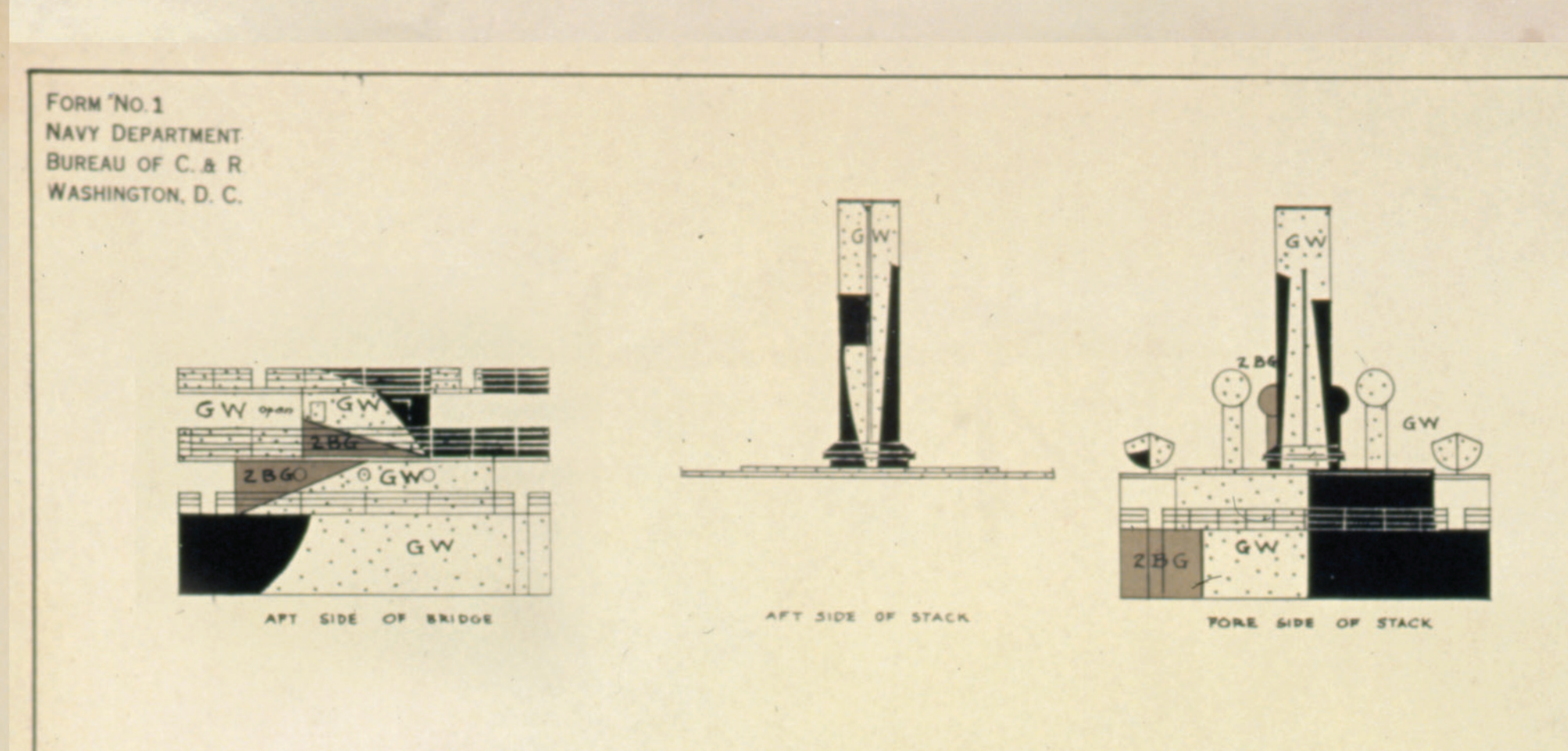
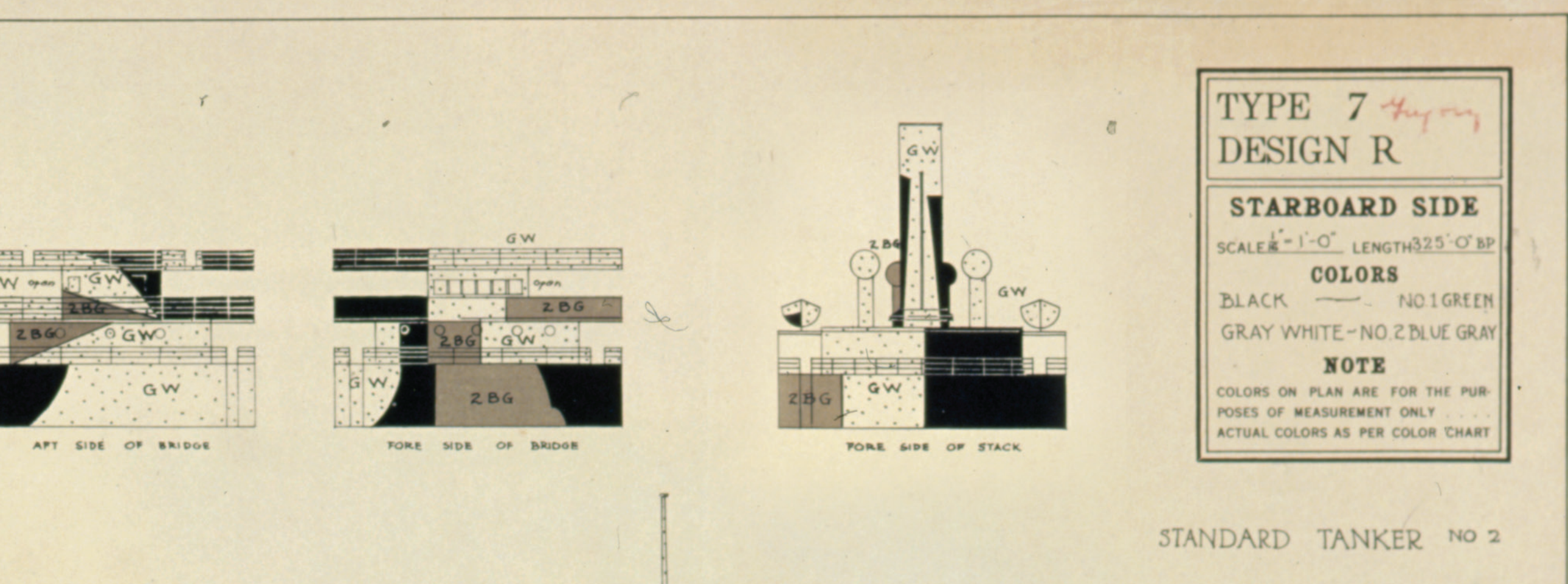
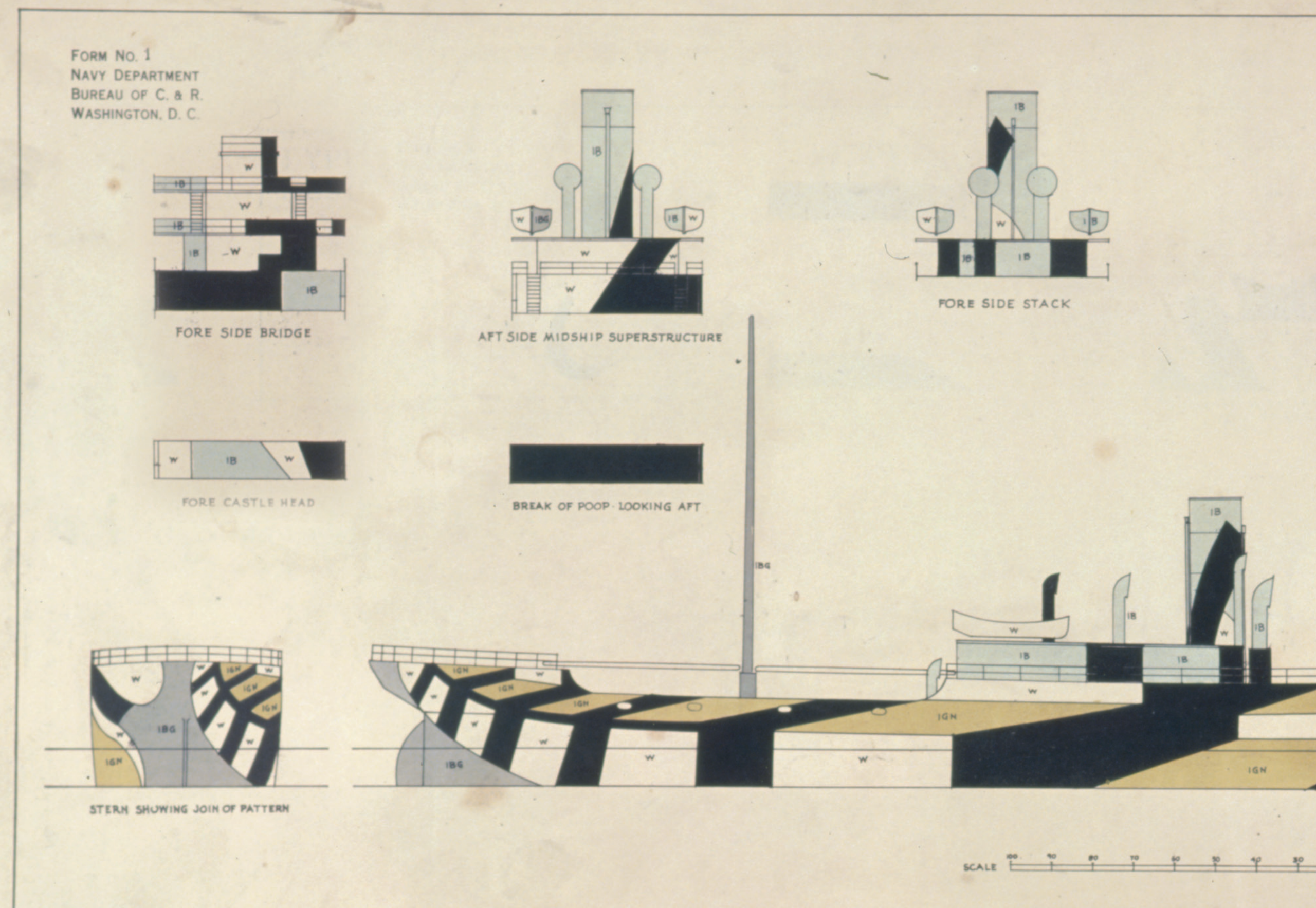
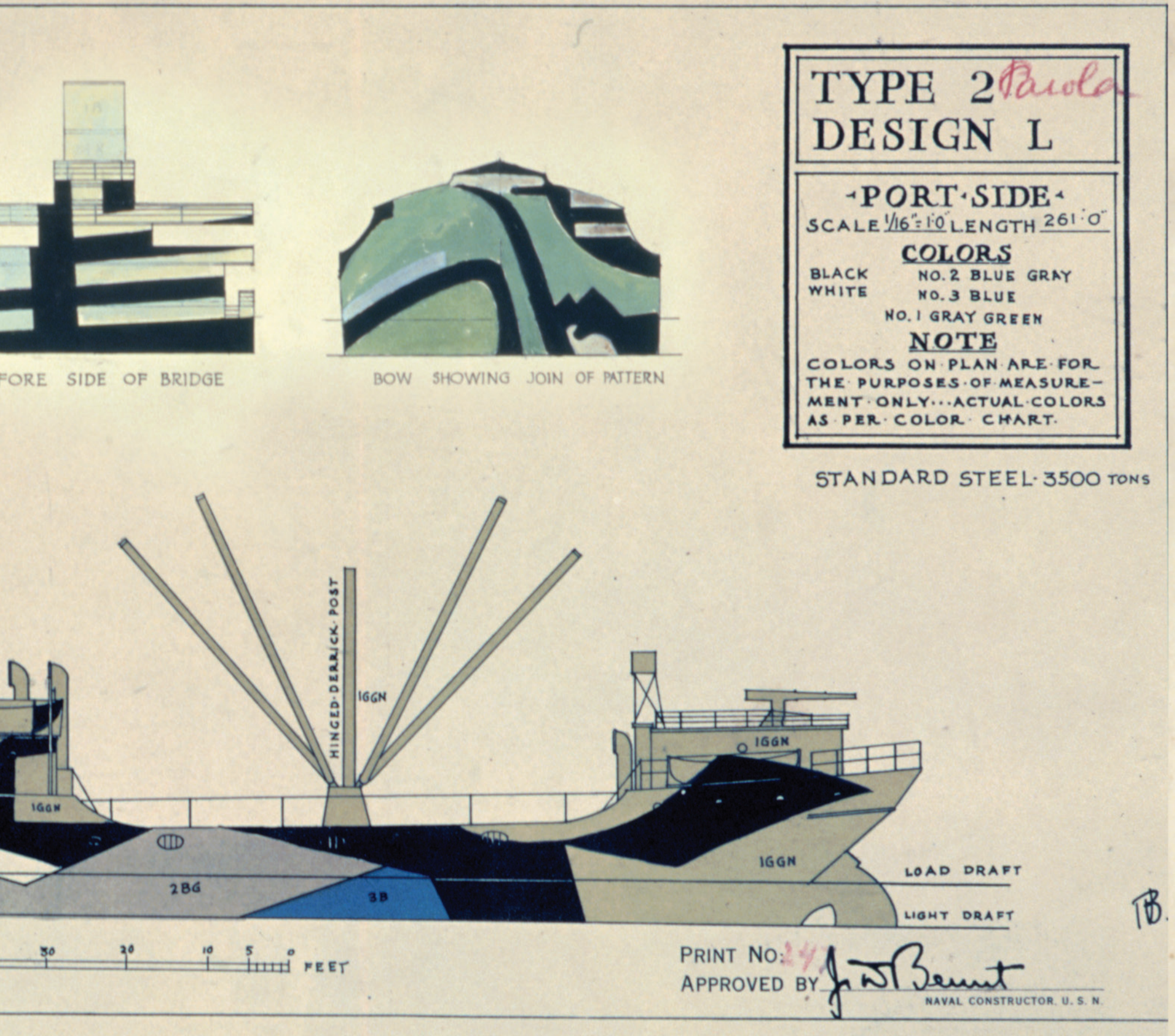
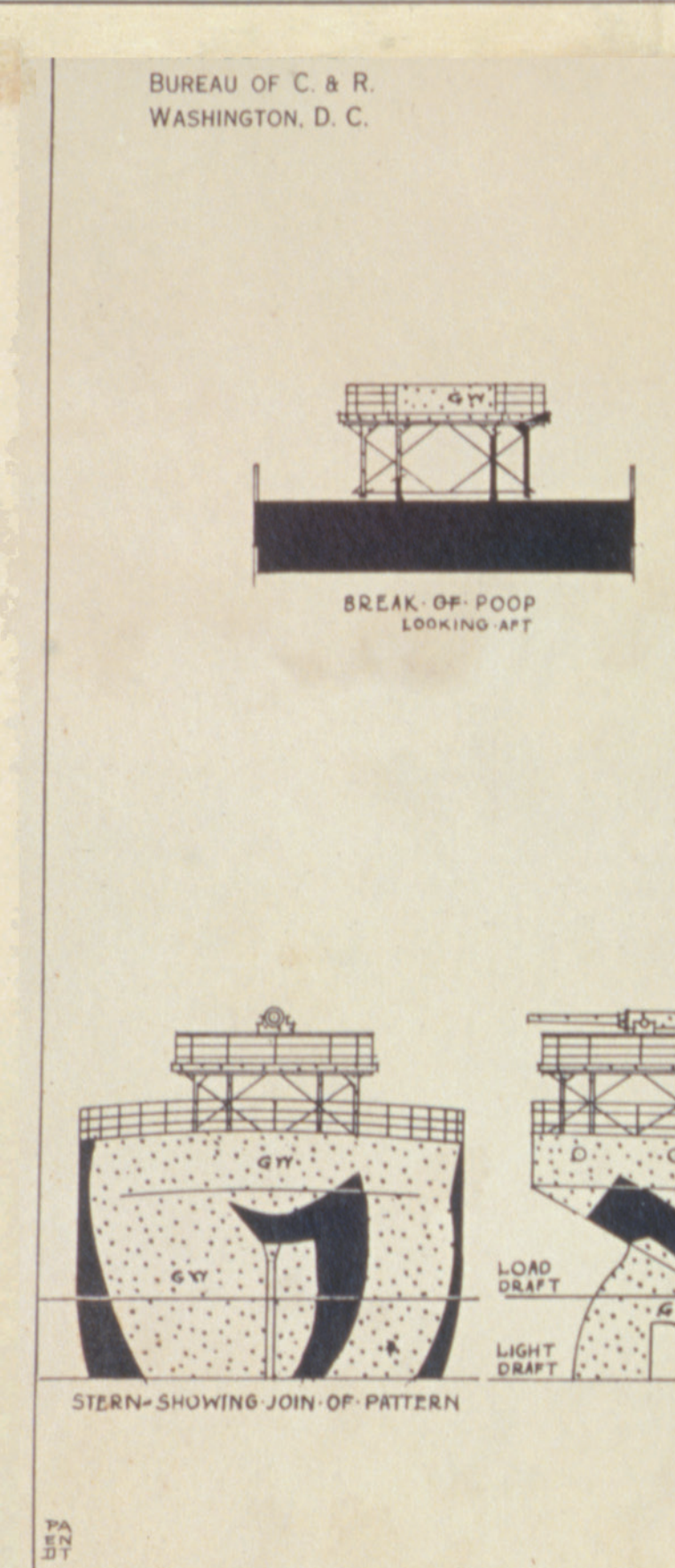
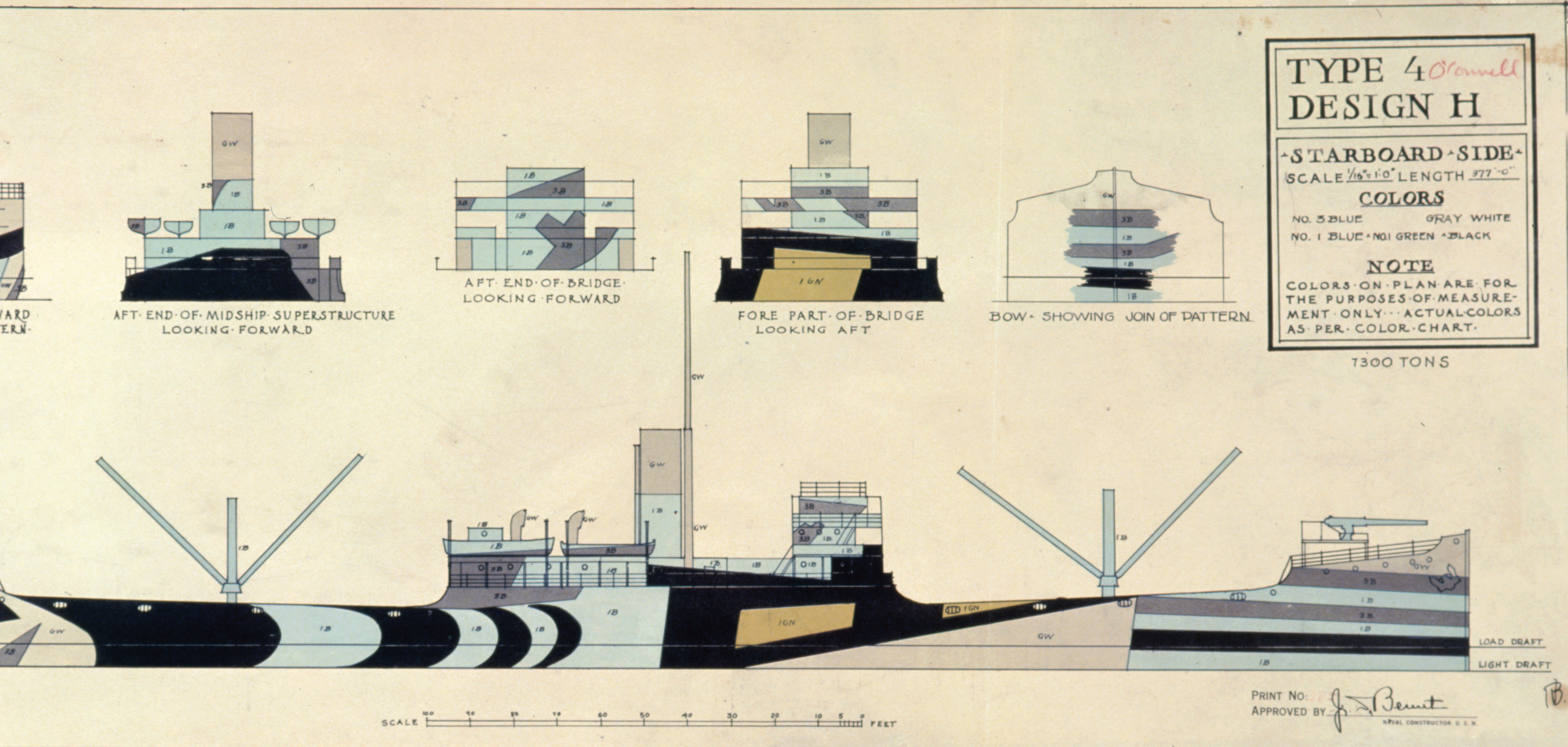
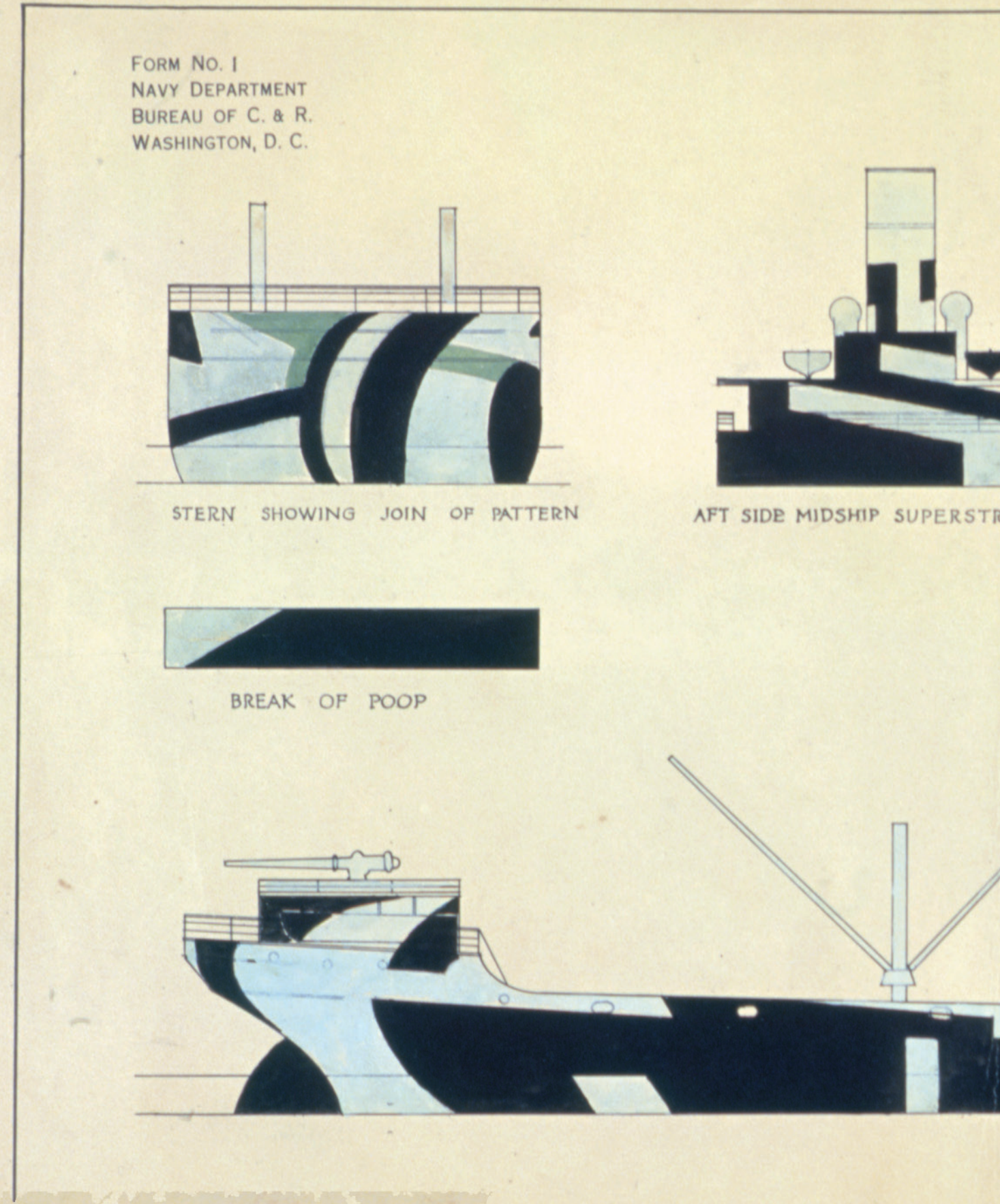
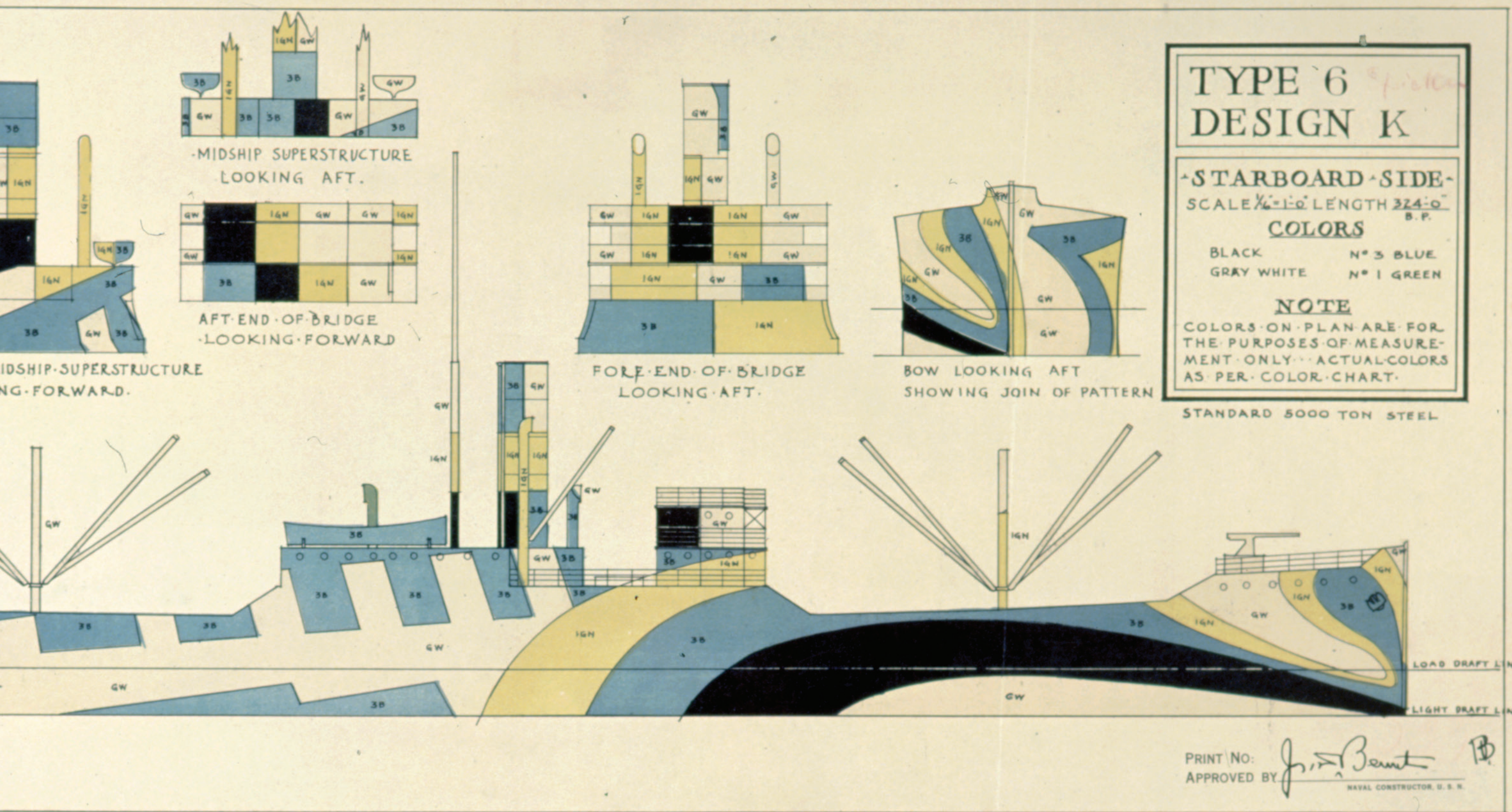


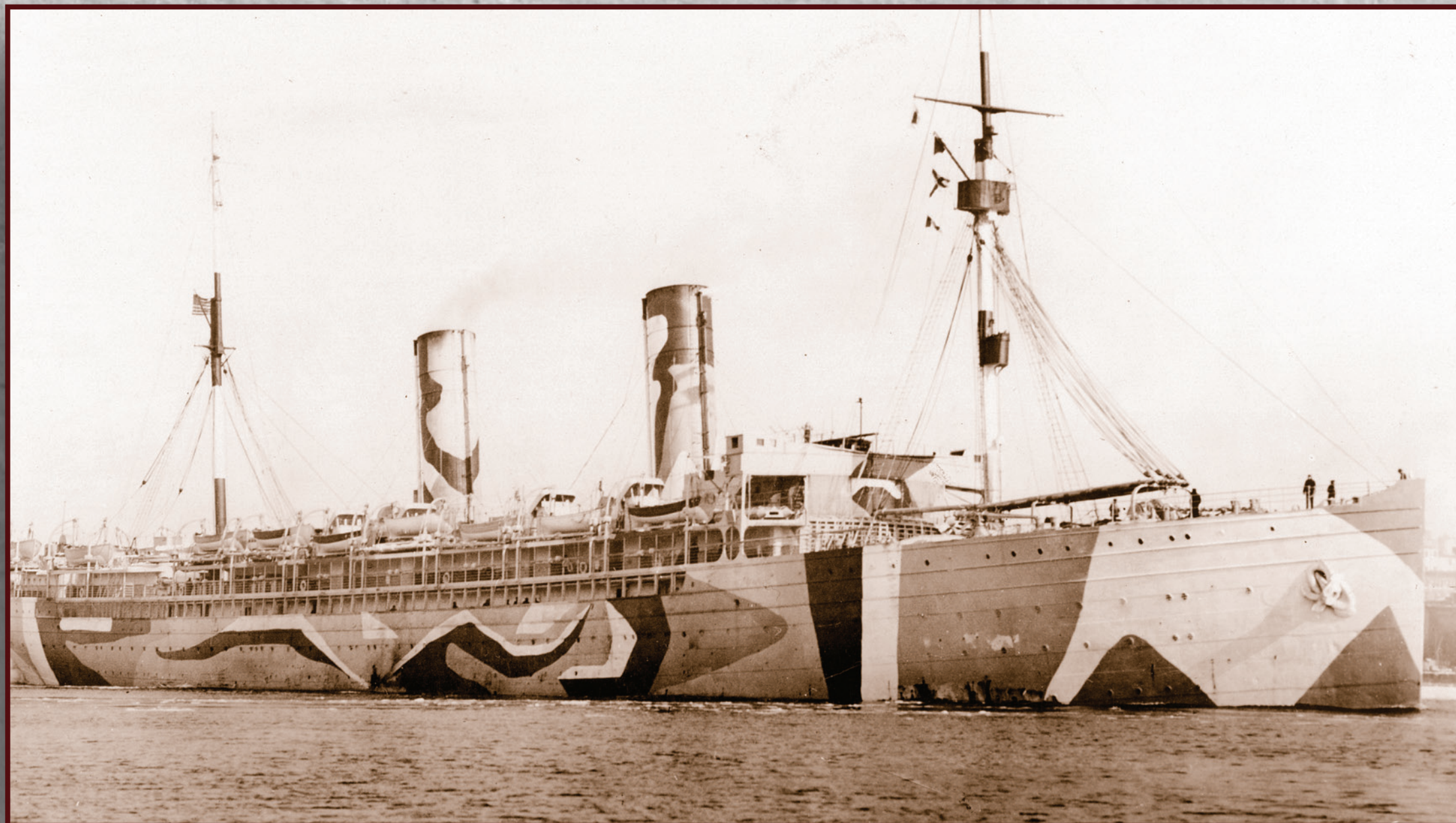
An Array of Schemes



Convinced that anti-submarine camouflage could improve the survivability of ships at sea, but lacking the time to conduct definitive tests, the U.S. Navy's Camouflage Section decided to approve several different designs and let actual conditions determine which was most effective.

Pure Razzle Dazzle

Some of the camouflage schemes relied solely on distorting the appearance of a ship to confuse enemy observers, according to the principles of Thayer and Wilkinson. These systems were most representative of the Razzle Dazzle idea.



Warner Disruptive Dazzle System

Considered by the Navy to be the best of the disruptive schemes, this design by Everett Warner made no attempt at concealment but employed a classic Razzle Dazzle design to confuse the observer as to a ship's size and heading.

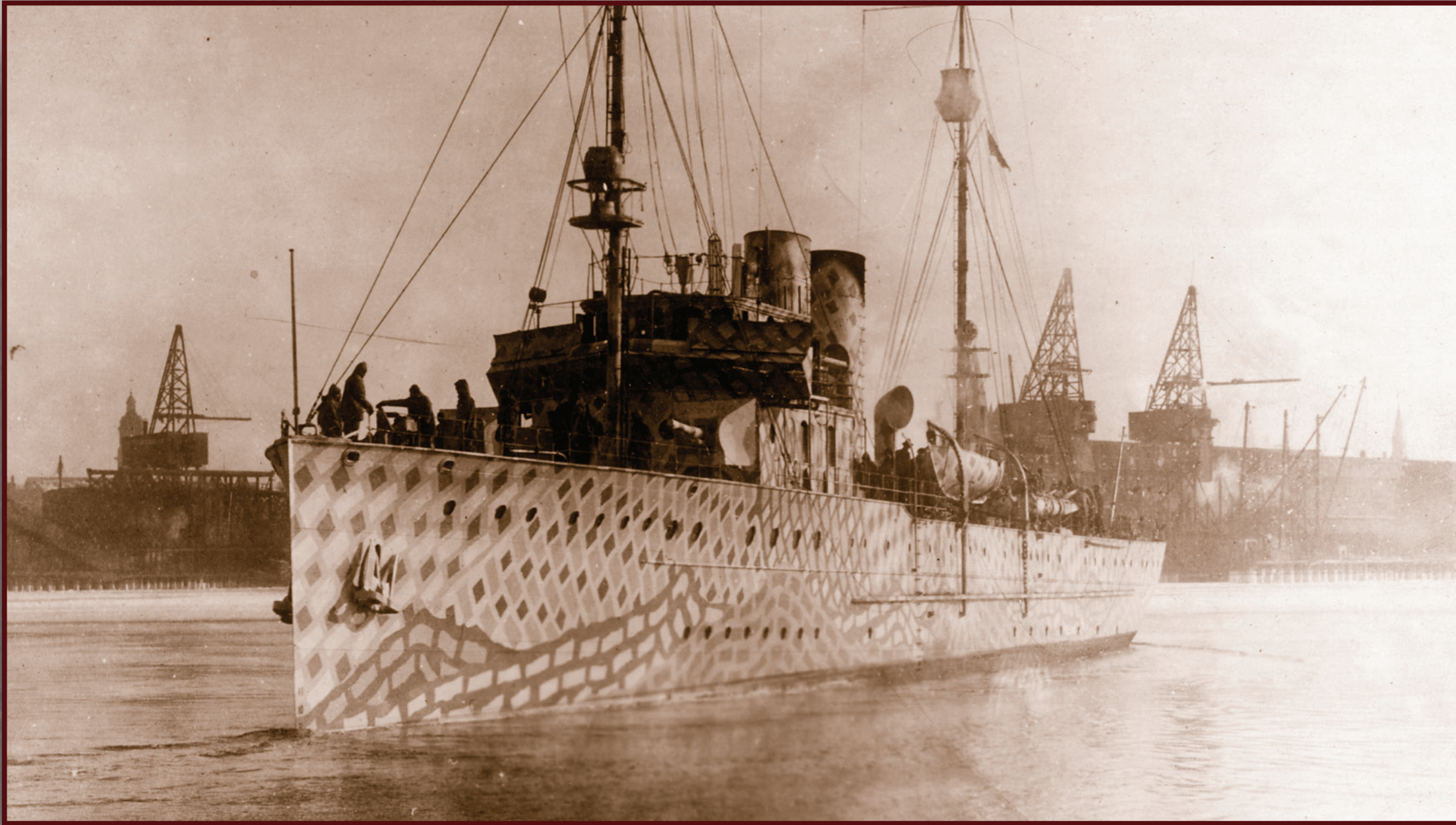


United States Navy Dazzle Painting

This design, the most widely applied scheme for U.S. Navy destroyers and U.S. Naval Overseas Transportation Service ships, had a great variety of patterns that all aimed at distorting a ship's appearance to thwart enemy submarines' course prediction and ranging attempts.

Low Visibility

Some of the approved designs were classified as “low visibility” schemes, attempting concealment rather than the distortion effects of true Razzle Dazzle. Authorities eventually concluded that given the technology of the time, low visibility camouflage was ineffective except at very long ranges.



■ Brush Counter-Shading System

Designed by George de Forest Brush, the first proponent of countershading camouflage, this scheme darkened raised surfaces that reflected the most light, and lightened shadowy recesses. This reverse coloration was intended to make a ship less apparent to distant observers.

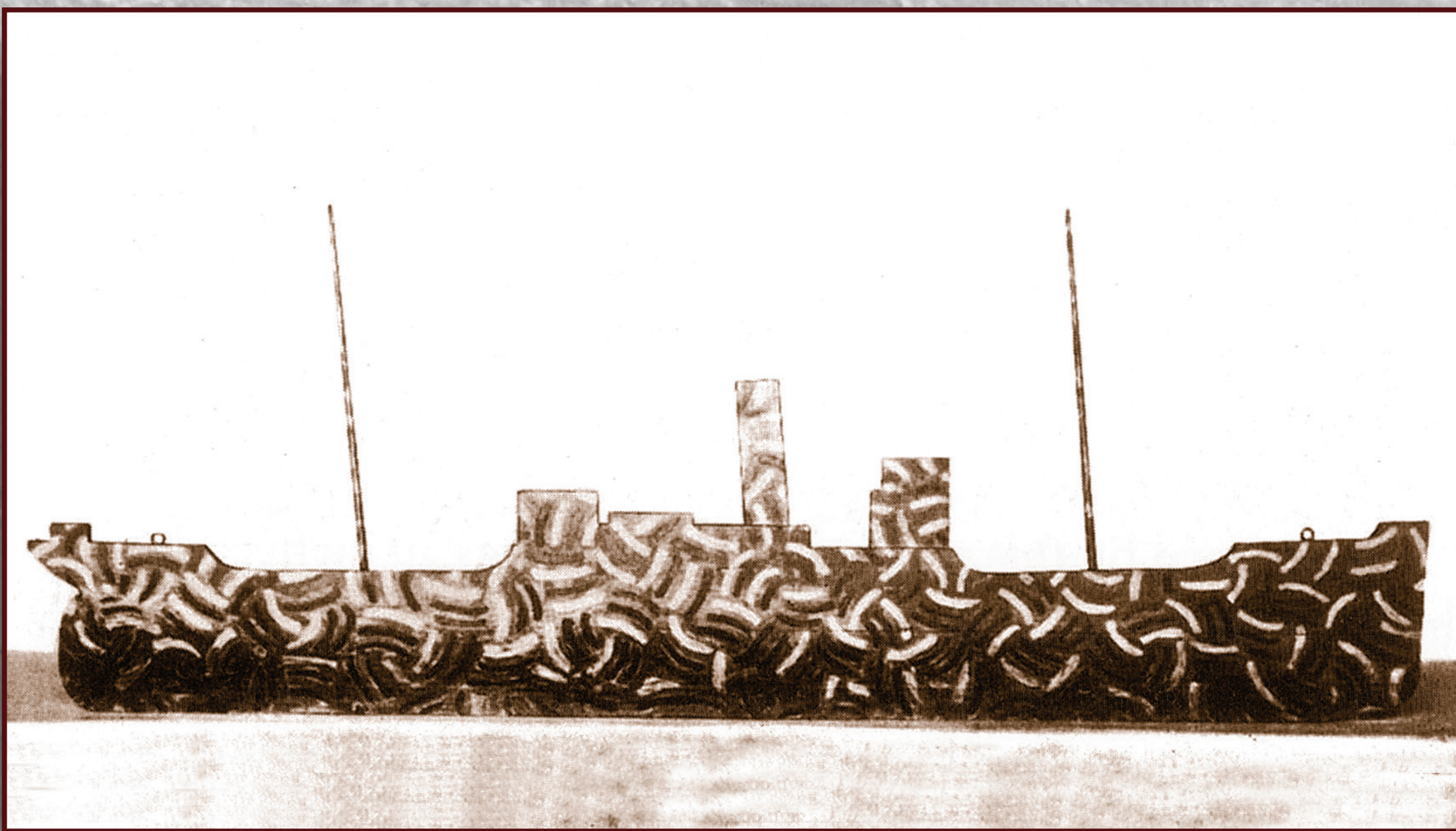


■ Mackay Low Visibility System

Artist William Mackay designed this scheme around the idea that a multitude of contrasting points on the surface of a ship would overwhelm an observer's optic nerves, creating the illusion that the ship was just part of its background. It was never proven whether or not this effect was achieved.

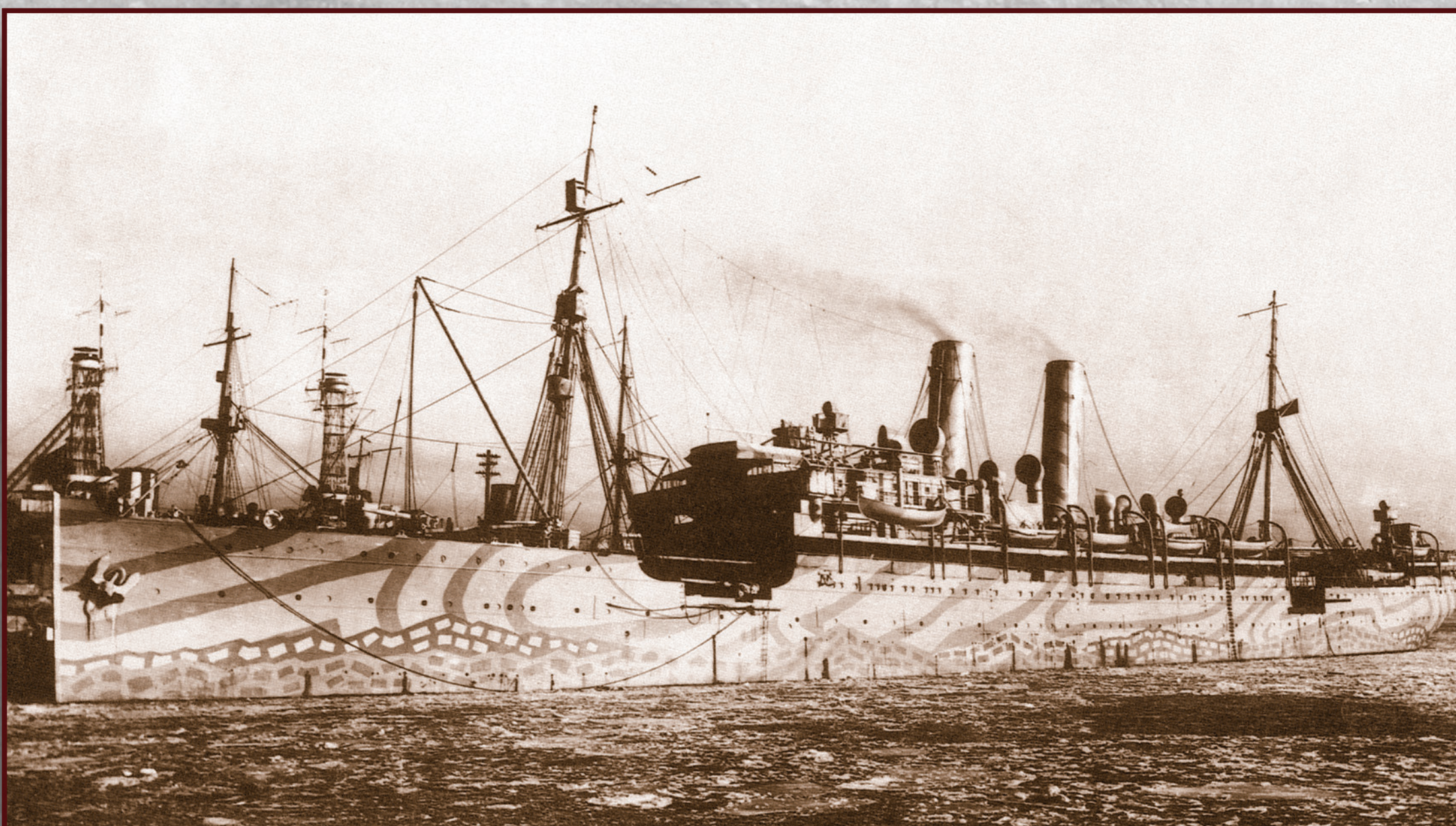
Combining Low Visibility and Disruptive Coloration

Some of the Camouflage Section's designs attempted to combine the aims of concealment and disruptive distortion. Previously these two goals were considered to be mutually exclusive, since distortion design relied on high-contrast schemes that were easy to see.



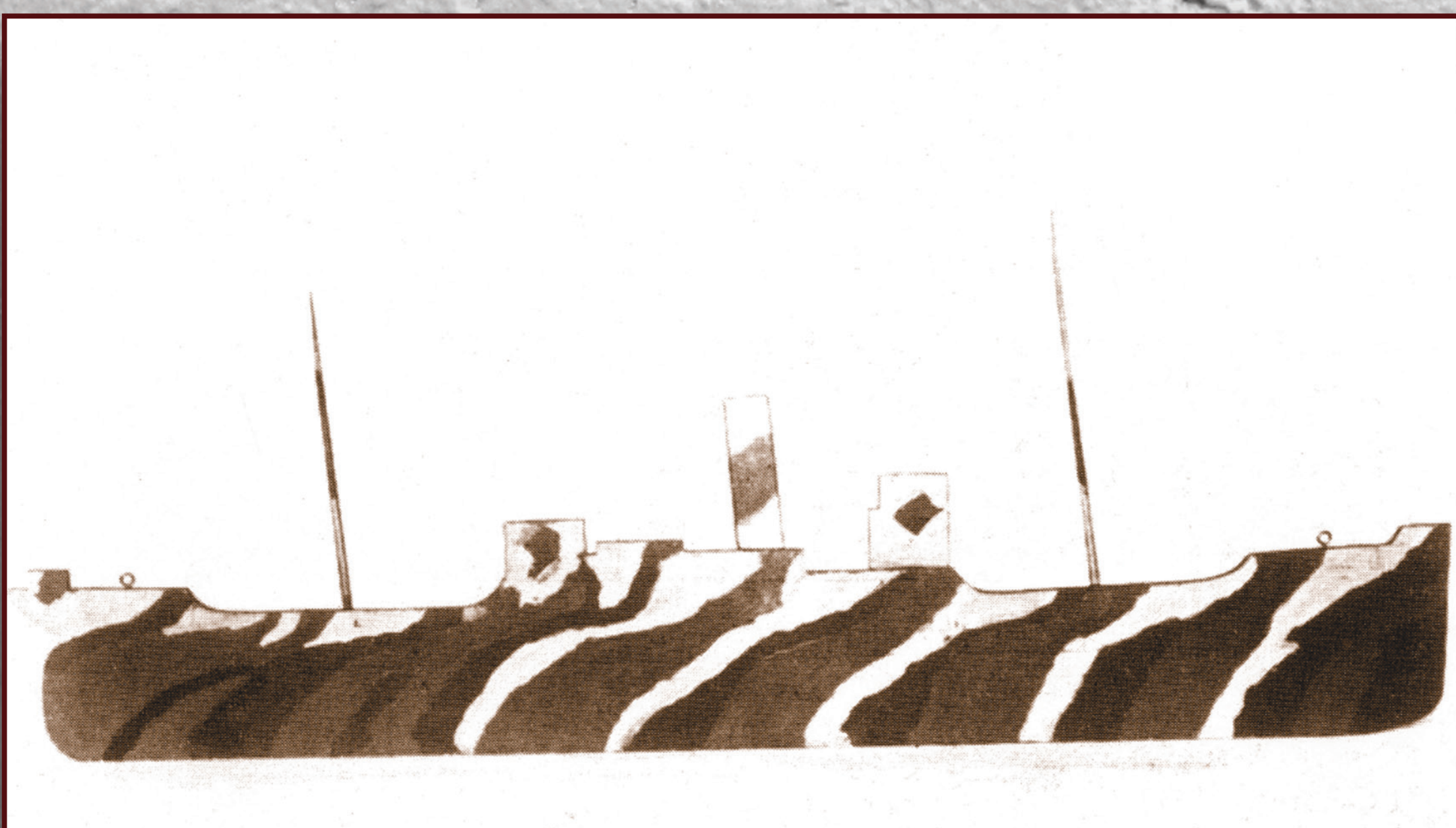
Herzog Low Visibility/ Disruptive System

Design Subsection artist William Herzog designed this scheme to confuse observers regarding the range and course of a ship at certain distances, while concealing it at others. However, the United States Navy ultimately judged it to be ineffective.



Mackay Disruptive/ Low Visibility System

Designed to overcome the opposing requirements of low visibility and disruptive systems, this system used high-contrast patterns that offered poor optical resolution at long range, and distorted a ship's appearance at close range.



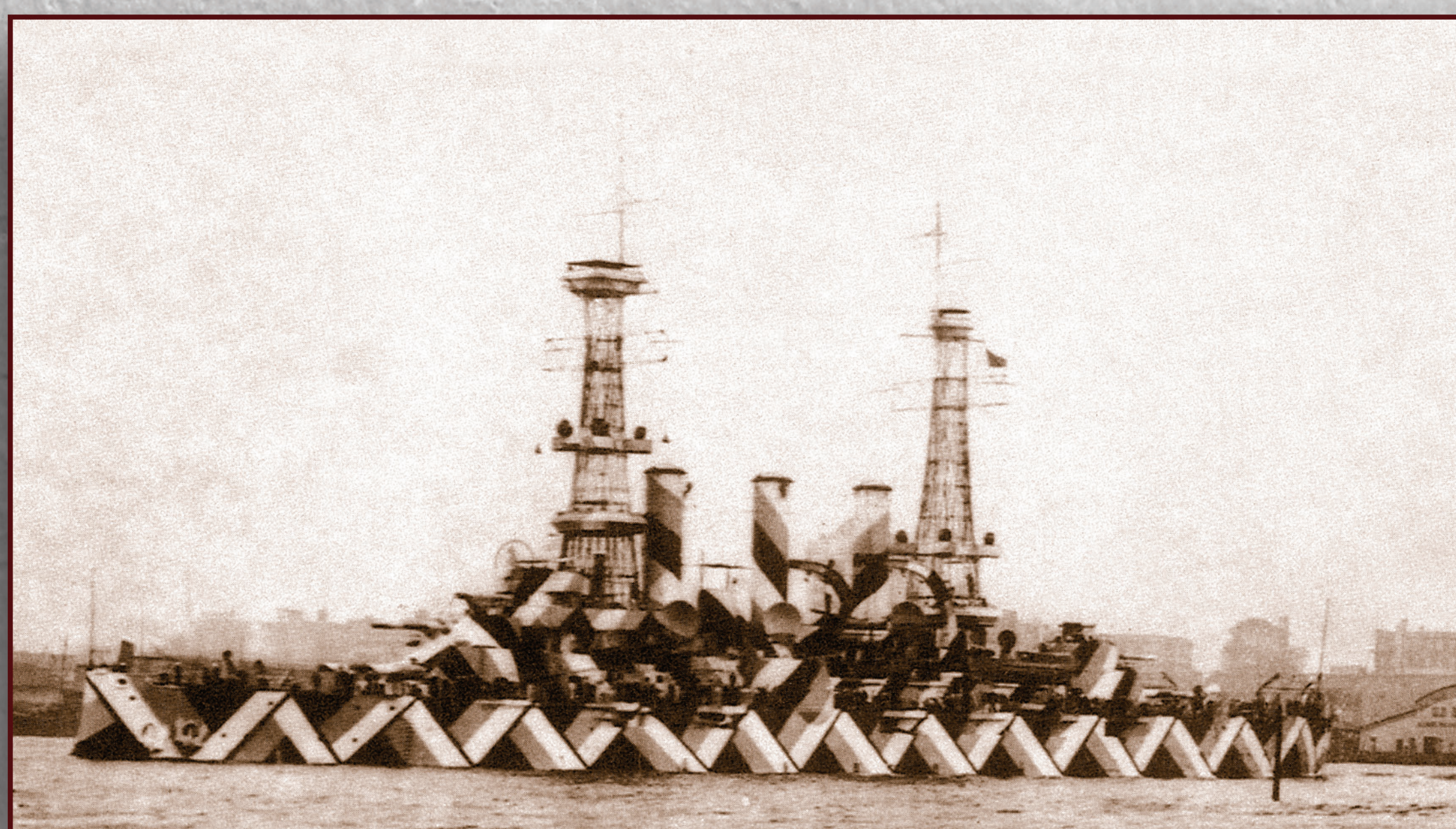
Toch Disruptive/Low Visibility System

Research Subsection chemist Maximilian Toch designed this scheme using research on optics done at the Eastman Kodak laboratories. It was intended to create optical illusions to conceal ships at long range and hamper range estimation once the ship was sighted.

Other Camouflage Techniques

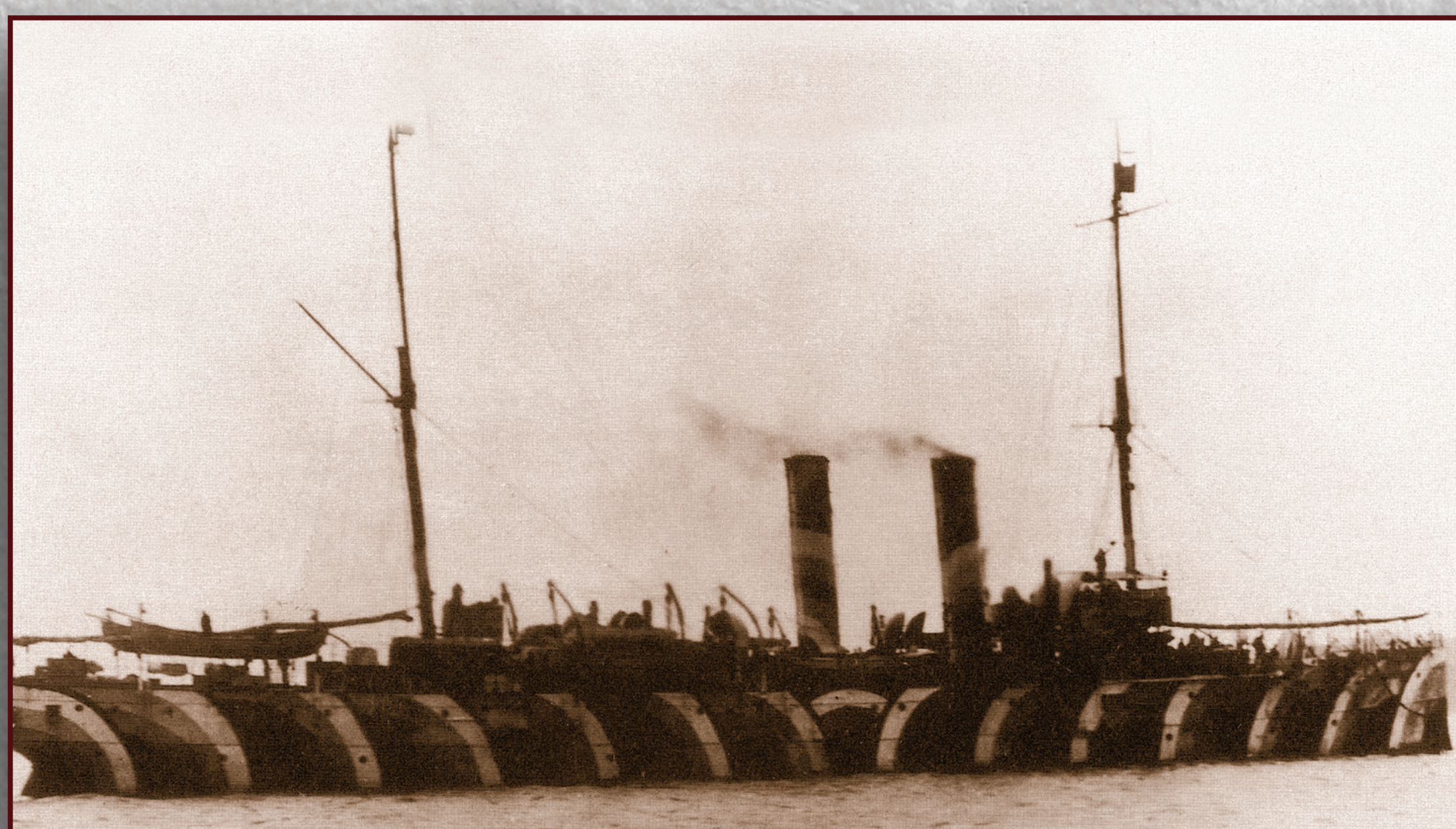
The U.S. Navy also approved several camouflage systems not intended for use against enemy submarines, but to protect the U.S. battle fleet in combat. The Navy also approved a system designed by a private company for the U.S. Shipping Board that was later applied to vessels of the merchant marine.

By the war's end, eight months after the Camouflage Section's establishment, some camouflage systems were preferred over others. Overall, Razzle Dazzle, when combined with convoys and aggressive anti-submarine measures, had made a favorable impression on the U.S. Navy.



■ Watson/Norfolk Disruptive Dazzle System

Designed at the Norfolk Navy Yard by "Mr. Watson, master painter," to protect U.S. Navy battleships, this scheme was intended to impede enemy gunners' range finding by breaking up a ship's vertical and horizontal lines, which were used to judge distance.



■ Submarine Defense Association Low Visibility/Deception System

Named after the private research and development company that designed it, merchant ships that applied approved systems, such as this one, obtained lower insurance premiums. America's large shipping corporations protected their investments by funding anti-submarine research.



■ Fleet System

This scheme was devised for use by the battle fleet — battleships and armored cruisers — which steamed in long, orderly lines that gave away their course and made ordinary Razzle Dazzle ineffective. After the war it was discovered that German battleships' range finders were not foiled by such optical illusions.

