

**Brunel
200th
Anniversary**

The Great Eastern

The Great Ship Company was established in 1858 to purchase the partly-finished Great Eastern (ex Leviathan) from the bankrupt Eastern Steam Navigation Company, supervise her completion and undertake her subsequent operation.

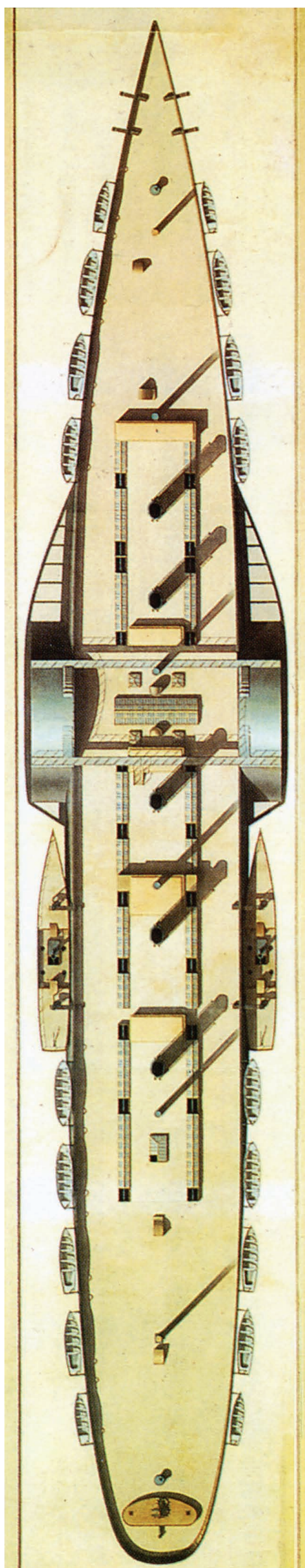
The Great Eastern was an extraordinary step in development. Completed in 1858, only fourteen years after the Great Britain, the ship was immense, five times the displacement of any other afloat. With length overall of just under 700ft, breadth 83ft, the ship was too big to be propelled by the screw engines of the day. Power requirements approached 10,000ihp for the design speed of 15kts and it was simply not possible to manufacture a screw shaft large enough to transmit this power. Furthermore, the engines themselves would be beyond the practice and capabilities of the day. Accordingly, both screw and paddle propulsion were fitted, of 4,980ihp and 3,676ihp, respectively.

Great Eastern introduced almost as many new features to shipbuilding as did the Great Britain: sophisticated longitudinal framing was adopted, together with a complete cellular inner bottom which, extending up the sides, gave her safety undreamed of at the time. Indeed, it is reasonable to surmise that had she been substituted for the Titanic in 1912 she would have survived the accident. In fact she survived one of much the same nature when a considerable length of her bottom was ripped by an uncharted rock near New York. The passengers did not even know she had been holed. The inner skin remained watertight, and the outer one was repaired by a coffer dam which was sunk, placed around it and then pumped out. The ship was extremely well subdivided with ten watertight bulkheads dividing her into compartments each 60ft long.

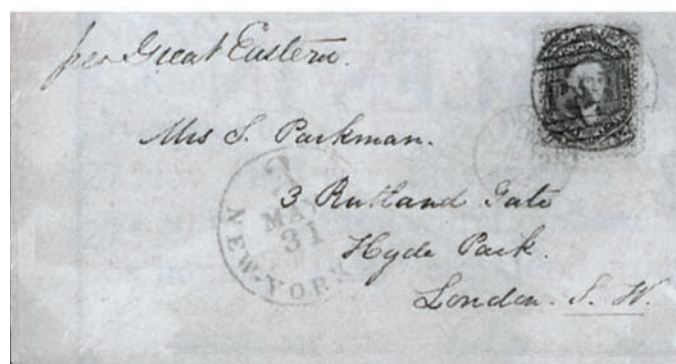
Great Eastern was built mainly with standard plates whose number reached the staggering total of 10,000; approximately three million rivets being driven to hold them together. All the hull plates were 3/4in and all the bulkheads 1/2in in thickness. The angle irons used in her construction were standardised at 4 1/2in x 1 1/2in, but being longitudinally framed she did not have the conventional "ribs" and with her cellular deck was thus of enormous longitudinal strength, probably approaching the best modern standards. Commercially she was a failure but this was not really a conceptual fault so much as the result of two other factors; first, she was designed- non-stop, without coaling, to Australia; and second, when she was put on the Atlantic service her owners refused to have any truck with the only source of large numbers of passengers, namely the emigrant trade. In retrospect it is clear that the Great Eastern could have made much money carrying emigrants to either Australia or America. The grandeur of the ship probably frightened nearly everybody concerned with her, with the sole exception of the "little big man" (Isambard Kingdom Brunel) himself.

The stern frame was ambitious, like all else in this ship, being the first ever of cast iron cellular construction and designed to spread loads into the stern structure. Some details such as the careful streamlining of the stern and rudder posts were in advance of much single screw practice of half a century later.

If Brunel's The Great Britain was at the very edge of technological knowledge, then the Great Eastern was well beyond it. Twice the length of any ship so far built and over five times the displacement, the ship's dimensions were fixed by the requirement to steam from England to Ceylon, round the Cape, without taking on additional coal (bunkering was very expensive abroad). Because no known machinery could deliver enough power, the ship was designed with a unique combination of screw and paddle propulsion. The Leviathan, as she was most appropriately to have been named, bankrupted her builder and her owners and suffered a series of misfortunes in service, however, she represented one of the greatest engineering achievements of the century.



She was the first large ship whose underwater shape was designed according to the principles of hydrodynamics.



John Scott Russell (on the left) and Isambard Kingdom Brunel (second from right) during the first launch of the 'Great Eastern' on 3 November 1857. Although Russell was a famous naval architect and shipbuilder, Brunel demanded complete control of the project. This was to prove a constant source of conflict. Russell favoured the delegation of operational decisions to his senior staff, but Brunel frequently intervened in almost everything that took place. Photograph: Robert Howlett © National Portrait Gallery

Da sinistra: John Scott Russell, Henry Wakefield, Brunel e Lord Derby al varo del Great Eastern.

Top: envelope from New York May 31, 1862 to London, franked with an 1862 24c. lilac tied by a black grill "Paid" and a red "London EC/Paid" d.s. with a "3/New York/May 31/ A(M Pkt)" alongside. The Great Eastern completed 9 Transatlantic voyages between 1860-63, this voyage being the first of three during 1862, before going on to lay the first successful Transatlantic cable. We can find no reference to the Great Eastern being hired as a contract packet ship but this envelope has been charged and stamped as an American Contract Packet letter and could indicate that she may have been hired for a one-off voyage. Sold by Cavendish Auction, Derby, UK, on March 10, 2000 for £ 300.