

© 1957 Edwin Tunis

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 - August 2021

Next Meeting: September 18, 2021
"Super Detailing" – J. Boeck

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August Meeting

We Zoomed this month, with 12 that signed in. Our web master has installed a button on our web site home page that allows you to click on it and come directly into the zoom meeting.

If you are having trouble setting up a zoom contact or signing in, try accessing the meeting through the web site. I also encourage you to contact Bob Mains for assistance.

The Westerville Public Library opened their two classrooms for public meetings. September, we will have an in-person and a zoom meeting if it remains safe.

Announcements

Northeast Ship Model Conference

This conference will be held Saturday, October 2, 2021, from 9 AM to 3 PM, at the "Port'n'Starbord Convention Center, Ocean Beach Park, New London, CT. If you will be out that way, plan to attend. For more information, go to: www.uscmsg.org click on "More" and scroll down to Northeast Ship Model conference.

Cruising on the River

Want to get out and see some history this summer and visit a living historic site? At this time, the USS LST-325, a World War II veteran ship of the U.S. Navy and participant in D-Day, will leave her home port, Evansville, Ind. August 31, 2021 for a cruise up the Ohio River with stops at: Brandenburg KY, Sept 01 – 06; Ashland KY, Sept. 08 – 14; then up the Kanawha River to Charleston WV, Sept 15 – 22; returning to Evansville IN, Sept. 25, 2021.

The ship will be open for tours at each location. To read about her history and visitor information go to: www.lstmemorial.org

Presentation Schedule

The following are the presentations scheduled for the remainder of 2021:

- Sep: Super Detailing – J. Boeck
- Oct. Illuminating Models – S. Keller & A. Phelps
- Nov. Touring: Maine to Mystic – B. Mains
- Dec. Laser Engraving & 3D – J. Boeck & S. Keller

Web Site

We are in the process of setting up a server that will allow access to past presentations from our web site. I have already told you about the button on our home page that will allow access to our zoom meetings with a click of your finger.

Have you reviewed our "Members Showcase"? We feature the models built or restored by our members, past and present. Is your work displayed? Take digital pictures of your models and

send them to John Boeck to be included under your name.

Presentation:

Marine Engineering – Steam Engines

By Bill Nyberg

Would you know how to interpret the following:

- Walking Beam, 36" bore, 72" stroke, fire tube boiler.
- Compound, direct acting engine, water tube boiler

Back in the mid-50's I spent some time studying Marine Engineering, before realizing this was not my calling. So, putting together this presentation was partially a trip down memory lane.

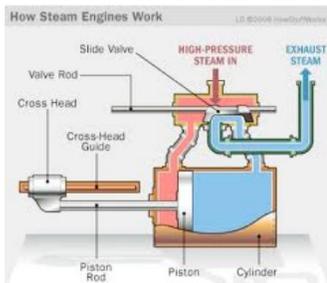
History:

We start with a basic introduction: Heat x water = steam. As steam expands, pressure is exerted causing movement. The first known steam engine was a toy built by Hero of Alexandria, a mathematician, 2000 years ago.



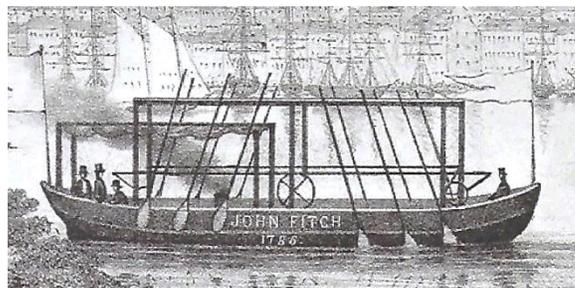
Fire heats the water in the pan. The steam is fed through the pipe to the drum above and vented out through the nozzles, causing movement of the toy.

England, in the late 1600's and 1700's, had a problem on how to remove water from coal mines. Their solution was using valves, atmospheric pressure and condensation to create a partial vacuum to pull the water out of the mines. It was not until 1796 that James Watt, using steam pressure to push a piston in both directions solved the problem.



The biggest difference between Watt's engine and the previous engines was that there was no cooling phase – therefore the engine was more efficient and faster. Steam entered one side and pushed the piston to the other side. The steam was then forced out through an exhaust valve. The steam would re-enter the cylinder and push the piston back the other way. The piston could be connected to gears and levers to drive machines and move tractors, trains and boats.

In American, John Fitch, in 1787, built a steam boat, a 45-foot craft, that navigated the Delaware River.



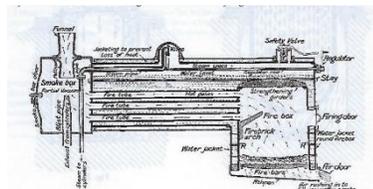
Fitch constructed four different steamboats that successfully plied rivers and lakes. He used various combinations of propulsion all steam powered: Ranked paddles (above) patterned after Indian war canoes; paddle wheels; and screw propellers. The boats were successful, but he failed to pay attention to construction and operating expense and lost his investors.

Twenty years later, in 1807, Robert Fulton constructed a steamboat, *Clermont*, that successfully steamed the 150-miles from New York to Albany at an average speed about 5 miles per hour.

A year after the end of the War of 1812 and Perry's victory on Lake Erie using sail, Canada built a sidewheel steamer *Frontenac* on Lake Ontario and the next year (1817) the U.S. had launched the sidewheel steamer *Ontario*. This ushered in steam navigation on the Great Lakes

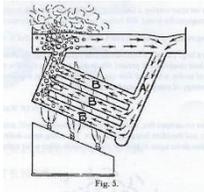
How Steam Engines Work:

Steam power systems aboard ships consist of four parts: boiler, steam engine, condenser, and evaporator. The boiler uses heat to convert water into steam. There are two types of boilers: fire tube and water tube.



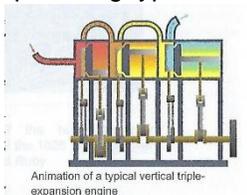
A fire tube: (shown above) – Heat passes through tubes suspended within a tank of water. They are primarily used for auxiliary purposes requiring low

pressure steam and, in some cases, to power small steam engines on ships.

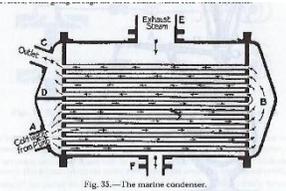


In a water tube: (shown above) – Water passes through tubes suspended inside of a firebox. These types are primarily employed for high-pressure, high temperature, high-capacity applications such as a ship's steam engine or steam turbine.

The marine engine is used to power a ship and is of the reciprocating type.

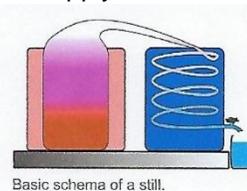


Their inception in the early 1800's lasted till after WW II when the reciprocating engine was replaced by the steam turbine. The photo, above, is a vertical triple-expansion engine. Steam enters the high-pressure cylinder (red) which starts moving the piston which turns the crank. It vents into the next stage which in turn vents into the low-pressure cylinder (green), before venting to the condenser.



The third component is the condenser, shown above. Its purpose is to convert the waste steam back to water and return the water back to the boiler to repeat the cycle.

The fourth component is the evaporator, which adds water to the cycle as required. Boilers require a continual supply of feedwater.



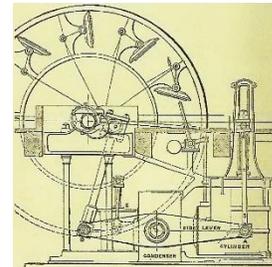
Early boilers used seawater directly, which gave problems with the build-up of brine and scale.

The use of an improved surface condenser permitted the use of a fresh water feed, as the additional feedwater now required was only the small amount required to make up for losses. The distillation system for boiler feedwater was usually termed an evaporator. In most cases on fresh lakes and rivers, the boilers need for a continual supply of fresh water can be drawn from the lake/river.

The system is a closed circuit. The boiler heats water to make steam and feeds it to the engine where it, the steam, is converted to work. The exhaust steam is returned through the condenser where it is converted back to water and sent to the boiler to start the cycle over.

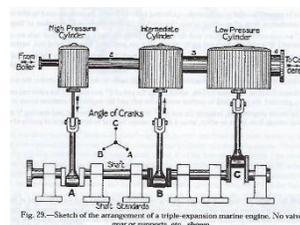
Steam Engine:

The engines are classified by either cylinder technology, connection mechanism or both.



The photo above is of a single cylinder, low pressure (cylinder technology), side lever beam (connection mechanism) engine. The boiler is not shown; the engine is on the right (single cylinder, low pressure); condenser shown bottom middle; and the side lever beam connects to the paddle wheels on the left (connection mechanism).

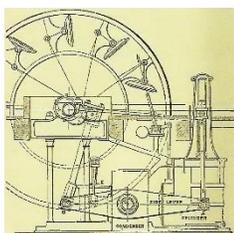
The steam engines, them-self, are classified by their cylinder technology. Based upon the steam pressure (PSI-pounds per square inch), the size of the cylinder bore, determines whether it is low, intermediate or high pressure. Engines are either a simple expansion or a compound expansion. A simple expansion engine expands steam through one stage, while a compound expansion engine has more than one stage, where each cylinder operates on a different PSI.



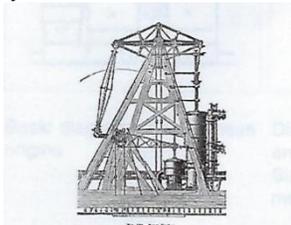
The drawing above is of a triple-expansion engine – three different pressures.

Most early marine engines had the same cylinder technology (simple-expansion, but a number of different methods of supplying power to the crankshaft (connection mechanism) were in use. Connection mechanism are either "side-lever" or "direct-acting". There are four "side-lever" connection mechanism: side-lever, grasshopper, steeple, walking beam". Under the "direct acting" connection mechanism are: direct-acting, oscillating, trunk, vibrating lever, back acting, and vertical.

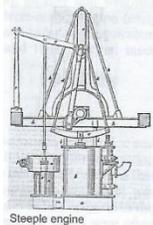
Only four connection mechanisms will be covered.



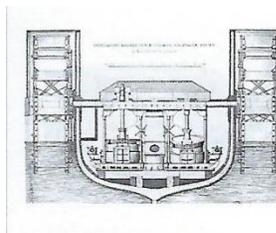
"Side lever" connects the steam piston to the crank that turns the bucket wheel. This was the first connection mechanism and was widely adopted in 1815 for marine use in Europe. It is most common for inland waterway and coastal marine service.



"Walking Beam", also known as "vertical beam", "overhead beam", or simple "beam". It is primarily a U.S. adaption. The "Beam" connection was used as a paddlewheel engine for inland waters and rarely used for powering propellers. The height of the beam made the vessel "less" stable in heavy seas but was well suited to shallow drafted boats.



"Steeple" also referred as a "crosshead" was an attempt to come up with a smaller, lighter, more efficient design. The vertical oscillation of the piston is used to move an assembly, composed of the crosshead and guides to rotate a crankshaft.

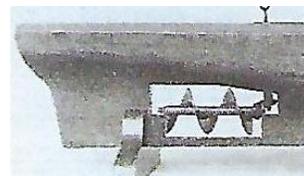


Shown above, is an "oscillating" direct acting engine driving a sidewheel. The engine sits thwart ship. A direct-acting engine applies power directly to the crank-shaft via a piston rod or connecting rod. It can be adapted to both sidewheel and propeller. The advantage: is smaller, less weight and smaller engine rooms. The disadvantage is, it is more prone to wear & tear, requiring more maintenance.

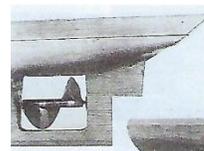
Propeller

Initially sidewheel steamers dominated the steam powered ships built between 1817 and 1837. The performance of sidewheel or sternwheel vessels was affected by variations in draft as coal and stores were used up, plus the paddle-box offered resistance to progress, and in naval ships the paddlewheels were a detriment if damaged, plus the engine, beam and paddlewheels were all above the waterline and affected stability. The propeller resolved those issues.

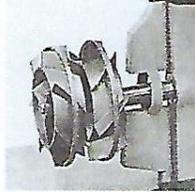
The first propeller to drive a vessel was tested in 1804. It was developed by Col. John Stevens. She was a small twin-screwed steam launch. The first screw propeller was applied to a ship in 1837.



Francis Smith (1808-74) patented a screw propeller, shown above. During trials, half the screw blades broke off, which made the vessel faster. The inventor devised a screw with a single turn, which is a two-bladed propeller.



Jon Ericsson (1803-1889) patented a screw propeller consisting of 2-drums on a shaft in 1839. Both drums had a series of helical blades round the periphery, and the blades on one drum were inclined in the direction opposite to those on the other drum.



The drums were mounted in a common axis, but revolved in opposite directions. The after drum revolved at a faster speed because it acted in water that had already been set in motion by the forward drum. The reversed direction of the after drum counteracted losses caused by the rotary motion of the water behind the leading drum.

It should be noted that the duplex screws revolving in opposite directions on one shaft are found in the modern-day torpedo and counteracts the "torque" or force that would endeavor to turn or roll the torpedo over during its run.

Ships on Deck:

The following is an update on what your fellow craftsman have been working on. I encourage each of you to share photos of your works in process, what you have completed in the past, and what you plan to work on in the future. Send it to your editor in jpeg format with a short write up.

U.S.S. Kidd

Cliff Mitchell



Bluejacket's solid hull kit of the *USS Kidd*, was completed in 2013. The *Kidd* is one of 175 Fletcher-class destroyers built during World War II. She is one of three that remain. The *USS Kidd* DD 661 is moored in Baton Rouge, LA. The other two are the *USS Cassin Young* DD 793 which is on display at the Boston Navy Yard in Charleston, Mass. and the *USS Sullivans* DD 537 in the Servicemen's Park, Buffalo, NY. I had procured Robert Steinbrunn's build description of this model, that was published in "Ships in Scale" (a five-part series printed January-October 2001). Mr. Steinbrunn's build is outstanding and his attention to detail far exceeded my build. His meticulous documentation

included 2025 hours over 4.5 years and over 14,000 pieces!



My attempt, however, was satisfying and although I remember a lot of sanding required in shaping the hull and a lot of parts that had to be fabricated because parts were damaged in handling due to malleability. This is my first kit housed in a glass case as shown in the following pictures.



U.S.S. Niagara

Darrell Markijohn





Darrell has entered her in the 2021 NRG Photo Competition. Top photo was taken with professional equipment; bottom photo taken with a cell phone.

Red Jacket

Stan Ross



Bowsprit and jibboom are installed, as is the figurehead of Red Jacket. The stern, which also has a bust of Red Jacket is complete and the masts are stained but not yet installed. Time to start rigging the upper masts and making the 15 yardarms.

August 23, 2021

Lumber Hooker

Bill Nyberg



Cargo hold carved out. The dowel ends are shown, indicating that the hull thickness is 3/16" thick.



Keelson and deckbeam supports installed then cargo hold primed.

A lumber "hooker" is a nautical term for a Great Lakes ship designed to carry her own deck load of lumber and to tow one or two barges. The lumberman nicknamed the ship and its barges loaded with lumber as "hookers". The barges were schooner barges: large old schooners stripped of their masts and running gear to carry large cargoes of lumber.

Other Notes: "Stuff", Tugs & Things

Nautical Terms

Picket boat: A boat on sentry duty, or one placed on a line forward of a position to warn against an enemy advance.

Pier: A raised structure, typically supported by widely spread piles or pillars, used for loading and unloading commercial ships, The lighter structure of a pier contrasts with the more solid foundations of a quay or the closely spaced piles of a wharf.

Pilot: A knowledgeable person qualified to navigate a vessel through difficult waters.

Pilot boat: A boat used to transport maritime pilots between land and the inbound or outbound ships that they are piloting.

Pilot ladder: A form of rope ladder, typically used to embark and disembark pilots over the side of a ship. The design and construction of pilot ladders

is governed tightly by international regulation and includes spreaders – elongated versions of the standard machined step.

Pinnace: A small, light boat propelled by oars or a sail, used as a tender to larger vessels; In modern usage, any small boat other than a launch or lifeboat associated with a larger vessel.

Pintle: The pin or bolt on which a ship's rudder pivots. The pintle rests in the gudgeon.

Pipe (bos'n's): A whistle used by a boatswain to issue commands. Consisting of a metal tube that directs the breath over an aperture on the top of a hollow ball to produce high-pitched notes. The pitch of the notes can be changed by partly covering the aperture with the finger of the hand in which the pipe is held. The shape of the instrument is similar to that of a smoking pipe.

Pipe down: A signal on the bosun's pipe to signal the end of the day, requiring lights (and smoking pipes) to be extinguished and silence from the crew.

Piping the side: A salute on the bosun's pipe, performed in the company of the deck watch, on the starboard side of the quarterdeck or at the head of the gangway, to welcome or bid farewell to the ship's captain, senior officers, and honored visitors.

Pitch: A vessel's motion, rotating about the beam or transverse axis, causing the fore and aft ends to rise and fall repetitively.

Pitchpole: To capsize a boat stern over bow, rather than by rolling over.

Plimsoll line: (*National Load Line*) A special marking, positioned amidships, that indicates the draft of the vessel and the legal limit to which the vessel may be loaded for specific water types and temperatures.

Nautical Research Journal

If you are not already an NRG member, go to info@thenauticalresearchguild.org. Yearly subscription is available in three forms: Print copy, On-Line copy (E-Journal) and a combined both Print & On-line.

Print Journal - \$55

E-Journal - \$40

Combined - \$65

In each journal, there is always something to expand your knowledge of ships, ship modeling and maritime history.

August 23, 2021

Tugs

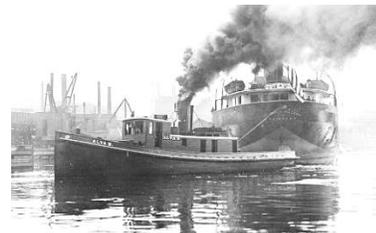
John Cudahy



Built in 1900, by H.B. Kirby, Ballard, Washington, for the Pacific American Fisheries Co. at Bellingham, Wash. She was a steam powered, wooden vessel with measures: 85.5' x 21.2' x 10.3', 122 grt. She had a series of owners: "Grays Harbor Stevedoring Co. in 1903, followed by Merrill and Ring Lumber Co, Pacific Tugboat Co. and Allman-Hubble Tugboat Co. and then in 1934 the Knappton Towboat Co. all on the west coast. In 1941, she was acquired by Foss Launch and Tug Co. She was renamed *Henry Foss* after her steam engine was replaced by a single, diesel engine. She was rated as a single screw, 750 horsepower. In February 1959, she sank in 150 feet of water near Saltspring Island, British Columbia.

Original Source: "Tugboat Information.com";

Alva B



A steel tug, built by Union Drydock Co. in 1890 for the Vessel Owners Towing Co. both of Buffalo. Her measure were: 73.6' x 18.5' x 10.5', with a gross tonnage of 83. She was powered by a single, high pressure, non-condensing, steam engine, single screw and rated at 425 horsepower. She spent her entire career on Lake Erie as a harbor and local towing tug and was owned by: Great Lakes Towing Co. (1899), H.S. Kerbaugh Inc. (1914), and American Towing Co. (1917). She foundered November 1, 1917 off Avon Point, OH, Lake Erie. No lives lost.

Original Source: "Tugboat Information. com; BGSU Historical Collections & C. Patrick Labadie, Alpena County Library

Presentation Schedule:

2021

- Jan 16 — History of Ship Modeling
- Feb 20 — Carving Ship Decorations
- Mar 20 — Photographing Models
- Apr 17 — Setting up a Hahn Frame Jig
- May 15 — Sail Making
- Jun 19 — Video: "Ship That Changed the World"
- Jul 17 — Evolution of the Wooden Ship
- Aug 21 — Marine Engineering — Steam Power
- Sep 18 — Super Detailing
- Oct 16 — Illuminating Models
- Nov 20 — Tour: Maine to Mystic
- Dec 18 — Laser engraving & 3D

Events & Dates to Note:

2021 Tentative Schedule

~~IPMS-Columbus~~ **Canceled**

47th Anniversary BLIZZCON

Arts Impact Middle School
680 Jack Gibbs Blvd. Columbus 43215

Saturday, February 20, 2021

~~Miami Valley Woodcarving Show~~

Canceled

Christ United Methodist Church
700 Marshall Rd., Middletown, Ohio 45044

March 6 & 7, 2021

~~66th "Weak Signals" R/C Model Show~~

Canceled

~~31st North American Model Engineering Expo.~~

Canceled

Wyandotte, MI

April 23-24, 2021

~~44th Midwestern Model & Boat Show,~~

Virtual competition will take place.

Wisconsin Maritime Museum, Manitowoc, WI

May 15-16, 2021

~~Photography for Ship Models~~

NRG Virtual Seminar

June 05, 2021

~~Lakeside Antique & Classic Wooden Boat~~

Lakeside Hotel, Lakeside, OH

July 18, 2021

~~NRG Photograph Competition~~

Submission Deadline

Aug 02, 2021

~~Toledo Antique & Classic Boat Show~~

Canceled

Aug 21-22, 2021

August 23, 2021

~~BlueJacket Rigging Class for novice~~

Belfast, ME — **Enrollment closed**

Sept 20 – 24, 2021

~~NRG Conference~~

Canceled

Oct. 21-23, 2021

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Wooden Steamers on the Great Lakes

Written by William E. Nyberg

1855-B

Nicolet: Built in the Province of Quebec by P. Calto of Nicolet on the Trois River which empties into the St. Lawrence River. She was of wood construction and powered by a steam propeller drive. Her measures were 100' x 22' x 9' with her tonnage (old style) at 233. She was enrolled at Quebec with her owner listed as A. MacDonald and she ran between Montreal and Quebec in the passenger, package freight trade. In September 1856, the *Nicolet*, laden with sugar and molasses, capsized in the River St. Lawrence at Batiscan, Que.

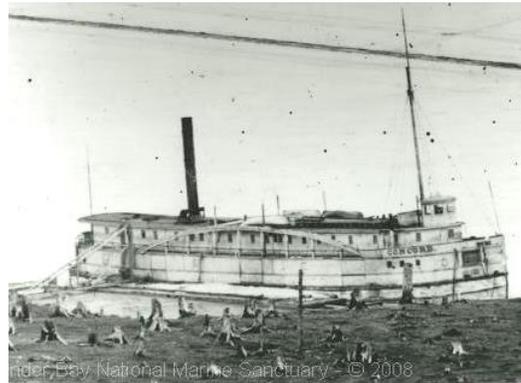
Ownership of the propeller *Nicolet* was changed to A. M. Smith, Toronto, Ont. who refloated the vessel. The *Nicolet* was re-enrolled at Quebec in 1857.

In 1859, her ownership was changed to T. Sapen, Bowmanville, Ont. who had her rebuilt and renamed *J. L. Tucker*. Her tonnage was listed as 157. She was renamed back to *Nicolet* in 1861 and used on Georgian Bay. Her master for the 1861 season was Captain George Bannerman Milne; he was also listed as chief engineer in 1861. In Oct of that year, while loading grain at Detroit, the *Nicolet* sprang a leak and had to discharge her cargo and be dry docked for repairs. Released from dry dock later in October, she was bound down from Detroit for Kingston, Ont., laden with grain, when she went ashore at Rondeau Bay, Ont. Lake Erie. Released. In September 1862, the *Nicolet*, laden with wheat, entered Fairport Harbor, OH on Lake Erie, and struck on the "Bar" at the harbor entrance due to low water. She backed off, jettisoned 1,500 bushels to lighten and then proceeded into the harbor.

In 1863, her ownership was changed to Edward Butterworth, Collingwood, Ont. In August of that year, she was sent with provisions to relieve the 50 - 60 tourists stranded near Little Current, Ont. when the steamer *Ploughboy* broke her cylinder head. The *Nicolet* relieved the passengers and crew with her provisions and then took the steamer in tow back to Collingwood, Ont.

In 1864, ownership of the *Nicolet* was changed to Captain Harkley who had her rebuilt as a 3-mast schooner; 195 tons, and renamed *Ann Hartley*. When enrolled she was issued official number C33287. Her master for the 1864-66 season was Captain Robert Harkley. On October 11, 1866,

while bound for Owen Sound, Ont., laden with 170 barrels whiskey and 50 barrels coal oil, the schooner *Ann Hartley* struck a sunken rock near Cove Island, off the Bruce Peninsula, while entering Georgian Bay and was holed. She drifted ashore and broke her back. She was declared a total loss. No lives were lost. In May 1867, the wreck washed ashore on Rabbit Island off Oliphant, Ont.



Old Concord: At Detroit, on August 30, 1855, the wooden propeller *Old Concord* was first enrolled. Her measures were: 167' 9" x 27' 4" x 10' 6"; with a tonnage (old style) 457 18/95. She was owned by J.L. Hurd & Co., Detroit and she was powered by a steam engine with 2 cylinders: 27", 27" bore x 40" stroke. Both the engine and boiler were built by Detroit Locomotive Works, Detroit in 1855. Hurd & Co. intended her for the package freight trade and her master for the 1855 season was Captain Hodson with E. Canfield as engineer.

In March 1856, ownership of the propeller *Old Concord* was changed to Western Transportation Co., Buffalo, NY. Down bound from Chicago for Buffalo, the *Old Concord* broke her cross-heads (A piston rod is attached to the piston and links it to the crosshead, which is a large casting sliding in crosshead guides, allowing it only to move in the same direction as the piston travel. The crosshead also houses the gudgeon pin on which the small end of the connecting rod pivots) near Mackinac, MI, Straits of Mackinac, in September 1858. She required a tow to port for repairs. Her master for the 1859 season was Captain Langley. In October of that year, the *Old Concord* broke her cross-heads about fifteen miles below Point Pelee, Ont. on Lake Erie and was towed to Detroit for repairs. In April of 1861, she broke her shaft while in ice, a short distance from the mouth of the creek at Buffalo. While being towed into the harbor, the *Old Concord* ran afoul of a sunken hulk alongside the lighthouse and went aground. Released.

April 1864, her ownership was changed to the Buffalo & Detroit Transportation Co. Buffalo, NY.

In November of 1864, her ownership was changed to John Hutchings, Detroit. She was rebuilt and readmeasured in May 1866 with her enrollment updated to 166' x 27.8' x 11.2'; 552.76 gross tons. She was also assigned official number 18923. In the fall of 1866, the *Old Concord* went ashore at Keweenaw Point, MI, Lake Superior and filled with water. She was pumped out and released. Her master for the 1867 season was Captain John McKay.

September 1869 ownership of the *Old Concord* was listed as Eber B. Ward, Detroit. Her master for the remainder of the 1869 season and 1870 was Captain Charles R. Cleveland.

In April 1870, her ownership was changed to Harry Baby of Detroit, MI. In April of the following year, her ownership was changed to A. B. Crawford, John Gordon & William Hanna, Detroit. Master of the *Old Concord* was Captain Simmons and Captain John Lemay. In April 1872, her ownership was transferred to William Hanna, Detroit, MI.

The following year, April 1873, her ownership was listed as Charles Bewick & William Thorn both from Detroit. In December of that year, the *Old Concord* with two barges in tow, grounded on St. Clair Flats, St. Clair River. In the grounding, the *Old Concord* had her tow post carried away.

April 1876, Charles Bewick of Detroit gained control of the *Old Concord* when all shares were transferred to him. He had the propeller *Old Concord* rebuilt as a schooner-barge for the lumber trade. Her enrollment was updated: 3-masts, tonnage 318.54 grt.

In August 1880, the schooner-barge *Old Concord* was purchased by the Sturtevant & Co., Cleveland, OH. September 1881, under tow of the tug *Fannie Tuthill* (US120130) on the Cuyahoga River at Cleveland, the *Old Concord* collided with the Seneca Street Bridge.

Ownership of the schooner-barge *Old Concord* was transferred to Sturtevant Lumber Co. of Cleveland in April 1883. She received major repairs that year. Her master for 1885 was Captain Frank Holland. Winter layup of 1885-86, she was rebuilt by Colin McLaughlin, Port Huron. July 1888, bound up, the schooner-barge *Old Concord*, laden with 600 tons coal for Owen Sound, Ont., sank off Lyon's Head, Ont., Georgian Bay, in heavy fog. Sturtevant Lumber Co. abandoned the vessel where she lay after saving most of her cargo.

Final enrollment for the schooner-barge *Old Concord* was surrendered December 27, 1888 and endorsed "foundered".



Planet: John Bushnell, Newport, MI, built for Eber B. Ward, Detroit, a wooden sidewheel steamer. Enrolled at Detroit in August 1855, her measures were recorded as: 257.1' x 33.1' x 12.1'; tonnage (old style) 1153.90. She was powered by a vertical beam engine, 60" bore x 120" stroke, built by Macklem Iron Works, Chippewa, Ont. in 1845. The engine was originally installed in the sidewheel steamer *Canada* (C-1846) then *Caspian* (US-1851), then *E.K. Collins* (US-1853). The steamer was built for the passenger, package freight trade and ran from Detroit to Lake Superior ports. Her master for the 1855 season was Captain M.H. Estabrook. In October of her first year, she broke her shaft on Lake Superior. A property loss of \$1,500 was declared.

Ownership of the steamer *Planet* was changed in 1856 to Solomon Gardiner of Chicago. She would operate between Chicago and Collingwood, Ont on Georgian Bay. Her master for the 1856 season was Captain Joseph Nicholson. In June of 1856 the steamer *Planet* broke her machinery near Grand Island on Lake Superior. She was repaired, with the property loss set at \$1,500. In September, the *Planet* struck a rock in the Nebbish Rapids, Saint Mary's River. Property loss of \$1,000 was set.

Early in 1857, her ownership was changed to Walter S. Gurnee, Chicago, IL who would operate her between Chicago and Milwaukee, WI. Her master for the 1857 season was Captain F. G. Butlin with Captain Joseph Nicholson as master for the 1858 & 59 seasons.

In September 1860, ownership of the steamer *Planet* was changed to Orin W. Potter of Chicago. He had her engine replaced with a vertical beam, 62" bore x 120" stroke from Detroit Locomotive Works, Detroit that fall. Down bound from Lake Superior to Chicago in October of that year, the steamer *Planet* was driven on shore at Eagle River, MI, Lake Superior. She was released and continued her journey. In the Spring of 1861, she broke her machinery on Lake Huron. Repaired, her property loss was set at \$600. July 1862, the *Planet* collided with the brig *Lucy A. Blossom* (U14570) on Lake Erie. She sustained a property loss of \$500. September

1862, her enrollment measures were updated at Chicago, IL to: 257.5' x 32.5' x 12.5'; 993.65 grt. June 1863, the *Planet* struck a rock in fog on Lake Superior. Her property loss was set at \$600.

Spring 1865, ownership of the steamer was changed to Goodrich Transportation Co., Albert E. Goodrich, Chicago owner. He had her engine replaced with a vertical beam, 60" bore X 144" stroke engine. The vessel was also readmeasured at Chicago, IL, and her enrollment updated: 259.58' x 32.58' x 13.58'; 780.60 grt, and an official number 54228 assigned. Moored at Mackinac, Straits of Mackinac in September of that year, the steamer caught fire but it was extinguished before much damage was done. For the 1866 & 67 seasons, the steamer operated between Chicago and ports on Lake Superior. June 1866, the steamer *Planet* damaged her machinery on Lake Michigan. Property loss was set at \$1,000. That summer Captain Goodrich had the *Planet* laid up and dismantled. Her engine and cabin were removed and the hull converted to a barge for the lumber trade. Her enrollment rig was changed to barge at Chicago: 257' x 32' x 12'; 712.08 grt.

Ownership of the barge *Planet* was changed to Peshtigo Lumber Co, Peshtigo, WI in October 1867. In November 1872, laden with 700,000 board feet of lumber, the barge *Planet* foundered in shallow water off the pier at Two Rivers, WI. Seven lives were lost.

Final enrollment for the barge *Planet* was surrendered at Chicago, June 30, 1874 and endorsed "vessel total wreck".

Potomac: Luther Moses, master carpenter, at Buffalo, built a wooden, propeller for Charles Ensign, Rufus C. Palmer & William Foot of Cleveland. She was enrolled at Cleveland, August 21, 1855 and her measures recorded: 209.14' x 33.04' x 12.43'; tonnage (old style) 818.45. She was powered by two engines: 25" bore x 36" stroke each, built by Buffalo Steam Engine Works, Buffalo in 1855 and a firebox boiler, 17' x 7 1/2' also built in 1853. The *Potomac* was built for the bulk freight trade with a capacity of 900 tons. Her master for the 1855 season was Captain Calvin Herrick.

Ownership of the propeller *Potomac* was transferred to American Transportation Co., Buffalo in October 1855. In October 1856, the *Potomac* and the brig *John G. Deshler* (US-1854) collided on Lake Michigan with both receiving minor damage. Her master for the 1858-60 seasons was Captain Nicholas Gebhard.

Ownership of the *Potomac* was changed to William Williams, Andrew J. Rich, and Henry Martin

all from Buffalo in March 1860. In April of that year, Franklin Lee, Silver Creek, NY was listed as owner. The following month Nicholas Gebhard was listed as shared ownership with Franklin Lee. September of 1860, the *Potomac*, laden with railroad iron, broke her shaft off Kewanee Peninsula, WI on Lake Michigan. She was towed to Milwaukee for repairs. April 1861, Franklin Lee's shares were transferred to Charles Ensign, Buffalo. April 1862, the *Potomac* collided with the tug *Dart* (US6148) on Lake Huron. Damage loss was set for both at \$400.

In April 1864, ownership of the *Potomac* was changed to Western Transportation Co., Tonawanda, NY. She was readmeasured in April 1865: 210.6' x 33.7' x 11.25'; 1021.66 grt; 2 decks and assigned official number 19618. In May of 1866, she was rebuilt and measures recorded as: 210.6 x 33.7 x 12.6; 1108.35 grt. In July 1866, the propeller *Potomac* was damaged in a collision with the bark *J. P. March* (US13482) on the St. Clair River. Property loss was set at \$200. Two months later, the *Potomac* sprang a leak on Lake Erie. She was repaired at a cost of \$150. During winter layup of 1871, the *Potomac* received major repairs at Mason & Bidwell, Buffalo at an expense of \$25,000. Master of the propeller *Potomac* was Captain R. P. Webster for the 1871-72 seasons. August 1871, she ran aground on an island in the St. Clair River. She required to be lightered to be released. October of the same year, bound down, the *Potomac* ran on a wreck at Bar Point, Lake Erie, staving a hole in her hull which caused a leak. She returned to Detroit for repairs. The chief engineer for the propeller *Potomac* in the 1874-77 seasons was J. N. Gregory. In September 1877, the *Potomac* received new arches, bulwarks and boilers.

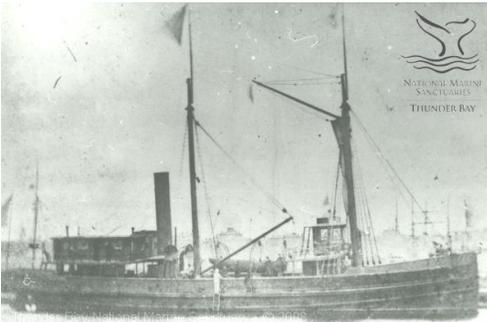
May 1881, ownership of the propeller *Potomac* was changed to John Green, Buffalo. Laden with coal, the propeller *Potomac*, went aground on Bois Blanc Island, Detroit River. She was lightered to be released. Her damage from the grounding was a loss of 34 feet of her keel and she required a partly new bottom.

March 1882, her ownership was changed to Samuel L. & Henry W. Watson of Buffalo. July 1882, partial ownership was changed in the transfer of shares to Louisa Wex & Henry Watson of Buffalo. Her master for the 1883 season was Captain Peter Wex and Captain James Shells. August 1883, the *Potomac*, laden with rye, struck a rock and beached near Ahnapée, WI, Lake Michigan. She was badly damaged. September 1884, while loading coal at the Lehigh coal shoots, the propeller *Potomac* sprang a leak aft and began to fill rapidly, sinking in place. She was raised and repaired at Union Dry Dock, Buffalo. June 1885, the *Potomac* had her machinery removed

and was converted into a barge. Her enrollment measures were changed to: 659.61 grt, 627.31 net.

April 1892, ownership of the barge *Potomac* was changed to Niagara Falls Paper Co., NY. She was towed by the propeller *St. Louis*, US 23356. October 1892, the barge *Potomac* struck a pier and smashed her stern at Sault Ste. Marie. In 1895, the barge *Potomac* was abandoned at Buckhorn Island, NY, Niagara River.

Her final enrollment for the barge *Potomac* was surrendered, June 30, 1899 and endorsed 'abandoned'.



Relief: Shipwrights Van Slyke & Notter of Buffalo, built a wooden, propeller, towboat for the Buffalo Mutual Insurance Co., Buffalo, NY. She was enrolled at Buffalo November 03, 1855 with measures: 128' 2" x 25' 4" x 12' 1"; tonnage (old style) 362 09/95. She was equipped with an oscillator engine, 30" bore x 36" stroke, and both the engine and boiler were built by Buffalo Steam Engine Works. She was built for salvage work and her master for the 1855 season was Captain E. P. Door. In May 1858, the tug collided with the brig *Black Hawk* in Cleveland harbor, damaging the brig's stem and head gear. Property loss was set at \$500. October 1865, she was readmeasured at Buffalo: 127.16' x 25.42' x 12'; 267.33 grt - 133.66 net and issued official number US 21133.

Ownership of the tug *Relief* was changed, in 1871, to Smith & Bliss; homeport Boston, MA. She was rebuilt at Buffalo. She had arches added in 1876 and her chief engineer for the 1876-79 seasons was James W. Baker.

Ownership of the tug *Relief* was changed to Evans & Sons, et al, Tonawanda, NY in 1879. She received a new deck & engine: non-condensing 25" bore x 40" stroke and a tubular boiler, 8'6" x 17' in 1880. Her chief engineer for 1880 was James E. Evans.

In 1882, ownership of the tug *Relief* was changed to J. C. Gilchrist & Co., Vermillion, OH for August 23, 2021

\$8,000. July 1884, the tug *Relief* caught fire in her forward compartment and burned to a total loss. The flaming hulk was towed near Starve Island in Lake Erie, a mile south of South Bass Island, where she burned out and sank.



Rescue: May 22, 1855, on that date the first enrollment was recorded for the wooden, propeller driven tug, built by Bidwell & Banta at Buffalo, that would be used in the towing trade on the St. Clair Flats and in the St. Clair River. Her owners were listed as: Henry C. Walker, ¼, Isaac C. Walker, ¼, both from Buffalo; and B.S. Shepard, ½, from Chicago. Her recorded measures were: 123.42' x 28.0' x 10.0', with a tonnage (old style) of 285 29/95. Her original engines were from Sheppard Iron Works, Buffalo. Later notes indicate two oscillating engines but they may not refer to the originals. Her master for the 1855 season was Captain Heber Squire. In July 1856, the tug *Rescue*, while moored at the foot of Bates Street, Detroit, on the Detroit River, caught fire near her boiler room. The fire was extinguished before material damage had been done.

In January 1857, ownership of the tug *Rescue* was transferred to Lake Navigation Co., Buffalo, Henry C. Walker, president. Her master for the 1857 season was Captain H. M. Mixer. In July of that year, while in a dense fog on the St. Clair River, the tug *Rescue* went ashore at Algonac, MI. She was released with minimum damage. April 1858, the Lake Navigation Co. declared bankruptcy and the receivers of their assets, put the tug *Rescue*, 61-schooners & brigs, three other tugs and all other equipment up for auction at Buffalo. The next day, the tug *Rescue*, valued at \$22,000, was auctioned with an asking bid of \$14,000. She received no bids and was passed.

Later in 1858, ownership of the tug *Rescue* was changed to Captain James Dick and other Toronto citizens who organized the Northwest Trading and Colonization Co, Toronto, Ont. She was registered Canadian as *Rescue* and issued an official number: C33528. The *Rescue* was fitted with passenger accommodations by L. Shickluna, St.

Catharines, Ont. and sailed from Collingwood, ONT, July 12, 1858. The *Rescue* passed through the Soo locks on July 13, 1858, and she became the first registered Canadian steamer on Lake Superior. She ran the Georgian Bay to Lakehead, Ont., Lake Superior mail run until 1861. Her master for the 1859 – 1860 seasons was Captain Thomas Dick. In October 1863, the *Rescue* struck a rock and went aground in Georgian Bay. She was released but her incurred hull damage was set at \$500.

Ownership of the *Rescue* was changed in 1861 to J. McMurrich, Toronto, Ont and she was used for Royal Mail on Lake Ontario for the 1861 – 62 seasons before returning back to the Georgian Bay – Lakehead run. In 1866, the *Rescue* was chartered to the Canadian Provincial Government, who her armored as a gunboat and fitted with a 32-pounder for use during the Finian invasion.

In 1871, the gunboat *Rescue* worked on the Pacific Railway survey in Lake Superior, hauling workers and supplies from the lower lakes. She was rebuilt at St. Catharines in June 1872 from the waterline up and had accommodations for 4 officers and 40 crew. She was rigged with auxiliary sail; 2 – 24 pounders & 2 – 14 pounder guns; and plated with ½" iron; to serve at the Welland Canal and on Lake Ontario.

Released by the government back to McMurrich, the *Rescue* returned to the Royal Mail run from Georgian Bay to Lakehead, Ont. for the remainder of the 1872 and the 1873 seasons. Masters of the *Rescue* were Captain G. W. Chadwick in 1872 and Captain Fitch in 1873.

Ownership of the *Rescue* was changed in 1874, to the St. Lawrence Steam Navigation Co., Montreal, Que. and she was placed in service below Montreal on the St. Lawrence River.

The *Rescue* was dismantled and her registry closed in 1876 or 77.

Sebastopol: Luther Moses, Cleveland, built for Henry Chisholm, Alexander Morrison, and Luther Moses, a wooden, sidewheel steamer with measures: 234.1' x 30.71' x 12.38'; tonnage (old style) 863 12/95. She was powered by a vertical beam, low pressure engine with a 32" bore x 132" stroke and rated at 800 horsepower. The engine was built by Cuyahoga Steam Furnace Company. She was fitted with two cone boilers built by McGray & Company. Her engine had been previously installed in the sidewheel steamer *Saratoga* (US-1846). The steamer *Sebastopol* was built for the passenger, package freight trade and ran between Buffalo, Sandusky and Chicago. Her master for the 1855 season was Captain Thomas Watts with Thomas Cole and Samuel Curtis as first engineers.

June 1855, ownership shares were transferred to William Wells, Luther Moses & George Whitelaw all from Cleveland. In September of that year, bound up with sixty passengers and a cargo of merchandise, she tried to enter the harbor at Milwaukee, WI in heavy weather, mistook the harbor lights and went aground and became stranded. Five crew and seven passengers were lost. The property loss to her owners was set at \$350,000.

Mary Stewart: Built on the shore of Swan Creek for J. L. Hurd & Co. by John E. Dixon of Newport, MI, the wooden propeller was first enrolled at Detroit, April 06, 1855. Her measures were recorded as; 170' 11" x 21' 2" x 10' with a tonnage (old style) of 442 40/95. She was powered by a low-pressure engine, 27" bore x 40" stroke, built by Detroit Locomotive. Her boiler was 8' x 18' and rated at 120 pounds steam. The propeller *Mary Stewart* was built for the package freight trade. Her master for the 1855 season was Captain Henry Watts. In November of her first year, she collided with the schooner *Aerial* (US-1847) on Lake Erie. Property loss was set at: propeller \$600; schooner \$500.

Ownership of the *Mary Stewart* was changed to Western Transportation Co., Tonawanda, NY in March of 1856. November of that year the *Mary Stewart* lost her rudder and stern post and sprang a leak while in gale on Lake Erie. She made Long Point Cut, Ont where the tug *Relief* assisted her to safety. In November of 1859, downbound on Lake Erie, from Milwaukee for Buffalo, the *Mary Stewart* broke her crosshead (A piston rod is attached to the piston and links it to the crosshead, which is a large casting sliding in crosshead guides, allowing it only to move in the same direction as the piston travel. The crosshead also houses the gudgeon pin on which the small end of the connecting rod pivots) near Point au Pelee. Ont. and was towed back to Malden, Ont. for repairs. Bound for Cleveland in May 1860, the *Mary Stewart*, collided with the bark *Republic* (U21151), bound up for Detroit, in dense fog off Madison Dock, west of Geneva-on-the-Lake, Ohio. Repaired.

During the winter layup of 1860-61, the *Mary Stewart* received a new deck and arches at Buffalo. Her master for the 1861-66 seasons was Captain William H. Rowan. In April 1862, bound down from Detroit, the *Mary Stewart*, laden with flour and pork, was damaged by floating ice off Buffalo and sank in Buffalo Creek after hitting sunken timbers in the harbor. She was pumped out, raised and repaired. In May 1863, bound down from Detroit for Buffalo, the *Mary Stewart* went aground on the head of Fighting Island, in the Detroit River. She was released and proceeded on her way, but was caught in heavy fog

and ran aground on the fishing station near Sandusky, OH. Released.

In April 1864, ownership of the *Mary Stewart* was changed to Buffalo & Detroit Transportation Co., Buffalo. In September 1865, the *Mary Stewart* was readmeasured: 2 decks, 1 mast; 168.33' x 28' x 8.8'; 526.93 grt, 268.55 net. The *Mary Stewart* struck bottom while entering Chicago harbor in September 1866 and burst her steam flue in her efforts to get off. November of that year, while bound from Chicago to Grand Haven, MI, the *Mary Stewart* stranded during a storm off Pentwater, MI on Lake Michigan and sank just outside the shipping lanes. Declared a total loss.

Tinto: D. & J. McCarthy, Sorel, Que. built for Gibb & Ross, Quebec, a wooden propeller to be used for the passenger, package freight trade between Montreal and ports on Lake Ontario and Lake Erie. She was launched in November 1855 and had measures of: 135' x 23' and tonnage (old style) 347. She was powered by (2) 22 1/2" bore x 30" stroke, both attached to at right angles on the same shaft, rated at 180 horsepower the engines were built by Miln & Miln Dock Engine Works, Montreal, Que. Master of the propeller *Tinto*, for the 1855 & 1856 seasons, was Captain Patrick Campbell with Alex. Henderson and George Bannerman Milne as chief engineers.

July 1856, bound up from Montreal to Lake Erie, the propeller *Tinto* caught fire around her funnel and burned to a total loss between Snake Island and Nine Mile Point on Lake Ontario. The women, children and most of the crew lowered her lifeboat while the vessel was still running ahead, causing the lifeboat to capsized. The *Tinto* drifted ashore on Cedar Island and burned to the water's edge. Eighteen lives were lost including the captain and chief engineer.

In later investigations it was determined that the captain had sold two of the three lifeboats prior to the trip. The two boilers and engine plus chains, anchors and other ship gear were recovered and sold at auction in August 1856 to be placed in the new propeller *Avon*, 400 tons burden built for Messrs. Hooker & Pridham at the Marine Railway Shipyard, Kingston, Ont. and launched in June 1857.

Union: Built at Port Huron, Michigan by Joseph P. Arnold as a ferry for the Detroit River passenger trade between Canada and the United States, the *Union* was a wooden, sidewheel steamer with measures: 92' x 18' 5" x 7' 6" and a tonnage (old style) 116 28/95. She was owned by E. T. Brockway & James Moffatt, both from Port Huron and the

vessel was enrolled at Detroit, June 12, 1855. Her engine is unknown.

April 1857, ownership of the passenger ferry was changed to James Maffett, Detroit.

April 1863, ownership of the passenger ferry was changed to J. S. Betsford et al, Detroit.

August 1864, ownership of the passenger ferry was changed to H. B. Boyers et al, Detroit.

December 1865 the sidewheel ferry *Union* caught fire at Detroit, Detroit River and burned to a total loss. Her document was surrendered December 30th, 1865 and endorsed "burned".

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.

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: $Tonnage = ((length - (beam \times 3/5)) \times Beam \times Beam/2)/94$

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 forecandle 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, that 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.)