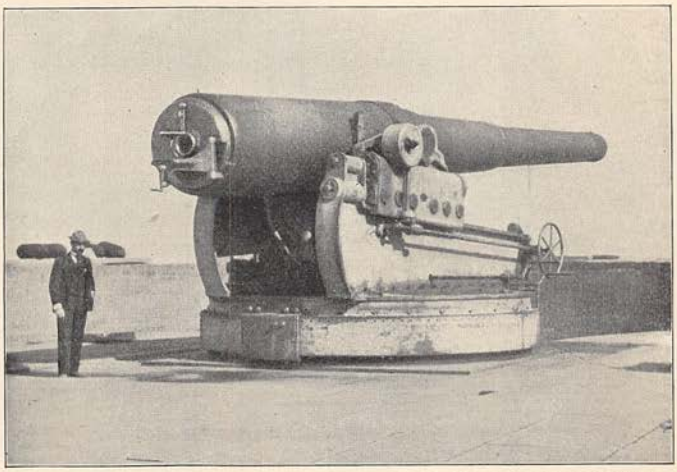
for its object the cover of the gun when loading, and exposure only when firing,—the gun being loaded out of sight behind the parapet, and then, by means of compressed air, electricity, or counterweights, raised above the parapet, the muzzle of the gun elevated to the proper angle required for covering the desired distance, and also traversed to the proper azimuth angle. The shock of recoil on firing is enormous, and this terrible blow must be absorbed by some suitable means, such as hydraulic and pneumatic cylinders, or counterweights. In addition to taking up this force of recoil in such a manner as will not shatter the carriage and everything connected with it, the desideratum has been so to store the energy of recoil as to make it available for manipulating the gun—that is, raising it into battery again for the next round, traversing, etc.

A properly constructed disappearing carriage, therefore, does not expose the gun for a longer period than is required to lay the piece (about twenty seconds is the maximum time); and if smokeless powder is employed it will be impossible for a hostile vessel to locate the gun. The moral effect, therefore, of a hidden attack is very apparent, and no vessel could attempt the silencing of an unseen battery.

A series of extremely interesting experiments was conducted in England a few years ago for the purpose of ascertaining the ability of a vessel to hit a gun mounted in this manner. A model gun was mounted on a disappearing carriage sunk in a pit, and arranged to rise every two minutes, remain exposed for twenty seconds, and then disappear again. A puff of smoke from powder fired just as the gun disappeared made the conditions for the ship's practice exactly similar to what they would have been had the gun been a real one. Hundreds of rounds were fired from machine-guns, rapid-fire guns, and heavy guns (10-inch), but not a bullet fell within the pit, not a shot struck the model. It should be remarked, however, that all the conditions worked to the disadvantage of the ship—high winds, strong tides, thick weather; but the commanding officer admitted that even had all the circumstances been favorable, the results would have been the same.

The only carriage of the disappearing type which seems to have been tested with any success abroad is the English Moncrief, or Elswick, hydropneumatic disappearing carriage, as it is called; and according to the standard United States service requirements of what a carriage of this type should be, the results obtained cannot be considered at all satisfactory.

Three distinctive types of disappearing carriage, all of American design and manufacture, have been purchased by the government, and are now under test at the Sandy Hook proving-ground. They are the pneumatic disappearing gun-carriage, the Gordon counterpoise carriage, and the Crozier-Buffington disappearing carriage,—all being adapted to the 10-inch breech-loading rifle.



MODERN 12-INCH BREECH-LOADING RIFLE. CREUSOT CARRIAGE AND GUN-LIFT.

The pneumatic carriage resembles in many features the English Elswick hydropneumatic carriage, while the Gordon carriage is the most novel of the three types, and affords the greatest amount of cover to the gun and its crew,—a projectile, to enter the carriage-pit, requiring an angle of fall of not less than 13 degrees with the horizon. None of these carriages has been tested to completion; but in the trials for rapidity of action conducted with the Crozier-Buffington 10-inch carriage during the past summer, the unprecedented record of 10 rounds in 14 minutes and 42 seconds was obtained, the carriage being manœuvered throughout the trials entirely by hand.

The Crozier-Buffington is exclusively a hand-power carriage,—its manœuvering (elevating, depressing, traversing) being performed by hand, while the elevation into battery is of course accomplished by means of the counterweights, in which sufficient energy for this purpose is stored by the recoil.

The Gordon carriage is capable of being operated either by hand or by electric power. The second Gordon carriage, operated *entirely by*

SERVICE CHARGES AND PROJECTILES. THE LARGEST CHARGE IS FOR A 10-INCH BREECH-LOADING RIFLE.

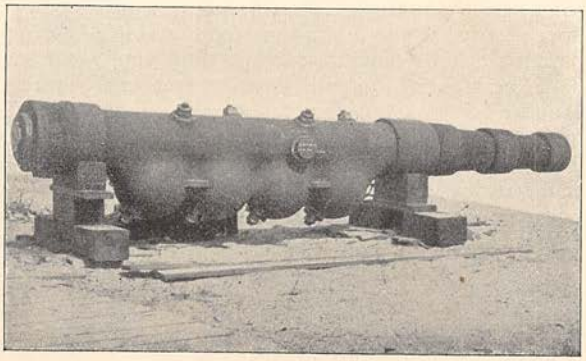
hand-power, was tested for rapidity December 3, 1894, and proved to be a phenomenal success, thirty-two rounds being fired within an hour.

The tests thus far conducted with the Gordon and the Crozier-Buffington disappearing gun-carriages have been very satisfactory and extremely gratifying, for these tests have proved these carriages to be far superior to any type of sea-coast carriage constructed in Europe; and the importance of these results cannot be overestimated. These experimental carriages cost between $40,000 and $60,000 apiece, including the platform. In addition to the cost of purchase must be added about $20,000 for the test of each carriage.

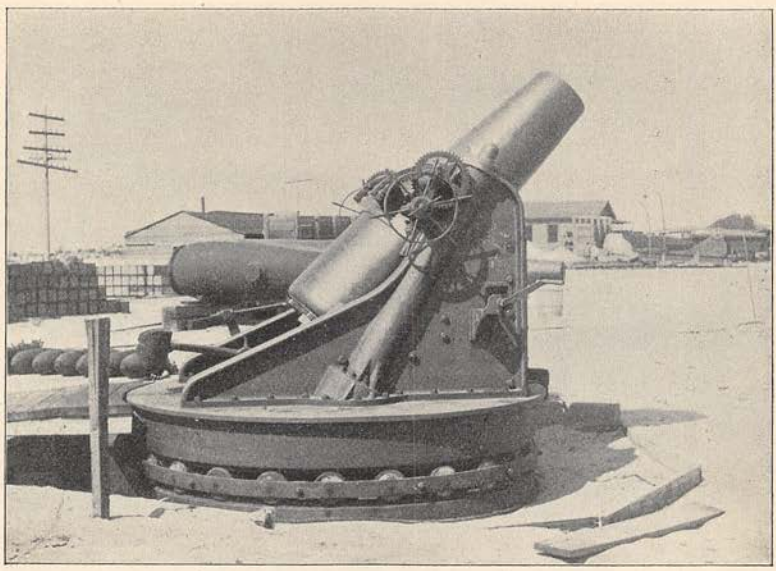
EXPERIMENTS WITH HIGH EXPLOSIVES.

PROBABLY one of the most important series of experiments conducted by the government during the past few years has been that with high explosives. Lieutenant William R. Hamilton, in THE CENTURY MAGAZINE for October, 1888, says: "As is well known, many attempts in years past have been made to throw shells charged with dynamite from guns fired with gunpowder; but, due to the terrific shock of discharge, the shells generally burst in the guns, and were more dangerous to those firing than to those fired at"; but although not much more than six years have elapsed since the publication of this statement, a high explosive has been developed, almost as powerful as dynamite, which is capable of being safely fired from large-caliber cannon giving a velocity of not exceeding 1400 feet per second.

At the Sandy Hook proving-ground very extensive and instructive experiments have been conducted with the different explosives furnished by the inventors of this country and abroad, and the results of these interesting investigations have already reached a point justifying conclusions of no small importance. The knowledge has already been given to the public that there can be safely fired from mortars of as large a caliber as 12 inches, 100 pounds of Emmensite and of wet guncotton; and, as stated in the annual report of the Board of Ordnance and Fortification, United States Army, for 1892 (page 29), which conducted these tests, "it is quite certain that 100 pounds of Emmensite exploded in the interior of a war-



HASKELL 8-INCH CAST-IRON MULTICHARGE GUN. (THE "OLD SOW.")



12-INCH BREECH-LOADING HOOPED MORTAR. SPRING RETURN CARRIAGE. FIRING POSITION.

ship, whether entering through the deck or unarmored side, would be decisive; and mortar-shells carrying this charge are easily and cheaply provided. Moreover, so long as the propelling charge in the 8-inch, 10-inch, and 12-inch high-power guns is restricted to give initial velocities not exceeding 1000 feet per second, charges up to this limit may be safely fired from them."

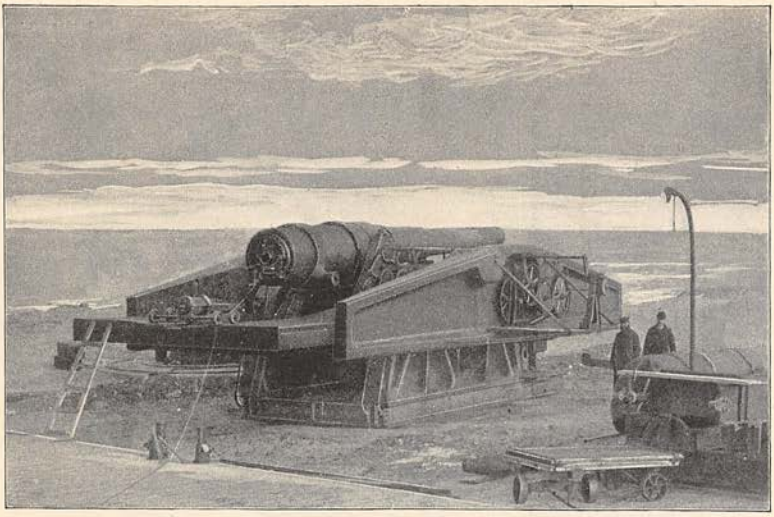
The importance of these statements is better appreciated when it is borne in mind that the simple knowledge of the fact that we can fire 100 pounds of high explosive from these modern high-power mortars, with the extreme accuracy of which they are capable at ranges of five and six miles, amounts almost to a protection in itself of our harbors where these modern mortar-batteries are mounted, rendering an approach thereto an undertaking so hazardous that very few vessels would be willing to risk it.

THE NEW POWDERS.

POWDER, as a propelling charge for cannon, has been in use for over 300 years. The development, however, of the high-power steel breech-loading guns has rendered necessary the employment of a different-sized grain for each caliber; and in order to secure the highest ballistics it has not only been found desirable to devise a grain of different size for the different guns, but also of particular form. The best results from brown powders in our modern guns have been obtained with those grains of prismatic or hexagonal shape having a hollow core running longitudinally. The grains are so arranged as to have the hole in each next that immediately in front and behind, so that when ignited the combustion begins in the interior, producing a steadily increasing volume of gas as the exterior and larger surface of the grain is reached.

No invention of the present century relating to military matters has aroused keener interest or given promise of producing as far-reaching results as that of smokeless powder. Mr. Alfred Nobel, of Stockholm, the inventor of dynamite, succeeded in 1863 in producing in large quantities nitroglycerin (formed by the addition of glycerin to a mixture of concentrated nitric and sulphuric acids). But it was not until 1885 that he was able to produce his firing-powder by dissolving collodion cotton in an equal part of nitroglycerin. Since his discoveries there have been many inventions in smokeless powder, most of which have nitroglycerin or guncotton for a base. The peculiar and distinguishing characteristics of these powders is that, as the product of their combustion is almost entirely gaseous, they burn without the production of any smoke, and leave no solid residue; and as they are slow-burning, give a steadily increasing pressure on the base of the projectile. Physically they differ materially from the old forms of black powder, being manufactured either in thin sheets or small tubes, and range in color from a straw-yellow to a red-brown. They are rarely black.

The government has now under test, with a view to selection for the military service, types of smokeless powders submitted by various inventors and manufacturers of this coun-



10-INCH BREECH-LOADING RIFLE. GORDON DISAPPEARING CARRIAGE. LOADING POSITION.

try and Europe. These powders, which will unquestionably be adopted for every piece of ordnance in the United States military service, from the infantry rifle to the high-power sea-coast guns, in addition to possessing the extremely desirable quality of not hiding the field of fire, and of not indicating to the enemy the location of the firing-piece, possess a higher coefficient of strength than the black or brown powders; and owing to the fact, above mentioned, that the resulting product of their ignition is almost entirely gaseous, there is very little fouling of the piece.

The greatest difficulties that have thus far been experienced with smokeless powders are their liability to deterioration during storage, and the widely different ballistic results which the same lot of powder may produce without apparent cause. These, however, are difficulties which experience in manufacture and use will undoubtedly soon overcome.

Almost all the foreign governments have adopted for their military services smokeless powders, the composition and method of production being kept secret. The United States navy has used to the greatest extent the so-called "navy smokeless" designed by Professor Charles E. Munroe, late chief chemist of the naval torpedo station at Newport, and now professor of chemistry in the Columbian University, Washington, D. C.

The most promising smokeless powders of domestic manufacture, and which are unquestionably equal, if not superior, to any produced thus far abroad, are the Peyton and the Leonard smokeless. The keeping qualities of the Leonard have not yet been determined, but the experiments thus far show it to be a highly promising powder, since it has given a muzzle velocity of 2875 feet per second, with a pressure of but 46,800 pounds per square inch, from the 5-inch Brown segmental wire gun.

RANGE- AND POSITION-FINDERS.

One of the greatest difficulties that have always existed in connection with good shooting is the measurement of the range, and this difficulty has been augmented by the increased range and cost of practise-firing with modern high-power guns. It has been found necessary, therefore, to devise special instruments for locating accurately and speedily distant objects. They are based upon the well-known trigonometrical principle of solving a triangle at the apex of which is the object, a permanent base-line being given; and after the two angles thereat are ascertained by the observer, a close approximation to the true range is rapidly secured.

These instruments are termed range- and position-finders, and designs of the most improved types have been submitted by inventors of both the United States and Europe, including the Fiske, the Lewis, and the Zalinski range- and position-finders.

They will undoubtedly form a necessary part of the armament of every fortification where high-power guns are mounted, and it is not improbable that they will also be extensively used in the field.

APPROPRIATIONS NEEDED FROM CONGRESS.

The far-reaching and all-important changes which have been taking place during the past few years in almost every kind of *matériel* of war in the different branches of our military service, were inaugurated by the Fortification

10-INCH BREECH-LOADING RIFLE. GORDON DISAPPEARING CARRIAGE. FIRING POSITION.

Appropriation Act approved September 22, 1888, prior to which time it was not unjustly charged that the United States was utterly without any means of protection for her sea-coast, and that the munitions of war in the hands of the army were obsolete and ill fitted to cope with the improved weapons adopted by other nations; and yet within the short period of six years this task of selecting types of modern equipment throughout every branch of our military service has been undertaken with that energetic spirit and intelligent consideration which is the characteristic of our race. And the results obtained are as highly gratifying as they are extremely satisfactory.

The army has performed its part. It now rests with Congress whether, after the expenditure of so much time, so much energy, and so much money, the proper encouragement shall be extended to our officers and to American inventors, and the proper protection given to our country, by providing the requisite number of guns, mortars, carriages, etc., for sea-coast defense, and by issuing to our military service.

It is absolutely certain that the practice, which has existed in this country, of waiting for a declaration of hostilities before inaugurating defensive and offensive preparations, can no longer be followed. "We defeated England twice, and we can do it again," is an oft-repeated boast that creates a pleasant tinkle in our ears, and lulls us into an overestimated feeling of security — a boast that the United States, with all her vast resources, would find it extremely difficult to carry out unless provided with the proper armament to do so. And the reasons for this are apparent. At the time of our conflicts with Great Britain in 1776 and 1812, the means of war at the disposal of the British army were not superior to those in the hands of our own. But the discovery of steam, and the invention of the telegraph and the improved methods of treating steel, have wrought a change in military matters but little short of miraculous; and other nations have not been as slow as we have been up to within a very recent period in taking advantage of these inventions as applied to the methods of warfare. Within ten days from a declaration of war England could land on the borders of this country many thousands of men,— the fast transports at her disposal, and the numerous supply-stations which have been established by that government, and which now almost completely surround us, facilitating this to a degree but very little appreciated. The trite truism of Washington — "to be prepared for war is one of the most effectual means of preserving peace" — that has been so often repeated, applies now with added force. The fact that we are prepared to fight is the surest guarantee that we shall not have to fight.

With a superior magazine small-arm, with high-power sea-coast- and field-guns inferior to none, and with the development of other types of implements and engines of war of unequaled excellence, the necessary appropriations to supply these weapons for our national defense should not be withheld.

Victor Louis Mason.

as the sum of villainies, and pursued its authors with unrelenting bitterness, even to the extent of impeachment, yet no word of criticism was ever uttered against the "assiento," the slave-trade part of the treaty.

All this shows plainly not what *was* right, but what was universally *regarded* as right, up to a comparatively late date. It was Judge Taney's purpose to show how people thought a century or so before. Was not Judge Taney right in saying that from the earliest days of English and American history down to the Declaration of Independence and the formation of our Constitution, the negroes *had been regarded* "so far inferior that they had no rights which the white man was bound to respect"?

'T is true 't is pity;
And pity 't is 't is true.

James Buchanan once, in a speech on currency, casually remarked that money might be made so scarce and dear that ten cents a day would be good wages for a workingman; and we all remember the howl that was raised against the man "who wanted to starve the laboring man on ten cents a day."

E. H. Bristow.

Infancy in Art.

IN M. Hovelaque's article on the French sculptor Carriès, published in the March number of THE CENTURY, particular stress is laid upon his treatment of childish figures. I do not question the great charm or personality of the artist's work in this direction, but is it true that he thus showed himself a pioneer — that "through him infancy entered into art"?

Even those who are ignorant of Greek and Roman art must know that as soon as Christianity entered into art it necessitated the portrayal of infant forms. Had no child but the Christ-child been represented, we should still have an immense gallery of baby forms, treated with the widest diversity in conception, the most versatile charm and power in realization; and to the Christ-child were added the infant Baptist and those troops of little angels which are prominent in religious scenes of many kinds. Then, with the resuscitation of pagan ideals at the time of the Renaissance, came new troops of *putti;* and as naturalism gained the day over idealism, such simple realistic portrayals of babyhood as, for example, those which made the Della Robbia family famous.

But in addition to his general assertion that no one before Carriès had made infancy conspicuous in art, M. Hovelaque makes the direct and very misleading statement that "there are no children in Greek art." There are a great many of them in that minor branch of sculpture which is represented by what we call "Tanagra figurines." And in art of a more monumental sort they also had an important place. They frequently occur in those tombstone reliefs which reproduce domestic scenes. Pliny and Pausanias both speak of the great fame of two boyish figures by Lykios — one blowing embers, and another, holding a holy-water basin, which was prominent on the Athenian Acropolis; Pericles dedicated to Athena another statue of an ember-blowing child by Stypax; a boy pulling a thorn from his foot is preserved to us in two ancient copies; the children of Niobe and of Laocoön need hardly be called to mind, nor the *putti* which overrun the great figure of the Nile in the Vatican Gallery, nor the numerous representations of Eros as a child. And if it be said that some of these are half-grown children, there is the famous infant Hercules with the serpent, and the "Babe Struggling with a Goose" attributed to Boëthos. Moreover, the finest antique statue which we have in the original — the Hermes of Praxiteles at Olympia — bears the infant Bacchus on its arm. Here, indeed, the special characteristics of babyhood are not very well reproduced; but this was probably a work of Praxiteles's youth, and we have in the Louvre a copy of his "Silenus Tending the Infant Bacchus," where the baby is beautifully successful. Pliny and Pausanias speak of another "Hermes and Bacchus" wrought by Kephisodotos, the father of Praxiteles, and of a Tyche (or Goddess of Fortune) with the child Plutos on her arm, the work of Xenophon and Kallistonikos. And more famous still was the "Eirene with the Infant Plutos" of Kephisodotos. An old copy of this is now in the Munich Museum, and fragments of another have been found on the Acropolis, while the fact that it was reproduced on Athenian coins proves the high value its contemporaries set upon it.

This is but a hasty mention of those Greek portrayals of infancy which chance to be best known to us. When we remember how famous they were, and how scanty is our knowledge of the art that gave them birth, we may well believe that many more were executed. And, at all events, we can confidently say that there *were* children in Greek art, as well as at all periods in Roman and in Christian art, and that no one should claim "originality" for any modern man simply because he has portrayed them.

M. G. Van Rensselaer.

The Haskell Multicharge Gun.

THE CENTURY for February, 1895, contains an article on new American guns, by Victor Louis Mason, which contains some statements in relation to the Haskell multicharge gun that I wish to correct. Mr. Mason says:

> This gun, like the second one of similar design, is of 8-inch caliber. The second Haskell gun, made of steel, has a reduction in the number of its additional powder-chambers, and was constructed, as was also the first one, by direction of Congress.

This last statement is not correct. The first of the Haskell multicharge guns mentioned was constructed of cast-iron, but lined with steel. It was not of 8-inch caliber, and was not built by direction of Congress. It was of 6-inch bore, and was built at the expense of Mr. J. R. Haskell and his associates. The second Haskell multicharge gun was of 8-inch caliber, made of steel, and was constructed and paid for by the United States Government. Mr. Mason says, "The 8-inch Haskell gun weighs more than the 10-inch steel built-up gun." So it does weigh a little more, but it throws a projectile weighing considerably more, with a much heavier amount of powder. The Haskell multicharge guns of the same caliber as the single-charge guns throw a projectile weighing twice as much, with three times the weight of powder.

A half-inch multicharge gun was constructed about two years ago at Reading, Pennsylvania. It was made so that it could discharge six charges of powder in succession behind the projectile as it passed along the bore of the gun. This gun was constructed to demonstrate the absolute success of the multicharge system, and to what extent it could be applied. The experiments with it demonstrated that the multicharge guns have three and one half times the power of the single-charge guns. These experiments have been repeated many times.

This 6-inch multicharge gun was manufactured by the inventor and his associates, and was made principally of cast-iron, simply lined with steel; and although made of inferior metal, it exceeded in power and range single-charge guns made entirely of the best steel, of the same bore, and also of much larger bore (see official reports).

With the Haskell multicharge dynamite gun shells charged with high explosives can be thrown at great ranges, with gunpowder as the propelling force, and with no danger of premature explosion of the shells in the gun.

J. R. Haskell.

PASSAIC, N. J.

Where the Regiments Came From.

I HAVE wondered that General D. H. Hill's theory of the dual names attached to so many of our battle-fields has so long passed unchallenged; and Dr. J. Harvie Dew, writing on the "Yankee and Rebel Yells" in the April (1892) CENTURY, seems to be laboring under a somewhat similar and, as I think, erroneous impression that, the Northern regiments "being drawn and recruited chiefly from large cities and towns," while the Southern soldiers came mainly from rural districts, many of the differences in the attributes and belongings of the two armies are to be accounted for thereby.

General Hill, in THE CENTURY "War Series," made the discovery that in nearly every instance where two names were given to the same battle-field, the name given by the Northern soldiers was that of some *natural* object upon the field. "Being recruited chiefly from the cities," they were attracted more by objects of nature; hence Bull Run, Pittsburg Landing, South Mountain, Antietam, etc., became their names of great battles; while the Southern soldiery, "coming from the rural districts," found greater attractions in towns, buildings, etc.; so the same battles were called by them Manassas, Shiloh, Boonsboro', Sharpsburg, etc.

It is a surprise to me that the general's logical mind did not recognize the further fact that in each case each side adopted the name of some object or feature of the field prominent on his side of the line, and frequently unknown upon the other.

Probably Dr. Dew is correct in his supposition that the Southern people are more given to loud calling or hallooing than those of the North; but I wish he would dispel the delusion that the Northern soldiers were drawn chiefly from large cities and manufacturing centers, and consisted largely of clerks and mechanics. Of course more regiments were recruited from the populations of the cities North than South — simply for the reason that a greater population of that kind existed in the North; but for the same reason there was a larger rural representation in the ranks of the Northern army. The plow, the ax, and the pick were abandoned for arms as well as were the yard-stick, the loom, and the hammer.

SHOTWELL, MO. *H. Calkins.*

Note on the Civil Service.

MR. LEWIS N. DEMBITZ of Louisville, Kentucky, writes as follows:

As a champion of reform in the civil service in 1876, I succeeded in putting into the national platform on which Hayes was elected a clause which locates the evil of the spoils system in the distribution of the patronage by congressmen, and seeks the remedy in its restoration to the President and heads of department, to whom it is intrusted by the Constitution.

Mr. Dembitz says, "Nothing is left to cure the bite but a hair from the same dog," and he suggests the establishment of a school for the consular and diplomatic service, to which nominations shall be officially made by members of Congress, giving to the members for each of the 356 districts, "in one of four terms, in alternate years in each class, the nomination of a consular pupil, say, forty-four or forty-five a year." He adds: "But, unlike West Point, the school should furnish nothing free of cost but tuition, books, and stationery, the students to board where they like."

IN LIGHTER VEIN.

A Puzzle.

ALAS! I am a graybeard;
My years are fifty-three;
I 'm old and grave, but Bessie ne'er
Will sit upon my knee.

Yet once this dimpled maiden,
With birdlike sounds of glee,
And sweet proprietary airs,
Would perch upon my knee.

And oft we 've romped together,
When summer winds blew free,
But evening stars and sleepy eyes
Brought Bessie to my knee.

But now I cannot coax her;
What *can* the difference be?
Her gowns are long, she romps no more,
Nor sits upon my knee.

James B. Kenyon.

Curtain!

VILLAIN shows his indiscretion;
Villain's partner makes confession;
Juvenile with golden tresses
Finds her pa, and dons long dresses;
Scapegrace comes home money-laden;
Hero comforts tearful maiden;
Soubrette marries loyal chappie;
Villain skips, and all are happy.

Paul Laurence Dunbar.