

Henry Hall

Notebooks for shipbuilding in the United States, 1881-1883 - Volume II, Models and Measurements

Courtesy of Penobscot Marine Museum

Manuscript number MS 408

STEPHEN PHILLIPS MEMORIAL LIBRARY

PENOBSCOT MARINE MUSEUM
SEARSPORT, MAINE 04974

Models

and

Measurements.

New York

March 24, 1883.

Henry Hare -

Ships of Donald McKay

Clipper Ship Donald McKay.

Keel - White oak, 5 pieces, and in 2 depths. Sided 16". Upper piece moulded 20"; lower 12". Scarphs 12'. 10 copper bolts 1". Lower piece fastened to upper with copper bolts, 6' to 8' apart, 1" to 1½" in diameter. Shoe, oak, 4", fastened with treenails & copper bolts, 1".

Stem - At head, 16" x 25"; at foot 16" x 30". Scarphs 8' hooked, & bolted with 6 to 8, diam. 1" to 1½". Jo keel with 6 to 8 copper bolts, 1" to 1½".

Gripe - Tapered to 4" and 5" on front edge: copper and iron bolts, 18" apart, 1½" diam.

Sternpost. - 16" x 25" at heel; 20 x 22 at head. Fastened to keel with 20 = 1½" copper bolts. Inner - moulded 20" and 16"; 1½" bolts; 20' apart.

Deadwoods. - Oak. 1½" copper and iron bolts.

Frames. - Spaced 30". Siding of floors 14"; 1st futtocks, 14"; 2nd futtocks, 12"; each following shift diminishes in siding; top timbers at p.s. 10"; stanchions at rail 9". Moulding over keel 20"; turn of bilge, 12"; lower deck 10½"; middle deck, 9½"; upper deck 7½"; rail 6½". Floors 24' long amidships; short floors 22'; shift of timbers 6 to 8'. Frame bolts in the bottom of ship 1½"; in top, 1". Every 2nd floor bolted to the keel with 1½" copper. Each cant (comes into deadwood) and fastened with 6 = 1½" iron bolts.

Apron - Sided under bowsprit 32"; bolts of 1½" iron, 18" apart.

Knighthead - Bolted to apron with 1½" iron, 20" to 24' apart: where it can be done bolts go clear through apron & both keels.

Header timbers - 4 on each side; sided 12'; 1½" bolts, 2' apart.

Sternpost knee: Arms 16' and 8': moulded 50" in throat; 16 bolts.

Stern timbers - Two at side of stern post sided 14"; at keel side 10": 1½" bolts through stern post. Other timbers sided 10"; 1½" bolts. Round stern.

Keelson - Pitch pine. Three tiers each 15' x 15'. Lower streak fast^d to every other floor with 1½" copper bolts, bolts riveted on under side lower tier of keel. Second tier bolted with

$1\frac{3}{8}$ " iron, 6' apart, bolts going to within 2" through upper depth of keel. Bolts through upper tier of keelson $1\frac{3}{8}$ " down through naval timbers. 8 foot 2 carplis, waked and keyed.

Sister keelsons, in 2 tiers, each 14" x 14"; $1\frac{1}{2}$ " bolts through every futtock. Horizontal $1\frac{1}{2}$ " bolts clear through, riveted, 4' to 4 $\frac{1}{2}$ ' apart.

Ridge keelsons, 14", 5' 2 carplis. Square and edge bolted $1\frac{1}{2}$ " iron.

Ceiling of floor, 12" wide, 5" thick, greenails & spikes. From ridge to deck clamp, in two thicknesses 4 $\frac{1}{2}$ " and 10", and 14 $\frac{1}{2}$ " wide, the lowest being 4 $\frac{1}{2}$ "; 2 carplis, 4 $\frac{1}{2}$ ' and 5'. Edge bolted. Pine.

Hooks and pointers, sided 10" and 12".

Lower dock - Clamps, pitch pine, 12" x 13 $\frac{1}{2}$ " thick; 4' to 5' ap. Bolted edgewise in every 2^d frame space to strake below $1\frac{1}{8}$ " iron and sq. fast. to frame with same. $\frac{1}{2}$ of bolts riveted on frame and $\frac{1}{2}$ on clamp. Beams, pitch pine, 15" x 15", with taper to 11" at ends. Set into clamp & bolted. Hanging knees, w.o. body, 6 $\frac{1}{2}$ ' and 7', arms 4 $\frac{1}{2}$ ' or 5'; sided 11" to 12"; throat 24"; 20 bolts, $1\frac{1}{8}$ " in throat, rest 1"; foot rests on strake bolted to side, 15" x 8". Lodging knees oak, arms 3 $\frac{1}{2}$ ' and 4'; sided 8"; throat 30". Eight 1" bolts through beam. Ledges, pitch pine, sided 10" x 6". Carlings 10" x 7". Waterways 15" x 16"; $1\frac{1}{8}$ " bolts to each timber, half riveted on frame, half on w.w., two $1\frac{1}{8}$ " bolts through beam into clamp; 6' 2 carplis. Binding strake, 12" x 10", 2 bolts through beam, one going clear through knee, and others through w.w. and each alternate frame timber. Deck plank, 3 $\frac{1}{2}$ x 6", 2 spikes in each beam; pitch pine. Two thick strakes in center of deck, 14" x 6". Standing strakes, 2, 20" x 10", sq. fast. 1" bolts. Filling in strakes under main deck clamps, b.b.

Main deck - Clamps 14" x 10", sq. fast. & edge bolted.

Beams, 16 x 15 and 10 $\frac{1}{2}$ " p.p. Knees, oak, resting on standing strakes; arms 4 $\frac{1}{2}$ ' and 4 feet; sided 10" or 11" and 24" in throat 18" = $1\frac{1}{4}$ " and 1" bolts. Lodging knees, 10', 28" in throat; arms 4 $\frac{1}{2}$ ' to 5'. Carlings, b.b. 10" x 8". Ledges 9" x 6". Waterways, 15" x 16"; a $1\frac{1}{2}$ " bolt through each timber; two $1\frac{1}{8}$ " bolts clear thro into clamp. Binding strake, 10" x 12"; $1\frac{1}{8}$ " bolts. Plank, 7" x 3 $\frac{1}{2}$ "; thick center strake 14" x 5". Two standing strakes, 18" x 10"; sq. fast $1\frac{1}{2}$ " iron & edge bolted. Filling in strakes, 14" x 7", sq. fastened.

4 Scantling of Donald McKay's Ships.

Great
Republic

Sovereign
of
the Seas

Packets
Common-
dore
Perry.

Champion
of
the Seas

Empress
of
the Seas

Length

Beam, moulded.

Beam, extreme.

Depth amidships, moulded.

Draft, loaded.

Draft, for calculation.

Register dimensions.

Register tonnage.

Keel.

Kind of timber

all
oak and
Rock
maple.

Always in 2 pieces, ^{vertically} with shoe. Sided.

Moulding of upper piece, lower piece, and shoe.

Length of scarf ^{hooked & wared} & thickness at ends.

Copper bolts, no. and diameter.

Upper & lower pieces fastened with ^{upper} bolts.

Shoe fastened with comp. bolts & trenails.

Stem

White oak. Timber, sided.

Moulding at head and foot ^{hooked} reefing.

No. of pieces, and length of scarf.

No. of bolts, & diameter.

Stem bolted to keel with bar & copper, 1" to 1 1/8".

False Stem, or Gripe.

White oak.

Siding tapered on front edge to

Fastened to stem with bolts, of

Diameter, & distance apart.

Sternpost

White oak always.

Siding at keel and top.

Moulding at head and foot

No. of, & diam. of copper bolts to keel

Deadwoods.

Sided same as keel. & bolted with

Copper and iron, 1 1/4" in diameter.

Stern and stem frames

fastened with 1 1/4 and 1 1/8" bolts.

Rock
maple

16"

20", 12", 4 1/2"

12 bolt
5 and 4

10 & 12, 1 1/8"

1"

1"

16"

26" x 30"

2. 12'

6 to 8, 1 1/2"

4" and 5"

copper

1 3/8", 18"

16" x 24"

22, 26"

20, = 1 3/8"

oak
6 lengths

16"

20", 14", 4 1/2"

12 bolt
5, & 4"

10 & 12, 1 1/8"

oak & maple

1"

16"

24" x 28"

2. 8'

6 to 8, 1 1/2"

4" to 5"

copper

1 1/2", 2 to 4'

16" x 20"

21, 24"

18, = 1 1/4"

oak & maple

5

20", 12", 4 1/2"

12 bolt
5, & 4"

10 & 12, 1 1/8"

oak & maple

1"

16"

20" x 24"

2. 8'

6 to 8, 1 1/2"

4" to 5"

c & i

1 1/4", 2 to 4'

16" x 20"

21, 24"

16, = 1 1/4"

oak & rock
maple.

5

20", 14", 4 1/2"

12 bolt
5, & 4"

10 & 12, 1 1/8"

oak & maple

1"

16"

20" x 26"

2. 8'

6 to 8, 1 1/2"

4" to 5"

c & i

1 1/4", 2 to 4'

16" x 20"

21, 24"

16, = 1 1/4"

5

16"

20", 14", 4 1/2"

12 bolt
5, & 4"

10 & 12, 1 1/8"

oak & maple

1"

16"

20" x 24"

2. 8'

6 to 8, 1 1/2"

4" to 5"

c & i

1 1/4", 2 to 4'

16" x 20"

20, 21"

16, = 1 1/4"

Light- ning.	Packet Star of Empire	Clippers Stafford Shire	Flying Cloud	Clippers Flying Fish Westward Ho	Stag Horned.	Packet Daniel Webster	Packet. Cornel- ius Prinnel	Packet Plymouth Rock	Packet Antar- tic	Packet Annapolis Saxon
✓			✓		✓					
5	4	5	4	5	5	4	4	4	4	4
16"	15"	16"	16"	16"	16"	15"	15"	15"	15"	14"
20.14.4½	20.12.4½	20.12.4½	20.14.4½	20.14.4½	20.14.4½	20.12.4½	20.12.4½	22.12.4½	20.12.4½	20.12.4½
12; 5.4"	12; 5.4"	12; 5.4"	12; 5.4"	12; 5.4"	12; 5.4"	12; 6.3½	12; 6.3½	12; 6.3½	10; 6.3½	10; 6.3½
10+4af	10+4af	10+4af	10+4af	10+4af	10+4af	8+4af	8+4af	8+4af	8+4af	8+4af
16"	15"	16"	16"	16"	16"	15"	15"	15"	15"	14"
20+24	20+26	20+26	20+26	20+24	20+24	18+24	18+24	18+24	18+24	18+22
2. 8'	2. 7½'	2. 7'	2. 7'	2. 6'	2. 6'	2. 5½'	2. 5½'	2. 5½'	2. 5½'	2. 5'
4" to 5"	4" to 5"	4" to 5"	4" to 5"	4" to 5"	4" to 5"	5" to 7"	5" to 7"	5" to 7"	5" to 7"	5" to 7"
c + i	c + i	c + i	c + i	c + i	c + i	c + i	c + i	c + i	c + i	c + i
1½, 2 to 4	1½, 2 to 4	1½, 3 to 4	1½, 2 to 4	1½, 2 to 4	1½, 2 to 4	1½, 3 to 4	1½, 3 to 4	1½, 3 to 4	1½, 3 to 4	1, 3 to 5
16. 20	15. 19	16. 19	16. 20	16. 20	16. 18	15. 18	15. 18	15. 18	15. 18	14. 16
20. 21	19. 20	19. 24	19. 21	19. 21	19. 21	18. 20	18. 20	18. 20	18. 20	16. 19
16. 1½	16. 1½	16. 1½	16. 1½	15. 1½	15. 1½	14. 1½	14. 1½	14. 1½	14. 1½	12. 1½

	Great Republic	Sovereign of the Seas	Packets Com. Perry, & Great T.	Champion of the Seas and Jas. Baines	Empress of the Seas
<u>Frames.</u> White oak in all.					
Spaced.	28"	30"	30"	30"	30"
Siding of Floors	12-15. 14"	14"	14"	12" to 14"	12" to 14"
" " 1 st futtocks	14"	14"	14"	12" to 14"	12" to 14"
" " 2 ^d futtocks.	13"	12" to 13"	12" to 13"	12" to 13"	11" to 13"
" " top timbers at plank sheer	12"	10"	10"	10"	10"
" " stanchions at rail.	11"	9"	9"	9"	9"
Each shift diminishes from 2 ^d futtocks					
Moulding over the keel,	22"	19"	20"	20"	19"
" at turn of bilge.	14"	11"	13"	13"	11"
" at lower, middle, & upper decks.	12½, 10½, 8	9½, 7"	11½, 9, 7"	11½, 9, 7"	10, 9, 7,
" at the rail.	7½"	6"	6"	6"	6"
Regular taper between these points.					
Length of floors and short floors amidships	26', 25'.	18 to 20'.	24' -	24' -	20' -
Shift of floors and futtocks ^{not less} than	7 to 10	5½ to 7	5½ to 7	5½ to 7	5½ to 7
" " futtocks and top timbers	6 to 10	6 to 8	6 to 8	6 to 8	6 to 8
Timbers of frame framed closely together					
<u>Frame Bolts.</u> Number in each futtock	9 to 7	7 to 4	7 to 4	7 to 4	7 to 4
Diameter in bottom and top of ship.	1¼, 1½	1½, 1	1½, 1	1½, 1	1½, 1
Horizontal keys between the frames at every butt, driven from the inside to within 2" of the planking, to prevent hogging.	5 inches thick				
Every 2 ^d floor bolted to the keel with from 1" to 1½", or 1¼" copper, driven through the keel, and riveted.					
<u>Cant frames</u> , tenoned into the dead-wood, and fastened with 6 iron bolts, 1" or 1½" in diameter, driven blunt.					
<u>Apron.</u> Always white oak.					
Sided at the bowsprit.	44"	30"	30"	30"	30"
Fastened to stem with 1½" to 1¼" iron bolts, 18" apart.					
<u>Knight heads.</u> moulded to receive bulwarks. They reach down to the forward cant. Bolted with 1½" or 1¼" iron, 20" to 24" apart, driven where possible clean through.					

Light mrs.	Packet Star of Empire	Clipper Stafford Shire	Flying Cloud	Flying Fish, and West. Ho.	Stag Hound.	Packet Dan Webster	Packet Corn's Grinnel	Packet Plymouth Rock	Packet Ambanc- tic	Pt. 7 Anglo Saxon
30'	30"	30"	30'	30"	30'	30"	30'	26"	30"	30'
12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	11 to 14
12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	12 to 14	11 to 12	11 to 12	11 to 12	11 to 12	11 to 12
11 to 13	11 to 13	11 to 13	11 to 13	11 to 13	11 to 13	10 to 11	10 to 11	10 to 11	10 to 11	10 to 11
10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"
9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"
19'	17"	19"	18"	18"	18"	16"	16"	16"	16"	15"
11'	11"	11"	10 1/2"	10"	10"	10"	10"	10"	10"	10"
9. 7"	10. 9. 7"	10. 9. 7"	9. 7"	9. 7"	9. 7"	9. 7"	9. 7"	9. 7"	9. 7"	9. 7."
6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
18. -	18. -	17 to 18'	16 to 17'	16 to 17'	16. -	16. -	16. -	16. -	16. -	16. -
5 1/2 to 7	5 1/2 to 7	5 1/2 to 7	5 1/2 to 7	5 1/2 to 7	5 1/2 to 7	5 to 7	5 to 7	5 to 7	5 to 7	4 1/2 to 6 1/2
6 to 8	6 to 8	6 to 8	6 to 8	6 to 8	6 to 8	5 to 8	5 to 8	5 to 8	5 to 8	5 to 8
7 to 4	7 to 4	7 to 4	7 to 4	7 to 4	7 to 4	7 to 4	7 to 4	7 to 4	7 to 4	7 to 4
1 1/8. 1	1 1/8. 1	1 1/8. 1	1 1/8. 1.	1 1/8. 1.	1 1/8. 1	1. 1.	1. 1.	1. 1.	1. 1.	1. 1.
30'	30"	30"	28"	28"	28"	28"	28"	28"	28"	26"
						20 to 30	20 to 30	20 to 30	20 to 30	20 to 30

	Great Republic	Sovereign of the Seas	Packets Com. Perry and Great T	Champion of the Seas Jas Baines	Empress of the Seas
<u>Mast pieces</u> , 4 in number each side; moulded as the frame; sided 12"; fastened to knightheads and each other, with 1" to 1½" iron bolts, 2' apart.					
<u>Inner Stern post</u> . Sided same as post. Moulded at head and foot. Bolted with 1¼" bolts, 20 inches apart.					
<u>Stern Post Knee</u> . Sided same as keel. Length of body, and arm, Moulded in the throat, No. of cop. & iron bolts thro' keel & post.					
<u>Stern timbers</u> ; Two at side of post sided Moulded at knuckle. ten inches. Fastened to post Other st. timbers sided 10",					
<u>Square Sterns</u> . Wing transom, oak, sided and moulded. Fastened to post with 4 iron 1½" bolts. Other transoms, sided 10", moulded 12", spaced 14" from center to Fashion timber in square sterns, sided 8", and fastened to all Side counter timbers, made of a knee, whose body is bolted to Stern timbers, sided 8", and spaced 18". A counter timber					
<u>Main Keelson</u> . Pitch pine Composed of no. of tiers. Sided, and moulded whole height. The lower tier fastened to every other floor with 1½" or Second tier, fastened about 6' apart, with 1¼" and 1⅜" iron Third tier, 1¼" and 1⅜" inch bolts, driven through the Scarphs, generally 8' feet, winged and keyed.					
<u>Sister Keelsons</u> . No. of tiers Sided: and whole moulded height. 1½" and 1¼" bolts through every futtock. Horizontal Bolts					
<u>Bilge Keelson</u> . Pitch Pine. No. of tiers Sided. Moulded. Length of scarphs.					

Light- min.	Packet Stand Empire	Clipper Stafford Shire	Flying Cloud.	Flying Fish West. Ho.	Pa. Stag Horned	Packet Dund Webster	Packet Cornel's Grinnel	Packet Plymouth Rock	Pt Antar- tic	Pt Angle Saxa
										N
20. 16	19. 15	19. 16	20. 16	20. 16	18. 16	18. 15	18. 15	18. 15	18. 15	16. 14
						18. 22	18. 22	18. 22	18. 22	1. 24
15. 8½	15. 8½	14. 8	14. 8	14. 8	14. 8½	14. 8	14. 8	14. 8	12. 5½	12. 5
3' 6"	3' 6"	3' 8"	3' 6"	3' 4"	3' 4"	3'	3' 2"	3' 2"	3' 4"	3'
16	16	15	14	14	14	12	12	12	12	12
14'	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
with 1½" bolts, which go through where convenient and are riveted. the cant frames and inner stern post with 1½" iron.										
						Sq. stern	Sq. stern	Sq. stern	Sq. stern	Sq. stern
bolted a timber, 8" x 24", to receive the ends of the stern and counter timbers. center, and fastened to post with two 1½" bolts.										
The transoms with two 1" bolts.										
The wing transoms with 8 or 10, 1½" bolts.										
between every two stern timbers. Both bolted to wing transom.										
3	3	3	3	3	3	2	2	2	2	2
15. 45	15. 45	15. 45	15. 45	15. 45	15. 45	14. 28	14. 28	14. 28	14. 28	14. 28
1½" copper bolts, bolts going through both depths of keel and riveted. bolts driven to within 2" of lower edge of upper tier of keel.										
mazel timber.										
						6'	6'	6'	6'	6'
2	2	2	2	2	2	1	1	1	1	1
14 x 30	14 x 30	14 x 30	14 x 30	14 x 30	14 x 30	14 x 15	14 x 15	14 x 15	14 x 15	14 x 15
of the same size, driven 4 to 4½ feet apart, clear through, riveted.										
1	1	1	1	1	1	1	1	1	1	1
						4 betweens 10 x 16	6 betweens			
14 to 10	14 to 10	12 to 10	12 to 10	12 to 10	12 to 10	12 x 14	10 x 16	10 x 16	10 x 16	10 x 14

	Great Republic	Sovereign of The Seas	Packets Com. Perry & Great T.	Champion of The Seas Jas. Baines	Empress of The Seas
Ceiling, of floor, pitch pine.	Fastened with trenails & spikes				
Width, and thickness in inches.	12 x 10	12 x 5	12 x 5	12 x 5	12 x 5
Birge strakes, from birge keelson to deck clamp, generally					
Width in inches.	12	14½	14½	14½	14
Thickness of lower and upper pieces	6 and 9	4½ and 10	4½ + 10	4½ + 10	4½ + 8
All the birge strakes, ceiling, waterways etc are scarphed up to					
The birge strakes are fastened edgewise with 1½" bolts, every					
Books and Pointers, all of white oak. Sided 10 and 12"					
Lower Deck Clamps. Pitch pine.	Bolted edgewise to the next strake				
Width, and thickness.	12 x 15	12 x 10	12 x 13½	10 x 13½	12 x 13½
Beams. Pitch pine. Sided	15 inches. Beams are let				
shouldered 14" in the middle, 10½ at ends.	15 x 12	15 x 11	15 x 10½	14 x 10½	
Hanging Knees. White oak.	Twenty bolts through each				
Length of body, in feet	7 to 7½	5½ to 7	6½ to 7	6½ to 7	6 to 6½
" " arm. 4½ to 5 feet.	The foot of the knee rests on				
Sided, generally 11 to 12 inches.	11 to 14				
Thickness in the throat.	26"	24"	24"	24"	26"
Lodging Knees. Oak. Arms 3½ to 4 feet in length.					
Lower Deck ledges. 10" x 6".					
Carlings. 10 x 7 inches. Pitch pine					
Waterway, lies flat on beam ends. One 1½" bolt two each					
Depth and width, inches	16 x 16	15 x 16	15 x 16	14 x 15	14 x 15
Binding strake on the beam, next the waterway. Two bolts thro					
Width & thickness, generally 12" x 10".	14" x 12"				
Deck plank, 3½ inches thick. 6 inches wide. Two spikes in					
Thick strakes, in middle of deck for stanchions. Pitch pine, two in					
Standing strakes, on top of waterways, 2 in number, 20" x 10"					
Filling in strakes, to deck clamps, pitch pine					
Main, or Middle Deck. Clamps	16 x 10; the rest 14 x 10 inches.				
Beams. Pitch pine. No.	40	31	27		28
Sided 15 inches. Shouldered at ends	15 x 11	15 x 10½	15 x 10½	15 x 10½	15 x 10½
Hanging Knees. White Oak.	Eighteen bolts, 1 and 1½ inch thro				
Arms 4½ to 4 feet long.	6 to 4½				
Lodging knees. Oak. Arms	4½ to 5 feet long. Sided 10 to 11				
Carlings. Pitch pine, 10 x 8 inches.					

Lightning	Star of Empire	Staffordshire	Flying Cloud	Flying Fish West. Ho.	Stag Horns	Daniel Webster	Cornelius Grinnel	Plymouth Rock	Antarctic	11 Anglo Saxon
12 x 5	12 x 4 1/2	12 x 4 1/2	12 x 4 1/2	12 x 4 1/2	12 x 4 1/2	10 to 12 x 4 1/2	10 to 12 x 4 1/2	10 to 12 x 4 1/2	10 to 12 x 4 1/2	10 to 12 x 4 1/2
double.						angle	angle	angle	angle	angle
14	14	14	14	14	14	10 to 12	10 to 12	10	10	10
4 1/2 x 10	4 1/2 x 10	4 1/2 x 8	4 x 8	4 x 8	4 x 8					
The upper deck, Scarphs 4 to 4 1/2 ft. and 4 1/2 to 5 feet in length.										
second frame, Square fastened with 4 bolts in each frame, riveted, half in, half out										
below, every second frame, with 1 1/8" iron, Square bolted to the frame, with 1 1/8" iron										
12 x 13 1/2	12 x 12	12 x 12	12 x 12	12 x 12	12 x 10	14 x 10	14 x 10	14 x 10	14 x 10	14 x 10
into, and bolted to the clamp with 4 bolts.										
one, being 1 1/8" in the body, and 1" in the arm.										
6 to 6 1/2	6 to 6 1/2	6 to 6 1/2	6 to 6 1/2	6 to 6 1/2	6 to 6 1/2	6 to 6 1/2	7 1/2 to 8	5 1/2 to 6	5 1/2 to 6	5 to 5 1/2
a strike 15 x 7 inches (15 x 8 in the first 4 ships) bolted on.										
		10 to 11.						10 to 12	10 to 11	10 to 11
24"	24"	22" to 23"	20" to 24"	24"	24"	22"	26"	24"	24"	23"
Sides 7 to 8 inches. Moulded in the throat, 26, 28, and 30 inches										
8 x 6' 8 x 6" 8 x 6 8 x 6 8 x 6 8 x 6 8 x 6 8 x 6 8 x 6 8 x 6 8 x 6 8 x 6										
9 x 7 9 x 7 9 x 7 9 x 7 9 x 7 9 x 7 9 x 7 9 x 7 9 x 7 9 x 7										
half riveted in, half out. Two bolts of same Through beam into clamp.										
All the rest 14" x 15".										
the beam, one riveted on hanging knee, Bolt through w.w. and each alternate timber.										
12 x 9 12 x 9 12 x 9 12 x 9 12 x 9 12 x 9 12 x 9 12 x 9 12 x 9 12 x 9										
every beam Yellow pine.										
no. in first 8 ships. one in rest. 14 x 6 in first 5 ships. 14 x 5 in the rest.										
; scarphed 4"; and square bolted.										
square fastened thro the timbers, and bolted edgewise with 3 bolts.										
30	27									
Fastened to the clamps with 4 bolts										
15 x 10 1/2	15 x 10 1/2	15 x 10 1/2								
each one. Sides 10 to 11 inches; 22 to 24 inches in the throat.										
strikes.										
inches. Moulded 28 in the throat. Bolt nearest arm end goes thru both & is riveted.										

Great Republic	Sovereign of The Seas	Corn. Perry Great J.	Champion of The Seas Jas. Baines	Empress of The Seas
-------------------	-----------------------------	----------------------------	--	------------------------

Main Deck, ledges. 9 x 6 inches, let into lodging knees.
 { Waterways. Pitch pine, 16 x 16 16 x 15 16 x 15 15 x 14 15 x 14
 { One 1 1/4 inch bolt thru every frame timber, half riveted out. half
 Binding Strake. Pitch pine, 12 x 10 inches. Two bolts, 1 1/8,
 Thick strakes, in middle of deck, 14 x 5 inches.
 Deck plank, 7 x 3 1/2, pitch pine and yellow pine. Two
 Standing strakes, two in no 18 x 12 18 x 10 out to Stag Horn inclusive
 Filling in strakes. 14 x 8 inches. Edge bolted with 1 1/8 inch

Upper Deck. Clamps. 15 x 12 15 x 10 15 x 10 15 x 10 15 x 10
 Beams. Pitch pine. Sided 20"; the rest 15 and 16 inches.
 " Moulded in center and ends the same 12" 10 10 10 9 & 10.
 Knees. hackmatack, resting on standing strakes. Arms
 Sided, in inches. 13 12 12 10 to 12 10 & 12
 Moulded in throat, inches 22 to 24 20 & 22 20 to 22 21 21
 Lodging knees. hackmatack and oak. Arms 3 1/2 to 4 ft.
 Carlings, pitch pine, 8 and 10 x 6 inches.
 Sedges. " " 9 x 6 inches.
 Waterways, pitch pine, 12 x 14 inches. 1 1/8 bolt into
 Binding strake. 10 x 8 inches. Fastened as usual.
 Deck Plank, yellow pine, 6 x 3 1/2 inches, 2 spikes into beam.
 Hatch coamings, white oak.

Mast Partners. Main & foremast, inches. 15 x 15 15 x 15 15 x 15 15 x 15
 Mizzenmast, in inches. 14 x 15 out to Stag Horn. Then

Plank Sheer, 15 x 6 inches. 16 x 7. Fastened through each
 Ceiling above plank sheer 3 1/2" 3" 3"

Stanchions. in hold & bet. decks. 18 x 24 7 x 22 7 x 22 7 x 22 7 x 22

At the foot, hold stanchions are fastened with straps wh. reach
 aft side of stanchions, at head, up over beam to stanchions
 on every deck, except that at upper deck, the strap goes
 In Great Republic. Stanchions of hold are double, and
 ended on keelson with fore and aft wooden knees.

Span Deck, or Quarter deck. Reaches to
 Beams. no. 84

Hanging knees. hack. Sided 7"; moulded 19' in throat. arms
 Covering board. 7 x 20". Deck Plank 6 x 3" white pine
 Mitten nail. 12 x 5 inches. It's tot 3 1/2 ft above main rail

Light- ning	Star of Empire	Staff- fordshire	Flying Cloud	Flying Fish West ^d to	Stag Hound.	Dart Webster	Cornish Grinnell	Plymouth Roch	Antar- tic	13 Anglo Saxon
15x14	15x14	15x14	15x14	15x14	15x14					
in. Two $1\frac{1}{2}$ bolts into the beam into clamp. into the beam, going thro & riveted on hanging knee. Bolts thro w.w. & each alternate spikes into each beam, one in the ledges. Scaples $3\frac{1}{2}$ to 5 feet. Edge bolted; square bolted with $1\frac{1}{2}$ in. iron, and square bolted.										
15x10	14x10	14x10	14x10	14x10	14x10		Sq. fastened	& edge	bolted	
7 or 8 bolts $1\frac{1}{2}$ & $1\frac{1}{2}$ in. into beam.						1"	1"	1"	1"	1"
9x10	9x10	10	10	10	10	9	9	9	9	9
$4\frac{1}{2}$ feet. 15 or 16 bolts $1\frac{1}{2}$ and $1\frac{1}{2}$ in. wid. Through each knee.										
10x12	10x12	10x12	10x12	10x12	10x12	10x11	10x11	10x11	10x11	10x11
21	21	20	21	20	19	18	18	18	18	18
Sides 7 inches.										
every timber; two through beam.						14x14	14x14	14x14	14x14	12x12
						2 Strakes $4\frac{1}{2} \times 6$	2 Strakes $4\frac{1}{2} \times 6$	2 Strakes $4\frac{1}{2} \times 6$	2 Strakes $4\frac{1}{2} \times 6$	2 Strakes $4\frac{1}{2} \times 6$
15x15	15x15	14x15	14x15	14x15	14x15	14x15	14x15	14x15	14x15	14x15
12x14. Secured with 6 inch lodging knees. moulded 8 and 10 in. in throat attachment with a 1" bolt; also to waterway, & planking. Laid inclined, to round of beam.										
7x22	7x22	7x22	7x22	7x22	7x22	10x10	10x10	10x10	10x10	10x10
if possible to 2^d tier of keelson; bolts riveted at both end. Straps from fore & above, with 2 bolts through each attachment and 3 through beam. Same over the beam and comes down on the attachment again. reaches up to main deck, embracing the beams of both decks. They are fast-										
6 and $4\frac{1}{2}$ ft										

Great Republic	Sovereign of the Seas	Comm. Perry	Champion of the Seas Jas Baines	Empress of the Seas
-------------------	--------------------------	----------------	---------------------------------------	------------------------

Planking. All of pitch pine

Ganboards, inches.

14 x 10 14 x 10 14 x 16 15 x 9 16 x 8

Bolted through keel

into opposite ganboard with $\frac{1}{2}$ iron

Thick strake, next to ganboard

14 x 9

8 6

Bolted edgewise every

5 feet into ganboard with $\frac{1}{8}$

Bottom plank, out to bridge

14 x 6"

7 - 5 $\frac{1}{2}$ 4 $\frac{1}{2}$

Fastened with square locust treenailed.

$1\frac{1}{4}$ ", and

Bridge strakes, projecting, on

Great Republic, 4, 12" wide,

Wales; no. of strakes.

24 24

Width and thickness, inches.

8 x 6.

7 x 6 7 x 6

Plank from the wales down to the bridge strakes. taper

Plank from wales to p.s.

All the planking is double, or square treenailed, when

bolts of copper. All planking tapers toward the

Bulwark plank.

5 and 6
x 4 inches

Calculations:

Length on deck, feet.

325 $\frac{1}{4}$

Length on the Load water line, ft.

314

Breadth, moulded, feet.

49 $\frac{1}{4}$

" extreme.

50 $\frac{1}{2}$

Depth, from base line to plank sheer.

Depth from base line to load line: ft.

Draught for calculation, feet.

23

Total Displacement, tons

5273.

D. per inch at load draught above

26.86

that is to say, at dft for calculation

D. at 25 feet.

5923.

D. at 20 "

Area of load line, moulded, sq. feet

" " " " "

Coefficient of D.

" " load line

" " "

Light- ning	Star of Empire	Stafford shire	Flying Cloud	Flying Fish West Ho	Stag Hounds	Dart Webster	Corn. Grimmel	Plymouth Rock	Antarctic	15 angle Saxon
16 x 8	14 x 7	14 x 7	14 x 7	14 x 7	14 x 7	14 x 7	14 x 7	14 x 7	14 x 8	14 x 8
bolts	5 ft apart.	Through every	3 ^d frame	into sister	keelson	with 1 st	c. & c.			
7	7	6	6	7	7	7	7	7	7	7
in,	and into frames	with 1 st	copper	and iron						
all the rest	14 x 4 ¹ / ₂						13 x 14 x 4 ¹ / ₂			
butt bolts	of 1" copper.									
8" thick.	equal treenails,	locust 1 ¹ / ₂ "								
24	24	20	18	16	16	20	20	20	20	20
8 x 5 ¹ / ₂	7 x 6	7 x 5 ¹ / ₂	all the rest	7 x 5 ¹ / ₂						
in thickness,	and in width	from 8 to 12	inches.							
over 8 inches	in width;	double and	single where	under;	butt					
nabbits.										
237 ¹ / ₂			217 ¹ / ₂							
228			209 ¹ / ₂							
43			40							
44			41							
			237 ² / ₃							
16 ¹ / ₂			17 ¹ / ₂							
367			1951. ⁰⁷							
16.78			13.9 ¹							
			2375. ²³							
			5660.							
			486. ⁹							
			0.5146							
			0.682							
			0.82							
			See page							
			22 bar							
			0.10							

16 Year	Name of Vessel.	Register Tonnage	No. of Decks	Register Dimensions			Moulded Dim ^{ns}			Draft of water loaded.
				Length	Breadth	Depth	Length	Beam	Depth	
1845	Ship Wash ⁿ Irving	751	2	150 $\frac{11}{12}$	33	21				
1846	" Anglo Saxon	894 $\frac{9}{15}$	2	158	35 $\frac{1}{4}$	21				
'6	" New World.	1404	3	187	40 $\frac{1}{2}$	28				
1847	" Ocean Monarch	1301	3	178 $\frac{1}{2}$	40	26 $\frac{5}{6}$				
'7	" A. J.	675	2	143 $\frac{7}{12}$	32 $\frac{1}{6}$	22				
'7	" Anglo American	704	2	149 $\frac{1}{2}$	32	20 $\frac{1}{4}$				
1848	" Jenny Lind.	532	2	141 $\frac{1}{2}$	28 $\frac{1}{2}$	22				
'8	" L. J.	897	2	163 $\frac{1}{4}$	34 $\frac{7}{12}$	22 $\frac{1}{2}$				
1849	" Plymouth Rock	972	2	174 $\frac{1}{4}$	34 $\frac{2}{3}$	22 $\frac{1}{2}$				
'9	Bark Helicon	414	2	127 $\frac{11}{12}$	26 $\frac{1}{2}$	19 $\frac{1}{3}$				
'9	Ship Reindeer	800	2	156 $\frac{1}{2}$	33 $\frac{5}{12}$	22				
'9	" Parliament	997	2	173	35 $\frac{1}{3}$	22 $\frac{1}{2}$				
1850	" Moses Wheeler	871	3	165	33 $\frac{5}{6}$	23				
'50	" Daniel Webster	1187	3	185	37 $\frac{1}{4}$	34				
'50	" Stag Bound	1534	2	209	39 $\frac{2}{3}$	21				
'50	" Cornelius Grinnell	1118	2	182	36 $\frac{5}{12}$	23 $\frac{1}{2}$				
'50	Bark Sultana.	451	1	121 $\frac{1}{2}$	28 $\frac{1}{3}$	14 $\frac{1}{2}$				
'50	Ship Antarctic.	1115	2	177	37	23 $\frac{1}{2}$				
1851	" Flying Cloud.	1782	2	229	40 $\frac{2}{3}$	21 $\frac{1}{2}$				
'1	" No. America.	1463	2	200 $\frac{1}{2}$	39 $\frac{2}{3}$	25 $\frac{2}{3}$				
'1	" Stofferdahine	1817	3	230	41	29				
1852	" Westward Ho.	1650	2	214	40 $\frac{2}{3}$	23 $\frac{1}{2}$				
'2	Ship. Sovereign of the Seas	2421	2	258 $\frac{1}{6}$	44 $\frac{7}{12}$	25 $\frac{1}{2}$				
'2	" Bald Eagle	1703	2	215 $\frac{1}{3}$	41 $\frac{1}{6}$	23 $\frac{1}{2}$				
1853	" Empress of the Seas	2197	3	240 $\frac{1}{2}$	44 $\frac{1}{6}$	27 $\frac{1}{2}$				
'3	" Star of Empire	2050	3	222 $\frac{3}{4}$	40 $\frac{7}{12}$	28				
'3	" Chariot of Fame.	2050	3	222 $\frac{3}{4}$	44 $\frac{7}{12}$	28				
'3	" Great Republic	4555	4	334 $\frac{1}{2}$	53 $\frac{1}{2}$	38				
'3	" Romance of the Sea	1782	2	240 $\frac{1}{3}$	39 $\frac{1}{2}$	29 $\frac{1}{2}$				
1854	" Lightning	2084	2	243	42 $\frac{2}{3}$	23				
'4	" Champion of the Sea	2448	3	252	45 $\frac{1}{2}$	29				
'4	" James Baines	2515	3	266	44 $\frac{7}{12}$	29				
'4	" Santa Claus	1256	2	184	38 $\frac{1}{2}$	23				
'4	" Commodore Perry	1964	3	212	44 $\frac{11}{12}$	29				
'4	" Japan	1964	3	212	44 $\frac{11}{12}$	29				
'4	" Blanche Moore	1787	2	220	41 $\frac{2}{3}$	25 $\frac{7}{12}$				

For Whom Built	Name of Captain	Remarks
E. Train & Capt. E. Caldwell, Boston	Capt. E. Caldwell	Div. packet
E. Train & Co.	" Gordon	" "
Capt. Skiddy, Grinnell, Minton & Co.	" Skiddy	" "
E. Train, and R. G. Shaw, Boston	" Murdoch	" "
Zerega. N.Y.	" "	Lost 1858.
E. Train & Co. Boston	" "	" "
Fairbanks & Wheeler	" "	" "
Zerega & Co. N.Y.	" "	" "
Geo. B. Upton & Capt. E. Caldwell		
Capt. Adams		
Geo. B. Upton		
Geo. B. Upton, & John Forbes	Capt. Albert H. Brown	
Wheeler & Capt. King		
E. Train & Co.	Howard.	
Geo. B. Upton, Sampson & Tappan	Josiah Richardson	
Grinnell, Minton & Co.	Fletcher	
Edward Lamb & Bros.	Watson	
Zerega & Co.		
Train & Co. Sold to Grinnell, M. & Co.	Josiah P. Cressy	
Nickerson & Co.	A. Dumban	
Capt. A. H. Brown, & E. Train & Co.	A. H. Brown	Lost by Capt. Richardson near Cape Sable
Sampson & Tappan	Hussey.	
Donald Mc Kay.	L. Mc Kay.	
Geo. B. Upton	De Merick	
Donald Mc Kay.		
E. Train, And J. Hall, & Benj. Bangs.	A. H. Brown	
Capt. Knowles, & same as last	Knowles.	
Donald Mc Kay.		
Geo. B. Upton	De Merick	
Jas. Baines & Co. Liverpool		
" " "		
" " "		
H. Harris. Boston		
Donald Mc Kay. Baines & Co.		
Jas. Baines & Co.		
Chas. Moore & Co.		
Thos. Harrison & Co. Liverpool.		

Ground when loaded ready for use, at Peck cliff.
Paid for by insurance. Bought by A. G. Low, & Co.
With B. Palmer, Rebuilt.

There is a ship named Great Teesman
sister to Com. Perry. I think this is the one

18 Year	Name of Vessel	Register Tonnage	No. of Decks	Register			Moulded			Draft loaded
				Length	Breadth	Depth Holes	Length	Breadth	Depth	
1855	Ship Donald Mc Kay	2595	3	260 $\frac{1}{2}$	46	29				
'5	" Defender	1413	2	202 $\frac{5}{12}$	38 $\frac{7}{12}$	24 $\frac{1}{4}$				
'5	" Minnehaha	1695	3	209	41 $\frac{10}{12}$	28 $\frac{1}{3}$				
1856	" Baltic	1320	2	187 $\frac{1}{12}$	39 $\frac{1}{6}$	24 $\frac{1}{2}$				
'6	" Adriatic	1327	2	187 $\frac{1}{3}$	39 $\frac{1}{4}$	24 $\frac{1}{2}$				
'6	Bank Henry Hill	568	1	140 $\frac{1}{2}$	30 $\frac{1}{2}$	14 $\frac{1}{2}$				
'6	Ship Mastiff	1030	2	168 $\frac{8}{12}$	36 $\frac{1}{2}$	22 $\frac{1}{2}$				
'6	" Amos Lawrence	1396	2	193 $\frac{3}{4}$	39 $\frac{1}{2}$	24 $\frac{1}{4}$				
'6	" Abbott Lawrence	1497	2	202 $\frac{1}{2}$	39 $\frac{11}{12}$	24 $\frac{1}{3}$				
1857	" Flying Fish	1346	2	198 $\frac{5}{12}$	38 $\frac{1}{6}$	22				
'7										
'7										
1859	Ship Alhambra	1097	2	174 $\frac{1}{2}$	37	23 $\frac{11}{12}$				
1859	Sch. Brig. S. Wright	107	1	84	24	8				
1861	U.S. Str. Ashuelot									
'6	Monitor Mansett									
'6	Prop. Trefail									
'6	" Yucca									
1865	Sloop of war Adams									
1866	Str. Theo. D. Wagner	604	2	172	27 $\frac{2}{3}$	21 $\frac{1}{3}$				
'6	" Geo. B. Upton	607	2	164 $\frac{1}{2}$	27 $\frac{2}{3}$	21 $\frac{1}{3}$				
1867	Brig North Star	409	2	120	29	15				
1868	Ship Helen Morris	1285	2	174 $\frac{1}{3}$	36 $\frac{5}{12}$	23 $\frac{2}{3}$				
'8	" Sov. of the Seas?	1502	2	202	41	24				
'8	Schr. R. R. Higgins	90	1	78 $\frac{1}{2}$	22.7	8				
1869	" Frank Atwood	107	1	88	24.5	8 $\frac{1}{6}$				
'9	Ship Glory of the Seas	2102	3	240 $\frac{1}{6}$	44	28 $\frac{1}{4}$				

The record above was obtained from the
as registry data are concerned. Owners etc. were obtained
from belonging to Mrs. Mc Kay and the names of
year not stated.

Ship Ashburton
" Currier
" Joshua Bates
" St. George

For Whom Built	Name of Captain	Remarks
Jas Baines & Co. Liverpool H. Kendall & Plinton, Boston		
Hugh Kendall & Son		
Zerega. N.Y.		
" " "		
Chas Brown & Capt Watson		
Geo. B. Mpton		
Emmises & Parsons		
Geo. B. Mpton, E. Caldwell		
Sampson & Tappan		
Wm Irving & Co. Boston		
U.S. Government		Iron, side wheeler
" "		
" "		Wooden hull
" "		" "
" "		
" "		

Custom House in Boston. in January, 1883, as far from papers, sent by Mrs. Mc Kay. On one memorandum the following^s vessels, built before 1845 apparently, but the

Liverpool packet
" "
" "

Freighting Ship Alhambra; Donald McKay

Calculations of the builder:-

L. on deck,	175 feet.
" on load line	168½ "
Beam, moulded	38 "
" extreme	38' 10"
D. at 19½ ft. draught.	2478½ tons.
" per inch at that line	13.27 "
" at 21 feet draught.	2718½ "
Probable burden at this ft.	1868½ "

Clipper Ship James Baines.

Calculations by the builder:

Length on deck,	251½ feet.
" on load line	240 "
Beam, moulded	45 "
" extreme	46½ "
Depth, base to plank sheer.	30.05 ft.
Draught, for calculation.	22.25 "
D. at 22¼ feet.	3839.62 tons
D. per inch at load line	19.77 "
Area of load line, moulded,	8100.40 sq. feet.
" " X "	824.88 " "
Area of rails	19,886 sq. feet.
Center above load line	66.76 feet.
" forward of middle.	4.35 "

Moulded D.	3640 tons
Coefficient D.	0.594
" Load line	0.759
" X	0.914
Center of D. below load line	8.604 feet
" " " aft of middle.	3.462 "

Meta center above Center of D.	8.242 ft.
$S \frac{2}{3} y^3 dx$	1050047.07
Center of immersed vertical long section aft of middle	6.04 feet

Flying Cloud, Sail Calculations:-

Center of effort above load line,	62.55 feet.
" " " aft of middle.	0.58 "
Vertical moment of sail	1061418.
Center of gravity of D. below load line	6.27 feet
" " " " aft of middle.	2.15 "
$\frac{2}{3} \int y^3 dx$	530467
Height of meta center above center of D.	8.28 feet.
" " " " load line	2.017 "
Area of immersed long ^l vertical section	3653 feet.
Center of " " " aft of middle,	6.45..