



Historic Ships of Philadelphia -- comparison of technologies



September 21, 2016

Rev. April 2022



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<u>Name</u>	<u>Date Launched</u>	<u>Where Built</u>	<u>Purpose</u>
USS Olympia	1895	USA	Military
Gazela	1901	Port.	Fishing
SV Moshulu	1904	UK	Cargo
USS New Jersey	1942	USA	Military
USS Bacuna	1944	USA	Military
SS United States	1951	USA	Passenger



S.V. Moshulu

Name:	<i>Kurt</i>
Namesake:	Dr. Kurt Siemens
Owner:	G. H. J. Siemens & Co., Hamburg
Route:	Europe to Chile and Newcastle, Aust.
Builder:	Alex. Wm. Hamilton & Co., Port Glasgow
Cost:	£36,000 (equivalent today: \$4,595,000)
Type:	4 masted barque
Launched:	18 April 1904
Maiden voyage:	June 1904 via Santa Rosalía , Mexico to Valparaíso , Chile
Homeport:	Hamburg, Germany





Moshulu

Completed 1904 (Clyde) -christened KURT (German ownership)

1904-1914: In service hauling: Nitrates from Chile to Germany; Coal from Wales to Mexico

1914 -1917: in port in Oregon

1917: seized by US renamed Moshulu (*fears nothing* in Seneca, “Dreadnought” already taken)

1917-1920: US Shipping Board used to ship wool and chrome from Far East

1920-1928: various private shipping company owners shipping timber from West Coast to Australia

1928-1935: Laid up on West Coast

1935-1939: Swedish owner(Finnish flag) hauling grain from Australia to Europe

1938-1939: Winner of Last Grain Race

1940 -1948: Seized by Germans in Norway and derigged to use as floating warehouse

1948-1970: Various Scandinavian owners used as floating warehouse

1970 -1974: Purchased by American Specialty Restaurants –re-rigged with phony masts, yards and line

and towed to South Street Seaport, NYC

1975-1989: Restaurant in NYC until damaged by fire

1994- 1996: Purchased by HMS Ventures (Dodo Hamilton*) and towed to Camden for restoration

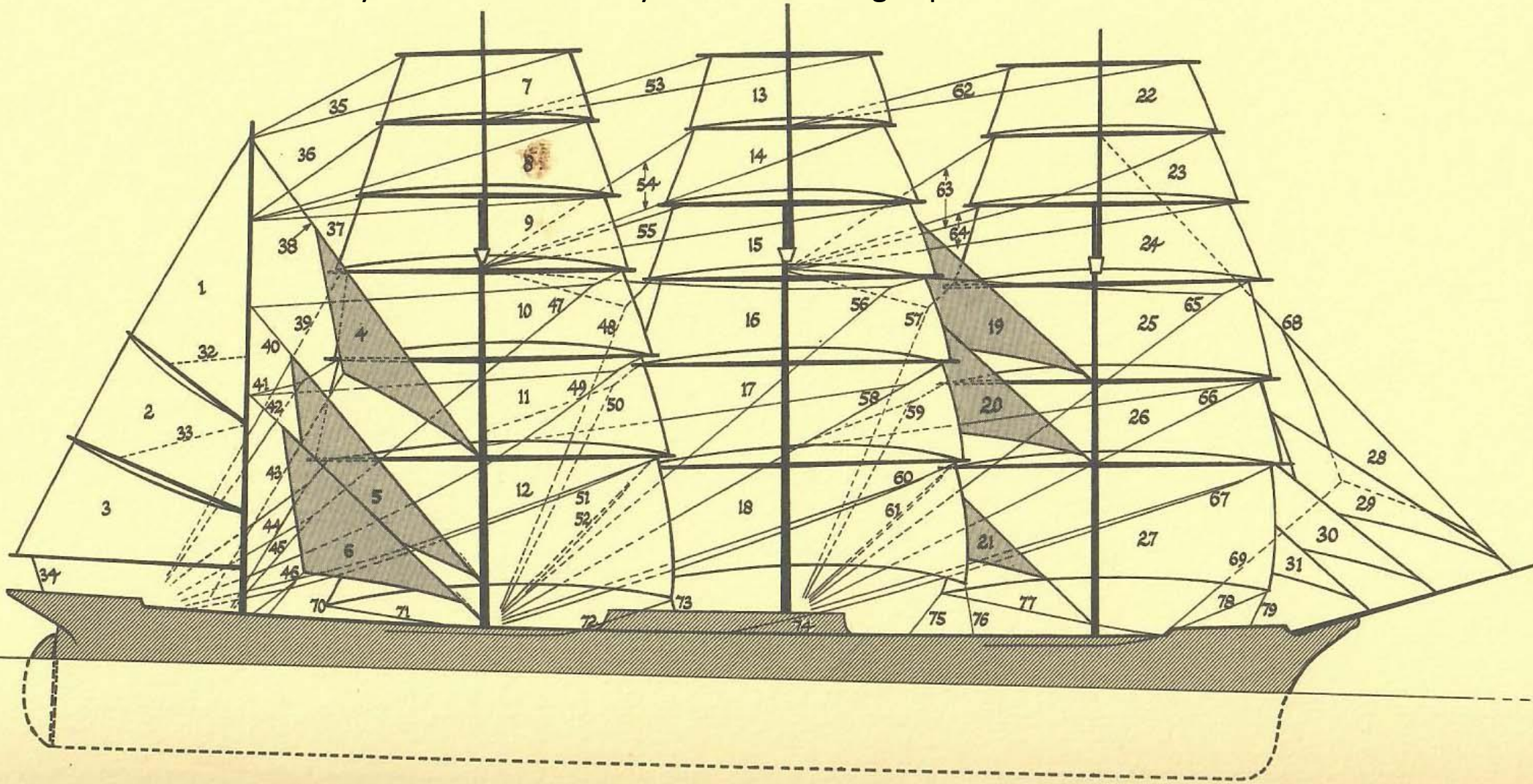
1996-present: Restaurant on Philadelphia waterfront



*Dodo Hamilton -
-Heiress to
Campbell Soup
founding family

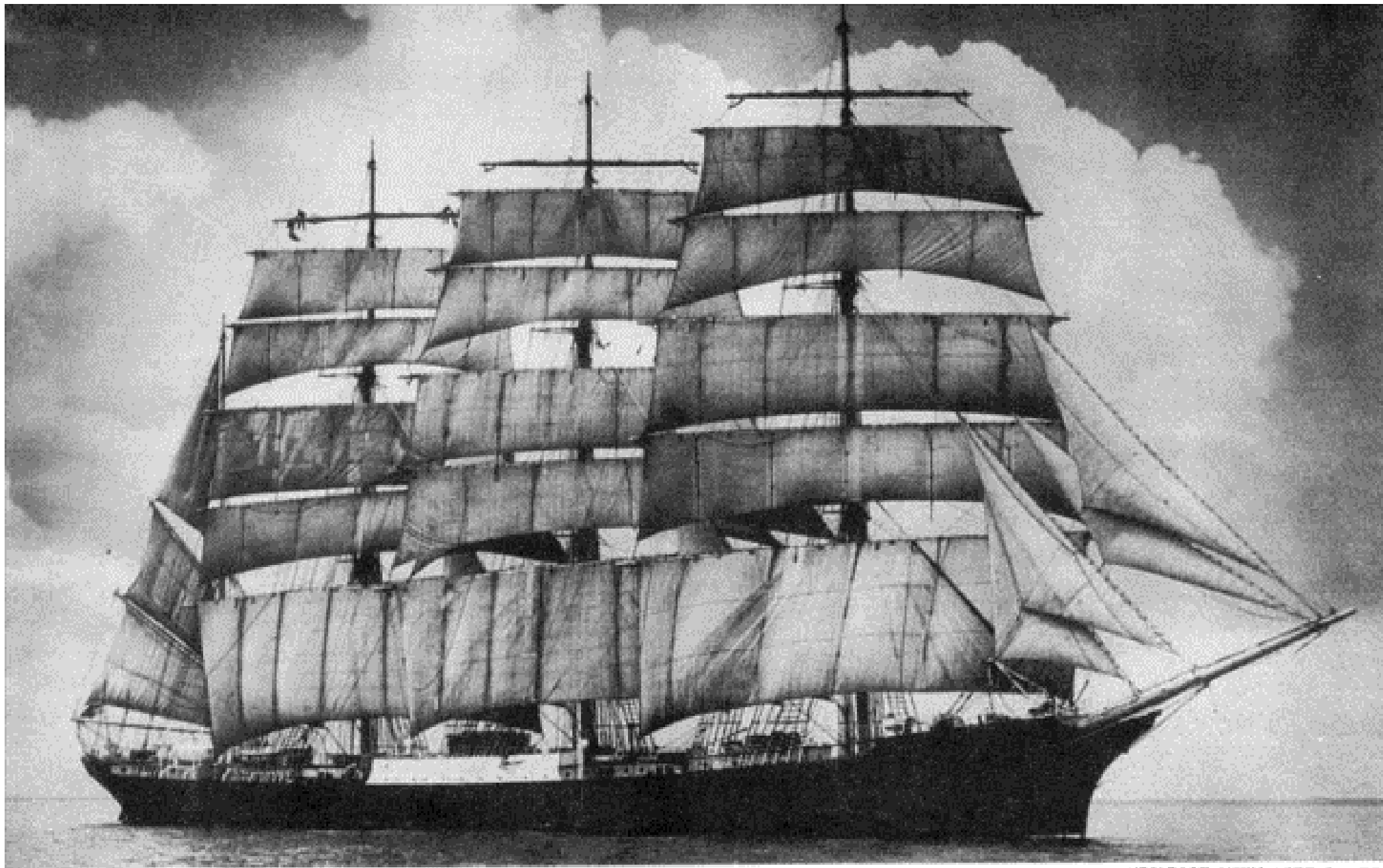


The four-masted [barque](#) was the ultimate refinement of aerodynamic study and thousands of years of seafaring experience



S. V. MOSHULU
Sail plan and diagram of running rigging





(BELFAST NEWS-LETTER, LTD)

Steel 4-Masted Barque MOSHULU ex DREADNOUGHT ex KURT, 3,116 Gross Tons

Left at Belfast on 26 September 1922



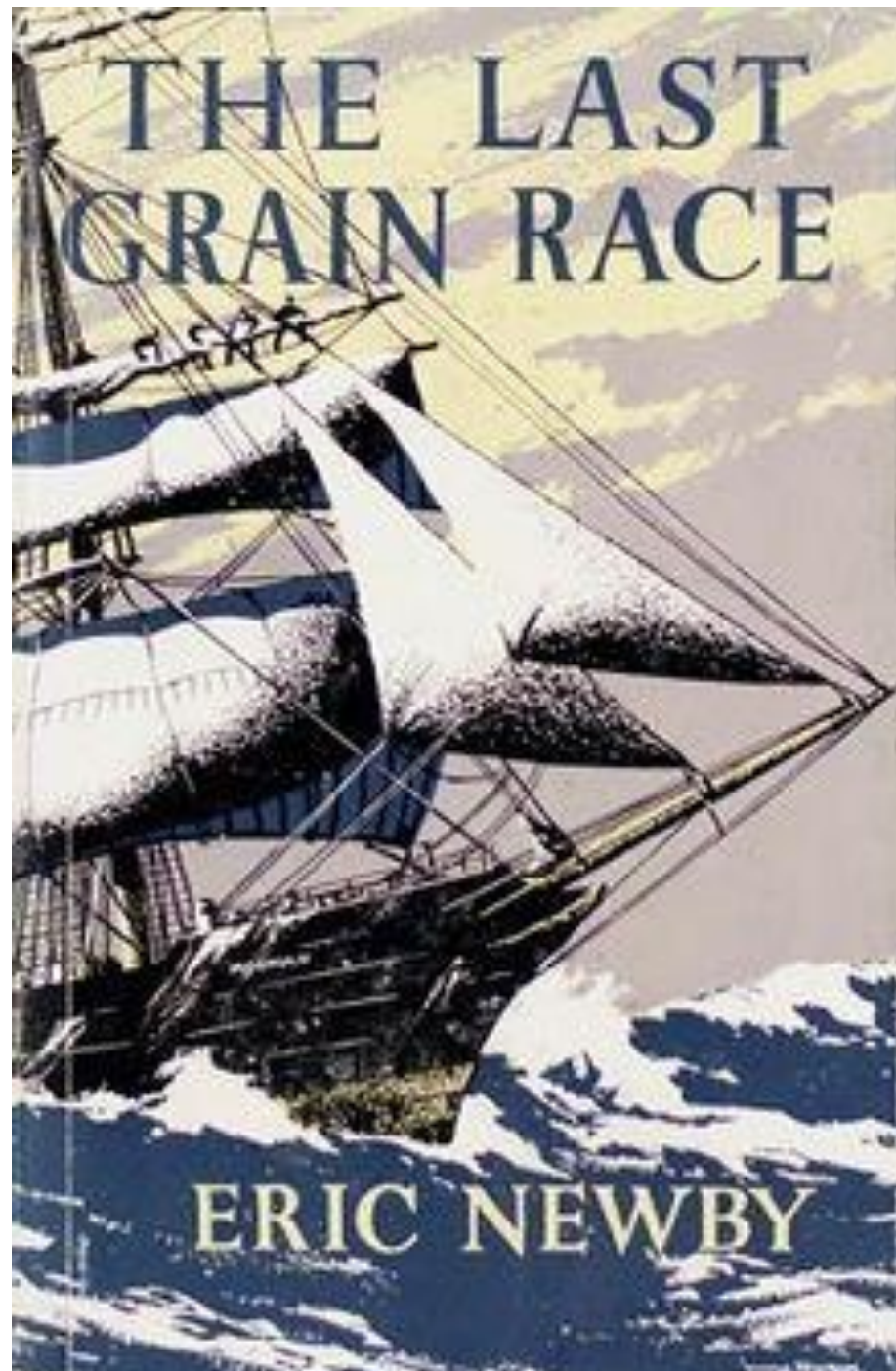
Moshulu Technology

1) Steel hull and masts:

- A. steel was stronger and thus could enable larger ship size and considerable economies of scale,
- B. iron and steel hulls took up less space and allowed for more cargo to be carried, and
- C. they were cheaper to maintain than a wooden hull.

2) Small steam engine for winches and rudder reduced crew size required.

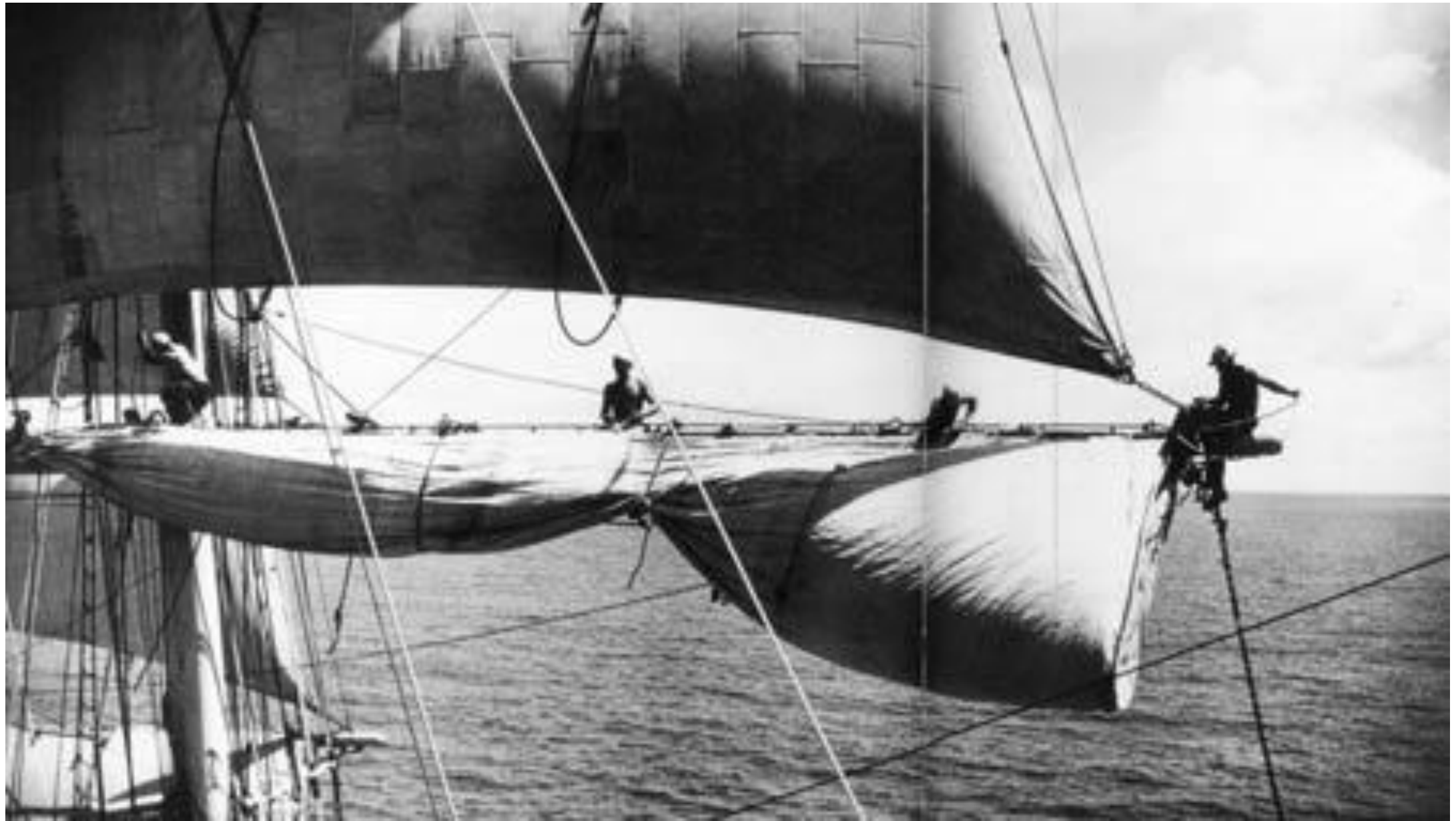




Newby was a young Irish reporter who shipped aboard the Moshulu on what would be her last voyage. This book tells of his experiences.



Newby and friends bending on sail





**Crew member
Berndt Hilbertin
skylarking on
the fore royal
truck 200'
above the water
while underway
in 1939**



"At midnight...the wind was north-northeast, Force 7. Down to topsails now, her upper and lower yards naked, gleaming yellow like great bones in the moonlight, she was a terrible wild stranger to us. At the wheel a Swede and a Dane were fighting to hold her as she ran 13 and 14 knots in the gusts. I knew then that I would never see sailing like this again. When such ships as this went it would be the finish. The windbelts of the world would be deserted and the great West Wind and the Trades would never blow on steel rigging and flax canvas again."
-- Eric Newby, The Last Grain Race





USS OLYMPIA

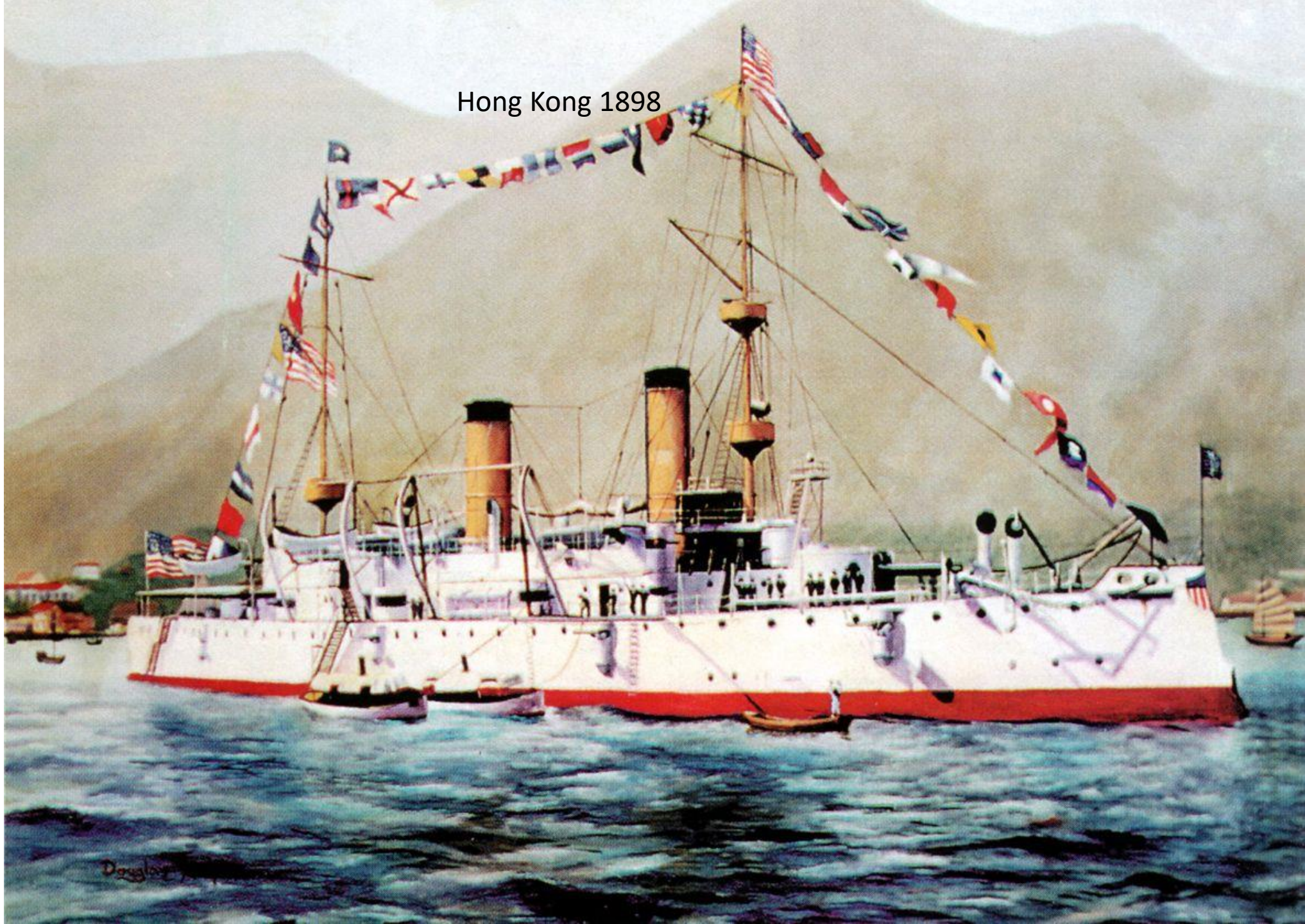
From the moment of her launching in 1892, Cruiser *Olympia* was a rare treasure in the U.S. naval fleet, as no sister ships were ever built. **She is the world's oldest floating steel warship and the sole surviving naval ship of the Spanish-American War.**

Cruiser *Olympia* served as Admiral Dewey's flagship at the Battle of Manila Bay, which marked the U.S.'s emergence as a world naval power. Cruiser *Olympia*'s last official naval mission was to carry the body of the Unknown Soldier from France to the United States in 1921.

A National Historic Landmark, Cruiser and also a National Historic Mechanical Engineering Landmark.



Hong Kong 1898



Cruiser Olympia

- **Beam:** 53 feet ; Length 344 ft
- **Displacement:** 5,870 tons
- **Crew:** 33 Officers, 396 enlisted men
- **Top Speed:** 22 knots (25mph)
- **Coal Consumption at Top Speed:** 633 lbs./minute
- Range 14,960 miles
- Cost 1,796,000 (1895) dollars-(\$50.3 million today) Commissioned 1895
- Armaments four- 8" guns in two turrets and ten 5" in beam casements

May 1, 1898, in an eight-hour battle, Cruiser *Olympia* devastated the Spanish fleet at the Battle of Manila Bay in the Philippines. This was not only the first victory of the Spanish-American War, but the Cruiser *Olympia*'s efforts helped catapult the United States into the role of superpower and won fame for her most famous officer, Commodore George Dewey. It was from Cruiser *Olympia*'s recently restored bridge that Dewey delivered his famous order, "You may fire when you are ready, Gridley."



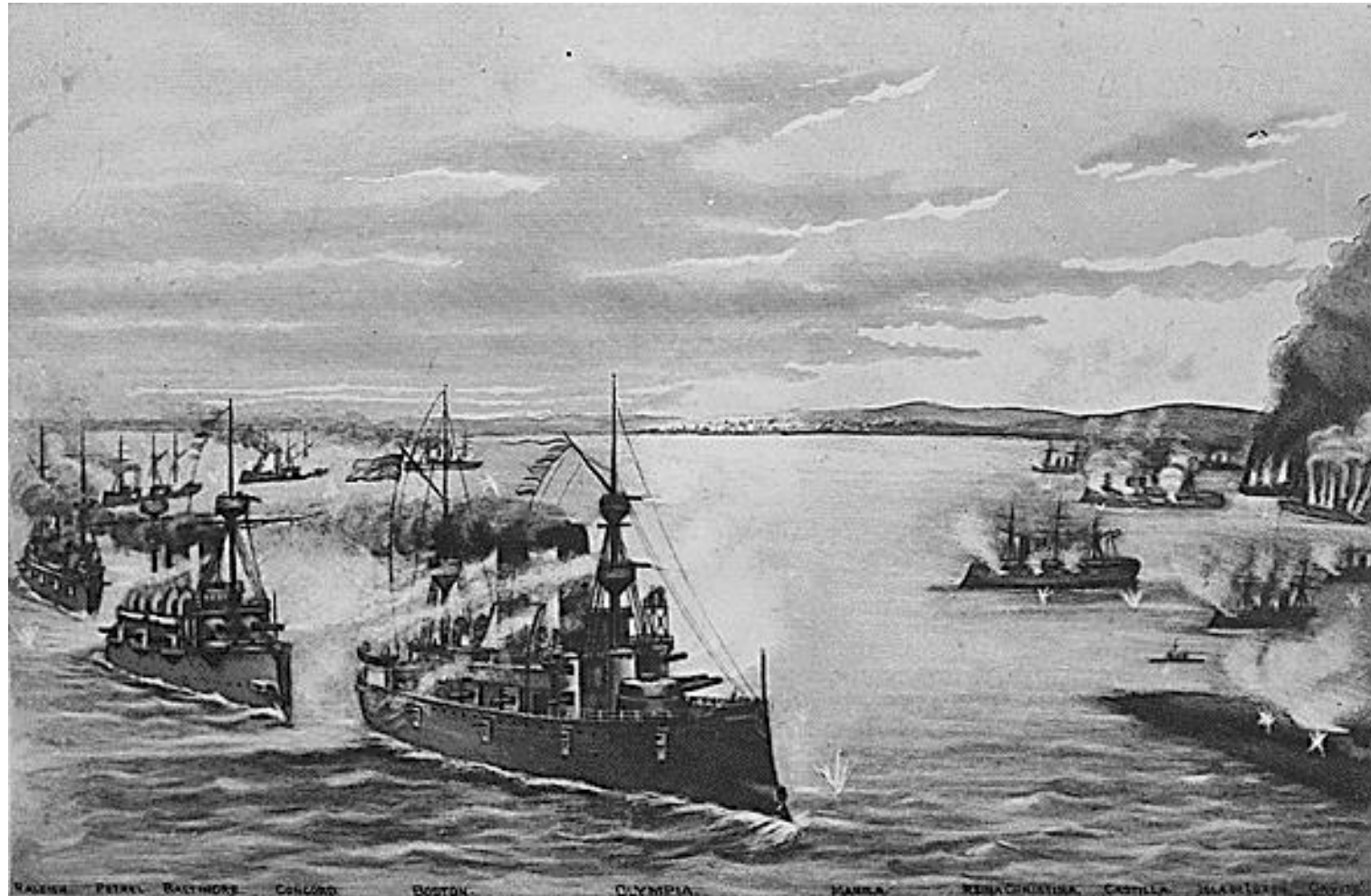
Cruiser Olympia History Summary

1895 -1898	Duty in Chinese waters as flagship of Asiatic Squadron
April 1898	Dewey placed in command; Ordered to Manila Bay
May 1 1898	Battle of Manila Bay;
1898-1899	Supported Army actions in Philippines with shelling
May –Oct 1899	Returned to Chinese waters
Nov 1899 -1902	Decommissioned and put in reserve
1902-1906	Recommissioned to join Atlantic fleet (also Caribbean)
1906-1916	Training ship, barracks ship and in reserve
1916 -1918	Updated armaments-placed on Atlantic patrol and escort duty in WWI
1918-1921	Various duties including tour in Adriatic, training, and Army/Navy experiments
Oct 1922	Left Philadelphia for France to bring the Unknown Soldier to Arlington National Cemetery
Dec 1922	Decommissioned in Philadelphia
1957	Released to the Cruiser Olympia Association and restored to 1898 configuration



Battle of Manila Bay

First major engagement of the Spanish–American War. The battle was one of the most decisive naval battles in history and marked the end of the Spanish colonial period in Philippine history.



United States

Engaged Forces:

4 protected cruisers

2 gunboats

1 dead and 9 wounded,
or 13 killed and 30+ wounded

1 protected cruiser damaged

Spain

Engaged Forces

2 protected cruisers

4 unprotected cruisers

2 gunboats

Shore defenses

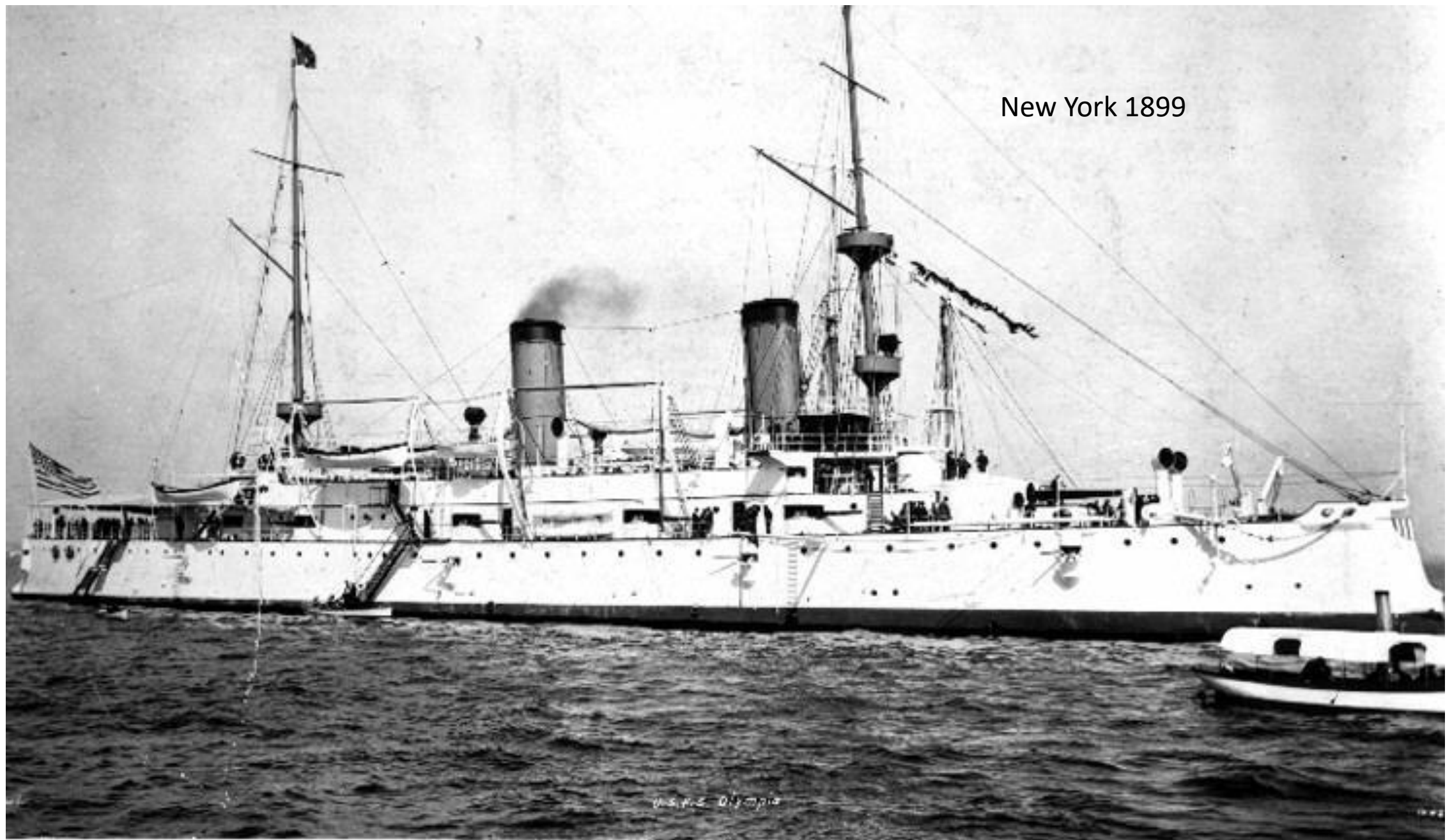
6 batteries

3 forts

77 dead and 271 wounded

2 protected cruisers sunk,
5 unprotected cruisers sunk,
1 transport sunk





New York 1899

Photo # NH 2894 USS Olympia, photo by Hart



OLYMPIA TECHNOLOGY

Protected class cruiser- protected refers to 5” deck armor-specialty hardened steel developed by Carnegie.

When built largest and fastest cruiser in the Navy with power being a **new type of vertical triple expansion steam engine**. Only partially trusted-note spars for suite of sails in an emergency.

One of first naval ships to have electricity and powered steering gear.

First ship to have mechanically chilled water dispenser which was called a the small barrel or butt, the Scuttlebutt. Sailors exchanged gossip when gathered at the scuttlebutt to dirk this **the term scuttlebutt** was born.

The keel of *Cruiser Number 6* was laid in June 1891, and the U.S. Navy launched the ship on November 5, 1892. While the primary construction occurred in San Francisco, the heavy armor plate was fabricated back East. The Navy tasked the Bethlehem Steel Company of Bethlehem, Pennsylvania, with furnishing the steel. When the company had difficulties providing enough steel, Carnegie Steel Company stepped in to furnish the material for the ship’s armor.

Images: <http://www.navsource.org/archives/04/c6/c6.htm>

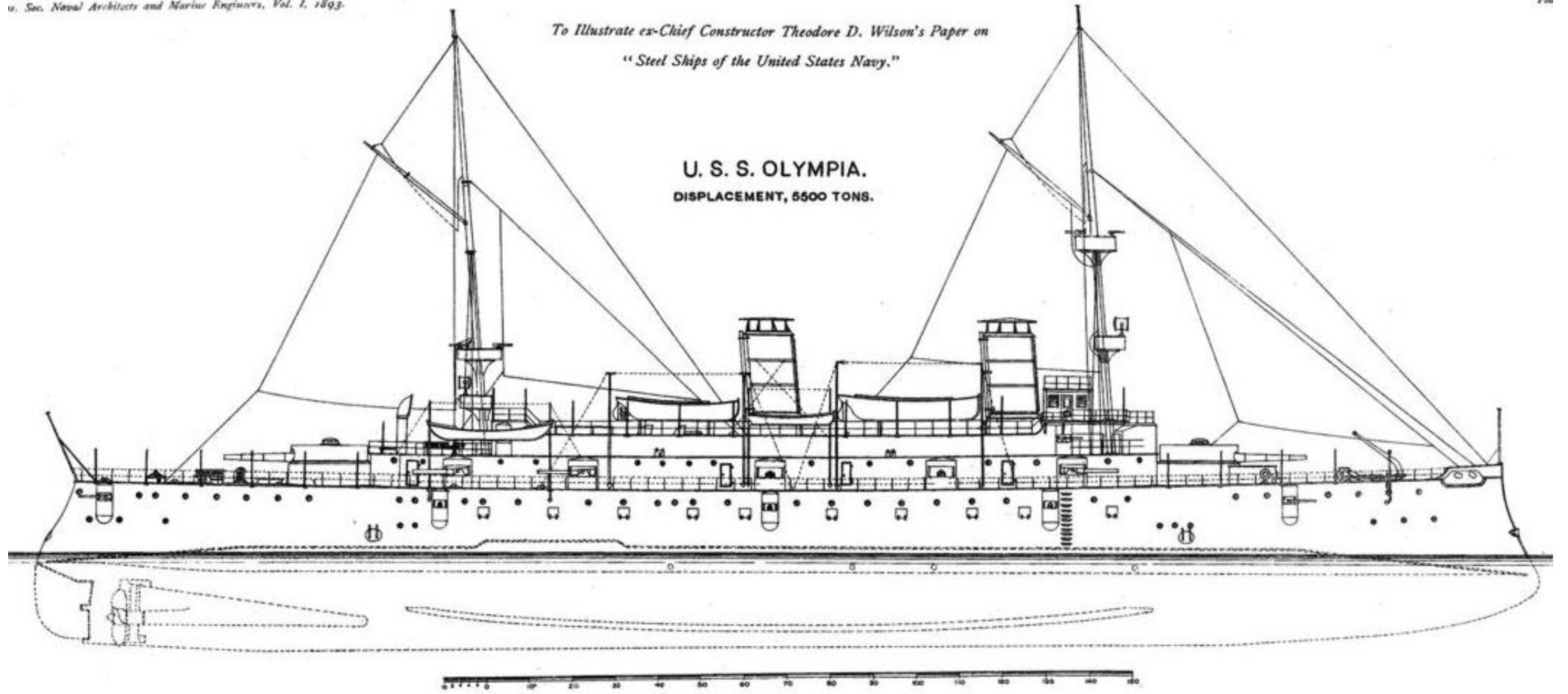


OLYMPIA

U. S. Naval Architects and Marine Engineers, Vol. I, 1893.

To Illustrate ex-Chief Constructor Theodore D. Wilson's Paper on
"Steel Ships of the United States Navy."

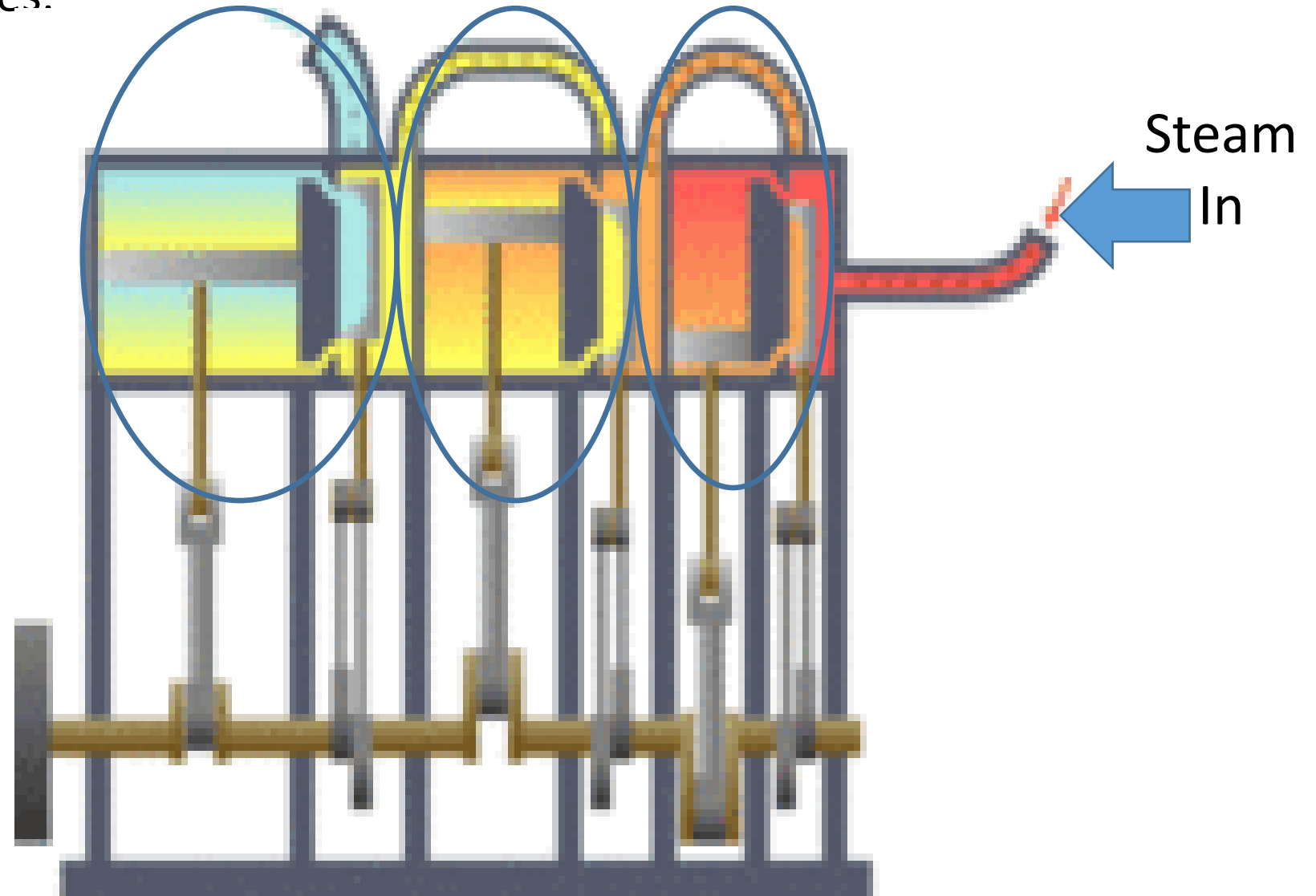
U. S. S. OLYMPIA.
DISPLACEMENT, 5500 TONS.



— SCALE OF FEET. —



A **triple-expansion engine** is a compound engine that expands the steam in three stages, i.e. an engine which has cylinders operating at three different pressures.



The first successful commercial use of a triple expansion was an engine built at [Govan](#) in [Scotland](#) by [Alexander C. Kirk](#) for the [SS Aberdeen](#) in 1881.

Multiple-expansion engine manufacture continued well into the 20th century. **All 2,700 Liberty ships built by the United States during World War II were powered by triple-expansion engines, because the capacity of the US to manufacture marine steam turbines was entirely directed to the building of warships.**¹

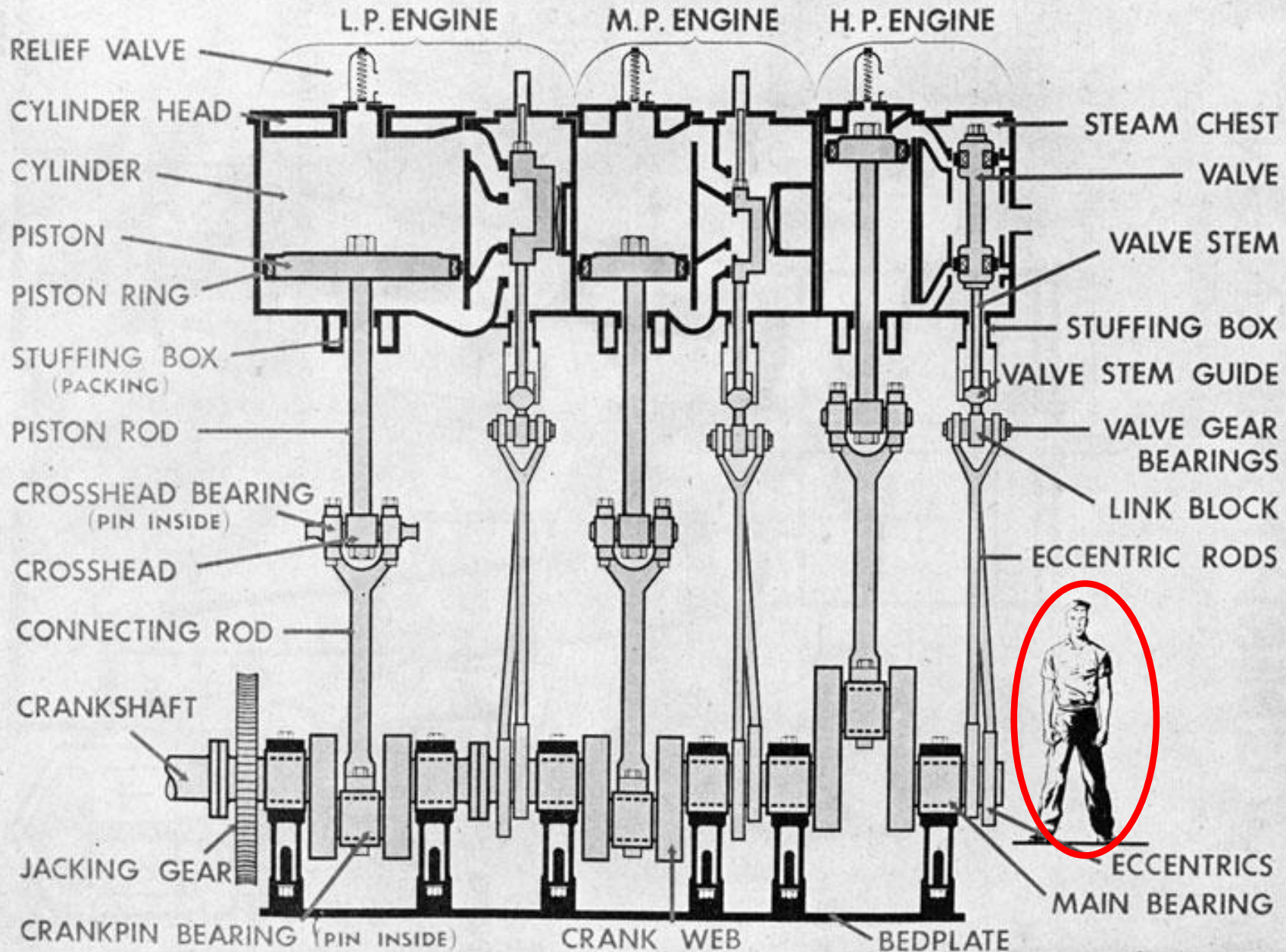
Video USS Olympia video-
15 min:

https://www.youtube.com/watch?v=G_U9PaZbF0Q



LIBERTY SHIP ENGINE

TRIPLE EXPANSION



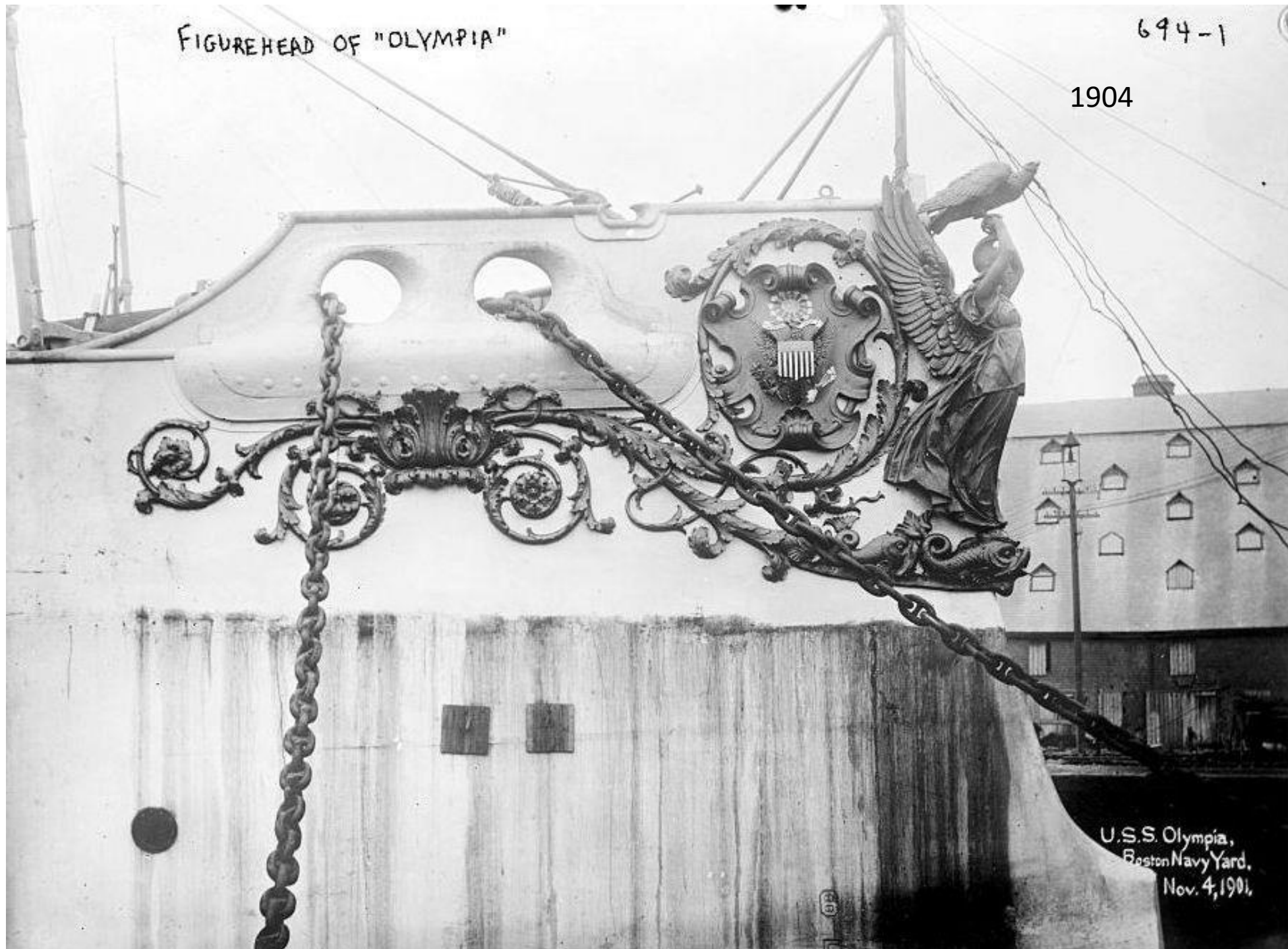
Olympia- Philadelphia?; date unknown



FIGUREHEAD OF "OLYMPIA"

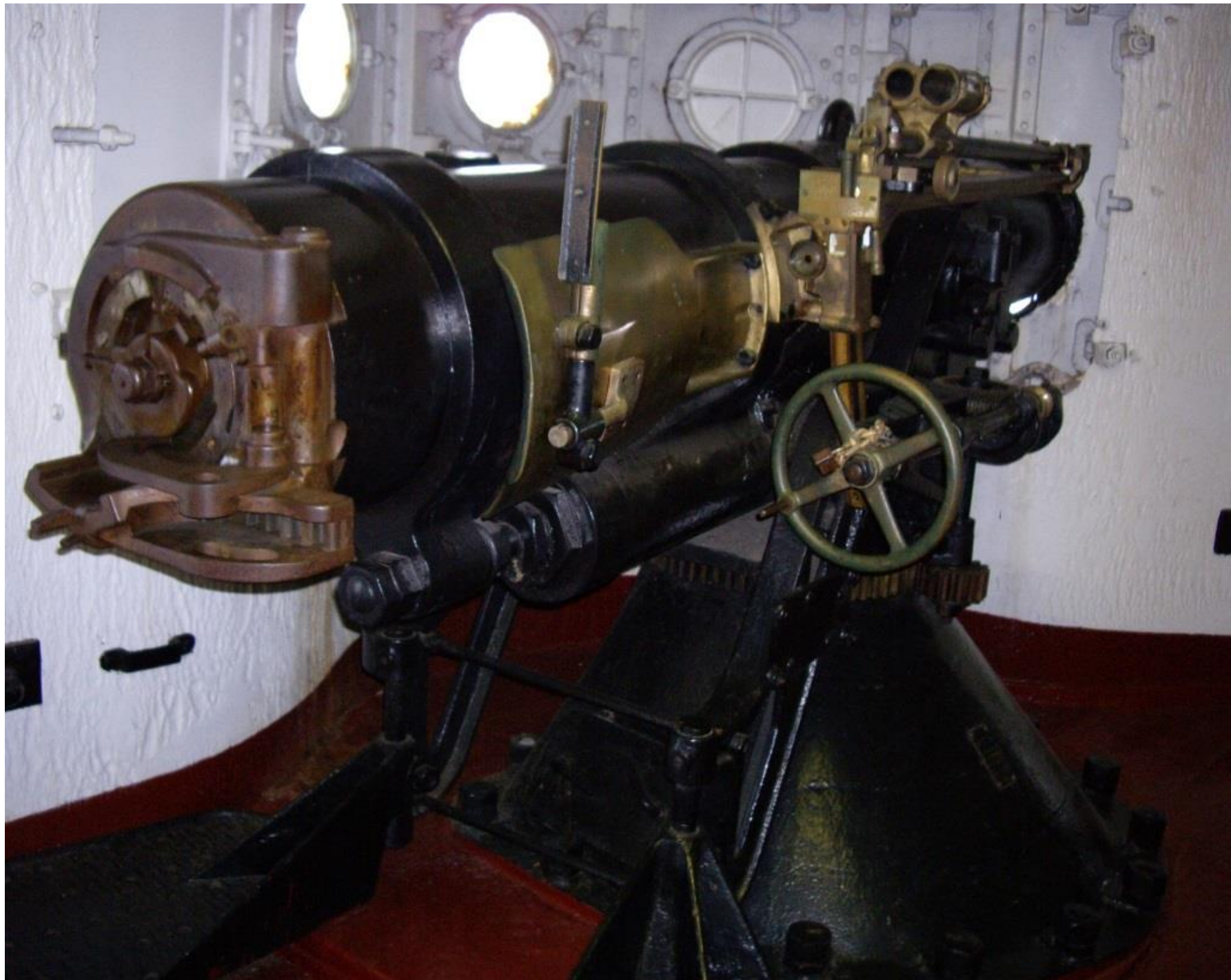
694-1

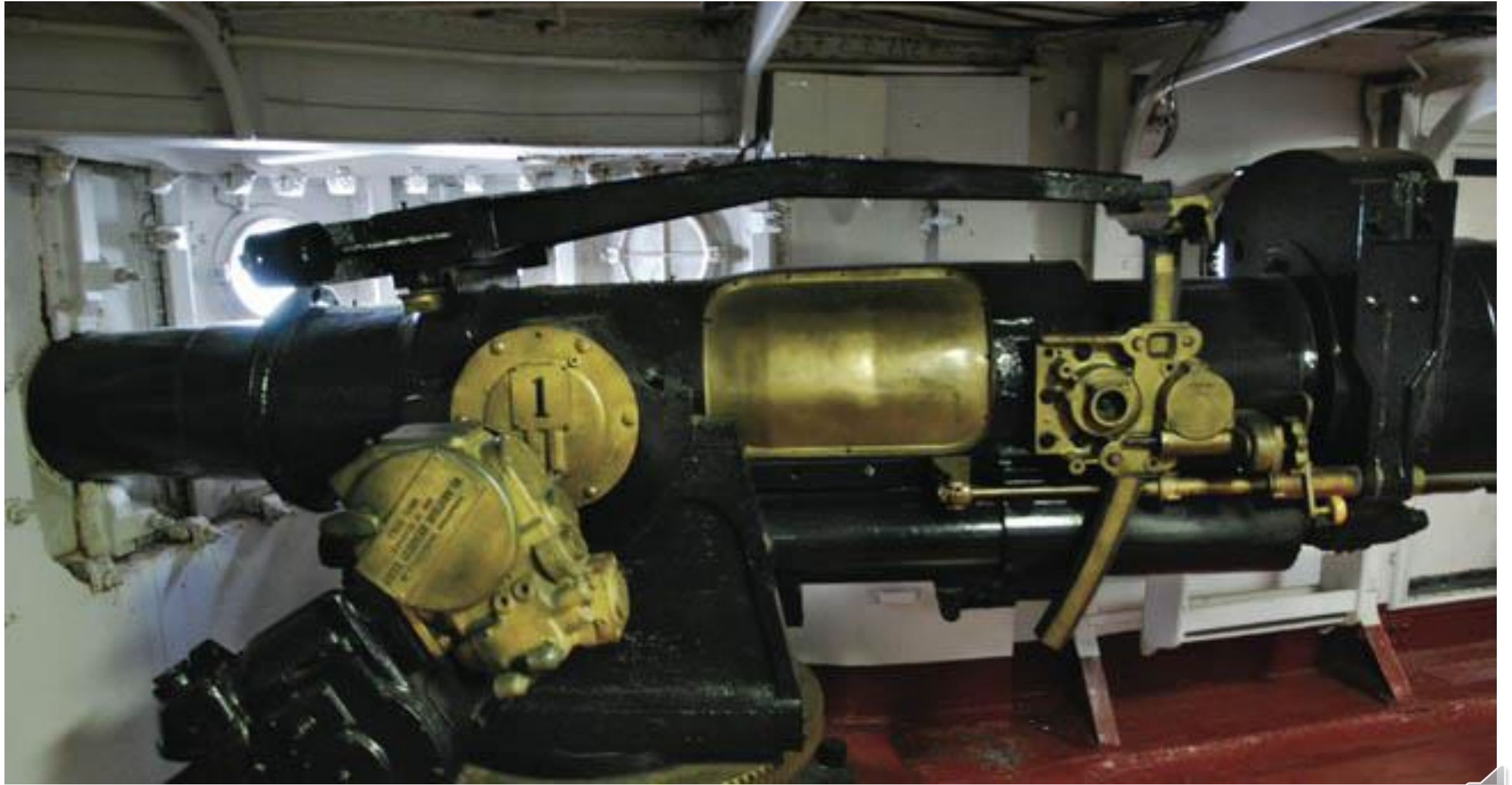
1904



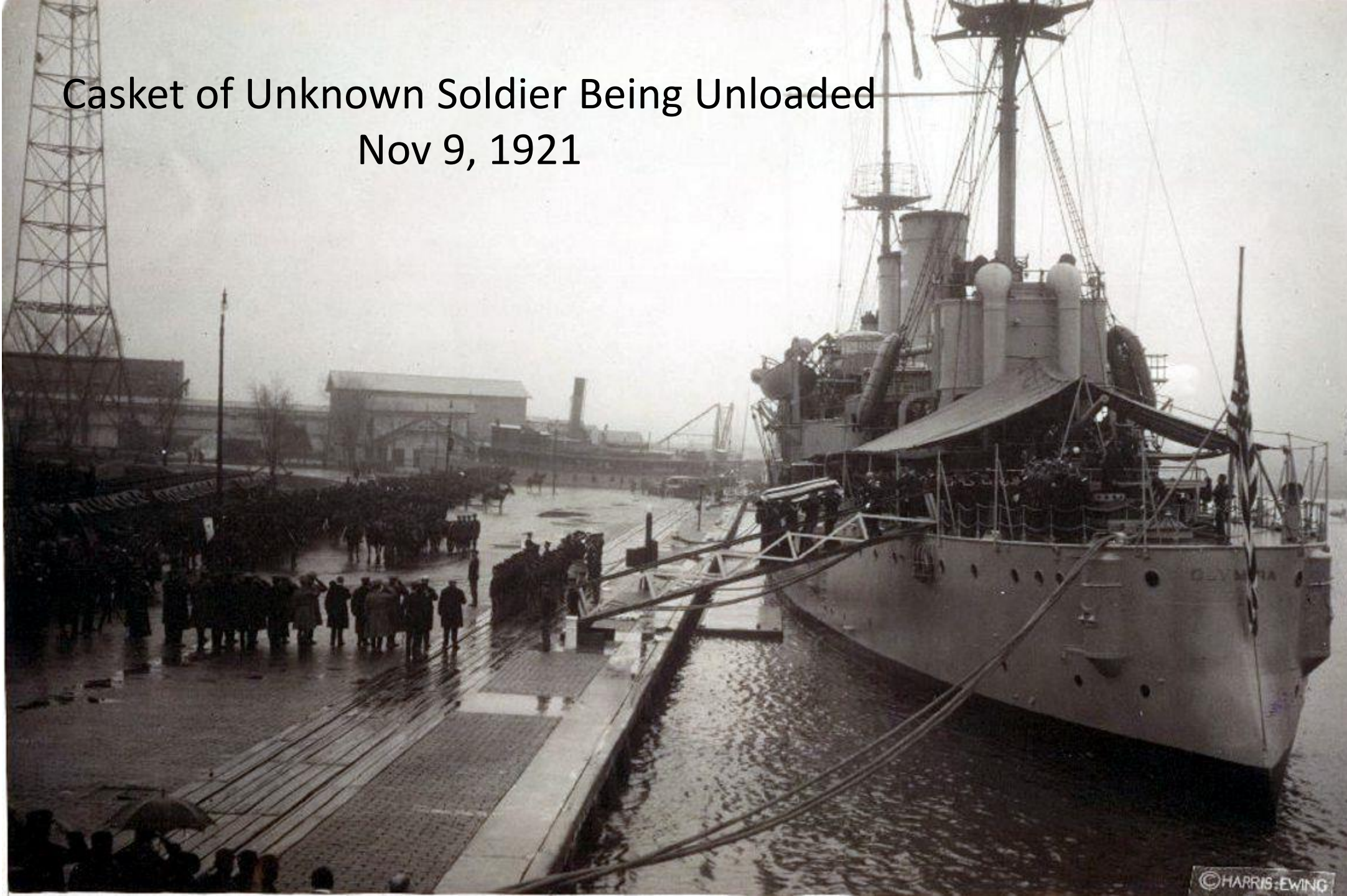
U.S.S. Olympia,
Boston Navy Yard,
Nov. 4, 1901.



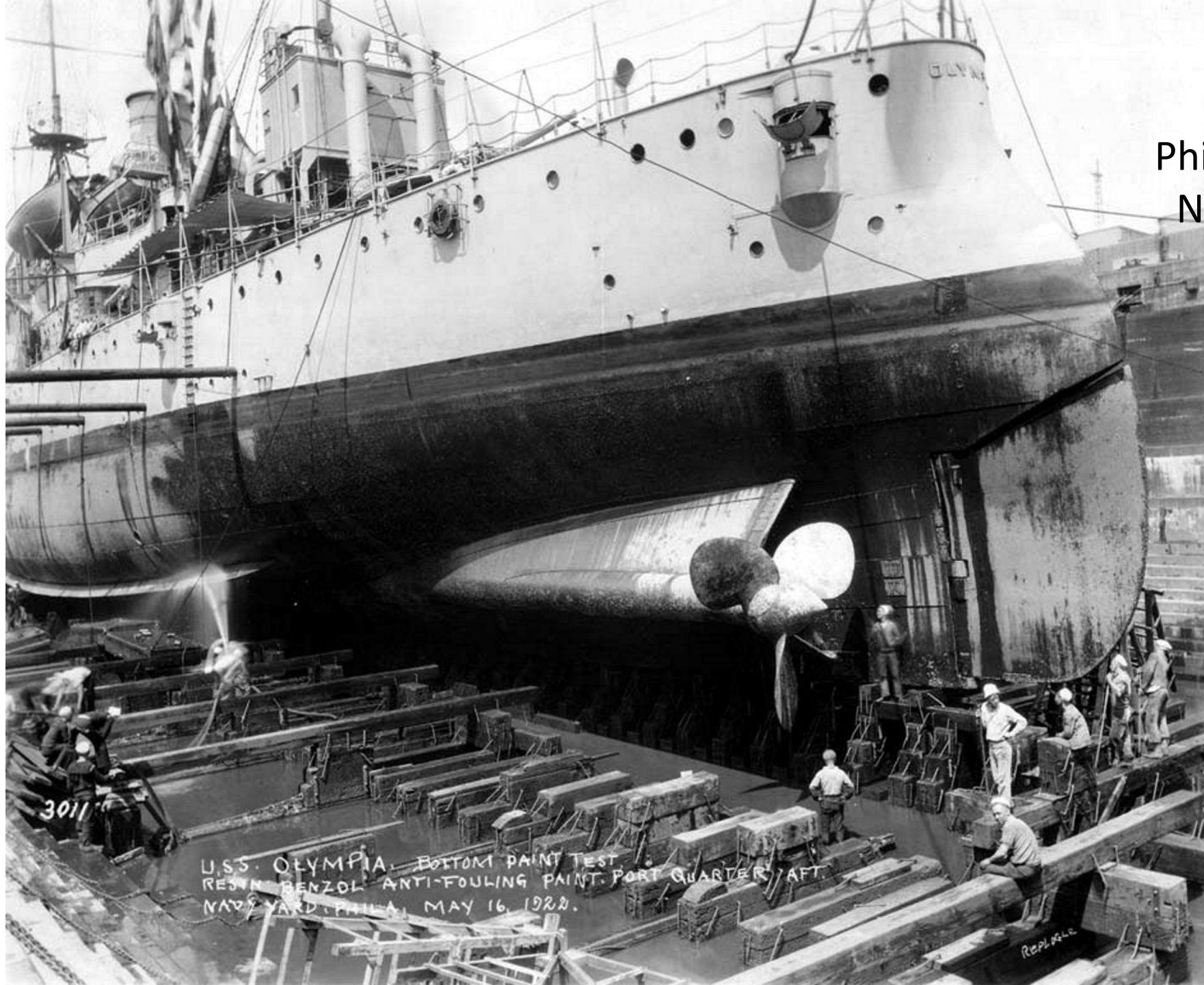




Casket of Unknown Soldier Being Unloaded
Nov 9, 1921



1922
Philadelphia
Navy Yard



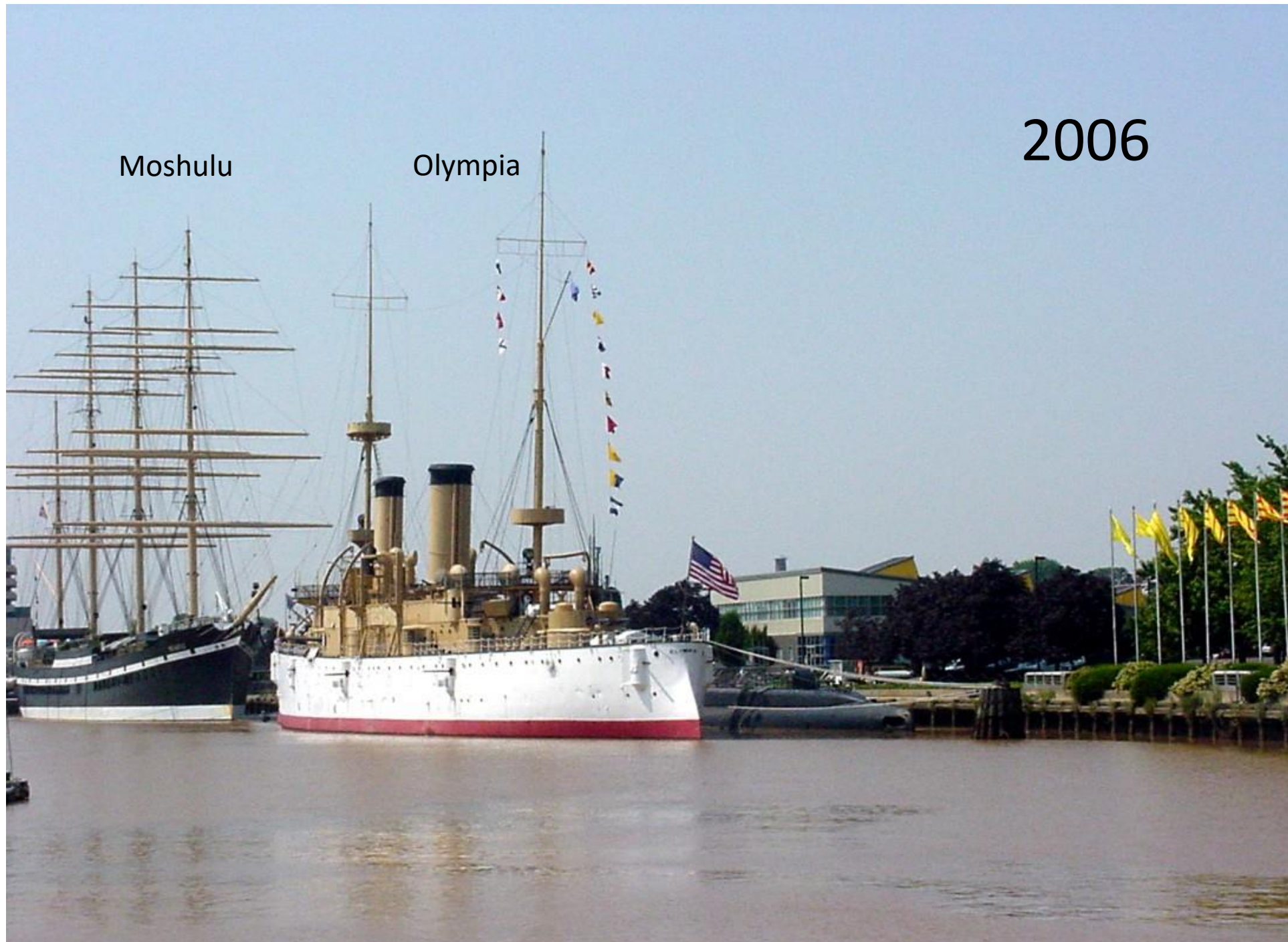
U.S.S. OLYMPIA. BOTTOM PAINT TEST
RESIN BENZOL ANTI-FOULING PAINT. PORT QUARTER YARD
NAVY YARD, PHILA. MAY 16, 1922.



Moshulu

Olympia

2006



SS UNITED STATES (the "Big U")



SS UNITED STATES

Name:	<i>United States</i>
Operator:	United States Lines
Port of registry:	New York City
Route:	Transatlantic
Ordered:	1949
Builder:	Newport News Shipbuilding and Drydock
Cost:	\$79.4 million (\$724 million in today's dollars)
Launched:	June 23, 1951
Maiden voyage:	July 3, 1952
Out of service:	November 14, 1969
Nickname:	The Big U



On her [maiden voyage](#) on July 3, 1952, *United States* [broke the transatlantic speed record](#) held by [RMS Queen Mary](#) for the previous 14 years [by over 10 hours](#), making the maiden crossing from the Ambrose lightship at New York Harbor to Bishop Rock off [Cornwall, UK](#) in 3 days, 10 hours, 40 minutes at an average speed of 35.59 knots (40.96 mph). The liner also broke the westbound crossing record by returning to America in 3 days 12 hours and 12 minutes at an average speed of 34.51 knots (39.71 mph), thereby obtaining both the eastbound and westbound speed records and the [Blue Riband](#), the first time a US-flagged ship had held the speed record since [SS Baltic](#) claimed the prize [100 years earlier](#).

United States maintained a [30 knots \(35 mph\) crossing speed](#) on the North Atlantic in a [service career that lasted 17 years](#).

United States lost the eastbound speed record in 1990 to [Hoverspeed Great Britain](#); however, [she continues to hold the Blue Riband as all subsequent record breakers were neither in passenger service nor were their voyages westbound](#).



LOGS OF THE RECORD CROSSINGS OF THE S.S. UNITED STATES

The S.S. UNITED STATES, flagship of the United States Lines, established new Atlantic speed records both eastbound and westbound on her maiden voyage, July 3, 1952. The superliner won the Blue Riband Speed Trophy gracefully, easily, and with plenty in reserve.



FACTS ABOUT THE *S.S. United States*

Length	999 feet
Breadth	161 feet 8 inches
Depth: Keel to top of superstructure	122 feet
Keel to top of forward funnel	173 feet
Number of decks	12
Propulsion	Steam Turbine—Quadruple Screw
Speed	33 knots plus
Gross tonnage	over 53,200

Total passenger berths	2,000
Total crew	1,400
Total cargo capacity, cubic feet	140,000
Refrigerated cargo space, cubic feet	40,000
Keel laid	February 8, 1950
Christening	June 23, 1951
Completion	June 20, 1952

Builders

Newport News Shipbuilding
and Dry Dock Co.
Newport News, Va.

Naval Architects

Gibbs & Cox, Inc.
New York, N. Y.

Interior Architects

Eggers & Higgins
New York, N. Y.

Interior Decorators

Smith, Urschalt &
Marekwald
New York, N. Y.



SS UNITED STATES





[The Hales Trophy for the fastest transatlantic crossing by a passenger ship is not only a test of speed, but a test of endurance and reliability.](#) The distinctive prize is ornamented with a globe of the earth, mythological gods of the sea and miniature paintings of selected Blue Riband winners, amongst them the *Hoverspeed Great Britain* (Hull 025 and now *High Speed Jet*).

The past three Trophy winners, all built by Incat, each in turn earned the right to fly the prestigious Blue Riband. [Since 1998, Cat-Link V \(049\) has held the Hales Trophy with a record of 41.284 knots.](#)

The essence of the Blue Riband dates back to the 1830s, when ships fought over the honour of being the fastest transatlantic liner. To encourage innovation in passenger transport and formalise the Blue Riband, Harold Hales, a British MP, commissioned and donated a four foot high, heavily gilded solid silver trophy, known as the Hales Trophy, in 1935.

[The last big liner to win the trophy was the SS United States on its maiden voyage in 1952, averaging 35.59 knots.](#)







United States had the most powerful [steam turbines](#) of any [merchant marine](#) vessel, with a total power of 240,000 [shaft horsepower](#) delivered to four [18-foot diameter](#) manganese-bronze [propellers](#).

This was the equivalent design of a [Forrestal-class aircraft carrier](#) and gave her the greatest [power-to-weight ratio](#) ever achieved in a commercial passenger liner, before or since.

The ship was could carry enough fuel and stores to steam non-stop for over 10,000 [nautical miles](#) (12,000 mi) at a cruising speed of [35 knots](#) (40 mph). Capable of steaming astern at over [20 knots](#) (23 mph).



United States' maximum speed was obscure for many years. An unlikely value of 43 knots (49 mph) was leaked to reporters by engineers after the first speed trial. A [*Philadelphia Inquirer*](#) article reported the top speed achieved as 36 knots (41 mph), while another source reports that the highest possible sustained top speed was 35 knots (40 mph).

capable of attaining 36 knots, which equates
to over 41 mph

Top speed was classified military secret!



Top Secret Turbine Engine



Shaft Alley (shaft connects engine to propeller)





SS UNITED STATES TECHNOLOGY

FOCUS OF DESIGN WAS SPEED

Design- long, narrow profile

Materials- Aluminum superstructure (lighter weight)

Propulsion- Four propellers driven by large steam turbines



Year	Owner	
1950-1969	United States Lines	Active Service
1969-1978	US Navy	Laid up in Norfolk, Virginia. Ken Wallis effort to acquire 1973
1978-1992	Richard Hadley	Intended to restore vessel to cruise service. Financing collapsed and ships interiors were stripped and sold at auction.
1992	US Marshals Office	The ship is seized after non payment of mortgage and docking fees
1992-1996	Marmara Marine, Inc.	Towed to Europe for asbestos removal
1996-2002	Edward Cantor	Purchased for \$6 million. Ship is passed onto his son Michael in 2002 after Edward's death.
2002-2003	Michael Cantor	Inherits the ship from his father.
2003-2010	Norwegian Cruise Line	Intended to restore the ship as a cruise liner. The 2008 Financial Collapse made this impossible.
2010-present	SS United States Conservancy	After a feverish Save our Ship campaign, the Conservancy raises \$5.8 million to save the ship from a scrapper sale.



First Class Restaurant



Actress Merle Oberon in First Class Dining Room



Judy Garland 1956



Monaco's Prince Rainier and his princess, the former Hollywood star Grace Kelly





A sense of forum was created by the use of the circular domed lighting and curved glass screens, separating the bar area from the dance floor. First class ballroom lounge; From the L Driscoll collection



Glass panels now decorate Celebrity Infinity SS United States Restaurant



Many passengers sailing the SS United States would be shocked if they knew the number of crew on board. We think of the ship as being a hotel with nearly 700 rooms. But it was also home for over a thousand crew members!

No wonder service, housekeeping and ops was so spectacular!

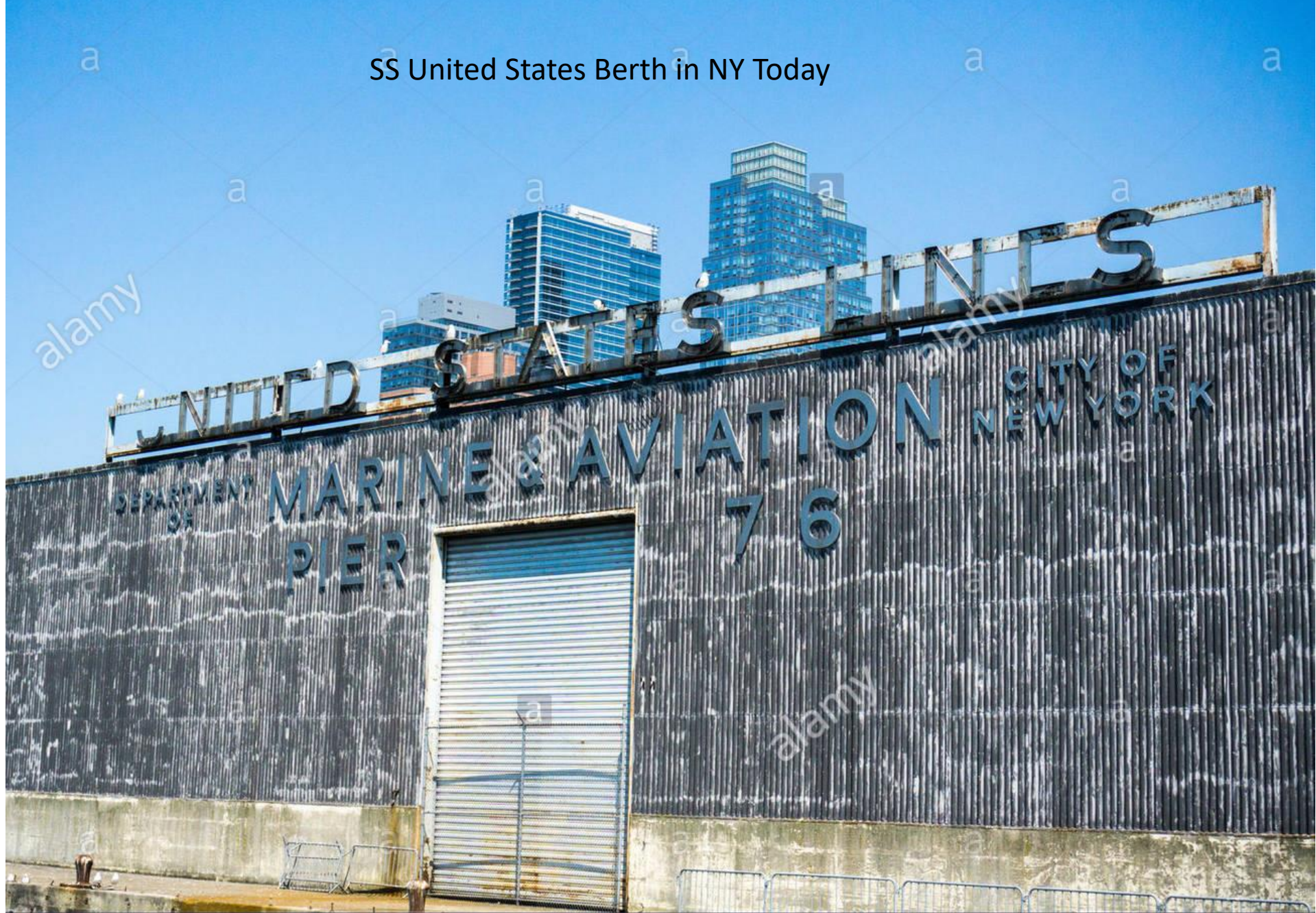
Where did they all live on board?

- Sports Deck.....24
- Sun Deck.....50
- Upper Deck.....74
- Main Deck.....64
- A Deck.....156
- B Deck.....413
- C Deck.....263
- D Deck.....22

Total: 1,066



SS United States Berth in NY Today



SS United States in Philadelphia Today



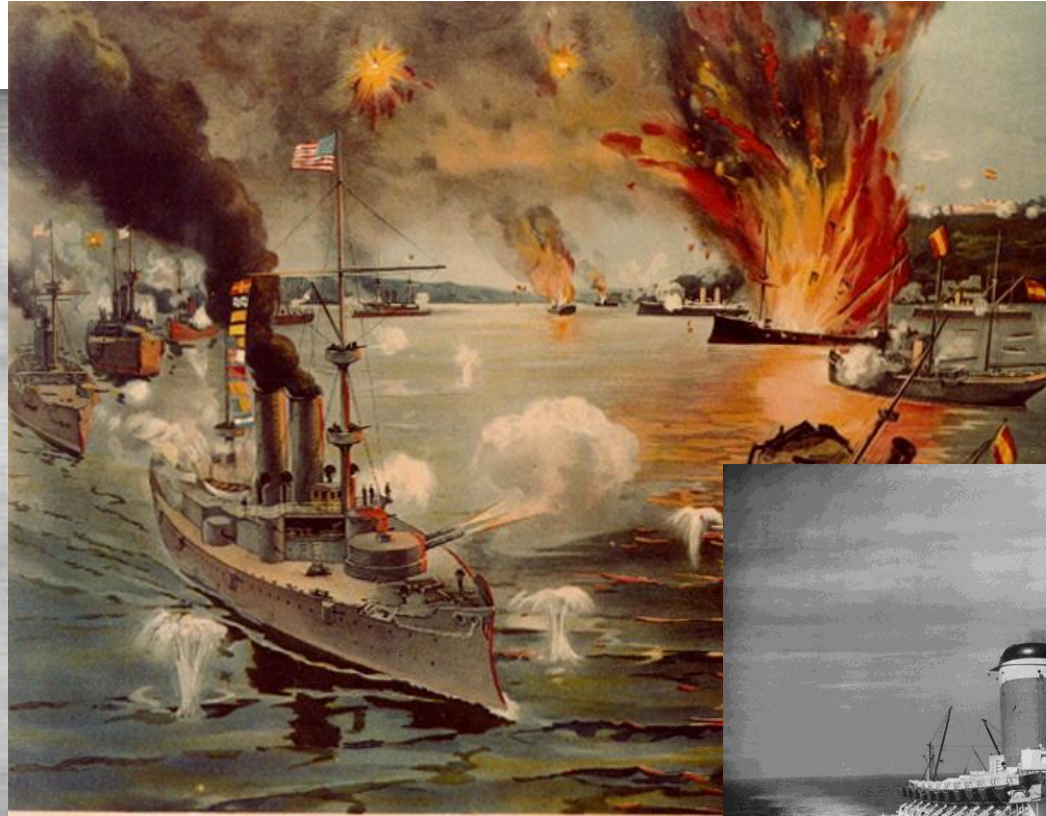
COMPARISON

	SV Moshulu sail power	USS Olympia steam power-coal	SS United States team power-oil	Carnival Inspiration electric power-oil
Built/Cost (today)	1904/ £36,000 (\$4.9MM)	1892/ \$1.8MM (\$50.3MM)	1952/ \$78MM (\$725MM)	1996/ \$270MM (\$415MM)
Length	359	344	995	855
Speed - kts	17	22	38	20
Beam	47	53	101	103
Draft	24	21	32	25
Weight- Displacement	1,700(7,000 with cargo)	5,586	53,350 (vs Queen Mary 75,000+)	70,367
Crew	38	428	1,096	920
Passengers	None	None	1,928	2,052-2,630
Power	Sail/donkey engine for winches	Coal-Triple expansion steam-17,000 hp	Oil-Steam turbine 240,000 hp	Diesel Electric 50,000 hp





Moshulu (ex Kurt)



BATTLE OF MANILA

USS Olympia

SS United States

