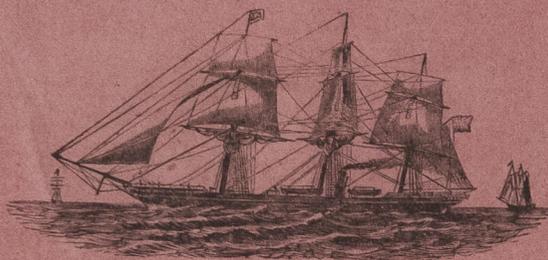


Iron 7929



SPECIFICATION

OF THE

ITALIAN IRON TWIN SCREW STEAM-SHIP,

"PO,"

^ 1.

Galv. Platense



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Lloyd's Register
Foundation

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SPECIFICATION

OF THE

ITALIAN IRON TWIN SCREW STEAM-SHIP,

“PO,”

Compound Engines, for the Mail and Passenger Traffic between Genoa and South America.

Dimensions.			Ft.	Ins.
	Length of keel and fore-rake	270	0
Breadth of beam	...	...	34	0
Depth of hold from top of floors to spar deck	...	...	25	6
Height of spar deck, deck to deck	...	...	7	0
„ main deck „	...	...	7	9
Round of beam	...	...	0	10

Gross tonnage under spar deck about 1,600 tons.

General Description.

The vessel to be built of the best material and workmanship, and under special survey of Lloyd's surveyors, for the Δ 1 class, and of Board of Trade surveyors, and certificates of surveys by both Lloyd's surveyors and Board of Trade surveyors to be supplied by builders.

To have accommodation for 40 first class, 40 second class, and 500 or more third class passengers, as may be arranged on main, 'tween and orlop decks.

The engines to be on the compound principle, and of a power sufficient to allow a speed of $11\frac{1}{2}$ knots easy, under steam only, on a trial run of about 60 knots, and on a 16 feet mean draft, and have bunker space for a sufficient quantity of coal for about 3,200 knots steaming.

Stem.

Of best hammered scrap iron, at the round of fore foot, $8\frac{1}{2}$ in. by 3 ins., and at top end $6\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins., well and securely scarphed to keel.

Stern Post.

Of best hammered scrap iron, $8\frac{1}{2}$ ins. by 3 ins. long, scarph to keel and eyes for rudder pintles forged solid.

Centre Keelson.

Of plate, $\frac{1}{6}$ in. thick, and 2 ft. 6 ins. deep, with angle-irons on top and bottom edge, 5 ins. by $4\frac{1}{4}$ ins. by $\frac{3}{8}$ in. rivetted to reverse frames on top of floors.

Frames.

Of angle iron, 5 ins. by 3 ins. by $\frac{3}{8}$ in., spaced 21 ins. apart throughout, the whole of the frames to extend in one length from centre keelson to spar deck stringer plate.

Reverse Frames.

Of angle iron, $3\frac{1}{2}$ ins. by 3 ins. by $\frac{3}{8}$ in., extending to main and spar deck alternately, and according to Lloyd's rules, with double angle irons across the floors in engine-room.

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- Floors.** Of plate iron, 24 ins. deep and $\frac{1}{8}$ in. thick on every frame, to meet at centre keelson, and securely rivetted thereto by angle iron.
- Keelsons.** All bilge and side keelsons to be in accordance with Lloyd's rules.
- Beams.** Spar deck beams of bulb iron, $6\frac{1}{2}$ in. by $\frac{3}{8}$ in., with two bars of angle iron on upper edge, $2\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins. by $\frac{5}{16}$ in., spaced on every second frame. Main deck beams of bulb iron, $8\frac{1}{4}$ ins. by $\frac{5}{16}$ in., with double angle iron on upper edge, $3\frac{1}{4}$ ins. by $3\frac{1}{4}$ ins. by $\frac{3}{8}$ in. Orlop deck beams of bulb iron, $8\frac{1}{2}$ ins. by $\frac{5}{16}$ in., with double angle iron on top edge, $3\frac{1}{4}$ ins. by $3\frac{1}{4}$ ins. by $\frac{3}{8}$ in. All beams to be well connected to ship's side.
- Stringers.** On beam ends of plate, spar deck, 29 ins. by $\frac{5}{16}$ in. for half length, ends of vessel 21 ins. by $\frac{5}{16}$ in. Angle iron at ship's side, 4 ins. by $3\frac{1}{4}$ ins. by $\frac{7}{16}$ in. Main deck, $38\frac{1}{2}$ ins. by $\frac{1}{2}$ in. for half length, and 29 ins. by $\frac{1}{2}$ in. Angle iron, 5 ins. by $4\frac{1}{4}$ ins. by $\frac{9}{16}$ in. Orlop deck, 29 ins. by $\frac{1}{2}$ in. All through angle iron, 5 ins. by $4\frac{1}{4}$ ins. by $\frac{9}{16}$ in.
- Ties and Diagonals.** On spar deck to have fore and aft tie-plates, 10 ins. by $\frac{7}{16}$ in. on each side of hatches, and to have diagonals 10 ins. by $\frac{7}{16}$ in. in pairs where practicable, from side to side of vessel. On main deck to have tie plates 13 ins. by $\frac{1}{2}$ in., and diagonal plates 13 ins. by $\frac{1}{2}$ in., from side to side where practicable. On orlop deck to have fore and aft ties, 13 ins. by $\frac{1}{2}$ in. on each side of hatches.
- Bulkheads.** Five in number, including after one for stern tubes, plates $\frac{7}{16}$ in., vertical bars of angle iron, $3\frac{1}{2}$ ins. by 3 ins. by $\frac{7}{16}$ in., spaced 30 ins. apart, and to have double frames at ship's side in way of bulkheads.
- Plating.**
- | | | | | | |
|-------------------------------|-----|-----|-----|-----|---|
| Centre keel plate | ... | ... | ... | ... | $1\frac{1}{8}$ ins. thick. |
| Garboards | ... | ... | ... | ... | $\frac{1}{8}$ in. ,, |
| Bottom to upper turn of bilge | ... | ... | ... | ... | $\frac{1}{8}$ in. ,, |
| Bilge to main sheer strake | ... | ... | ... | ... | $\frac{1}{8}$ in. ,, |
| Sheer strake | ... | ... | ... | ... | $\frac{1}{8}$ in. ,, for three quarters |
- of ship's length amidships, reduced at ends to $\frac{1}{16}$ in., $\frac{1}{8}$ in., and $\frac{9}{16}$ in.
- Spar deck plating $\frac{7}{16}$ in. thick, and spar deck sheer strake $\frac{9}{16}$ in.
- Engine and Boiler Foundations.** Of plate and angle iron, very strong, and as per Board of Trade surveyors.
- Rudder.** Of best hammered scrap iron in one piece, with pintles forged on solid, diameter at head $6\frac{1}{2}$ ins., at bottom 6 ins. by $3\frac{1}{2}$ ins., plated with $\frac{5}{16}$ in. plate, stayed and filled between with cement, shackles and chain pendants complete.
- Stanchions.** Of orlop main and spar deck beams of round iron 3 ins. by $2\frac{3}{4}$ ins. and $2\frac{1}{4}$ ins. diameter respectively, on every alternate beam, firmly attached to beams, and fitted over each other.
- Rivetting.** To be double rivetted throughout, thickness and distance of rivets according to Lloyd's rules, all left full and neatly rounded up to light water mark.
- Water Tanks.** Of plates $\frac{1}{4}$ in. thick, with angle irons $2\frac{1}{4}$ ins. by $2\frac{1}{4}$ ins. by $\frac{5}{16}$ in., and well stayed, fitted with pipes, plugs, pumps, &c., and to contain about 4,000 gallons.
- Hatch Coamings.** Of iron $\frac{1}{2}$ in. thick, to stand 10 ins. above deck, or height as may be required, with half round iron 2 ins. by 1 in. on upper edge, and an angle iron inside for supporting wood carlings.
- Bulwarks.** On spar deck as may be chosen by owners or their representative; either of iron stanchions

galvanized, spaced about 4 ft. 6 ins. apart, with teak rail on top, and rope netting with two iron rods $\frac{3}{4}$ in. diameter, running fore and aft, or teak stanchions and rail, with close bulwarks of well-seasoned yellow pine, $1\frac{1}{8}$ in. thick, tongued and grooved together, with hinged ports where necessary.

Steering Gear.

To have a screw steering apparatus, diameter of screw to be 5 ins. over the thread, all to be of the best forged iron, and fitted up with gun metal nuts, wrought iron standards, and yoke truly bored and keyed on to rudder head, stuffing box on deck, plate iron rudder trunk, caulked and made perfectly watertight, and to have a strong wrought iron tiller keyed on to rudder post under the yoke ready for relieving tackles, the whole to be covered in a neat manner, with gratings, and seats at the sides of teak, the steering wheel 5 ft. diameter of teak or mahogany, mounted and finished with brass.

Bell and Belfry.

To have handsome cast iron belfry and large bell, with the ship's name engraved thereon, also a brass bell 9 ins. diameter, and brass belfry for same, fitted aft as may be required.

WOOD WORK AND GENERAL FITTINGS.

Waterways.

On main deck of teak, 14 ins. by 6 ins. clear of inside frames, well bolted down to stringer plate, lower deck of red pine 12 ins. by 4 ins., and spar deck of teak 13 ins. by 5 ins.

Decks.

Main deck of yellow pine	...	...	6 ins. by 4 ins.
Spar deck	..	..	5 ins. by 3 ins.
Tween deck	..	..	5 ins. by 3 ins.

The whole of the deck plank to be well seasoned and free from sap, bolted to the beams with bolts and nuts, the heads dowelled, the seams well caulked and payed. In way of cables and capstans to be of oak or teak, $\frac{1}{2}$ in. thicker than the corresponding deck.

Ceiling.

In flat of bottom of American rock elm $2\frac{1}{2}$ ins. thick. To upper turn of bilge of baltic red wood $2\frac{1}{2}$ ins. thick, to tween deck beams of 2 ins. baltic red wood, berth and space, and all well fastened to reverse frames.

Breakwater.

To have a breakwater of wood fitted across the ship before fore hatch.

Cabins.

To be fitted on main deck for the accommodation of forty first-class passengers, sides of saloon to be neatly pannelled, and fitted with vertical ventilators, same plan as in P. and O. Company's steamers, with gilded cornice, bulkheads, dining state rooms and doors where required, to be also fitted with vertical ventilators, and otherwise arranged so that they may be kept as airy and comfortable as possible.

Furniture and fittings to comprise telescope dining tables, with covers and plate guards complete, sideboard with marble top and handsome brass rail all round, to be fitted with lockers and drawers, and lined with crimson baize, settees on each side of tables with folding backs, securely fastened to deck with screw bolts and plates. A handsome mirror with carved and gilt frame above sideboard.

Pianoforte of first-class description and make, bookcase, three dozen spittoons of brass or other material as may be ordered, cabin stove with brass funnel, three dozen camp stools, time piece, two handsome moderator lamps in saloon. One set Brussels carpet and runners for saloon and state rooms, mats for lobby, passages and doors, sofa backs, cushions, and settees stuffed with hair, and covered with crimson Utrecht velvet or haircloth.

Each state room to have a stuffed seat, two mirrors, and swinging candle lamps, basin stand in each passage with marble tops, all to be enclosed and fitted with locks and keys, and other minor fittings, two baths to be fitted in cabin, heated by steam.

Captain's, officers', and engineers' room to be fitted as required with wash stands, lamps, mirrors, sofas, cushions, seats, and other conveniences; captain's room to have chart table, chronometer shelf, &c.

Pantry to be fitted complete with every requisite, including a filter.

Purser's room and surgery to be fitted up with the necessary drawers, &c., to have racks for holding glasses over each table in saloon; on each side of cabin passages to have 1½ ins. round polished mahogany hand-rail, with brass ball brackets and handsome brass rail on each side of cabin stairs.

Ladies' Cabin. To have a neat ladies' cabin, with stuffed seats and backs all round of best hair, covered with crimson Utrecht velvet or hair-cloth, with handsome mirror and marble washstands. A handsome lamp and small mahogany table in centre.

Second-class Cabin. On main deck, according to approved plans, for forty second-class passengers, with saloon state rooms, tables, seats, washstands, lamps, and looking-glasses, complete; there will also be a ladies' cabin in this department, with all fittings necessary, and water-closet in close proximity for same, to be well ventilated in all parts.

Officers' Rooms. On main deck, as per plan for officers, engineers, purser, doctor, stewards, fitted with berths, sofas, wash-basins, lamps, &c., and to have mess-room, water-closets, and store-room as arranged.

Forecastle. Fitted in the fore end of the ship, fitted up for the crew and firemen, with berths, mess tables, lockers for clothes, and seats.

Steerage Passengers' Accommodation. The whole of the 'tween deck to be fitted up for third-class passengers, and to have separate berths fitted for females. The fittings to be of iron, and made so as to unship when there are no passengers. The berths will be arranged three in depth, and in conformity with plans furnished. All to be properly ventilated.

Orlop Deck. To have short orlop deck forward, made portable, and fitted for third-class passengers.

Baggage Rooms. To be fitted as may be arranged, and of suitable size for the number of passengers.

Mail Room. To be built where required, and fitted with desks, tables, drawers and racks, lamps, hooks, &c., for the convenience of the mail master in sorting the letters.

Bullion Room. To be built where requisite under cabin deck, sides being of iron secured with a patent Chubb's or other lock.

Galley. To be supplied with a cooking-range, oven, &c., of sufficient size to cook for forty first and forty second class passengers and officers; also, one of suitable size to cook for about 600 emigrants and crew, fitted in separate galleys, with a complete set of utensils for each, first-class galley to have floor laid with Mosaic tiles; galleys to have dressers, iron coal boxes with sliding doors, lockers, hooks, and racks for cooking-utensils, which are to comprise every requisite except earthenware, as follows, viz:

One gallon copper kettle
One copper boiler
Two copper stew-pans
Four copper saucepans
Six iron saucepans
Two iron oval pans
Two iron frying-pans

One cook's axe
One paste board
Two slices
One spoon
One chopper
One grater
One dredger

One basting spoon	One fish pan
One coffee roaster	One fish slice
One ladle	Copper pump
One meat saw	Six baking pans
One water cask	One set knife
One roller	One paste brush
Two dippers	Two copper pudding moulds
Two cook's knives	One steel saw
One tormentor	One egg whisk
Four goblets	One oil feeder
One cook's lamp	Eighteen meat hooks
One lamp	One meat cleaver
One gridiron	One mincing knife
One tin basin	One set of skewers
One colander	One coffee mill

If required, a small cooking range, for use of crew only, to be placed on spar deck.

Baker's and Butcher's Shop. At one end of galley, with sliding doors. Bakehouse to have dresser-top of hard wood, hung with strong hinges; flour bins lined with tin, fitted with suitable lockers and shelving. Strong galvanized hooks to be fastened to bulk-heads at butcher's shop, and to have dresser-top of hardwood, hung with hinges, and fitted with lockers and shelving.

Vegetable Lockers and Ice Houses. Fitted with shelving and racks. Bulk-heads of ice-houses to be double, 1½ in. thick, with an air space of 1½ in. between each bulk-head, to have a false bottom, 2 ins. thick and 4 ins. clear of deck, lined with lead, and to have 1½ in. scupper leading to bilges.

Scullery. To have a galvanized-iron trough, 1⅜ in. thick, supported on brackets bolted to the bulk-head; to be supplied with salt and fresh water from deck-condenser; to be fitted with dresser, locker, and shelving.

Lamp Room. To be fitted with lockers and box-racks to fit the various sizes of lamps, and to have strong iron hooks fastened to the roof as hangers for lamps.

Paint Lockers. Fitted with shelves and racks, and to have iron rods fitted on each side as hangers.

Skylights. Of well-seasoned teak, firmly put together and made water-tight at the joints; to be well fitted, and bolted to the deck in such a way as to be easily kept tight. Skylights over saloon to have circular frames, tops glazed with thick glass panes, and with seats on each side; below seats, on sides of skylights, to have sliding sashes glazed with thick glass; on top, to have strong hinged guard frames, of 1⅝ in. brass wire. The ends of these skylights to have ornamental stained-glass panes, protected with guards same as top, square companions with flat tops, and brass-framed lights on each to be fitted over hatches.

House on Deck. To have two deck houses, pannelled with teak; one to form an entrance to cabin, with smoking-room at aft of ditto, and captain's room at fore end, say 22 ft. by 10 ft.; the other, forward, of same dimensions.

Seats on Spar Deck. Folding grating seats to be fitted round bulwarks from main mast on each side and round stern, to be hinged to iron stanchions, so as to hang down and stow when not in use.

Boats. To have six boats, two fitted as life-boats, and of sizes to pass Board of Trade requirements; two boats to be fitted with Clifford's lowering apparatus, fitted in chocks, and to have davits of suitable strength for size of boats. Boats to be fitted with oars, boat-hooks, &c., complete, and to be built of elm and copper-fastened.

Compasses
and
Binnacles.

By the best makers, of the most approved principle and construction; all to be correctly adjusted with the latest improvements in magnets and with vertical iron bar, to owner's option; a tripod compass to be fitted aft, sufficiently high to be clear of any deviation that may be caused by the hull of the vessel. In addition, to have two steering, one azimuth, one spare tell-tale compass, fitted in captain's cabin, one boat compass, spare cords, agates and needles to each compass, one telescope, one Board of Trade barometer, one aneroid barometer, two brass thermometers, one each Wilson's ship and engineer's six-month log-book, two log slates, one Edye's clinometer, two chronometers.

Guns.

To have two 6-pounder cast-iron guns, with brass-mounted teak or mahogany carriages with ramrod, sponge, &c., complete, supplied with twenty-four rounds ammunition. Also twelve breech-loading rifles, with bayonets, with say 100 rounds cartridges, &c., twelve boarding-pikes, twelve cutlasses, properly fitted in arm closet. Also six revolver pistols.

Steam
Winches.

To have two steam winches—one placed at the main hatch, the other at the after-hatch, to be firmly bolted on a hard wood sole 2½ ins. thick above the deck. Over the length and breadth of the sole plate each winch to have two cylinders 6 ins. diameter, and to be of a strength sufficient to lift three tons.

Donkey
Boiler.

To have a donkey boiler of ample capacity for working winches, to be connected to large boiler, and to be fitted with all the usual mounting, including small donkey engine.

Plumber work

To have manual labour pumps to each hold, and sounding pipes to each compartment. A salt-water tank, for galley purposes. Two 3 ins. close brass chamber pumps, with copper air vessel and cock for fresh water, with 1½ in. suction pipes from bottom of tank, and placed in a convenient part for galley. Fresh-water tanks to be fitted with filling, air, sounding, and suction pipes, all carried to main deck.

A condenser, with separate boiler for fresh water, capable of condensing 500 to 600 gallons per day, to be supplied, of improved construction, with all necessary fittings and connections.

Two Downton's fire engine pumps, and one portable fire engine pump.

Scuppers.

Four on each side of spar deck. Four on each side of main deck. Two on each side of 'tween decks. The main and 'tween deck scuppers are to lead into bilges.

Waterclosets.

Fitted as per plan for first-class passengers, six for steerage passengers, one for captain, two for engineers and officers. Galvanized iron trough closets, carried on cast-iron brackets, sufficient for male steerage passengers, crew, and firemen.

Plunge and shower bath, fitted with check valve on outlet pipe on ship's side. Closets to be fitted with lead cisterns.

Painting.

To have three coats of paint outside and two coats inside. The wood work on deck to be grained and varnished.

The ceilings of cabins and state-rooms to be painted white, with gilt mouldings. The third coat of paint on the outside up to the 12 feet water line to be of the most approved composition in general use in the Merchant Service. Stem and sternpost to be marked on both sides, and figures cut as well as painted.

Cementing.

Bottom of vessel to be cemented with best Portland cement to upper part of bilge, to cover rivets, also to cement aft about rudder trunk.

Carving.

To have handsome carved figure-head to suit name of ship, and also stern carving, having Company's arms and name of vessel neatly painted and gilded.

Ladders.

To have two accommodation-ladders of teak, fitted with platform, handrails, &c., complete, also the necessary ladders to holds and for passengers.

Side Lights.

One 8 in. in each state-room, one 8 in. to each cross passage leading to state-rooms, one 8 in. to each length of berth in second-class berths, between, spar, and main decks, and one 6 in. to each length of berth in steerage, between the main and tween decks, one 6 in. to each length of berth in fore-castle, store-rooms, and closets as may be required for proper lighting.

Coal Scuttles.

Above the bunkers in main and spar decks to have iron scuttles secured to each deck, and to be connected by moveable or fixed shoots as may be best adapted for their position on deck. Coaling ports as may be arranged.

Cargo Ports.

To have four large cargo ports, two on each side from spar deck to main deck, fitted with strong iron hinges, to have an angle iron all round the edges of doors to stiffen them. Port cills 12 ins. above the main deck. All to be well secured.

Gangways.

The rail and stanchions opposite hatches to be moveable to form gangways.

Hawse Pipes,
Timber Heads,
and Mooring
Pipes.

To have one hawse pipe on each side of stem, fitted above main deck; also four timber heads and mooring pipes on each side for mooring; to have also a small transporting capstan on spar deck aft, with brass top, also one forward.

Masts and
Spars

Lower masts, and bowsprit of iron ¾ in. thick, jibboom, topmasts, yards, booms, and derricks of wood, and fitted with the necessary smith's work and appurtenances complete, sizes, &c., as may be arranged, to be fitted with Sir W. Snow Harris's lightning conductors, if required.

Rigging.

Standing and running rigging complete. To be rigged as a brig or barque in owner's option. Standing rigging of galvanized charcoal wire rope, running rigging of best St. Petersburg hemp, and fitted with the necessary blocks, deadeyes, &c. Lower rigging turned up and seized, and to be set up with deadeyes of lignumvitæ and lanyards.

Sails.

To be of the best quality of canvas, and of the following numbers:—

Two jibs	...	...	...	...	No. 4
Two forestaysails	...	...	...	...	„ 2
Two boom foresails	...	...	...	...	„ 4
Two fore topgallant sails	...	...	...	...	„ 6
Two main topsails...	...	...	...	...	„ 4
One flying jib	...	...	...	...	„ 4
Two fore square sails	...	...	...	...	„ 2
Two fore topsails	...	...	...	...	„ 4
One main trysail	...	...	...	...	„ 2
Two main topgallant sails	...	...	...	...	„ 6

If rigged as a barque to have such additional sails as are requisite for the purpose.

One suit of sails for each of the four largest boats. One cover for each boat, made to rise in the centre. One awning of good canvas to spread right fore and aft, with curtain two feet deep from main mast aft, including galvanized stanchions, ridge rope, &c. Two winch covers. Six tarpaulings. One cover for each skylight. Covers for stokehole gratings. Covers for bell, binnacles, and capstan.

Four windsails. One canvas screen to fit across main deck in front of cabin. Awning for captain's gig, and covers for sails.

Topsails to have Cunningham's reefing gear, if required.

Anchors and Chains. To be furnished with anchors and cables of the most approved description, and sizes and weights, according to Lloyd's rules for ships of this class and tonnage, say :—

Two bower anchors, 30 cwt.	Exclusive of stock.
One „ „ 25½ „	„ „
One stream „ 12 „	With stock.
One kedge „ 6 „	„ „
One „ „ 3 „	„ „

Two spare bower shackles. The bower anchors to Admiralty test, viz., 28⁶/₁₀ tons. Two best bower chains, 1½ in, 150 fathoms each, proved to Admiralty test, viz., 55¹/₁₀ tons. One swivel to put to each 150 fathoms length. One stream chain, 75 fathoms, ½ in.

Chain Lockers To be fitted of suitable size and in position, as may be arranged, large enough to house the cables.

Hawsers and Warps.	Ninety fathoms	...	...	...	10 in. hawser.
	Ninety fathoms	...	...	...	9½ „
	Ninety fathoms	...	...	...	7 „
	Ninety fathoms	...	...	...	6 „
	Ninety fathoms	...	...	...	5 „
	Ninety fathoms	...	...	...	4 „
	Fifty fathoms, each 3 in. and 3½ in. heaving line.				
	One coil, each 2½ ins. and 2 in. and 1½ ins. rope.				
	One coil, each 21, 18, and 15 thread.				
	One coil, each 2 and 3 yarn, Hambro' and houseline.				

If required by owner any of the foregoing hawsers to be of tarred Manilla.

Two deep sea leads and lines | Two hand leads and lines
Two log lines and ships.

Blocks. All blocks of running gear fitted in first-class style :—

Two fish tackle blocks	Two cut blocks
Davit blocks, upper and lower	Two iron top blocks
Capstan bars, long and short	Six span blocks
Two watch tackle blocks	Twelve spare sheaves and pins
Two large iron-bound snatch blocks	Six pair handspikes

Cargo Gear.	Three iron gins	Four pig iron slings
	Four crow bars	Four bale hooks
	Four chain nippers	Two crab hooks
	Three puncheon slings	Chains pans and iron gear for cargo
	Derricks complete	

Anchor Pur-chase. The ship to be fitted, in the best manner, with Messrs. Brown & Harfield's Patent Capstan or Windlass, as may be considered best by the owners ; with bow and deck stoppers, rollers, and every

convenience for the proper working of this important part of the ship ; to be arranged to work both by hand and by the steam winch.

Flags.	One ensign	One set Marryatt's Code of Signals and Book complete
	One blue peter	Two Italian, one Argentine, and one Montevideo flags
	One private signal	One set of Commercial Code of Signals and Book complete
	One Union Jack	
	One burgee	
	One signal bag or chest	

Cooperage.	Six harness casks, brass hooped	One wash-deck tub, galvanized hoops
	Twelve deck buckets, in rack aft	Two cooks' deck tubs, galvanized hoops
	Twelve deck buckets, galvanized hoops in rack forward	Two tar kegs, galvanized hoops
	Four draw buckets, galvanized hoops	Two water funnels, galvanized hoops
	Eight tar buckets, galvanized hoops	Twelve mess kids, galvanized hoops
	Two slop buckets, galvanized hoops	Eight water casks, 150 gallons each, galvanized hoops

Bread Tanks. Six bread tanks, each 4 feet square, made of plate iron 3/16 in. thick, with man-holes and covers.

Boatswain's Stores.	Four double luff tackle blocks	Two anchor fish hooks
	One pair rigging screws	Twelve spare bolts, extra heavy canvas, also rockets and blue lights in box, as required by the Board of Trade
	One patent log	Two holystones, mounted
	One hand reel and glasses	Two hand leads
	Twenty-four paint brushes	Four long tar brushes
	Two dozen brooms	Two varnish brushes
	Six paint scrubbers	Two whitewash brushes
	Six hand scrubbers	Six deck scrubbers
	Six mast knives	Two log reels and ships
	Six palms	Forty-eight sail needles
	Twelve scrapers	Four cork fenders
	Twelve paint tins	Two life buoys
	One copper mast-head lamp	Four oil cans
	Two copper side-head lamps	Four oil feeders
	One copper anchor lamp	Twelve coupling shackles
	Six marline spikes	Two 28 secs. brass log glasses
	One brass speaking trumpet	Two 14 secs. brass log glasses
	Six boat pads for each boat	Four serving mallets
	Four tin dippers	One set funnel boards
	Four hand lanterns	Six ballast shovels
	Two fog horns	Twelve thimbles, assorted
	Three globe lamps, for deck use	Two deep sea reels
	One hide pump leather	Two coal gins
	Twelve hand holystones and six handles	Four mops
	Two dog clip and one dog galvanized hooks	Two pair lamp scissors
	One ship's name brander	
	Three boat axes	

Oil and Tallow Tank. To have the necessary oil and tallow tanks for ship and engines, those for engines being specified under that head.

Cow House, Pig and Sheep Pens. To have a cow-house fitted in a convenient place on deck ; also pens for pigs, lined with galvanized iron ; for sheep, pigeons, ducks, geese, and hens, as may be required.



- Carpenter's Stores and Spare Stores, One spare lower yard, Vancouver junk
- One spare topmast, Vancouver junk
- One spare topsail yard, jibboom
- Four spare topmast and topgallant studding sail booms, if required
- 100 lineal feet, each 1 in. and 2 in. boards
- Thirty lineal feet, each 1 in., 1½ in., and 2 in. teak boards
- One each axe, adze, hand hammer, maul, jack, smoothing, and hand planes
- One each hand and cross-cut saw
- One draw knife
- Six wood chisels
- Six screw augers to 1½ in.
- Six screw gimblets, assorted
- Four gonges
- Six cold chisels
- One ratchet brace and six drills, all fitted in carpenter's locker
- One grindstone and trough, pitch-pot and ladle
- Two mops and handles
- Two sounding rods

- Six valve keys
- Six handspikes
- Twelve dozen hatch wedges
- Six chain hooks
- Six boat axes
- Six gutta percha boat buckets
- Three pump spears and breaks
- Two pump hooks
- One berth lamp
- One stone of oakum
- One screw key
- Two small oil feeders
- Two oil funnels
- One cwt. nails, assorted
- One hand truck
- Six ring bolts
- Two dozen belaying pins
- Three sheets yellow metal
- Two pounds copper nails
- Six dozen forelocks, assorted
- Two dozen shackles, assorted.

NOTE.—The vessel to be built of the best material and workmanship, in conformity with the foregoing Specification; but should anything be omitted to be enumerated that may be required to equip the vessel for service, such parts or things as may have been omitted shall, nevertheless, be done by the contractors to the satisfaction of the owner's superintendent, and the vessel made ready for sea in all respects with the outfit as usual and necessary for a vessel of her class.

Beds, bedding, napery, plate, cutlery, crystal, crockery, or other like cabin or steward's furnishings and stores excepted, as also such articles or fittings as may be twice mentioned here.

SPECIFICATION

OF

COMPOUND ENGINES,

Of 275 Nominal Horse-power reckoning 30 Circular Inches one Horse-power.

The vessel to be propelled by two 3-bladed iron screws, 10 ft. 6 ins. diameter, and 15 ft. 6 ins. pitch, each driven by a pair of inclined compound direct-acting condensing engines.

Revolutions of engines 98 to 108 per minute. Average, 85 for 10 knot speed.

Indicated power at 33 lbs. pressure in the high pressure cylinders, and 12 lbs. pressure in the low pressure cylinders=1,250 horse-power.

Guaranteed proportion of effective horse-power to nominal horse power five times.

Cylinders. } Four. Two of 33 ins., and two 55 ins. diameter, and 22½ ins. stroke, carefully bored and fitted with double port steam-slides, having relieving rings on backs, the slide faces cast on solid, having cast iron slides accurately scraped and fitted, water cocks to be fitted at bottoms of cylinders and slide cases, escape valves having suitable metallic cases to obviate the danger of scalding, to be fitted at both ends of cylinders; cylinder covers to be polished, and suitable apparatus to be provided for taking indicator figures from each end of cylinder. The cylinders, &c., to be jacketted, covered with felt, and lagged with mahogany, with brass hoops round same.

Pistons. To be fitted with metallic packings, which are to be so constructed as not to require the use of hemp or other packing behind them, and solid blocks to be placed under the pistons in lieu of springs, the junk-ring nuts to be of gun metal, and the piston-rod glands to be double.

Piston Rods. Forged in one solid piece with head and guide, the head fitted with brasses and steel cod-piece, having an adjusting screw and jam-nut, and the guide fitted with gun metal, adjustable, bearing plate faced with patent metal.

Connecting Rods. To be coupled to crank by brasses having wrought iron caps, bolts, and nuts, and to have a fork end and pin at upper end, fitted to the brasses in piston-rod head.

Slide Gear. To consist of double eccentrics of cast iron, with brass hoops and malleable iron rods, neatly finished and fitted with link motion and reversing gear, and apparatus for fixing the links in any position, all got up bright.

Crank Shafts. Of the best hammered iron, forged in one solid piece, turned to place, and fitted with balance discs, arranged to turn the engines by hand.



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- Propeller Shafts.** Of the best hammered iron, forged with solid collars on ends, for coupling together, and a set of collars for taking the thrust of propeller; the bearing parts in stern tubes to be cased with gun-metal.
- Thrust Blocks.** Fitted with brasses, having a set of collars to suit those on shafts.
- Stern Tubes.** Of cast iron, fitted with patent bearing (Babbit's) metal. After-bush, on Lignumvitæ bearing-strips, properly fitted and bored to receive shafts.
- Bed Plates.** To be of very strong construction, having proper brass bearings of large surface, well fitted, and bored out true to receive the crank shafts, and the whole firmly bolted down to the condenser and engine sleepers.
- Surface Condenser.** Of cast iron, strongly ribbed and fitted with brass tubes, on Davison's patent, with hot well and air-pump seats, and to be so constructed as to form part of the engine framing. Cooling surface in condenser to be not less than 2,250 feet.
- Air Pumps.** To be horizontal and double-acting, the air-pump liners, buckets, rods, valve seatings, and guards, and all rubbing parts of pumps to be of brass, and the valves of vulcanised indiarubber.
- Feed and Bilge Pumps.** Two of each, of cast iron, lined with gun metal in all rubbing parts, with plungers and valve seats of brass, accurately fitted; valves of brass or vulcanised indiarubber feed-pumps to have suitable escape valves.
- Donkey Engine.** To be adapted to draw from the sea or bilge to discharge into the boilers or on deck, and capable of supplying sufficient water for full steam, to have a large air vessel, and to be made to work by steam or hand.
- Oil Cups and Lubricators.** To be fitted to all bearings, the crank and propeller shaft-bearings to have large lubricators, water-service, and branch pipes of brass to be provided with cocks, &c., got up bright.
- Wrought Ironwork.** Such as piston rods, connecting rods, &c., to be of best hammered iron, and all parts usually made bright to be polished.
- Engine Pipes.** All to be of copper, except the bilge suction, which may be of lead, main steam pipes to be felted and covered with canvas, a strong and efficient stop valves of gun metal, and strong, to be fitted at the ship's side, to the waste water pipes and non-return valves to be fitted to the extremities of all pipes discharging into them. Kingston valves with the spindles cast on solid, and furnished with stop cocks, are to be fitted to the blow-off pipes and to the suction pipes of auxiliary pumps. A pipe and cock to be fitted to the circulating pump for drawing water from the bilge in the event of a leak in the ship.
- Governor.** To have one patent marine governor for regulating engines.
- Engine Telegraph.** To have a telegraph communicating between bridge and engine room, with all cranks, rods, and other connections complete, having illuminated dial on bridge, and bell and indicator in engine room, to have also voice tubes leading to the engine from bridge if necessary. To have also an engine counter and tell-tale visible from the quarter deck to show speed and direction of engines, whether going ahead or astern. All requisite lubricators to be supplied.
- Bunkers.** To be formed of $\frac{3}{16}$ in. and $\frac{1}{4}$ in. plate properly stiffened with angle iron, and of a capacity

sufficient to contain what may be considered requisite for about 3,200 knots steaming, arranged as may be determined upon, and having not less than 13 ins. clear space between boiler and bunkers in every part.

BOILERS.

- Two in number, to have four furnaces in each, with tubes above furnaces, grate surface not less than 0.7 per square foot per horse power, total external tube surface not less than 4,000 square feet.
- Superheaters.** To be placed over boilers, and connected to the same with copper pipes.
- Tubes.** To be of iron, lapwelded, about 3 ins. external diameter, and about 6 ft. 6 ins. long, the thickness not less than No. 12 wire gauge, and the distance between them not less than 1 in.
- Quality of Plates.** Back tube plates, crowns and sides of furnaces, and the whole of the combustion chamber to be of Bowling, Farnley, or Lowmoor iron, front tube plates, and bottom of furnaces of best Staffordshire iron, the remainder of best Staffordshire iron.
- Thickness of Plates.** Back tube plates of $\frac{3}{4}$ in. thick, front tube plates $\frac{3}{4}$ in., all other fire surface $\frac{7}{16}$ in., remainder $\frac{5}{8}$ in.
- Fittings and Proving.** The boilers to be made to bear a constant working pressure of 50 lbs. per square inch, and to be tested by hydraulic pressure to 100 lbs. before going on board, to be fitted with funnel, damper in ditto, safety and stop valves and gear, waste steam pipe, gauge cocks, glass water gauges, furnace and smoke box doors, damper doors and fittings, surface and bottom blow-off cocks, a blast pipe and cock, and a full set of cast iron firebars, all manhole and mudhole doors to be of wrought iron, and placed on the inside of boiler. Boilers to be felted and lagged with wood complete.
- Deck Casings and Stoking Floors.** Deck casings to be fitted to funnels, stoking floors and starting platform of rolled iron chequered plates, engine room ladders to be iron, also handrail around engines.
- Painting.** The engines and boilers with their connections to be well painted with three coats of paint, and the paint on engines to be varnished.

SPARE GEAR AND TOOLS.

- | | |
|---|---|
| Four connecting rod bolts | Forty-eight boiler tubes |
| Four crank shaft pillow block bolts | Forty-eight condenser tubes |
| Four coupling bolts | One dozen brass bolts for tube plate |
| Twelve piston bolts | Tubing and extracting tools for condenser, as required |
| Twelve cylinder cover bolts | Two propellers. |
| Twelve brass bolts for air pumps, &c. | One propeller shaft fitted complete |
| Four dozen bolts, assorted | One set of furnace bars |
| One set of piston springs | Twelve boiler gauge glasses |
| Four spiral springs for escape valves, &c. | Leather hose with brass couplings, swan neck and director to Board of Trade requirements. |
| One eccentric strap complete | Oil tank, with filling and cleaning screws. |
| One set link motion brasses | Drain cock and drainers |
| One air pump, bucket, and rod | Tallow tank |
| One circulating pump brass | One vice with bench fitted up |
| Two sets of indiarubber valves complete for air and circulating pumps | |



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One salinometer
 One copper cooler
 One copper tallow kettle
 One metal tallow kettle
 Two pairs blocks with brass sheaves, falls for blocks
 One heavy hammer
 One medium hammer
 One copper hammer
 Two hand hammers
 One 14 in. ratchet brace
 Nine drills
 Six chisels, assorted
 Two steel punches
 Six valve scrapers
 One shifting spanner
 Screw keys to suit all nuts about engines
 Twelve eye bolts
 Six packing screws
 One steam whistle
 One Fahrenheit thermometer
 One set taps and dies from $\frac{3}{8}$ in. to $1\frac{1}{4}$ ins., with stock, &c. complete
 One portable forge
 One anvil, smith's tongs, chisels, shovel, rake, &c., for forge
 One brass tallow syringe.
 Two 4 gallon oil cans
 Two quart oil cans
 Four oil feeders
 Six hand lamps
 Three bunker lamps
 Four boiler space lamps
 One oil filler
 One gallon measure
 One gallon tin
 Lamps (gauge and other, to suit engine-room and stoke-hole)
 Two steam and one vacuum gauges (Bourdon's)
 One dark lantern
 One pair lamp scissors
 One emery cloth box
 One black-lead and chalk canister
 Two drinking cans for firemen
 Eight iron ash buckets
 Four iron water buckets
 Four firing shovels
 Four trimming ditto
 Four furnace rakes
 Four furnace prickers
 Six spare pricker blades
 Four furnace slices
 Four tube brushes and rods
 Six spare tube brushes
 Two tube scrapers
 Eight tube slices
 Six scaling hammers
 Four coal hammers
 Four sludge rakes
 Small windlass and block for lifting ashes
 One engine indicator of approved construction, as may be decided on
 Two lamp feeders
 One ladle for patent metal
 One each cylinder cover, for high and low pressure cylinder
 One piston and rod for high-pressure cylinder
 Two junk rings for piston
 Half-set connecting brasses
 Two quadrant blocks
 Two valve spindles
 Twenty-three studs for stuffing box
 One valve chest for feed pump
 Twelve sets india-rubber valves for feed and bilge pumps
 Half-cwt. white metal
 Twelve bath bricks
 Four dozen emery cloth
 Two lbs. fine emery powder
 Two lbs. black lead
 One banister brush
 Two chain mats
 Two lbs. copper wire, assorted
 Six lbs. half-round iron wire
 Four ft. each $\frac{3}{8}$ in. and $\frac{3}{4}$ in. copper rod
 Two cuts worsted
 Twenty-one lbs. green paint, in can
 Forty-four lbs. sheet lead
 Ten lbs. sheet brass
 Four lbs. brass spelter
 Two lbs. solder
 Sixteen lbs. copper sheet
 Six sheets tin
 Three lbs. rosin
 One copper soldering bolt
 Three-quarters-cwt. sheet iron
 One cwt. rod iron
 Five cwt. plate iron
 Eighteen lbs. hoop iron
 Twenty-eight lbs. boiler rivets
 Five lbs. washers
 Six lbs. silver steel
 Thirteen lbs. sheet india-rubber
 One ship's scraper
 Fourteen lbs. lamp cotton
 One gross solar wick
 Three yards cloth wick
 Half-cwt. valve yarn
 Seven lbs. soda in tin
 One lb.

Two lbs. sulphur in can
 One dozen broom handles
 Two dozen brooms without handles
 One grab
 One set hammer
 One screw-driver and handle
 Three hand hammers
 Two 4/0 paint brushes
 Two No. 6 sash tools
 Twelve coal baskets
 Two glass salinometers and jug
 Four dozen tube brushes, in small press
 Three handles for small tube brushes
 Six $\frac{3}{4}$ in. rods, about $6\frac{1}{2}$ ft. long, screw at ends, with nuts and washers
 Three cold chisels
 One diamond tool for boiler
 One 6 in. hand vice
 One dozen files, assorted
 Half-dozen file handles
 One feed check valve and seat
 One cwt. red lead, in keg
 Half-cwt. white lead, in keg
 Six yards canvas
 One yard wire cloth
 One yard moleskin
 One steel tommy
 Two hanks sail twine
 Two balls filling twine
 Five dozen fire bricks
 Half-cwt. fire-clay
 Seven lbs. black ashes
 One bottle spirits of salts
 One short rake
 One short pricker with blade

Models and Plans.

The builders to furnish three models of vessel made to a scale of one-quarter inch, representing one foot; one to be well-finished, showing internal fittings as minutely as possible; also, sectional drawings of main parts of ship, engines, and boiler, and detailed drawings of such parts separately as may be required. These plans or drawings to show the centre of gravity of the whole machinery, coals, &c.

Note.

All material and workmanship of engines and boilers to be of the best description, and equal in finish to the best engines turned out by us, fitted on board ready for trial, to the satisfaction of the company's superintendent.

SUPPLEMENT.

Cabins.

If desired, it will be in the option of the owners to have the dining saloon for first-class passengers fitted on spar deck, as required; dimensions, say, about 50 ft. long, including companion, &c., by about 18 ft. wide, with iron stanchions and rail on top.

Bridge.

To have a bridge platform fitted in front part of funnel, raised about $6\frac{1}{2}$ ft. above spar-deck, of such a width as may be requisite, with galvanized stanchions and rails, and teak ladder leading from ditto to spar deck.

Name Plates.

To have brass name plates for all doors of officers' rooms, cabins, &c., &c.

Galvanizing.

All light iron work about deck to be galvanized, including bulwark stanchions and rails.

Ventilators.

To be extra large, made of galvanized iron, brass mounted, and placed where required.

(Signed) Builders, JOHN DUDGEON AND WILLIAM DUDGEON.

(Signed) Purchaser, ANTONIO ONETO.

LONDON, 2nd August, 1869.

E. FISHER, Printer, 50, Lombard Street, London.



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