

NOTES ON NAVAL
ORDNANCE
OF THE
AMERICAN CIVIL WAR
1861-1865

By Eugene B. Canfield

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This précis, with comprehensive tables and authentic drawings, is the third of a series to be published by the American Ordnance Association in observance of the forthcoming centennial of the War Between the States.

The text was prepared by Eugene B. Canfield who is known for his scholarly studies on the history of artillery, the American Civil War, and the art of war. He is on the engineering staff of the Ordnance Department, a major unit of the General Electric Company, at Pittsfield, Mass.

THE AMERICAN ORDNANCE ASSOCIATION

Mills Building • Washington, D. C.

1960

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FOREWORD



WHEN the battles of the American Civil War are discussed by strategists and tacticians—professional as well as arm-chair—the major emphasis is on engagements fought on land, and rightly so. In number and intensity the struggle was for strategic places on the land in the North and the South.

Nonetheless, naval engagements and naval weapons figure prominently in the record of our Civil War. Although fewer in number, these engagements and the weapons with which they were fought were no less vital factors in victory or defeat. Control of the sea and all its approaches to the land has been from time immemorial an essential factor in the prosecution of war. Mother Earth is responsible for that, as approximately three-quarters of her surface is covered by water.

It is fitting therefore that this précis be devoted to naval ordnance of the American Civil War—guns, ammunition, torpedoes, and mines. The author has assembled here a galaxy of facts and statistics which are not readily available to the student of the Civil War and yet are of basic importance in the study of particular battles and the final outcome of the conflict.

Mr. Canfield, the author, is well known for his researches in American history, especially the history of the American Civil War, artillery, and the art of war. He received a degree in electrical engineering from Syracuse University in 1946, after which he entered the employ of the General Electric Company in what was then known as the Aeronautics and Ordnance Systems Department at Schenectady, N. Y. He is presently advanced control engineer in the Ord-

nance Department of that company at Pittsfield, Mass. His field of engineering includes work on inertial guidance, sonar, torpedoes, and fire-control systems for naval guns and missiles. He has an extensive library on artillery and the American Civil War.

The author and the editors make special acknowledgment of the assistance rendered them in the preparation of this text by Rear Adm. E. M. Eller, Director of Naval History, Office of the Chief of Naval Operations, U. S. Navy Department. Admiral Eller and his staff graciously furnished a number of historical texts to be found only in very rare collections and not available in Mr. Canfield's personal library of books and other source materials.

This is the third in the series of monographs on ordnance of the American Civil War which is being published by the American Ordnance Association in connection with the Centennial Observance. The first, published in April 1959, was the work of a recognized authority, Harold L. Peterson,

staff historian of the National Park Service—its title: "Notes on Ordnance of the American Civil War."

The second in the series, "Notes on Ammunition of the American Civil War," was published in December 1959 and is the work of Col. Berkeley R. Lewis, a lifelong student of American small arms and ammunition, who is also the author of the authentic treatise, "Small Arms and Ammunition in the United States Service."

The concluding précis of the series will be published in April 1961 and will be devoted to aeronautics and the use of flying devices in the battles of 1861-1865.

Copies of this and the two précis published earlier are available to members of the Association and other interested students of American weaponry. They may be had upon application to the editorial offices of the Association, Mills Building, Washington 6, D. C. The price is \$1.00 each to members of the Association and \$2.00 each to nonmembers.


October 1960

The Editors of *ORDNANCE—
Bimonthly Journal of the
American Ordnance Association*

NOTES ON NAVAL ORDNANCE OF THE AMERICAN CIVIL WAR, 1861-1865

By Eugene B. Canfield

Part I—Guns

URING the Civil War the Navy, as well as the Army, used a great variety of guns. Navy guns were assigned to fill the needs of three basic categories: pivot guns, broadside guns, and boat guns. In addition, special guns were developed for the monitor turrets. The types of guns available were shell guns, rifles, shot guns, and howitzers.

The guiding light of naval ordnance was Lieutenant (later Admiral) John Dahlgren. First assigned to the Bureau of Ordnance in 1847, he progressed to become its Chief in July 1862 and retained that position until June 1863 when he took command of the South Atlantic Blockading Squadron.

Dahlgren's best-known contribution was the shell gun which ranged in size from 8-inch to 11-inch. He also developed the bronze boat howitzers, the

15-inch smoothbores for the monitors, and a lesser-known line of heavy rifles (see Fig. 3, p. 7).

Perhaps Dahlgren did not place as much emphasis on rifles as on smoothbores because of the Navy's special problem. On land, heavy rifles had the great advantage of high accuracy at long range. Not so aboard ship where the gunner had to aim his piece from a rolling deck. Consequently, direct fire was not often used at long range. Instead, the guns were fired at low elevation so that the projectile would ricochet over the water. Ricochet fire from smoothbores might commence at 600 yards and continue to be effective at more than 2,000 yards.

Unfortunately, projectiles from rifled guns, upon striking the water, would lose their sureness of direction on the rebound. During the summer of 1863, ricochet fire from the 11-inch shell

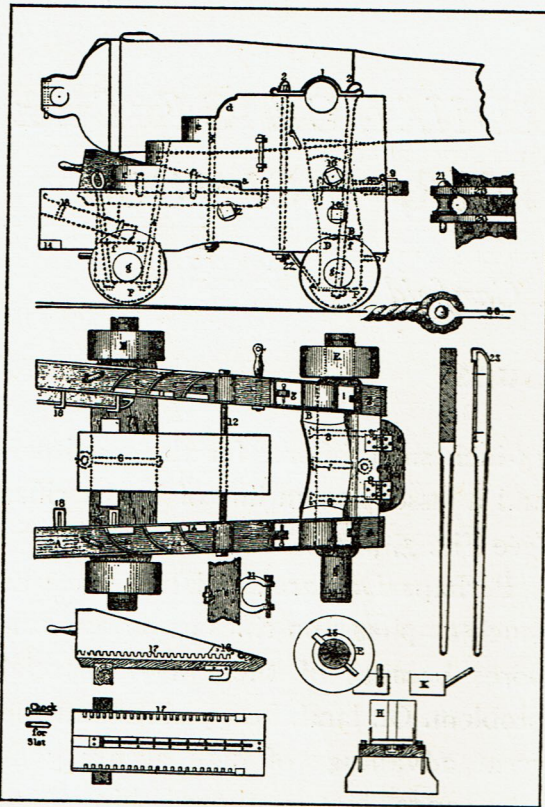


Fig. 1. Sectional view of a 4-wheel naval carriage such as used for mounting 32-pounder broadside guns.

guns of the NEW IRONSIDES was highly successful in assisting with the capture of Battery Wagner.

HOWEVER, the Navy did use a large number of rifles, primarily those manufactured by Robert P. Parrott. His 8-inch or 150-pounder (as it was called in the Navy) was the largest rifle used and was generally mounted as a pivot gun or placed in the turrets of monitors. Likewise, the

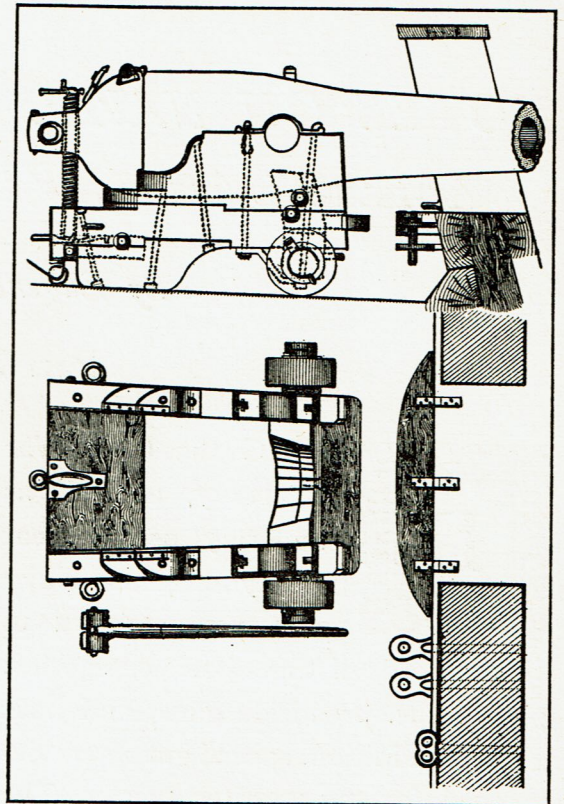


Fig. 2. The 9-inch guns mounted on the 2-wheel Marsilly carriage could be fired every 40 seconds.

Dahlgren 10- and 11-inch shell guns were normally mounted in pivot. The 9-inch and smaller shell guns were used in broadside as were the variety of 32-pounders. Completely general statements cannot be made, however, for 9-inch shell guns and even the lightest rifles often were mounted in pivot, while the NEW IRONSIDES had fourteen 11-inchers in broadside.

In Confederate service, armament was much the same as in the Union

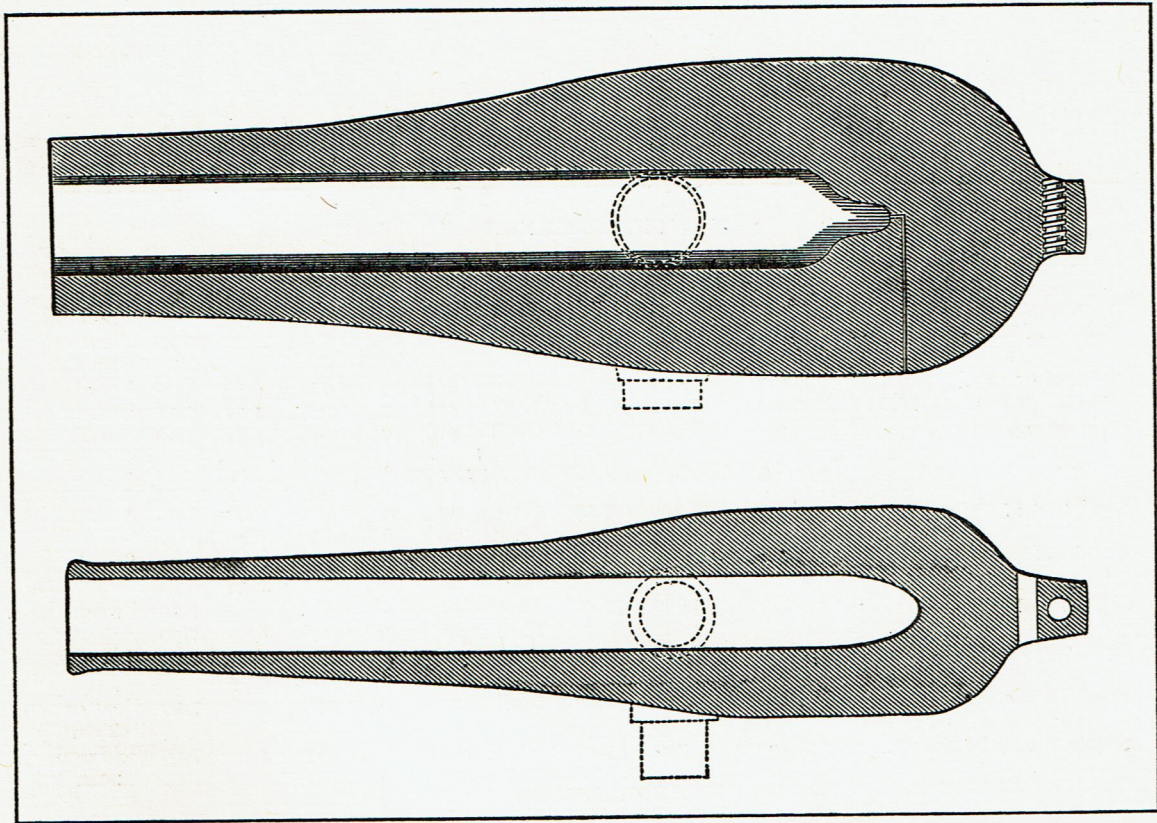


Fig. 3. The Dahlgren 15-inch gun, top, as originally designed. Later models had the test chamber reamed to parabolic form and the muzzle lengthened 16 inches. Bottom drawing shows the Dahlgren 11-inch shell gun.

Navy because of the large number of guns captured in the navy yards. In addition, many heavy Brooke rifles and a variety of British ordnance could be found.

THE Brooke rifle was similar to the Parrott in appearance, but instead of the one-piece breech band of the Parrott the breech band of the Brooke rifle was made up of separate rings which were shrunk on, one after

another. The 7-inch Brooke rifle weighed 14,500 pounds and fired an 80-pound shell with a charge of 14 pounds. Length of the bore was 119.9 inches.

The Brooke rifles were considerably heavier than the Parrotts of the same bore diameter. The 8-inch Parrott weighed 16,500 pounds while the 8-inch Brooke weighed 22,000 pounds. The 4.2-inch Brooke rifle was 1,150 pounds heavier than the 3,550-pound Parrott

Type	Bore dia. (in.)	Material	Weight of tube (lbs.)	Length of bore (in.)	Type of projectile	Weight of projectile (lbs.)	Weight of charge (lbs.)	Range (yds.) at 5° elevation	Time of flight (sec.)	Height above plane (ft.)	Normal usage
SHELL GUNS											
15-in.....	15	Iron	42,000	130 ¹	Shell	350	35	1,700	5.70	..	Monitors
11-in.....	11	Iron	15,700	132	Shell	136	15	1,712	5.81	10.00	Pivot
10-in.....	10	Iron	12,000	119-1/3	Shell	103	12½	1,740	5.80	11.00	Pivot
9-in.....	9	Iron	9,000	107	Shell	72½	10	1,710	5.96	10.75	Pivot or broad.
8-in. of 63 cwt.....	8	Iron	7,000	102 ²	Shell	51½	9	1,770	6.32	8.00	Broad.
8-in. of 55 cwt.....	8	Iron	6,000	95.4	Shell	51½	7	1,657	5.82	7.50	Broad.
8-in. of 6,500 lbs.	8	Iron	6,500		Shell	51½	7	1,657	5.82	7.50	Broad.
SHOT GUNS AND HOWITZERS											
32-pdr. of 57 cwt.....	6.4	Iron	6,400	107.90	Shot	32	9	1,930	6.60	8.00	Broad.
					Shell	26	6	1,850	6.40	..	
32-pdr. of 42 cwt.....	6.4	Iron	4,700	92.05	Shot	32	6	1,756	6.00	7.50	Broad.
					Shell	26	6	1,710	6.50	..	
32-pdr. of 32 cwt. ³	6.4	Iron	3,600	75.10	Shot	32	4½	1,598	..	7.50	Broad.
					Shell	26	4½	1,648	6.00	7.50	
32-pdr. of 27 cwt.....	6.4	Iron	3,000	68.40	Shot	32	4	1,469	5.40	7.00	Broad.
					Shell	26	4	1,460	5.75	..	
24-pdr. howitzer.....	5.82	Bronze	1,300	58.20	Shell	20	2	1,270	5.68	7.00	Boat or deck carr.
12-pdr. heavy howitzer ⁴ .	4.62	Bronze	760	55.25	Shell	10	1	1,085	4.80	7.00	Field and boat
RIFLE GUNS											
Parrott 150-pdr.....	8.00	Iron	16,500	136.00	{Long shell	155	16	2,100	6.25	..	Monitors and pivot
Parrott 100-pdr.....	6.40	Iron	9,700	130.00	{Solid shot	100	10	2,200	6.50	..	Pivot or broad.
					{Long shell	100	10	2,150	6.50	..	
Parrott 60-pdr.....	5.30	Iron	5,400	105.00	Shell	50	..	..	..	..	Pivot or broad.
Parrott 30-pdr.....	4.20	Iron	3,550	96.80	Shell	29	3¼	2,200	6.87	..	Pivot or broad.
Parrott 20-pdr.....	3.67	Iron	1,750	79.00	Shell	19	2	2,100	6.50	..	Pivot or broad.
Dahlgren 20-pdr.....	4.00	Bronze	1,340	65.60	Shell	20	2	1,960	6.50	8.00	
Dahlgren 12-pdr.....	3.40	Bronze	880	55.25	Shell	12	1	1,770	6.00	8.00	Field and boat
MORTARS											
13-in.	13	Iron	17,200	35.00	Shell	200	20	4,200 ⁵	30.50		Mortar vessels

NOTES: 1. Short 15-in. gun (long 15-in. guns were 16 in. longer).
2. Bore length might also be 100.3 in.
3. It appears this gun is often mistakenly labeled as being of 33 cwt.
4. A 12-pdr. light howitzer of 430 lbs. also was available in small quantity.
5. Mortar range given at elevation of 45 degrees.

The data in the table have been taken from various contemporary works. These sources frequently disagree with each other because of variations in individual guns, powder, measuring techniques, etc. The guns listed are those more commonly in use. No attempt has been made to list every available type. Calibers of naval guns are printed throughout this text in Arabic numerals although they were frequently cited in various texts of the period in Roman numerals.

Table I. Characteristics of Civil War naval ordnance.

of the same size. It is also interesting to note that the maximum outside diameter of the 7-inch Brooke (31.2 inches) is only slightly less than that of the 8-inch Parrott (32 inches).

THE boat howitzers, 12- and 24-pounder smoothbore and 12-pounder rifled, were intended primarily for use ashore and for the defense of small boats. A 12-pounder boat howitzer was in the bow of Cushing's launch when he exploded the torpedo against the ALBEMARLE. Both a boat carriage and a field carriage (having a wheel at the end of the trail) were available for mounting these howitzers.

Among the other carriages available were the pivot carriage, the conventional 4-wheel carriage, and the Marsilly or 2-wheel carriage (see Fig. 2, p. 6). The 32-pounders usually were mounted on the 4-wheel carriage. The 9-inch shell guns mounted in broadside on the Marsilly carriage could be fired once every forty seconds by an experienced crew.

Continuous firing of cast-iron guns caused the inner surface of the vent to wear away. This, of course, seriously weakened the piece, and to help overcome this problem Dahlgren placed two vents in his guns. One was filled with

zinc, the other being used for firing until it should become so enlarged as to be dangerous. At that time the enlarged vent was filled with zinc and the new one opened up.

Because ships in action were continually rolling and pitching and the guns could bear on the target for only a moment, it was desirable to reduce to an absolute minimum the time lag between the moment of correct aim

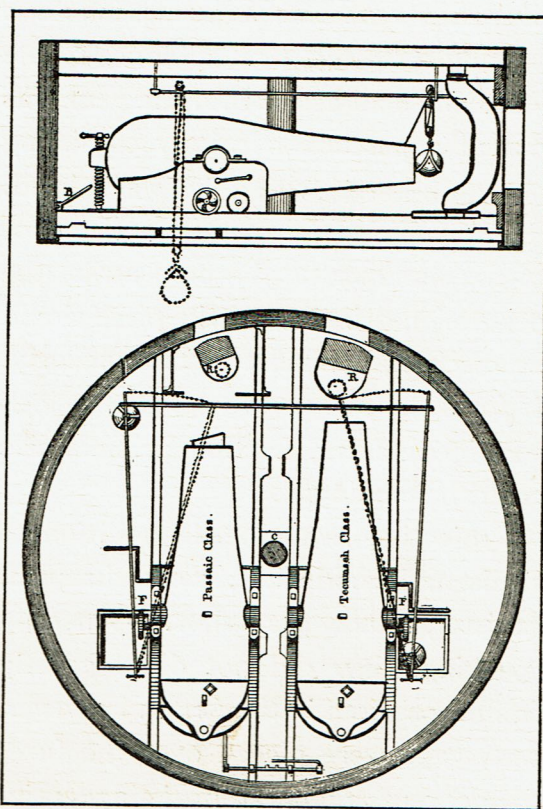


Fig. 4. Monitor turret showing mounting of 15-inch guns. Smoke box was used with PASSAIC-class guns. TECUMSEH-class guns were lengthened 16 inches so that muzzle could be run out flush with gun port.

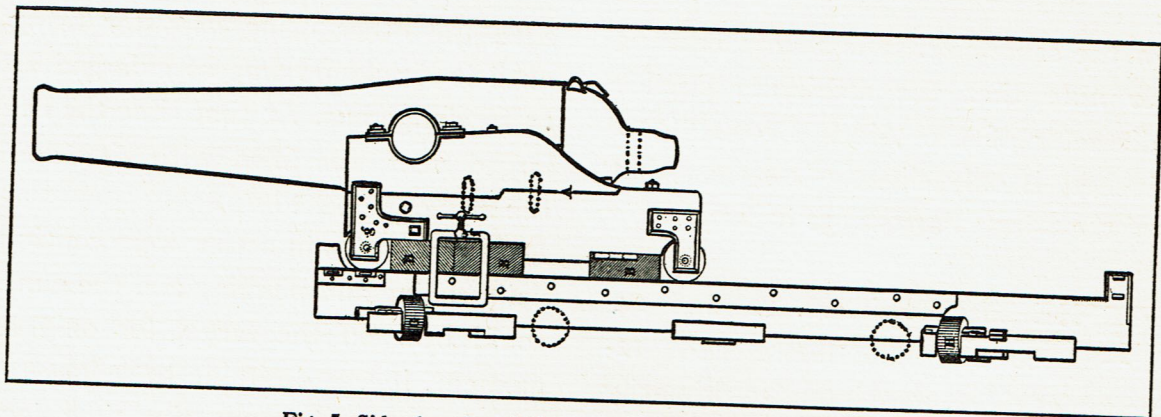


Fig. 5. Side elevation of pivot carriage for 11-inch naval gun.

and the discharge. Therefore, mounted over the vent was a percussion lock bearing some slight resemblance to the locks on small arms. Into the vent was placed a percussion primer consisting of a quill-barrel with a flat wafer head.

On pulling the lanyard, the face of the hammer head would strike the percussion primer, and the piece would be discharged almost instantaneously. If for some reason the percussion lock was inoperative, friction primers also could be employed.

Projectiles available, in addition to shells and solid shot, were shrapnel, canister, and grapeshot. Generally speaking, they did not differ greatly from those used in the Army. However, watercaps were placed over the fuzes to prevent them from being extinguished as the shell ricocheted along the surface of the water. For the

15-inch guns shell, solid and cored shot only were available.

The cored shot carried no charge but had a 6-inch hollow sphere in the center. In loading, it was necessary to ensure that the plug of the core hole was outward in the bore. In firing shells from guns of all sizes, the fuze was placed outward in the bore.

TYPICAL armament of Navy ships may be illustrated by the following excerpt from the report of the Chief of Ordnance of the Navy Department for 1864:

"The governing rule in arming our ships of war has been to place on board of them the very heaviest and most effective gun they can bear with safety. In general it may be stated that the 9-inch are used for broadside; the 10-inch, 11-inch, and the Parrott rifles in

pivot; the 15-inch for the monitor turrets, and the bronze howitzers and rifles for boat and deck service inshore. A few of our ships continue to be armed with the 32-pounder and 8-inch guns of the old system; but these will probably give way to the modified guns of similar classes above alluded to . . .

"Thus the battery of a first-rate is represented by the MINNESOTA, carrying: one 150-pounder rifled, and one 11-inch smooth, in pivot; forty-two 9-inch smooth, and four 100-pounders rifled, in broadside; and four howitzers.

"Of a second-rate by the BROOKLYN, carrying: two 100-pounders rifled, in pivot; twenty 9-inch smooth, and two 60-pounders rifled, in broadside; and two howitzers.

"Of a third-rate by the EUTAW, carrying: two 100-pounders rifled, in

pivot; four 9-inch smooth, two 24-pounders smooth, and two 20-pounders rifled, in broadside.

"Of the fourth-rate by the OWASCO, carrying: one 11-inch smooth and one 20-pounder rifled, in pivot; and two 24-pounder howitzers, in broadside; also by the NIPSIC, carrying: one 150-pounder rifle and one 30-pounder rifle, in pivot; two 9-inch smooth, in broadside; and four howitzers.

"Of the monitors, by the TONAWANDA, four 15-inch; the ONONDAGA, two 15-inch and two 150-pounders; and MONTAUK, one 15-inch and one 150-pounder.

"Of the iron-plated gunboat of the Western rivers, by the CARONDELET, carrying three 9-inch, four 8-inch, two 100-pounder rifles, one 50-pounder rifle, and one 30-pounder rifle."

Part II—Torpedoes

"DAMN the torpedoes! Go ahead!" These are the now-famous words of Adm. David G. Farragut as he ordered his flagship, the HARTFORD, to pass the stopped BROOKLYN in front of the guns of Fort Morgan at the entrance to Mobile Bay.

Was the fear of the torpedo real and justified or was the torpedo art so new

as to constitute primarily a psychological menace? In short, did Farragut feel contempt for the torpedoes' power?

Certainly not. Just a few moments before, a torpedo had exploded under the twin-turreted monitor TECUMSEH, sending her to the bottom in less than half a minute. Furthermore, Farragut

(Continued on p. 14)

TABLE II
SHIPS SUNK OR DAMAGED BY TORPEDOES DURING THE CIVIL WAR

<i>Date</i>	<i>Name</i>	<i>Service</i>	<i>Class</i>	<i>Tons</i>	<i>No. of Guns</i>	<i>Location</i>	<i>Extent of Damage</i>
Dec. 12, 1862	CAIRO	MS	IGB	512	13	Yazoo River	S
Feb. 28, 1863	MONTAUK	SABS	Monitor	844	2	Ogeechee River	D
Apr. 6, 1863	MARION	Confed.	Transport	..	..	Ashley River	S
Apr. 6, 1863	ETIWAN	Confed.	Transport	..	..	Charleston	S
July 13, 1863	BARON DE KALB	MS	IGB	512	13	Yazoo River	S
Aug. 5, 1863	COM. BARNEY	NABS	Gunboat (ferry)	512	5	James River	D
Sept. 1863	JOHN FARRON	U. S. Army	Transport	250	0	James River	D
Oct. 5, 1863	NEW IRONSIDES	SABS	Ironclad	3,486	18	Charleston	D
Feb. 17, 1864	HOUSATONIC	SABS	Sloop of war	1,240	11	Charleston	S
Feb. 17, 1864	H. L. HUNLEY	Confed.	Sub. torpedo boat	..	0	Charleston	S ⁽¹⁾
Apr. 1, 1864	MAPLE LEAF	U. S. Army	Transport	508	0	St. Johns River	S
Apr. 9, 1864	MINNESOTA	NABS	Frigate	3,307	48	Newport News	D
Apr. 15, 1864	EASTPORT	MS	IGB	700	8	Red River	S
Apr. 16, 1864	GEN. HUNTER	U. S. Army	Transport	460	0	St. Johns River	S
May 6, 1864	COM. JONES	NABS	Gunboat (ferry)	542	7	James River	S
May 9, 1864 ⁽²⁾	HARRIET A. WEED	U. S. Army	Transport	290	2	St. Johns River	S
June 19, 1864	ALICE PRICE	U. S. Army	Transport	320	0	St. Johns River	S
Aug. 5, 1864	TECUMSEH	WGBS	Monitor	1,034	2	Mobile Bay	S
Oct. 28, 1864	ALBEMARLE	Confed.	Ironclad ram	..	2	Plymouth	S
Nov. 27, 1864	GREYHOUND	U. S. Army	Transport	900	0	James River	S ⁽²⁾
Dec. 7, 1864	NARCISSUS	WGBS	Tug	101	1	Mobile Bay	S
Dec. 9, 1864	OTSEGO	NABS	Gunboat	974	8	Roanoke River	S
Dec. 10, 1864	BAZELY	NABS	Tug	50	0	Roanoke River	S
Jan. 15, 1865	PATAPSCO	SABS	Monitor	844	2	Charleston	S
Feb. 20, 1865	OSCEOLA	NABS	Gunboat	974	8	Cape Fear River	D
Feb. 20, 1865	Launch of SHAWMUT	NABS	Launch	..	0	Cape Fear River	S
Feb. 22, 1865	SHULTZ	Confed.	Transport	..	0	James River	S
Mar. 1, 1865	HARVEST MOON	SABS	Wood steamer	546	5	Winyah Bay	S
Mar. 4, 1865	THORNE	U. S. Army	Transport	403	0	Cape Fear River	S
Mar. 6, 1865	JONQUIL	SABS	Tug	90	0	Ashley River	D
Mar. 12, 1865	ALTHEA	WGBS	Tug	72	0	Blakely River	S
Mar. 17, 1865	BIBB	SABS	Coast. srvy. stmr.	..	..	Charleston	D
Mar. 28, 1865	MILWAUKEE	WGBS	T. T. monitor	970	4	Blakely River	S
Mar. 29, 1865	OSAGE	WGBS	Monitor	523	2	Blakely River	S
Apr. 1, 1865	RODOLPH	WGBS	Tinclad G. B.	217	6	Blakely River	S
Apr. 13, 1865	IDA	WGBS	Tug	104	1 ⁽⁴⁾	Blakely River	S
Apr. 14, 1865	SCIOTA	WGBS	Wood gunboat	507	4	Mobile Bay	S
Apr. 14, 1865 ⁽⁵⁾	Launch of CINCINNATI	WGBS	Launch	..	0	Blakely River	S
May 12, 1865	R. B. HAMILTON	U. S. Army	Transport	400	0	Mobile Bay	S

Sept. 1863	NEW IRONSIDES	SABS	Ironclad	3,486	18	Charleston	D
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May 12, 1865	R. B. HAMILTON	U. S. Army	Transport	400	0	Mobile Bay	S

Abbreviations

NABS — North Atlantic Blockading Squadron
 SABS — South Atlantic Blockading Squadron
 MS — Mississippi Squadron
 WGBS — West Gulf Blockading Squadron

IGB — Ironclad gunboat
 T. T. — Twin turret
 S — Sunk
 D — Damaged

NOTES:

1. Sunk by her own spar torpedo in attack on HOUSATONIC.
2. Sunk by a coal torpedo.
3. OR-I-XXXV-1-392 gives date of sinking as shown. ORN-I-15-426 gives date of sinking as May 10, 1864.
4. Gun was probably a 12-pounder howitzer.
5. Approximate date.

This table has been developed from extensive research through the Official Records of the Union and Confederate Armies (OR) and the Official Records of the Union and Confederate Navies (ORN). The various sources contain a number of contradictions which make absolute accuracy improbable if not impossible.

Armament of the ships was changed from time to time. That given is for date as near as possible to date of torpedoing and generally was taken from ORN-II-1. Twelve-pounder howitzers and smaller have been excluded.

At least two other tables are available, one in "The School of Submarine Mining at Willets' Point" by Henry L. Abbot, Journal of U. S. Military Service Institution, Vol. 1, 1880; the other in "History of the Confederate States Navy" by J. T. Scharf, 1887. Both contain errors.

had expressed an appreciation of torpedoes several months previously when he wrote: "Torpedoes are not so agreeable when used on both sides; therefore, I have reluctantly brought myself to it. I have always deemed it unworthy a chivalrous nation, but it does not do to give your enemy such a decided superiority over you."

The Civil War is not responsible for the first warlike use of torpedoes. David Bushnell invented a torpedo to be used with his submarine, the *TURTLE*, during the American Revolution. Robert Fulton also developed a system of torpedoes in 1805, and Samuel Colt, the inventor of the revolver, successfully demonstrated his torpedoes in the early 1840's.

During the Crimean War, the Rus-

sians used both contact-exploding submarine and land mines with some success, and electric torpedoes also were developed. Nevertheless, it was not until the American Civil War that torpedoes and mines became highly developed and were recognized as a legitimate means of warfare.

The Confederacy, of course, was first to adopt a system of torpedoes, for she had a vast extent of coastline with many navigable rivers to protect, and she had no navy to oppose the substantial navy of the Union. By October 1862, the Torpedo Bureau had been established at Richmond under Brig. Gen. G. J. Rains, and as early as the summer of 1861, Matthew F. Maury, late of the U. S. Naval Observatory, had been planning the construction of

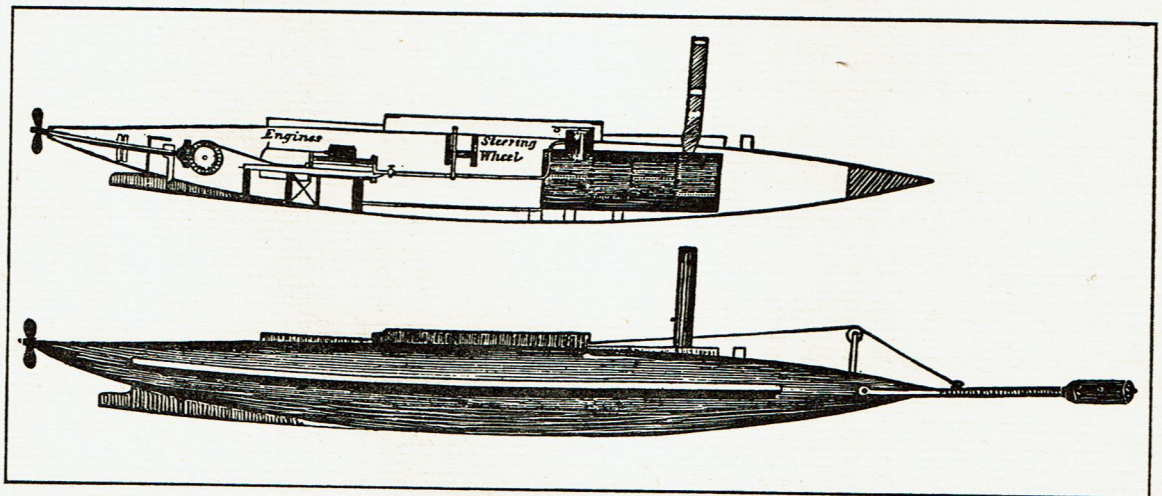


Fig. 6. Steam torpedo boat DAVID that successfully attacked and damaged the NEW IRONSIDES.

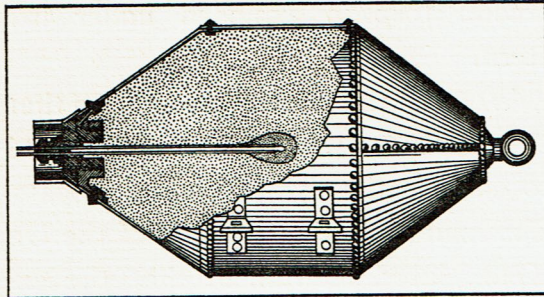


Fig. 7. Confederate electrically exploded torpedo. Conductors were ordinary gutta-percha-covered No. 16 copper wire with an additional protection of tarred hemp. It was employed in harbor defense.

submarine mines to be placed in the rivers and harbors of the South. Maury also did much to perfect the electric mine but finally was sent to England on special service. The work was carried on by Lieut. Hunter Davidson.

Torpedoes eventually were adopted by the Union in September 1863. Up to that period of the war, the Union naval forces were continually on the offensive, and a defensive torpedo system had not been found necessary. However, the Confederates were constructing a ram and an ironclad floating battery on the Roanoke River. The only Union vessels available to oppose this threat were made of wood.

Therefore, Gideon Wells, Secretary of the Navy, recommended "an effort on the part of the Army to surprise and destroy the rebel ram and battery referred to, or of obstructing the river by torpedoes and piles or otherwise,

so as to prevent their descent." As a result, the Union planted torpedoes at the mouth of the Roanoke River, thus appropriating the defensive torpedo system for its own purpose.

THE first use of torpedoes in the Civil War appears to be on July 7, 1861. Cylinders of boiler iron were filled with powder and suspended beneath floating oil casks (Fig. 9, p. 17). Fuzes led from the casks to the powder chambers, and these devices, tied together in pairs, were floated down the Potomac River against the Federal squadron at Aquia Creek. It was hoped that the rope would catch on the bow of a ship, swinging a cask to either side. However, the casks were quickly discovered, and a boat crew put out from the squadron and extinguished the fuzes before any harm could be done.

Harper's Weekly for March 15, 1862, reports that U. S. gunboats had discovered torpedoes in the mouth of the Wright River near Fort Pulaski. One of the torpedoes was raised and examined, but no damage was done. However, this installation may be among the first of a practical nature (using submerged anchored torpedoes) where results could have been expected.

Shortly after the fall of Vicksburg,

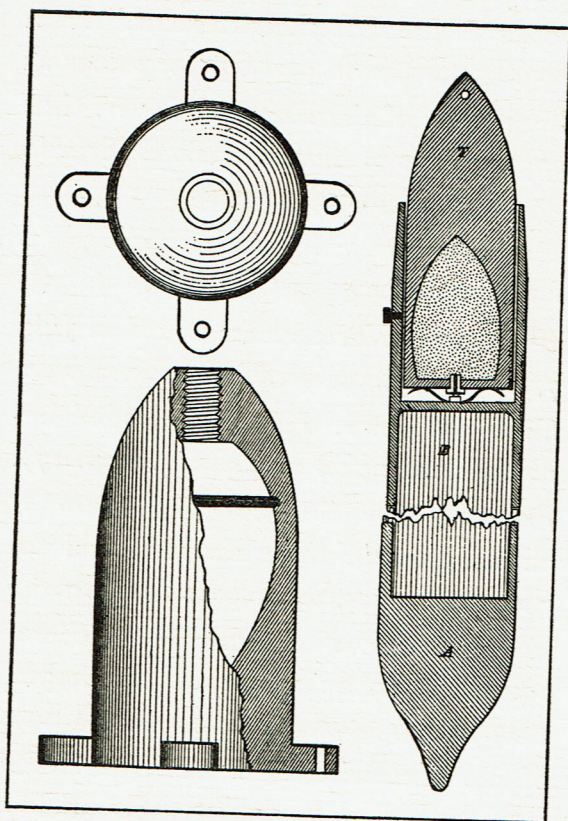


Fig. 8. These frame torpedoes, for mounting on spars or timbers, contained about 27 pounds of powder. Pressure on the head of the right-hand torpedoe would compress the supporting spring and ignite the fuze.

the Confederates determined to fortify Yazoo City as a base from which to collect supplies for their army. To prevent this, a joint Army-Navy expedition was formed of 5,000 Yankee troops, three small gunboats, and the ironclad *BARON DE KALB*. After the assault, in which the Confederate works were captured, the *DE KALB* ran upon a submerged torpedo and sank in fifteen minutes. As she was going down, a

second torpedo exploded under her stern.

Water in the Yazoo was high, so that the torpedoes were too far submerged to damage the lighter-draft gunboats. Commander Walke, captain of the *DE KALB*, later determined that the explosion which had sunk his ship came from an ingenious device known as Singer's torpedo.

The body of the torpedo was made of tin, and contained from 50 to 100 pounds of powder in addition to an air space to keep it buoyant on the end of its mooring. (See Fig. 13, p. 21.) On the top of the body was a shallow, cone-shaped hat which would be knocked off if struck by a vessel. As the hat fell, the attached lanyard pulled a pin releasing a spring-loaded plunger. The plunger, in striking hard on the bottom of the main body, transmitted its force to a small iron rod within the body shell and caused it to explode the primer. This torpedo was one of the simpler and more successful types in the Confederate arsenal.

Another successful type of moored torpedo consisted of a conical copper chamber attached to one end of a spar. The other end of the spar was secured to a mud anchor. The top of the powder chamber was hemispherical and held at

least five contact-type fuzes which were easily set off even if struck lightly. The fuzes were of a style in which several percussion caps or primers were mounted beneath a thin, well-annealed copper shield. Seven pounds of pressure would collapse the copper without fracturing it, permitting the primers to explode. Or the fuze would contain sulphuric acid in a small glass tube which, when broken, would bring about the proper chemical action to create a flame and explode the torpedo. (See Fig. 11, p. 19.)

To make this torpedo extremely difficult and hazardous to sweep, the mooring spar was attached by wire to another form of torpedo, "the devil circumventor," which contained 100 pounds of powder and was located on the bottom about 50 yards from its companion. It was hoped that the boat crew which tried to remove the moored torpedo would inadvertently yank the

lanyard to "the devil circumventor" and henceforth no longer be available for minesweeping duty. Perhaps the same reasoning applies as to why there are no reports on the actual success of this combination.

BEFORE the end of the war, a large number of torpedoes were placed in the defenses of Charleston harbor. During the attack of the monitors on April 7, 1863, Admiral DuPont's flagship, the *NEW IRONSIDES*, drifted over a large iron boiler torpedo containing 2,000 pounds of powder. However, the torpedo did not explode, for it was designed to be set off electrically from Battery Wagner, and it was later discovered that one of the wires to the torpedo had been run over and cut by a passing ordnance wagon.

Subsequently, more of these electrically exploded torpedoes were sown in Charleston harbor, and Capt. M. M.

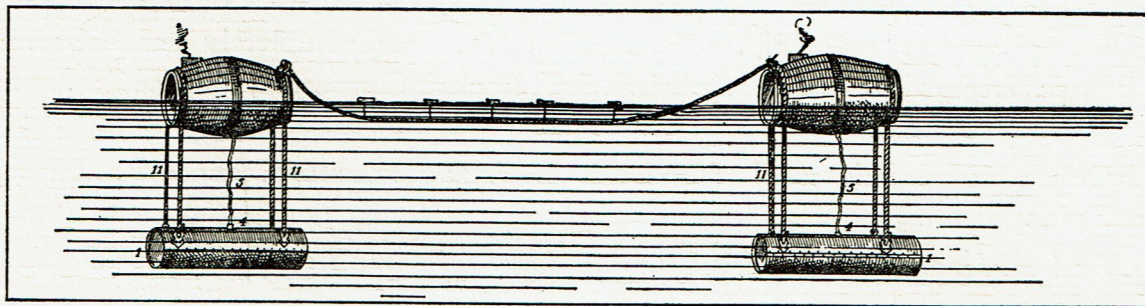


Fig. 9. Two casks, joined by a buoyed line and containing ignited fuzes leading to powder-filled boilers suspended beneath, were set adrift in the Potomac in hopes they would snag on an enemy ship.

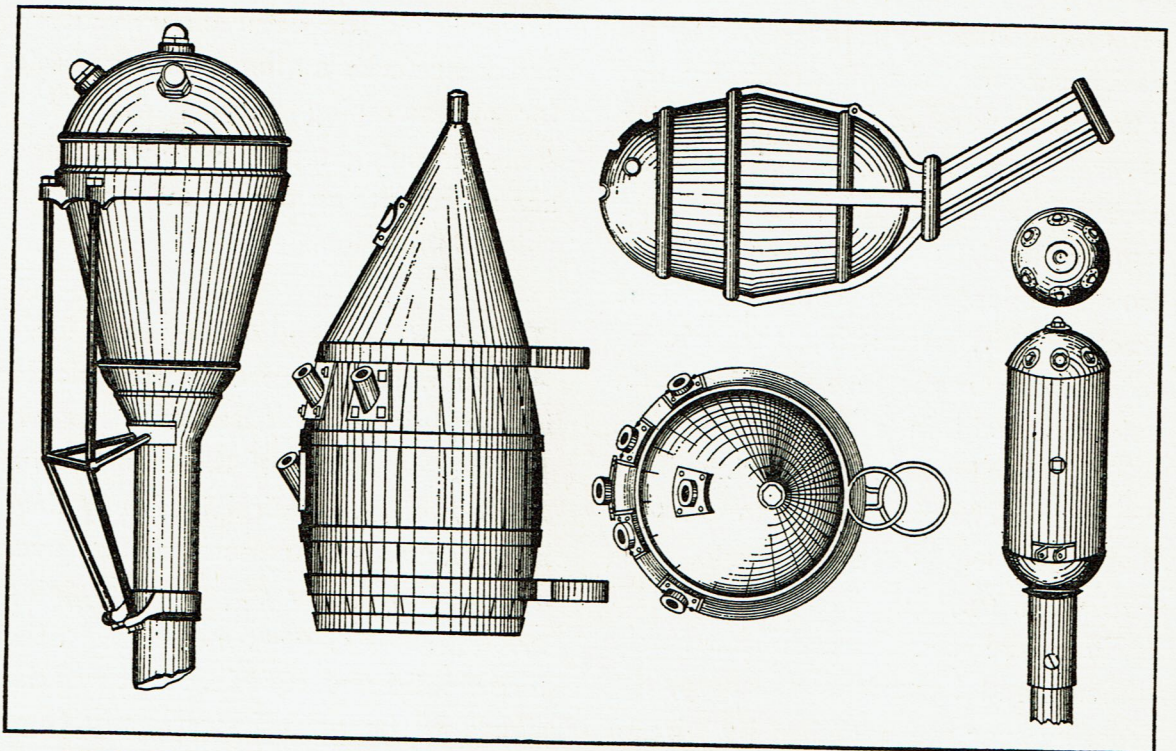


Fig. 10. Variety of ram or spar torpedoes. Type at left was used on Confederate ironclads at Richmond and Charleston. Type at right, containing up to 70 pounds of powder, was carried by torpedo boats.

Gray, the Confederate engineer in charge of Charleston's submarine defenses, testified that General Beauregard "placed more reliance upon one torpedo than upon five 10-inch columbiads." (See Fig. 7, p. 15.)

The one, and perhaps only, instance where a large 2,000-pound electrical torpedo was completely successful in carrying out its mission of destruction took place in the James River on May 6, 1864. Maj. Gen. Ben Butler and Capt. Samuel P. Lee, U. S. N., were proceeding up the river in cooperation

with Grant's army against Richmond. Portions of the river had been carefully mined by the Confederates, and, in spite of dragging and sweeping operations, the 542-ton gunboat *COMMODORE JONES* was caught over one of the monsters and completely demolished.

Back at Charleston, the Confederates continued in their attempts to disable the *NEW IRONSIDES*. Theodore Stoney had personally financed the first Confederate steam torpedo boat, or *DAVID*, as it was commonly called. According to Barnes (in "Submarine Warfare"),

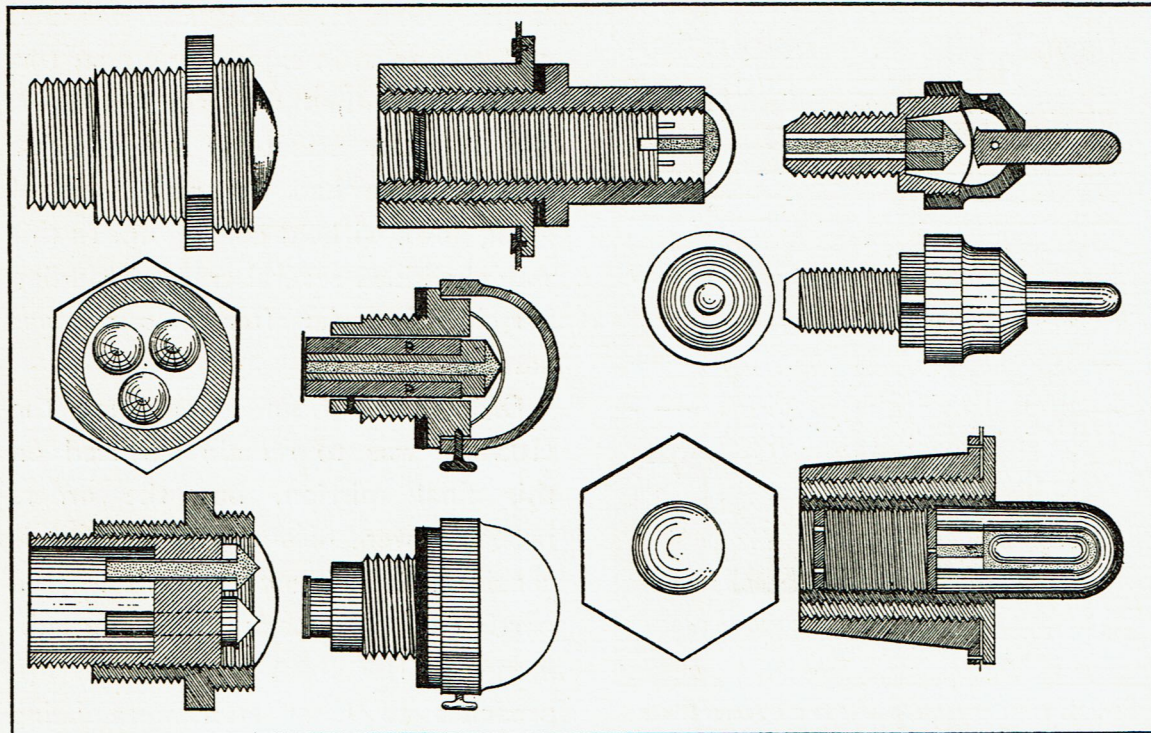


Fig. 11. Types of torpedo contact fuzes used by the Confederate Navy. The chemical fuze at bottom right contained sulphuric acid in a glass vial which when broken would set off the primer.

“the name ‘David’ was given to the first of this form of craft, likening her to the David of Holy Writ, who, with a sling, slew Goliath (*sic*).”

WHETHER or not this is true, the name became familiar and was applied to all craft of a similar nature. DAVID could be managed by a crew of four, and had a steam boiler forward, with the engine aft (Fig. 6, p. 14). She was double-ended, under sixty feet long, and, when ready for action, was nearly submerged. Perhaps the most

notable feature was the funnel which stuck straight up in the air like a broken-off mast.

The torpedo armament was carried off the bow on the end of a long spar, and could be raised or lowered by means of a line passing back to the crew's compartment. The torpedo itself was made of copper, contained from fifty to seventy pounds of powder, and was exploded by means of a contact fuze. On October 5, 1863, DAVID was ready, and, with Lieutenant Glassell in command, put out into the hazy

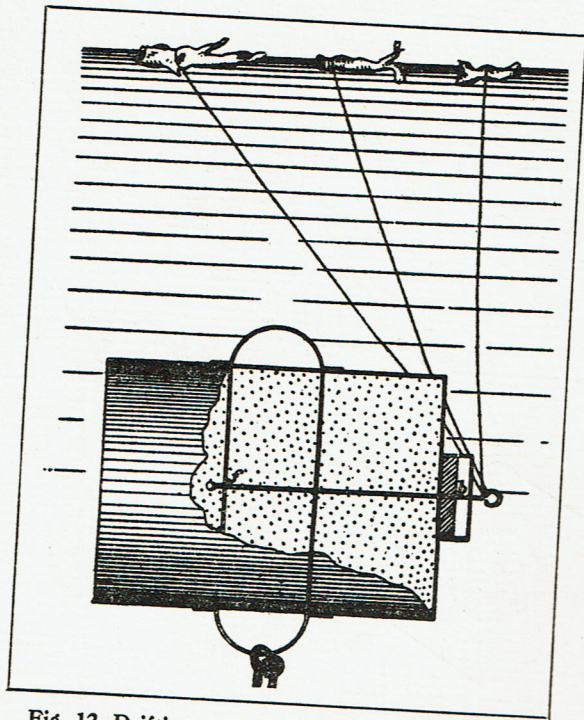


Fig. 12. Drifting torpedo used in the James River. Containing 70 pounds of powder the case was supported at the proper depth by a log. Three pieces of driftwood were attached to the trigger by lines which were supposed to foul a ship's propeller and thus detonate the torpedo's explosive charge.

night straight for the *NEW IRONSIDES*. When about 300 yards away, lookouts aboard the Yankee vessel spotted the strange craft but were helpless to take action. Moments later the torpedo exploded against the hull, seriously damaging the $4\frac{1}{2}$ inches of armor and 27 inches of wood backing. While the *IRONSIDES* did not sink, it was put out of action for a considerable time.

The Confederates also were successful against the new Union blockader, *HOUSATONIC*. This time the submarine

torpedo boat *H. L. HUNLEY* was used and succeeded in exploding a spar torpedo against the hull of the blockader. The *HUNLEY* was truly a submarine although she had the reputation of going down without coming up. In this way she killed several crews, including her chief financier after whom she was named.

Orders had been given that the *HUNLEY* was to remain surfaced on this final mission, but the orders probably were disobeyed, for there is considerable evidence that at least a portion of the attack was made submerged. After the war, when the approaches to Charleston were being cleared, the sunken torpedo boat with all hands aboard was found pointing straight to the sunken *HOUSATONIC* about one hundred feet away.

Not all of the glamour and daring of torpedo-boat attacks can be claimed by the Confederates. Far up the Roanoke River from Albemarle Sound the Confederates were building a powerful, light-draft, ironclad ram, the *ALBEMARLE*. In the latter part of April 1864, the ironclad proceeded down the river, sinking one Union ship and causing the others to retreat into Albemarle Sound. Plymouth fell to the Confederates, and the entire Yankee fleet was in danger,

for not a single Union ironclad could cross Hatteras Bay and enter the sound.

William B. Cushing, brother of the famous artillerist who lost his life repelling Pickett's charge at Gettysburg, had a plan for eliminating the ALBEMARLE, and his plan had the direct approval of the Assistant Secretary of

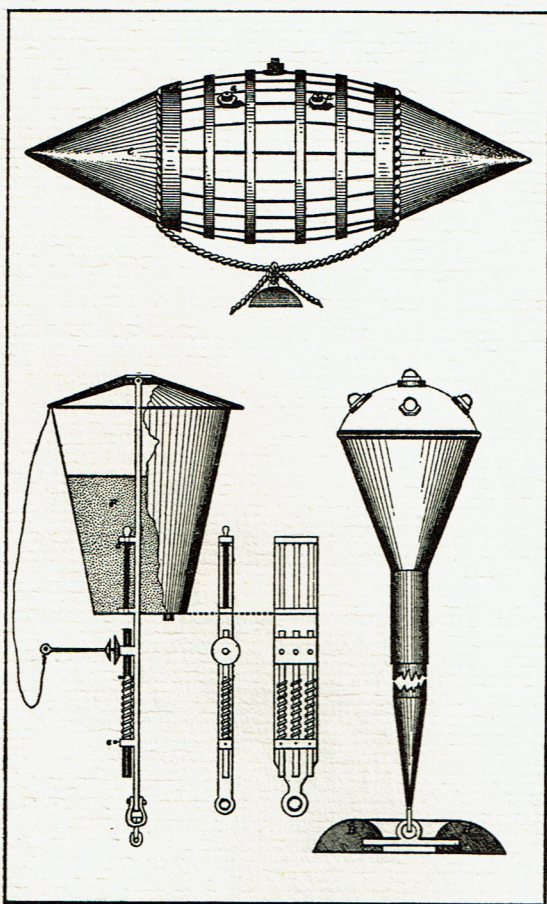


Fig. 13. Beer barrels with wooden cones attached (top) made excellent buoyant torpedoes and carried up to 120 pounds of powder. When the iron cap of Singer's torpedo, bottom left, was knocked off it would pull the lanyard and fire the primer. An antisweeping device was sometimes attached to the buoyant torpedo shown at the bottom right.

the Navy. Consequently, Cushing set out for New York City where he purchased two 30-foot, screw-propelled, open launches to help him place a torpedo under the ALBEMARLE's hull. The launches were fitted with a 12-pounder howitzer and a 14-foot boom or spar. The boom was hinged to the bow, could be raised or lowered by means of a windlass, and held a scoop to grip the torpedo shell.

THE torpedo itself, invented by John L. Lay and introduced by W. W. Wood, was not an ordinary spar torpedo as used by the Confederates. Instead, the torpedo was placed well under the hull of the intended victim by lowering the boom. Then a line was pulled actuating a pin to release the torpedo shell from the scoop, and the ejected torpedo floated up until it nestled against the bottom of the ship. At this time another line was pulled, releasing a pin within the torpedo's firing mechanism. This permitted a large iron ball or grapeshot to fall on the fulminate cap setting off the explosion—provided, of course, that one had time to complete the lengthy procedure in the face of the enemy.

On the night of October 27, 1864, Cushing and his volunteers made their

way up the river, bumped the launch over the protecting log boom and exploded the torpedo, blowing through the ALBEMARLE's hull.

The use of torpedoes was not restricted to naval warfare. Several types were developed for planting in roadways or the approaches to forts. Occa-

sionally, even naval types were found buried in the ground with the firing means well concealed.

The torpedoes made a significant contribution to the Confederate cause everywhere they were used, and, when finally adopted by the Union, proved also to its great advantage.

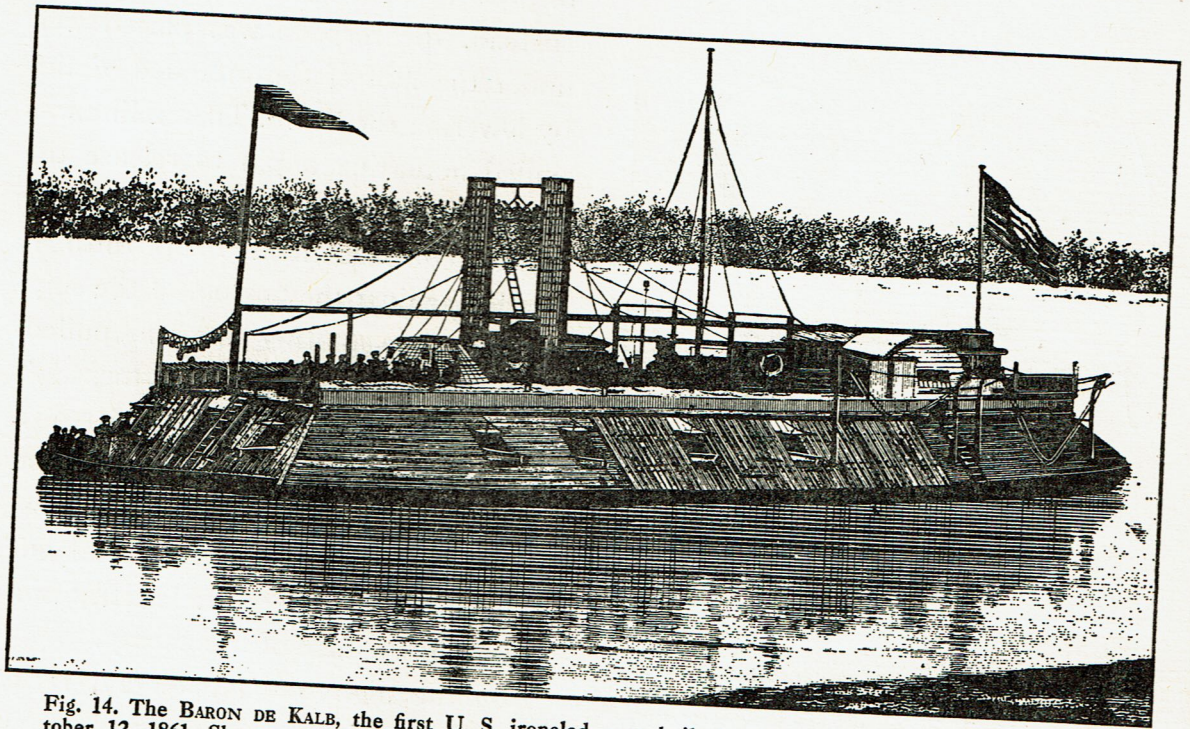


Fig. 14. The BARON DE KALB, the first U. S. ironclad, was built by James B. Eads and launched October 12, 1861. She was sunk in July 1863 when she struck a Singer's torpedo in the Yazoo River.

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(Fig. 6 is from J. T. Scharf, "History of the Confederate States Navy"; Figs. 7, 8, 10, 11, 12, and 13 are from J. S. Barnes, "Submarine Warfare"; Fig. 9 is from ORN, Series I, Vol. 4; Fig. 14 is from Boynton, "History of the Navy.")

"... In this fearful convulsion of the 1860's each ending was always a new beginning, as if the journey that had been begun so heedlessly and with such high spirits must go on and on, consuming decades and generations, making the break with the past absolute."

—BRUCE CATTON, "This Hallowed Ground"