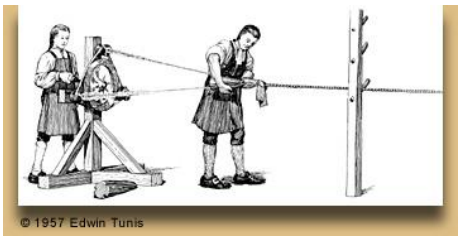

While one man cranks the spinner, the one holding the "top" walks backwards as the rope is twisted. From Edwin Tunis, *The Young United States, 1783 to 1830* (New York: World Publishing Co., 1969). Used by permission of the estate of Edwin Tunis.

Ropewalk

The Newsletter for
Shipwrights of Ohio – April 2023

Next Meeting: May 20, 2023;
"Capstans & Windlasses" – B. Nyberg

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April

Great turnout for our meeting Saturday as we returned to in-person meetings.

Besides Doug, Rick and Lee shown, and Bill Schwartz (Avon Lake, OH) and Loran Black, who joined us late, we had 13 who joined on zoom. In our almost three-year absence from the library, the Westerville library has installed Smart monitors in Classroom C & D. In the photo above, you can see the Smart monitor with my laptop attached.

In the future, Classroom D will be a backup meeting room. It is about 10-foot wide and 40-feet long, with 2.5 walls brick and the other 1.5 walls glass. Long and narrow, and to see the Smart screen, the attendees have to sit on one side of the table. May's, June and July's meetings will be in the conference room (Classroom C).

It was good to be back with in-person meetings. We welcomed back jeff Northup, who joined us from Phoenix, AZ, and our Zoom Master set all this up and monitored the meeting from Florida.

At 11:30 we switched to the NRG workshop on "Paper Ship Modeling", but our in-person conversations continued until after 1 PM. Doug had questions about planking and had brought two ship models that he was working on, Bill Schwartz is building a U.S.S. Cleveland (C-19) and shared his tale of getting the plans from the Smithsonian and then getting them reduced to 38% of the originals so that they were at 1/8" scale.

Those of you that can, we will see you in May at the Westerville Public Library. Note the change in the scheduled presentation schedule. May's topic will be "Capstans & Windlasses" with Darrell joining us from Manitowoc. His presentation on "Masts, Yards, & Spar Making" is now scheduled for August.

Your newsletter Ropewalk, has a new section called "Modeling Tips". We have all found

unique ways to solve some of the problems we experience as we build our ship models. This section will allow you to share your modeling solutions with your fellow shipwrights. Send your editor your tips and techniques, with a write up and photos, and they will be included in future issues.

As always, take care of yourself and your families, look to those you know who may need help, are lonely and may be in need of human contact. Till next month.

Your editor.

Business

Hybrid Meeting Planning

The May 20th, June 17th, and July 15th meetings have been scheduled and will be hybrid and held in the libraries conference room. Both meeting rooms C & D have had Smart Screen Monitors installed.

I will bring the chocolate-chip cookies.

2023 Presentation Schedule

This year's presentation schedule has been adjusted to honor Darrell's plan to attend the MW Model Ship & Boat Competition, at this time, the schedule is:

01/21 - ~~The Principles of Rigging - Nyberg~~
02/18 - ~~Research: Internet, Historical Info - Boeck~~
03/18 - ~~Getting Started with RC Boats - Phelps~~
04/15 - ~~Fixtures: Rudders – Nyberg~~
05/20 - Fixtures: Capstans & Windlasses - Nyberg
06/17 - Standing Rigging & deadeyes - Keller
07/15 - Running: Block & Tackle, Belaying - Mains
08/19 - Making Sails - Nyberg
09/16 - Masts, Yards, & Spar Making - Markijohn
10/21 - Finishing: Natural & Paint - Mitchell
11/18 - Displaying & mounting ship models - Ross
12/16 - Soldering - Phelps

Announcements

Midwestern Model Ships & Boats Contest

Ever wonder how good of a shipwright you are? The *46th Midwestern Model Ships & Boats Competition* is your chance to find out. Held at the Wisconsin Maritime Museum, Manitowoc, WI, which is located at the mouth of the Manitowoc River where it empties into Lake Michigan, on May 19 – 21, 2023.

There are three builder level of entry: Novice, Intermediate, and Advanced; Six categories of model: Scratch, Kit, Paper, Operational, Diorama, Nautical Craft. Competition is against a set of standards, with every entry starting at 100 points. Awards are: Bronze, Silver, Gold.

If you are interested, go to: https://www.wisconsinmaritime.org/programs-and-events/midwestern-model-ship-contest/ Information, registration, schedule, and hotels are all listed. It is 531 miles from Columbus to the museum and can be driven, transporting your model, in 10 hours.

Key deadline date is:

May 1st – Cutoff date for registration of your ship models entry into the competition.

Lakeside Wooden Boat Society

The Lakeside Wooden Boat Society, sponsors for the 20th Annual Lakeside Wooden Boat Show, organized and held at Lakeside, Ohio. Lakeside is a summer Chautauqua on the shore of Lake Erie, opposite Kelly's island. This year's show will be held on Sunday, July 16th, from 12-4pm. Once again, Lakeside will be pairing the show with the Plein Air Art Festival, which runs from Friday–Sunday.

This year, the Maritime Museum of Sandusky will be joining the show at Lakeside from Friday–Sunday. The Maritime Museum's display will include pop-up exhibits sharing the maritime heritage of the area, including: the Golden Age of Steamboats, Johnson's Island confederate prison camp, commercial shipping, prohibition, and the local boatbuilding industry.

There are cottage and hotel rentals available and, as always, a discount is offered at the historic Hotel Lakeside if you mention that you are there for the Boat Show. There is also a gate fee.

For more information please contact Mame Drackett at mame@drackett.cc

Paper Ship Modeling

On April 15th, at 11:30 EST, the NRG held a workshop on Paper Ship Modeling.

The above left cover page of the NRJ, summer 202, Vol. 65, #2, and on the right, the cover page of the NRJ, spring 2023, Vol. 68, #1 are paper ship models of *HMS Wolf*, the paddle steamer

Alexander Arbuthnot built by David Sakrison. David, along with Chris Cooke of "Marcle Models", both from the UK, with Paul Fontenoy from the U.S., introduced the zoom audience (100) to paper ship modeling. They discussed the tools, paper, glue and kits that are available and history of card modeling.

This session outlined the building of four very different card models and the painting of paper and card surfaces. This Zoom broadcast and the one March 18 were recorded and are available to NRG members on the NRG web site.

Modeling Tips

David Steel's Book

In 1794, David Steel published his "Elements of Mastmaking, Sailmaking and Rigging". That book will sell on the internet from $40 to well over $300.

You can now own your own copy of a 200-plus year old authoritative book on British seamanship.

This is a comprehensive, classic English textbook of rigging, seamanship and naval tactics. A key reference for those interested in the age of Nelson. Although at times difficult because of its fine detail, it will reward those that search through it to understand the technology of the era.

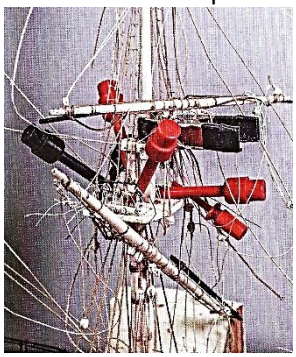
This document resides on the site http://www.hnsa.org/doc/steel/index.htm as photocopies. You can download it for free. The site is maintained by Historical Naval Ships Association. (Sourced from the April 2023 "Scuttlebutt", newsletter "Rocky Mountain Shipwrights")

Retractable-hook test clips

In my modeling, I use many different clamps. The most basic are wooden clothespins. I have a collection ranging from 1", 1 ¾" and 3". The smaller one is great for adding weight to a line or to clamp a line out of the way while you work on something else.

They are available a Hobby Lobby, Joann Fabric and Michaels.

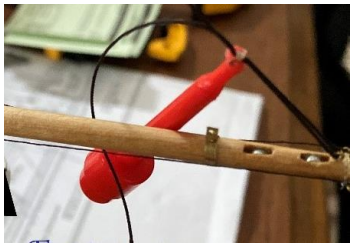
While reading through Rob Napier's book on "Caring for Ship Models" in preparation to restore the Xebec, I saw that he used a small clamp device called a retractable-hook test clip.



They looked a bit "clunky", so I did a search on the internet and found the following under the same name:

The front end of the hook is retractable with a spring, so objects can be firmly hooked. Dimensions LxWxH 4.72 x 3.15 x 0.79 inches. Weight .01 kilograms or .35 ounces. Cost $11.45 for 10.

It dawned on me, that I had seen these before, so went into the files, and sure enough, Cliff Mitchell shared a photo last month with one holding rigging on his *Bluenose*.



Presentation

The Rudder

We started this presentation with the question; "How many of you, truly believe that a rudder steers a ship/boat?"

As an introduction, I quoted from the book off, James, chapter 3, verse 4, written in 46-49 AD – "Behold the ships also, though they are so great and are driven by strong winds are still directed by a very

small rudder, wherever the inclination of the pilot desires.

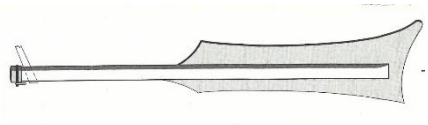
There have been basically four types of steering functions used to steer a ship/boat
Oar (Steering board) – hand operated
Quarter Rudder - hand operated
Pintle/Gudgeon - hand operated or machine controlled
Water Nozzle Jet - machine controlled only

After thousands of years, you can still find ships/boats controlled by each.

The photo above is off a river boat model from King Tut's tomb – 1352 BC. Note the dual oars for steering. Vessels were limited to river, lake or close In-shore transportation. Steering was hand controlled. The problem with mounting an oar off the stern, is that much of the oar is unsupported. By the vessels design, it prevented any fittings below the cap rail on which the oar shaft rested on.

Sometime, 3,000+ years ago, the Quarter Rudder was developed. It was supported to the ships hull at two points.

The photo above shows the quarter rudder lashed at two separate points to the hull. The quarter rudder is balanced on either side of the shaft.



The development of the rudder was different whether you sailed in the Mediterranean or the Baltic. In the Baltic, the vessels had a lower free board to allow delivering goods to the beach or to allow the crew to quickly leave the ship when attacking villages (Viking). The Southern development required larger quarter rudders since the vessels had multiple decks and high sterns.

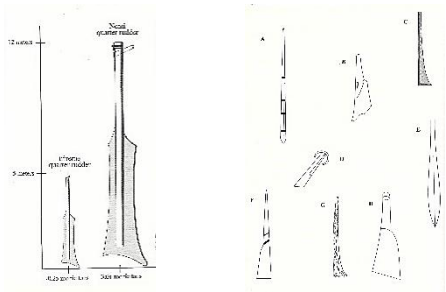
The requirements for the quarter rudder were:

- hold the rudder at two points along the shaft length;
- permit the rudder to rotate around the axis of its shaft;
- permit the rudder to move along the axis so that the depth of blade beneath the water could be adjusted;
- the rudder had to be able to be dismounted.

The disadvantage to the quarter rudder was drag and turbulence which downgrades its performance.

The progress of ship building between the 6th and 11th century A.D. is almost barren, with written references to ship construction nearly non-existent. During this period the lateen rig was widely adopted, frame-first hull construction appeared, and the rudder moved from balanced to off-balanced. The photo below provided two views of the rudder.

Balanced Un-balanced



In the 11th C. it is believed that the pintle gudgeon rudder came into existence. A Winchester baptismal font dated 1150 AD and the first seal of Ipswich dated 1200 AD are the earliest known evidence found of pintle gudgeon rudder. The major factor to the development was the introduction of a straight stern post from the curved one previously used by Viking and Mediterranean ships.

The advantages of the Pintle Gudgeon rudder are:

- The rudder was less vulnerable to damage from ship collisions during battle;
- the helmsmen could be protected from arrows and gunfire by being under protection in the stern of the ship;
- and mounting the rudder on the sternpost improved ship behavior in a following sea.

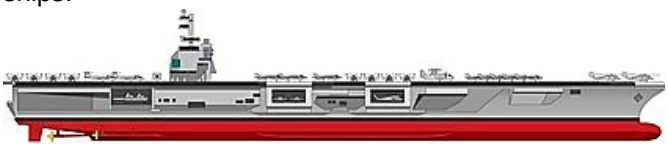
The disadvantages were:

- turbulent water significantly decreases the amount of lift of a rudder;
- the rudder was harder to repair when damaged while underway.

(Lift: the component of total water force acting on a rudder that is perpendicular to the water flow.)

Back to the original question: do you, truly believe that a rudder steers a ship/boat?

Today we have two examples of modern ships:



Nimitz-class aircraft carriers has a length of 1,092 ft (333 m) overall and 1,040 ft (317 m) at the waterline

Large Container Vessel (ULCV)14,501 and higher 1,200 ft (366 m) and longer

Both have two very small rudders, that direct a ship wherever the inclination of the pilot desires. SURE?

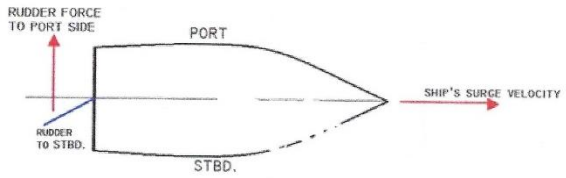
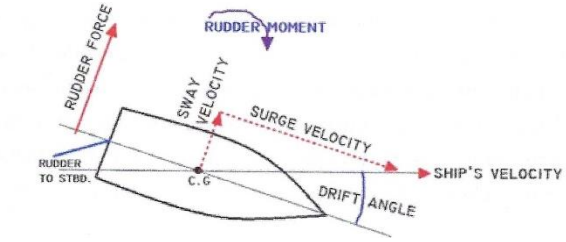


Photo above assumptions:

- the vessel is making a starboard turn;
- helmsman changed the rudder angle from zero to some angle towards Starboard;
- the rudder is moved to the starboard side.

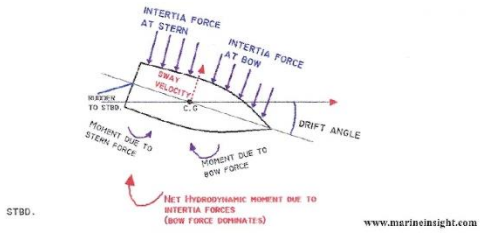


The rudder moment acts about the ship's center of gravity (C.G.).

- It gives the ships orientation by giving it a drift angle;
- this moment is not large enough to turn the ship to the required heading angle;
- the ship, with the drift angle, is now moving along the initial direction;
- by introducing a drift angle, the rudder has introduced a small surge velocity to the ship;

What happens next, makes the ship turn.

The prime focus should be on the sway velocity component. It changes the hydrodynamics around the ship's hull to cause it to turn.

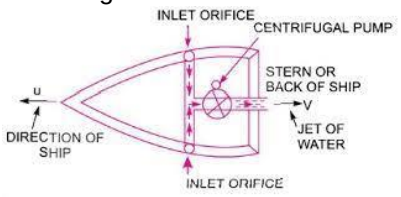


With a sway velocity towards the port side, the hull sways to port, exerting a force on the water particles that are on the port side. The water particles exert an opposite force on the ship's hull, due to the inherent inertia of the water particles. (The direction of the inertia force is always opposite to the sway velocity (inertia force always opposes motion)). Part of the inertia acts on the stern – creating an anticlockwise (toward port) moment on the center of gravity; part of the inertia acts on the bow – creates a clockwise (towards starboard) moment on the center of gravity

Important to know: when the hull exerts force on the water around it, its sway velocity is to port, the inertia force exerted on the hull tries to achieve equilibrium. Which means the **magnitude of the inertia force is in the order of the ships displacement. The hydrodynamic moment is also a magnitude of the ships displacement.**

The rudder does not turn a ship, it only initiates a drift angle in the ship, which results in a hydrodynamic moment, which is actually the driving force behind a turning action'

The fourth steering function is jet nozzle propulsion/steering.



The basic principle behind a jet engine is a consistent cycling motion. The internal system utilizes rotating blades to draw water into the engine itself and then forcefully streams the water back out. The constant high-power motion of this process is what propels the water vessel forward or sideways.

Jet nozzle steering is used on personal water craft, some harbor tugs, and inshore naval vessels. The restriction to its use is expense.

Ships on Deck

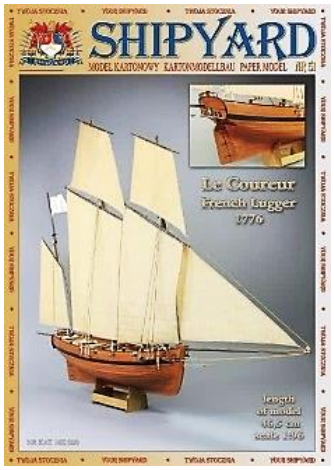
Swift 1805

Julie Holloway

Here are three photos of my progress on the Swift. I started on the « booths » while waiting for hull planks to dry.

and took a bit of artistic license with the doors.

Julie has purchased « Le Coureur » paper kit to work on while in France.



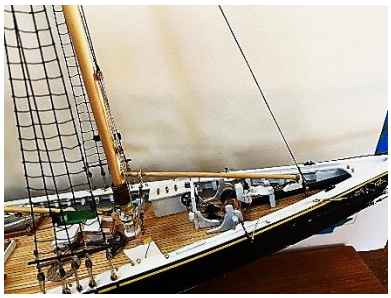
Bluenose

Cliff Mitchell

Left: Continuing with the Main Boom. Cliff worked on the **Main Boom Topping Lift** which pulls the boom up. It runs from the main mast cap to the end of the main boom. It has a series of sheaves ad blocks at the end to allow it to be tightened or loosened.

Left: There are two quarter lifts on each side of the sail. These run from the bottom of the trestle trees down to the boom. The lines are attached to the stern of the boom.

Right: Next he worked on the Fore Boom Rigging. The following was installed: The Fore Boom Tackle; Fore Boom Sheet; Fore Boom Topping Lift; linking the Fore Boom to the Mast.



Finally, he installed the Jumbo Jib Boom which included the following: Jumbo Jib Boom Sheet; In Haul Tackle; Jumbo Jib Topping Lift.

New Bedford Whaleboat

Jeff Northup

Jeff joined us from Phoenix. He has been dealing with health issues and is just getting back to ship modeling. This is his return project.

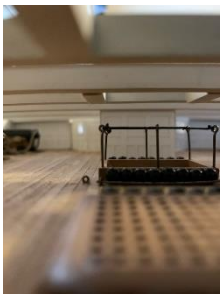
Good to have you back, Jeff.

U.S.S. Ohio

Richard Stratton

Rick has finished up the upper gun deck and the aft cabins.

In addition to the paneled walls, he added enough furniture to give something to see if you look through the windows or gun ports. The work is not perfect but sufficient for a deck that’s covered up by another deck. The main cabin has a table and the state rooms have bunks and sea chests.



The main cabin also has proof that he was on this planet for some time.

Left below: His attention is now on planking the spar deck. Along with all of the deck beams with the correct camber, he added a false deck of card stock and penciled in lines for plank staggering.

Right above: he then cut a whole LOT of planks. Scale equivalent of about 22 feet from deck beam to deck beam

He thinks he is roughly half way done with this phase.

Other Notes: “Stuff”, Tugs & Things

Nautical Terms

Bight: A loop in a rope or line – a hitch or knot tied "on the bight" is one tied in the middle of a rope, without access to the ends.

Bilander: A small European merchant sailing ship with two masts, the mainmast lateen-rigged with a trapezoidal mainsail, and the foremast carrying the conventional square course and square topsail. Used in the Netherlands for coast and canal traffic and occasionally in the North Sea, but more frequently used in the Mediterranean Sea.

bilge: The compartment at the bottom of the hull of a ship or boat where water collects and must be pumped out of the vessel; the space between the bottom hull planking and the ceiling of the hold.

bilge keel:
One of a pair of keels on either side of the hull, usually slanted outwards.
bill: The extremity of the arm of an anchor; the point of or beyond the fluke.
binnacle: The stand on which the ship's compass is mounted, usually near the helm, permitting ready reference by the helmsman.
binnacle list: A ship's sick list. The list of men unable to report for duty was given to the officer or mate of the watch by the ship's surgeon. The list was kept at the binnacle.
bite: Verb used in reference to a rudder, as in "the rudder begins to bite". When a vessel has steerageway the rudder will act to steer the vessel.
bitt: A post or pair of posts mounted on the ship's bow for fastening ropes or cables. A strong vertical timber or iron fastened through the deck beams that is used for securing ropes or hawsers.
bitter end: The last part or loose end of a rope or cable. The anchor cable is tied to the bitts; when the cable is fully paid out, the bitter end has been reached.
black gang: The engineering crew of the vessel, i.e. crew members who work in the vessel's engine room, fire room and/or boiler room, so called because they would typically be covered in coal dust during the days of coal-fired steamships.

Nautical Terms Wikipedia

Tugs: Great Lakes

Robert E. Burke **(Towboat) 1899**

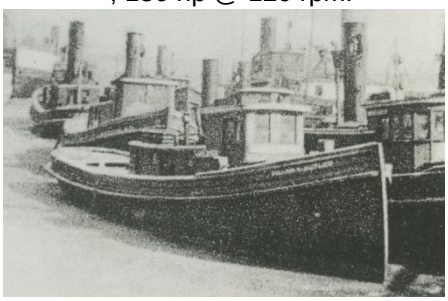
The wooden towboat *Robert E. Burke* was built at Manitowoc, WI by H.B. & G.B. Burger and enrolled at Chicago, December 30, 1899. Her original owner was Barry’s Independent Towing Co., Chicago. Her measures were 84.3’ x 20.7’ x 6.3’, with a tonnage of 73 grt, 49 net. Her official number was 111257. She was powered by a high-pressure engine, with a 10” x 30” stroke, built by Vulcan Iron Works, Chicago. She also was equipped with a 4.5’ x 7’ boiler. December 1901, she burned while in layup at Muskegon, MI. She was rebuilt for the Chicago to Lincoln Park service. And operated in general freight and passenger service. May 1908, she was renamed *South Shore* and equipped with a 30” x 30” stroke engine. April 1909 her ownership was changed to Emil Erdress. Sault Ste. Marie and ran in the Lake Superior, south shore passenger & freight trade. In November 1912, caught in a storm on Lake Superior, she was blown ashore and wrecked, 7 miles west of Grand Marais, MI.

BGSU University Libraries; Historical Collections of the Lakes & Alpena County George N. Fletcher Public Library; C. Patrick Labadie Collection

,

Frank S. Butler **(Towboat) 1865**

, 180 hp @ 120 rpm.



The wooden tug was built by John Gregory, Chicago, for S.C. Shenck, Toledo. Her measures were 65.9’ x 14.5’ x 7.9’, with a tonnage of 38 grt, 19 net. Her official number was 9200. Powered by an engine with a 18” bore x 20” stroke. In 1866, her ownership was changed to Van Dolson, Chicago. In 1878 and 1885 she was rebuilt. The *Frank S. Butler* was abandoned in 1922.

BGSU University Libraries; Historical Collections of the Great Lakes & Alpena County George N. Fletcher: Public Library; C. Patrick Labadie Collection

Presentation Schedule:

2023- Tentative
Jan 21 – ~~Principles of Rigging~~
Feb 18 – ~~Research: internet, Historical~~
Mar 18 – ~~Getting Started with RC Boats~~
Apr 15 – Fixtures: Rudders
May 20 – Capstans & Windlasses
Jun 17 – Standing Rigging & Deadeyes
Jul 15 – Running Rigging, Blocks, Belaying
Aug 19 – Making Sails
Sep 16 – Mast, yard & Spar Making
Oct 21 - Finishing: Natural & Paint
Nov 18 – Displaying & Mounting ship models
Dec 16 - Soldering

Events & Dates to Note:

2023 Tentative Schedule

Columbus Woodworking Show
Ohio Expo Center
~~**January 20-23, 2023**~~

IPMS Columbus
BLIZZCON 2023
Makoy Center, Hilliard, OH
~~**Saturday, February 18, 2023**~~

Miami Valley Woodcarving Show
Christ United Methodist Church
Middletown, OH
~~**March 4 & 5, 2023**~~

46th Midwestern Model & Boat Show,
Wisconsin Maritime Museum, Manitowoc, WI
May 19 - 21, 2023

Lakeside Antique & Classic Wooden Boat
Lakeside Hotel, Lakeside, OH
July 16, 2023

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Web Site: www.shipwrightsofohio.com

Email: shipwright@breezelineohio.net

Cargo Hold

www.shipwrightsofohio.com/cargo hold/

Here you will find how to order Challenge Coins, as shown above, on left, that have been used historically for Identification within an organization, Recognition of achievements, Appreciation of services and Trading/Collecting. Our Shipwrights of Ohio coin contains both the Club Logo and the Club Coat-of-Arms.

You can also order Logo shirts from "Lands End". They offer an on-line link for direct, personal purchases of many of their products without Shipwrights of Ohio logo.

There are currently two logo styles available**:**

- **Full Club logo – with Motto, for digital print use on the backside of T-shirts. 10" or 12" round.**
- **Small Club logo – without Motto for embroidered or digital print on the front of items. 4" round.**

Wooden Steamers on the Great Lakes

Written by William E. Nyberg

1866-77, Reconstruction

1866-b

Florence: S. & H. Jenkins, Windsor, Ontario, built a wooden propeller with measures: 82.0' x 20.0' x 7.0' for J.S. Jenkins, Windsor, and intended for the ferry trade on the Detroit River, running between Windsor and Detroit. She was powered by a high-pressure engine, with, 22" bore x 24" stroke, 75 horse power, built by George N. Oill, St. Catharines, Ont. in 1866. Her master for the 1867 season was Captain Wilcox and she ran in connection with the Erie & Niagara Railway between Buffalo, NY and Fort Erie, Ont. on the Niagara River. In 1868, the *Florence* ran between Windsor, Wallaceburg and Sarnia on the Detroit & St. Clair Rivers. In May 1869, the propeller *Florence* had her machinery disabled on the Detroit River. In that same month, she was damaged in a collision with the propeller *Guiding Star* (US85079) on the Detroit River. In August of that year, acting as a towboat, with scow *Huron* in tow, laden with lumber, the *Florence* received considerable damage in a collision on the Detroit River. March 1871, the *Florence* caught fire and burned to the water's edge while at her dock at Amherstburg Ont., Detroit River. Damage was set at $5,000. For the 1872 season her chief engineer was Jacob A. Noble. In December of that year, the *Florence* struck a snag and sank in Bear Creek, NY. She was raised and repaired. The "Lake Vessel Registry of 1873" lists the propeller *Florence* as a harbor tug. Owned by Jenkins, Windsor, Ont., and valued at $9,500.

In 1877, ownership of the propeller *Florence* was changed to Bulmer & Springer, Hamilton, Ont. Her chief engineer for the 1877 season was Robert H. Field. In January 1878, the propeller *Florence* was registered at Hamilton, Ont. and assigned number C77691. During the winter layup, 1879/80, the propeller *Florence* underwent a winter rebuild by H. Jenkins, Mill Point, Ont.; 92.0 x 20.0 x 7.9, 179 grt, 121 net tons.

Ownership of the propeller *Florence* was changed in 1880, to McMurrich & Playfair, Toronto, Ont. and she was rebuilt at Deseronto, Ont. July 1880, she was renamed *Cherokee*, and her enrollment at Toronto District updated. Her master for the 1880 season was Captain Robert S. Field (1880).

In 1881, ownership of the propeller *Cherokee* was changed to the Toronto Lumber Co., Toronto, where she would operate as a tug. October 1883, the *Cherokee* assisted the Canadian tug *R. B. McPherson* and a dredge tug pull the grain laden schooner *Granger* (US85376) when she went aground at the Dummy light-house at the entrance to Collingwood, Ont., Georgian Bay.

In 1884, ownership of the propeller *Cherokee* was changed to the Ontario Lumber Co., Midland, Ont. where she operated as a tug on Georgian Bay. In 1888, she received a new boiler. In 1890, the propeller *Cherokee* foundered off Midland, Ont. harbor, Georgian Bay. She was raised in 1892 and then scrapped.

Enrollment for the propeller *Cherokee* was surrendered at Midland, Ont. in 1890 and endorsed "foundered".

William Goodnow: Allen & McClelland, Milwaukee, built for Captain Larkins, a wooden propeller towboat. She was enrolled at Milwaukie in 1866 and her measures recorded as: 129.0' x 20.2' x 11.4'; with a tonnage of 171.76 grt, 100.0 net. She was issued official number 26251. She was powered by a high-pressure engine, 28" bore x 30" stroke. Steam was generated by a tubular boiler, 8.5' x 16', 95 psi. The *William Goodnow* was built for the towing trade. In June 1869,
while lying to, in the dark, off Lexington, MI, Lake Huron, the she was rammed by the bark *Sunnyside* (U22388) and sank in 13 fathoms of water. No lives lost. In July, she was raised by Canadian steamer *T. F. Parks* (ex-*Ploughboy* 1851) and towed to Sarnia, Ont. where she sank again. She was again raised and towed to Detroit for repairs.

In 1871, ownership of the tug *William Goodnow* was changed to John Miner, Detroit. July of that same year, she broke her shaft off Bar Point, Ont., Detroit River and was towed to Detroit for

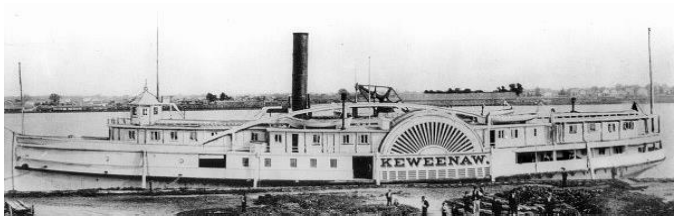
repairs. In November 1871, bound up on the Detroit River, light, the tug *William Goodnow* collided with the tug *Samson* (U22381), bound down with a tow of four vessels, causing damage on the port bow to the *Goodnow*. Repaired.

In 1879, her ownership of the *William Goodnow* was changed to J. Newton, et al, Cleveland.

In 1881, ownership of the *William Goodnow* was changed to S. T. Everett, and then to J. H. Palmer et al.

In February 1874, ownership of the *William Goodnow* was changed to W. N. Wolf & Thomas Davidson, Milwaukee. Bound up on the Detroit River, in September 1884, with a tow of vessels, the *William Goodnow* stranded on Ballard's Reef, Detroit River.

The tug *William Goodnow* was abandoned and dismantled in April 1885.



Keweenaw: Thomas T. Arnold, Marine City, MI, built for a group of investors, including Eber Ward; J.W. Wilkins; John M. Nichol; Charles H. Westcott; all from Detroit; a wooden, sidewheel steamer named *Keweenaw.* She was enrolled at Detroit, May 15, 1866, and her measures recorded as: 202.00' x 29.58' x 11.66'; with tonnage of 800.94 grt, 636.75 net; and issued official number 14043. She was powered by a vertical beam engine, 50" bore x 120" stroke, originally installed in *North Star* (US -1854) and built by Cuyahoga Steam Furnace Co. The *Keweenaw* was built for the Buffalo and Lake Superior passenger, package freight trade and her home port was Detroit. In August 1866, laden with a cargo of lumber, the *Keweenaw* went ashore at Superior City, Lake Superior. She was released after jettisoning some of her cargo. Her master for the 1868 – 1872 seasons was Captain Steward with William J. McClure as chief engineer from 1868 to 1872.

In July 1869, the steamer *Keweenaw* collided with the Canadian ferry *Essex* (C – 1860) on the Detroit River. In November of the same year, the *Keweenaw* went aground on St. Clair Flats, Lake St. Clair. Her master for the 1873 – 1877 seasons was Captain A. M. Shepherd.

Ownership of the steamer *Keweenaw* was transferred, in 1874, to Ward's Central Pacific Lake Co. and she ran Detroit to Mackinaw, MI under the Peoples Line. She underwent an extensive overhaul during winter layover at Detroit prior to the start of the 1874 season. In August of that year, she went aground at Detour Passage, Saint Mary's River. Her property loss was set at $600. In May 1875, the *Keweenaw* went ashore at Grosse Isle, Detroit River. She was released by the tug *Winslow* (U26243). Due to the passenger traffic almost closed for the season the *Keweenaw* went into winter layup late in September 1878.

Ownership of the steamer *Keweenaw* was changed in August 1878 to Arthur Van Norman and William W. Lamon, trustee for Willis J. Kelsey, both from Cleveland. The following month, the steamer *Keweenaw* was transferred to the Cleveland & Saginaw Transportation Co., Cleveland, for a sale price of $14,000. She ran the Cleveland to Saginaw run. Her master for the remainder of the 1878 season was Captain Thorne.

In 1880, ownership of the steamer *Keweenaw* was changed to: Campbell S. Fisher; Charles Root; and J.F. Maloney, all from Detroit. Her master for the 1881 season was Captain Jones.

In 1882, ownership shares of the *Keweenaw* were changed to William W. Warriner; Campbell S. Fisher; W.O. Ashley; H.L. O'Brien; and Charles B. Gauley, all from Detroit.

In 1883, her ownership share were transferred to Detroit Mutual Steamboat Company, Detroit. In July of that year, the *Keweenaw* went aground on Starve Island Reef, Lake Erie. She was released by the tug *W.B. Castle* (U26860). In October of the same year, the steamer went aground on Pipe Island, near the mouth of the Sault, Saint Mary's River. She was released by the wrecking tug *Leviathan* (U14612) out of Mackinaw, MI in October. Her master for the 1884 season was Captain John Sloan Sr. In October of 1884, the steamer *Keweenaw,* with passengers, stranded on Pipe Island, Saint Mary's River, Lake Huron. Her hull damage was set at $2,500. Her owners changed the rig of the steamer *Keweenaw* to a schooner barge and removed her machinery at Detroit, for her usage in the lumber trade. It was estimated that she would carry 650,000 feet of lumber. Her enrollment

measures were updated in June 1887: 205.33’ x 30.16’ x 11.16’; 493.49 grt, 468.82 net.

In 1888, ownership of the schooner barge *Keweenaw* was changed to Thomas Nester, Baraga, MI. In tow of the steamer *J.E. Potts* in June 1889*,* the schooner barge *Keweenaw* collided with the barge *John Martin* (U75717) which was in tow of the steamer *City of Cleveland* (U126033), and sank in Neebish Rapids, St. Mary’s River and later recovered. Her master for the 1895 season was Captain W.J. Willoughby. In November 1901, during a northerly storm blowing through the mouth of the Grand Marais, MI harbor on Lake Superior, the schooner barge *Keweenaw* was wrecked. Recovered. In 1906, the barge *Keweenaw* sprang a leak and sank in the harbor at Sandusky, OH. The final enrollment for the schooner barge *Keweenaw* was surrendered at Detroit, August 13, 1906 and endorsed "abandoned". The hull of the barge *Keweenaw* was burned at Sandusky and the hulk was buried when the Sandusky harbor was filled.

John A. MacDonald: Henry Roney, Garden Island, Ont. built for Calvin & Breck, also of Garden Island, a wooden sidewheel steamer. Her first enrollment was issued at Kingston, Ont. June 03, 1866, and her recorded measures were: 139.4’ x 23.4’ x 9.3’; 268.27 unit tons. She was built as a tug for lumber rafting. Her master for the 1866 - ? season was Captain Tim Sullivan (listed by the "British Whig" as captain of the *John A MacDonald* in his obit dated March 19, 1886)

In September 1866, the *John A MacDonald* was used to pump out the schooner *Raleigh* (US21135) which was on a shoal opposite the Market Battery, Kingston, Ont. In May 1869, the tug *John A MacDonald* went ashore at the foot of the Lachine Rapids, St. Lawrence River. In November 1881, she was used to recover the steamer *Travelers* (C725) boiler from 40 feet of water.

In May 1883, bound from Chateauguay, Que. for the head of the Lachine Rapids, St. Lawrence River, the steamer tug *John A. MacDonald*, while towing a raft of oak timber, worth $6,000, with 13 men aboard the timber raft, had the hawser to the raft break and the raft and men entered the rapids. The raft struck rocks twice breaking apart while the men clung to the raft mast until reaching calmer waters and were picked up. All survived. In October of that same year, the tug ran on to Chapman's Shoal, near Clayton, NY, St. Lawrence River. In August of 1884, the *John A MacDonald,* while towing a raft of ten drams on the St. Lawrence River, broke her shaft while opposite of Prescott, Ont. She made port successfully. In December 1887, she ran on to Duffy's Shoal, breaking two frames and was dry docked for repairs.

Her master for the 1888 season was Captain Alex Gignac and for the 1889 season. Captain J. Sutherland. In May 1889, the tug *John A MacDonald* arrived at Quebec with a raft of timber from Ohio, Michigan, and Toronto that was the earliest delivery for the year.

Final enrollment for the sidewheel steamer tug *John A MacDonald* was surrendered at Kingston, Ont. in 1895 and endorsed as "abandoned".

Mackinac: John Stupinski, built a wooden sidewheel steamer for Edward Kanter, both from Detroit. The steamer was enrolled at Detroit in 1866 and her measures were recorded as: 107.2’ x 25.9’ x 8.2’; 141.75 grt and she was assigned official number 90135. She was powered by a vertical beam engine, originally installed in sidewheel steamer *Sunbeam* (1861). Edward Kanter planned to use her for the general freight trade carrying grain, lumber and lightering. Her master for the 1866 season was Captain W. R. Clinton.

Ownership of the steamer *Mackinac* was changed, in February 1869, to Henry C. Penny, John Weston and Ellen Garfield all from Detroit. She ran Detroit to Wallaceburg, Ont. on the St. Clair River.

In April 1870, ownership of the steamer *Mackinac* was changed to William Livingstone and Charles Kellogg, Detroit. In May 1872, the steamer *Mackinac* was used to lightered a considerable quantity of railroad iron and other goods from the sunken iron propeller *Merchant* (16332).

In April 1875, her ownership was transferred to Douglas W. Dana and Evaline MacKinne. They in turn, had her converted to a propeller early in 1877.

In October of that year, shares in the propeller *Mackinac* were transferred to Douglas W. Dana and John A. Smith, Algonac.

Later in October, her enrollment shows that her ownership was transferred to John A. Smith, Algonac, MI.

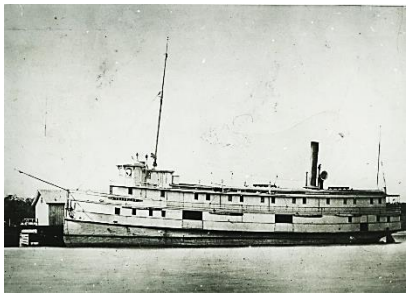
In November 1879, ownership of the propeller *Mackinac* was changed to David B. Mudgett, Greenbush, MI. He had her rebuilt as a steambarge at Dunford & Alverson's shipyard, Port Huron and her enrollment transferred to Port Huron May 1880: One mast; 124.'9 x 26.3' x 8.6'; 203.6 grt, 164.3 net.

In April 1881, ownership of the steambarge *Mackinac* was changed to George L. Collwell, Harrisville, MI. She ran Alpena, MI to Cleveland, towing the schooner barge *Genesee Chief* (1846) in the lumber trade.

In September of that year, shares in the steambarge *Mackinac* were transferred between George L. Collwell and William E. Rice, Harrisville, MI.

May 1885, ownership of the steambarge *Mackinac* was transferred to W. E. Rice et al, Harrisville, MI. Her master for the 1885 – 1890 seasons was Captain William E. Rice. During that time period shares in the steambarge *Mackinac* were transferred to W. E. Rice and J. VanBuskirk, Harrisville, MI. In November 1890, the steambarge *Mackinac,* while moored at her dock at Black River, MI, south of Alpena, unloading a cargo of lumbermen supplies, caught fire under her boiler and was pushed out on to Lake Huron where she burned to a total loss.

Final enrollment was surrendered at Port Huron, November 20, 1890.



Messenger: On September 29, 1866, the wooden propeller *Messenger* was enrolled at Cleveland with measures: 150.0' x 25.5' x 10.5'; 444.57 grt, 341.62 net. Built by Peck & Masters, Cleveland for the passenger, package freight trade between Cleveland, OH and the Lake Erie Islands, she was owned by E.M. Peck; G.W. Calkins; and Sarah H. Lewis, all from Cleveland. When enrolled, she was assigned official number 16654. She was powered by a horizontal crosshead engine, built by Cuyahoga Steam Boiler Works, Cleveland. Her master for the 1866 season was Captain Edward Kelly. In October of that year, bound from Cleveland for Kelly's Island, she went aground at Put-In-Bay, on the Ballast Island Reef.

February 1867, ownership of the propeller was changed to Nathan Englemann, Milwaukee, who assigned her to the passenger, freight service between Lake Michigan and Lake Superior ports. In June 1869, the *Messenger* broke her wheel on Lake Michigan. The following month, she was damaged in a collision at Chicago, IL. In August of that year, she and the propeller *Ironsides* (US12091) collided at Milwaukee.

Ownership of the propeller *Messenger* was transferred to Englemann Transportation Co., Milwaukee in 1871. In July of that year, she and steamer *Little Ada* collided at Milwaukee, WI. January 1873, the *Messenger* was caught in ice for 54 days while off Muskegon, MI. In November 1874, the *Messenger* collided with the excursion steamer *Lake Breeze* (US15572) at Ludington, MI.

In 1875, her ownership was changed to John H. Graham, Benton Harbor, MI and Andrew Crawford, IL. In 1880, ownership of the propeller *Messenger* was transferred to Graham & Morton Transportation Co., Chicago.

In April 1883, ownership of the *Messenger* was changed to Charles R. Smith, et al. Cheboygan, MI. The M*essenger* was re-measured in April 1883, under the Act of August 5, 1882 at Chicago, and her recorded tonnage changed to: 444.57 grt, 341.62 net.

In 1888, ownership of the *Messenger* was changed to Margaret Zengerle; Joseph G. Lefevere; and John Baker, all from Au Sable, MI. In June 1888, her passenger accommodations were removed and she was reduced to a steam "lumber" barge, and enrolled at Port Huron: 136' x 27' x 9.33'; 288.58 grt, 224.09 net.

In 1889, her ownership was changed to John Stevenson; George Lindsay; and Peter Henkle all from Detroit.

In 1890, the steambarge *Messenger* ownership was consolidated to John Stevenson and Peter Henkle. In November 1890, while loading cedar posts at Rogers City, MI, the steambarge *Messenger,* caught fire in her hold and burned to the water's edge. The lines were cut to prevent the fire from spreading to the lumber on the dock, and she drifted 5 miles out into Lake Huron still burning. No lives lost.

A.J. Mowry: H. Framer & Co., Milan, OH built a wooden propeller (steambarge) for A. J. Mowry, John Beckel, & John H. Beckel all from Milan, to be used in the bulk freight trade. The steambarge *A. J. Mowry* was enrolled at Sandusky, OH, August 13, 1866, and her measures recorded as: 138.3' x 23.7' x 6.8'; 207.64 grt, 177.30 net. The *A. J. Mowry* was issued official number 1028. Her master for the 1866 season was Captain Bickel. In October 1866, the steambarge had her machinery broken while on Saginaw Bay. In September 1867, she caught fire and burned while off Lexington, MI on Lake Huron. She was towed to Port Huron for rebuilding and in May 1868, her enrolment register was update to a rig: schooner with 3-masts pairs and tonnage: 188.28 grt.

In May 1869, ownership of the schooner *A. J. Mowry* was changed to John C. Maxwell, Chicago, IL & John H. Beckel, Milan, OH.

In March of 1871, her ownership was changed to Samuel A. Brown & William B. Phillips, Chicago, IL.

The following month, ownership of the schooner was changed to Galen Eastman, Grand Haven, MI; Newton Eastman, Chicago; & John H. Beckel, Milan, and the schooner was converted to a two-masted barge

Ownership of the *A. J. Mowry* was changed to Beckel & Charles Mears, Lincoln, MI, in March 1872. The had the barge rebuilt as a three-mast schooner during the winter layup of 1872/73.

In April 1886, ownership of the schooner *A. J. Mowry* was changed to William Fisher, Chicago and her tonnage recorded as 178.87 grt.

In April of the following year, her ownership was changed to William H. Horn, Chicago.

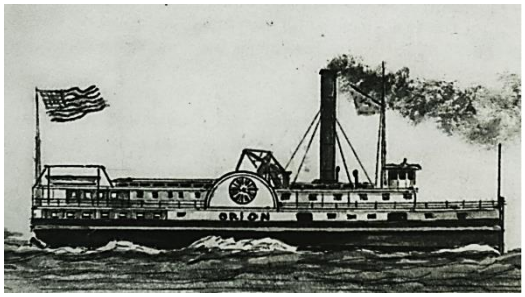
In April of 1888, ownership of the schooner *A. J. Mowry* was listed as William H. Horn & F. Bernston, Chicago.

Her next owner was Sakaris Bernston, Chicago in August 1891.

In April 1892, William J. O'Brien, Chicago was listed as her owner.

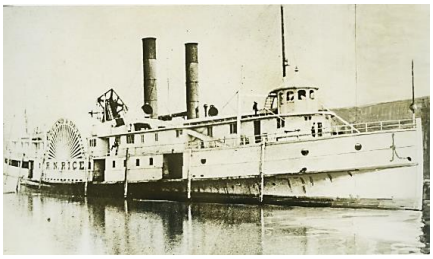
In October 1893, ownership of the schooner *A. J. Mowry* was changed to John Fahey & Michael Doyle, Chicago.

Final enrollment for the schooner was surrendered June 30, 1896 and endorsed "abandoned".



Orion: In July 1866, Greenfield S. Rand, Manitowoc, WI, enrolled at Chicago, a wooden, sidewheel steamer owned by Captain Albert E. Goodrich, Chicago. Her recorded measures were: 184.33' x 48.25' x 11.0', and a tonnage: 494.74 grt. She was issued official number 18917. The steamer *Orion* was powered by a vertical beam engine, 44" bore x 120" stroke, built by the Detroit Iron Works Co., Detroit, originally installed in the *Michigan*, 1847, built by R.G. Goodsell, Detroit. Captain Albert E. Goodrich would use the steamer *Orion* in the passenger, package freight trade along the east coast of Lake Michigan. Her cost to build was $80,000. In October 1866, the steamer *Orion* broke her machinery near Waukegan, IL, Lake Michigan. The property loss was set at $2,000.

Ownership of the steamer *Orion* was transferred to Goodrich Transportation Co., Chicago in 1868. In June of 1869, while on Lake Michigan, she broke her crank pin, and again in August of the same year. In October of 1869, her machinery was disabled while on Lake Michigan. Her master of the steamer *Orion* was Captain Butlin in 1870. In October of 1870, the steamer *Orion* stranded on a bar about a half mile from the harbor entrance to Grand Haven, MI, during a full gale and was pounded to pieces. No lives lost.



R. N. Rice: Campbell & Owen at Detroit, built a wooden sidewheel steamer for the Detroit & Cleveland Steamboat Navigation Co: John Owen, et al; Detroit. Launched in 1866 as hull # 00020, she was enrolled at Detroit, April 15, 1867. Her measures were 238.58’ x 32.50’ x 13.16’; tonnage 1096.94 grt. She was powered by a vertical beam engine, 62” bore x 132" stroke, built by Fletcher & Harris, North River Iron Works, New York, New York in 1867. Steam was generated by a tubular return-flue boilers, 8' x 9', built by Detroit Locomotive Works, Michigan. The *R. N. Rice* was built for the passenger, package freight trade. She could carry 200 cabin passengers and she ran passengers and freight between Detroit and Cleveland. Master of the steamer *R. N. Rice* was Captain William McKay for the 1866-77 seasons. In February 1869, a a feed pipe burst, sinking her at her dock in Detroit. She was raised and repaired. In August 1871, the steamer *R. N. Rice* and the propeller *Buffalo* (1851) collided opposite Detroit, on the Detroit River. In June 1874, she lost her rudder and was disabled at Detroit. In June 1877, *R. N. Rice* caught fire and burned while lying at her berth at Detroit. The damage was confined to her cabins.

The Detroit Dry Dock Company took possession of the steamer in September 1877. The dry dock converted the *R. N. Rice* a barge. Her new recorded tonnage, October 1877 was 622.02 grt, 592.80 net.

In 1879, ownership of the barge *R. N. Rice* was changed to McVittie et al, Detroit. They in turn, converted the barge to a schooner barge at Buffalo, NY in November 1880.In May 1881, the schooner-barge *R. N. Rice* went aground in fog at Clark's Wharf, Sarnia, Ont. In September of the following year, she lost her rudder off Sturgeon Point, Michigan on Lake Huron and then collided with the tow steambarge *Potomac* (U19618). She was found adrift off the Charity Island.

In 1884, ownership of the schooner barge *R. N. Rice* was changed to R. R. Heffard, Buffalo.

In August 1885, ownership of the *R. N. Rice* was changed to Patrick O'Day and she was placed in the Chicago lumber trade. September 1888, down bound with a cargo of 600,000 feet of lumber, the schooner-barge *R. N. Rice* became waterlogged during a storm and was abandoned by her crew. She drifted ashore 4 miles north of Holland, MI, and was pounded to pieces. No lives lost. (09/30/1888)

Saginaw: Thomas Arnold built a wooden sidewheel steamer at Marine City, MI for Eber Ward et al., Detroit. The steamer was enrolled at Detroit, July 31, 1866 and was assigned official number 115118. Her recorded measures were: 194.42’ x 27.66’ x 11.58’; 707.47 grt, 550.46 net. She was powered by a vertical beam engine, 44” bore x 120" stroke, built by Cuyahoga Iron Works, Cleveland, in 1848. The engine was originally installed in the *Pacific* (U19662), then into *Forest Queen* (U37061), before installed in the *Saginaw.* She was built for the passenger, package freight trade and could accommodate 250 to 300 passengers. Her master for the 1866 season was Captain P. Kinton,

In January 1868, the ownership of the steamer *Saginaw* was changed to Green Bay Transit Company, Green Bay, WI. Her price was $90,000. Her master for the 1868 season was Captain Alfred Taylor. She would ply between Fort Howard and Escanaba, MI in connection with the North Western Railroad Co. Captain William Grey was her master for the 1870 season and Captain James F. Trowell was master for the 1872 season.

In April 1873, her ownership was changed to Engelmann Transportation Company, Milwaukee, WI.

In April 1875, ownership of the steamer *Saginaw* was changed to Northwestern Transportation Company, Detroit.

In November of 1878, ownership of the steamer *Saginaw* was changed to Star Line of Steamers, Detroit. Her master for the 1878 to 1880 seasons was Captain Frank Hebner, Sr. with John Smith as chief engineer.

In April 1882, the *Saginaw* was transferred to White Star Line, Detroit.

April 1885, ownership of the steamer *Saginaw* was changed to J.K. Tillotson, Chicago. Her master for the 1885 season was Captain C. F. Moore. In August of the same year, ownership of the steamer *Saginaw* was changed to Alonzo N. Moffat, et.al.

In April 1886, ownership of the steamer *Saginaw* was changed to Lake & River Excursion Company, Detroit. Her master for the 1886 – 88 seasons was Captain John M. Mitchell. In 1887, the steamer was converted to an excursion steamer and had her cabins dismantled.

In June 1889, ownership of the steamer *Saginaw* was changed to Frank N. Quayle, Toledo. During the winter 1890/91, the rig of the steamer *Saginaw* was changed to schooner-barge at Toledo and rebuilt by Abram Gilmore. Her measures were recorded as: 198.25’ x 28.66’ x 11.42’; 434.67 grt, 412.97 net.

Her ownership was changed, in May 1891, to Abram Gilmore, Toledo. Her master for the 1891 was Captain Hiram C. Eldredge.

In 1893, her ownership was changed to Alvin Peters, Toledo. The rig of the schooner-barge *Saginaw* was rebuilt at Gilmore & Sons, Toledo, as a screw steamer, for coal & lumber trades. She received a high pressure non-condensing engine, 22” bore x 22" stroke, 194.5’ x 28.8’ x 11.5', 508.86 grt, 430.68 net. Her master for the 1895 season was Captain C. A. Peltier.

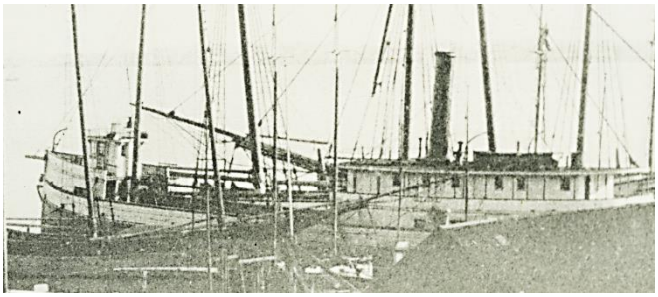
In April 1901, ownership of the steam-barge *Saginaw* was changed to Charles W. Kotcher, Evin, MI. Her master for the 1902 – 04 seasons was Captain William Hoffman with Milo O. Roach in 1902 and A. Hayward in 1904-05 as chief engineers. Her master in 1905 was Captain A. Kotcher in 1905 and Captain D. M. Fishes in 1906 with William McMartin in 1906 as chief engineer. In November 1905, the steam-barge *Saginaw* caught fire during a southwest gale while coming up the St. Clair River, off Port Huron. The fire was extinguished by local fire fighters.

In May 1906, ownership of the steam-barge *Saginaw* was changed to Black Diamond Transit Company, Detroit.

In January 1908, ownership of the steam-barge *Saginaw* was changed to F.H. Riebenach, Alpena, MI.

In April of 1908, her ownership was changed to Frank S. Upton, Charlotte, NY.

Final enrollment surrendered at Rochester, NY, November 04, 1913, and endorsed "abandoned".



Salina: Gallagher & Tremaine, Marine City, built a wooden propeller (steambarge) for David Gallagher et al, Marine City, MI. The steambarge *Salina* was enrolled at Detroit, April 1866 and her measures recorded as: 130.8’ x 25.7’ x 10.7’, 212.32 grt, 146.0 net. Her engine is unknown, but it was rated at 140 horsepower and built by Flower & Brothers, Detroit Her official number was 23106. She was built for the bulk freight, lumber & salt, trade, and she was intended for the Saginaw and Toledo lumber trade. In May 1866, the steambarge went aground in the Detroit River. In September 1867, the steambarge *Salina* broke her wheel on Lake Erie.

In May 1869, ownership of the steambarge *Salina* was changed to Erie & Western Transportation Co., Erie PA. in September 1869, the steambarge *Salina* had her machinery disabled on the Detroit River. In June 1875, she went aground on Fighting Island, Detroit River. November 1879, during a gale on Lake Huron, the *Salina* lost her three tows, who went ashore on Sand Beach. Two of them were pounded to pieces. Her master of the steambarge *Salina* was Captain Alexander P. Gallino in 1880 with William Brake as chief engineer.

In April 1884, ownership of the steambarge *Salina* was changed to AuSable Transportation Co., AuSable, MI. Her master for the 1883 – 84 seasons was Captain Eugene Rathbun with Captain W. Ashley for the 1886 season.

In April 1891, ownership of the steambarge *Salina* was changed to J. C. Miller, Marine City. Her master for the 1894 season was Captain John Miller. In June 1895, the steambarge *Salina* was struck by the schooner *Lizzie Law* and sank in the Saginaw River off Bay City, MI. Recovered. In January 1896, bound for Marine City, the steambarge *Salina* caught fire and burned to a total loss. Property loss $12,000. No lives lost.

Final enrollment for the steambarge *Salina* was surrendered, June 30, 1896.

Some Notes:

Black River, Ohio: Drains Medina County, emptying into Lake Erie at Lorain, OH.

Cargo-carrying capacity in cubic feet, another method of volumetric measurement. The capacity in cubic feet is then divided by 100 cubic feet of capacity per gross ton, resulting in a tonnage expressed in tons.

Freshet: a great rise or overflowing of a stream caused by heavy rains or melted snow.

Mail Steamer: Chartered by the Canadian government to carry the mail between ports.

Navigation: The reader may wonder what, with so few vessels on the lakes, why steamers could not avoid each other. Two main reasons, the visibility during storms and the vessels did not carry any lights so you came upon a vessel you could not determine if the vessel was approaching or departing from you.

Old Style Tonnage: The formula is: Tonnage= ((length - (beam x 3/5)) x Beam x Beam/2)/94

where: *Length* is the length, in feet, from the stem to the sternpost; Beam is the maximum beam, in feet.

The Builder's Old Measurement formula remained in effect until the advent of steam propulsion. Steamships required a different method of estimating tonnage, because the ratio of length to beam was larger and a significant volume of internal space was used for boilers and machinery.

In 1849, the Moorsom System was created in Great Britain. The Moorsom system calculates the tonnage or cargo capacity of sailing ships as a basis for assessing harbour and other vessel fees.

Up to 1848, most freight was shipped, on steamers or propellers, as package freight. This meant that coal, grain, apples, and produce had been placed in a container or sack and carried aboard on the back of a laborer. Bulk freight in the form of lumber would have been loaded on barges and schooners and towed by a steam driven ship. In 1848, Joseph Arnold built at Port Huron, MI, a the steambarge *Petrel* (found in the third section) for the bulk freight trade answering a need to move bulk coal to the northern communities and iron ore, lumber, and grain south to the growing cities in the East.

By 1848, some ships built in that year, continued to operate beyond the "War of Rebellion" and may be listed with two different tonnage ratings. Most ships built on the Great Lakes were rated as Tonnage (Old Style). This dates back to the 1600's and comes to the U.S. from our cousins.

Tonnage (Old Style): The British took the length measurement from the outside of the stem to the outside of the sternpost; the Americans measured from inside the posts. The British measured breadth from outside the planks, whereas the American measured the breadth from inside the planks. Lastly, the British divided by 94, whereas the Americans divided by 95. The upshot was that American calculations gave a lower number than the British. For instance, when the British measured the captured *USS President* (a three-masted heavy frigate), their calculations gave her a burthen of $1533\frac{7}{94}$ tons, whereas the American calculations gave the burthen as 1444 tons. The British measure yields values about 6% greater than the American. The US system was in use from 1789 until 1864, when a modified version of the Moorsom System was adopted (see below).

Unit Ton - The unit of measure often used in specifying the size of a ship. There are three completely unrelated definitions for the word. One of them refers to weight, while the others refer to volume.

Measurement Ton (M/T) or ***Ship Ton*** Calculated as 40 cubic feet of cargo space. Example, a vessel having capacity of 10,000 M/T has a bale cubic of 400,000 cubic ft.

Register Ton - A measurement of cargo carrying capacity in cubic feet. One register ton is equivalent to 100 cubic feet of cargo space.

Weight Ton (W/T) - Calculated as a long ton (2,240 pounds)

In 1849, a Royal Commission was formed in England with the secretary of the commission as George Moorsom, and the resulting tonnage admeasurement system was called the "Moorsom System". The idea of this system is that the fees charged to vessels should be directly proportional to their potential earning capacity, i.e., the space occupied by passengers or cargo. A vessel is measured at a series of sections throughout its length, the transverse area determined at each section, and the areas integrated to determine the volume. The total internal volume was then divided by 100 to determine the vessel's "tonnage", since at that time, 100 cubic feet was determined to be the appropriate factor so that vessels would maintain approximately equal tonnages under the new and old regulations. There were two tonnages determined under the Moorsom System: "gross" and "net" tonnage. Gross tonnage reflected the entire measured volume of the vessel less certain "exempted" spaces, initially spaces used only for the crew or for navigation of the vessel, and spaces in the superstructure not used for cargo. Net tonnage was equal to gross tonnage less a deduction for the machinery space, reflecting the earning capability of the vessel.

A measurement of the cargo-carrying capacity of merchant vessels depends not on weight, but on the volume available for carrying cargo. The basic units of measure are the *Register Ton*, equivalent to 100 cubic feet, and the *Measurement Ton*, equivalent to 40 cubic feet. The calculation of tonnage is complicated by many technical factors.

The current system of measurement for ships includes:

Gross Tons (**GRT**) - The entire internal cubic capacity of the ship expressed in tons of 100 cubic feet to the ton, except certain spaces which are exempted such as: peak and other tanks for water ballast, open forecastle bridge and poop, access of hatchways, certain light and air spaces, domes of skylights, condenser, anchor gear, steering gear, wheel house, galley and cabin for passengers.

Net Tons (**NT**)- Obtained from the gross tonnage by deducting crew and navigating spaces and allowances for propulsion machinery.

P.Q.: Province of Quebec

Packet Freight: almost every imaginable item of merchandise – bags of onions, grain, etc., processed foods, bags of coal, stoves, furniture, which can be packed and moved by manpower from dock to hold and reverse.

Patriot War: A conflict along the Canada – U.S. border where bands of raiders attacked the British colony of Upper Canada more than a dozen times between December 1837 and December 1838. This so-called war was not a conflict between nations; it was a war of ideas fought by like-minded people against British forces

Ship Inventory: Will include the names of wooden steamers that will not be identified in the manuscript. The research project that the information was gathered for included all wooden steamers built on the Great Lakes or St. Lawrence River and operated on the Great Lakes with a gross tonnage at or over 100 tons.

Up-bound: Going against the current – St. Lawrence River to Lake Superior. (Lake Michigan – steaming north)

Down-bound: Going with the current – Lake Superior to the Saint Lawrence River. (Lake Michigan – steaming south)

(Original Source: "Wooden Steamers on the Great Lakes" – Great Lakes Historical Society; Bowling Green State University – Historical Collection; Thunder Bay National Marine Sanctuary Collection; Maritime History of the Great Lakes; and the scanned newspaper collection of the Marine Museum of the Great Lakes, Kingston, Ont. and 746 additional documented sources.)