

STEAM DEMI-BARK ANTELOPE

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THE JAPAN AND CHINA PACKET PROPELLER ANTELOPE.

THE establishment of commercial relations with Japan, has furnished a new field for American enterprise in constructing vessels adapted to the trade between that and other countries. An original, and skilfully designed vessel, fitted out at a liberal expenditure, and embracing almost all the popular improvements of the day, has been built in East Boston, Mass., by Samuel Hall, for parties in China, for which she sailed on the 19th day of July last. This beautiful pioneer packet has been named the ANTELOPE; she registers 415 tons, and is well furnished with sail and steaming power.

The credit of her design and superintendence is due to Capt. R. B. Forbes, of Boston, and abundantly evinces his excellent taste and judgment in every point of utility, convenience, and facility which has been skilfully combined, to stamp the ANTELOPE as a production worthy of the nautical science of the age. And we would say, that although costing, in her construction, equipment, and experimental trials, more than \$50,000, not *one* dollar has been expended in superfluous glitter and ill-contrived ornaments, but nothing has been withheld, through a mistaken economy, that could properly and judiciously have been invested in making her *what she ought to be*.

She carries a small armament of an efficient description, as a defence against the pirates on the China coast, consisting of an 8-inch shell gun, of navy pattern, weighing 6,340 lbs., fitted on a slide carriage, to work in a large gangway port on either side. This gun would take a 64 pound shot, but is only provided with shells and hollow shot. On the bow she mounts a 32 pound shell gun, weighing 3,318 pounds, fitted expressly to pivot at the tail of the carriage; and on the quarter-deck is another gun of the same weight and calibre, pivoting in the same way. These guns and carriages were designed by Lieut. Dahlgreen, of the U. S. Navy, whose fame is well known for his boat guns and carriages. The cabin is also well stocked with small arms, which may be used to command the deck, through a port in the front of the cabin, in a case of invasion.

For her model, the ANTELOPE is jointly indebted to Mr. Samuel Hall, and S. H. Pook, of Boston, and is a fine specimen of their skill. We invite our readers to compare its points with those of other models of propellers, which we shall furnish in this volume of the Magazine. Through the kindness of Captain Forbes and Mr. Pook we have been furnished with the mould-loft tables of the ANTELOPE, from which the accompanying draught is drawn. Her dimensions are as follows:

Length on deck, 155 feet; on the keel, 147 feet; extreme breadth, $27\frac{1}{2}$ feet; depth of hold, $10\frac{1}{2}$ feet. Deadrise at half floors, 10 inches. In regard to her lines, Mr. Pook writes us as follows:—"The model was altered somewhat from the original design, being made *one* foot deeper, and ten feet longer,

and having a drag line of two feet put on to the bottom, which made her somewhat different from Mr. Hall's original design; but, in my opinion, the lines are still too full aft to get the best result from her propeller, and her midship section entirely too square for speed." He adds, "she is constructed as usual for vessels of her class, being stronger only, by extra fastening. Mr. Pook was called to superintend her building, inasmuch as the contractor was absent from Boston." Her bulwarks are 4 feet above the deck, surmounted by a monkey-rail of 14 inches, and she has a topgallant forecastle the height of the main rail and 25 feet long, a house abaft the foremast 18 by 11, and $6\frac{1}{2}$ feet high, a half poop deck, 32 feet long, with projecting rooms on each side for engineers, and the engine hatch flush with poop-deck, containing entrance to the engine room. The forecastle, the first of the kind, is sunk about three feet below the main deck; it is ventilated and lighted by two screw lights in the bow, and two ports in the after part of it are also fitted with screw lights, for air and light when the ports are closed. There are twelve berths in it and a table, and it is tastefully painted and grained.

A comfortable forecastle bespeaks the intelligence and humanity of the owner for the well-being of the sailor, and secures a willing discharge of duty, and hence is always a paying investment.

In the deck-house there are four berths, for the gunner, carpenter, and two boys. In separate rooms, there are also two berths for cook and steward, and two for the firemen, besides a mess-room and cooking apartment. On the main hatch is a small house, with two berths in it, for an hospital, if required.

The hawse pipes pass through above the forecastle deck, instead of through below it in the usual manner, and the chains do not, therefore, render the forecastle wet, dirty, and uncomfortable. The anchors are weighed from the topgallant forecastle deck.

The cabin, like the forecastle, is sunk about three feet below the main deck. There is nothing peculiar about its appearance, except its simplicity. It is entered in front on the port side; on the starboard side is the captain's room, having a side-light, a port in the bulkhead, and containing the small arms, carbines, cutlasses, &c.; between the captain's room and the gangway, amidships, is the pantry, with the mizzenmast stepped down through it; and on the larboard side is found the mate's room. Abaft these rooms is situated the main cabin, occupying the entire breadth of the vessel, in an octagonal form, having the corners cut off to supply length for berths in the rooms forward and abaft of it. The after cabin contains two berths and a water-closet. The tiller traverses here beneath the deck, in order to leave all clear for handling the pivot-gun on the poop-deck. The wheel, however, is placed on this deck forward of the gun, and the binnacle is formed in the skylight. The compass is one of Sir W. S. Harris's, suspended by India

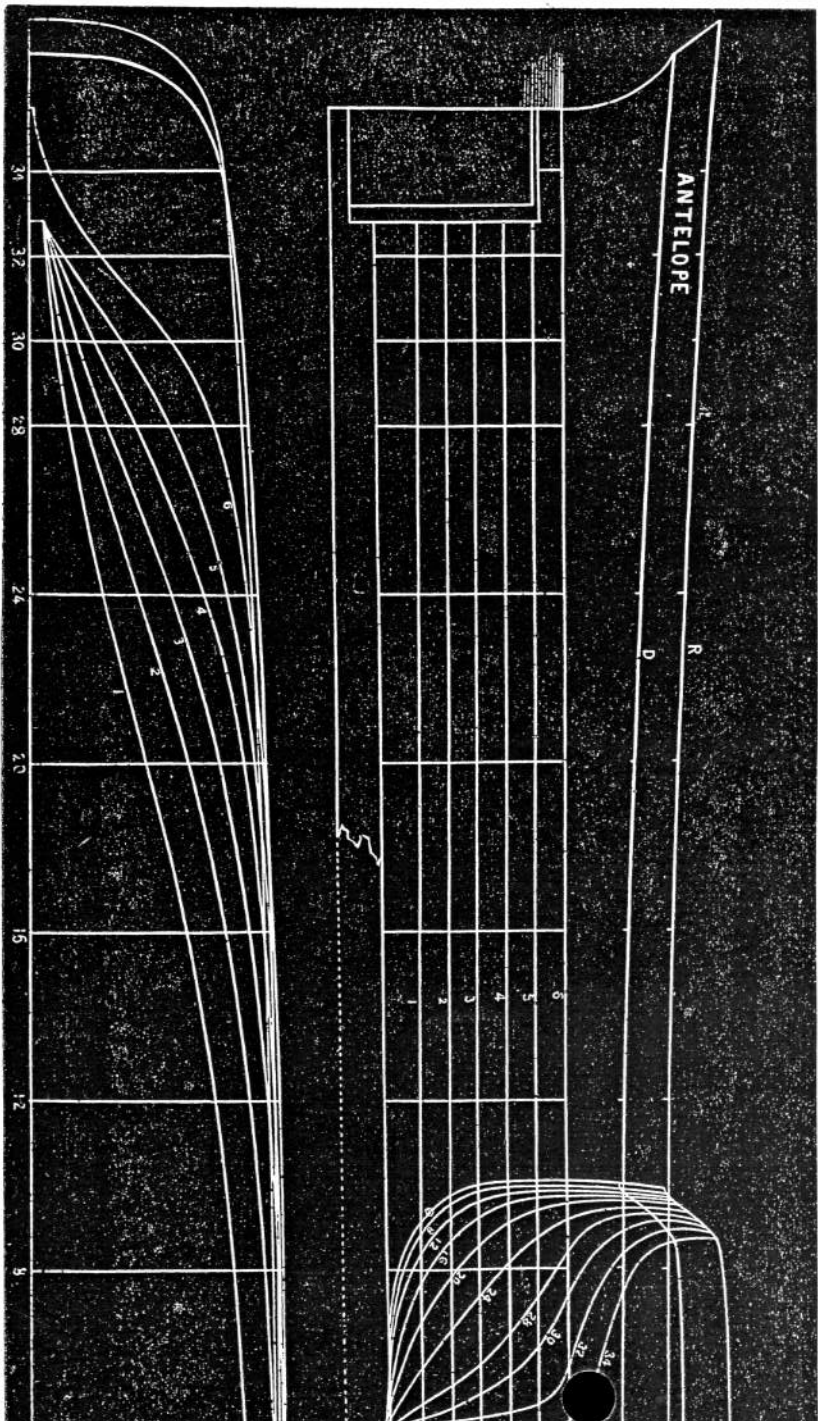
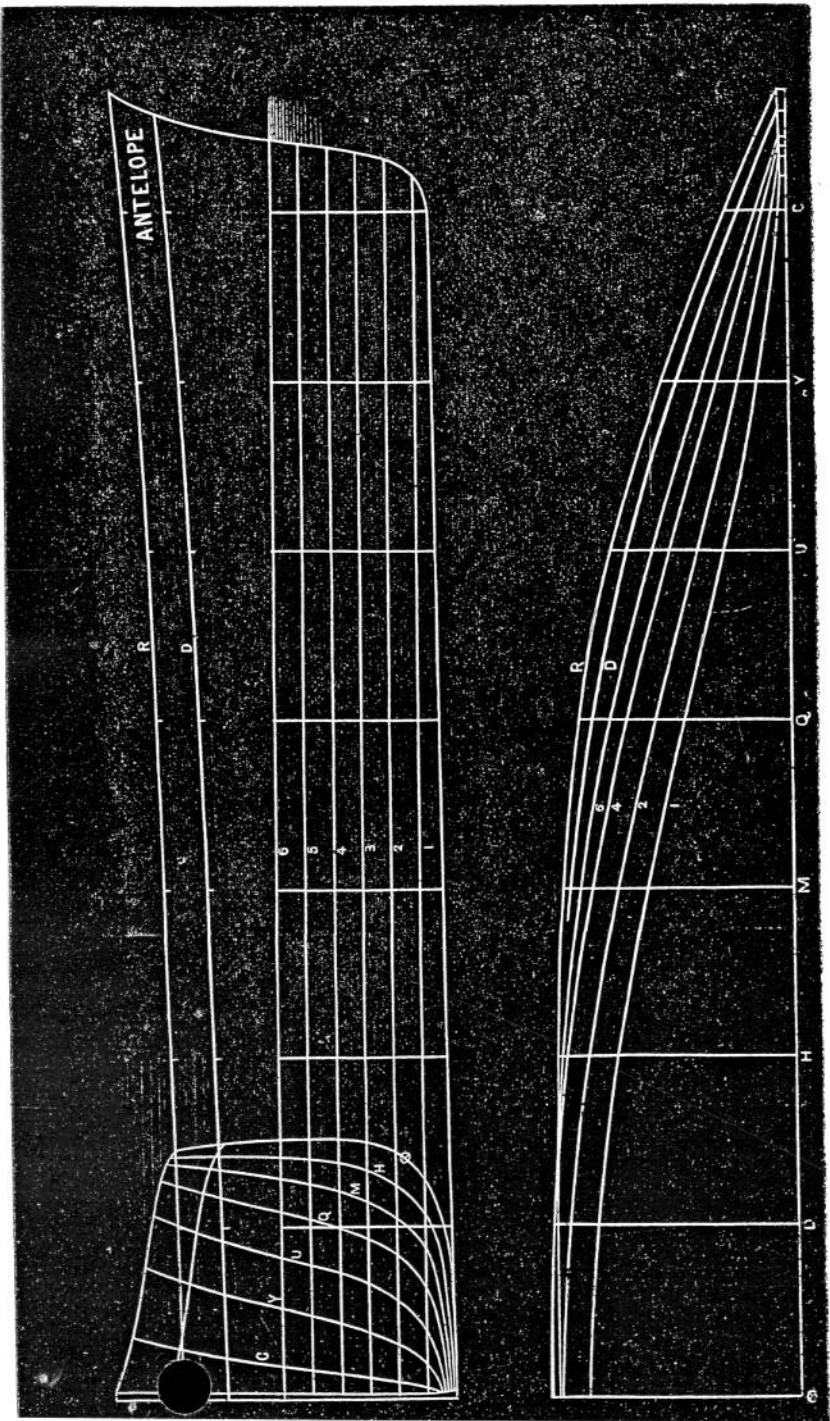
Rubber, and has been fully tested in many vessels, fitted out by Captain Forbes. This compass costs 30 to 35 dollars to import it, but when it is once on board, it can be depended on with far greater reliance than those in common use. What may not depend on a *good* compass, that a sum of \$20 might not secure?

The timber, scantling, and construction are as follows:—The keel is in two depths, being sided 12 inches, and moulded 28, with 10 feet scarphs, and is bolted with copper. The floors are sided 10 inches, moulded 12, and bolted alternately through the keel, and through the keelson and the keel, with one inch yellow metal. Moulding edges of frames two feet apart. The stem and stern-post side 12 inches each, the former being 12 inches at the head and 15 inches at the foot, moulded, while the latter is moulded 19 inches at head and keel. The apron and deadwood are bolted with yellow metal up to 14 feet draught. The lower log of keel, 12 by 14 inches, projects six feet beyond the inner stern-post, and into its extreme is stepped the outer stern-post, which is of live oak. The opening between the posts for the play of screw propeller is $4\frac{1}{2}$ feet, fore and aft, and 9 feet in a vertical direction. These posts are secured as usual, by two composition metal knees, each 7 inches wide and 1 inch thick, let into each side of the posts and keel, in the same manner as the usual dovetails, and are bolted through all. These knees or braces weigh 250 lbs. each. Above the propeller the same manner of securing the two posts of the fore and aft piece is adopted.

The main keelson is of pitch pine, sided 15 inches, and moulded 14. The bilge or boiler keelsons are of the same size, placed 7 feet outside of the main, and extend from the stern to midships.

The propeller shaft is worked through an oak rider, 19 inches square, layed upon the keelson, over which the angle is filled in with deadwood, quite to the head of the stern-post. The ceiling is of hard pine, three inches thick on the floor; the bilge is strengthened by 2 strakes of 6 by 14 inches, and 4 strakes of 5 by 14 inches, scarphed and square bolted. The remainder of the ceiling to the deck is all of the same thickness, $4\frac{1}{2}$ inches by 12, square bolted. She has 5 hooks and points forward, through bolted. The beams are sided 14, and moulded 10 inches, except two in wake of the large gun amidships, which are 14 inches square. Hanging-knees are fitted under all the beams, having 3 feet 4 inch bodies, and $4\frac{1}{2}$ feet arms, sided from 8 to 10 inches, and moulded from 16 to 18 inches in the throats. The berth knees are scarphed together. Her water-ways are 8 by 12 inches, with one strake of 4 inches inside. The deck-plank is 3 inches thick—the planksheer is $4\frac{1}{2}$ by 13 inches. All the spikes and bolts about the decks are galvanized.

Her garboards are white oak, 4 inches thick by 14 wide, let into the keel and bolted through it and the timbers; the bottom plank is pitch pine, 3 inches thick, the wales of white oak, 4 by 7 inches, flush to the covering-



board, the whole square fastened with treenails driven through and wedged. She is butt-bolted with copper, and sheathed with yellow metal up to ten feet forward and 12 feet aft. Outside she is painted black, and inside buff color. In line with the after part of the forecastle she has a water-tight bulkhead, which extends from the skin to the deck, so that if a hole were stove in her bow, she would float without danger. Before the engine-room there is another double bulkhead, filled in with paddy to keep heat from the cargo.

Her bed-plate is of cast iron, in one piece, and her engine-rooms and coal-bunkers are entirely ceiled with or made of iron, as a guard against accident by fire. Her motive power consists of two engines, direct action, with cylinders of 30 inches diameter, and 26 inches stroke, placed vertically over the shaft, one before the other. The cranks are of wrought iron, and the shaft is 30 feet long, in two parts, and 9 inches in diameter, with two bearings inside of the stern-post.

She has two boilers, each 7 feet in diameter, and 24 feet long, with furnaces adapted for either hard or soft coal. Her air-pump beams are made of wrought iron, and her engines are on the low pressure principle. The coal-bins are in the wings of the boilers, and have seventy-five tons capacity.

She is provided with a Griffith three-bladed propeller, of 9 feet diameter and 19 feet pitch; and a true screw also, of the same diameter, pitch, and number of blades. The Griffith propeller is an English invention, and has been tried with success in England, under the superintendence of the Admiralty.

Captain Forbes, however, was determined to test its comparative merits with the "true screw" in common use, for himself. "One trial of the Griffith propeller was made under disadvantageous circumstances of wind and weather, and like most first trial trips was not very satisfactory, owing to foaming of the boilers, and to other causes apart from the propeller and engines. On the second trial it gave good results; with about 58 revolutions and 17 lbs. steam only, the vessel made 9 and $9\frac{1}{2}$ knots (not statute miles), with some help from fore and aft sails.

One trial was made with the "true screw," during which the steam carried averaged nearly 10 lbs. more than with the other propeller, and gave 60 to 62 revolutions, and as a natural result, a mile or more greater speed than on the previous trial.

It must be borne in mind, however, that the "true screw" has about ten per cent. more surface than the Griffith propeller, and if that surface is judiciously placed, and *pitched* for propulsion, it ought to produce more speed than the other.

The consumption of fuel at 27 lbs. must also be greater than at 17 pounds steam pressure. The general result, so far as could be judged of by experiments made without weighing coal, and without scientific examinations into the

surfaces of the propeller's propulsion, without similarity in the tide on both occasions, and without trying a different pitch or angle with the Griffith propeller, amounts to this :

The Griffith propeller propels as fast, to say the least, as the other, with the same pressure of steam, and ten per cent. more turns. It causes less shaking or vibration to the vessel ; it does not impede the sailing when locked or stopped as much as the other ; the pitch or angle of the blades can be easily changed by getting at the hub, and a spare blade can be easily carried, to supply at short notice a broken one—and this is an accident often occurring to propellers. Against these manifest and very important advantages, it must be borne in mind, that more revolutions use more steam, and make wear on the engines and on the bearings.

The blades of this propeller, instead of being larger towards the periphery, as usual, are largest near the hub, and the hub itself is a globe of some two feet in diameter.

After the trial, Captain Forbes was perfectly satisfied that the Griffith propeller, if properly made, will do as well if not better than the ordinary "true screw." The increased expense of making it, and expense of patent fee, must, however, be drawbacks of a serious nature, unless the advantages claimed for it are fully realized.

The Antelope's shaft is contrived so as to uncouple and allow the propeller to revolve by the headway of the vessel, under canvas. The steam, though nearly enough for a full power propeller, is to be used mostly as auxiliary to the sails."

The Antelope is supplied with a steam-pump, besides which, she has two 7-inch French pumps, that will elevate coal or gravel, of small size, with a stream of water ; and in the forward hold compartment there are means to flood the magazine, or shell-room located there, from the sea, and to expel the water when in ; and, by a force pump and hose, she can take water from the sea and throw it to the mast-head, if required. Attached to the steam-pump is a hose 50 feet long, to be used for washing decks, or to put out fire ; and besides all this in the hydraulic line, she can throw *hot water from her boilers* to a distance of one hundred yards from her side. Her boiler surface is sufficient to steam 6 knots with one boiler only in use, and 9 or 10 knots with 30 lbs. on both boilers, with a natural draft. The nuisance of cinders, sparks, and smoke, is almost entirely avoided on this vessel. Her machinery was furnished by Mr. Otis Tufts, of the East Boston Steam Engine Company.

The ANTELOPE is rigged on three masts, being square-rigged on the fore-mast, and fore-and-aft rigged on the main and mizzenmasts. This is a new rig which is fast gaining popularity, and is variously denominated, as "barque," "demi-barque," "three-masted schooner, brig-rigged, &c." Inasmuch as it has been proposed to denominate three-masted schooners, TERNS,

meaning threefold, we suggest that this rig be called *brigantern*, as the combination of brig and schooner rig on *two* masts is now named *brigantine*. When combined on *three* masts, let it be called *Brigantern*; then we shall avoid a confusion with the old legitimate rig of "barque." The rig of the foremast in this case, however, is between a brig and topsail-schooner.

Captain Forbes has fitted the foremast with his rig, with the topmast fidded before the mast-head; yet the arrangement is such that this mast can be housed without preventing the use of the topsail. She has a square foresail for moderate weather. Four staysails are carried forward, namely, fore-staysail, cap-staysail, jib, and flying-jib. On her main is carried a mainsail and gaff-topsail, and two staysails. One of the latter is carried on a shifting mainstay, and designed for a storm staysail, to set when the fore-spencer is not used. The mizzenmast carries a hoisting-spanker and gaff-topsail. The masts and spars are proportioned as follows:—Bowsprit, of hard pine, 17 feet outboard, diameter, 19 inches; jibboom, 17 feet outside of cap; flying jibboom, 13 feet; pole, 3 feet; extreme length, 48 feet.

Foremast, 66 feet; head, 16 feet; diameter, 23 inches; topmast, topgallant, royal and skysail, all in one, 50 feet long. Fore yard, 56, arm, 4 feet; topsail yard, 46, arm, 4 feet; topgallant, 36, arm, 3 feet; royal, 26, arm, 1½ feet; skysail, 20, arm, 1 foot. Mainmast, 80 feet; head, 8 feet; diameter, 23 inches; main boom, 38 feet, and gaff, 28 feet. Mizzenmast, 70 feet, stepping at cabin floor; head, 6 feet; diameter, 17½ inches; boom, 36, and gaff, 21 feet.

The ANTELOPE works admirably under steam or canvas. She has Capt. Forbes' patented improvement on the lightning conductor of Sir W. S. Harris, on the fore and mainmasts. This conductor is let into the masts until it approaches the eyes of the lower mast rigging, when it branches off by tubes or sockets to the outside of the vessel, and is connected with the copper on the bottom. She carries a complement of 21 persons, all told, viz:—captain, 2 engineers, 2 firemen, gunner, carpenter, cook, steward, 2 mates, 2 landsmen, and 8 seamen. She is provided with two metallic life-boats, having the end chambers built separate from the boat, and removable at pleasure. One was built by the Francis Company, and the other by Louis Raymond, New-York. The latter has side-tanks and delivery-valves for self-bailing, is of galvanized iron, and superior to Francis' metallic boat, for the reason that the iron is of uniform thickness, and is, consequently, more durable, inasmuch as the corrugations in the Francis' boats are thinner than other parts of the sheet, and yet the wear is greatest on the corrugated parts. The ship's boat is built of cedar, with great beam and buoyancy.

If the Navy Department of the United States were in possession of a few such vessels, instead of cumbrous ships, that are a scare-crow only when the free-booter is caught napping, or ranged alongside, because not capable of

overtaking anything, or pursuing it into shallow waters, the pirates on the China and East India coasts might soon be driven from the sea, and thorough protection be secured to our trade, which is growing so fast in that part of the world. Indeed, the necessity for maintaining an expensive armament on board our merchant vessels is due mainly to the want of suitable protection on the part of commercial governments against the free-booters of the ocean. We propose that those governments contract the *job* to rid the China and East India coasts of pirates, in order that it may be taken hold of by men who will push the operation to a speedy and profitable conclusion.

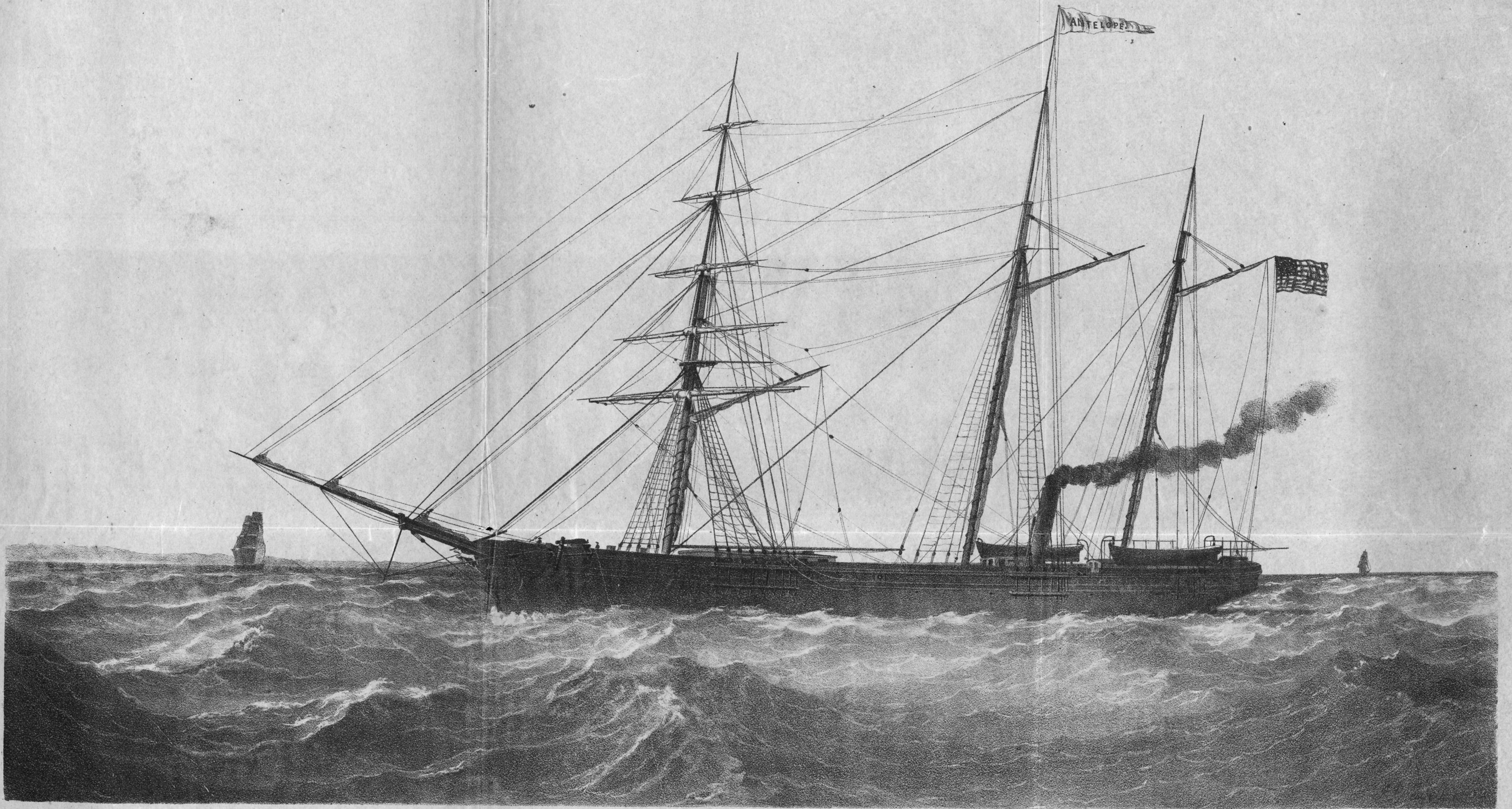
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PROPELLER PORTSMOUTH, OF BUFFALO.

Of the many screw-vessels that navigate the interior lakes, the propeller *Portsmouth* is not the least worthy of a place in these pages. Although built for a freighting vessel, and not designed for speed to any great extent, yet, in performance, she will compare favorably with any screw-vessel built at the same time in this country. The *Portsmouth* was built in 1852, by Messrs. Bidwell & Banta, of Buffalo; machinery by the "Shepherd Iron Works." We furnish the mould-loft tables, from which her draft may be projected. She is built for an equal draught of water at the ends, and it will be seen that, although drawing only about 8 feet, when loaded, her propeller is 13 feet diameter, with 17 feet pitch, or 4 feet greater diameter than the propeller of the *Antelope*, described in a preceding article, with 2 feet less pitch. The *Portsmouth* is 525 tons, carries a cargo of 575 tons, and runs 10 miles per hour. Her engine is high-pressure, non-condensing; cylinder standing vertically over the shaft; 42 inches stroke, and 27 inches diameter. Average number of revolutions, 65 per minute. The engine, screw, and boiler, weigh about 30 tons. She has no help from sails, they being long ago discarded on screw vessels on the lakes; a foremast being the only mast that is carried.

|            | Heights of Half brdths. |           |           |           |           |           |           |       |
|------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| Frame.     | deck line.              | 1st W.L.  | 2nd W.L.  | 3d. W.L.  | 4th W.L.  | 5th W.L.  | 6th W.L.  | Deck. |
| Stem.....  | 15.17....               | .....     | .....     | .....     | .....     | .....     | .....     | ..... |
| M, or 12.. | 14.92....               | .....     | .58....   | .92....   | 1.17....  | 1.42....  | 1.67....  | 2.46  |
| K.....     | .....                   | .....     | .....     | .....     | .....     | .....     | .....     | ..... |
| H, or 8..  | 14.29....               | 1.75....  | 2.07....  | 3.39....  | 4.00....  | 4.59....  | 5.10....  | 6.54  |
| D, or 4..  | 13.75....               | 3.69....  | 5.09....  | 6.00....  | 6.79....  | 7.39....  | 7.96....  | 9.41  |
| Y.....     | 13.17....               | 5.92....  | 7.42....  | 8.33....  | 9.08....  | 9.62....  | 10.10.... | 11.21 |
| U.....     | 12.66....               | 7.89....  | 9.41....  | 10.21.... | 10.83.... | 11.25.... | 11.64.... | 12.39 |
| Q.....     | 12.25....               | 9.41....  | 10.83.... | 11.57.... | 12.08.... | 12.42.... | 12.70.... | 13.17 |
| M.....     | 11.92....               | 10.58.... | 11.83.... | 12.42.... | 12.87.... | 13.12.... | 13.29.... | 13.62 |
| H.....     | 11.66....               | 11.32.... | 12.46.... | 13.02.... | 13.33.... | 13.05.... | 13.70.... | 13.87 |
| D.....     | 11.42....               | 11.74.... | 12.87.... | 13.33.... | 13.60.... | 13.75.... | 13.83.... | 14.00 |





J.H. Bufford's Lith. 260 Washington St. Boston.

STEAM DEMI BARK ANTELOPE, 615 TONS.

From a Painting by F.H. Lane.