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NATHANAEL G. HERRESHOFF—THE "GREAT MASTER"

For Nearly Half a Century His Influence Had a Dominating Effect on American Yachting

By HERBERT L. STONE



IF, AS HAS been said in a previous article of this series, the "big four" in naval architecture, A. Cary Smith, Edward Burgess, William Gardner and Nathanael Herreshoff, dominated the field of yacht designing from the 1870's to 1920, then undoubtedly the last named had a greater influence on the development of the sport in America than any other single person. He was the most widely known designer and yacht builder this country has ever produced. His fame spread around the world and the period of his greatest activity, from 1890 to 1920, might almost be called the "Herreshoff era," so greatly did his personality and the yachts he designed dominate the sport. From the *Vigilant* in 1893 to the *Resolute* in 1920, every defender of the America's Cup came not only from his board but from the Herreshoff plant at Bristol, R.I. Many of his creations had a marked effect on the development of design in this country and he probably turned out more successful one-design classes than any other designer.

With all these achievements to his credit it is an impossible task to tell the full story of his life and accomplishments in a single article in a magazine. The most one can do in that space is to touch the high spots of his career, look at the yachts he designed that had a decisive influence on the sport, or that marked a turning point in design and in his own thinking. Someday there should be a biography of Nathanael Herreshoff in book form. Perhaps his son Francis has already started on this in a magazine series recently published.

While Nathanael G. Herreshoff acquired his greatest fame as a designer and builder of yachts he started his career as an engineer and received his training for that profession at the Massachusetts Institute of Technology. After graduation, young Herreshoff went to work with the Corliss Engine Works in Providence, R.I. It was there that he got his experience in engine designing which enabled him to develop lightweight steam engines, for both yacht and naval use, which brought him into prominence before he turned his talents seriously to the designing and building of racing yachts. But being brought up on the shores of Narragansett Bay, he became a skillful sailor, and the sailing yacht was never far from his mind. Sailing was "in his blood" as the saying goes.

Born in 1848, the grandson of Frederick Herreshoff, an engineer who came from Prussia in 1790 and settled in Rhode Island, Nathanael and an older brother, John B. Herreshoff, spent much of their time on the water and in

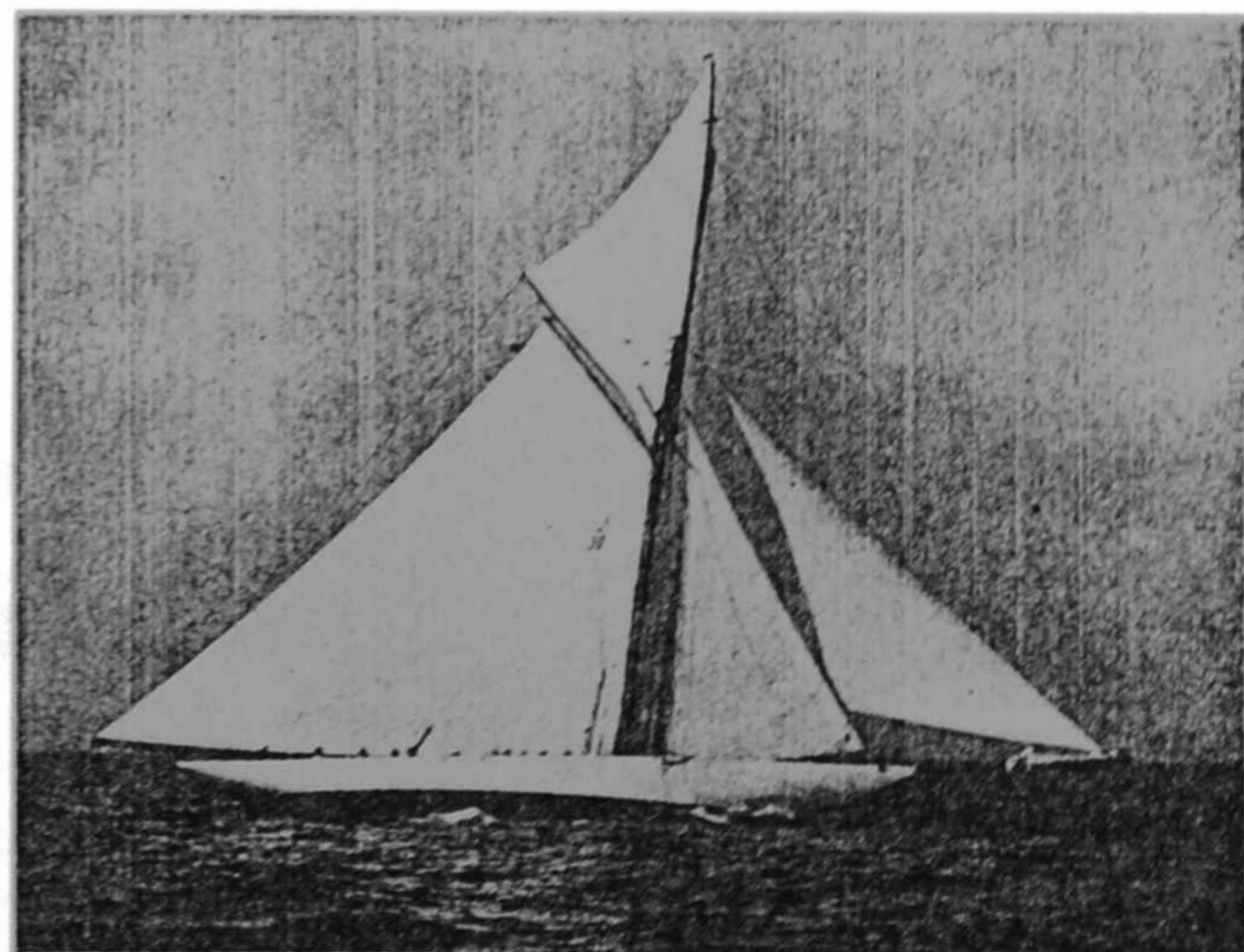
sailing and building small boats, mostly for their own use. Early in life John B. fitted up a work shop in which he did wood turning and metal work, and when in 1855 the family moved into Bristol from their home across the harbor he had a greater opportunity to develop his flair for boatbuilding and mechanical work. About this time, at the age of 14, John B. became totally blind, his eyesight having been defective from childhood. However, with his indomitable will and energy he kept on with his chosen work and in the next few years he built, with the help of his father and a brother, several sailboats and fitted up a shop for boat building, as well as one for machine work. In 1863 he enlarged his shop and went into the building of boats as a business, and in the following year was so well established that no less than eight sailing craft were launched there, ranging from 22 to 35 feet in length. This was the beginning of the business that developed over the years into the Herreshoff Manufacturing Co.

After a few years it was evident that John B. needed more assistance in his growing business, which required much designing and engineering work. So his

brother Nathanael left the Corliss Engine Company in 1878 and joined the fast growing company at Bristol. This was to have been expected as "Nat" had been a constant companion of his older brother and his "eyesight" since John's



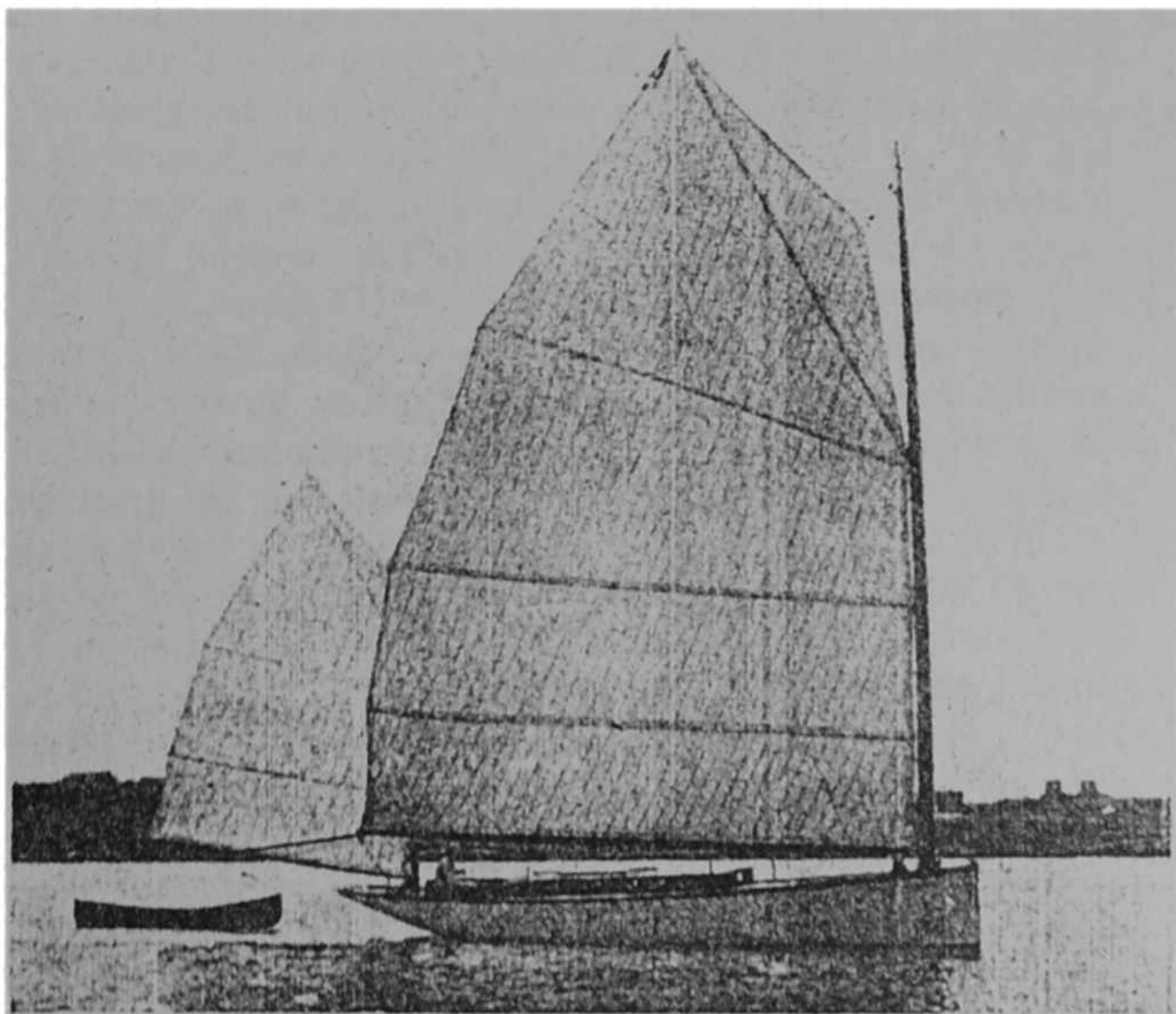
Nathanael G. Herreshoff — the "Great Master" himself



"Gloriana," designed in 1891, had a great effect on future yacht design. She was unbeaten during her first season



The Bristol, R.I., shop of John B. Herreshoff as it appeared in 1866. On the ways is the 33-foot "Clytie"



In the late 80s Nathanael Herreshoff designed and built a novel cat-yawl, the "Clara," for his own use

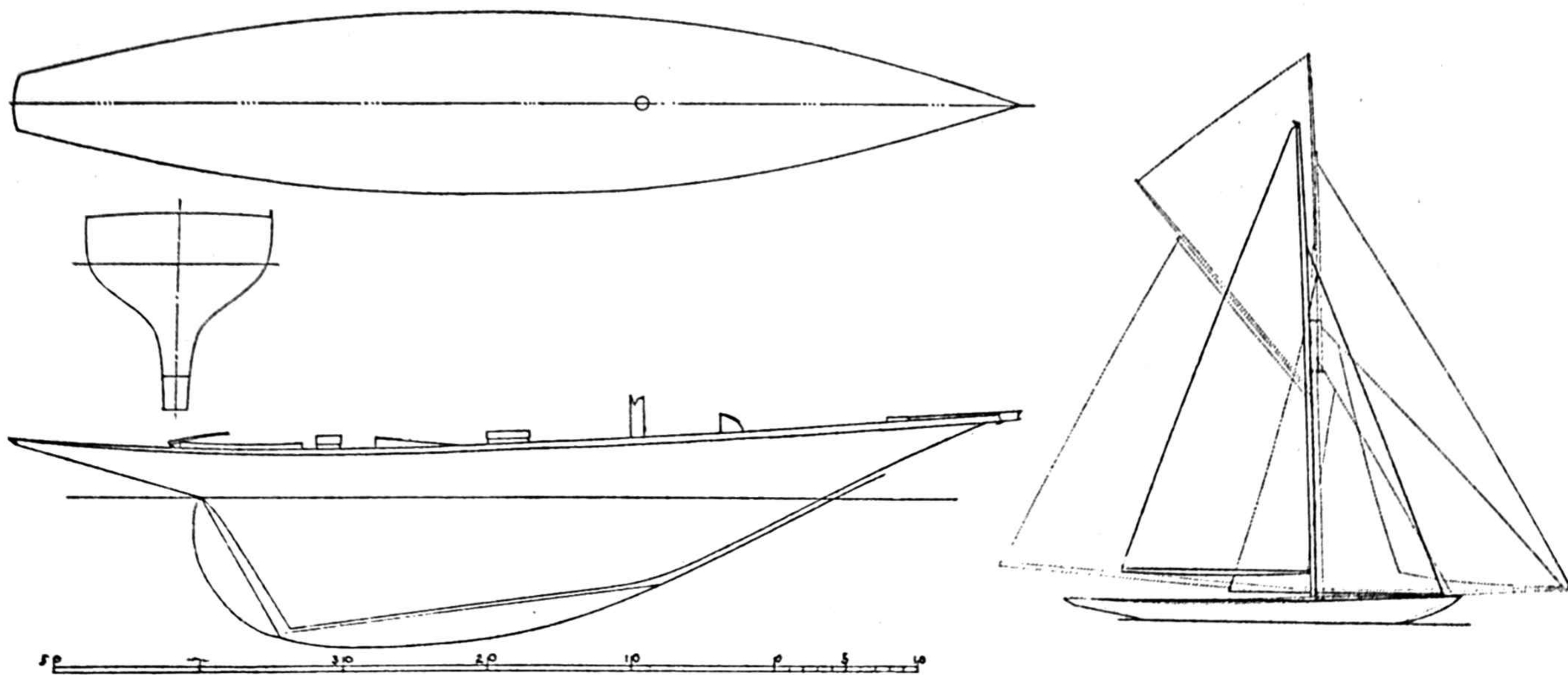
blindness when Nat was only eight years old. Even in a boat built by John B. in 1859-60, the *Sprite*, the younger brother did what drafting was necessary and he continued to help in that part of the work while at Tech and later at the Corliss Works, making the plans and doing the drafting after working hours and in his spare time.

When Nathanael joined the firm most of the work of the shop was in steam driven craft and their machinery. John B.

had built his first steamer in 1868, to be followed by others in which the company developed the machinery and boilers as well. These were commercial vessels, pleasure launches, and later steam yachts and small fast naval vessels. About 1875 they built the first torpedo boat for the U. S. Navy, named the *Lightning*, which made a speed of 21 knots on her trials. She was followed by other vessels for the Navy. This was the state of the business when Nat became active in the company. Occasionally an order would come in for a small sailing yacht, and Nat always had a boat of his own to sail and experiment with, but the main work of the plant was in steam craft. It would take a chapter itself to describe and list the various steam driven yachts, naval vessels and other craft turned out during this period and give the details of the many experiments that were constantly being made in their development. As space limitations forbid, we must get back to Nathanael's work in sailing yachts, on which his great reputation was made.

It was about 1890 that a return to the building of sailing yachts came about at the Herreshoff shop at Bristol, now grown into a "plant" through improvements and enlargement over the years. During the late '80s Nat had designed and built for himself a cruising yacht with a novel cat-yawl rig, called the *Clara*. She had a plumb stem, a long after overhang, full length battens in her sails and other interesting features. She was, as all of Nathanael's boats, a smart sailer. She so impressed Commodore E. D. Morgan of the New York Yacht Club by her many fine qualities that he placed orders for two somewhat similar boats except that they were to have overhangs forward instead of the plumb stem. These were the cat-yawls *Pelican* and *Gannet*.

In the autumn of 1890, a new class of 46-foot waterline sloops was proposed to take the place of the somewhat smaller 40-footers which had become popular, and which had grown into a sizable fleet. A number of new yachts were ordered for this new class, five of them being from the board of Edward Burgess, of Boston, then one of the most prominent yacht designers by reason of his success with his America's Cup defenders, *Puritan*, *Mayflower* and *Volunteer*, and, following them, with some of his 30-footers and 40-footers. Designs for other yachts in the new class of 46-footers went to various designers. Commodore E. D. Morgan discussed a boat for this class with Nat Herreshoff and the latter submitted to the N.Y.Y.C. commodore the design of a boat, which was built and was destined not only to have a marked effect on the future of yacht design, but to bring immediate fame to her designer. This was the *Gloriana*, which at once jumped to the top of her class. Winning her first race of 1891,



The plans of "Gloriana," 70' x 45'9" x 13', designed and built in 1890 for Commodore E. D. Morgan of the New York Y.C. Her sail plan (dotted lines) is superimposed on that of the much later 12 meter-"Vim," a boat of nearly identical dimensions

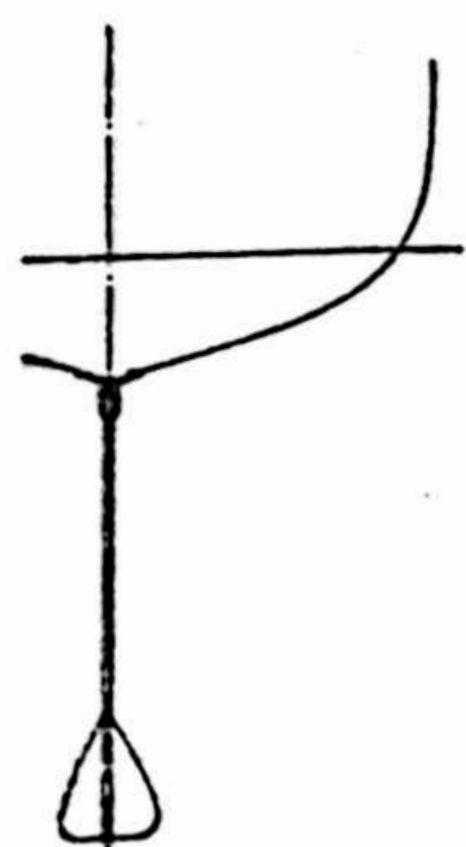
In New York waters, and making a clean sweep of the season, including a race for the Goelet Cup, which had never been won before by anything but a sloop of the largest size, *Gloriana* was not beaten in her first year. This was a great achievement as several other of the new 46's were distinctly faster than any previous yachts of their size.

In *Gloriana*, Herreshoff had made a bold departure from existing practice. Among other things he cut away the forefoot entirely drawing in its place a long sweeping line from the end of the forward overhang to the turn of the keel where it joined the outside lead casting. This reduced the measured length by several feet, and with her long overhangs forward and aft (one of her most obvious features) gave her a long sailing length when heeled. In addition to these features which were readily apparent to the eye, the whole form of the boat showed evidences of the skill that was to mark Herreshoff as a great designer.

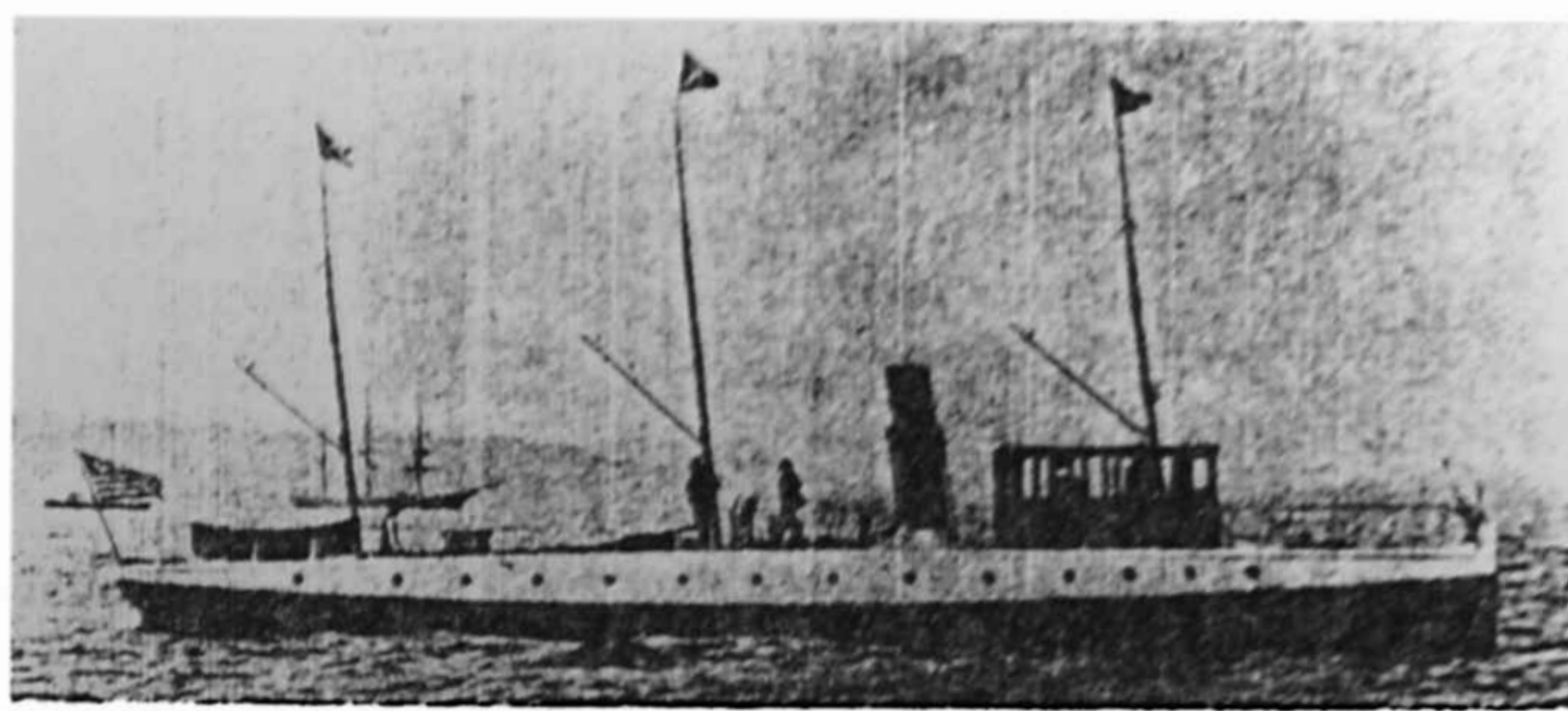
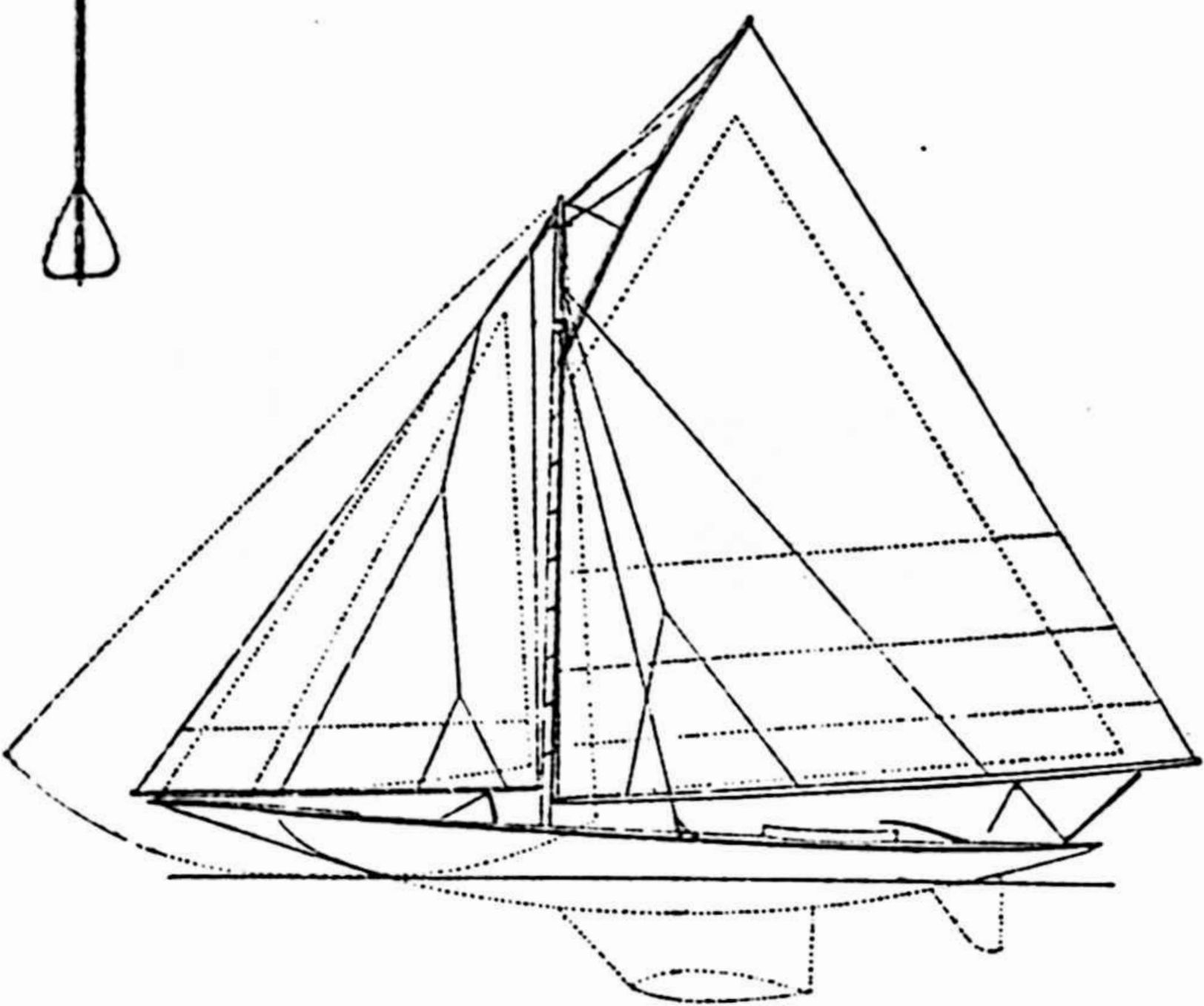
As in the case of the *America* 40 years earlier, yachtsmen immediately jumped to the conclusion that it was the obvious, the long radical bow, that made *Gloriana* so fast, and there was an immediate tendency to incorporate this feature in new or existing yachts. But the results were not always successful or commensurate with the expense involved. In commenting on the features that contributed to *Gloriana's* success we can, perhaps, do no better than to quote from an article by Harry Maxwell in an issue of *YACHTING* (June, 1941) on the 50th anniversary of that yacht's first race.

"Looking at the picture from the viewpoint of today, what it was that made *Gloriana* so fast is readily apparent. First of all, Nat Herreshoff, her designer, had reverted to the age-old trick of substituting, on the same l.w.l. length, a larger hull with longer sailing lines, and therefore, with a potentially higher maximum speed. Also, he reduced her displacement somewhat, despite her full ends, and gave her a much greater water plane area. This latter provided a better fulcrum for sail carrying purposes. She was designed to sail on her side, her long full ends giving her a longer inclined sailing length. Being double planked, she was not as flimsy as her competitors.

"As to driving power, *Gloriana* was far in advance of existing practice. She had a large sail area, much better stayed, and this, thanks to her long overall length, could be held in its proper place in strong breezes. With this large sail area, plus a reduced wetted surface, she had to be fast in light weather, while her longer inclined sailing



Sail, profile plan and part of mid-section of "Dilemma." She was the first of Herreshoff's fin keel boats, a type which later became very popular. The sail plan is dated 1892, and the dotted lines show the original rig which was later enlarged



Levick



One of Herreshoff's early high speed steam yachts was the 94-foot "Stiletto" (top), built in 1885. She did 26½ m.p.h. with a 400 hp engine. She was later purchased by the U. S. Navy and converted by Herreshoff into what is believed to be one of the earliest successful torpedo boats (above)



"Javelin," another of Herreshoff's fast steam yachts

length, with more reserve buoyancy, made her equally fast in heavy weather.

"Without minimizing in any way Mr. Herreshoff's ability, it is nonetheless true that his rival yacht designers had shown little engineering skill in the matter of rigging design. There was no team work between their hulls and sail plans. Once the hull had been designed, all they did was to pile on as much sail as they guessed could be used without too many breakdowns, the factor of safety being small. Needless to say, their creations spent many hours of each summer in the shipyards. This was not true of *Gloriana*."

Another factor in *Gloriana's* success lay in her construction and here Herreshoff displayed his engineering genius which was to play such a great part in his success as a builder. *Gloriana* was lighter than the Burgess yachts, and the others of her class. Following a system developed in the steam yachts by the Herreshoffs, she was of semi-composite construction, having steel frames with the planking in two thicknesses, the outer strakes being laid with white lead but no caulking in the seams, giving an unusually smooth surface. The rig also was an excellent job of engineering and efficiency for the period and the yacht never had any difficulty in keeping her spars in her.

Gloriana's triumph was not to last long, however, as Herreshoff received an order from Archibald Rogers, a prominent yachtsman of that day, for a new boat for the class to be completed the following year. This was the *Wasp*, which proved faster and superior in every way to the *Gloriana*. Following the same general idea as *Gloriana*, *Wasp* was somewhat larger, with more power, and in the hands of Captain Charlie Barr she "cleaned up" in her first season, and was prominent and up near the top for several years. Her success was so great that she practically killed interest in the class. However, *Gloriana* had a long and useful life as a cruiser and in club races, and was always a boat that attracted admiration.

These two yachts changed the character of yacht design
(Continued on page 82)

NATHANAEL HERRESHOFF

(Continued from page 35)

to a marked degree, and thereafter long ends and the elimination of the deep forefoot was the order.

Even while the *Gloriana* was making a name for herself Nat Herreshoff was already thinking of other radical ideas to obtain greater speed on a given length, and in the late summer of 1891 he built, for himself and for experimental purposes, the first fin keel yacht, with a metal plate with a heavy bulb of lead at its bottom in place of the conventional keel built into the hull. This was the *Dilemma*, which turned out to be the forerunner of a type that gained considerable popularity during the following years. In this boat he sacrificed displacement and seagoing qualities for speed. *Dilemma* had a very shoal body, and thus light displacement, long ends, little wetted surface and a small area of mid-section. She was 38 feet long on a waterline of 26 feet, with only seven feet of beam, while her two-ton lead bulb enabled her to carry a good sized sail area. She was a great departure from existing practice and had a marked influence on future design in cruisers as well as racers, although the type had little to commend it for cruising purposes, due to the natural restrictions it placed on accommodations. In fact, she was probably the inspiration for Herreshoff's first one-design class, the successful Newport 30's, built in 1896. This was strictly a racing class, with bronze fins, some 20 boats being built to it. It was popular both at Newport and adjacent waters for many years, until replaced by the famous N.Y.Y.C. 30's in 1905.

To go back to *Gloriana* and her influence on future design. Impressed by the success of that yacht and *Wasp*, in the fall of 1892 Royal Phelps Carroll placed an order with Herreshoff for a much larger yacht, 84 feet on the waterline. This was the steel cutter *Navahoe*. In her, Herreshoff carried out the fore-and-aft lines into long overhangs, as in *Gloriana*, but as originally designed she had a centerboard instead of a deep keel, with the lead ballast cast in the keel trough, inside. This was later removed and cast on the keel outside. *Navahoe* was taken across the Atlantic by Mr. Carroll in 1893 and raced in British waters against the *Britannia*, *Valkyrie II*, *Satanita* and other racing yachts, but with rather poor success. However her appearance there heightened interest in the match for the America's Cup which was to be sailed later that year, with Lord Dunraven's *Valkyrie II* the challenger. And Nat Herreshoff, *Navahoe's* designer, was also the designer of two new yachts built for the defense of the Cup that year. It was Herreshoff's first chance at an America's Cup yacht, a field which he was to dominate for nearly 30 years.

(To be continued)