

1863

DESCRIPTION

OF THE

LARGEST SHIP IN THE WORLD,

THE NEW CLIPPER

GREAT REPUBLIC,

OF BOSTON.

DESIGNED, BUILT AND OWNED

BY DONALD MCKAY.

The figures for this book are:

[Figure No. 1.](#) Sail Plan

[Figure No. 2.](#) Is a fore and aft vertical view of the ship amidships, showing side-views of the keel, mouldings of the floor timbers, depths of the midship keelsons, stanchions and their knees, beams, ledges and carlines, outlines of the decks and rail, stern post and rudder, and positions of the masts and tanks.

[Figure No. 3.](#) Is a view of the inside of the ship, representing the cross diagonal iron braces, the pointers, forward and aft, outlines of the decks and hanging knees, and the diagonals between the upper deck knees; also, the positions of the ports, the whole embraced in a general outline of her hull.

[Figure No. 4.](#) Represents the horizontal outline of the third deck, with its beams and lodging knees, carlines, ledges and their knees, positions of the bitts, forward capstan, hatchways, masts and rudder case.

[Figure No. 5.](#) Represents 10 outlines of her beamed hooks forward and aft, all numbered, with the style of their knees.

[Figure No. 6.](#) Contains a plan of the mainmast, its hounds, trestle-trees, top, and two plans of its cap; also the topmast trestle-trees and cross-trees ; also, side and bed views of the forward capstan, showing the mode of heaving in the chain; also a representation of the midship section of the ship, which embraces the keel, outside planking, timbers, ceiling, keelsons, stanchions, the beams and their hanging knees, with the style of their bolting.

1872

DESCRIPTION

OF THE

LARGEST SHIP IN THE WORLD,

THE NEW CLIPPER

GREAT REPUBLIC,

OF BOSTON.

DESIGNED, BUILT AND OWNED

BY DONALD MCKAY,

AND

COMMANDED BY CAPT. L. MCKAY.

WITH

Illustrated Designs of her Construction.

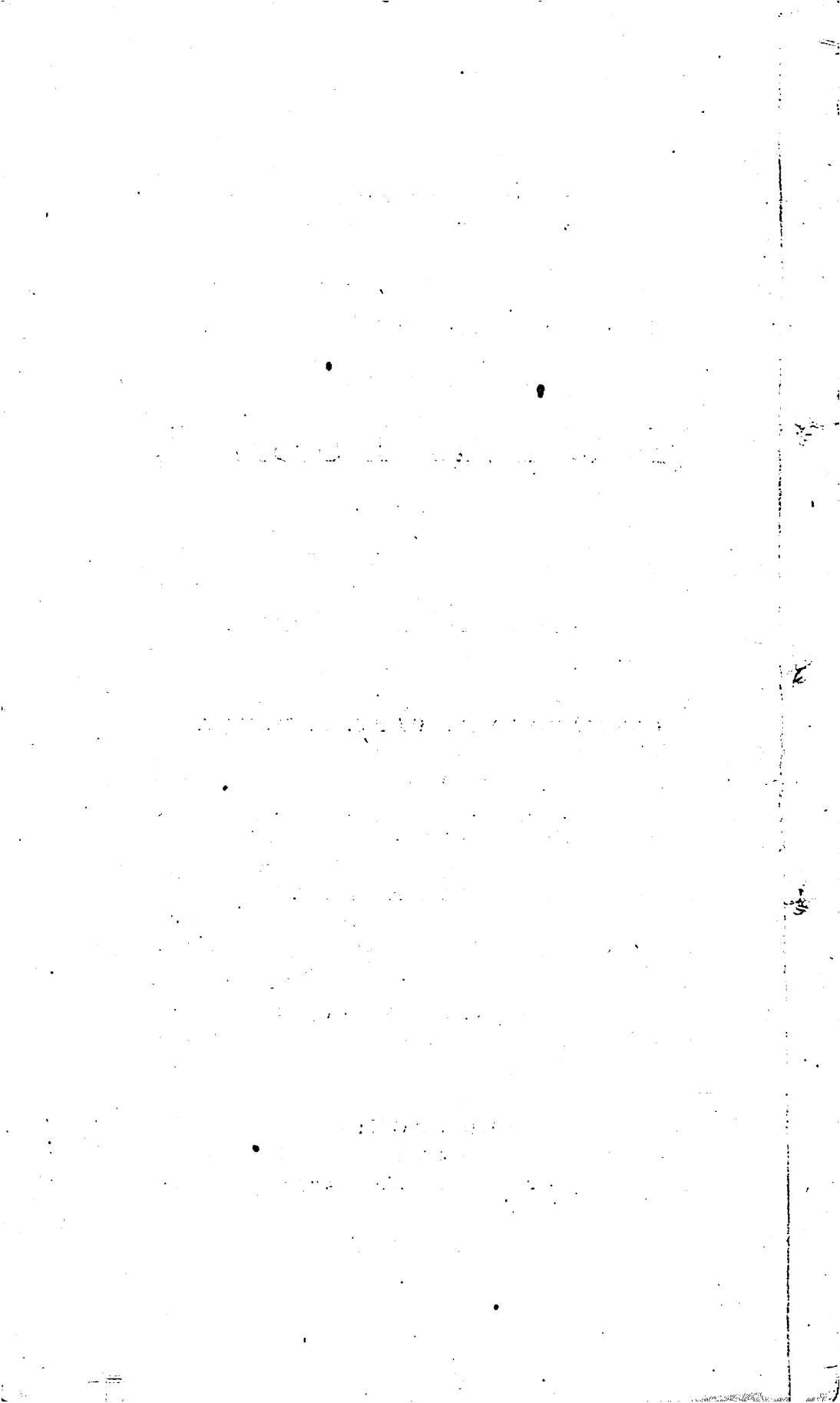
WRITTEN BY A SAILOR.



BOSTON:

1853.

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SHIP GREAT REPUBLIC.

AMONG the many wonderful results which have followed the discovery of gold in California, none is more wonderful than the magnificent fleet of clippers which has been built within a few years, to perform the carrying trade of the new State. Rapidly as the population of California increased, it hardly kept pace with the means to furnish supplies, notwithstanding the length and rugged nature of the seas over which they had to be carried. Month after month, ships surpassing in beauty and strength, all that the world had before produced, were built and equipped by private enterprise, to form the means of communication with the new land of promise. Our most eminent ship-builders and most enterprising merchants vied with one another to lead in the great race round the Horn. The established rules, which had for years circumscribed mechanical skill to a certain class of models, were aban-

done, and the capitalist only contracted for speed and strength. Ships varying in size from 1500 to 2000 tons were soon built and sent to sea, and their wonderful performances, instead of satisfying, increased the desire to excel—to be first upon “the world of waters;” and this desire has known no abatement even to the present day. The Flying Cloud, built by Mr. McKay, on her first passage not only made the quickest run from New York to San Francisco ever known, but attained the highest rate of speed on record. Her passage was made in 89 days, and she ran in 24 consecutive hours 374 geographical miles. Such results would have satisfied most men that they had at last produced a model which might defy competition, and would have flattered themselves during the rest of their lives, that they had discovered perfection, and made no further efforts to excel. But such were not the conclusions of the designer of the Flying Cloud. His daring and ever active mind was not satisfied with a single triumph. He carefully reviewed all his past works and analyzed their results, and came to the conclusion, that perfection in modelling had not yet been discovered; that whatever success he had attained had been the result of increased information, derived from experience, and that if he desired to excel he must never cease to improve. Impressed with these common sense views, he determined to build a clipper that should outsail the Flying Cloud, and he produced the Sovereign of the Seas, a ship of 2400 tons, and then the largest, longest and sharpest merchant ship in the world. Contrary to the advice of his best friends, he built her on his own account; he embarked all he was worth in her, for no merchant in this vicinity would risk capital in such a vessel, as she was considered too

large and costly for any trade. But his clear mind saw the end from the beginning. Before her keel was laid, he had mastered the workings of the California trade, and when she was ready, to the surprise of even those who knew him best, he played the merchant successfully and loaded her himself. His business capacity for mercantile transactions was scarcely less conspicuous than his skill as a mechanic. And well he was rewarded. He not only sold her upon his own terms, but her performances exceeded his expectations. Although she did not make so quick a passage to San Francisco as the Flying Cloud, yet she beat the swiftest of the entire fleet which sailed about the same time, 7 days, although she was dismasted; and on the homeward passage, made the greatest runs ever recorded. In 24 consecutive hours she ran 430 geographical miles, or 56 miles more than the greatest run of the Flying Cloud, and in 10 consecutive days she ran 3144 miles. Her next passage, which was from New York to Liverpool, though performed in the month of June, under very unfavorable circumstances, was the shortest ever made by a sailing vessel. In 11 months her gross earnings amounted to \$200,000.

But long before these gratifying results were known, her enterprising builder had taken another step — we ought to say another bound — in advance of all his previous undertakings. Experience had shown that the passage to California had been lengthened by the tremendous westerly gales in the vicinity of Cape Horn, and that to combat these gales successfully, vessels of greater size and power than any which had yet been built, were necessary. He accordingly designed the Great Republic, a ship of 4000 tons register, and full 6000 tons stowage capacity, and has built her entirely

upon his own account, and will sail her too. She is 325 feet long, 53 feet wide, and her whole depth is 39 feet. The keel for 60 feet forward is gradually raised from a straight line, and curves upwards into an arch, where it blends with the stem, so that the gripe of her forefoot, instead of being angular, like that of other vessels, is the complete arc of a circle. This arch, both inside and outside, is formed of solid oak and binds all the joints together, so that the greater the pressure the more firmly will the arch be knit together. Strength, however, is only one reason for adopting the arched form for her forefoot; another reason is to facilitate her working, and at the same time to make her entrance as clean as possible, to obviate resistance. She has vast surface of floor, with about 20 inches dead rise, and a very long and clean run, which, however, as it rises, is spread out to prevent her settling aft, no matter how swiftly she may fly through the water. Her lines are concave forward and aft, up to a few feet above the load displacement line, but become gradually convex as they ascend and form her outline on the planksheer. The angular form of the bow, however, is preserved entire; and such a bow for sharpness, beauty and strength, has never before been produced in this country. Yet it is plain, even to nakedness, having the national eagle represented as emerging from below the bowsprit, as its only ornament. But even simple and appropriate as is this ornament, it adds nothing to the beauty of the bow.

Her sides are arched, or swell somewhat like those of a ship of war, but not so much, in proportion to her size; and her sheer is graduated her whole length, with just sufficient rise forward, to impart ease and grace to the bow. She has a waist of 9 narrow strakes, defined

between the mouldings of the upper wale and the planksheer, and every line and moulding is graduated to correspond with her sheer. Her stern is semi-elliptical in form, and corresponds well with her after body. It is spanned by a large, gilded eagle, with the American shield in his talons, and extends 36 feet between the tips of the wings. Her name and port of hail are also on the stern, and its ground, as well as the hull, is painted black. She is yellow metalled up to 25 feet draught. Instead of bulwarks, the outline of her spar deck is protected by a rail, on turned oak stanchions.

She has 4 complete decks. The height between the upper and spar decks is 7 feet, and between each of the others 8 feet. Aft the foremast is a house 23 feet long by 16 wide, the forward part of which is designed for a work room in wet weather, or as a shelter-house for the watch on deck in stormy weather. The after part of it is a *sick-bay* or hospital, where those off duty will be properly taken care of, and every means used to restore them to health. Aft the fore hatchway is another house, 25 feet long, 16 wide and 6½ high, which contains the galley, and aft the galley is a blacksmith's shop and an engine room, where there is a steam engine of 15 horse power. This engine is designed to do all the heavy work of the ship, such as taking in and discharging cargo, setting up rigging, working the fire engine, hoisting topsails, pumping ship, &c., and connected with it is an apparatus for distilling fresh water from salt water. The advantages of a steam engine on board of such a ship must be great, and must prove a blessing to her crew, as well as a source of profit to her owner.

Aft the mainmast is another house, 40 feet long by 12 wide, which contains a mess-room for the officers,

and has a staircase in its forward part, which leads to the quarters of the petty officers and boys, on the deck below. Farther aft there is still another house, 17 feet long by $11\frac{1}{2}$ wide, of the same height as the others. It protects a staircase which leads to the vestibule of both cabins below, and contains lockers, &c. Aft, near the taffrail, is the wheel-house. Like a ship of war she has a double wheel, an iron tiller, and a gun-tackle purchase, as her steering apparatus. She has four large boats on the spar deck, two of them of 20 tons each, 30 feet long, $10\frac{1}{2}$ feet wide, and 5 feet deep, fitted with sails and all the other appliances necessary to preserve life in the event of disaster to the ship. She also carries four quarter boats of 26 feet length, and a captain's gig of 22 feet. Notwithstanding the space occupied on the spar deck by the houses and boats, such is her vast size, that the deck looks comparatively clear fore and aft, and is more roomy for working ship than that of a ship of the line. There are four working hatchways, the main one 11 by 14 feet in the clear, which is large enough to take down an omnibus, if required. Her heavy spare spars are stowed on the deck below, and in the spar deck on each side is an oblong square opening, combinged the same as the hatchways, to admit of the spars being taken up or sent down. These openings, when not required, are hatched over, the same as the other hatchways. She will also carry spare topsail yards in her channels, like the heavy ships of war.

The accommodations for her crew are on the upper between decks, and as she purchases her anchors with a capstan instead of a windlass, the space is not only ample, but light and airy as the cabin, and is most admirably designed for comfort and safety; and the

entrances on the spar deck are protected by companions.

Abaft the heel of the bowsprit are the riding-bitts, and abaft the capstan, near the foremast, are other bitts, suitable for weather-bitting, so that she has bitts enough to ride with four anchors down. The space abaft the foremast will be partly occupied with spare spars, hawsers, spare rigging, &c. Between the accommodations for her crew, and the after storerooms and cabins, there is space for 5 or 600 tons, which will be used as occasion requires.

Abaft the after hatchway is a large sail-room, with a boatswain's storeroom next to it, and abaft the latter is another sail-room for light sails, such as studding sails and staysails. Farther aft are rooms for the boys, for she will carry thirty boys, and has spacious accommodations for them near the cabin of the petty officers. Leading from the sides of the petty officers' and boys' cabins, are a carpenter's room, state-rooms for the second officer and steward; and farther aft, two state-rooms and the pantry. Next, aft, is the dining saloon, which is 30 feet long by 14 wide, and contains 4 large state-rooms on each side. It is finely painted and grained, and elegantly furnished; and its state-rooms are spacious, and well designed for the accommodation of passengers. Abaft the dining saloon is a vestibule, which communicates with the deck above and with both cabins below. It contains the captain's cabin on the starboard side, and the chief officer's opposite, both handy to the deck, and both clear of the cabins, so that their occupants may be called at all times, without interfering with the passengers.

The after cabin is 25 feet long by 14 wide, and contains 3 state-rooms on each side, two recesses with sofas,

and is beautifully wainscotted with mahogany, rose and satin wood, set off with pilasters, papier maché cornices, and gilded mouldings. The backgrounds of the recesses are ornamented with plate glass mirrors, and mirrors also ornament the forward part of the cabin. The curve of the stern is fitted with a sofa, and over it aft, are circular plate glass air ports, and over all an oblong square skylight. In every state-room there are also deck and side lights, and skylights over all the other cabins, already described. Her cabin tables were furnished with plate, &c. by Mr. Samuel T. Crosby, the most eminent in his line of business in Boston.

On this deck, in each side, there are three large ports, with bitts near them, suitable for making the ship fast by, when alongside of a wharf.

Her chain lockers are in the lower hold forward, and before the main hatchway and abaft the mainmast are two iron water tanks, each of 8000 gallons capacity. These were made by Messrs. Leonard, Holden & Co. of East Boston. The space between the other decks and the hold is entirely clear for the stowage of cargo, and in the sides of the main deck are three cargo ports, nearly as large as those between the decks above. She has also double main hatchways below, so that goods hurriedly put in the decks below in rainy weather, can be lowered into the hold without exposing them to wet.

These details will convey a general idea of the outline of this splendid ship, and now the details of her materials and construction will be reviewed.

The keel is of rock maple, in two tiers, which combined side 16 inches and mould 32, and the scarphs are 12 feet long, which, as well as the parts of the keel,

are bolted with copper. The shoe, or false keel, is $4\frac{1}{2}$ inches thick. Her frame is of selected seasoned white oak. The floor timbers on the keel are sided from 12 to 15 inches, and moulded 22 inches, and the top-timbers at the planksheer vary from 11 to 13 sided, by 8 inches moulded. The space of frames from centre to centre is 26 inches. All the frames are doweled or coaged and bolted together, near every joint. The coags are of white oak, cylindrical in form, $3\frac{1}{4}$ inches in diameter and $3\frac{1}{2}$ inches long, and join both parts of the frame together, after which an inch bolt was driven through the frame and the heart of the coag. The object of coaging is twofold: first, it binds the joints together, beyond the possibility of working; and second, it protects the iron bolts driven through them from being corroded by salt water. Any person who has inspected a vessel of 7 or 8 years old, undergoing repairs, could hardly fail to observe that the frame boltings were corroded, and that the action of frequent caulking had raised the butts of the frames. To guard against these contingencies is the object of coaging this ship's frames. But she is closely coaged elsewhere, as will be seen hereafter.

Her stem is sided the same as the keel, and is moulded 2 feet at the foot, and 4 inches less at the head, and the cutwater is tapered almost to an edge, to correspond with the sharpness of the bow. The apron is $4\frac{1}{4}$ feet through, and fills the angle of the bow, and inside of that is a massive stemson, which forms an arch covering all the joints of the stem and keel, as they meet at the forefoot, and also receives the lower ends of the cants. Every through bolt in the stem, apron, stemson and cutwater is of $1\frac{1}{4}$ inch copper, up to 26 feet

draught, and the bolts are nearly within 6 inches of one another.

The stern post is in three upright pieces, coaged and bolted together, sided the same as the keel, and moulded between 5 and 6 feet, with 5 angular supports inside. The stern knee is sided 16 inches, is moulded 3 feet in the throat, and extends 8 feet along the sternpost and 20 feet along the keel, and is scarphed to the lower midship keelson, and bolted with copper. The sternpost is bolted in the same style as the stem.

Her frame is diagonally cross-braced with iron on the inside, fore and aft, the braces 4 inches wide, 1 inch thick, and 36 feet long, and extend from the floor heads to the top-timbers. There are 90 of these on each side. The first brace is let into the frames, and the second, or cross brace, is let into the ceiling, and these are bolted with inch iron into every timber, and are rivetted together at every intersection.

Her keelsons, ceiling and deck frames are of hard pine. She has 4 tiers of midship keelsons, each 15 inches square, and 3 tiers of sister keelsons, the two first 15 inches square, and the upper one 12 by 14 inches. These are all coaged and bolted together vertically, and are lock scarphed, and square keyed. There are two $1\frac{3}{8}$ inch copper bolts through every floor timber and the keel, the first driven through the timber and the keel, and the second through the first and second tiers of keelsons also, and all rivetted on the base of the keel. The navel timbers are bolted through all the keelsons with iron driven into the keel, within a few inches of its base. These bolts were so long and stout, that it was found necessary to drive them with a pile-driving machine. The sister keelsons are bolted diagonally through the navel timbers into the keel, and

horizontally through the midship keelsons. The whole depth of her back bone, from the top of the keelsons, including the moulding of the floor timbers, is 9 feet 10 inches, and its spread on the inside is 45 inches.

There are 9 strakes of 10 by 12 inches on the floor, all scarphed, square fastened through the frames, and bolted edgeways together every 5 feet. Over the floor heads are 4 bilge keelsons, each 15 inches square and in two depths. These are also coaged together, scarphed, keyed, square fastened with $1\frac{1}{4}$ inch refined iron and bolted edgeways, also. The ceiling above is in two depths, the first 6 inches, and the second 15, the latter covering all the scarphs of that below, and is itself scarphed, and both are square bolted. In a few words, she is square fastened and edge bolted throughout, on the inside, and scarphed and keyed in all her ceiling. The whole bilge is double ceiled in this style, up to a lap-strake of 6 by 15 inches, upon which the lower ends of the hanging knees rest, and the lower deck clamps are also in two depths, of 6 and 10 inches thickness, fastened and finished in the same style as the work below.

The waterways of the lower and main decks are 16 inches square, the strake inside of them 10 by 12, and the thick work over them 12 by 18; and the waterways and deck strakes are coaged in every beam, and bolted through the coaging, and are also bolted vertically and horizontally. The ceiling above is 8 inches thick, scarphed, keyed and square bolted, and the clamp under the upper deck beams is 12 by 15 inches.

The upper deck waterways are 12 by 13 inches, with one strake inside of them of 8 by 13 inches, and the waterways, like the work below, are coaged and cross-

bolted and scarphed; and the ceiling above is $3\frac{1}{2}$ inches thick, and the clamp under the spar deck beams is 6 by 14 inches. The outline of the upper deck above the waterways is covered by a planksheer of 7 inches thickness, and the covering board of the spar deck is 7 inches thick and 20 wide, and on this is a chock of 12 by 6 inches, and into it are morticed the turned stanchions, which, with a rail that is $3\frac{1}{2}$ feet high and 5 by 12 inches square, protect the outline of the spar deck.

Her garboards are 10 by 14 inches, let into the keel, and are bolted through it and each other, and square fastened through the timbers; the next strake is 9 inches thick, and the third 8, champered off to 6 inches, the substance of the planking on the bottom; the bilge is covered with 8 inches thickness; the wales are 6 by 8, up to the moulding below the planksheer, and the waist is $4\frac{1}{2}$ inches thick. The outside is square fastened with treenails, is extra copper bolted, and finished smooth as glass.

The beams under the lower and main decks are 15 by 16 inches amidships, and under the upper deck 12 by 15, but 25 of the upper deck beams are double, bolted together, and side 22 inches, and the spar deck beams vary in size, but are very close together. There are 38 beams under the lower deck, 40 under the main deck, 41 under the upper deck, and 89 under the spar deck. The hanging and lodging knees connected with the two lower sets of beams are of oak, and those with the beams above, are of hachmatack. The hanging knees are sided from 10 to 13 inches, moulded from 22 to 24 inches in the throats, have from 5 to 6 feet bodies and 4 to $4\frac{1}{2}$ feet arms, and have 20 $1\frac{1}{4}$ inch bolts and 4 spikes in each. The knees under the spar deck, like the beams, are light and are all diagonal; and the lodg-

ing knees, connected with the beams below, are sided 8 inches, are scarphed together in every berth and closely bolted. All the ceiling between the main and upper decks, has diagonal, hard pine braces, extending from the throat of one hanging knee to the foot of the other, from forward to aft, and these braces are bolted through the ceiling and the timbers. The upper deck fore and aft framing, usually square in other ships, is diagonalled, between every beam, the diagonals fayed to the beams and carlines, and the beams are also kneed amidships to the central fore and aft framing, which is 8 by 14 inches, and to which there are 144 knees. The spar deck is of white pine, 3 inches thick, and the other decks are of hard pine, of 3 and 3½ inches thickness, and the thick strakes amidships and over the wing stanchions are coaged and bolted through the beams. She has 1,650 knees in all.

She has three tiers of stanchions, which extend from the hold to the main deck beams, and which are fitted around the lower deck beams, as if they had been rove through them, and these are in two pieces, which combined, are 10 by 23 inches. The wing stanchions are stepped into the bilge keelsons and double kneed to them, and the midship stanchions are stepped into the upper keelson, and are kneed fore and aft, the knees, scarphed together in every berth, thus forming a rider over the upper keelson.

The stanchions under the corners of the main hatchway are clasped with iron to the beams, and like the others are continued to the deck above.

The stanchions under the other decks are of oak turned, secured with iron rods through their centres, which set up with screw-nuts, and are 10 inches in diameter.

Her hooks and pointers are of white oak. In the hold forward are three sets of pointers, from 30 to 40 feet in length and of 9 by 11 inches in substance, and except the lower pair, which fay into the angles between the keelsons and the skin, are filled in with hooks, cross all the cants diagonally and fay to the lower deck beams. In addition to these, about 5 feet above the keelsons, is a horizontal hook, shored off with two beams, and to each beam there are 4 knees. The after end is secured in the same style, and the knees under the deck are very stout, and extend well aft and forward.

The chain lockers, as already stated, are in the hold, near the foremast; and the iron water tanks, which extend to the upper deck, and are cylindrical in form, are placed, one 64 feet before the main mast, and the other 24 feet abaft it, and rest upon massive beds, strongly bolted, and the stanchions before and abaft them are kneed on the sides to the keelson. The mast-steps are of oak, and are also very strongly bolted; and the pump wells, for she has 4 hold pumps, are large and well secured. The bow, between the lower and main decks, is spanned by a heavy hook, which extends along the sides to the 4th beam, and is braced off by two beams, kneed like those below, that is, 4 knees to each beam. The after hook is beamed and kneed in the same style, and the after hook between the decks above is built double around the curve of the stern, and is also beamed and kneed to the distance of the 4th beam before the stern post. Between the main and upper decks her bow is spanned in the same style, with hooks, beams and knees, and over and under the bowsprit, which is stepped on the upper deck, the angles of the bow are filled with heavy hooks. Her ends, like every

other part of her, have been secured in the strongest style. All her hatchway combings and mast-partners are kneed to the beams, and every thick strake on all the decks, as already stated, is coaged and bolted through the beams, so that it seems almost impossible for any part of her to work loose, while her materials endure.

She is ventilated upon a new principle. A plank is open along the sides of all the houses on deck, with glass below, so that the air acting upon the sides of the houses will follow the ventilators into the decks below on one side, and escape through those on the side opposite, thus keeping a continued current of air passing from side to side through every deck and the hold. These ventilators also answer for skylights, and are so arranged that water cannot enter them.

The ship has 4 masts, the after one named the spanker mast, which is of a single spar; the others are built of hard pine, the parts doweled together, bolted and hooped over all with iron. The bowsprit is also built and hooped in the same style, and the topmasts and jibbooms are of hard pine. She has Forbes's rig, and is square rigged on the fore, main and mizzen masts, and fore-and-aft rigged on the spanker mast. The main yard is 120 feet square, and the lower maintopsail yard 92 feet. Excepting these, all the other yards above are alike on the fore and main masts, and the lower foretopsail yard is of the same dimensions as the crossjack yard, and all the yards above are alike on both masts. The following are the dimensions of her masts and yards:

MASTS.

	Diameters.	Lengths.	Mastheads.
	Inches.	Feet.	Feet.
Fore,	44	130	36
Top,	24	76	12
Topgallant,	18	28	0
Royal,	15	22	0
Skysail,	11	19	pole 12
Main,	44	131	36
Top,	24	76	12
Topgallant,	18	28	0
Royal,	15	22	0
Skysail,	11	19	pole 12
Mizzen,	40	122	33
Top,	22	69	10
Topgallant,	16	22	0
Royal,	10	19	0
Skysail,	8	15	pole 8

YARDS.

Fore,	26	110	yard-arms, 6
Lower top,	24	90	5
Upper "	19	76	4½
Topgallant,	15	62	4
Royal,	12	51	3½
Skysail,	9	40	3
Main,	28	120	6
Lower top,	24	92	5
Upper, "	19	76	4½
Topgallant,	15	62	4
Royal,	12	51	3½
Skysail,	9	40	3
Crossjack,	24	90	5
Lower mizzen top,	19	76	4½
Upper " "	15	62	4
Topgallant,	12	51	3½
Royal,	9	40	3
Skysail,	6	29	2

The spanker mast is 26 inches in diameter, 110 feet long, including 14 feet head, and the topmast is 40 feet long, divided at 15 and 10 feet above the cap, for the gaff topsail and gaff topgallant sail. The spanker boom is 40 feet long, including 2 feet end, and the gaff 34 feet, including 8 feet end. The bowsprit is 44 inches in diameter and 30 feet out-board; the jibboom 22 inches in diameter and 18 feet outside of the cap, with 4 feet end, and the flying jibboom is 14 feet long, including 6 feet end. Her fore and main rigging and fore and main topmast backstays are of $12\frac{1}{2}$ inch patent rope, wormed, and served over the eyes, and over the ends to the leading-trucks. The mizzen rigging and mizzen topmast-backstays are of 11 inch, and the fore and maintopmast rigging is of 8 inch. She has 6 shrouds on a side, for the lower rigging over the trestle-trees, and two shrouds on each side from the caps at the extremes of the lower mast-heads. There are 4 shrouds on each side for the topmast rigging, three topmast after backstays, and shifting breast-backstays, double topgallant and royal backstays, with outriggers in the topmast crosstrees; and there are also outriggers in the tops for the topmast breast-backstays. The lower and topmast stays are double, and she has also capstays leading from the extremes of her lower mast-heads on deck. The fore stays set up to the knight-heads, and her topmast and jibstays lead in through the bow and set up inboard. She has iron futtock rigging, chain bobstays and bowsprit shrouds, martingale stays and guys, and topsail sheets and ties. She has iron patent trusses, and iron jackstays on all the yards. As the topmasts are fidded before the heads of the lowermasts, the lower topsails set upon the heels of the topmasts, between the tops and the caps. She has

pole topgallant, royal and skysail masts, which are in one spar, and are also fidded forward of the topmast-heads; and her tops are of solid oak. Her sails are made of cotton duck. There are double reefs in the courses and lower topsails, and single reefs in the upper topsails and topgallant sails. The topsails and courses are roped along the reef-bands, and are also cross diagonally banded and roped between every reef, and from opposite clews to opposite earings over their whole surface. They are also belly-banded and roped at regular distances their whole depth. All the rope of her sails is of Manila hemp, and the leech and foot ropes of her topsails and courses are of 8½ inch. She has no lower swinging studding sail booms, for her lower studding sails are triangular, terminating in a point at the rail, and, consequently, will set better and can be carried longer than if they were square. Her rig is the best square rig ever invented, and ought to be applied to every large clipper. By adopting it Mr. McKay has displayed the same practical common sense, which characterizes all his mechanical operations.

Harris's lightning conductors are applied to all her masts; in fact, nothing has been omitted in her outfits aloft that could be considered of the slightest utility. Aloft, as well as below, she is all that a ship ought to be, in strength, beauty and completeness.

She has three hawse holes and 4 anchors. Her best bower is of Porter's patent, and is 8,500 lbs. weight, the working bower is 6,500 lbs., the small bower or stream anchor 2,500 lbs., and the kedge 1,500 lbs. Her bower chains are each of 2½ inch, and each 120 fathoms in length; the stream chain is of the same length and of 1½ inch size, and she has two hemp stream cables and several hawsers.

It has been already stated that her anchors will be purchased by a capstan instead of a windlass. The capstan is of cast iron, invented by Capt. L. McKay, and can be worked on both decks. Its lower part has an angular indention, which receives the chain, and prevents its surging up, and the vertex of the angle contains grooves into which the links of the chain become imbedded as the capstan revolves; and to keep the chain in the grooves, there is a circular roller on deck, placed opposite the forward part of the capstan, and the chain, as it leaves the grooves, has a half turn over this roller, and is drawn aft as it is hove in, or it is payed down into the locker, if desirable. This plan supercedes the use of a messenger, and occupies one-sixth less space than a windlass. As she has Crane's self-acting chain stoppers, no danger can be apprehended from surging, for every link, as it is hove in, is stoppered at the hawse hole. The upper part of this capstan can easily be disconnected from that below, and is therefore available for deck work when required. On the quarter deck is one of Allyn's largest patent purchase capstans, which is highly spoken of as one of the best ever invented. There are 6 crab winches on the spar deck, one near the after parts of the fore, main and mizzen riggings on each side; and nearly all her running rigging leads through blocks along the covering board, and in the beds of the masts. Every block, therefore, is an index of the name of the rope rove through it.

The following additional facts in relation to this noble clipper are interesting:

Hard pine used in her construction,	1,500,000 feet.
White oak,	2,056 tons.
Iron,	336½ "

Copper, exclusive of her sheathing,	56 tons.
Number of days' works upon her hull,	50,000
Yards of canvas in a suit of sails,	15,653
<u>Will carry a crew of 100 men and 30 boys.</u>	

As the names of several of the master mechanics employed on this ship have been already mentioned, the others must not be omitted. First in importance is her blacksmith, Mr. Mendum, who has made the iron work of all Mr. McKay's ships; Mr. Young made her spars, Mr. Thomas J. Shelton, her blocks and pumps, Capt. Brewster, of East Boston, rigged her, and Messrs. Friend & Southward made her sails. Messrs. Manson & Ford did her joiner work, including the cabins, Messrs. Gleason & Co. ornamented her head and stern, Clark & Co. painted her, and Messrs. Sewall & Day made her cordage.*

The master spirit of all, who designed this mighty fabric of mechanical beauty, has been already mentioned; but reference only was made to two clippers, the Flying Cloud and the Sovereign of the Seas, which he has built, whereas he has built several others celebrated for beauty and speed. These two, however, were mentioned because he built them on his own account, and was, therefore, alone responsible for their success. Although restricted to size in the others, they were all of his own designing, and all have performed well.

The following sailed from New York to San Francisco :

Flying Cloud,	1,700 tons,	passage,	89 days.
Flying Fish,	1,600 "	"	92 "
Sovereign of the Seas,	2,400 "	"	103 "
Bald Eagle,	1,600 "	"	107 "
Empress of the Sea,	2,250 "	"	118 "
Staghound,	1,550 "	{ via Val- paraiso. }	" 112 "

The following sailed from Boston to San Francisco :

Westward Ho,	1,700 tons,	107 days.
Staffordshire,	1,950 “	101 “

These passages show an average of 103 days 15 hours—an average which has not yet been equalled, by the same number of ships, built by any builder in the world. And yet, all these vessels are of different models, some are very sharp and others comparatively full ; and those which had the longest passages, were made crank by their heavy deck-loads. The Empress of the Sea, independently of houses, water-casks, &c., had 100 tons of boilers on the upper deck, and was consequently so crank that, when the wind was on the beam, she was compelled to double reef her topsails, when she ought, if not overladen, to have carried all sail. Notwithstanding this exception, the passages of all the others show a uniformity of speed, that speaks highly for the skill of their designer. And what is equally gratifying, not one of them has cost the underwriters a dollar, or has ever put into a port in distress. To triumph over them all—to excel all his other works, was the object Mr. McKay had in view when he designed the Great Republic. Capt. L. McKay, formerly of the Sovereign of the Seas, commands her. He has proved himself worthy of commanding the best and most beautiful ship in the world.

Such is the Great Republic—the ship of ships. She is a monument of the skill and genius of her builder, and an honor to our common country.

EXPLANATION OF THE FOLLOWING PLATES:

No. 2. Is a fore and aft vertical view of the ship amidships, showing side-views of the keel, mouldings of the floor timbers, depths of the midship keelsons, stanchions and their knees, beams, ledges and carlines, outlines of the decks and rail, stem, sternpost and rudder, and positions of the masts and tanks.

No. 3. Is a view of the inside of the ship, representing the cross diagonal iron braces, the pointers, forward and aft, outlines of the decks and hanging knees, and the diagonals between the upper deck knees; also, the positions of the ports, the whole embraced in a general outline of her hull.

No. 4. Represents the horizontal outline of the third deck, with its beams and lodging knees, carlines, ledges and their knees, positions of the bitts, forward capstan, hatchways, masts and rudder case.

No. 5. Represents 10 outlines of her beamed hooks forward and aft, all numbered, with the style of their knees.

No. 6. Contains a plan of the mainmast, its hounds, trestle-trees, top, and two plans of its cap; also the topmast trestle-trees and cross-trees; also, side and bed views of the forward capstan, showing the mode of heaving in the chain; also a representation of the midship section of the ship, which embraces the keel, outside planking, timbers, ceiling, keelsons, stanchions, the beams and their hanging knees, with the style of their bolting.

The figures for this book are:

[Figure No. 1.](#) Sail Plan

[Figure No. 2.](#) Is a fore and aft vertical view of the ship amidships, showing side-views of the keel, mouldings of the floor timbers, depths of the midship keelsons, stanchions and their knees, beams, ledges and carlines, outlines of the decks and rail, stein, stern post and rudder, and positions of the masts and tanks.

[Figure No. 3.](#) Is a view of the inside of the ship, representing the cross diagonal iron braces, the pointers, forward and aft, outlines of the decks and hanging knees, and the diagonals between the upper deck knees; also, the positions of the ports, the whole embraced in a general outline of her hull.

[Figure No. 4.](#) Represents the horizontal outline of the third deck, with its beams and lodging knees, carlines, ledges and their knees, positions of the bitts, forward capstan, hatchways, masts and rudder case.

[Figure No. 5.](#) Represents 10 outlines of her beamed hooks forward and aft, all numbered, with the style of their knees.

[Figure No. 6.](#) Contains a plan of the mainmast, its hounds, trestle-trees, top, and two plans of its cap; also the topmast trestle-trees and cross-trees ; also, side and bed views of the forward capstan, showing the mode of heaving in the chain; also a representation of the midship section of the ship, which embraces the keel, outside planking, timbers, ceiling, keelsons, stanchions, the beams and their hanging knees, with the style of their bolting.