

SS *UNITED STATES*  
Pier 82, Columbus Avenue  
Philadelphia  
Philadelphia County  
Pennsylvania

HAER PA-647  
*HAER PA-647*

PHOTOGRAPHS  
COLOR TRANSPARENCIES  
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

## HISTORIC AMERICAN ENGINEERING RECORD

### *SS United States*

HAER No. PA-647

<b>Location:</b>	Pier 82, Columbus Avenue, Philadelphia, Philadelphia County, Pennsylvania
<b>Type of Craft:</b>	Passenger ship
<b>Trade:</b>	Transatlantic express liner service
<b>Propulsion:</b>	Steam turbines driving quadruple screws
<b>Dates of Construction:</b>	Keel laid: February 8, 1950 Christened: June 23, 1951 Delivered: June 20, 1952
<b>Naval Architects:</b>	Gibbs & Cox, Inc., New York
<b>Interior Architects:</b>	Eggers & Higgins, New York
<b>Interior Decorators:</b>	Smyth, Urquhart & Marckwald, New York
<b>Builder:</b>	Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia
<b>Original Owner:</b>	United States Lines Company
<b>Present Owner:</b>	SS United States Conservancy
<b>Disposition:</b>	Disused. Awaiting redevelopment.

**Significance:** The steamship *United States* is one of America's finest engineering achievements. Its design and construction between 1943 and 1952 harnessed the technological skill and industrial capacity of the United States after World War II to create the fastest and safest passenger ship ever built. It was a colorful, comfortable luxury hotel able to carry 2,000 passengers and 1,000 crew members across the inhospitable Atlantic Ocean at high speed in any weather at any time of year as well as to double, if necessary, as a naval auxiliary in times of national emergency. Its designers, led by the eminent naval architect William Francis Gibbs, paid unprecedented attention in its design and fit-out to reducing weight and preventing fire, with the result, in part, that more aluminum was used in the ship's construction than had been used in any construction project on land or sea up to that time. The ship's maiden voyage set records that still stand for the fastest east- and westbound crossings of the Atlantic Ocean by a vessel in commercial service. The *United States* enjoyed a healthy following among the traveling public and was widely acclaimed in professional circles for its performance, superlative engineering, and high quality construction. Unable to compete with commercial airliners without government subsidies, the ship was withdrawn from service in 1969. It has been idle since, and the SS United States Conservancy, the vessel's owner since 2011, is currently working to redevelop it as a shoreside attraction. The SS *United States* was listed in the National Register of Historic Places in 1999.

**Author:** Michael R. Harrison, 2012

**MARAD Design No.:** P6-S4-DS1

**Builder's Hull No.:** 488

**Official Registry No.:** 263934

**IMO No.:** 5373476

**Radio Call Letters:** KJEH

**Principal Measurements:**

Length (oa):	990'-0"
Length (lwl):	940'-0"
Length (bp):	905'-3"
Beam (molded):	101'-6"
Depth (molded):	74'-3"
Designed operating draft:	31'-3"
Maximum draft:	32'-4"
Displacement at max. draft:	47,264 long tons
Displacement at design draft:	45,400 long tons
Lightship weight:	30,817 long tons
Deadweight:	16,447 long tons
	(also given as 15,283 long tons)
Gross tonnage:	53,329
Net tonnage:	29,475
Shafts:	4
Normal shaft horsepower:	158,000
Maximum continuous shaft horsepower:	240,000
Maximum trial shaft horsepower:	247,785
Service speed:	33 knots
Maximum trial speed:	38.32 knots
Range at 35 knots:	10,000 nautical miles
Number of decks:	12
Cargo capacity (bale):	148,000 cu. ft.
Refrigerated cargo capacity:	48,000 cu. ft.
Bunker capacity:	10,306 long tons
Total passengers:	2,008
Total crew:	1,093
Theoretical troop capacity:	13,035
	(also given as 13,864, possibly counting ship's crew)

(The listed dimensions are as-built, but it should be noted that draft, displacement, and tonnages were subject to alteration over time as well as variations in measurement.)

<b>Cost:</b>	Total:	\$77.7 million
	National defense features subsidy:	\$26.3 (33.8%)
	Construction differential subsidy:	\$18.6 (23.9%)
	Cost to United States Lines:	\$32.8 (42.2%)

**Project Information:** Documentation of the SS *United States* was undertaken as part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. The Heritage Documentation Programs of the National Park Service, U.S. Department of the Interior, administers the HAER program. The project was prepared under the direction of Todd Croteau, HAER Maritime Program Coordinator. HAER Photographer Jet Lowe created large format photographs. James A. Jacobs and John Patrick Sabatos participated in the field team. Historian Michael R. Harrison led the field team and wrote the historical report, which was adapted from his script for *The Ocean Liner United States: Celebrating the Past and Future of America's Flagship*, an exhibition sponsored by the SS United States Conservancy and held at the Forbes Galleries, New York City, May 18 to October 20, 2012. The team wishes to thank Susan Gibbs, Executive Director, SS United States Conservancy, and Dan McSweeney, Managing Director, SS United States Redevelopment Project, for their generous support in providing access to the ship.

**Related  
Documentation:**

For information on the history and cargo operations of the United States Lines Company, see the following HAER documentation:

*American Racer*, HAER CA-346

## DESCRIPTION

The *United States* is a commercial steamship intended for express carriage of passengers and limited amounts of high-value cargo in liner service between New York City and ports in Northern Europe. The ship's long and proportionately narrow hull, with its straight, raking stem, slightly bulbous bow, cruiser stern, and long, fine entrance and run, was designed for speed balanced with good seakeeping. The welded steel hull supports an aluminum superstructure. The defining elements of the ship's profile are two large, raking funnels, a radar mast positioned just aft of the wheelhouse, and two pairs of king posts, one forward and one aft, for handling cargo from the ship's three holds, baggage room, and mail room.

The ship has twelve decks, eight in the hull and four in the superstructure. A preponderance of the interior was formerly dedicated to passenger and crew accommodations and included 695 passenger staterooms in first, cabin, and tourist classes; two dozen public rooms; several miles of passageways and open and enclosed promenades; as well as three galleys and crew working areas of all kinds. Few of these compartments remain today, as virtually all of the vessel's interior finishes and joiner partitions were stripped out in the 1990s as part of hazardous materials abatement.

The high-performance propulsion system, which remains in place, comprises eight oil-fired steam boilers divided between two boiler rooms and four high-speed geared turbine sets divided between two independent engine rooms. The turbines in the forward engine room formerly drove a pair of outboard, four-bladed propellers; those in the after engine room drove a pair of inboard, five-bladed propellers. The propellers have been removed, and one of each type is stowed on the ship's deck.

The boilers are of the Babcock & Wilcox type with ten burners each, those in the forward boiler room manufactured by Babcock & Wilcox and those in the after boiler room by Foster Wheeler Corporation. They were designed to operate at a superheater outlet pressure and temperature of 1000 pounds per square inch gauge (psig) and 1000 degrees F but were run in service at 950 psig and 965 degrees F to reduce superheater maintenance. The turbines and reduction gearing were made by Westinghouse Electric Corporation. Electrical supply was generated by six 1,500-kw General Electric turbo-generators, installed two in each engine room and one in each boiler room. Diesel emergency generators, also still in place, are located in compartments on the Navigating Bridge Deck forward and the Promenade Deck aft. The forward auxiliary machinery room contains four York air-conditioning machines and three Griscom Russell water distillers, each with a capacity of 250 tons of water per day. Similar equipment is installed in an after auxiliary machinery room.

The ship's lifesaving equipment originally included two 26' rescue boats with 40-person capacity, two 36' motor lifeboats with 133-person capacity, and twenty 36' hand-propelled lifeboats with 140-person capacity. These and their davits were all removed from the vessel in the 1990s.

## HISTORY

By the end of World War II, the United States had the largest merchant fleet and the most powerful navy in the world, but the national prestige that came from having the best and fastest transatlantic passenger liners still belonged to Britain and France. Capitalizing on

Americans' wartime and postwar pride, optimism, and technological ability, the United States Lines Company commissioned preliminary design studies for the world's most advanced passenger ship in 1943 followed by further research and design work in 1946. This intensive development and design period resulted in the completion in 1952 of the passenger liner *United States*, the fastest and, arguably, the finest engineered merchant ship ever built in America.

Dates of Construction	
Research & development begun:	1943
Design begun:	March 1946
Bids submitted:	December 1, 1948
Construction authorized:	April 8, 1949
Contract awarded:	May 3, 1949
Keel laid:	February 8, 1950
Christened:	June 23, 1951
Delivered:	June 20, 1952

The *United States* was the brainchild of self-taught naval architect William Francis Gibbs, head of Gibbs & Cox, Inc., of New York City, the world's largest naval architecture and marine engineering firm. Under the leadership of Gibbs and his brother Frederic Herbert Gibbs, the company grew through the 1930s and 1940s into the leading designer of warships and high-performance, high-pressure steam-engine plants for the U.S. Navy, experience that directly influenced the advanced design and exacting engineering of the *United States*. It was William Francis Gibbs's life-long study and deep understanding of the requirements of express liners, as well as his firm commitment to perfection in every detail that made this passenger ship, as he himself immodestly put it, "far superior to anything in the world."<sup>1</sup> It was also his influence that convinced United States Lines to order such a large and powerful ship when its directors sought to modernize the company's passenger fleet after World War II.

Gibbs & Cox collaborated closely with United States Lines, federal agencies, and the Newport News Shipbuilding and Dry Dock Company to fashion a vessel that would be faster and safer than any ship in the world. To justify and fund this expensive effort, the firm designed the ship to double as a troopship. As such, it could be quickly converted to carry about 13,000 troops and was equipped with sufficient fuel-oil tanks and fresh-water-generating capacity to steam 10,000 miles without stopping – a range 67 percent greater than the ship's commercial needs. The navy paid one third of the ship's \$77.7 million price tag through a national defense features subsidy. The Maritime Administration contributed \$18.6 million through a construction-differential subsidy and provided an additional \$6.3 to \$10.2 million annually in operating-differential subsidy funding during the seventeen years the ship was in service.

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<sup>1</sup> U.S. Congress, House, Committee on Merchant Marine and Fisheries, *Superliner Legislation: Hearings before the Committee on Merchant Marine and Fisheries . . . on H.R. 9342 to authorize the construction and sale by the Federal Maritime Board of a superliner passenger vessel equivalent to the steamship United States . . . [and] H.R. 9432 . . . 85th Cong., 2d sess., Feb. 6, 1958, 177.*

"This ship is the product of a prodigious explosive power," Gibbs declared, "American industry!"<sup>2</sup> Indeed, in addition to the labor of hundreds of employees at Gibbs & Cox and over 5,000 at the shipyard, more than 800 firms from twenty-eight states built items for or supplied fittings or materials to the *United States*. (Some reports said it was all forty-eight states.) As the editors of *Marine Engineering and Shipping Review* put it, "it is the belief of both Newport News and Gibbs & Cox that the total hours of technical work, investigation, and research applied to this project are many times greater than have ever been required in the case of any other ship of any type. It was this careful technical effort which accounts in large part for the outstanding performance of the ship."<sup>3</sup>

To protect defense secrets and stymie foreign commercial competitors, Gibbs ensured that many of the ship's technical details – such as its true top speed and its underwater hull form – were kept secret. (The navy declassified them in August 1968, a year after Gibbs's death). Still, it was widely publicized that the liner incorporated large quantities of lightweight materials to reduce weight and improve stability. Its powerful engines were compact, based on those developed for aircraft carriers. Its interior was fully air conditioned. And, as everyone who read a newspaper knew, the ship was fireproof to a degree never before achieved on a commercial vessel.

As William Francis Gibbs told a reporter for the *New Yorker*, "You can go into one of the staterooms [on the *United States*] and, if you're a rich man, you can set fire to your luggage, and nothing else will burn."<sup>4</sup> This accomplishment – total fireproofing – was the result of Gibbs's special fervor in carrying out and far surpassing marine fire-safety requirements he himself helped to establish in the U.S. in the 1930s in response to a series of shipboard fire disasters. Five-hundred-thousand square feet of Marinite asbestos-containing panels partitioned the ship's interior. Green Neotex latex composition covered the sports decks. Glass-fiber, synthetic fabrics, ceramics, glass, and metals formed the decor. Wood was banned, except in a few special places: the two butcher's blocks in the galleys, the eleven pianos, the bilge keels, the propeller-shaft bearings, and the salt and pepper mills in the dining saloons. Over time additional wood came aboard in the form of high chairs, bassinets, and bed lee-boards. (Gibbs's attempt to procure a custom aluminum piano from Steinway & Sons was rebuffed with a firm assurance that standard models would not burn.) To save weight and improve stability and maneuverability, 1,400 tons of aluminum alloy went into the ship's superstructure and giant smokestacks. Six-hundred additional tons were fabricated into furniture, doors, ducts, lifeboats, railings, vases, picture frames – anything that could be made fireproof or lighter by its use. More aluminum went into the *United States* than had ever been used in any vessel or building up to that time.

Although Gibbs & Cox designed the ship, the architects Eggers & Higgins of New York City laid out its interior, and Anne Urquhart and Dorothy Marckwald of the Manhattan firm of Smyth, Urquhart & Marckwald designed the decor. Because of the stringent fire precautions, nothing used to decorate the ship could burn. Instead of traditional woods, the

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<sup>2</sup> "Steamship *United States*," *Marine Engineering and Shipping Review* 57, no. 9 (January 1952): 85.

<sup>3</sup> *Ibid.*, 84.

<sup>4</sup> "Mr. Gibbs's Baby," *The New Yorker* (Nov. 16, 1957), 43.

interior featured aluminum furniture and trim, rubber flooring, glass tabletops, and synthetic-fiber bedspreads and draperies. In total, 15,500 pieces of bespoke furniture were made for the ship, all upholstered with custom, noninflammable fabrics.

The resulting interiors were clean, bright, and awash with color. “Reds, greens, pleasant blues, and warm browns are blended to create an atmosphere of quiet relaxation,” *Newsweek* reported. *Marine Engineering* lauded the ship’s “smooth, ease-giving functional ingenuity and native American good taste.” Responding to criticism that the interior spaces were perhaps a touch too spare and modern, William Francis Gibbs is said to have declared, “The *United States* is a ship, not an ancient inn with oaken beams and plaster walls.”<sup>5</sup>

Dorothy Marckwald and Anne Urquhart worked for three years with a dozen assistants out of a tiny Manhattan office to plan the interior decoration of the ship’s many public spaces and hundreds of passenger staterooms. Veterans of over two dozen maritime projects dating back to 1930, the pair also designed the interiors of the ship’s older running mate, *SS America*, as well as other ships in collaboration with Gibbs & Cox.

The interior designers hired muralist Hildreth Meiere and sculptor Austin Purves Jr. to organize the liner’s overall decorative-art program. Meiere and Purves selected Americana, nature, and the sea and sky as organizing themes, and hired a dozen artists to execute works for specific rooms. The constraints of fireproofing demanded creative use of materials and, sometimes, the creation of new techniques by the artists.

Peter Ostuni interpreted Navajo sand paintings for the first-class cocktail lounge using powdered enamel fired onto copper. Gwen Lux sculpted lightweight symbolic figures for the first-class dining saloon out of Foamglas, an insulating material. Charles Gilbert sandblasted sea-life designs onto glass panels for the ballroom. Austin Purves modeled bas-relief animals and flowers in aluminum for stair landings. Michael Lantz formed extruded aluminum into figures representing the constellations for the cabin-class dining saloon. Mira Jedwabnik made vitreous enamel cocktail-table tops representing the night sky reflected in the sea for the first-class observation lounge as well as enamel plaques of North American birds for one of the first-class suites. Louis Ross executed Hildreth Meiere’s design for a stylized map of the Mississippi River in the cabin-class lounge using nonflammable gesso and metal leaf on aluminum.

The *United States* boldly asserted American industrial superiority and American style on the world stage. On its 1952 maiden voyage, the new ship became the first American vessel in 100 years to claim the mythical “Blue Riband” for the fastest commercial crossing of the Atlantic Ocean, beating the Cunard liner *Queen Mary*’s 1938 east- and westbound records by a wide margin and with power to spare. Greeted by enormous crowds in ports on both sides of the Atlantic and rewarded by healthy ticket sales, the ship was apostrophized in the press as a “nautical wonder.”

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<sup>5</sup> “S.S. *United States*: First Lady of the Seas,” *Newsweek* (June 30, 1952), 84; “Steamship *United States*.” *Marine Engineering and Shipping Review* 57, no. 9 (January 1952): 99. The Gibbs quote, which may be apocryphal, is from John Malcolm Brinnin, *The Sway of the Grand Saloon: A Social History of the North Atlantic* (New York: Delacorte Press, 1971), 524.

Maiden Voyage Records, 1952

Eastbound	July 3-7	Ambrose Lightship to Bishop Rock Distance: 2,942 nautical miles Time: 3 days, 10 hours, 40 minutes Average speed: 35.59 knots
Westbound	July 10-14	Bishop Rock to Ambrose Lightship Distance: 2,906 nautical miles Time: 3 days, 12 hours, 12 minutes Average speed: 34.51 knots

Publicity writers lavished attention on the celebrities, royalty, and captains of industry who sailed on the *United States*, but most passengers were vacationers, business travelers, and students, as well as military families and foreign-service employees being sent abroad or returned home at government expense. The highlights of every day aboard, many passenger accounts agreed, were the meals, but lounging in deck chairs, watching the sea from the rail, playing cards in the lounge, socializing at the bar, relaxing in bed, watching movies in the theater, and dancing in the ballroom were, for those not prone to seasickness, the delights of five days on the world's fastest ship.

The *United States* carried a crew of about 1,000, or about one crew member for every two passengers. The deck and engine departments held primary responsibility for the ship's safe passage, but the purser's and steward's departments made the passenger experience possible. The crew, many based in New York City and New Jersey, worked long hours and spent weeks at a time away from home in exchange for the best working conditions available in America's shrinking postwar merchant marine. Their quarters, although spare, were more spacious and comfortable than on any other merchant ship of the time.

The *United States* entered service during a travel boom, and, with its subsidy assistance, made a profit for United States Lines through 1960. Competition from jet aircraft, which already carried 40 percent of transatlantic travelers when the ship was new, cut into the revenue of all passenger liners by the end of the 1950s, and the ship began to operate at a loss in 1961. (See Appendix I.) Profitability was further hurt by missed sailings due to labor strikes in 1961, 1962, 1963, 1965, and 1969. The ship sailed on its first winter cruise in 1962; although cruise sailings increased over the decade, the ship was not well suited to this type of service. New owners of United States Lines allowed the company's operating-differential subsidy contract to expire at the end of 1969 to free the company from many government constraints. Without this funding, the *United States* became prohibitively expensive to operate and was withdrawn from service in November.

Throughout its seventeen year career, the ship never sailed late nor had a sailing cancelled because of mechanical failure, and its lifetime average speed in revenue service was 30 knots. These records for reliability and speed are unmatched by any other liner sailing the unpredictable and dangerous North Atlantic.

United States Lines sold the ship to the Maritime Administration in 1973. The agency in turn sold the ship to Richard Hadley in 1980, but his United States Cruises venture was not successful in raising the funds necessary to put the ship back into operation. In October

1984, Hadley sold the majority of the ship's furniture and fittings at a massive three-day auction. In October 1991, the ship was arrested for non-payment of docking fees and then sold for \$2.6 million at an April 1992 auction to Marmara Marine, a concern operated by Fred Mayer and Kahraman Sadikoglu. These men had the ship towed to Istanbul, Turkey, for a planned refurbishment in an ironically long thirty-six day voyage in June–July 1992. No work was done at Istanbul, but in October 1993 the ship was towed to Sevastopol, Ukraine, where the interior was stripped down to the structural members as asbestos-containing joiner panels and insulation were removed throughout the ship. The *United States* returned to Istanbul in April 1994, where the lifeboats, davits, metal ducts, and other components from the interior were gradually removed for their scrap value while financing was sought for a full refit. To prevent further scrapping, Mayer had the ship towed back to the United States in June–July 1996. By the end of 1996, the ship was docked at Pier 82 in Philadelphia, where it has remained to the present.

In 1997, the ship was arrested again for non-payment of mortgage and then purchased by creditor Edward Cantor at auction. Cantor's estate sold the ship to Norwegian Cruise Line (NCL) in 2003, but plans to renovate it for service in the Hawaiian cruise market were undercut by the global economic recession. When no purchasers expressed interest in buying the ship, the owners solicited bids from scrappers. The nonprofit SS United States Conservancy, founded by William Francis Gibbs's granddaughter Susan Gibbs and other ocean-liner enthusiasts in 2004 to help raise NCL's awareness of the ship's history, was able to secure a \$5.8 million pledge from Philadelphia businessman and philanthropist H. F. "Gerry" Lenfest to buy the ship from NCL and pay its carrying costs for twenty months. The conservancy took ownership of the ship in February 2011 and is working at the time of writing to secure funding to redevelop it into a multipurpose waterfront attraction. If the conservancy is not successful in this effort, its board will be forced to sell the ship for scrap.

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APPENDIX I:  
 Annual earnings of the SS *United States*, 1955-1969<sup>6</sup>

EARNINGS RECORD

Year:	Revenue	Voyage expenses	Subsidy	Owner's expenses	Profit/loss
1955.....	\$19,792,939	\$18,338,837	\$6,265,112	\$4,717,815	\$3,377,867
1956.....	20,949,233	20,245,882	7,044,612	4,833,741	3,367,371
1957.....	20,365,107	20,709,858	6,636,369	4,634,044	2,091,998
1958.....	20,254,463	20,262,426	6,558,159	5,019,298	1,941,905
1959.....	20,469,454	20,957,637	7,181,190	5,338,530	1,816,876
1960.....	20,148,373	21,837,371	7,533,591	4,964,932	1,515,829
1961.....	16,189,646	21,477,874	7,447,395	5,094,381	(2,415,369)
1962.....	18,897,348	22,257,747	7,443,986	4,832,015	(504,453)
1963.....	16,656,247	19,567,940	6,659,468	4,850,132	(956,909)
1964.....	17,198,964	22,492,010	7,907,868	5,072,757	(2,189,599)
1965.....	11,347,973	18,115,419	6,347,825	4,831,662	(4,868,131)
1966.....	18,493,773	24,065,760	7,849,329	5,466,242	(2,721,733)
1967.....	16,449,833	25,019,536	8,718,609	5,337,181	(4,645,258)
1968.....	16,870,984	26,886,067	10,182,430	5,492,865	(4,765,471)
1969.....	17,762,167	26,040,486	9,626,712	6,597,501	(4,693,918)

Note: The 1965 figures reflect a 77-day work stoppage of the SS "United States," and the 1969 figures are basically 10-month results except that layup costs are included for 2 months.

<sup>6</sup> U.S. Congress, House, Committee on Merchant Marine and Fisheries, *Passenger Vessels: Hearings before the Subcommittee on Merchant Marine . . . on H.R. 10577 a bill to authorize the foreign sale of certain passenger vessels*. 92d Cong., 1st sess., April 27-29, May 3-5, 17, 20, and September 21-22, 1971, p120.