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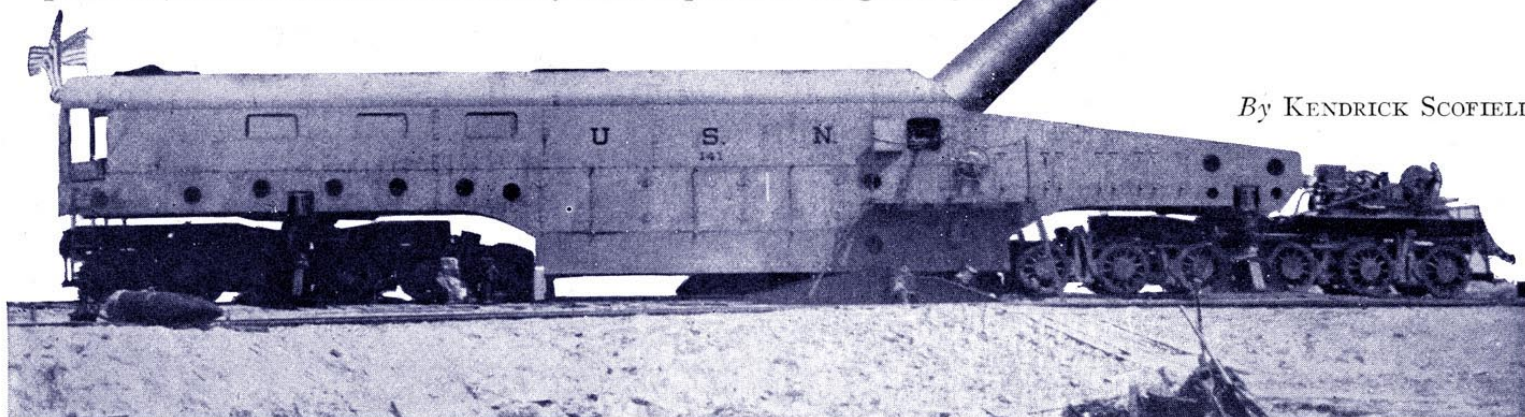
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"The Battle of St. Nazaire"

Being an account of how the Naval Bureau of Ordnance dreamed, planned, built and launched its dry-land squadron of great guns

By KENDRICK SCOFIELD



The steel clad gun car, jacked up into firing position with the giant 14-inch naval gun at nearly extreme elevation.

GIANT NAVAL RIFLES, up to the very moment when the armistice halted hostilities along the Western Front, were hurling heavy high-explosive projectiles far into the German lines, over twenty-five miles of disputed terrain. Railway centers, supply depots, track junctions—spots where lines of communication might be fatally disrupted—trembled under a ceaseless bombardment which was conceived, planned and executed by the United States Navy Railway Batteries.

Up and down behind the lines, night and day, rolled the heavy gun-trains, each mounting a weapon larger than any ever before placed on mobile shore carriages, doing their most effective work from behind the Serre Ouisse front and from other points where the powerful shells could be sent to gouge huge chunks from the road-bed of the Longuyon-Mezier Railroad, the Hun's principal artery of lateral military communication. Vervins and Rozoy knew the blast of their all-devastating shells. The great projectiles shrieked into Laon and St. Quentin while the sizzling breeches of the guns were served by bluejacket crews wearing gas masks and shrapnel helmets.

Perhaps the greatest part that the big gun played in the closing days of the world's red conflict was the bombardment of Sedan, where the crashing shells from the Railway Batteries laid down a barrage which so badly demoralized the Hun that an orderly military retreat was turned into a rout.

Peace has come too recently to make a log of the dry-land cruises of the Railway Batteries, charted and directed by Rear Admiral C. P. Plunkett, either advisable or permissible. Even though the trenches are silent and the points against which the great guns were turned are in the hands of the Associated Armies, there are still matters upon which too much may be said. Therefore to the future belong the tale of the fighting—the demolition of enemy lines, the repulse of hovering airplanes which sought to blow the batteries from the rails, the storms of shell from German long-range ordnance that in blind flight toward some more distant ammunition dump, barely missed the great gun cars. And so this tale has to do only with a task well done; "all in a day's work," efficiently accomplished to the everlasting glory of the Navy and its bluejackets.

It is the tale of an unparalleled feat of engineering design and production against head winds of heavy odds; a colossal problem of manufacture and shipping. It is a record of the genius of naval ordnance experts who, almost overnight, solved the perplexing and difficult problems involved in effectively using naval guns ashore; of the prodigious labors of the Naval Gun Factory, of locomotive works, car companies and bridge builders who strove without let-up, weeks and months on end, to make possible the fulfilment of the dream of the Navy men in time for the great batteries to count in the total of victory; of the ships that successfully braved the dangers scattered

through the wartime ocean to carry the giant guns to France. And last it is the story of "The Battle of St. Nazaire," where no shot was fired but where officers and men of the Navy fought against heavy odds to erect and assemble the immense batteries.

And the cost of all this? Well, never mind the actual figures; it is sufficient that the construction of all of the batteries did not occasion the outlay of as much money as would the building of two new torpedo boat destroyers.

From the moment that, on August 2, the first United States Navy Railroad Battery rolled over a shaky French trestle out of St. Nazaire, headed for the fighting front *via* Paris and Criel, the guns functioned perfectly and have proved the faith of the naval officers who dreamed the dream of which they are the realization. But if ever hostilities are resumed, or if this nation is embroiled again in war, either on its own soil or foreign soil, the Navy Batteries as used in France will be but a nucleus for a greater and more improved type; wherefore it is permissible even now to describe, at least in part, the huge engines of destruction which contributed to the ultimate discomfiture of the Hun and to the confusion of his lines of communication, and to give in some detail a picture of the giant guns and of the trains from which they worked their deadly destruction.

When the plans of the Navy Department for the construction of the United States Navy Railway Batteries were fulfilled, the expedition numbered several

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gun trains and a staff train, all operating from one of the Reserve Artillery Bases of the United States Army.

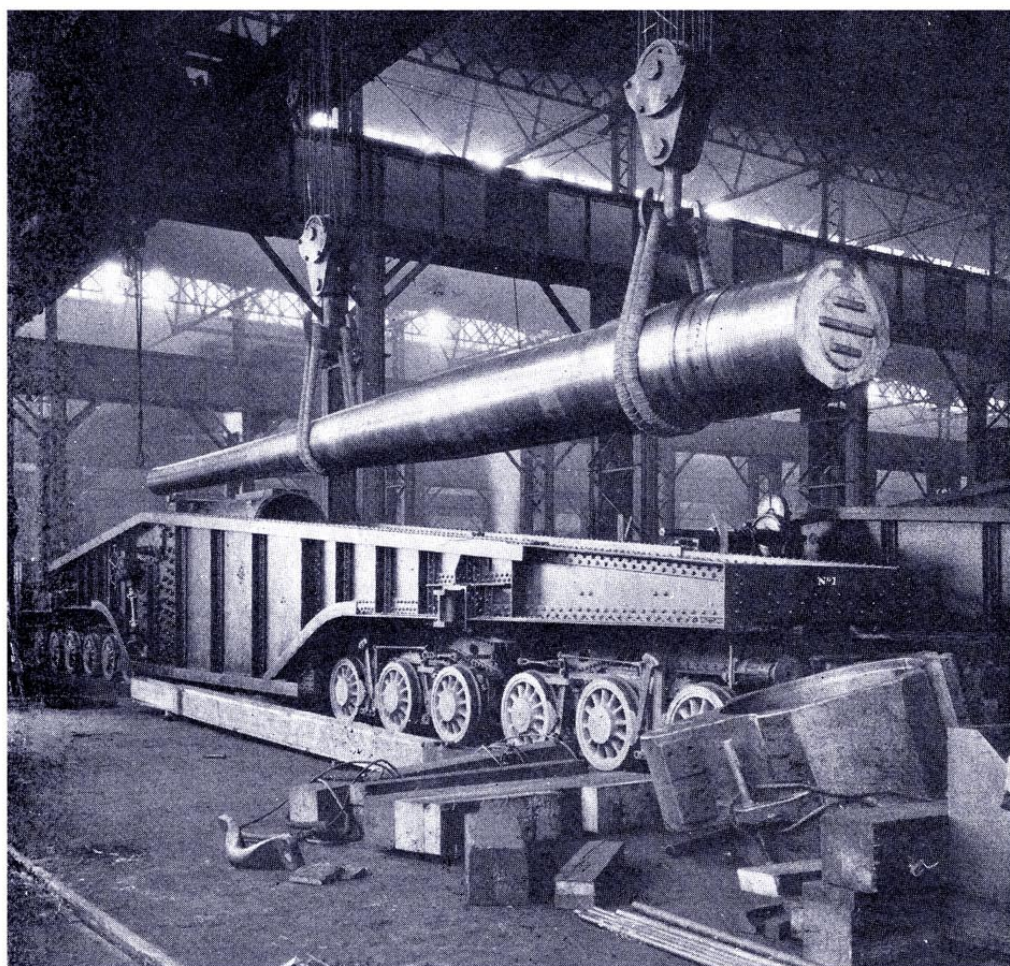
In each of the great gun trains there were fifteen units, in this order: a powerful locomotive; a sand and log car; a crane car; four cars of foundation materials; the gun-car proper; the workshop car; the battery headquarters car; the kitchen car; three berthing cars; and two ammunition cars, each holding 100 rounds of ammunition for the huge guns. The fifteen units in every gun train represent a bulk of equipment so great as to overshadow the previous efforts of all other nations to devise batteries which on rails can be sent into action at any given point, and which will be self-sustaining while on such duty. An adequate idea of the immensity of one of these batteries can only be gained by considering the size and weight of some of the principal units in detail.

The great gun cars, about which the entire equipment centered, measure about 85 feet in length, are about 9 feet wide and about 13 feet high. The total weight of car, gun, mounting and yoke, armor plate and the trucks upon which the car proper rests is approximately 275 tons. Of this, a total dead load of approximately 500,100 pounds rests on the two trucks. The trucks themselves are worthy of notice. Each is equipped with 12 wheels, is about 25 feet long and weighs about 25 tons.

In constructing the gun cars, two giant girders 72 feet long, each weighing 145,000 pounds, were placed on the two 12-wheeled trucks. Upon the girders was placed the gun-mount and elevating gear. Then came the gun itself—what is technically known as a 14-inch 50 caliber naval rifle—a weapon which with its yoke weighs about 85 tons. Over the entire car is a sheathing of armor plate, weighing 8 tons and covering 1600 square feet.

The locomotives, great 4-driver machines, which hauled the Naval Batteries, are the most powerful built in this country. With the tender, this unit weighs 145 tons.

The other units, such as the crane car, the sand and log car and the berthing cars, are also covered with armor plate, but are not so heavy as the gun car. Yet each is completely equipped not only to meet every possible emergency in action but to provide for the comfort of the crew. Thus the berthing cars, with folding steel bunks, are commodious and comfortable, the tool car presents a complete machine shop with electrically driven drill presses, grinders, shapers and



One of the giant weapons being placed by means of a powerful crane in its bed on the colossal girders.

other necessary appliances; while the kitchen cars, the headquarters cars, and the foundations material cars all are fully equipped.

With each gun-train there went into action a complement of about 100 men, including an expert gun crew similar to those that work the guns afloat—gun-pointers, gun-trainers, and all the other highly trained specialists in great gun firing. In addition, each train had its train crew—enginemen, firemen, watchmen, a conductor, brakeman and flagman, machinists, boilermakers and carmen.

The Headquarters' Staff Train, with which moves all extra equipment and commissary stores, is the quarters of the staff officers, and the berthing car of what is known as "the emergency round house gang." This train is naturally not so massive as the gun trains, but is also composed of armor plated cars. Apart from either the gun trains or the Headquarters Staff train, several cars mounting anti-aircraft guns were originally provided for the expedition but these were not included in the equipment used along the Western Front.

Now as to the great guns whose long muzzles projected from their ports in the armor plated ends of the gun car. As

originally designed these guns are capable of throwing a projectile weighing 1400 pounds over a range of approximately 26 miles. This projectile, which is of the high-explosive type that came so greatly into prominence during the world war, leaves the muzzle of the gun at the rate of 2800 feet a second, a muzzle velocity which is greater than that possessed by any naval gun ever placed on mobile mounts for use ashore.

These great guns, which are nearly 59 feet in length, may be taken, by virtue of their railway mounts, any place where rails can be laid. They can be fired "from the rails" or transferred in an unbelievably short space of time to fixed mounts, resting on a solid foundation of timber and steel, which is entirely apart from the car.

So in operation this plan is followed. Targets less than 13 miles away call for an elevation of the muzzle of the gun to a limit of an arc of 15 degrees. This amount of elevation is possible while the gun rests on the trucks of the gun car, and the gun is "trained" (pointed to the right or left) in the direction of the target either by moving on to a circular track or a spur track. Working the gun in this fashion is known as "firing from the

rails." If, however, the target is between 15 and 25 miles distant, a greater elevation than 15 degrees is required, and when the muzzle is so elevated additional space must be provided for the giant gun in recoil; the gun is therefore moved to what is known as a "pit foundation." This consists in digging a pit beneath the tracks and erecting therein a steel-girder and timber base. The gun car is then run over the pit, where, by a powerful jacking arrangement, the monstrous girders and the huge gun with its armor

cannon have, in emergencies, been swung ashore and used in fighting on land. Three 64-pounders and three long 32-pounders figured in General Winfield Scott's assault on Vera Cruz during the Mexican War. Mounted upon ship's carriages fixed to heavy platforms, the guns were set up about 700 yards from the city walls, and were the deciding factor in the surrender of the enemy. Half a century later, when the Boers with siege guns threatened Ladysmith, General Robert Hastings Harris of the British

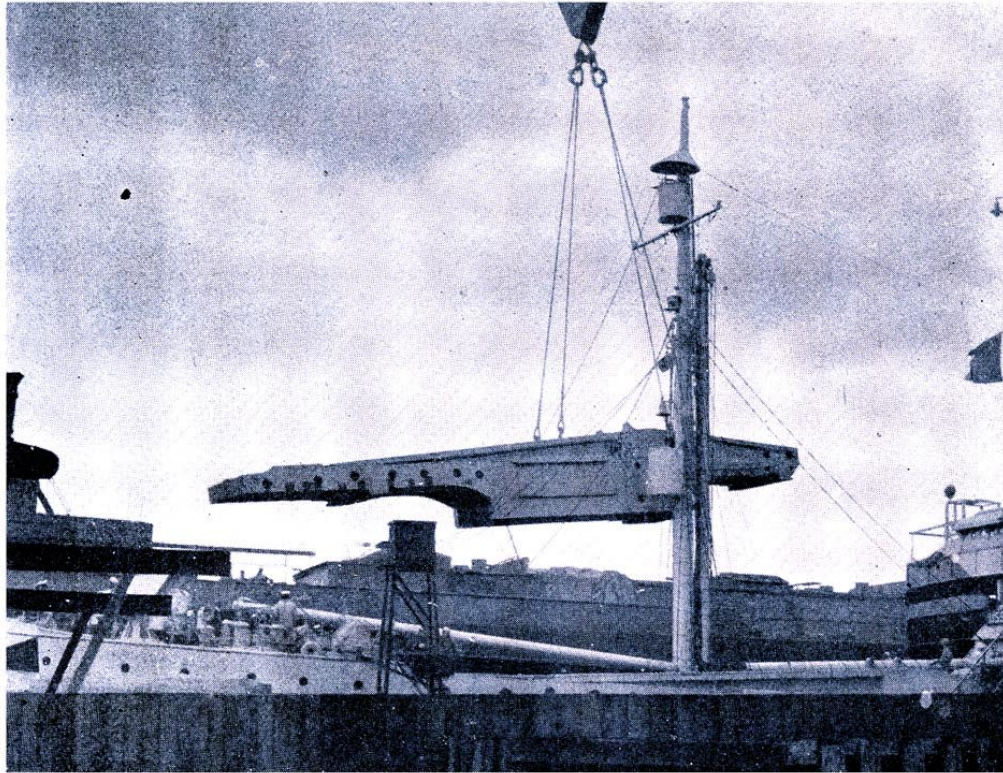
British expedition which joined the allied column during the Boxer disturbances in China a year or two later. In the European world war, Germany long ago mounted naval guns ashore for long-range bombardment and the guns which hammered Dunkirk from a distance of some 22 miles were weapons of this nature. It is also generally accepted that the Hun's monster 75-mile gun, which early in March opened fire on Paris, was a huge naval rifle, fitted with what is known as a sub-caliber tube, which tube made possible the extreme and even freakish range to which the gun would carry.

But it must not be supposed that the Naval Railway Batteries of the United States forces were in any way suggested by the German ordnance monstrosity, or that our long range guns were sent into action in reply to the Hun's 75-mile gun.

Early in the war, the British and French had proved the feasibility of mounting big guns on railway carriages, there having been several 12-inch batteries of this type; but these weapons, as huge as they were, could not in any way compare with the gigantic naval gun trains which our sea forces contributed to the fighting in France.

In November, 1917, months before the demolition of churches and hospitals in Paris announced the existence of the German monster gun, certain changes were made in the design of some of our newest and fastest battle cruisers. These changes made available for other use several huge 14-inch naval rifles which were, under the original plans, to have graced the turrets of the new fighting craft. For this armament the Navy had no immediate need, and even at that time there appeared to be every likelihood that the next twelve months would be decisive in the fighting ashore. Thereupon the experts of the Navy Ordnance Bureau under Rear Admiral Ralph Earle "called all hands and trimmed ship" for the job ahead, to devise some plan whereby the huge guns could be made of practical use to our Army and the Allies.

They dreamed a dream wherein a squadron of colossal trains, sheathed in armor plate, cruised constantly on dry land behind the battle lines. On each train a hundred bluejackets and their officers lived, ate, slept and worked giant guns that rested upon mechanically perfect mounts and hurled explosive shells to the limit of their extreme ranges. In short, they dreamed the United States Naval Railway Batteries just as they went complete to the firing line a few months later.



In preparation for the "Battle of St. Nazaire" the great girders were swung ashore from the holds of the ships which carried them to France.

plate housing are lifted clear of the trucks, and the steel and wood foundation is built up to meet the girders; so, literally in a few minutes, the huge 14-inch gun, with its 150 tons of mount and elevating gear, is moved from its rolling base on to a stable foundation where elevations to the limit of a 45-degree arc are obtainable, and where, through the operation of a travelling gear, the gun may be trained from right to left sufficiently to insure accurate fire up to 25 miles.

Actual experience has shown that, whether fired from the rails or from the pit foundation, there are no finer or more accurate guns than these in the equipment of any of the belligerents, and a new special shell for land use has increased their range from 25 to approximately 30 miles; also an increased muzzle velocity has given them even greater accuracy than before.

Since the days of the Revolutionary War, and perhaps long before that, naval

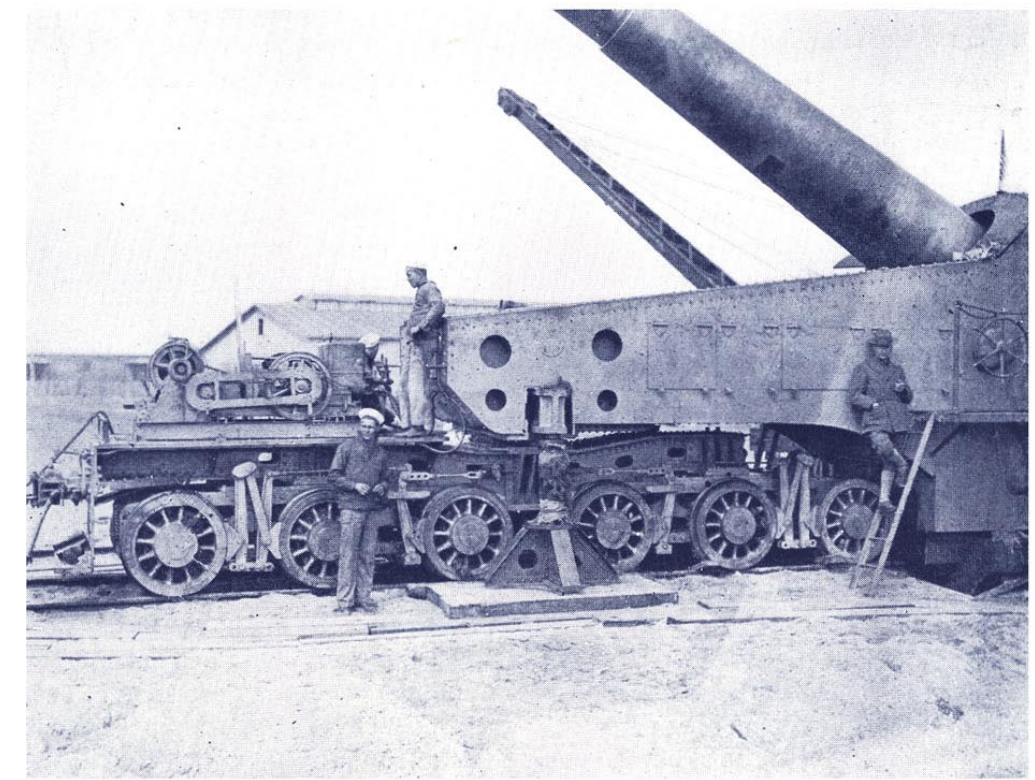
Army called upon Captain Percy Scott of H.M.S. first class cruiser *Terrible* for naval guns with which to keep the Boer artillery in check. Several 4.7-inch naval rifles on ship's carriages affixed to heavy timbers, with other ordnance, were taken to Ladysmith by way of Durban, and within a few days the British defences mounted two 4.7-inch guns, eighteen 12-pounders, one 9-pounder, and two 3-pounders, in addition to several smaller rapid fire cannon. Most of these guns were ultimately placed on improvised "split trail" mountings to permit of the proper amount of elevation. These guns not only did yeoman service at Ladysmith but were taken with columns on the march and figured in fighting at Colenso and Spion Kop. When at last a relief column started for beleaguered Ladysmith, it was accompanied by other 4.7-inch naval guns and eighteen naval long 12-pounders. Many of these naval guns which saw service in the Boer war turned up in the

But dreams and accomplished facts do not necessarily have much in common; and such things as improvised "split trails" and log platform mounts which had made the use of the naval guns feasible in land campaigns of the past were not to be thought of in connection with the question of engineering involved in using the 14-inch rifles in France.

The Ordnance engineers talked about their dreams. Some who heard said, "It cannot be done," but the Ordnance engineers went back to their offices to reappear with perfected plans, supplied by Commander Harvey Delano's designers. They had confounded the "Can't-Be-Dones" by doing it. In December, 1917, permission was given to put in motion at the Naval Gun Factory, Washington, D. C., the machinery which was to produce many of the vitally important and mechanically intricate parts of a new type of mount for the 14-inch 50-caliber naval gun, and Captain A. L. Willard undertook supervision of this important task.

But this was only scratching the surface. Time was the essence of this particular dream. Success or failure of the guns on land depended not only upon whether the mounts and the trains could be devised but upon whether they could be gotten into action during the summer of 1918—at the most, ten months from the time the plan was conceived.

It was considered vital that the batteries be completely mobile; to base them



One of the great guns elevated for extreme range. Note the powerful jacks by which the gun car is lifted from its trucks to rest on the pit foundation.

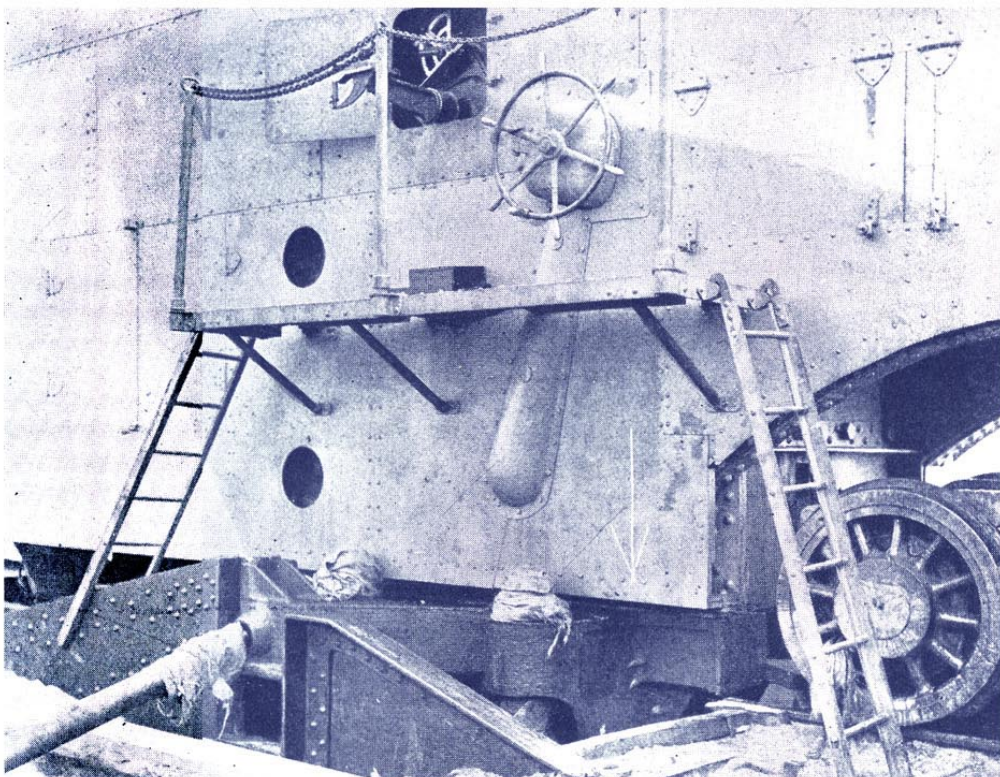
in any one spot would have seriously handicapped their use. The batteries must be complete, with all the paraphernalia for ammunition, berthing, fuel, workshop, headquarters, anti-aircraft, and radio units and the huge locomotives and their tenders, a total of approximately 80 cars. And, to complicate the prob-

lem still more, there must be a force of highly trained specialists to operate the trains and man the guns—specialists of the type not developed overnight or found by casual inquiry.

With the Naval Gun Factory working on its part of the equipment, bids on the giant girders, armor-sheathed box cars, huge locomotives, and all of the other battery components, were solicited by telegraph and were opened February 6, 1918. But the first bids did not meet the requirement as to delivery and, this point being the most essential of all, other bids were opened a week later, with the result that delivery on gun cars and locomotives was promised by June 15, and on the box cars in from 100 to 120 days. That night the contractors in a dozen different localities commenced work.

The first of the big girders was delivered by a bridge company at the plant where the gun cars and locomotives were being built one month after the contract was signed, and the first gun car was delivered April 25, nearly six weeks before it had been promised, and moved on for its proving, while the Naval Gun Factory, the bridge companies, car companies and locomotive works kept grinding night and day on the other components.

When it came to testing the first big gun on its new mount, the Navy Department Ordnance experts found themselves face to face with another problem.



The gun-car resting on the pit foundation. Note the wheel on the side of the car controlling the elevating gear. Upon this foundation, the guns can be trained on targets nearly thirty miles distant when the special shells for land use are fired.

The range of the gun was too great for the Indian Head Proving Grounds, and as the Kettle Bottom Shoals Grounds are not completed, there seemed to be no place where the giant battery could be fired. In this dilemma, the Army came to the rescue and offered the use of the Army Proving Grounds at Sandy Hook.

At the outset, the big battery began proving its practical qualities by traversing tracks laid newly upon sand on its way to Sandy Hook without causing any trouble. Once on the grounds, the preliminary firing tests demonstrated unusual ranging possibilities to the satisfaction of the Army and Navy officials, the ballistic experts and the foreign observers who witnessed the tests, hurling one of the shells nearly 24 miles on a full charge of powder and an elevation less than the maximum 45 degrees.

The nucleus of an operating personnel capable of working the big naval guns had been provided even by the time the first gun was ready for test, and the organization of this corps of experts kept pace with the progress of the work on the batteries themselves.

As soon as the production of material was well under way, Rear Admiral C. P. Plunkett, Director of Gunnery Exercises and Engineering Performances of the Navy, was detached to the command of the Navy Railway Battery Expedition and began immediately to build up the

force of 14 officers and 500 men necessary to their operation. The officers were drawn from the Navy and the Naval Reserve, while the men come from the Great Lakes Naval Training Station and from the Navy Rifle Ranges, each one being, in addition to his other special qualifications, an expert rifleman. The men underwent intensive training to fit them for their duties abroad and, looking ahead with a far-sightedness which was destined to be the turning point between success and failure in France, the men who were to become part of the force engaged in erecting and assembling the guns abroad were trained by employment as inspectors at the various plants where the units were being manufactured, while others were trained to handle the heavy shells, work the guns, put in the pit foundations, and in addition were given experience in the work of track laying, track repairing and other railroading essentials which would be necessary in making the batteries properly mobile.

Practically as soon as the guns were offered to the American Army, General Pershing personally accepted them, assigning them to the Reserve Artillery Base and urging that they be sent to France with as little delay as possible.

So well had the work of manufacture progressed that by April 15 enormous quantities of completed structural units were on the docks at the port selected for

the embarkation of the expedition. A few weeks later 260 men and 18 officers set sail with the first consignment of materials, arriving at St. Nazaire on June 9.

From that time on great cargo ships plied across the submarine infested seas, back again and across again, bearing the component parts of the batteries to the shores of France and to Pershing. Whether the Hun knew of the sailing of the Navy Battery ships is, of course, not known, but it is a fact that while all of the steamers safely delivered cargoes, not once but many times, one steamer originally included in the transport list, but later withdrawn, was among the first of the victims of the submarine *U-151* operating off our coast.

Thus far none of the many difficulties had even seriously delayed the realization of the naval experts' dream, and by August 12 all of the battery material was safely in France, but the work of assembling the units had begun long before.

While the steamers were transporting the batteries, which had been reduced to their standard component parts for shipment, there began in the French port of debarkation what is now and will always be referred to by the men of the Naval Battery Expedition as "The Battle of St. Nazaire." By the time the first two steamers had tied up to the French dock, and their heavy cargoes had been snaked

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Trestles had to be strengthened to carry the immense weight—275 tons each—of the gun cars as they left St. Nazaire for the front.