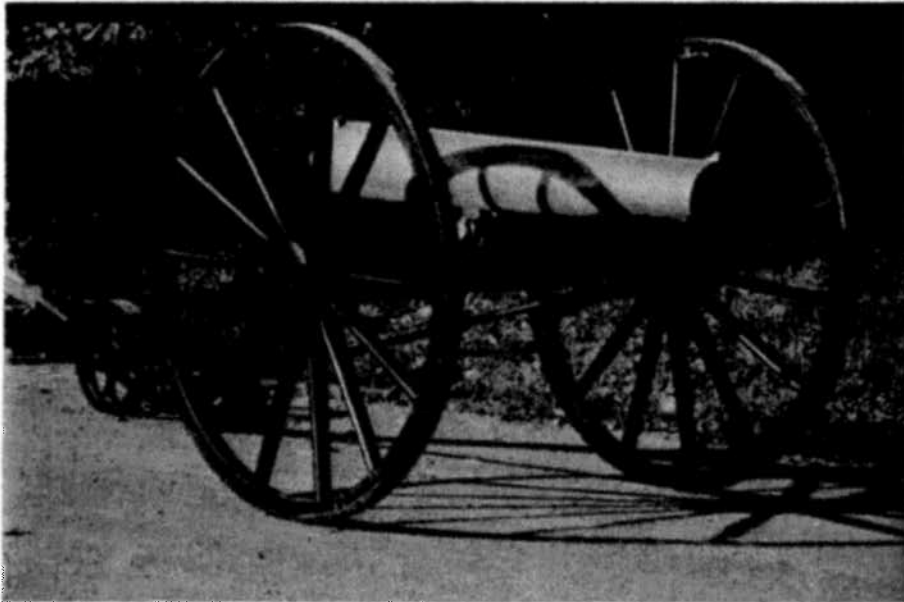


12-POUNDER DAHLGREN BOAT HOWITZER NO. 52**WASHINGTON NAVY YARD****1858**

- ✧ This is the best heavy Dahlgren boat howitzer extant. Its specific service in the Civil War is thoroughly documented. Its provenance is impeccable, and it combines numerous rarities. There are only 6 of this model known in private hands, vs. 20 of the light model. The hand-wrought iron carriage is original and correctly marked, including inspector's initials. It has an original, properly marked percussion hammer, and the wheels are of wood. Surviving carriages are few, and wheels are fewer. Most are all-iron, like those of old farm implements. The wheels of this specimen are newly restored to exacting specifications (e.g., solid, not laminated hubs, air dried for 7 years) by Amish and Mennonite wheelwrights of Lancaster County, PA, utilizing all original hardware. (When sold by Ables, wheels had been incorrectly rebuilt with two bent felloes - instead of 7 cut felloes.)
- ✧ Dahlgren Boat Howitzer, 1858, No. 52 of 761 LBS, manufactured at Washington Navy Yard and inspected by Dahlgren himself ("J.A.D"). "CT" in diamond on muzzle face is Washington Navy Yard foundry number.

- ♣ Original wrought iron carriage stamped "No. 385 OF 573 [pounds] and inspected "JRD" plus numerous assembly codes.,
- ♣ Hammer is stamped "DAHLGREN /12 PDR of 761 [pounds] / No 39", the result of a post-war switch at the Philadelphia Navy Yard.,
- ♣ Tube went on board USS *E. B. Hale* between May 16 and June 18, 1863, where it served for the duration of the war, along with four 32 pdrs and a 30 pdr parrot. *Hale* was a 220 ton screw steamer stationed at St. John's River Fla and Port Royal, where her duties, with No. 52 on deck, included the exploits in Ripley's Artillery and Ammunition of the Civil War, p. 47. Records in the National Archives document each round of No. 52's firing.

Hammer No. 61 served with its matching gun on the *Pinta* through Sept of 1866, and thence on *Constitution* at Philadelphia Navy Yard through 1877.

To Phila GAR, 1875; thence by Freeman's Auction to famed Howard K. Brown collection (Ambler PA) which was dispersed by Robert Abels in a special 1961 catalog. No. 52 was one of a pair which were the centerpiece of the collection, and Brown's son Ed bought them back. He sold them to the present owner ca. 1975.

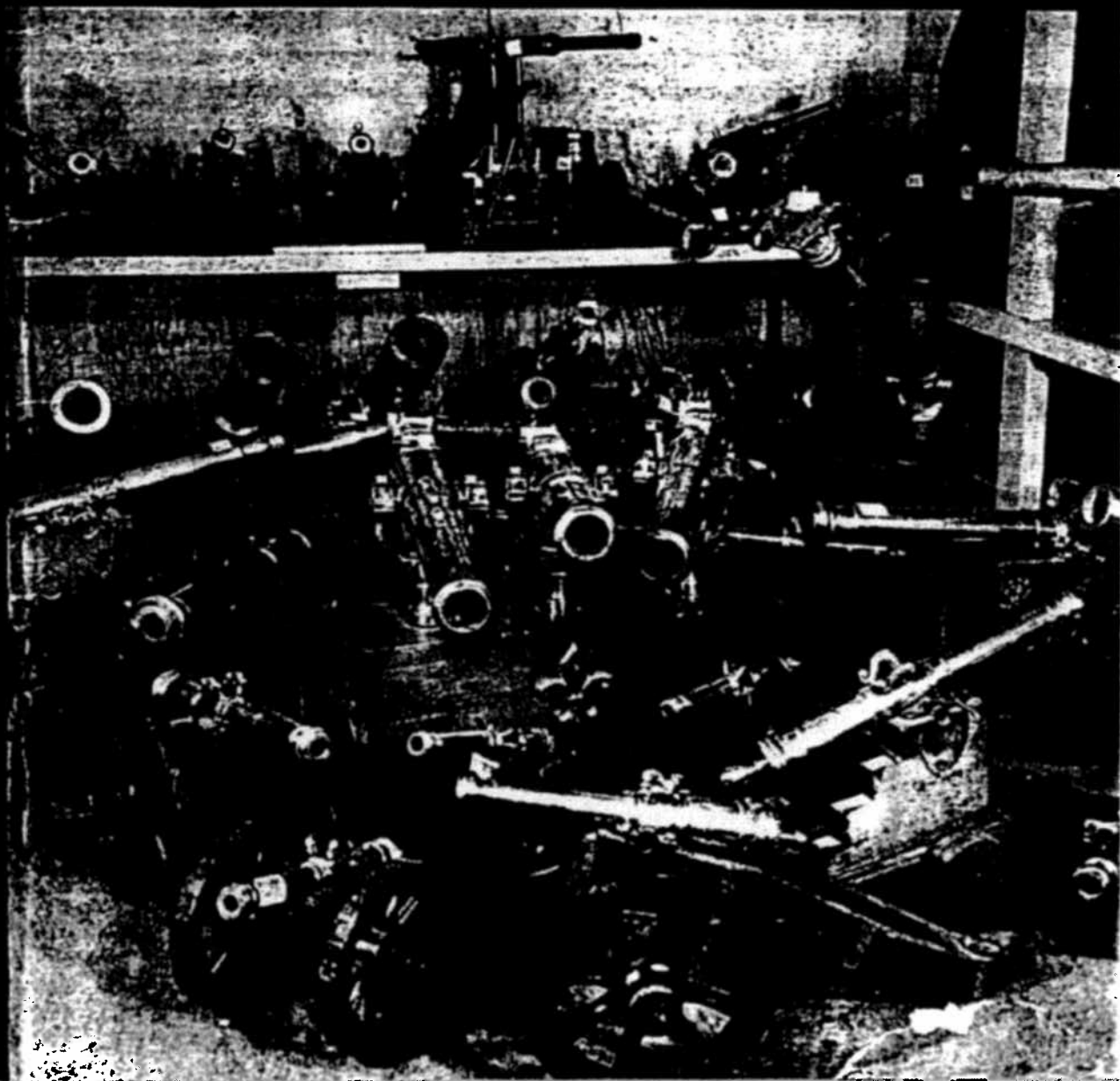
- ♣ Dahlgren designed the boat howitzers as a result of the Navy's lack of an efficient artillery system for amphibious landings during the Mexican war, in which they used old-fashioned split-trail carriages to avoid the cumbersome limbers of the new 1841 stock-trail system. Boat-howitzers were handled by men, not horses, and each of the crew carried one round of fixed ammunition in a leather pass-box slung over the shoulder. For land transport, Dahlgren's unique trail wheel was lowered. This replaced the entire limber. For firing, it was raised so the trail dragged on the ground to absorb recoil. To save weight, Dahlgren eliminated all turnings and moldings on the tube, thus producing the first streamlined gun, and anticipating the famed "Ordnance Rifle" in this respect by nearly a decade. Unlike previous cannon locks, Dahlgren's consisted on a single moving part, the hammer. Its percussive swing was propelled by the cammed lanyard. On firing, a volcanic rush of gasses from the vent could blow back the hammer and break it. Other Navy locks used a hammer that was pulled backwards on firing, but Dahlgren's solution for the relatively small propellant charge of the boat howitzers was elegantly simple: he simply put a hole through the steel hammer head, and gasses vented through it.

Boat howitzer's typically served on deck as anti-personnel weapons. They were especially prized by the inland navy, and often fired canister or shrapnel against Rebs on the river banks. Farragut, in defiance of Navy regulations since the War of 1812, mounted boat howitzers in the tops of his fleet when it ascended the Mississippi River past New Orleans. Dahlgren Boat howitzers also served on land, at First Bull Run, in the Peninsular Campaign (5th NJ Volunteers), and at Roanoke Island (Feb 7, 1862), where 6 boat howitzers were commanded the famed Benjamin Porter (killed in action at Fort Fisher). Porter's battery made a classic amphibious assault, and when the entire crew of one of his guns was killed or wounded, Porter worked the piece single-handed until the battle ended in victory. The Bull Run Boat Howitzers were hastily acquisitioned from the Washington Navy Yard, and might even have included No. 52.

The
Robert Abels

of the

CANNON COLLECTION



A TRIBUTE
to the late HOWARD BROWN
by Col. JOHN M. STODDARD
(AUS-Ret)



Howard Brown, a real "shooting cannoneer," fires one of his prize Civil War Dahlgrens at Cannon House, Ambler, Pennsylvania.

San Diego, California
3 December 1961

As his friend and agent, and as a fellow "Great Gun" of CHAOS, (Cannon Hunters' Association of Seattle, International) I unearthed many a European find for the cannon collection of the late Howard B. Brown, Esquire of Bennerbrook Farm, Pa., but even without them his collection of actual and model ordnance is, in my considered, professional view, the finest in the world outside governmental, royal or titled hands.

Certainly the Browns (Howard and Polly) strove to make it that, and they spared neither money, time, exhaustive research and a deal of effort to make their old guns gleam as brightly as ever they did when initially cast and burnished. And to them constantly flowed the finest guns gleaned from cob-webby attics, dreary cellars and half-forgotten shops the world over.

For nineteen months and over 14 countries I haunted "thieves markets", private museums, old barns and dusty apartments that were, in all truth, middle-aged in the time of Columbus. And from his era, too, I found an iron breech-loading ship's gun even finer than the one so proudly preserved in a Florence museum (and a deal of doing it took, too, in crossing four frontiers with such a prize.)

In a tumble-down farm in the Black Forest an aged and wealthy collector (who lived at the end of an icy, meandering track because "here it is peaceful by me" eventually parted with eleven guns so finely fashioned and so old and priceless that he insisted on providing his own bedding to cushion them on their departure. On that trip, too, we found two ancient cast iron guns still used to thunder in the new year and to hail the birth of a new family member... and guns so beautifully kept that the wood carriages, as well as the iron work, were originals.

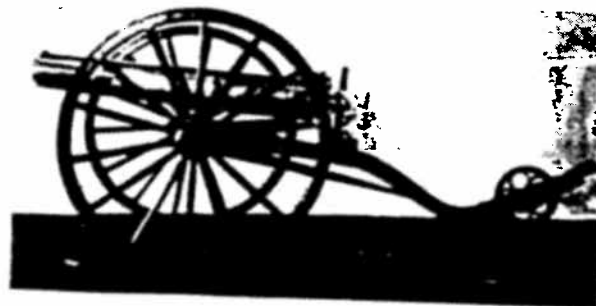
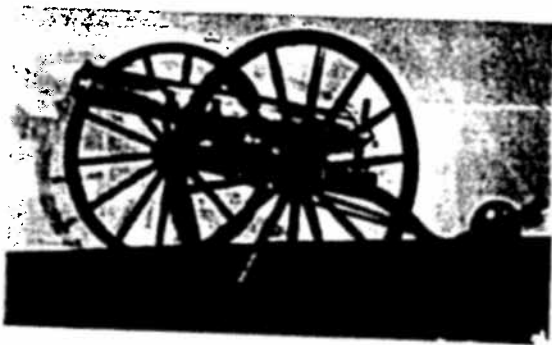
On a bitterly cold December day in the Flea Market, from crumpled old wrappings a century and more old came an authentic "training aid" from the army of the first Napoleon: three nested pontoons, their wheeled transport, a field gun and limber... all arsenal-made in faithful miniature so French gunners and engineers might learn the ferrying of artillery and transport in theory and before practice.

We of CHAOS miss Howard sadly, but hope, as I'm sure he would, that other "Master Gunners" will cherish and preserve his ordnance as it so richly deserved.

John M. Stoddard
John M. Stoddard,
Colonel, AUS-Ret

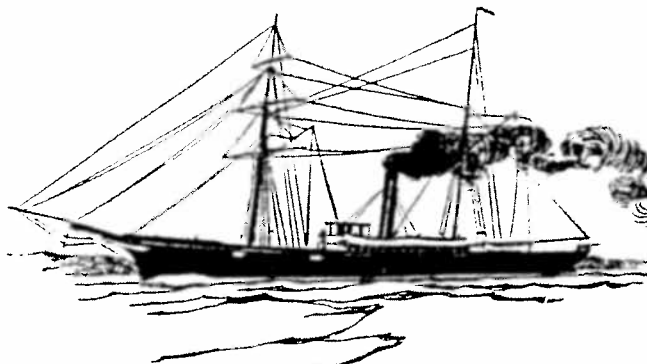


A PAIR OF RARE BRONZE BARREL
DAHLGREN BOAT HOWITZERS
OF CIVIL WAR FAME



1-104 The above pair of naval cannon used during the Civil War aboard gunboats, also used on land in some of the important land engagements, have iron wheeled carriages. They are 12 pounders, and smoothbore, one marked 1858 JAD on barrel above trunnion, serial number 52, the other is dated 1861 JAD and number 74 above trunnion, have the elevating screws, complete and in perfect serviceable order. The finest pair of cannon in the entire collection. With the pair: a pyramid of 10 cannon balls, 2 prints from Leslie's Gazette showing picture of Dahlgren, a marine standing alongside a Dahlgren cannon, a sailor firing this howitzer, 1 Dahlgren Manual, 1 large framed photograph of the pair at Fort Bennerbrook Farm.

Price the pair \$15,000.00



1858 Tube

ORN
973,740

Un 34

Data

USS Pilgrim II, 1

E. B. Hale

Captures by I, 13

Data II, 1

Expedition up S. Edisto R., S.C. Ap 29, 1862

I, 12

Joint attack on Confed. @ Port Royal Ferry, S.C.

I, 12

Mentioned

I, 4, 6, 8, 14-16,

Operations in

Ashepoo + S. Edisto Rivers

I, 15

Coosaw River, S.C.

I, 14

St. Johns R., Fla., Santer + Stono R's, S.C.

I, 13

Vicinity of Port Royal Ferry, S.C.

I, 14

Wrights and Mud Rivers, S.C.

I, 12

Orders for movement

I, 4, 6, 1

Reconnaissance in Ashepoo + Combahee R's, S.C.

I, 13

From a Blind, Silent Piece of Metal

By Steven J. Selenfriend

There is no greater joy in gun collecting than making an old piece come alive by the discovery of its hidden past. To my good fortune, the very first antique firearm I ever acquired became one of those collectors gems.

The piece is a Colt 1851, 4th Model, Navy revolver, serial number 99800. I came across it in a friend's gun shop some years ago. It was in very good condition, but what caught my eye was the simple inscription on the backstrap, "B.H. PORTER U.S.N.". I had to have it and after much bargaining it was mine.

My research efforts did not begin until a year later while doing graduate studies in the Washington, D.C. area. After many hours of work the story started to unfold.

Benjamin Horton Porter was born in Skeneateles, New York on July 10, 1844. In 1848 his father, James, took his family westward to Lockport, New York, on the shores of Lake Erie. It was here that Ben

fell in love with ships and water and developed his craving for a life at sea.

In 1859, at the age of 15, Ben won an appointment to the United States Naval Academy at Annapolis, Maryland. Here he pursued his studies and training until the advent of hostilities with the secessionist states forced the need for every able bodied man to come to the aid of the Union.

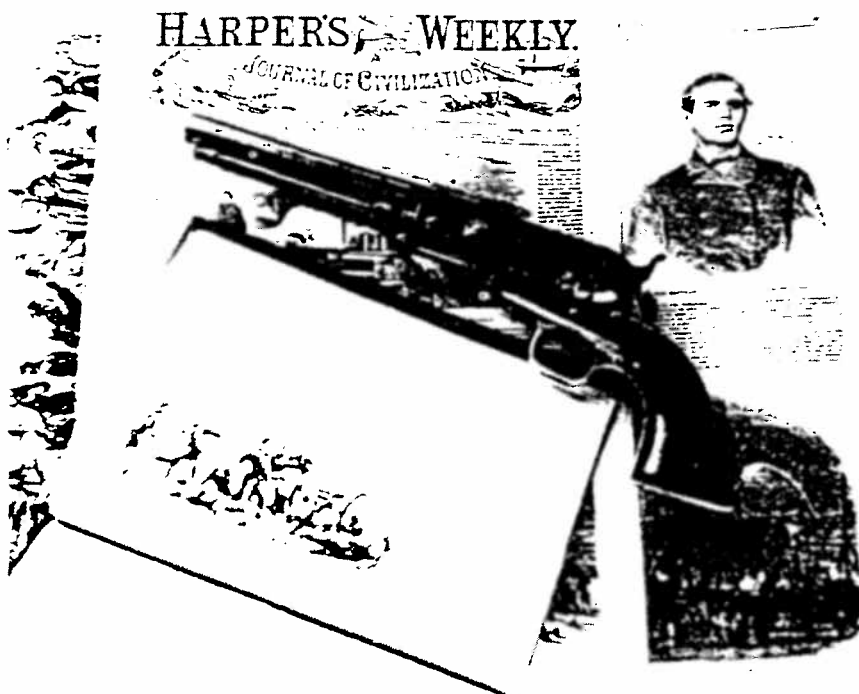
Early in 1861, Porter was ordered to the New York Naval Shipyards at Brooklyn, New York. It was while stationed here that he purchased his revolver at Colt's 240 Broadway office.

Porter was assigned to the Roanoke and entered service with her on blockade duty with the North Atlantic Blockading Squadron. This was dull duty for the action seeking youth, so when the vessel was drydocked for repairs, he volunteered for service with the Burnside Expedition then fitting out for action

1865



*Benjamin H. Porter
1865*

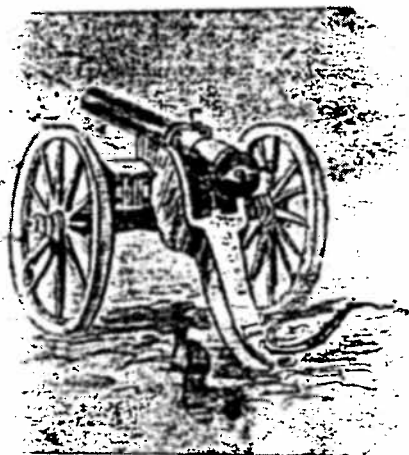


against the rebels in the North Carolina Sound. Young Ben was placed in command of six launches, each armed with a Dahlgren howitzer. These batteries were to be the artillery support for the land forces assaulting Roanoke Island.

On February 7, 1862 the battle began and fighting was fierce. The Confederates fought back bravely. Union casualties were heavy and at one point in the battle all the men at one of Porter's guns were killed or wounded. Porter took over at the howitzer and, alone, loaded and fired until the battle was won. For his part in this action he won the praise and esteem of many of his superior officers, including Generals Burnside and Foster and Admiral Goldsborough. The latter's letter of commendation was sent to the Secretary of the Navy.

Porter was soon rewarded for his gallantry and ability to command. He was promoted to Ensign and made Acting Master of the Gunboat Ellis. The Ellis was captured from the Confederates at the Battle of Roanoke Island. Aboard his vessel he conducted many future back-water raids into rebel territory.

Potomac Blockade



*Two ships' howitzers
having been attached
to the 2nd company*

wooden frame. It was very warm and would have been very comfortable, had it not been for the large amount of fleas and other varmint that infested it, and made the boys pass the hours in scratch, scratch, scratch.

*5th Regt.
N.J. Vols*

Two ships' howitzers having been attached to the 2nd company of our Regt. big things were expected from the Bloody Fifth (as we were styled by the other Regts) when we got into action. At some distance from our camp, an earthwork had been thrown up having for an armament two whitworth guns, and wishing to test their range, Genl. Hooker and staff had the gunners fire at the Rebels at Cockpit battery's opposite comming very near cutting down the flag staff, from which the rebel flag floated in the breeze. The fire was returned but did not come anywhere near, but that was not always the case for on one occasion as the 7th N.J. were forming for dress parade, a shell came screeching across the river and dropped close to the band, who were playing at the time. That tune was cut shorter than usual, and coat-tails was about all that could be seen as they disappeared behind the tents.

On Sunday March 1st the Rebs were quieter than usual, and although

43
Feb-March, 1862, Peninsular Campaign.

Bellard, Alfred d. 1891.
Gone for a soldier.

1. United States — History — Civil War, 1861-1865 — Personal narratives. 2. Bellard, Alfred, d. 1891.
3. United States — History — Civil War, 1861-1865 — Regimental histories — Army of the Potomac. 1. Title.
E601.B45 1975 973.7'91 75-19220
ISBN 0-316-08833-0

**BUREAU OF ORDNANCE,
NAVY DEPARTMENT.**

WASHINGTON CITY, Nov. 5, 1863.

It being of great importance to have the condition of guns in service, the Bureau desires all Commanding Officers, immediately after the receipt of the copies of this "Circular," to fill up the blanks of one of them, as far as in their power, and forward it to the Bureau; and to do the same at the expiration of every quarter.

When the "total number of fires to date" cannot be ascertained, the number since the vessel has been in commission is to be stated.

H. A. WISE,
Chief of Bureau.

NAME OF VESSEL.				STATION.							
(U.S. Steamer E. B. Hale)				(St. John River, Va.)							
CLASS OF GUN.	Register No.	FOUNDRY.	Date of Fabrication.	Charge of Powder.	Shot.	Shell.	Shrapnel.	Grape.	Cannon.	No. of Fires during Quarter.	Total No. of Fires to date.
32 Pdr 42 lb	142	E. & C.	1844	6 lb	2					2	39
" "	"	"	"	"	1					1	8
" "	187	"	"	4 lb							7
" "	"	"	"	6 lb	2					2	41
" "	"	"	"	"	1					1	8
" "	"	"	"	4 lb							6
" "	189	"	"	6 lb	2					2	17
" "	"	"	"	"	0						3
" "	"	"	"	4 lb							8
" "	190	"	"	6 lb	3					3	17
" "	"	"	"	"	0						3
" "	"	"	"	4 lb							8
36 Pdr Parrot Rifle	90	A. P. P.	1862	3 1/4 lb	4					4	87
12 Pdr heavy	52	W. Mary	1858	1 lb	0						7
32 Pdr heavy	"	Yards	"	"		0					1
"	"	"	"	"				1	1	1	1

} This gun.

Lumber 31 lb

C. F. Mitchell
Commander.

U.S. E. B. Hale

H. Schwab

Class of Gun	Range	Company	of Distribution	Charge of Powder	Projectiles	Length
52. B. & O.	192.	E. A. & Co.	1844.	6 lb.	Shell	
				6.	Shot	
				4.	Shot	
	17.	E. A. & Co.	1844.	6 lb.	Shell	
				6.	Shot	
				4.	Shot	
	150.	E. A. & Co.	1844.	6.	Shell	
				6.	Shot	
				4.	Shot	
	190.	E. A. & Co.	1844.	6.	Shell	
				6.	Shot	
				4.	Shot	
92. B. & O.	92.	R. P. P.	1862.	374.	Shell	This gun
52. B. & O.	52.	E. A. & Co.	1857.	1.	Shell	
				1.	Shell	

June 30th 1864

-411-

Howitzer No. 52 was on the Hale during this exploit.

Data on the muzzle face records that the Petersburg piece was cast by J. R. Anderson & Co. (Tredegar Foundry, Richmond, Virginia). The date apparently is on the left trunnion which, when the cannon was photographed, was jammed against another weapon and impossible to read. However, park records list it as 1862.

The bronze 24-pounder field howitzer (Fig. II-3) was cast by Ames Co. in 1847. Nothing has been discovered of its early history, but during the Civil War it showed up aboard the U.S.S. *George Washington*, an Army vessel, variously called a steamer and an armed transport, operating in the Beaufort, South Carolina, area.

The *Washington* and the Navy steamer *E.B. Hale* set out 8 April 1865 from Beaufort to reconnoiter nearby tidal rivers.⁴

Both vessels made their way up the Coosaw until the *Hale* grounded about 1:30 P.M. and despite efforts of the *Washington* remained fast on a mud bank throughout the afternoon and until 11 o'clock that night.

Once more afloat, her pilot preferred to brave the tricky navigation of the river in daylight, so the *Hale* dropped anchor near the *Washington* and both vessels lay quietly through the night not far from shore and close to a wooded area offering excellent concealment for any Confederates caring to take advantage of the situation. Realizing the potential danger, Lieutenant Edgar Brodhead, skipper of the *Hale*, weighed anchor about 4:30 A.M. and felt his way upstream leaving the *Washington* behind.

At daylight, the *Washington* got under way only to have shot and shell crash aboard from a Confederate battery that had been brought up under cover of darkness and emplaced in woods about a mile astern. The first shot knocked out the rudder and the second got the magazine setting the ship afire. With no means of navigation and his vessel burning, Captain Thomas B. Briggs considered discretion the better part and struck his flag.

The Confederates immediately ceased fire, but without boats, they had no way of actually taking possession of the surrendered steamer and while they sought smallboats, the vessel drifted in the fast-moving tide. Rudderless, she swept toward the opposite shore from the Confederates—the side toward Beaufort which, by virtue of patrol activity, was under nominal federal control. Before long she grounded against mud and marsh. Whereupon a general hegira ensued from her burning decks as officers and crew sought escape across the marsh to friendly territory.

Seeing their prisoners escape through what the Confederates considered downright ungentlemanly conduct, the Confederates danced in frustration and reopened fire as the fleeing Yankees fought their way through the mud toward land. Most seem to have made it, including Captain Briggs, for the majority of casualties reportedly occurred during the explosion of the magazine.

Finally, rescue hove in sight—the *Hale*, white wave curling from her bow, stack spouting smoke and sparks, straining to her full eight knots. Her skipper had heard the firing, but presumed the *Washington* was shooting up the woods a bit as she cruised up and down the river. Then a federal soldier rowed out from shore to report a vessel in trouble, and the *Hale* was on her way. She arrived to find the *Washington* had burned to the waterline and sunk in four feet of water. By this time a truce was in effect, so the *Hale* took aboard several injured men and headed for home.

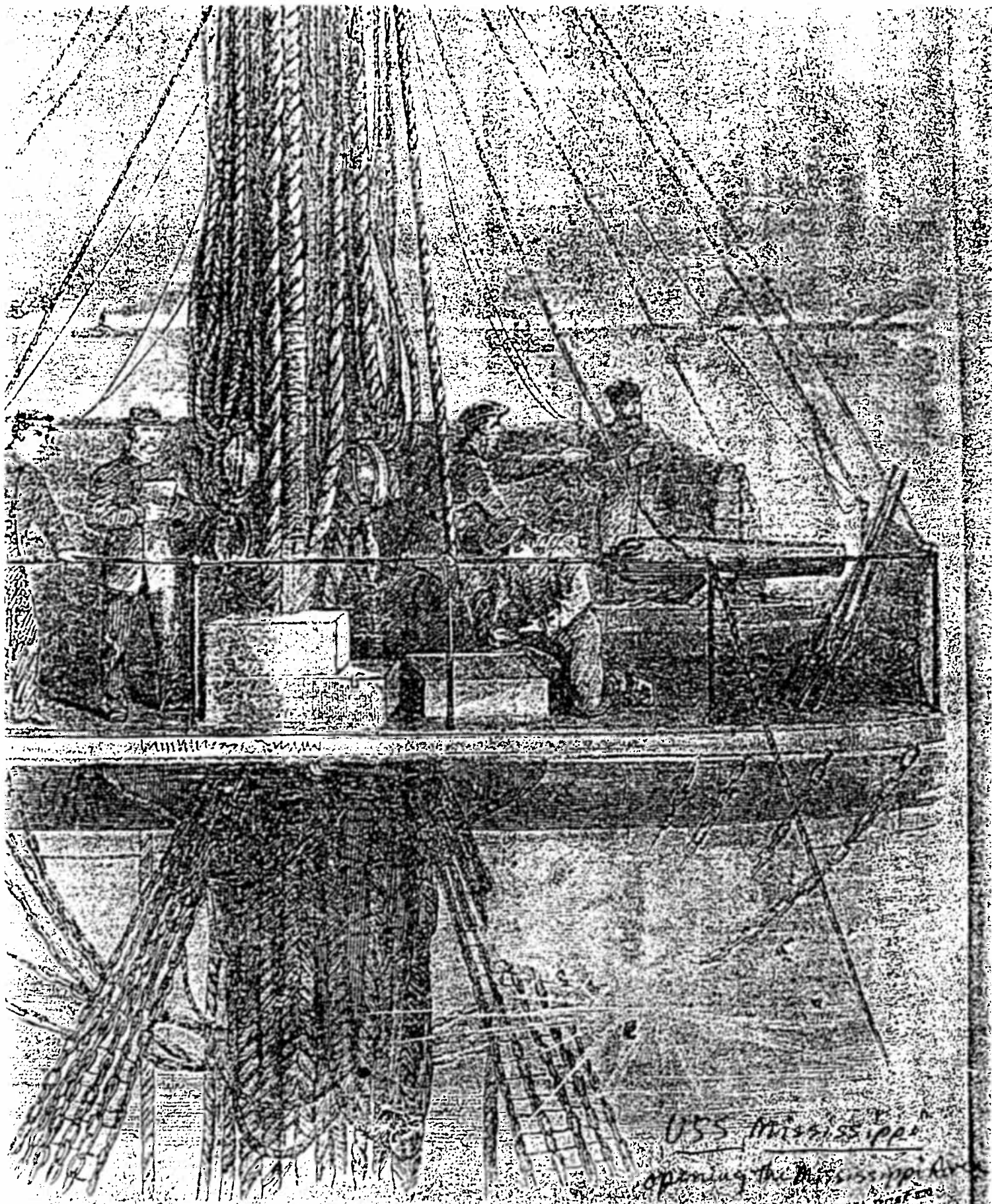
Back in the safety of the federal base at Hilton Head, recriminations flew thick and fast. The Army hurried an investigation which censured Briggs for surrendering and then escaping under the white flag—terming his conduct “unjustifiable and reprehensible”—but blamed the loss of the *Washington* on the *Hale* for sneaking off in the dark without notifying her companion vessel.

Furious over the charge, the Navy convened its own board of inquiry and pointed out that the *Hale* left with no attempt at secrecy, passing close enough for any Army lookout to have spotted the move. Furthermore, the Navy intimated that if Army skippers were so stupid as to spend an afternoon and night in the lee of an enemy shore and still be there at daylight, Navy men were not, and concluded by completely exonerating the *Hale*. Finally, as is often the case, both sides were happy to let the affair die quietly and get on to more pressing business.

As for the *Washington*, the *Hale* went back to the site to guard an Army salvage crew, but apparently nothing was attempted. Later the Confederates took a crack at it from small boats and hauled out one of her cannon which they dragged ashore, then hastily buried fearing the momentary appearance of a Union gunboat. It presumably still awaits a finder for there is no mention of its being recovered either during the war or later.

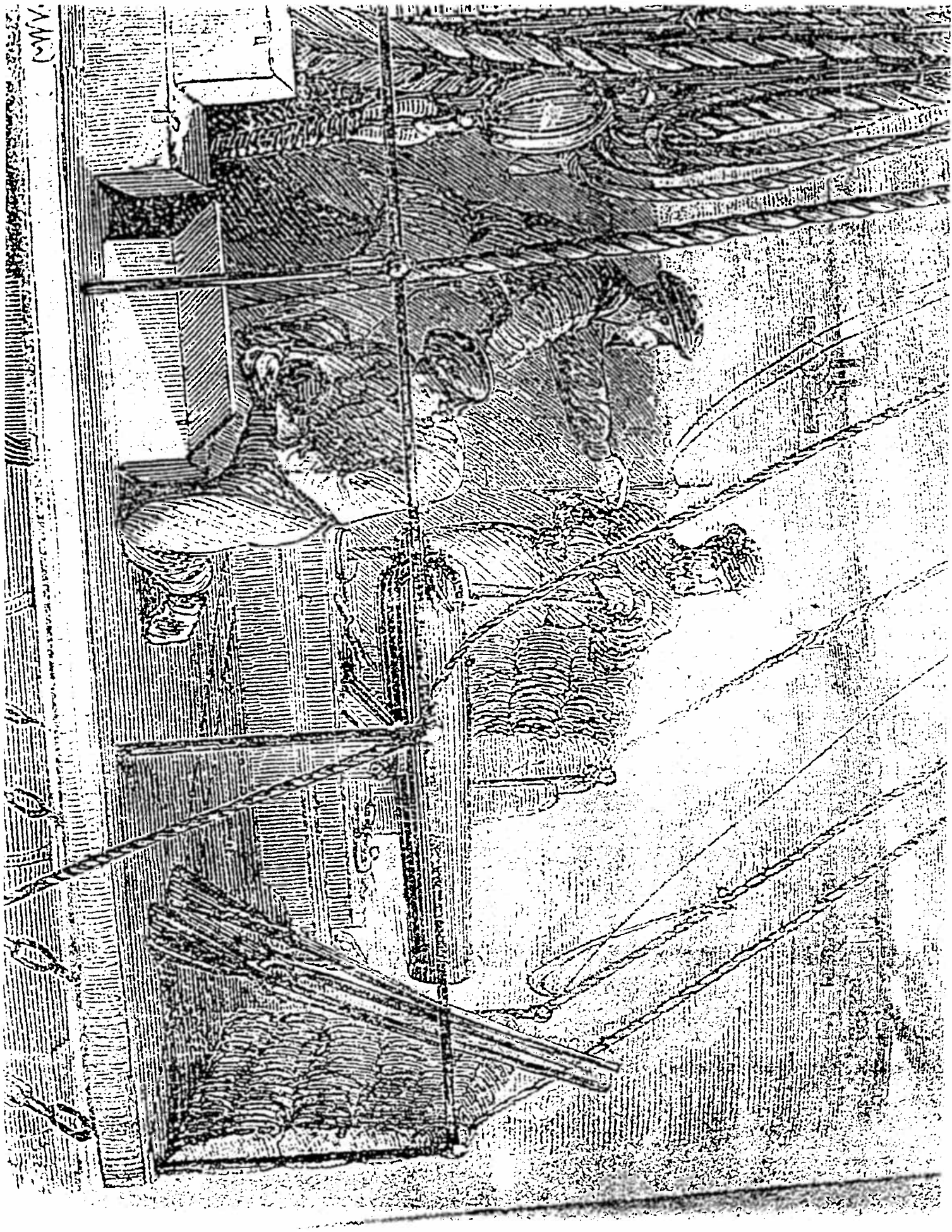
The weapon in Figure II-3, however, was still aboard the *Washington*. It was spotted some years ago by a man catching crabs amid the wreckage of the vessel. He knocked the oyster shells off a large piece of metal and recognized it as a cannon and a

*Warren Ripley, Artillery and Ammunition of the Civil War, Van Nostrand
Rheinhold, NY, © 1970,*



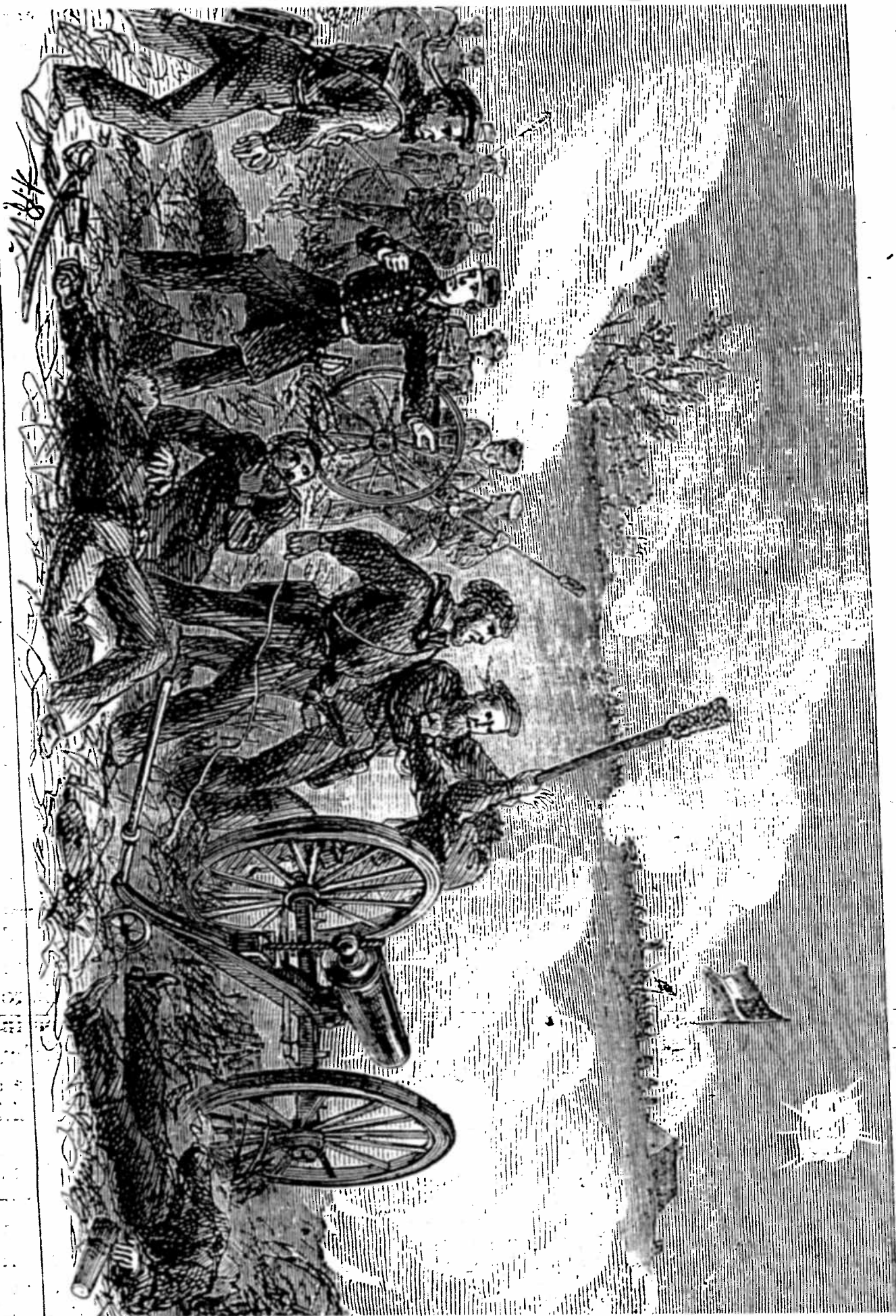
USS Mississippi
opening the Mississippi River

FROM THE DECK OF THE U.S.S. MISSISSIPPI, COMMANDER J. B. JOHNSON HAS
MADE A PHOTOGRAPH OF THE GREAT BRIDGE BETWEEN THE RIVER AND THE RIVER
AT ST. LOUIS, MO. THE BRIDGE IS A GREAT STRUCTURE OF STEEL AND
CONCRETE, AND IT IS THE LARGEST BRIDGE IN THE WORLD.





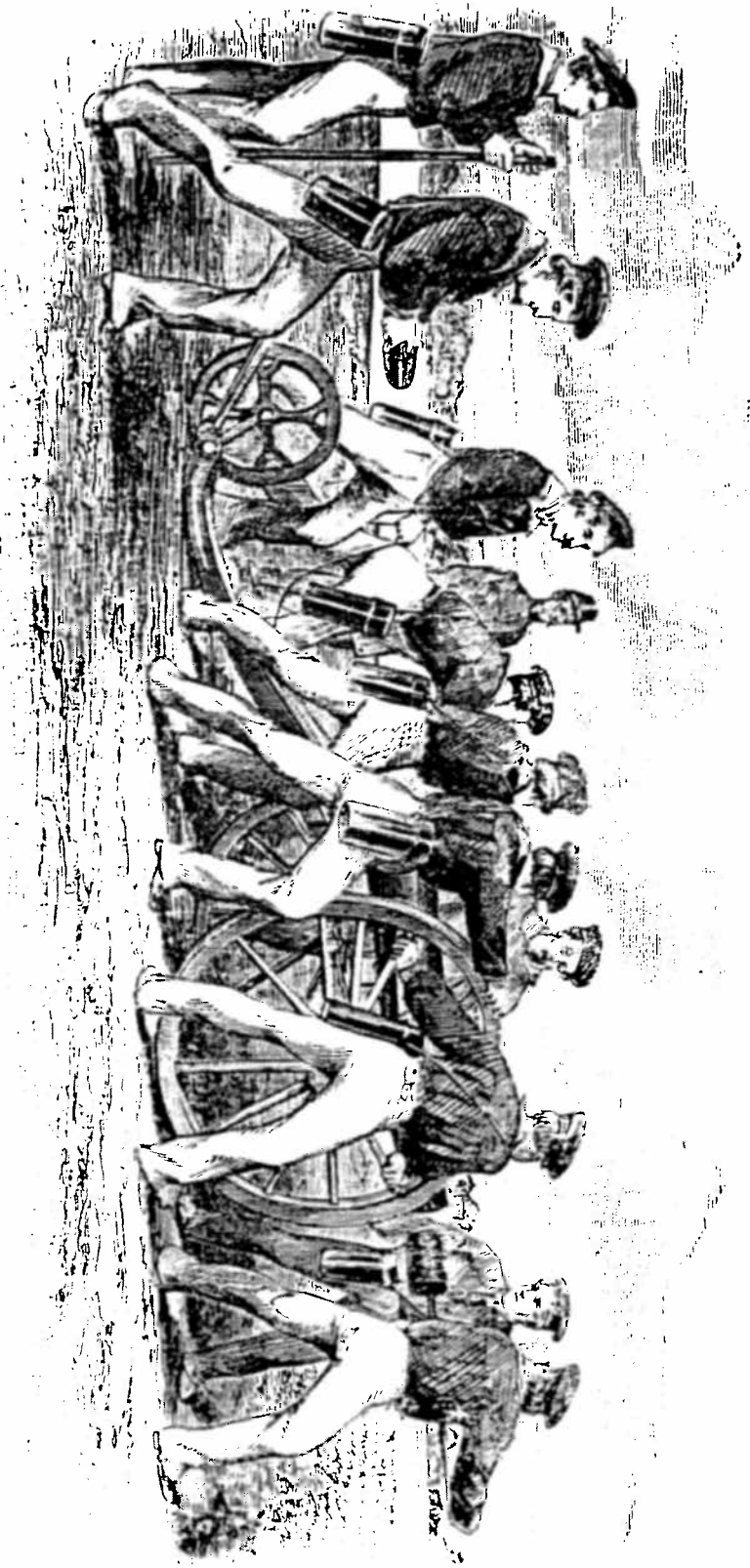
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PORTER AT ROANOKE.

2-2

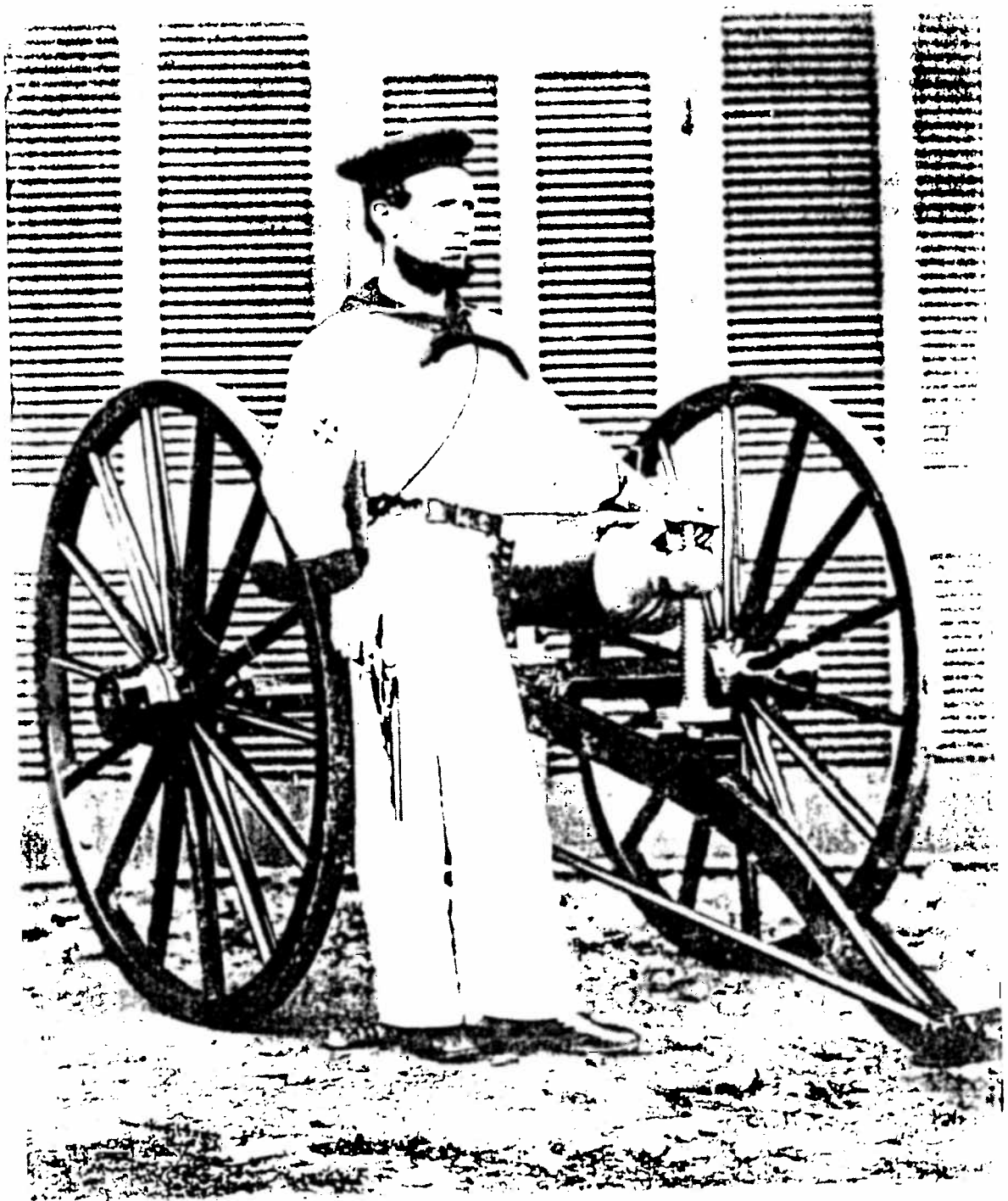
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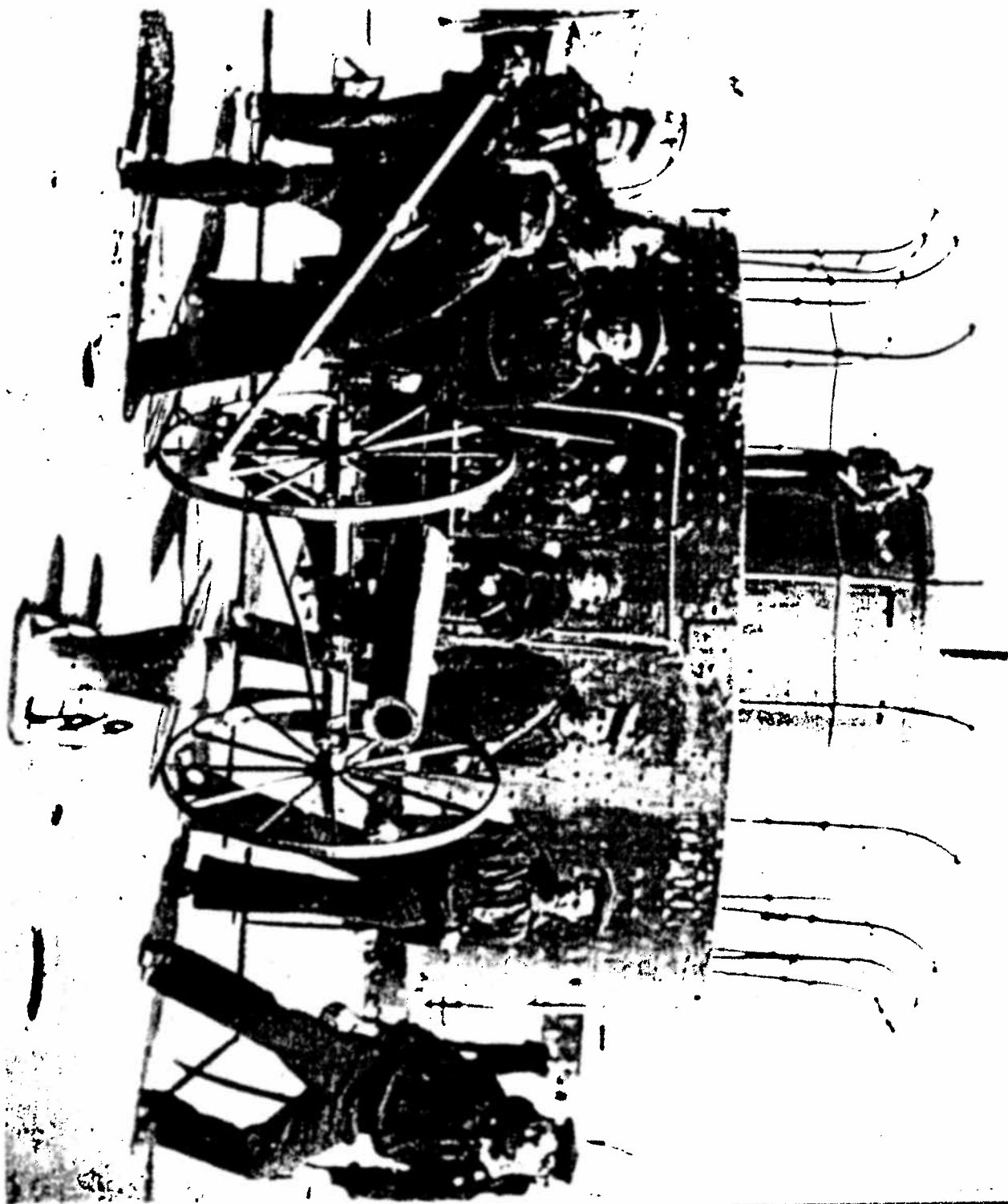
LAND PRACTICE OF SAILORS WITH THE DAHLGREN HOWITZER BOAT GUN—SHOOTING OUT THE GUN.



23

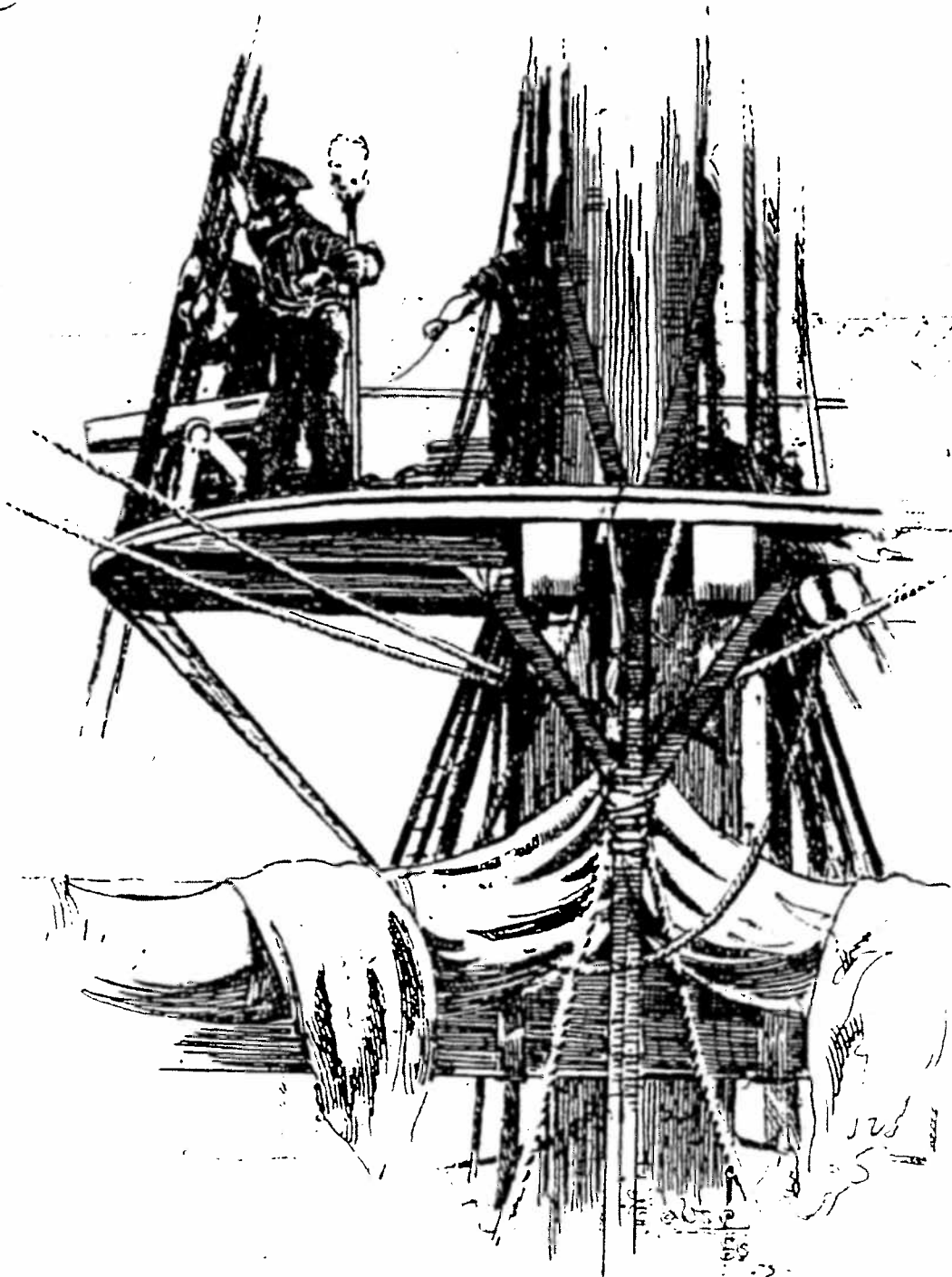


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2/1



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3-2



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From the collection of W. A. G. 11.62
T. L. M. G. 11.62
M. A. G. 11.62

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W/ McClellan's Peninsula Campaign

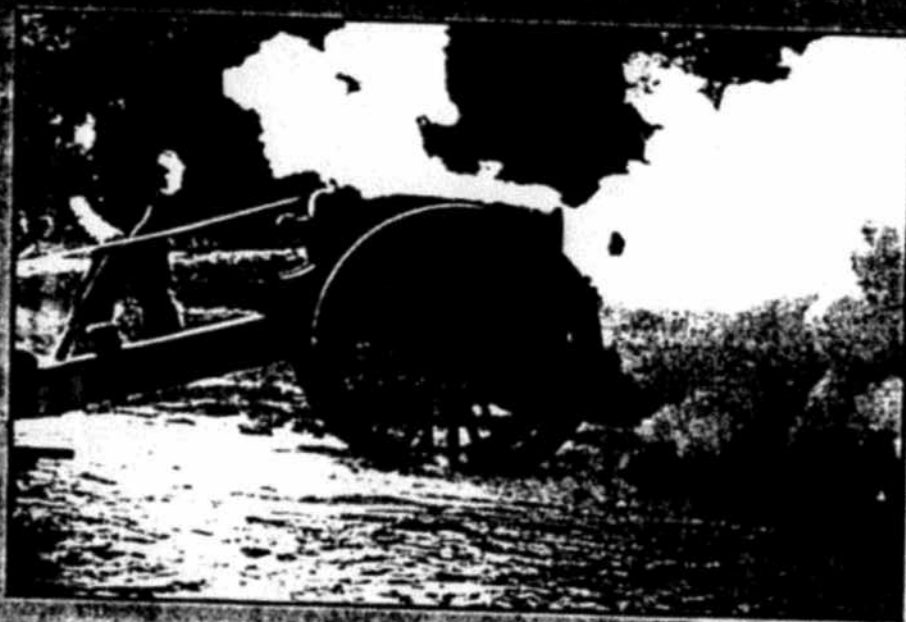
Ky Meredith - Mr Lincoln
Cameraman Matthew B. Brady
Dover, N.Y. p. 63

3-3



THE BIG GUNS

Civil War Siege, Seacoast, and Naval Cannon



by
Edwin Olmstead
Wayne E. Stark
Spencer C. Tucker

DAHLGREN BOAT HOWITZERS

BEFORE THERE WERE BOAT HOWITZERS

In the early days of naval warfare most guns aboard ships were small man-killers used at close quarters. As the size of guns increased and their number decreased, small guns remained in fighting tops of larger warships. From there, devastating short range fire could be delivered against exposed officers and crews working the upper deck of an enemy ship. Such weapons were of various types; those in the U.S. Navy were sometimes called howitzers. Smaller guns, named for the swivels on which they were mounted, fired from the rails of small warships and boats.

To pursue and attack enemy vessels in shoal waters, shallow draft craft were armed with the largest guns they could carry. For amphibious operations along the American coast during the War of 1812, the British employed both carronades and field guns in boats and launches. The early U.S. Navy used carronades for boat guns; in 1812 Robert Simmons illustrated a carronade mounted for a launch. A 6-pounder carronade, 2 feet 9.5 inches long was used in the launch of the sloop *Yorktown*, while a 12-pounder carronade of British origin served on the launch of the battleship *Columbus*. Iron carronades were, however, generally too heavy for boat use.¹

The U.S. Navy discovered the need for boat guns during the war with Mexico (1846-1848). The Navy's blockade of Mexican coasts necessitated operations in waters too shallow for even the smallest sloops. The Navy used boats but had no ordnance suited to them. The need was met by Army 6- and 12-pounder fieldpieces, 12-pounder mountain howitzers, obsolescent small carronades, and some old light 4.4-inch howitzers from Navy stores.²

EXPERIMENTAL BOAT HOWITZERS

After the Mexican War, Navy Lieutenant John A. Dahlgren was assigned to evaluate Army bronze mountain howitzers for use in fighting tops of warships and as boat guns. The only army Pattern 1835 mountain howitzers yet found with full navy stampings remain in Washington Navy Yard. Alger Registry Nos. 1 and 2 were accepted by Navy Ordnance Officer Andrew Allen Harwood in 1847. Dahlgren found them unsuitable before beginning work in 1848 on new howitzers for the Navy. Despite what he termed "great objections" from other quarters, he had the

support of the Chief of the Bureau of Ordnance and Hydrography, Commodore Warrington.³ The goal was to replace carronades with smaller, lighter weapons of no greater recoil. This meant sacrificing long range and ability to penetrate the heavy planking of a warship. Dahlgren intended his new weapons:

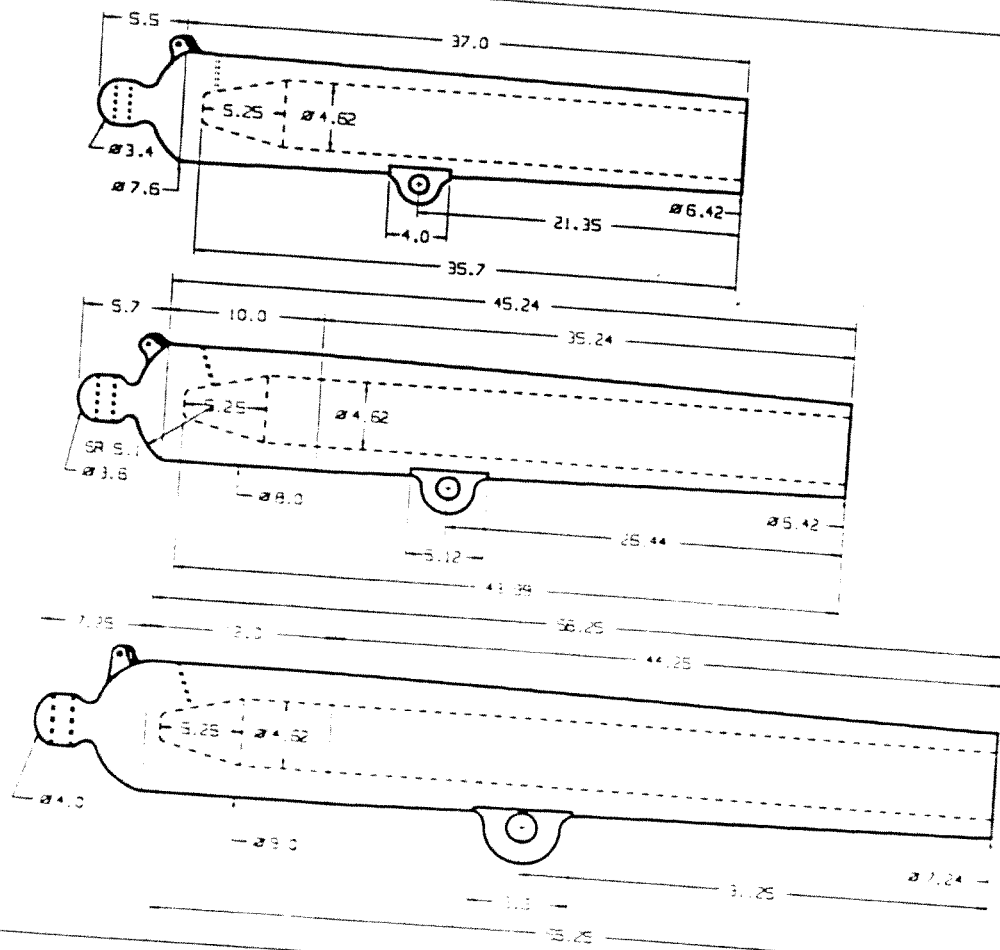
- to attack small lightly armed vessels
- to engage other armed boats
- to cover the landing of regular troops
- to accompany, when necessary, parties of disembarked seamen.⁴

On 21 February 1848 Dahlgren prepared a draft for such a 12-pounder howitzer. On 9 April 1849 he submitted an exceptionally complete report on finished weapons, numbered 1 and 2. The first was cast by A. Davis from a Navy Yard air furnace charged with "the ordinary combination" of 10 parts copper and 1 of tin. Two failures delayed the second satisfactory casting from a new cupola until charged with 10 parts copper, 2 parts zinc, and 1 part tin, presumably by weight. Both successful bronze castings differ from the army mountain howitzer in length, weight, kind of chamber, and naval breeching jaws. No. 1 was 37 inches long from the base to the muzzle face and weighed 276.5 pounds; No. 2 was 41 inches and 324 pounds. The mountain howitzer was 32.9 inches long and weighed 220 pounds. For his howitzers, Dahlgren wisely selected a readily loaded and sponged flat bottom Gomer chamber 5.25 inches long rather than the army cylindrical chamber 3.34 inches in diameter and 2.75 inches deep.⁵

The first two Dahlgren howitzers differ conspicuously from those to follow. Each had centered trunnions on nimbases as well as naval underloops similar to those of obsolescent carronades. These enabled actual carriage trials in order to fulfill exacting requirements for flexibility when used aboard small craft. Dahlgren found a modified carronade carriage the best compromise among cost, utility, versatility, and weight. Recognizing that ranges must be short, he disregarded the reputation of carronades as "notoriously unsteady on firing."⁶

Both bronze trial howitzers were later tallied without dates as unserviceable, probably because of their nonstandard sizes and dual means of support. On 11 February 1858 No. 1 was "Reserved in collection as a first sample." It survives, but No. 2 was "melted up. Apr '79."⁷

Another early Dahlgren innovation was to extend the lower breeching jaw for the elevating screw to be threaded



12-pounder Dahlgren Bronze Boat Howitzers. UPPER Small pattern weighing 300 pounds; preponderance, 25 pounds; weight ratio, 39 with 8.9-pound loaded shell, bore length, 7.73 calibers. MIDDLE Light pattern weighing 430 pounds; preponderance, 27 pounds; weight ratio, 48.3 with 8.9-pound loaded shell, bore length, 9.52 calibers. LOWER Heavy pattern weighing 750 pounds; preponderance, 70 pounds; weight ratio, 84.3 with 8.9-pound loaded shell, bore length, 11.96 calibers. The 3.4-inch Dahlgren bronze rifle was bored from this same casting. SOURCES Surviving Registry No. 19 at Washington, District of Columbia; RG74 E202, red series drawings 2905 (light), 2897c (heavy).

through it. Most later Dahlgrens howitzers have larger elevating screws threaded through substantial ball knobs without breeching jaws. Such threaded knobs were in turn first applied to Dahlgren 24-pounder No. 7, to heavy 12-pounder No. 21, and to medium 12-pounder No. 23. We believe that the extended and threaded lower breeching jaw was discarded as fragile.⁸

Sixteen intermediate "old pattern" boat howitzers had been melted and recast before 11 February 1858; one may survive. The only drawings found for transitional patterns are the illustrations in Dahlgren's two 1852 manuals.⁹

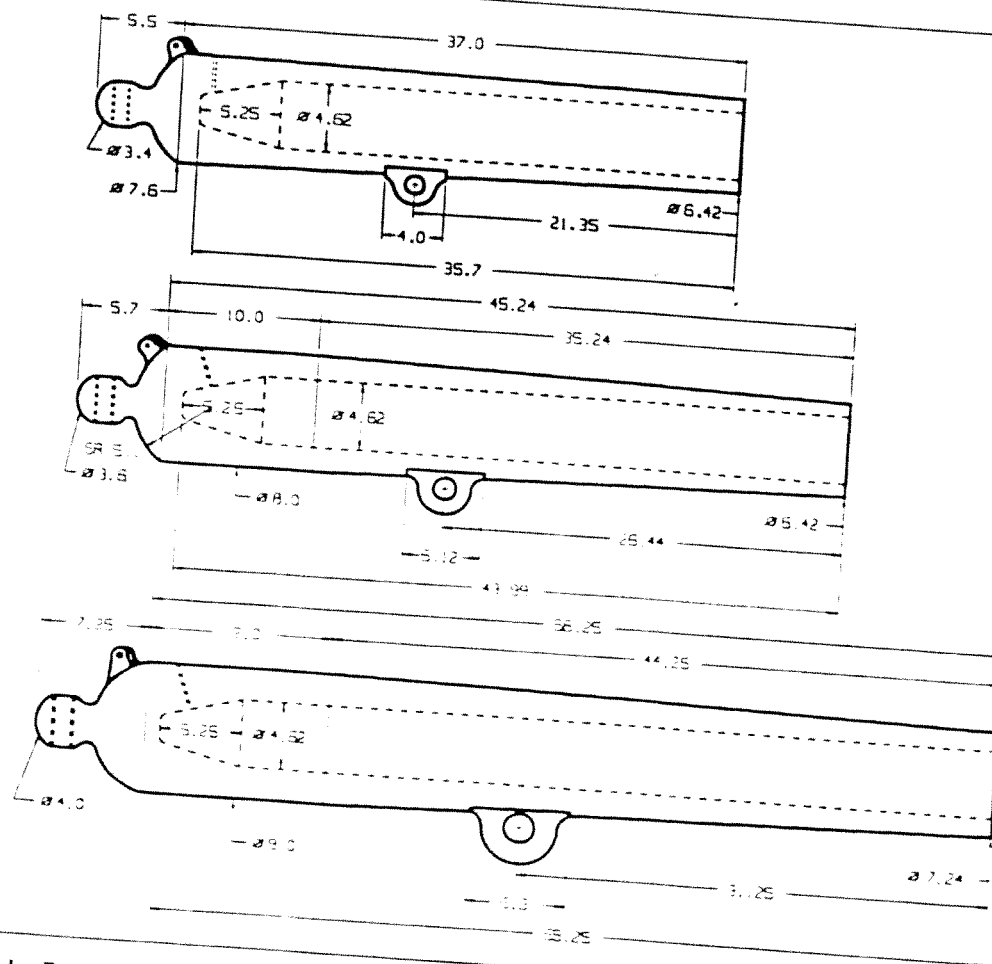
BOAT HOWITZER DEVELOPMENT

Dahlgren's penchant for unconventional bores surfaced in his 1849 report. His experiments were with tradi-

tional 12-pounder bronze boat howitzers of 4.62 inch bore. Like his later iron ordnance, Dahlgren suggested extraordinary bore diameters for proposed further pieces:

- No. 1 - 5.5 inch - 1300 [pounds] - equal nearly to calibre of 24 [pounder]
- No. 2 - 4.5 inch - 600 [pounds] - equal nearly to calibre of 12 [pounder]
- No. 3 - 4.5 inch - 300 [pounds] - equal nearly to calibre of 12 [pounder]¹⁰

Someone's insistence upon established sizes prevailed. The first service Dahlgren boat howitzer was light 12-pounder No. 1 weighing 443 pounds and completed with lock, sight, carriage, ammunition, and equipment. It was sent to Boston on 6 Jun 1849 for the sloop *John Adams*, then fitting out to cruise off Africa. She was a 2nd class



12-pounder Dahlgren Bronze Boat Howitzers. UPPER Small pattern weighing 300 pounds; preponderance, 25 pounds; weight ratio, 39 with 8.9-pound loaded shell; bore length, 7.73 calibers. MIDDLE Light pattern weighing 430 pounds; preponderance, 27 pounds; weight ratio, 48.3 with 8.9-pound loaded shell; bore length, 9.52 calibers. LOWER Heavy pattern weighing 750 pounds; preponderance, 70 pounds; weight ratio, 84.3 with 8.9-pound loaded shell; bore length, 11.96 calibers. The 3.4-inch Dahlgren bronze rifle was bored from this same casting. SOURCES Surviving Registry No. 19 at Washington, District of Columbia, RG74 E202, red series drawings 2905 (light), 2897c (heavy).

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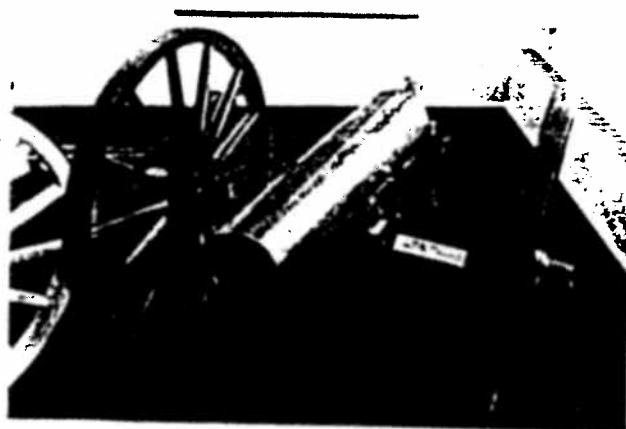


Photo 7.1: 12-pounder bronze Dahlgren boat howitzer, small. MARKINGS: Upper breech: U.S.N.Y. WASHINGTON 30SLBS 25Pre / No 19 Top of tube: plain anchor / SMALL 12PDR / BOAT HOWITZER / 1864 / W.N.J. / DAHLGREN / CLASS 7 / NO 20 Lower muzzle face: AA (inside diamond) Location: Washington Navy Yard, DC.

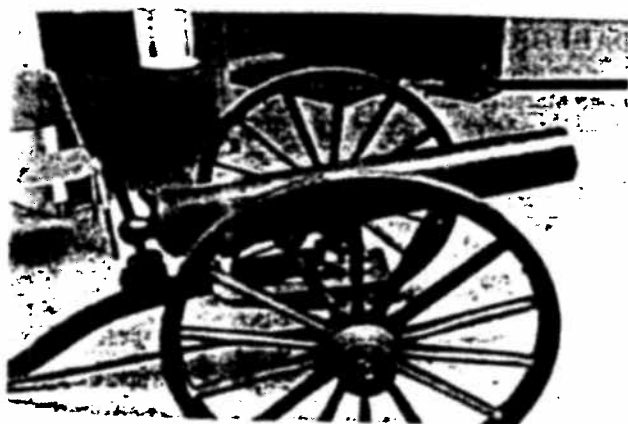


Photo 7.2: 12-pounder bronze Dahlgren boat howitzer, light. MARKINGS: Upper breech: U.S.N.Y. WASHINGTON 42SLDR 25PRE / No 168 Top of tube: fouled anchor / 12PDR / BOAT HOWITZER / 1871 / F.M.R. / DAHLGREN Lower muzzle face: HO Location: Washington Navy Yard, DC

landing, the howitzer could rapidly be mounted on its field carriage. It was easily returned to its launch mode and re-embarked. These changes could be accomplished by eight to ten men in two to three minutes, slightly more from land to boat than for the reverse.²⁷

The field carriage weighed less than 500 pounds, about half that for Army pieces of comparable caliber. It was entirely of wrought iron, save the wheels, which were at first made of wood. Occasional instances of wheels breaking caused Dahlgren in January 1862 to propose substituting [probably wrought-] iron wheels which weighed little more and were "more durable" in contrast to land practice, in which horses pulled artillery, sailors hauled boat howitzers by a drag rope attached to the trail.



Photo 7.3: 12-pounder bronze Dahlgren boat howitzer, heavy. The 3.4-inch bronze Dahlgren rifle was bored from this same casting. MARKINGS: Upper breech: U.S.N.Y. WASHINGTON 757LBS 58Pre / No 45 Top of tube: fouled anchor / 12PDR / BOAT HOWITZER / 1856 / J.A.D. Lower muzzle face: CJ (inside diamond) Location: Fairfax, VA. Photo by David E. Pierce.

A small wheel at the end of the trail eased movement. On smooth ground, or if there was too much recoil, a pin could be removed and the wheel turned upon its trail. There was no limber. The field carriage was carried in the stern of the launch. Screw nuts allowed its rapid disassembly and reassembly.²⁸

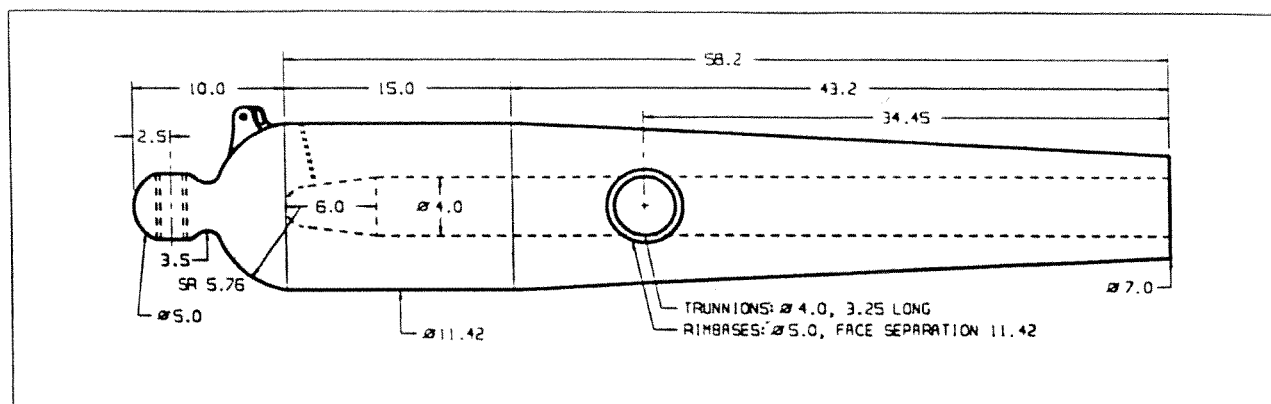
The essential anti-personnel mission of the howitzer reflects the provision of no solid shot. In addition to shell and canister, ammunition was to include shrapnel or spherical case, introduced in the U.S. Navy in 1859.²⁹

Boxes lashed to the carriage carried ammunition. Later carriages included small tapered locating pins to help position them. Regulations called for each crew member to carry two rounds, bringing total available rounds to 72. All were "fixed" - that is, the projectile was already attached to its charge.³⁰

Rapid fire was easily achieved. Dahlgren wrote that for proof and in drill the 12-pounders were fired at a rate of seven or eight times a minute, and there were instances of ten times a minute or better. Such high rates, however, could be dangerous for the loader. The maximum firing rate for canister from a field carriage was eight, but the usual rate was three or four times a minute. In the limited confines of a launch, where the howitzer was more difficult to serve, the maximum sustained rate was five times a minute.³¹

By 1856 time fuses designed by Colonel Bormann of the Belgian artillery were being utilized in shells for the Dahlgren howitzers.³²

Boat howitzers were not polished, to make them both less conspicuous to the enemy and easier to sight in sunlight.³³



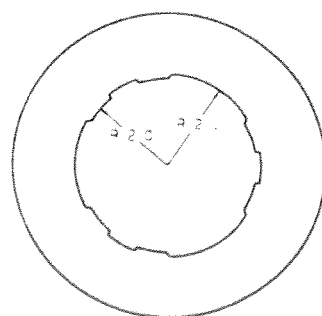
4-inch (20-pounder) Bronze Dahlgren Rifle. Weight, 1,350 pounds; preponderance, 145 pounds; weight ratio, 67.5 with 20-pound loaded shell; whole bore length, 14.55 calibers; rifling, 3 grooves, right-hand twist. SOURCE: RG74 E202, red series drawing 2889.

4-inch (20-pounder) BRONZE DAHLGREN RIFLE

Dahlgren's final bronze piece, identified as a "rifled 20-pounder," had a 4-inch bore and weighed 1,350 pounds. Made at Washington Navy Yard and introduced in 1863, it closely resembles the 24-pounder boat howitzer except for centered trunnions on rimbases instead of the under-loop. Of 100 produced, 13 have been found. Records afterward identify that of 1863 as "light." In 1871, after Dahlgren's death, a "heavy" 4-inch bronze rifle, not found today, was introduced, weighing 1,950 pounds.³⁴

Both 4-inch bronze rifles used 3-groove rifling superficially resembling that in 2.9- and 3-inch Parrott rifles. Grooves were 2.09 inches wide, like the lands, 0.1-inch deep, and their right-hand twist uniform, one turn in 12.5 feet or 37.5 calibers. Differing from that in other bronze Dahlgrens, the round bottom Gomer chamber was 6 inches long. Its single vent was fired by a single hammer.³⁵

While efforts were under way to update aging weapons, starting in 1876 36 light 4-inch bronze rifles were altered to load from the breech. They are mentioned here because of their extraordinary rifling. During conversion, an additional groove 0.722 inches wide and 0.08 inches deep, with its sides radial rather than parallel, was centered in each original land. Seven of the 14 found are converted



The 6-groove rifling in 4-inch bronze Dahlgren rifles after conversion to a breech-loader. SOURCE: RG74 E202 red series 716d

in this manner. So far as known, this differs from Atwater rifling.³⁶

CARRIAGES FOR 4-inch BRONZE DAHLGREN RIFLES

A drawing of 23 December 1864 shows a 2-truck wood Marsilly carriage. It is identified as "Proposed Plan of Broadside Carriage for 20 pdr. Rifled Bronze Gun". Such a carriage would permit elevation of 20° and depression of 6°. Most surviving 4-inch bronze light rifles, however, are on cast bronze 2-truck carriages. They resemble those of wrought iron that supported iron Dahlgren shell guns. Presumably they are of his design.³⁷

BRONZE DAHLGREN LOCKS

Army fieldpieces were usually fired by friction primers at the end of a lanyard. In the field, flying spent primer tubes were dangerous, particularly those from mortars. Dangers aboard ship were even greater. Flying hot metal tubes in a confined space would be potential hazards to crewmen, sails and rigging. Spent primer tubes, hot or cold, would be most uncomfortable for any sailor serving barefoot. Thus the navy adopted a percussion primer, "composed of a [bird feather] quill tube capped by an explosive wafer." The quill was about 2.12 inches long; the wafer, about 0.62 inches in diameter and 0.12 inches thick. What remained after firing could not damage sails. In 1831 Enoch Hidden patented a hammer to fire percussion primers. It was arranged to hold the wafer in place after being struck, while the hollow hammer head relieved destructive gas pressure. About the same time Dahlgren developed a similar hammer. Applied at first to weapons at Pencote Battery, it became the established lock for the boat howitzers of the United States Navy.³⁸

DAHLGREN MUZZLE DIAMONDS

Carronade underloop mounting leaves no convenient protected place, such as a rimbase face above a trunnion,

for stamping the maker's own identifications. Some British carronades have a flat surface, that we identify as a "quoins pad," on the underside near the rear. Marks for some appear on this pad, a practice not known to be imitated in America. Nearly half the surviving boat howitzers made at Washington Navy Yard, however, have one or two initials in sequence stamped on their lower muzzle faces. One series runs from 1855 to 1864; another, starting anew, from 1864 to 1874. None appears to be of a recognized Ordnance Officer. John L. Morris deduced that these might code each piece produced at the Yard, equivalent to familiar private foundry numbers. We broadly confirm this theory by a scan of 70 known stampings of varying legibility. Roughly one in three thus far recorded is enclosed within a crude dia-

mond, of unknown significance if any, formed by four strikes of a small cold chisel.

SUMMARY

Dahlgren boat howitzers in substantial quantity, particularly the initial three sizes, served the Navy long and well. Those made as rifles confirmed the Army's earlier discovery that bronze rifling soon loses its accuracy. They also contributed to the modern conclusion that the resistance of rifling to erosion increases with the melting point of the metal.

CHAPTER 7 NOTES

1. James 1902, VI:356-360; RG74 E117, 94, 200.
2. J.A. Dahlgren 1852a, 10; 1856a, 12.
3. M.V. Dahlgren 1891, 133, 143; Appendix C20.
4. J.A. Dahlgren 1856a, 51.
5. M.V. Dahlgren 1891, 133; RG74 E201, box 1, item 1. J.A. Dahlgren 9 April 1849, passim (pages not numbered); RG74 E202, red series 2886.
6. Hughes 1969, 42.
7. RG74 E202, red series 2886, sorely water damaged; Hughes 1969, 42; RG74 E112, 1:2, 2:0; RG74 E201, box 5, p. 12, Appendix C21.
8. RG74 E201, box 1, item 1. J.A. Dahlgren 9 August 1849 (pages not numbered).
9. RG74 E201, box 2, item 5, p. 12; J.A. Dahlgren 1852a, between 21 and 22; J.A. Dahlgren 1852b, Plate 1.
10. RG74 E201, box 1, item 1. J.A. Dahlgren 9 April 1849 (pages not numbered).
11. M.V. Dahlgren 1891, 133; J.A. Dahlgren 1856a, 13; Emmons 1850, 26; RG74 E201, box 2, item 5, p. 12.
12. *Ordnance Instructions* 1866, xvi, xvii; Appendix B No VI.
13. M.V. Dahlgren 1891, 143, italics in original.
14. I.C. Dahlgren Papers, box 21. General Order of 17 December 1850, M.V. Dahlgren 1891, 136.
15. J.A. Dahlgren 1852a, 7.
16. J.A. Dahlgren 1856a, 14.
17. RG74 E201, box 2, item 5, p. 12; J.A. Dahlgren letter and report 11 February 1858 to Ingraham, Chief of Bureau of Ordnance and Hydrography; M.V. Dahlgren 1872, 5, Appendix A; RG74 E121, passim, Serial Set 1826, 2, Appendix C23.
18. M.V. Dahlgren 1872, 5, Appendix A; RG74 E121, passim, Serial Set 1826, 2, RG74 E112, pp. 14, 20, 24; Appendix C24.
19. M.V. Dahlgren 1872, 5, Appendix A; RG74 E121, passim, Serial Set 1826, 2, Appendix C50.
20. RG74 E121, passim, Appendix C22.
21. RG74 E112, 1:46, 2:9, 48; Appendixes C2, C24.
22. RG74 E112, 2:10, 12; RG74 E122, returns Nos. 15, 33; Appendix C2.
23. *Ordnance Instructions USN* 1866, Appendix A: Table I, vi, No. VI: xvii.
24. Hazlett, Olmstead and Parks 1988, 144-146; Appendix C3.
25. J.A. Dahlgren 1856a, 21.
26. M.V. Dahlgren 1891, 132, 153.
27. J.A. Dahlgren 1856a, 120, 121.
28. RG74 E201, Box 2, item 5, letters of 14 October 1861 and 11 January 1862; J.A. Dahlgren 1856a, 49-51.
29. Canister was composed of iron shot, 1.07 inches in diameter, weighing 0.16 pounds each, packed in a tin cylinder. The interstices were filled with sawdust. The upper end was closed by a wrought-iron plate, the lower end by a wooden block which also served as a sabot. Shrapnel contained lead musket balls: 80, weighing a total of 4.67 pounds, in the 12-pounder; and 175, weighing 10.33 pounds, in the 24-pounder. J.A. Dahlgren 1852a, 52; J.A. Dahlgren 1856a, 39, 40, 73, 84, 85.
30. J.A. Dahlgren 1856a, 43.
31. J.A. Dahlgren *Ordnance Memoranda* 1853, 93; J.A. Dahlgren 1856a, 48-51.
32. J.A. Dahlgren 1856a, 88-90.
33. J.A. Dahlgren 1856a, 153.
34. Appendix C7; RG74 E202, red series 2888, 2889.
35. RG74 E202, red series 2889.
36. RG74 E112, 1:436; RG74 E202, red series 716d; Appendix C6, Glossary, "Rifling."
37. RG74 E202, red series 548a.
38. J.A. Dahlgren 1853, 32; Canfield 1992, "An experimental battery of Washington Navy Yard across the Anacostia River, on grounds of St. Elizabeth's asylum;" Gibbon 1860, 358-360; Gibbon 1863, 320, 321, 324-326; *Ordnance Instructions for the United States Navy*, Part III: 56 §172.

Appendix C23 - C24

FOUNDRY	REG#	INSP	FDY#	YR	WEIGHT	CITY or SITE	ST	COMMENTS
USNYW	142	FMR	GN	70	435	Glen Ellyn	IL	
	143	FMR	GP	70	431	Glen Ellyn	IL	
	148	FMR	GW	70	426	Miami	FL	privately owned, once there if no longer
	150	FMR	GT	70	428	Kalamazoo	MI	privately owned, once there if no longer
	155	FMR	HC	70	427	San Jose	CA	
	162	FMR	HH	70	426	Front Royal	VA	privately owned
	163	FMR		71	425	Oakland	CA	
	168	FMR	HO	71	425	USNY Washington	DC	
	170	FMR	HQ	71	429	Clear Lake	WI	privately owned
	171	*FMR	HR	71	429	Warminster	PA	privately owned
	173	FMR		71	425	Sudbury	MA	privately owned
	174	FMR	HU	71	423	Arlington	MA	
	175	FMR		71	429	New York	NY	
	176	FMR		71	426	New London	CT	
	179	FMR		72	424	New York	NY	
	181	*MS		72	425	[unknown]		
						Portland		
ME markings illegible								

Appendix C24 12-pounder BRONZE DAILGREN BOAT HOWITZERS, HEAVY

Sources: RG74 E112, v.1, pp.14-33; v.2, pp.2, 6, 7, 45-50, 58; RG74 E45, pp.120, 121 CA&Co

FOUNDRY	REGISTRY NUMBERS ASSIGNED	TOTAL	YEARS	INSPECTING OFFICERS
USNYW	1-197	197	1849-65	JAD, WNJ
Ames	201-310, 341-387, 415-459	202	1863-65	JAD, JAH
Alger	311-340, 388-414	57	1863, 64	TAH
		456		

SURVIVORS								
FOUNDRY	REG#	INSP	FDY#	YR	WEIGHT	CITY or SITE	ST	COMMENTS
USNYW	35	JAD	BU	54	759	E. Bridgewater	MA	served on USS <i>Colorado</i>
	36	JAD	CC	54	754	Portsmouth	VA	served on USS <i>Constellation</i>
	39	JAD	CA	55	761	Downingtown	PA	served on USS <i>Stonewall</i>
		JAD		55	723	Laurel Springs	NJ	
Alger	45	JAD	CJ	56	757	Fairfax	VA	served on USS <i>Lancaster</i>
	52	JAD	CT	58	761	Parkesburg	PA	privately owned, served on USS <i>E B Hale</i>
	651	JAD		58	760	Memphis	TN	privately owned, perhaps Alger fdy. No.
	74	JAD	EL	61	757	[unknown, private]		sold since reported in VA, on USS <i>Aroostook</i>
USNYW	91	JAD	HH	62	758	Asbury Park	NJ	served on USS <i>Cricket</i>
	92	JAD		62	*759	New York	NY	served on USS <i>Tyler</i>
	94	JAD		62	759	New York	NY	served on USS <i>T A Ward</i>
	96	JAD	HM	62	759	Vicksburg NMP	MS	served on USS <i>Pittsburg</i>
	101	JAD		62	740	Portland	ME	
	128	JAD		62	750	New Haven	CT	served on USS <i>Monongahela</i> & USS <i>Sciota</i>
	134	JAD	LA	62	763	New Haven	CT	served on USS <i>Lehigh</i>
	139	JAD	KZ	62	760	Islamorada	FL	recovered from wreck of *USS <i>San Jacinto</i>
	148	*JAD	LU	62	*764	Forsyth	GA	markings worn
	*150	*JAD	LB	62	*768	Quantico	VA	markings polished off
	152	JAD		62	751	Webster	MA	served on USS <i>Larkspur</i> & USS <i>Galena</i>
	155	JAD		63	754	New Haven	CT	served on USS <i>Sassacus</i>
	158	WNJ	UY	64	763	New Haven	CT	
	185	WNJ		64	769	Cover	ME	privately owned, on USS <i>New Hampshire</i>
	189	WNJ		64	758	Webster	MA	on USS <i>St. Lawrence</i> & USS <i>General Pillow</i>
	239	*JAH		63	781	Asbury Park	NJ	
Ames	245	JAH		63	*768	Seattle	WA	
	246	JAH		63	*772	Seattle	WA	
	255	JAD		63	774	Hanover Center	MA	served on USS <i>Aster</i>
	275	JAD		63	766	Kingsville	TX	privately owned
	276	JAD		63	761	Kingsville	TX	privately owned
	295	JAD		63	758	Exmaus	PA	private, served on USS <i>Cactus</i> & <i>Oleander</i>
	302	JAD		63	756	Bangor	ME	served on USS <i>Quachita</i>
	309	JAD		63	759	Chelsea	MA	served on USS <i>Pontiac</i>
	356	JAD		63	754	Annapolis	MD	served on USS <i>Althea</i>
	364	JAD		64	774	Pottsville	PA	served on USS <i>South Carolina</i>
	365	JAD		64	775	Pottsville	PA	served on USS <i>South Carolina</i>
	378	JAD		64	776	Ashburnham	MA	served on USS <i>Donegal</i> & USS <i>Bigonia</i>
Alger	*386			64	778	Newport News	VA	
	*392			*64	750	Quantico	VA	most markings polished off
	*75/ 9	JAD	IX	64	765	Sedan	KS	bored from 3.4-inch rifle, on USS <i>Catskill</i>
	*331/25	WNJ	UK	64	752	Westborough	MA	bored from 3.4-inch rifle, on USS <i>Moccasin</i>
Ames	417	JAD		65	767	Hanover Center	MA	
Ames	421	JAD		65	767	Fitchburg	MA	on USS <i>Monongahela</i> , reported stolen 1992
	438	JAD		65	776	Lancaster	MA	
					768	Huntington Sta	NY	some markings polished off
					762	Huntington Sta	NY	some markings polished off
Alger						Forsyth	GA	markings worn
USNYW						Lenox	MA	markings worn
unknown						Fairfax	VA	markings polished off

USS Pilgrim, built by Pusey, Jones + Co, Wilmington Del.
Launched Nov 1, 1864
Screw steamer, iron, tug., 170 tons.
Delivered to Govt @ Phila NY Mar. 2, 1865
Dropped from Navy Register Jan 1, 1889.

E. B. Hale

Purchased July 27, 1861 at NY
screw steamer, wood, schooner, 4th rate, 220 Tons.

Battery: no 12 lbs listed ~~prior to June 18, 1863~~
prior to June 18, 1863. List of that date is
~~includes~~ " 4 32-pdr. 42 cwt., 1 30-pdr.
Parrott rifle, 1 heavy 12-pdr. S.B."
Earliest list is Sept 6, 1861.

Decommissioned Feb 18, 1863 — ?

~~Dec~~ commissioned Sep 4, 1861

Sold @ Auction in Phila, June 20, 1865

Battery

Sept 6, 1861: 4 32 pdrs, 42 cwt

Feb 24, 1863: " + 1, 20 pdr Parrot Rif.

May 16, 1863: " + 1 30 pdr " "

June 18, 1863 " " + 1 12p. S.B.

#52

See Ripley, Artill + Ammo of C.W., p 47, re Hale near Beaufort, ^SC.

Arrestook

- Built Kennebunk Maine

- Screw Steamer, gunboat, wood, 4th rate, 2 masted schooner,
507 Tons.

- Battery ?

Mar 1, '62 2 24 pdr S.B., 1 X1 in. Dahlg. S.B., 1 20 pdr Parrott Rifle

June 11 '63 " " , 1 12 pdr heavy S.B., 1 24 pdr heavy S.B.

Dec 31 '63

Mar 31 '64

July 1 "

Oct 1 "

June 30 '65

Sept 22 '65

1861 Tube.

Aroostook, USS.

Captures by

I, 20, 21

Data on

II, 1

Engage. w/ Confed bats in James R, May 8, 1862.

I, 7

Mentioned

I, 1, 2, 5, 7, 8, 17, 19-22, 27.

Operations

On coast of Texas

I, 21

Off Mobile, Ala., Dec 16 '62, Mar 5, 1863

I, 19

Destroy
Blockade
runner

p 412, 649, 684

Mar '7, 63
unsuccessful
chase of blockade
runner. Escaped
into Mobile Bay.

p 780-782 - Abstract log for Feb 15 '64 to Nov 18,

- capture of numerous blockade runners

- engaged w/ rebel forts.

- numerous reference to use of howitzers. Tho 24 lbs
is oft. mentioned specifically, 12 is not.

Dahlgren 12 pounder boat howitzer on original field carriage. I've studied dozens of specimens, and this is the best. All marks sharp and clear. Tube marked

Carriage bears inspectors initials as well as numerous tiny punch marks (usually ~~obliterated~~ ^{obliterated} by corrosion) coding correct assembly of hand-forged, hand-fitted parts. Gun is complete and ready to fire, including seldom-seen original ^{bronze} percussion hammer marked

(hammers were interchangeable and navy ordnance regs ~~called for~~ required a spare for each gun).

Boat howitzers ^{were designed for amphibious operations} ~~used two types of carriages~~. ~~They were~~ mounted in the ~~launch~~ on a sliding compressor carriage ^{in the launch, they were speedily} ~~and~~ shifted onto the wheeled field carriage ^{after} ~~upon~~ landing. Field carriages used two types of interchangeable wheels: the so-called 'deck' wheels were entirely of iron and resembled those of an old ^{fashioned} farm ~~implement~~; field wheels had wooden hubs, spokes and felloes like ~~conventional field~~ artillery wheels in the ~~land service~~ army. Being more durable, the ungainly iron wheels have survived in greater numbers than the wooden ones.

Page
- 7695 -

Evening Bull, Tues, July 7, 1959 | Fee Lib.
Sect G, p 41

This Phila. Scene

Ruth. Seltyger,
Shows How ^{and} Brown

w/ Peat Howitzer.
+ good walk

GAR Post 2, Joe Reese knows ^{probably} street address, Was at auction
did research.

Bull '55-59,

Burtan Achardale of Bull Staff
just about Browns buying
at Freemans

for 600 apiece.

R.K. Titer

Ed Brown Paid \$9000 for paint to Ables.

" "

collected \$9000 from his insurance after fire

Side
Ed
Brown
verbal
agreement
this at
time of
fire has

Wm m

05675

100

Gun No 39, D' town + CT's hammer
761 pas.

Earliest Record

fired ~~800~~ ⁶ ~~times~~ ⁽¹⁰⁰³⁾ ^{thru} Ap 64
in June 65

Phila NY
on Pinta till Sept of 1866-

"Lat on Pinta"

- on Const. till June of 77

- Phila

- League Is May 74 (Saluting Beethoven
Dec 77

2 Hancock Post GAR

D' town PA 1899.

U. Penn. Archives

Perita Frager Box 18, ff 15

Nassau Post No 400, Dept of Penna. GAR. 1891,
NW Cor. Eighth + Vine Sts, Phila. - 1892
(from 1894)

previously (1st?) @ 1219 Chestnut. ←

V. J. P. Archives

and again in 1866 for eighteen months. Frazer married Charlotte Jeffers Cave (1815-1881 daughter of Thomas and Sarah Hollingsworth Cave in 1838. They had three children: (b. 1839), who married Rev. Thomas Kittera Conrad; Sarah (b. 1841), who married Richard Lewis Ashhurst; Persifor (1844-1909), who was also known as Persifor, Jr. John Fries suddenly on October 12, 1872 while giving a tour of the physical laboratory of the University on the day the new buildings in West Philadelphia were first opened to public inspection.

Persifor Frazer, 1844-1909

Persifor Frazer, the son of John Fries and Charlotte Jeffers Cave Frazer, was born on July 24, 1844 in Philadelphia, Pennsylvania. Frazer attended the school of St. Luke's Episcopal Church and then the classical school of Samuel Arthur. In 1858, he entered the University of Pennsylvania; he graduated in 1862 with an A.B. He was commissioned in the United States Coast Survey and assigned to a South Atlantic squadron under Dupont. At the beginning of the Civil War, he requested a leave of absence to serve in the First City Troop and fought in Gettysburg Campaign. In 1864, he served as acting ensign in the Mississippi squadron. Frazer received special commendation for the survey he took of the Charleston, S.C. harbor for preparation of the attack on Fort Wagner while under fire from Confederate boats. He was honorably discharged in 1865. That same year Frazer received his semi-honorary A.M. degree from the University of Pennsylvania.

At close of Civil War, Frazer studied six months in the laboratory of Booth and Garret in the study of practical chemistry. In May of 1866 until 1869, he attended the Royal Saxon School of Mines in Freiberg, Germany. Frazer passed with distinction in the examination on Mineralogy. He returned to the United States in 1869 and was appointed Assistant Geologist of Pennsylvania. As Assistant Geologist, he wrote the report on Mining and Mineralogy of Colorado and Wyoming. In 1870, Frazer was appointed Instructor in Natural History and Chemistry at the University of Pennsylvania. He was promoted to Assistant Professor in 1871 and to Professor of Chemistry in 1872, serving until 1874.

In addition to his tenure at the University, Frazer served as Assistant on the Second Geological Survey of Pennsylvania, 1874-1882. In 1889, he was appointed Professor of Chemistry of the Pennsylvania Horticultural Society. He filled the Chair of Chemistry at Franklin Institute from 1891 to 1893. He was a founding member of Society of American Geologists and of the *Franklin Institute Journal*. Frazer was the first foreigner to receive the Docteur és Science Naturelles from the University of France, which was awarded to him in 1882. He was also awarded the decoration of the Golden Palms of the Academy from the French Government in July 1890, for public instruction.

Very active professionally, Frazer's publications include: *Tables for the Determination of Minerals by the Physical Properties Ascertainable with the aid of a Few Field Instruments, Based on the System of Prof. Dr. Albin Weisbach*, 1891; *Biographical Catalogue of the Matriculates of the University of Pennsylvania, 1749-1893*, 1893; *Bibliotics, or Study of Documents*, 1894; *Cross*

Persifor Frazer
UPI 50, F848

Box 17	General Files, Mexican Tunnel Enterprise (cont.)
FF 29	November-December 1889
Box 18	
FF 1	1890-1891
FF 2	1899
FF 3	1902-1903
FF 4	Financial Statements, 1889
FF 5	Miscellaneous
FF 6	Receipts, 1889
FF 7	Miscellaneous
FF 8	Music
FF 9-10	"Ella" Plates
FF 11-14	"Le Retour de Paris" Plates
FF 15	Naval Post, GAR
FF 16	Pachucha, Mexico, Mining Operation, 1889
FF 17	Pennsylvania Society of Sons of the Revolution
FF 18	4th of July Celebration, 1891
	A-L
FF 19	M-Z, Bills
FF 20	clippings
FF 21	Miscellaneous
FF 22	Pepper, Edward
	Philadelphia Fencing and Sparring Club
FF 23	A-D
FF 24	E-Z
FF 25	General, 1861-1898
FF 25a	Photographs

John Frazer
UPT 50, F848

Oversize Material Persifor Frazer (cont.)

Diplomas

AB, University of Pennsylvania, 1860

AM, University of Pennsylvania, 1865

Docteur ès Sciences naturelles, Université de France, 1883 (and 2
copies)

Membership Certificates and Miscellaneous

Academy of Natural Science, 1869

Affidavit of Birth, 1883

American Philosophical Society, 1872

Board of Examiners, International Electrical Exhibition, 1884

Deutschen Gesellschaft, 1877

Franklin Institute, 1873

Franklin Institute, 1881, Appointment as Professor of Chemistry

General Society of the War of 1812, 1894

Historical Society of Pennsylvania, 1876

Honorable Discharge Certificate, 1865

Letter of Thanks, International Electrical Exhibition, Franklin
Institute, 1884

Military Order of the Loyal Legion, 1878

Officier de l'Instruction publique, Certificate, 1890

Pennsylvania Horticultural Society,

Philadelphia Naval Veteran Association, 1894

The John Scott Legacy Medal and Premium, 1905

Sons of the Revolution, 1892

Ledger record book of scientific exchanges, 1885 - 1892

Record book of a fraternity attendance and quotations

Dahlgren Boat Howitzer Hammer ("lock" in official ordnance parlance)

Dahlgren Boat Howitzer, heavy 12 Pdr, No. 154, served on the *USS General Putnam*, a paddle-wheeled 4th class vessel with 4 guns, Acting Master H. H. Savage commanding, where its presence was noted on quarterly returns of June 1863 and June 1864. The *General Putnam* was part of the North Atlantic Blockading Squadron, serving from November 1864 to the end of the war in the James and Appomatox Rivers, with stops at the Norfolk Navy Yard (Feb. 1865) and Mobjack Bay, to catch blockade runners.

Sources: USN Ordnance Manual, National Archives, Official Records of the Union and Confederate Navies in the War of the Rebellion.

VSS Gen Putnam June 3~~4~~ 63 + Jan '64

I, VII, ~~18~~ p 18, 20, 54, 72 N. Atl. Block. Squadron.

p. 18 - Ordered to Mobile Bay vs. Blockade runners
by Wm Radford, Commanding 5th Div., off
1865 Bermuda Hundred.

p. 20. In NABS, Feb 15, 1864 guns, Class 4, Acting
Master H. H. Savage in command, stationed
in James R.

p. 54 - ~~At~~ⁱⁿ Norfolk Navy Yard, Feb 25, 1865

p. 72 - 4 guns, paddle, Acting Master Savage, Detached.
Mar 18, 1865

I n. 12

39 NABS, 1 Nov, 1864 Act. Mast H. H. Savage, James R.

61 12 " " Appomattox R.

140 5 Dec " , Jas. R. , Savage.

192 15 Dec " " "

399 1 Jan 1865 " "

598 15 " " " "

636 24 " " Appomattox R.

642 25 " " " "

Dervine Auct. 2nd Lt. W H D Blake 56 NYV.

5w
ORS
927
973
740
WM 3.1

723 1 Feb 1865, Jas R.

736 20 Nov. Aground in James R

Wayne Stark Ap 76

CT's hammer

B.H. No. 154 On General Pitnam

heavy 12

o June 2 '63.

o June 14 '64.

CHAPTER IV.

EQUIPMENT OF BOATS

WHEN DIRECTED TO BE MANNED AND ARMED FOR SERVICE.

316. Boats are to be provided according to the time they are to be absent and the nature of the service they are to perform, keeping in view the details prescribed in table, *article 333*.

Boat Howitzers are to be distributed as follows:

317. *In Ships-of-the-Line and 1st class Propeller Frigates*, each of their two Launches is to have a 24-pdr. of 1,300 lbs. weight, with a boat carriage; and both the 1st and 2nd Cutters are to have a 12-pdr. of 750 lbs. weight, with a boat and also a field carriage.

318. *In all other Frigates*, each of the two Launches is to have a 12-pdr. of 750 lbs., with a boat and also a field carriage; and the 1st Cutter is to have a 12-pdr. of 430 lbs., with a boat carriage.

319. *In Peace Sloops, [Frigates cut down,] and 1st class Propeller Sloops*, the Launch is to have a 12-pdr. of 750 lbs., with a boat and a field carriage; and the 1st Cutter a 12-pdr. of 430 lbs., with a boat carriage. *In 1st and 2nd class Sailing Sloops*, the Launch is to have a 12-pdr. of 750 lbs., with boat and field carriages.

320. *In all other Sloops and Brigs*, the Launch is to have a 12-pdr. of 430 lbs., with a boat and a field carriage. Whenever the Howitzers are to be used in boats they are to be fitted for the purpose as directed in pages 4, 5, and 6 of 'Exercise and Manœuvre of Boat Howitzers.' (See *Appendix D*.) Their crews are to be armed with swords and revolvers.

321. For boarding parties, swords and revolvers, and rifles landing at the beach, with filled cartridge boxes, are to be supplied.

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Donated by Henry C. Justice, Major

CLARK
176

Hanson
Collection

OR SERVICE.

ne they are to be
n, keeping in view

igates, each of their
it, with a boat car-
12-pdr. of 750 pds.

is to have a 12-pdr.
the 1st Cutter is to

1st class Propeller
, with a boat and
9 lbs., with a boat
launch is to have a

s to have a 12-pdr.
r the Howitzers are
urpose as directed
of Boat Howitzers.
with swords and

and rifles leading at
ed.

322. When boats 'manned and armed' are ordered, the Officers assigned to the command of the boats will see that they are thus furnished, or otherwise, as may be specially directed, and report when the boats are ready. They will also see that all articles are safely returned, or duly accounted for, when the boats return to the vessel.

If the boats are directed to assemble alongside of any particular vessel the officers are to report as they arrive there. If signalled alongside of the ship of the Commander of the Squadron for *exercise* or for *inspection*, they are to be inspected, if he shall so direct, by an Officer appointed by him, whose duty it shall be to report those which may be particularly well prepared, and those which he may find deficient in equipment or arrangement, specifying particulars.

MANCEUVRES OF BOATS ARMED FOR SERVICE.

323. The boats of a vessel being completely armed and equipped, as directed, they are to hoist their colors, shove off, and fall in as follows:

No. 1. First Launch.

No. 2. Second „

No. 3. First Cutter.

No. 4. Second „

No. 5. Third „

No. 6. Fourth „

Or, if they be less than six in number, they are to fall in agreeably to the order of their size and designation, with the Senior Officer always in the leading boat.

The boats of each ship are to constitute a subdivision.

324. When the Officer designated to command all the boats of a squadron has had them assembled, they are to form, in the above order, into as many columns as there are vessels to which the boats belong.

ORDER OF COLUMNS.

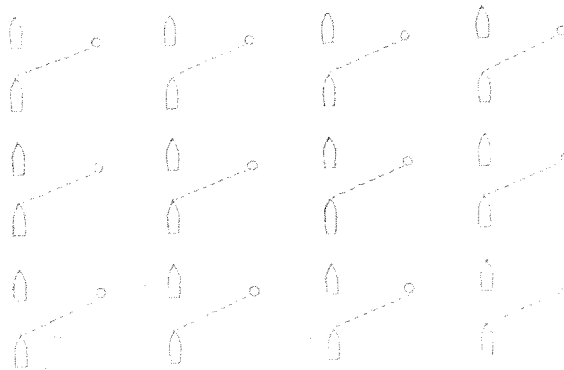
325. The order of seniority of the Commanding Officers of subdivisions of boats is to regulate the relative position of the columns; and, supposing that the natural series of the alphabet represents this order of seniority, the columns will be as follows:

D	B	H	F	A	G	I	C	E
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6

This arrangement of boats is to be called the first order, and it is to serve as a basis for all other manœuvring.

TO FORM IN THE ORDER OF ATTACK THREE DEEP.

326. Each even numbered boat of a column is to be placed to the right of the next ahead of it.

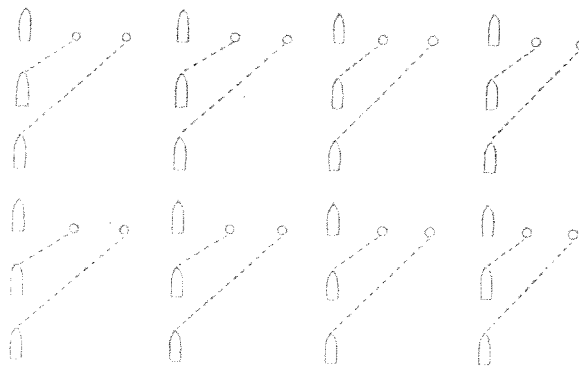


Thus, in the order of attack, three deep, the boats will be arranged as follows:

D	2	B	2	H	2	F	2	A	2	G	2	I	2	C	2	E	2
3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6

TO FORM IN THE ORDER OF ATTACK TWO DEEP.

327. In each column, boats Nos. 2 and 3 are to be placed to the right of No. 1, and boats Nos. 5 and 6 to the right of No. 4.



Thus, in the order of attack, two deep, the boats will be arranged as follows:

D	2	3	B	2	3	H	2	3	F	2	3	A	2	3	G	2	3	I	2	3	C	2	3	E	2	3
4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6

TO FORM IN THE FIRST ORDER.

328. To pass from either order of attack, just mentioned, to the First Order, the manceuvring is to be the inverse of that by which the order of attack is formed.

TO FORM LINE AHEAD.

329. The orders of attack being formed as designated, it is sufficient for all the boats together to alter the course eight points, one way or the other, to become arranged in a line ahead, in two or three columns.

Being thus arranged in a line ahead, by returning back eight points the boats will be again arranged in an order of attack, two or three deep.

TO CHANGE THE DIRECTION OF THE FRONT.

330. The evolution of changing the direction of the front of the orders of attack is effected by a general movement at the time the course, which the leaders of columns are to steer, is shown by signal.

TO FORM THE ORDER OF RETREAT.

331. This order is the reverse of the first order.

To pass from the first order to the order of retreat all the boats turn together 16 points in the same way, and thus retire protected by the guns of the launches.

FORMATION OF DIVISIONS.

332. Two or three divisions of attack may be formed to operate upon two or three points at the same time.

In the first case, the boats on the right, including those of the Commanding Officer, constitute the 1st division, and those on the left the 2nd.

In the second case, the third of the boats on the left constitute the 2nd division; the third on the right the 3rd division; and the third at the centre the 1st division.

NOTE. - The *Manœuvres* of boats armed for service, from articles 323 to 332 inclusive, are derived from the 'Règlement sur le service spécial bord les bâtiments de la flotte,' published by authority of the French government in 1852.

DETAILS OF THE FOREGOING TABLE.

334. BOAT CARRIAGE COMPLETE, consists of—

Bed.

Slide.

Compressor plates.

" screw-bolts.

" handles.

Lugs for loops.

335. FIELD CARRIAGE COMPLETE, consists of—

Axle.

Trail.

Braces.

Lugs for loop.

Train wheel, or runner.

Bolt for "

Socket for handspike.

Elevator.

Disc of elevator.

Box for elevator.

FIXTURES IN BOATS FOR BOAT GUNS.

336. Two eye-bolts on each bow, to receive the hooks of the skid; two cross pieces, of yellow pine, to bear the carriage, so as to carry the muzzle of the howitzer just above and clear of the gunwale and stem.

One piece of yellow pine scantling, laid lengthways and midship mortised into the rear cross piece, to sustain the carriage in sweeping.

45

The chocks with rollers at the stem and stern posts of launches, are arranged to be removed when the gun is to be used.

One muzzle block.

One selvagee strap.

One string spar.

One shoe, iron or wooden belt, which will enter the breeching hole, to keep the shoe on the right shoe.

339. *Implements, complete, for serving and working the Howitzer.*

Breeding for boat gun (if deemed necessary).

Lock with lock-string.

Elevating screw.

Sixth.

Priming-wire.

Boring-bit.

Vent-cloth.

Sponge and hammer.

79 . 12 100%

$$L_{\text{eff}} = L \left(1 - \frac{1}{2} \frac{v}{c} \right) \quad (1)$$
[illegible]

books of the field;
so as to carry the
rule and compass
days and week
in every hour.

Haversack, with strap, for Captain of howitzer, to contain a supply of primers, spare fuzes, spare lock, vent-bit, vent-cloth, and implements for spiking; leather ammunition pouches for each of the men of the field gun, except Nos. 1 and *2, to be supplied by the Quarter Gunner, with one round of ammunition each, a set of common fuzes, and two primers, when the order to land is given.

Drag rope, fitted with hooks and handles.

Trail handspike.

A rope, or chain, to lock the wheels in descending slopes.

340.

AMMUNITION.

A chest containing shrapnel.

" " shell.

" " canister.

These chests are of two sizes; the single, holding nine, and double, eighteen rounds.

A key is becketed to each box for unscrewing the lid.

*Cutting tool for opening the Bormann fuze.

FOR SMALL ARMS.

341. Cartridge boxes and belts, furnished with cartridges and percussion caps, screw-driver, cone-key, and wiper.

An empty powder tank for magazine, to contain filled cartridge boxes and spare cartridges.

SMALL ARMS.

342. Breech-loading guns, in hoops or brackets under the gunwale of the boat, protected by a water-proof canvas covering, running round the rising of the boat.

Rifles.

Revolvers.

Sabres.

Boat arm chest.

A good tarpaulin to cover them, when &c.

343. PROVISION.

Pork. (To be cooked if there be time.)

Bread, in water-proof bag.

Cheese.

Whisky, in bunker.

Fresh water, in kegs; always to be used for ballast when ballast is required.

Fuel and kindling.

344. UTENSILS AND ARRANGEMENTS FOR COOKING.

A box of sand, to make a fire-place in the boat.

A proper vessel for cooking.

A small frying-pan.

Mess kettle.

Tin pots and spoons.

Greg measure.

Funnel.

Bucket.

345. TOOLS AND ARTICLES FOR RETAINING DAMAGES.

Axe, 1 for each boat.

Hatchet, " "

Hammer, " "

Hand-saw, " "

Nails, 2 lbs. for each launch; 1½ lbs. for each large cutter; and 1 lb. for each of the rest.

Sheet lead, 3 square feet for each launch; and 2 square feet for each cutter.

Hacks (number), 100 for each launch; 75 for each large cutter; and 50 for each of the rest.

Marlin spike.

Spin yarn.

Grease.

346.

MISCELLANEOUS ARTICLES.

Boat ensign.

Set of signals for boat of Senior Officer.

Boat compass.

Spy-glass.

Lead and line.

Lantern.

Candles.

Tinder-box, with flint and steel.

Fishing-lines and hooks.

347.

FOR TREATMENT OF SICK AND WOUNDED.

Tourniquets.

Bandages.

Lint.

Medicines.

Surgical instruments.

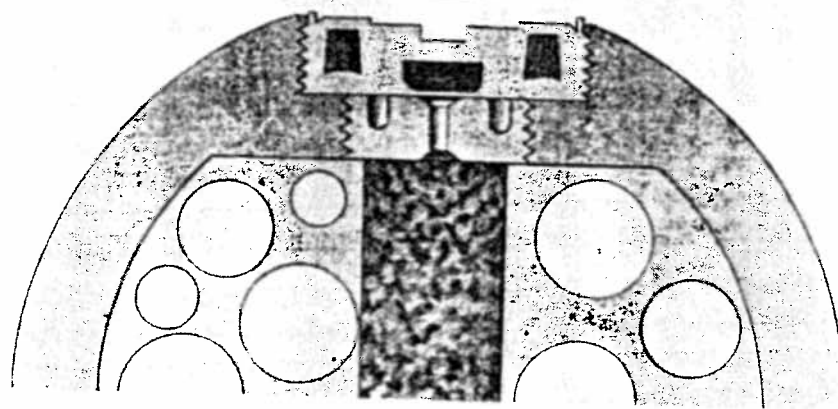
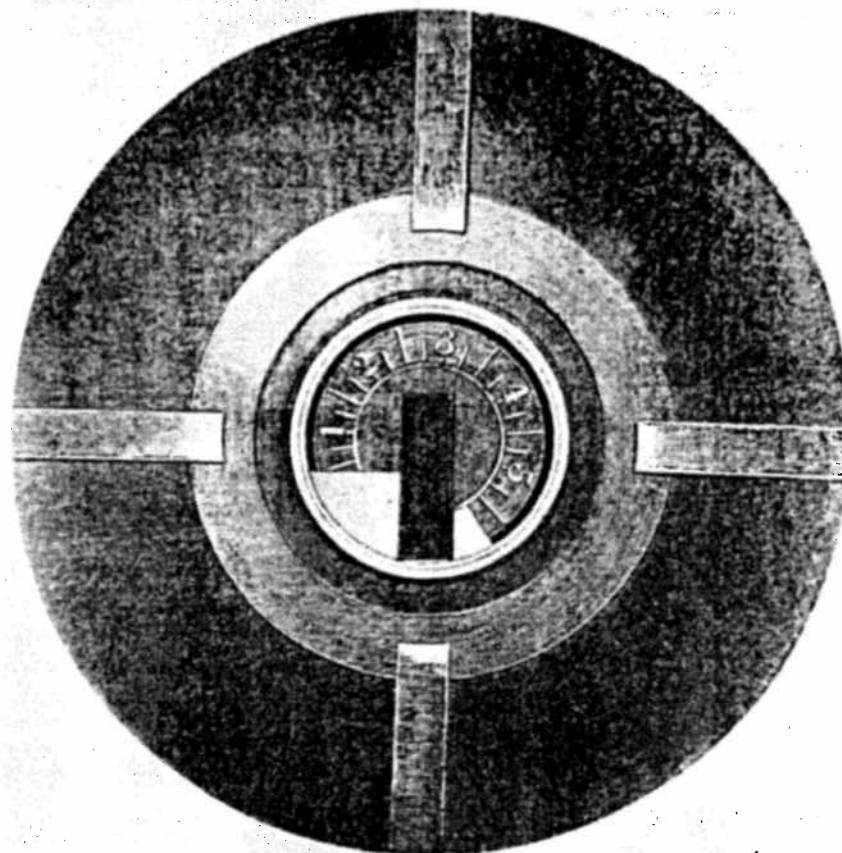


FIGURE: XII-48 IDENTIFICATION: Fuse, Time, Bormann. **SOURCE:** Ordnance Instructions for the U.S. Navy, 1866. **REMARKS:** Standard fuse for 12-Pounder Spherical Case such as this. Note adapter in cutaway drawing. Also various diameter balls. Circle around fuse with four straps affixed projectile to sabot.

expedient of cutting directly into the booster which exploded the projectile at the muzzle, or be used as shot by not cutting the fuse at all.

Although highly successful when produced by precision equipment in the North, the Bormann fuse was a miserable failure in the South.

FIGURE
IDENTIFICATION:
AMETER
Brass. 5
has been
type of
the shoe

circular
ture of
and pa
old am
men we
late as C

Fa
tion to
in which
cut off
Notches

on, Mullins, S.C.
s: Zinc.

all. Made of
plete fuse was
thick. Figure
n a strapped
ay view of the
trates the pre-

a horizontal
ape. Cutting
osed the train
uniform rate
d in a blind
econd mark.
a cylindrical
center which
v through a
ath the fuse.
n with a fuse
re made of
on was solely
ue to its soft
the shell by
use was the

slopes.

Ammunition.

A chest containing shrapnel.

" " shell.

" " canister.

These chests are of two sizes; the single, holding nine, and double, eighteen rounds.

A key is becketed to each box for unscrewing the lid.
Cutting tool for *opening* the Bormann fuze.

FOR SMALL-ARMS.

Cartridge boxes and belts, furnished with cartridges and percussion caps, screw-driver, cone-key, and wiper.

An empty powder tank for magazine, to contain filled cartridge boxes and spare cartridges.

Palmer 1862

Palmer 1862

Parker 1862
precaution a box of friction primers may be taken.

School of the Piece.

The howitzer, mounted on its field carriage, we will suppose ready for service; rammer and sponge and trail handspike becketed on the right side of the trail; ladle and spare rammer and sponge on the left side. Ammunition-boxes in place, drag-rope coiled up, and in charge of the quarter gunner.

The men will be armed with cutlass and pistol, and all but Nos. 1 and 3, sling a pouch over the left shoulder. No. 1 slings his havresack over the same shoulder, and No. 2 puts on his primer-box, becketts a priming-wire to his right wrist, and puts a thumbstall on his left thumb.

The men fall in two deep, in close order—No. 1 being on the right of the front rank, and Nos. 3, 5, 7, 9, and

Black.
Billman.
copy

any second pivot from any of the three initial pivot points (starboard, bow, port), so the howitzer was always secured, an important concern in rough seas.

Bracket carriage carried ammunition chest between the two trail pieces.

**Quarterly returns document the firing of this
exact gun, No. 52.**

Dahlgren evidently derived the arrangement of the boat carriage from a Russian prototype. The National Archives preserved an American plan of a Russian boat gun, which had to be totally disconnected from the gunwale to shift pivot points. Dahlgren's could be attached to any second pivot from any of the three initial pivot points (starboard, bow, port), so the howitzer was always secured, an important concern in rough seas.

Bracket carriage carried ammunition chest between the two trail pieces.

Quarterly returns document the firing of this
exact gun, No. 52.

p. o. r.

DAHLGEN'S BOAT ARMAMENT

11 Fig 7

FIRE!

- Field carriage with all-iron deck wheels on the monitor *Lehigh*. The inland navy favored boat howitzers and canister to drive rebels from the river banks.
- Crew armed with cutlasses.

12. Fig 8.

Half-size (450 pound) boat howitzer on compressor carriage in the maintop of Farragut's flagship *Hartford*.

In 1849, Admiral John A. Dahlgren designed an innovative armament system for amphibious assaults.

- Boat howitzers were light-weight artillery launched from the mother ship in 20-man boats. They were fired from the bow during landing, switched to a field carriage, and pulled by the crew on land.
- Boat howitzers were supported by the most advanced small arms, including the "Plymouth" rifle, which Dahlgren also designed.
- Boat howitzers served throughout the Civil War on land and sea, starting at First Bull Run.

Dahlgren Boat Howitzer, 12-pounder, No. 54, on field carriage.

- Manufactured under Dahlgren's direction at the Washington Navy Yard in 1858.
- Inspected by Dahlgren ("JAD" on top of tube).
- This specimen served on US Steamer *E. B. Hale* in North Carolina and Florida.
- Dahlgren saved weight with a minimal wrought-iron carriage.

- The modern, streamlined form anticipated that of the famed Ordnance Rifle and Colt 1860 revolver by a decade. It resulted from Dahlgren's elimination of decorative turnings on the tube to save weight.
- Single-pin mounting expedited transfer from boat to field carriage.
- Wooden wheels for use on land.

(p. o. r.)

- Trail wheel is raised for firing, so trail drags to curb recoil.
- Wheel is lowered for transport, eliminating the need for a limber and horses. Sailors pulled howitzers with ropes.

Boat Howitzer on boat (compressor) carriage in foretop of US Steamer *Mississippi*, as Farragut engages forts, rams, and gunboats on the Mississippi River, 1862.

Hammer in firing position, ready to strike percussion primer on vent.

- Cammed lanyard eliminated failure-prone lock mechanisms.
- Perforated head reduced blow-back of hammer.
- This specimen, No. 61, served on *Pinta* and *Constitution*.

SPONGE!

- Each man carries a complete round of howitzer ammunition in a cylindrical pass-box slung over his shoulder.
- Sailor 2nd from left passes his round forward for loading.
- Trail wheel is raised to absorb recoil.

Lt. Benjamin Porter commanded the boat howitzers in the assault on Roanoke Island (Feb 7, 1862) and worked one gun single-handed when its entire crew was killed or wounded. Porter was later killed in the landing at Fort Fisher.

Field carriage at Washington Navy Yard.

- Sailor armed with stocked Colt and Dahlgren-designed Bowie knife. Knife was intended for Plymouth Rifle but issued separately.
- Bronze lanyard handle behind sailor's left hand, inserted in hammer head.

Boat Howitzer on Boat carriage.

- **Screw handles of compressors adjust friction to control recoil.**

Boat (frigate's launch) ready to assault the beach.

- **Field carriage upside down in stern, wood wheels for land service.**
- **On landing, the crew shifted the howitzer to its field carriage in two minutes.**

Disabled boat howitzer, Battle of New Bern, NC.

NAME OF VESSEL.					STATION.					
<i>U.S. Steamer E. B. Hale</i>					<i>St. Johns River Fla.</i>					
CLASS OF GUN.	Register No.	FOUNDRY.	Date of Fabrication.	Charge of Powder.	Shot.	Shell.	Shrapnel.	Grape.	Canister.	No. of Fires during Quarter.
<i>32 Sh 400</i>	<i>112</i>	<i>C. & C.</i>	<i>1844</i>	<i>6 lb</i>	<i>2</i>					<i>2</i>
					<i>1</i>					<i>1</i>
				<i>4 lb</i>						
	<i>137</i>			<i>6 lb</i>	<i>2</i>					<i>2</i>
				"	<i>1</i>					<i>1</i>
				<i>4 lb</i>						
	<i>181</i>			<i>6 lb</i>	<i>2</i>					<i>2</i>
				"	<i>0</i>					
				<i>4 lb</i>						
	<i>190</i>			<i>6 lb</i>	<i>3</i>					<i>3</i>
				"	<i>0</i>					
				<i>4 lb</i>						
<i>30 Pdr Parrot Rifle</i>	<i>90</i>	<i>B. P. P.</i>	<i>1862</i>	<i>3 1/2 lb</i>	<i>4</i>					<i>4</i>
<i>12 Pdr heavy</i>	<i>52</i>	<i>W. Navy</i>	<i>1855</i>	<i>1 lb</i>	<i>0</i>					
<i>Great Howitzer</i>		<i>Yard</i>		"		<i>0</i>			<i>1</i>	<i>1</i>
				"						

December 31st, 1864.

C. F. Mitchell Soly M.

C.

Cutlass, or "sword"

Ames, 1861

Serial no. 861

These first deliveries were not inspected.

objects

- Gun
- tompion
- hammer, pivot, cotter
- lanyard toggle, lanyard
- elevating screw
- loop pin, spacer, cotter

Fixed round carried in pass-box.
Wood sabot joined (or "fixed")
fabric-enclosed powder charge to the projectile.
(*Inert replica, Smithgall collection*)

Pass box or "pouch"
held one fixed round of ammunition.
Each man slung one over his shoulder.

Original 1864 printed order by Admiral Dahlgren
directing that this exact howitzer, among others,
be protected with the Plymouth rifles that he had designed.

(Parker, 1862)

(Ordnance Instruction, 1852)

Article:

Dahlgren evidently derived the arrangement of the boat carriage from a Russian prototype. The National Archives preserved an American plan of a Russian boat gun, which had to be totally disconnected from the gunwale to shift pivot points. Dahlgren's could be attached to

3.

Hammer in firing position,
ready to strike percussion
primer on vent.

- Cammed lanyard eliminated failure-prone lock mechanisms.
- Perforated head reduced blow-back of hammer.
- This hammer, No. 61, served on *Pinta* and *Constitution*.

24b. Spm. 13

Bormann fuze-cutting tool.

(Use Parker's 1862 label).

Hammer in firing position, ready to strike percussion primer on vent.

- Cammed lanyard eliminated failure-prone lock mechanisms.
- Perforated head reduced blow-back of hammer.
- This specimen, No. 61, served on *Pinta* and *Constitution*.

Original 1864 printed order by Admiral Dahlgren
directing that this exact howitzer, among others,
be protected with the Plymouth rifles that he had designed.

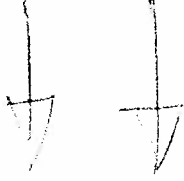
28.

Dahlgren's autograph.

(with 27 in plastic)

(Parker, 1862)

(Ordnance Instruction, 1852)



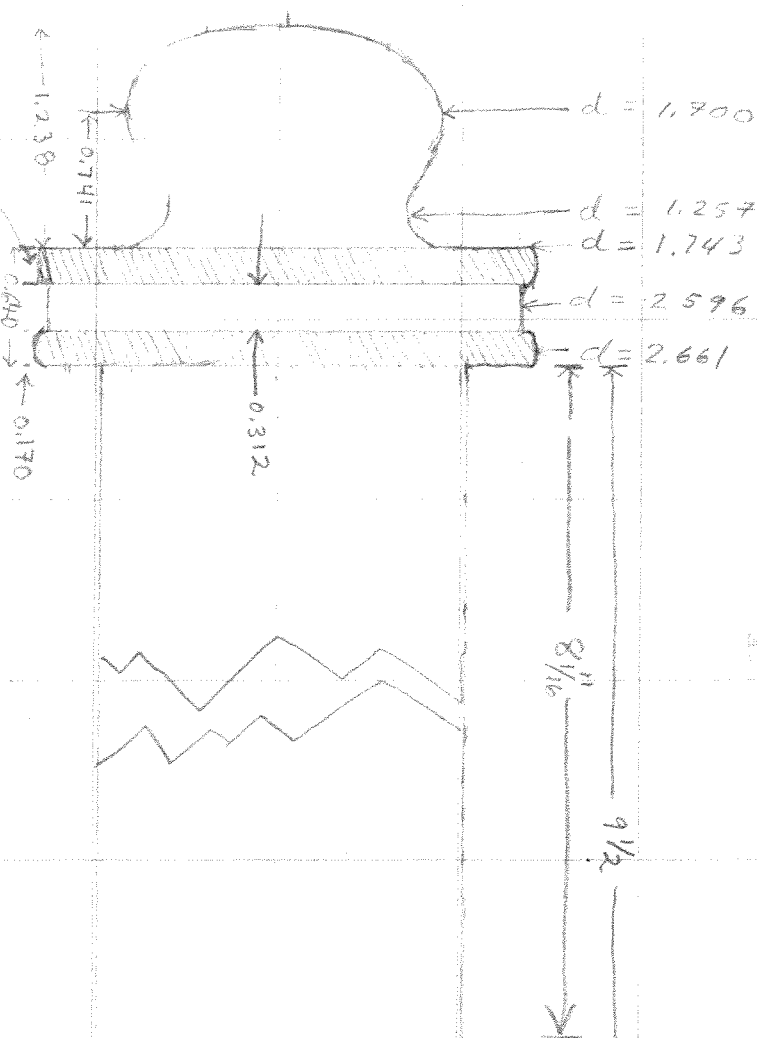
1/16 PIN, DOWEL PIN 1.38"
 HUBBARD, BRONZE
 SCALE = 1:1
 ON LENGTH

IS IDENTICAL
 WITH ELEVATING SCREW,
 TYPE + SPACING OF KNURLING,

4 KNURLS = 0.1570", = 2.5 per inch.

0.160' KNURLING IS

INCLINED IN DIRECTION SHOWN,



BRONZE COTTER PIN 3.4" LONG,

SINGLE HOLE FOR COTTER PIN

