

HISTORY AND DESCRIPTION OF THE STEAM-SHIP GREAT BRITAIN: BUILT AT BRISTOL FOR THE GREAT WESTERN STEAM-SHIP COMPANY; TO WHICH ARE ADDED, REMARKS ON THE COMPARATIVE MERITS OF IRON AND WOOD AS MATERIALS FOR SHIP-BUILDING

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History and description of the steam-ship Great Britain: built at Bristol for the Great Western Steam-ship Company; to which are added, remarks on the comparative merits of iron and wood as materials for ship-building by Christopher Claxton

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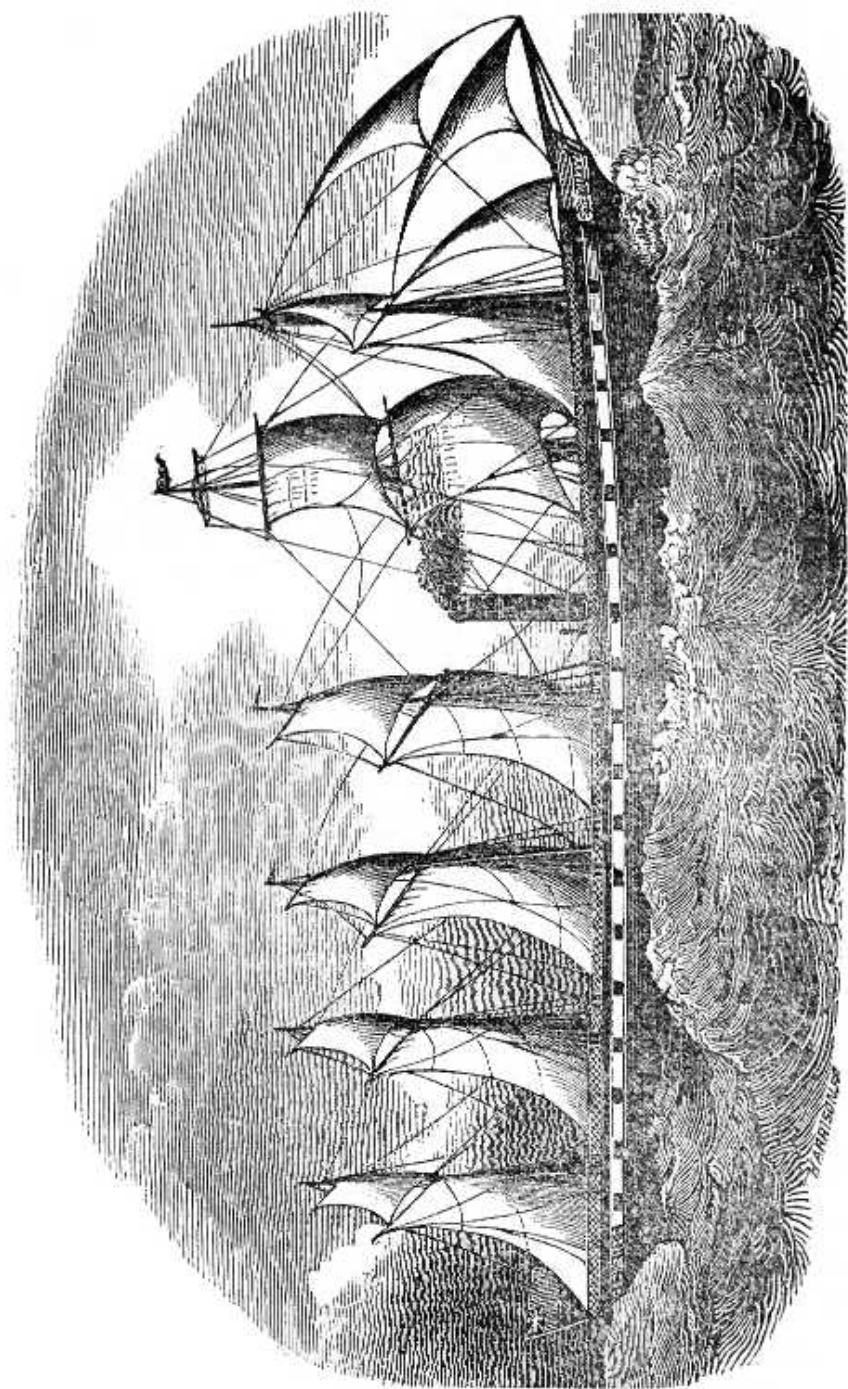
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CHRISTOPHER CLAXTON

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BY CAPT. CLAYTON, R. N.  
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NEW YORK:
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1845



THE

STEAM-SHIP GREAT BRITAIN.

THIS splendid iron ship—the largest vessel we believe in the world—was launched, or rather floated off, from the dock at Bristol in which she was built, on the 19th of July, 1843, in the immediate presence of Prince Albert and a large concourse of noblemen and gentlemen, and families of the first distinction from nearly every quarter of the kingdom, as well as of many thousands of spectators belonging to that town, and congregated on the adjacent heights, and every available point of view on shore, or from vessels on the river. The untoward delays that afterwards arose in getting the vessel ready for sea, are already before the public. Every difficulty has happily been overcome; and as the vessel has already most satisfactorily solved the problem involved in the magnitude of her construction, and her peculiar mode of propulsion (from which a new era in ocean steam navigation will henceforth be dated), we have taken steps to gratify our readers by a more detailed account of the leviathan and her machinery, with statistics, illustrated by wood-cuts, presenting views of her hull, machinery, &c., so that an accurate idea of the whole may be attained at a glance.

General Description of the Great Britain.

The following are the dimensions of the ship:—

Length of keel.....	329	feet.	Stroke of piston.....	6	feet.
“ from figure-head to taffrail....	322	“	Displacement of water when drawing		
Extreme width.....	51	“	about 16 feet (or loaded), about.....	3000	tons.
Depth of hold from upper or spar deck	32½	“	Stowage for coal.....	1100	“
Burthen, by old measurement, about..	3443	tons.	“ goods additional about.....	1300	“
Power, 2 engines of 500 horse-pow-			Will accommodate about.....	360	passengers
er each.....	1000		And dining accommodation for.....	350	“
Boiler (square) 34 feet by 22 in height.			Crew and firemen.....	350	persons.
Funnaces, 24—12 forward and 12 abaft.					

The vessel is entirely built of iron, with the exception of the boarding of her decks and some of her cabin fittings and carved-work. Her model is somewhat peculiar, yet accordant with the

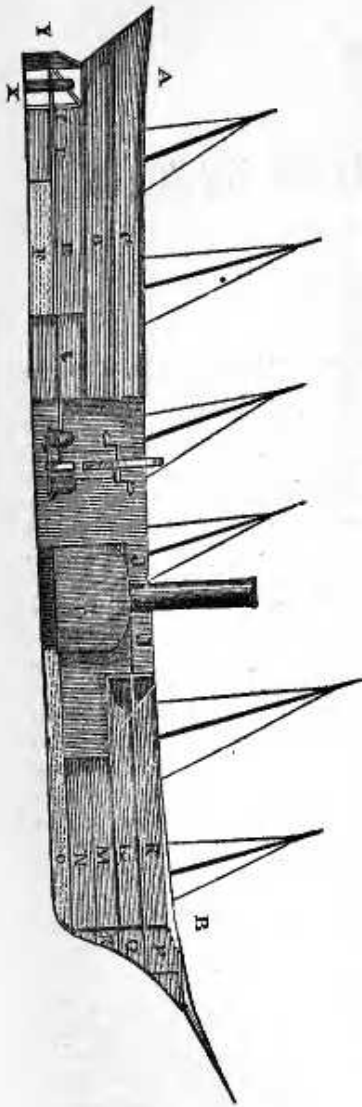


Fig. 1.*

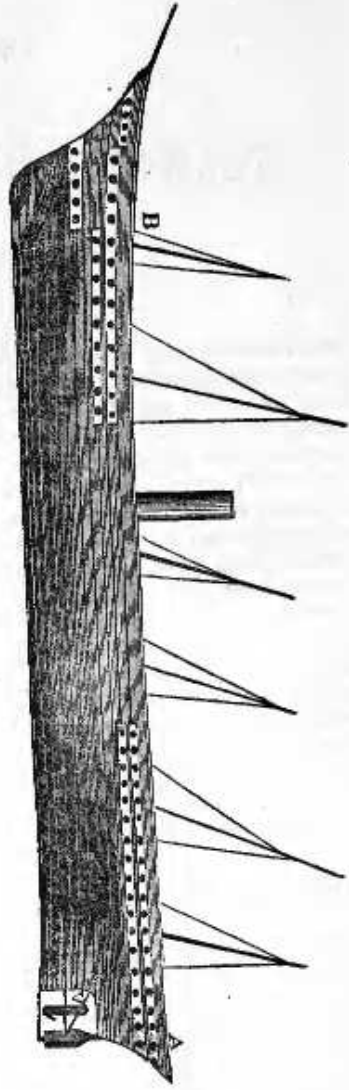


Fig. 2.*

taste (when she was built) of many nautical men, and the speed she has since attained, together with her good sea qualities, prove that their opinions were well founded. Her sides tumble, or fall in, a good deal towards the top deck, from about the middle of her length to the stern, giving her a man-of-war like appearance and a wholesome rotundity in the after body. Abreast of the boilers, which are forward of the longitudinal centre, her sides are rather flattish, but she has, after all abundance of bearings, for a steamer, and more aloft might have produced heavy rolling in a sea-way. Her bottom bearings are ample, and she is finely moulded with a sharp entrance, approaching to the plough form, and an equally fine run. Her upper works, like most of the Bristol ships, are plain, but substantial in finish. The hull is formed of iron plates, decreasing in thickness from the keel upwards, and angle iron ribs of great strength. The plates are not, however, so thick in proportion to her size as those of some iron vessels since constructed, particularly those built at North Birkenhead (for war purposes), but she is nevertheless a very strong ship, being bound securely by rods on the tension principle. The plates of her keel are from $\frac{3}{4}$ -inch thick in the middle, to 1 inch at the ends, and all the plates under water are from $\frac{5}{8}$ ths to $\frac{1}{2}$ -inch at the top, except the upper plate which is $\frac{5}{8}$ ths. She is chiefly clencher-built, and double riveted at many points. The ribs are 6 inches by $3\frac{1}{2}$, by $\frac{1}{2}$ -inch thick at the bottom of the vessel, and $7\text{-}16$ ths at the top. Her rig is that of what may be called a six-masted schooner, with fore and aft sails, and lugger topsails, with the exception of the mainmast (the second from the bow), which will carry a square mainsail and a topsail over it. She has four decks, and the upper, or spar deck, is 308 feet in length. The engines are somewhat on the patent of Sir Mark Brunel, with the cylinders, in place of being upright, standing on an angle of about 60 degrees. The main shaft for the turning of the screw, and which is of great length and large diameter, was made at the Mersey Iron Works; and is itself a great curiosity.

On the spar deck there are eight skylights for the fore saloon, and one large light over the engine room. The under decks and apartments have borrowed lights from these, and also circular lights in the sides of the ship—the latter of plate glass an inch in thickness. The companions, or entrances from the deck, are fitted with doors on either side, so as always to have a weather and a lee door, the former of which may be closed during gales. The windlass is on a patent principle. The best bower anchor weighs about three tons, and its iron chain cable is of $2\frac{1}{2}$ inches diameter in the metal of the link. The bowsprit is proportionably short, owing to the great length of the vessel. The bow is

enriched with carved work: in the centre are the Royal Arms, surrounded by emblems of the arts and sciences of the empire, and (in illustration of the power and speed of the ship) representations of the thunderbolt of Jove and the caduceus of Mercury.

Perhaps the most interesting portion of the whole structure is the machinery, and the *screw*, by which she is propelled. The latter is on the same principle, but slightly modified, as that invented by Mr. F. P. Smith, of the Patent Ship Propeller Company (who supplied it), and who, some years ago, exhibited it in the Archimedes. The manner in which it is fixed, worked, and speeded, will be seen by the illustrations.

The alphabets and figures are repeated over the same parts of the ship in all the views, so that the same parts in each may be identified.

Fig. 1*. A longitudinal vertical section of the entire vessel, showing the various compartments; and Fig. 2*, a side view.

- A. B. Surface line of upper deck.
 C. Principal promenade saloon; length, 100 feet by 48 at the widest part; height, 7 feet; 24 berths on each side.
 D. First class saloon, or dining room; length, 100 feet; greatest width, 50 feet; height, 8 feet.
 E. The cargo deck, 65 feet long, by 9 feet high.
 F. An iron fresh water tank; length, 49 feet.
 G. A room for a coal store, &c.
 H. Elevation of engines.
 I. Ditto of boiler.
 J. Iron deck over boiler, for cooking apparatus.
 K. First or second class saloon, 84 feet long, 7 feet 9 inches high.
 L. Lower fore saloon, length and height as

above; 40 bed places on each side of these saloons.
 M. and N. Iron-floored cargo decks.

O. Air chamber from boiler to bulk-head, of the shape of the ship.

P. Officers' berths, &c.

Q. Sailors' mess room.

R. Sailors' berths; r. small water tank,

S. Water-closets.

T. Ship's stern-post, through which the screw passes.

U. Shaft from engine to screw.

V. Diagonal stay from the ship's side to the stern-post.

W. Side view of screw stern-post, in which the end of the screw spindle revolves.

X. Keel under the screw, uniting the stern-post to the vessel.

Y. Hollow rudder foot, and of such a thickness as to receive the stern-post, which forms its pivot.

BOILER AND MACHINERY.

Boiler (square on plan), about	33 0	Diagonal framing for support of shaft, of very hard and strong foreign wood.	ft. in.
Length of fire-bars	6 0	Crooks, thickness at large hole	1 6
Width of ditto	2 6	Width at the head	3 6
Total surface of fire-bar (feet superficial)	284 0	Diameter of large driving-wheel	26 0
Chimney (diameter)	8 0	Ditto of rigger on screw shaft	6 0
Height of ditto about	43 0	Keel under screw, 12 inches wide on the top face, 9 inches under face, 5 inches thick.	
Diameter of four cylinders	7 1	Screw stern-post, 20 inches across the centre; rudder, 6 feet 6 inches wide at bottom.	
Length of main wrought-iron shaft	15 0	Distance between the stern-posts	11 0
Diameter at centre for driving-wheel	2 3	Height of screw, about	15 0
Weight in the rough, as from the forge, upwards of 16 tons.			

Fig. 1 represents a transverse section of the vessel at the engine-room, with an end view of the machinery.

Fig. 2. (double). A longitudinal section of the vessel, with a vertical section of the boiler, and an elevation of the starboard engines.

Fig. 3. Horizontal sections of the boiler, and general plan of the engines.

Figs. 4 and 5. Outline and section of a cylinder, steam-valves and a foundation-plate.

Fig. 6. Piston-valves to work the valve-cases.