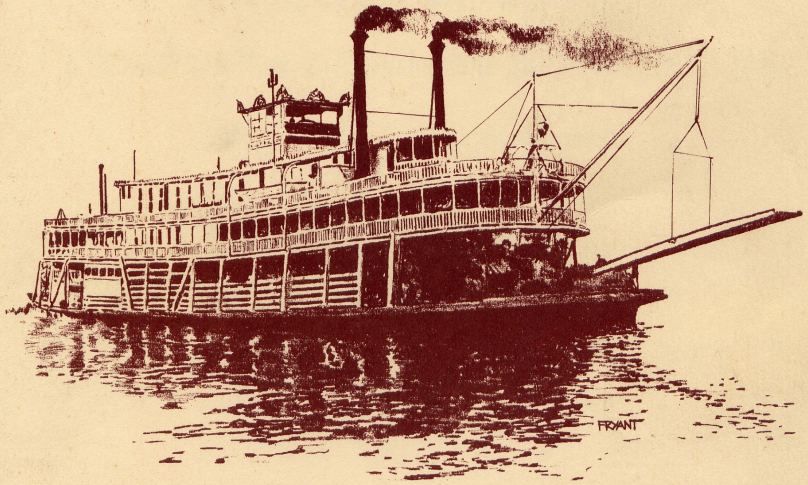
Mississippi River Steamboat Bi-Centennial

OLLI at WVU
Spring 2012

Wally Venable
Emeritus Associate Professor
Mechanical & Aerospace Engineering

THE WESTERN RIVERS

STEAMBOAT

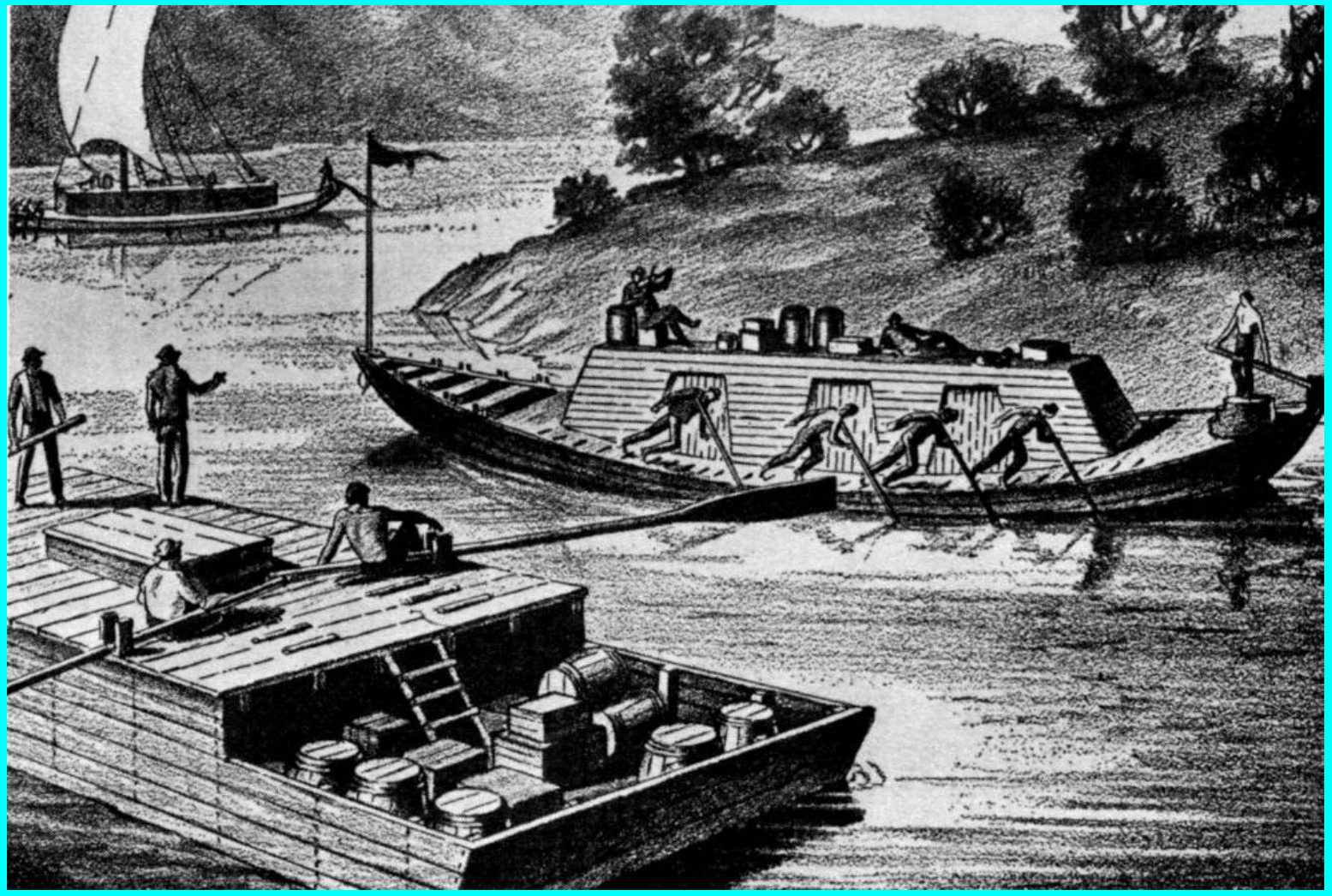


CYCLOPEDIUM

by

ALAN L. BATES

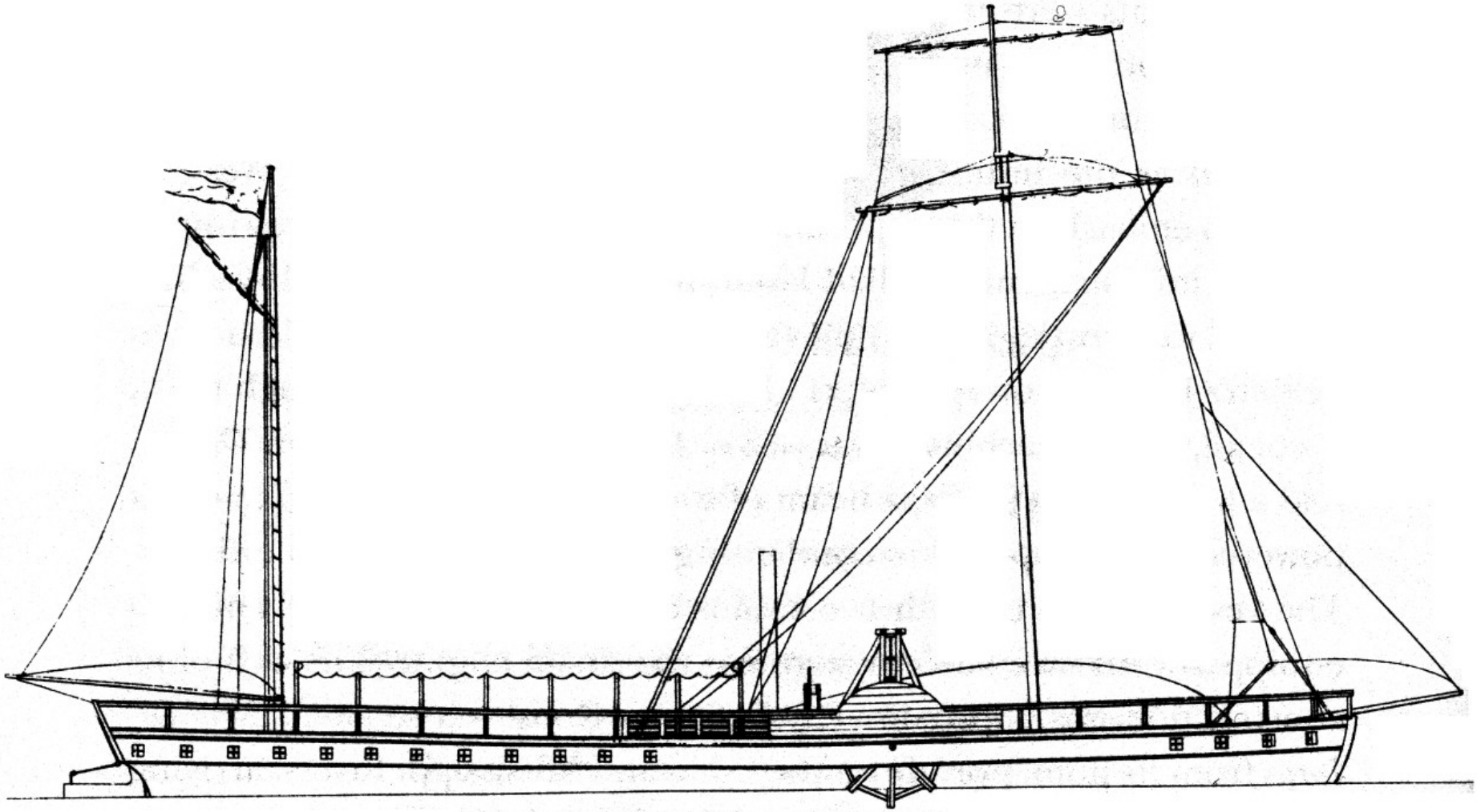
The Western Rivers Before Steam



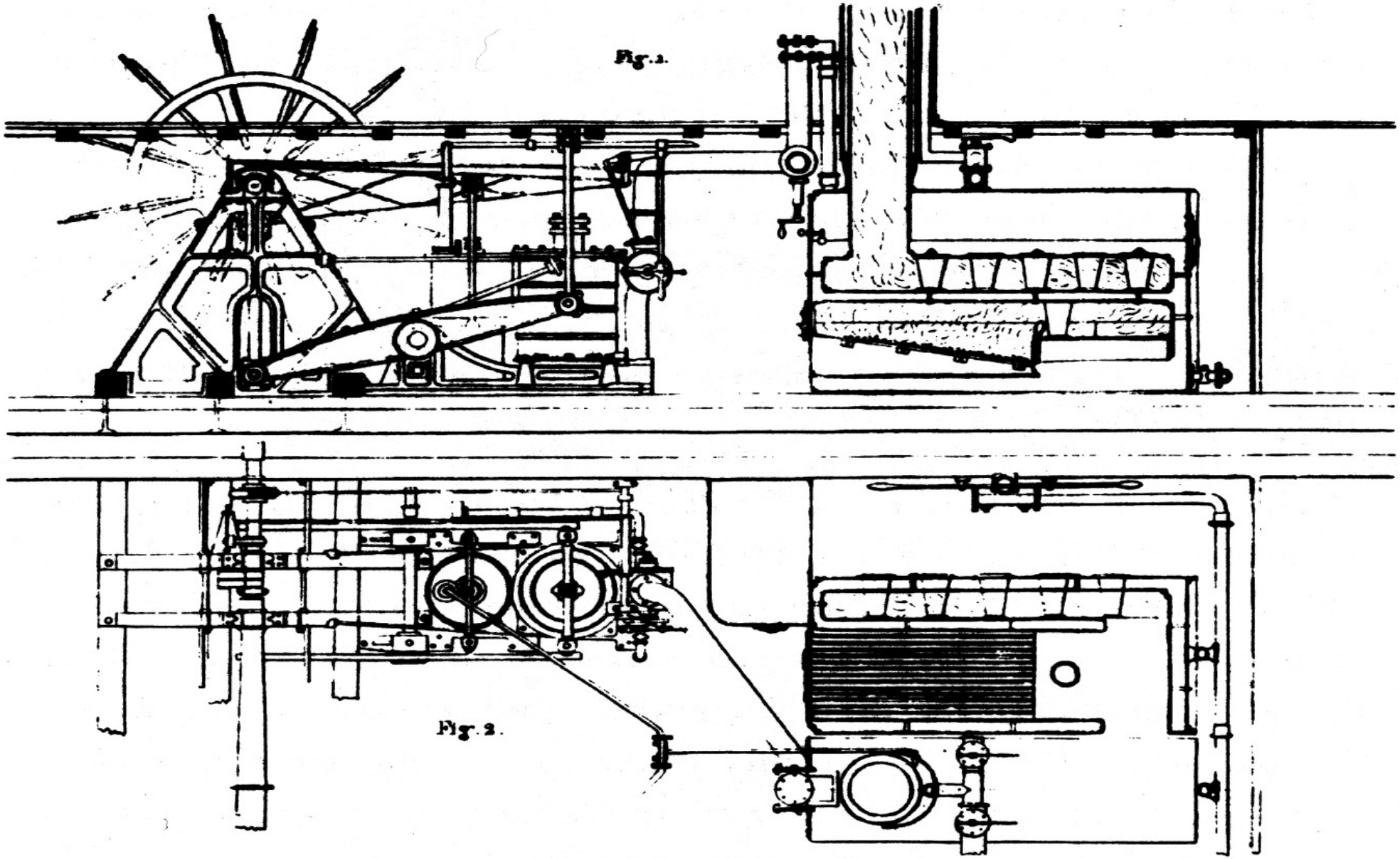
Steamboat ***New Orleans***

- First ***Western Rivers*** Steamboat
- Launched Pittsburgh in 1811
- Left Pittsburgh on October 20, 1811
- Reached Natchez after Christmas in 1811
- Reached city of New Orleans on January 10, 1812

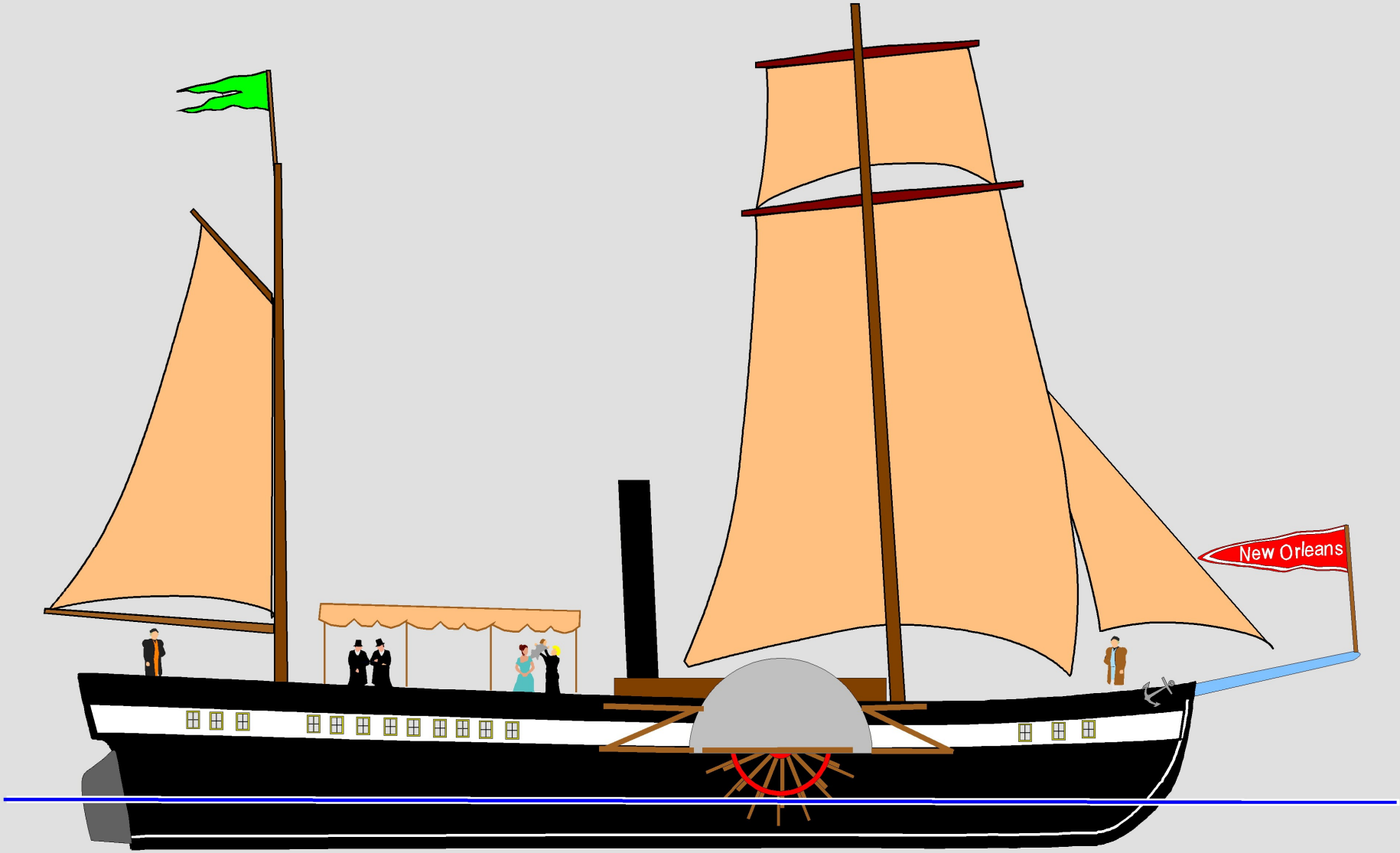
Fulton Type Steamboat - 1911



3.1. *Robert Fulton's* Paragon, *1811.*

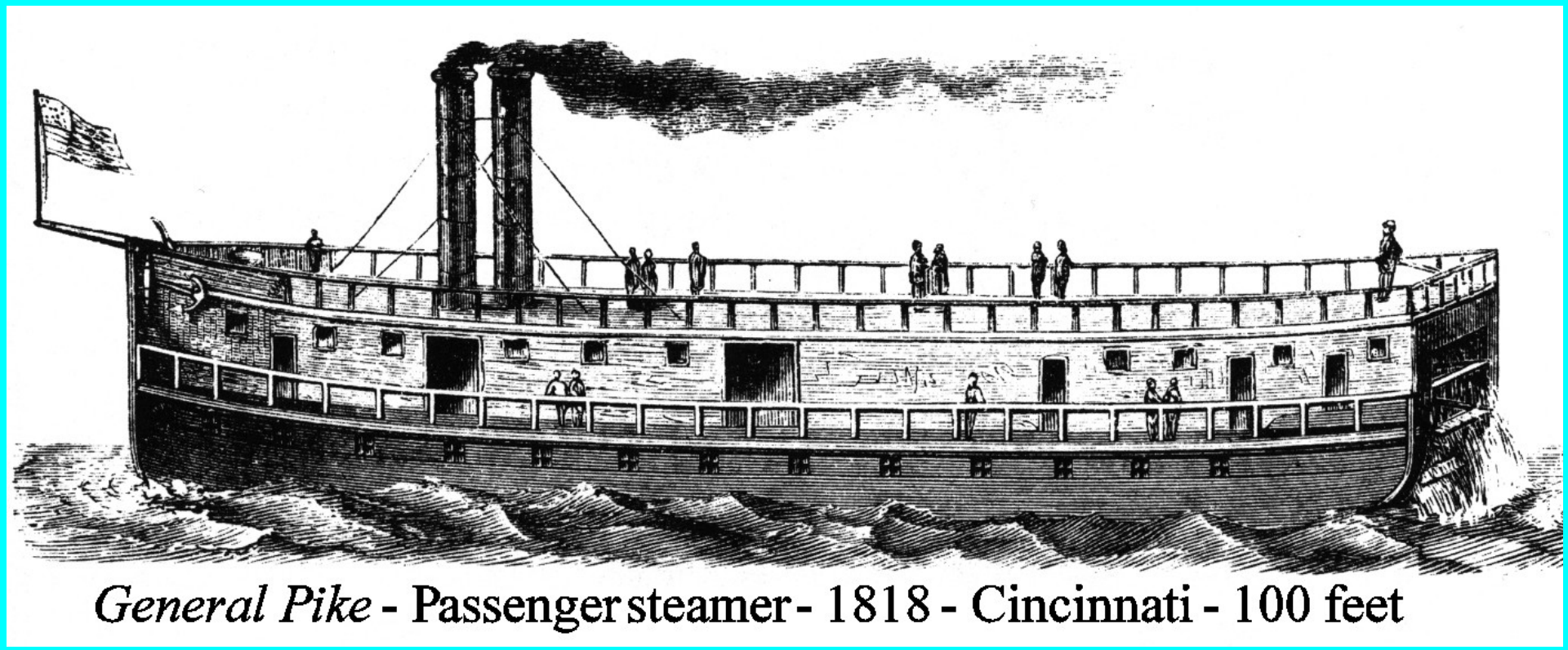


3.3. The profile view and plan of the low-pressure condensing engine used by Robert Fulton in his early steamboats.

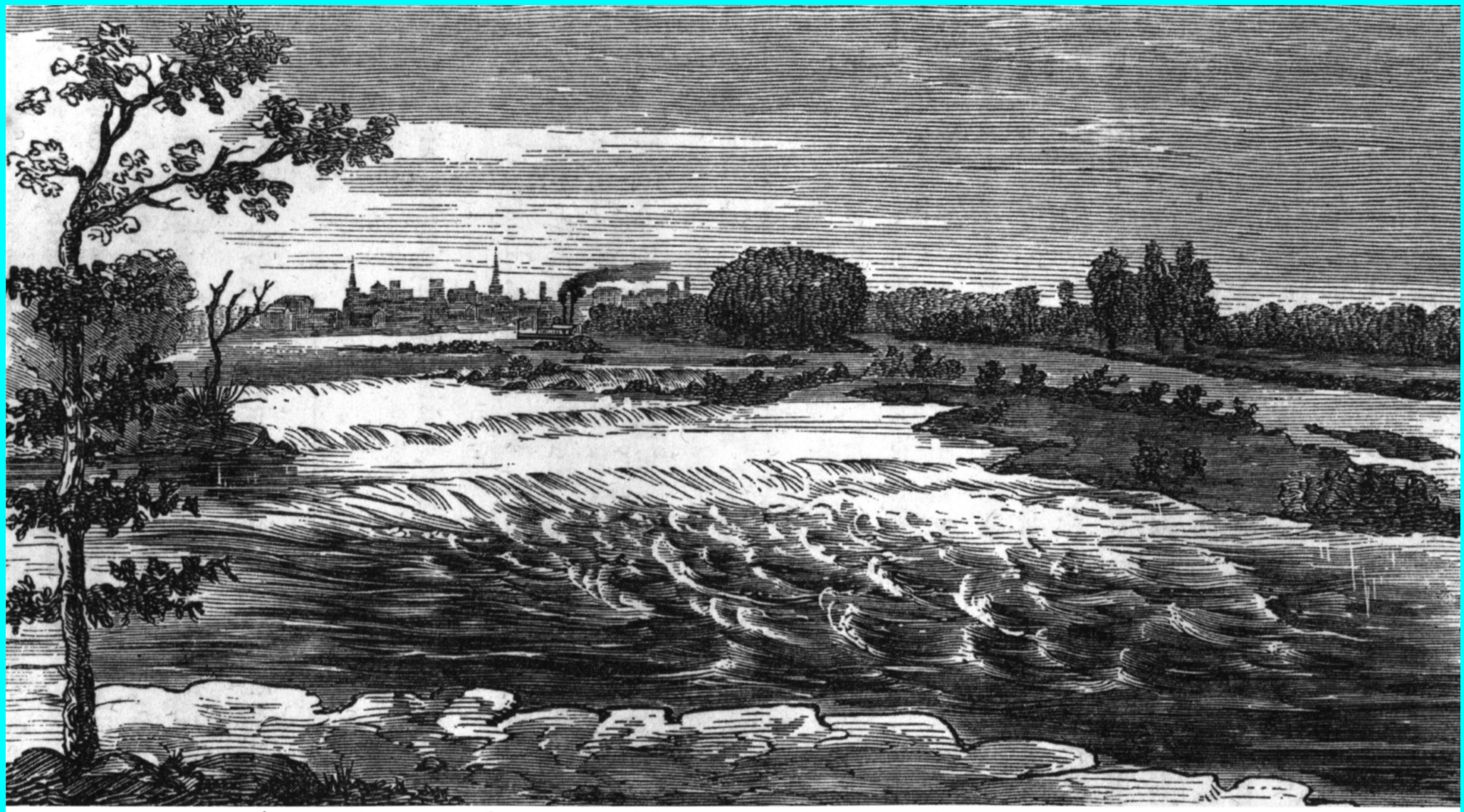

New Orleans

A Challange to Fulton

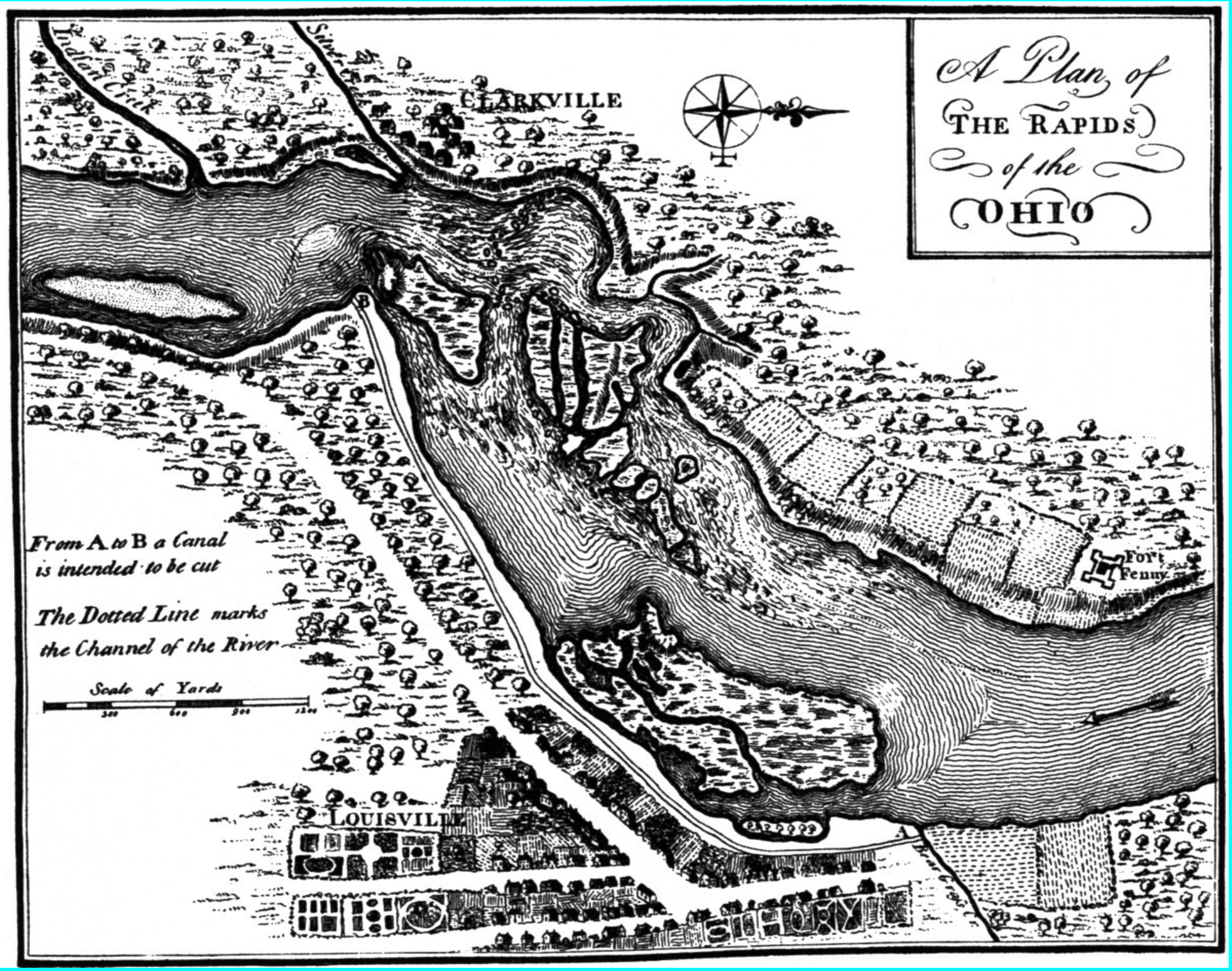
- Daniel French & Henry Shreve challanged Fulton group's monopoly in Louisiana
- Organized company at Brownsville to build smaller steamboats
- 1809 French patented horizontal engine
- French installed sternwheel on 30 foot fishing boat at Pittsburgh and raced *New Orleans*



General Pike - Passenger steamer - 1818 - Cincinnati - 100 feet



An etching of the Falls of the Ohio River, 1811

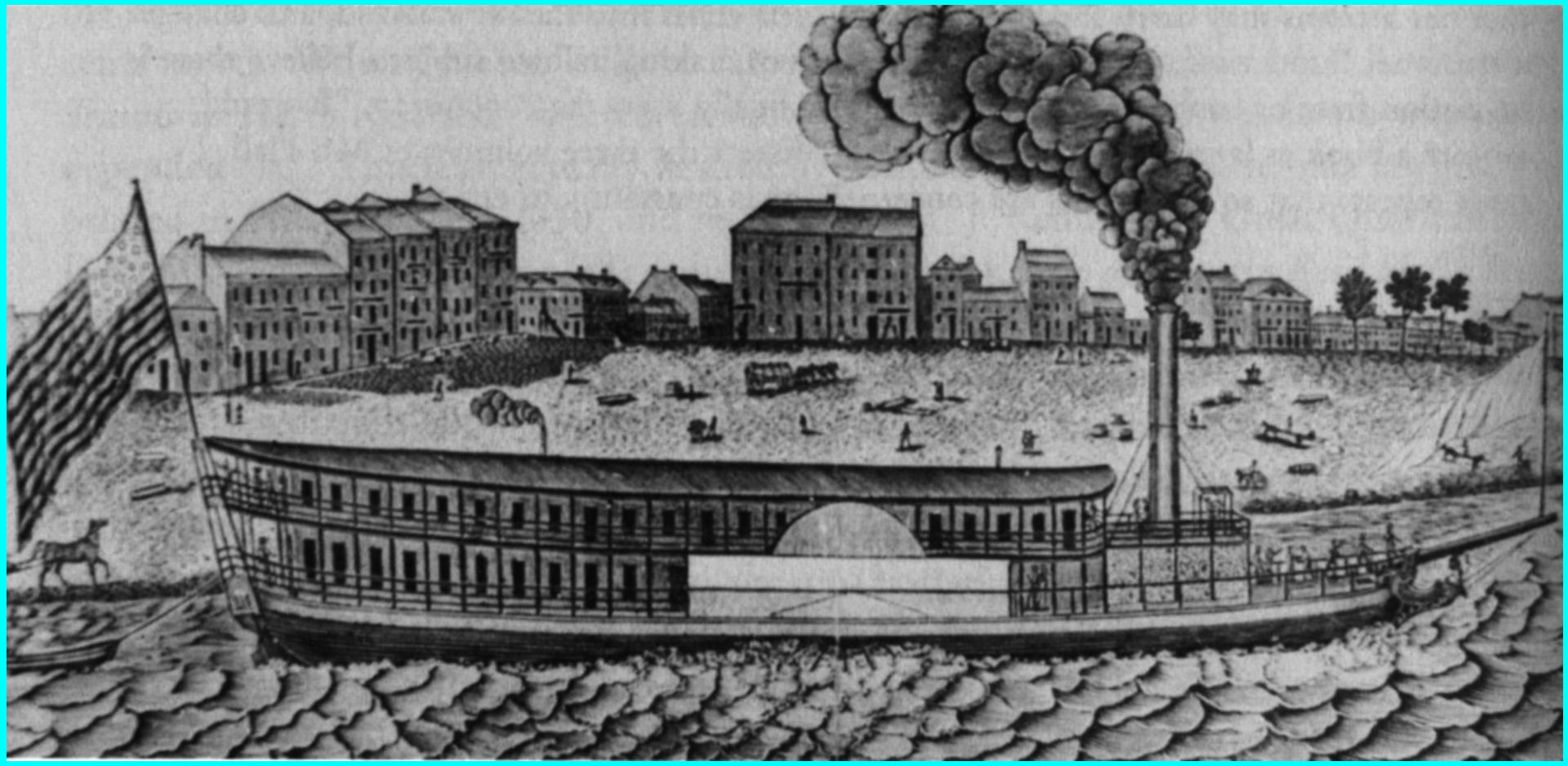

A Plan of
THE RAPIDS
of the
OHIO
Indian Creek
Silver Creek
CLARKVILLE
From A to B a Canal
is intended to be cut
The Dotted Line marks
the Channel of the River
Scale of Yards
300
600
900
1200
B
A
Fort
Fenny
LOUISVILLE

Louisville and Portland Canal

- The first canal and locks were built between 1825-1830, by the Louisville and Portland Canal Company, along with Federal support.
- The Canal was 50 feet wide, and the three locks, each 190 feet long by 50 feet wide, were the largest in the world. The locks raised or lowered boats 26 feet to overcome the drop in elevation at the falls. These locks served flatboat and steamboat commerce on the river until the 1870s.

- 1811 – Steamer *New Orleans*
- 1826 – Steamer *Reindeer* reached Morgantown

Unknown Packet About 1830



Packet Boats

A *use*, not a type of boat

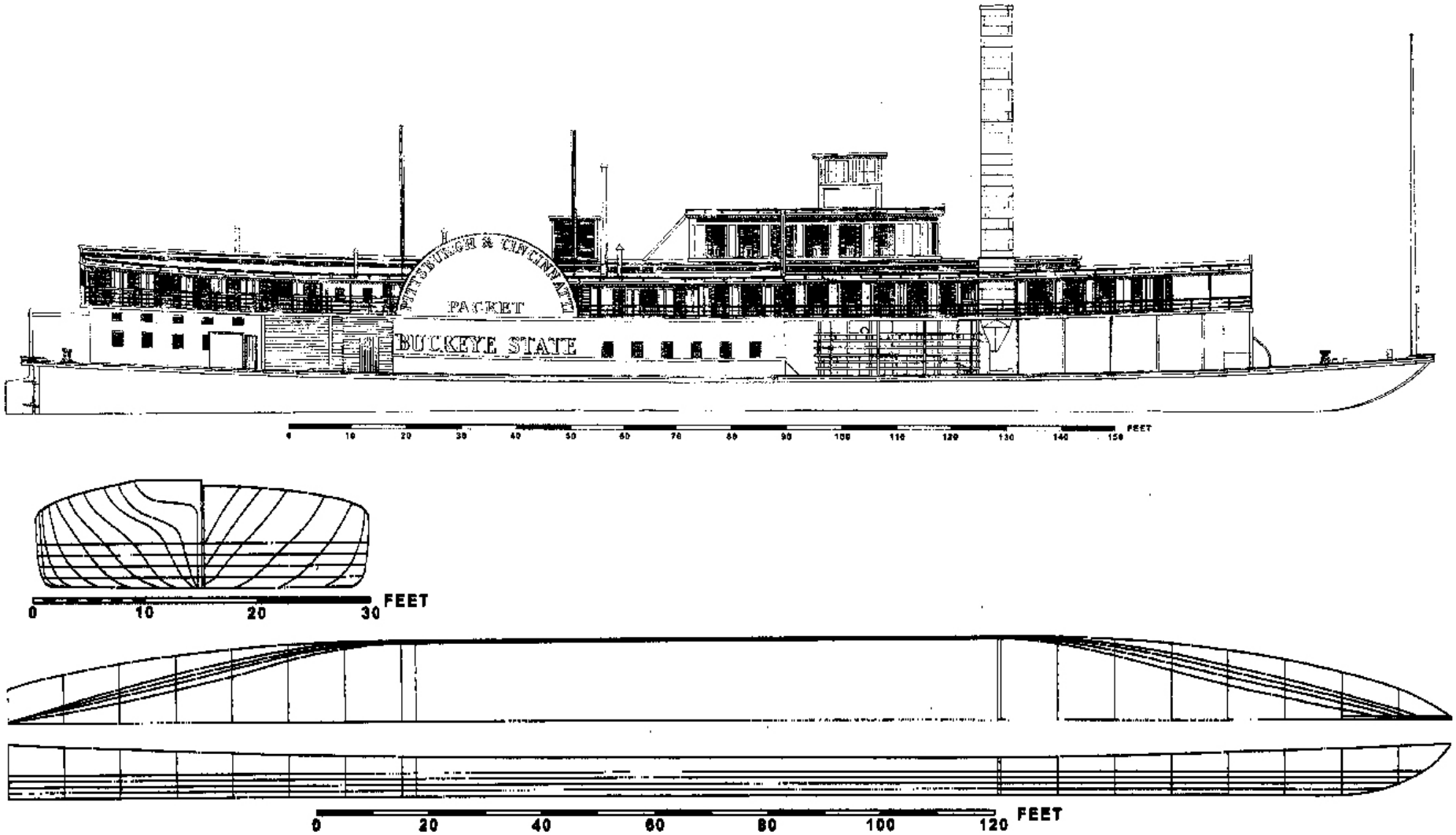
- Regular route
- Passengers
- Freight
- Overnight ?

Sidewheel vs. Sternwheel

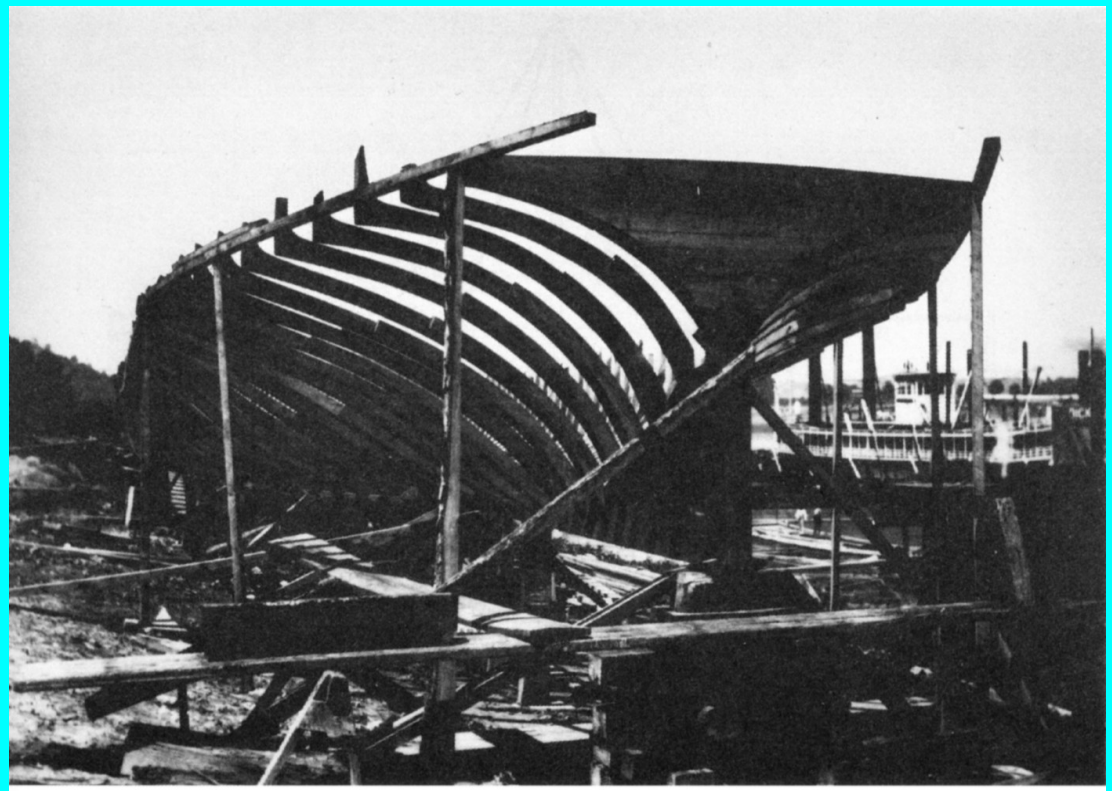
What do you plan to use the steamboat for?

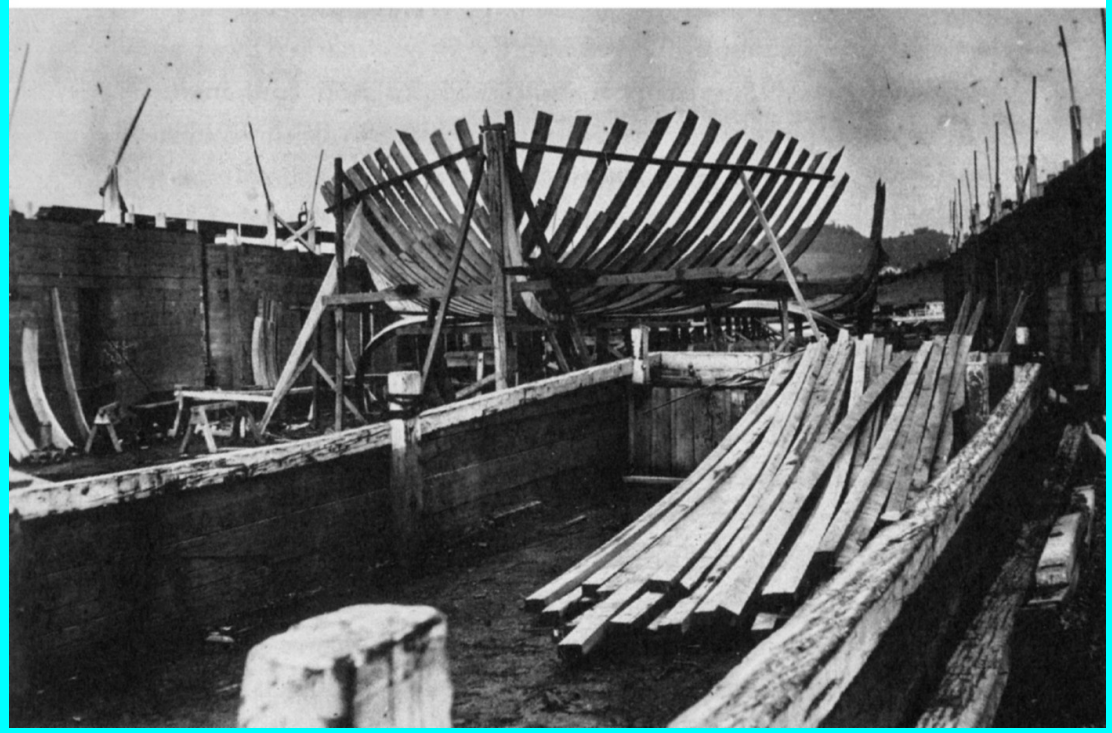
- Speed
- Handling
- Towing power
- Simplicity
- Cost

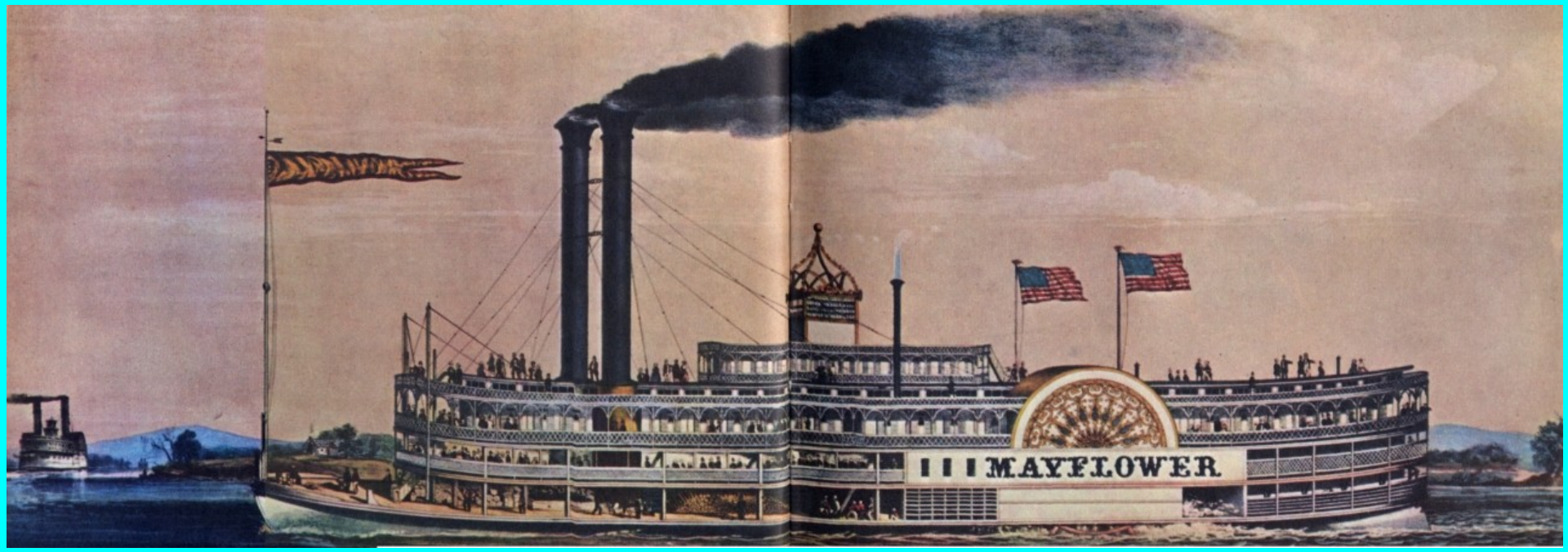
Length & Fine Lines Give Speed

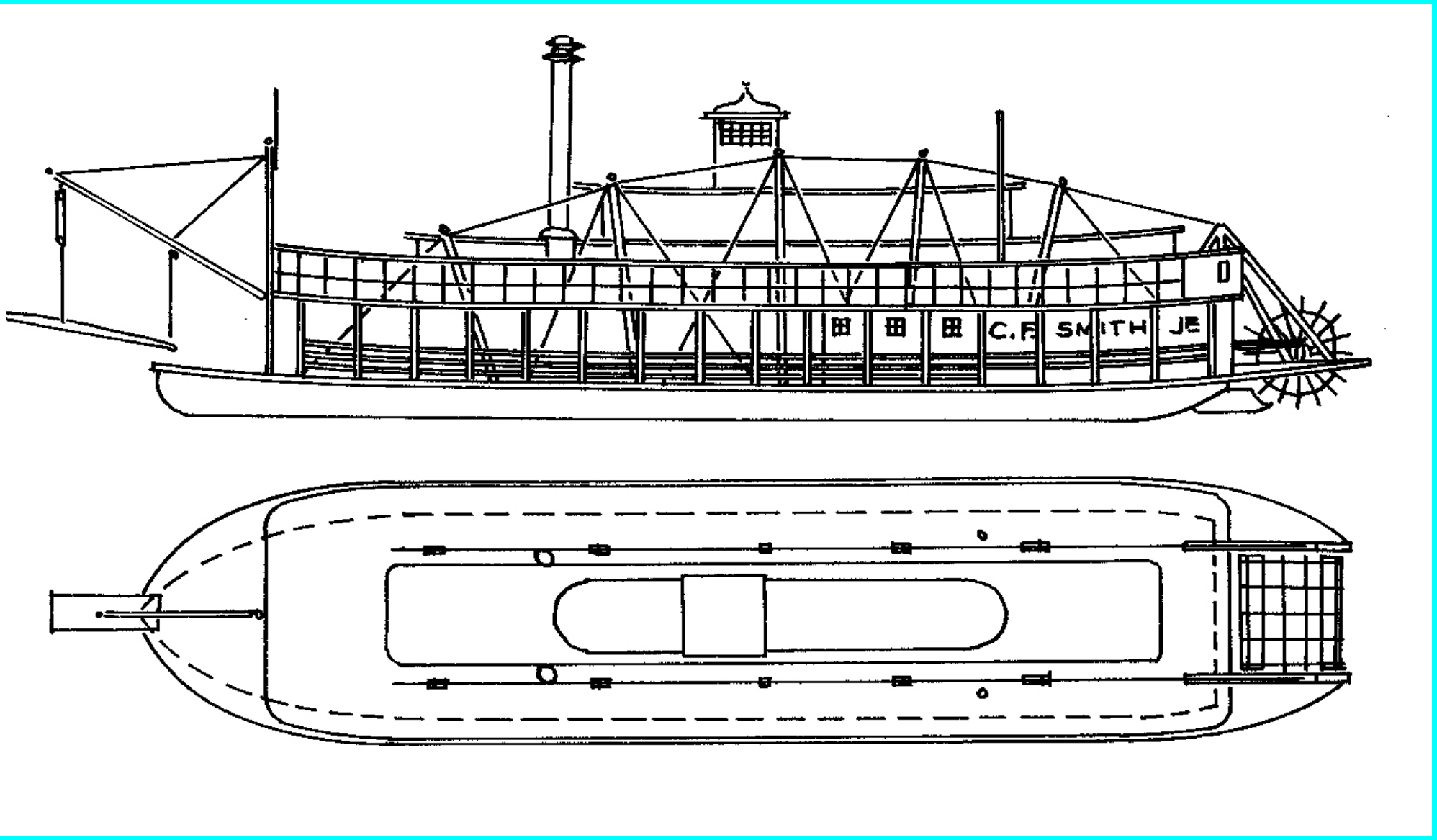


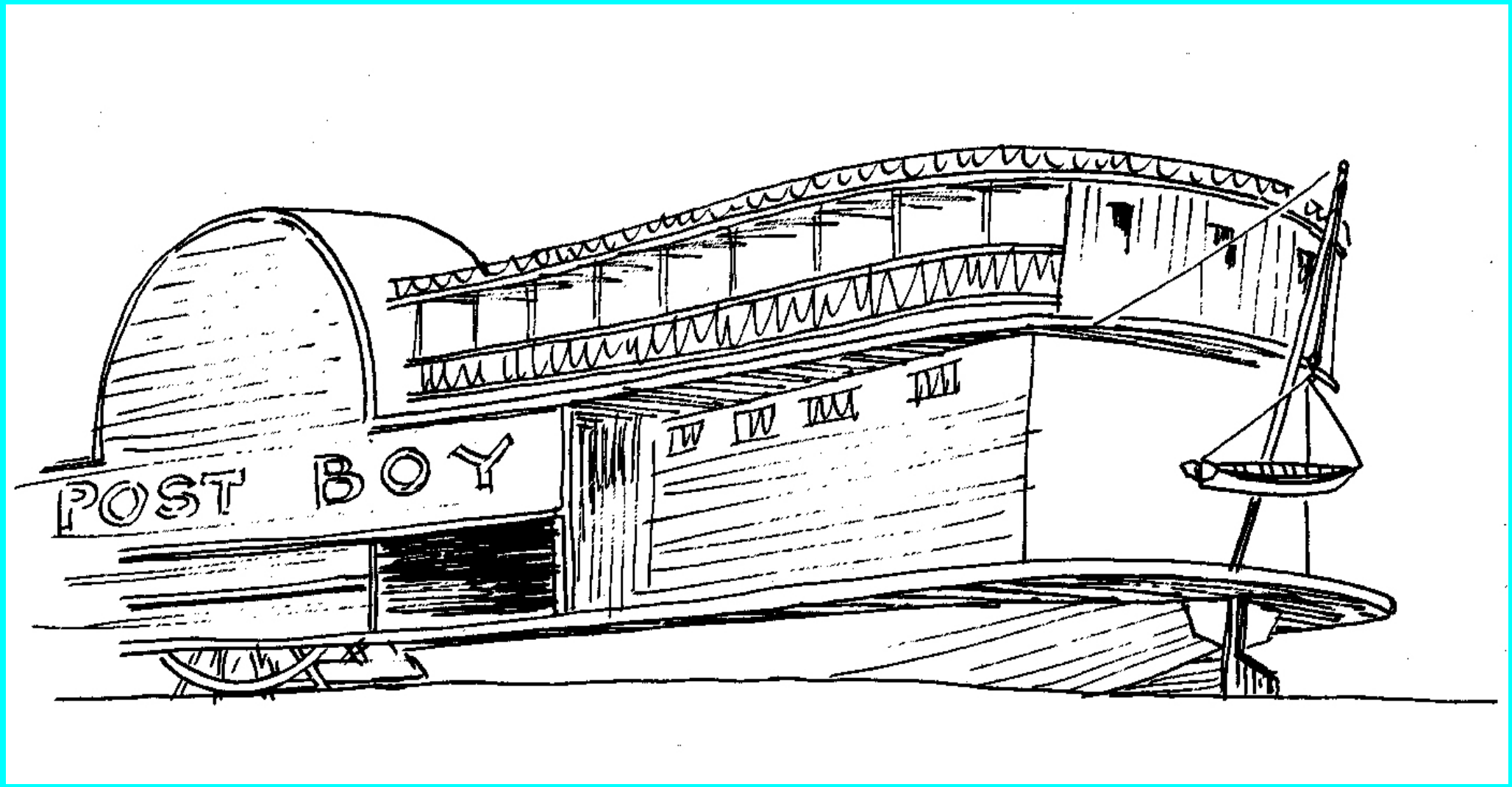
Sheer, half-breadth, and body plan of Buckeye State.

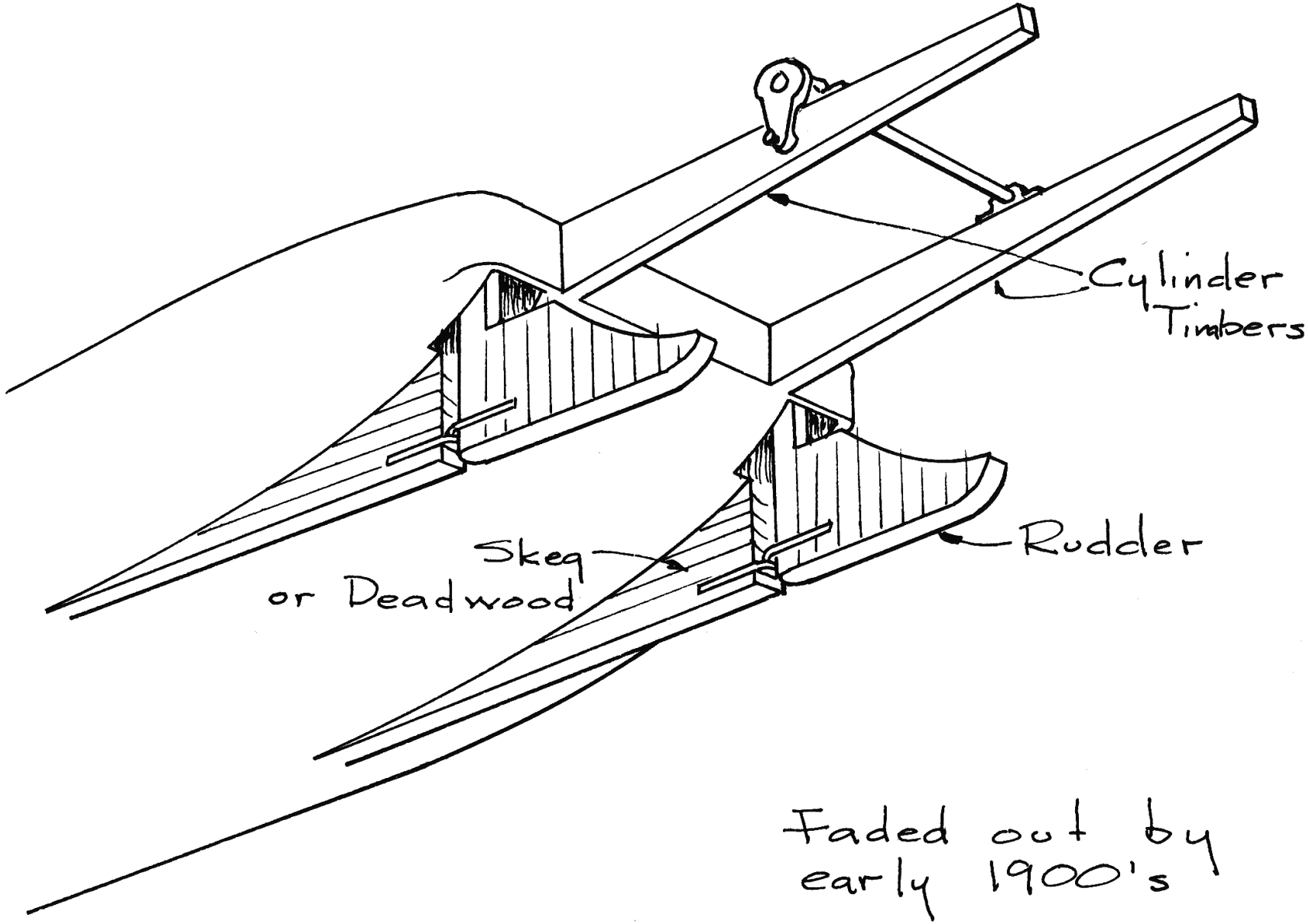




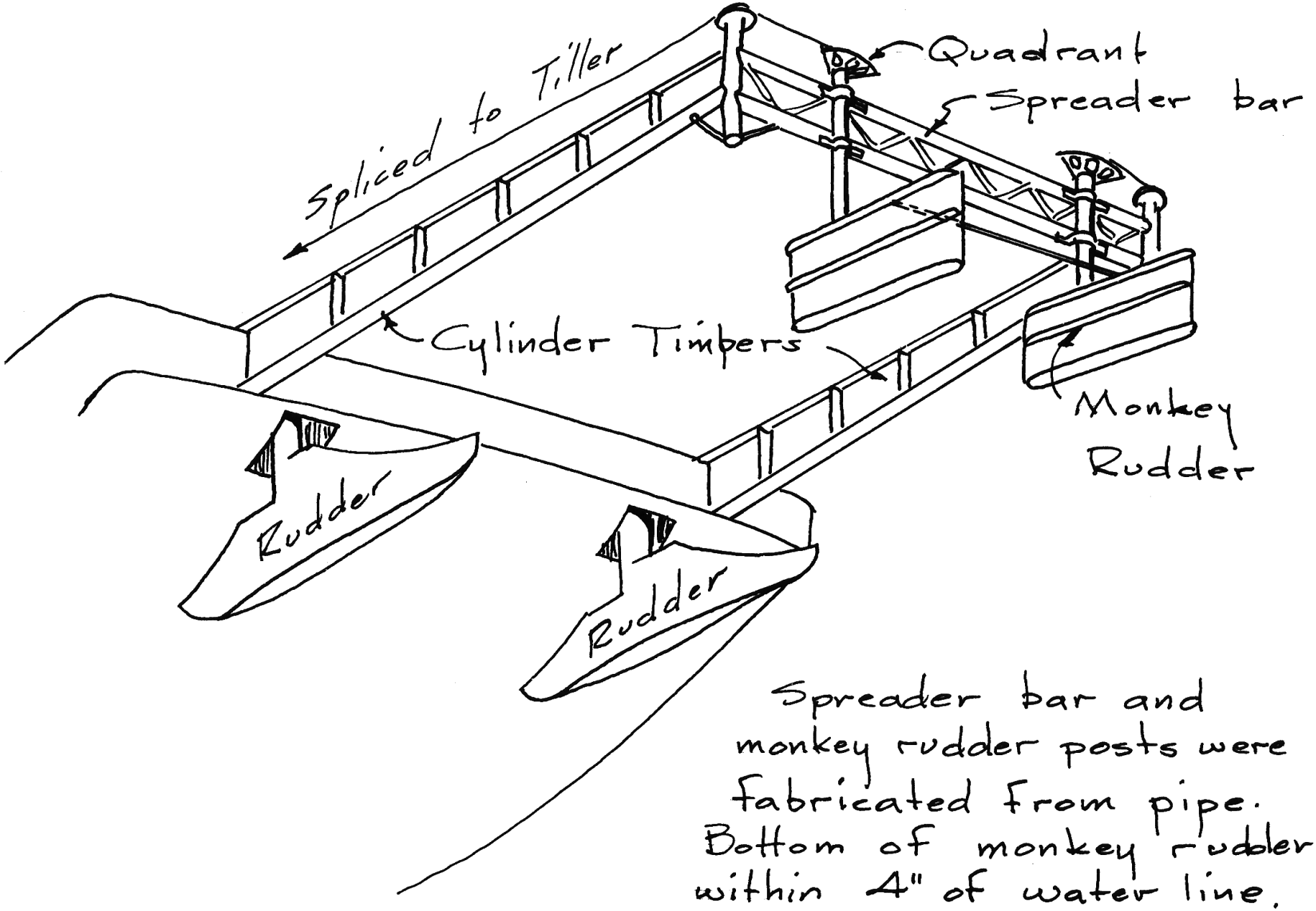

MAYFLOWER


C.F
SMITH
JE

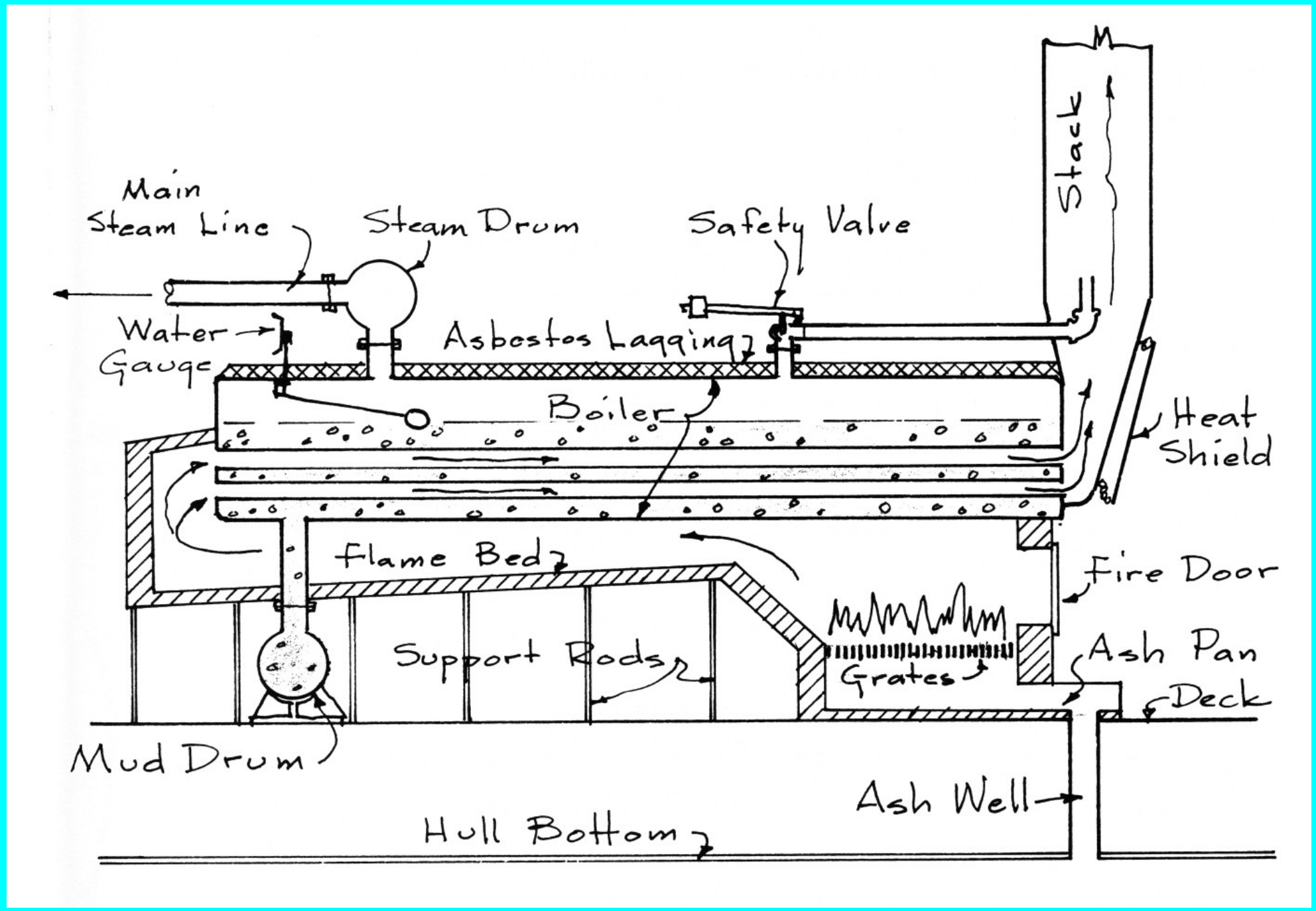

POST BOY

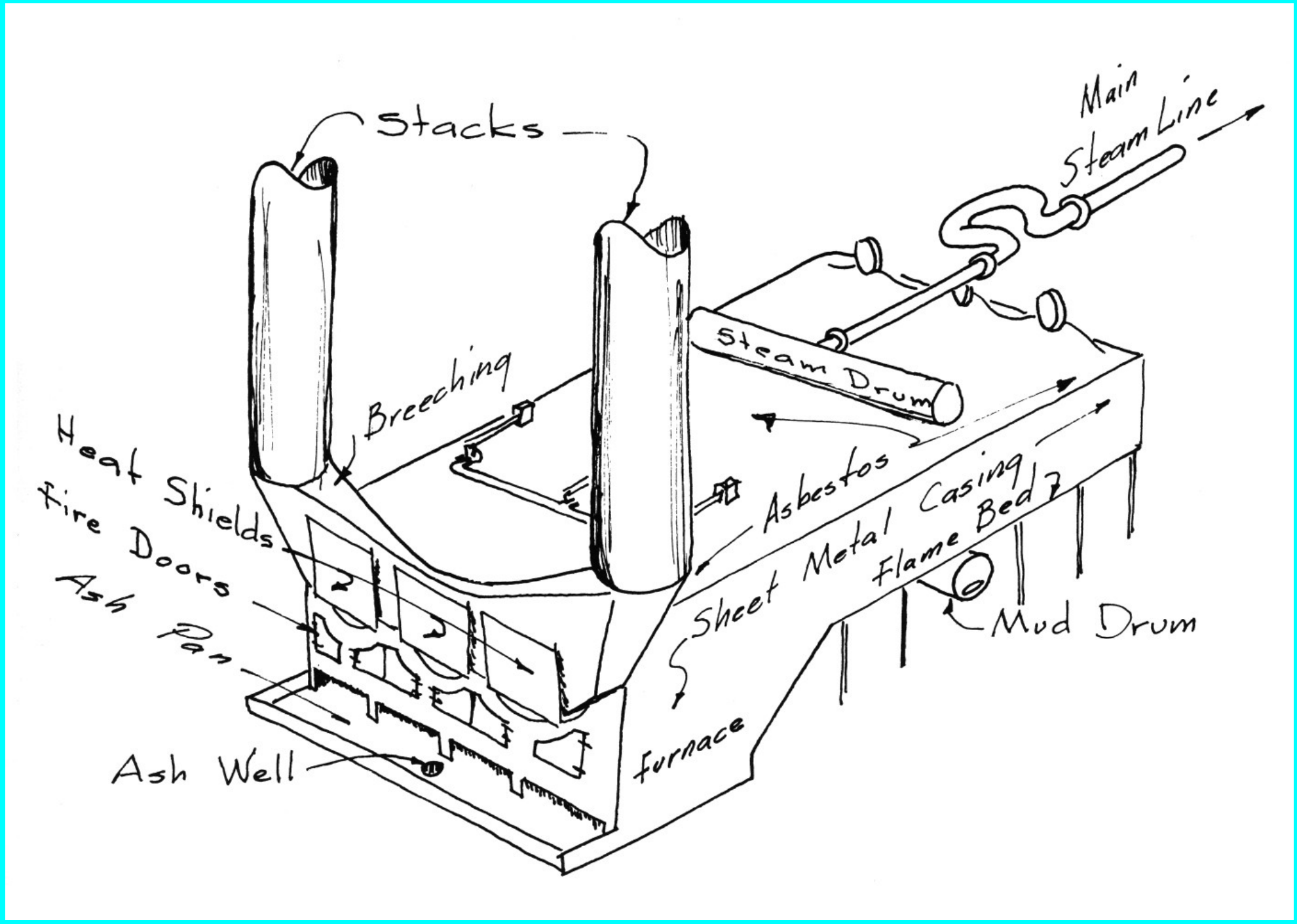


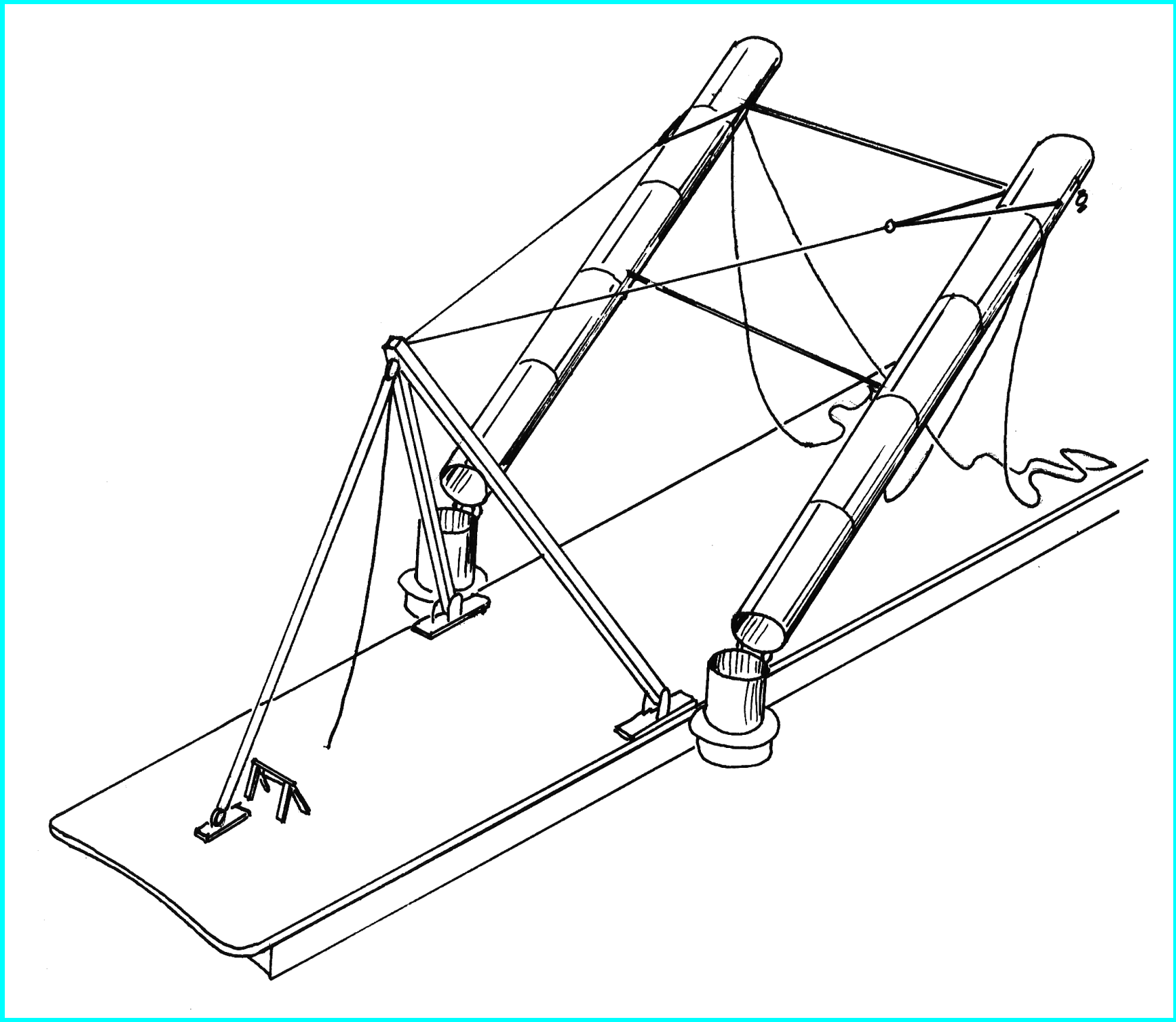
Faded out by
early 1900's



Spreader bar and monkey rudder posts were fabricated from pipe. Bottom of monkey rudder within 4" of water line.

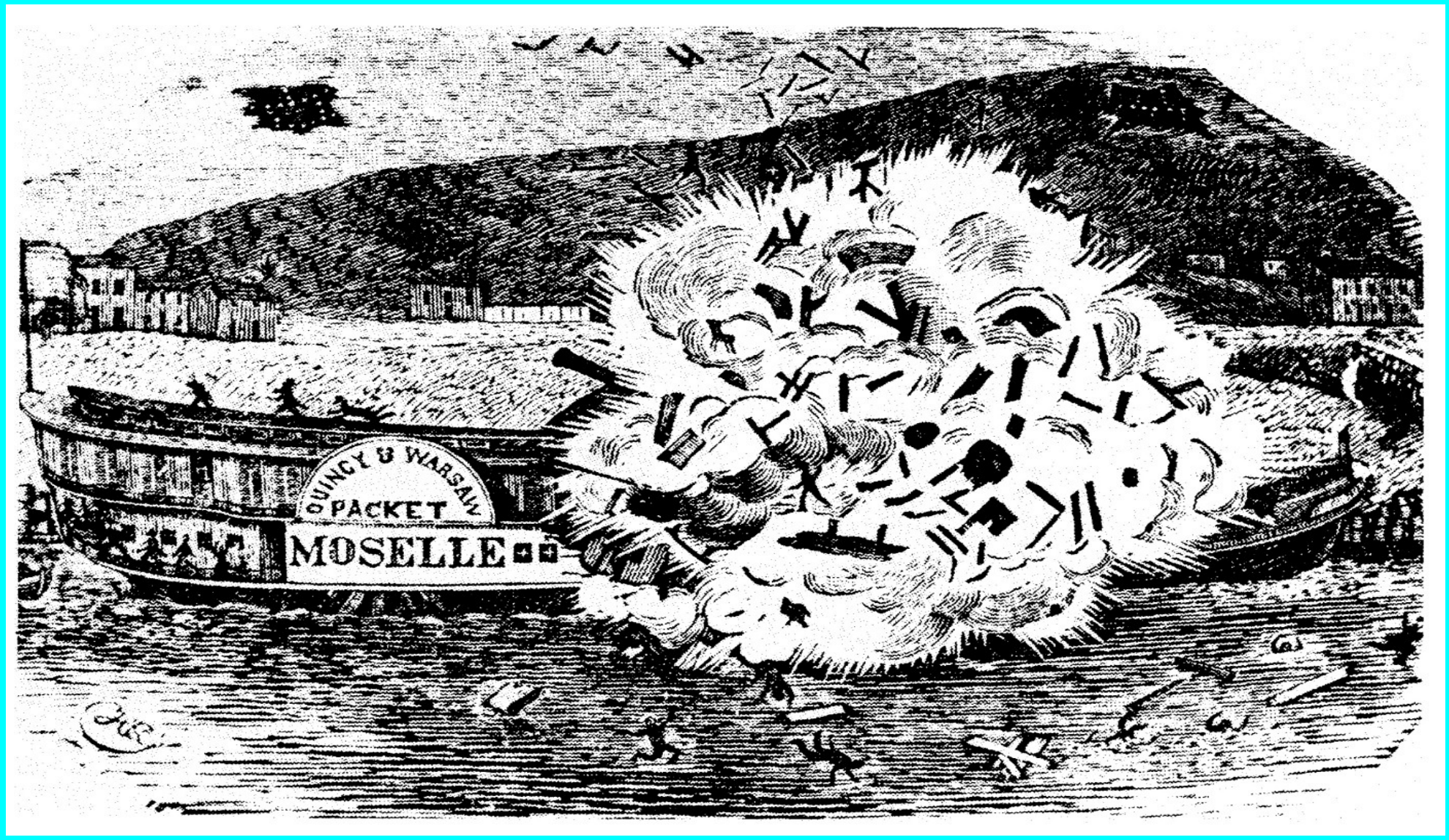

Main
Steam Line
Steam Drum
Safety Valve
Stack
Water
Gauge
Asbestos Lagging
Boiler
Heat
Shield
Flame Bed
Fire Door
Support Rods
Grates
Ash Pan
Deck
Mud Drum
Ash Well
Hull Bottom


Stacks
Main Steam Line
Steam Drum
Breeching
Heat Shields
Fire Doors
Ash Pan
Asbestos
Sheet Metal Casing
Flame Bed
Mud Drum
Ash Well
furnace

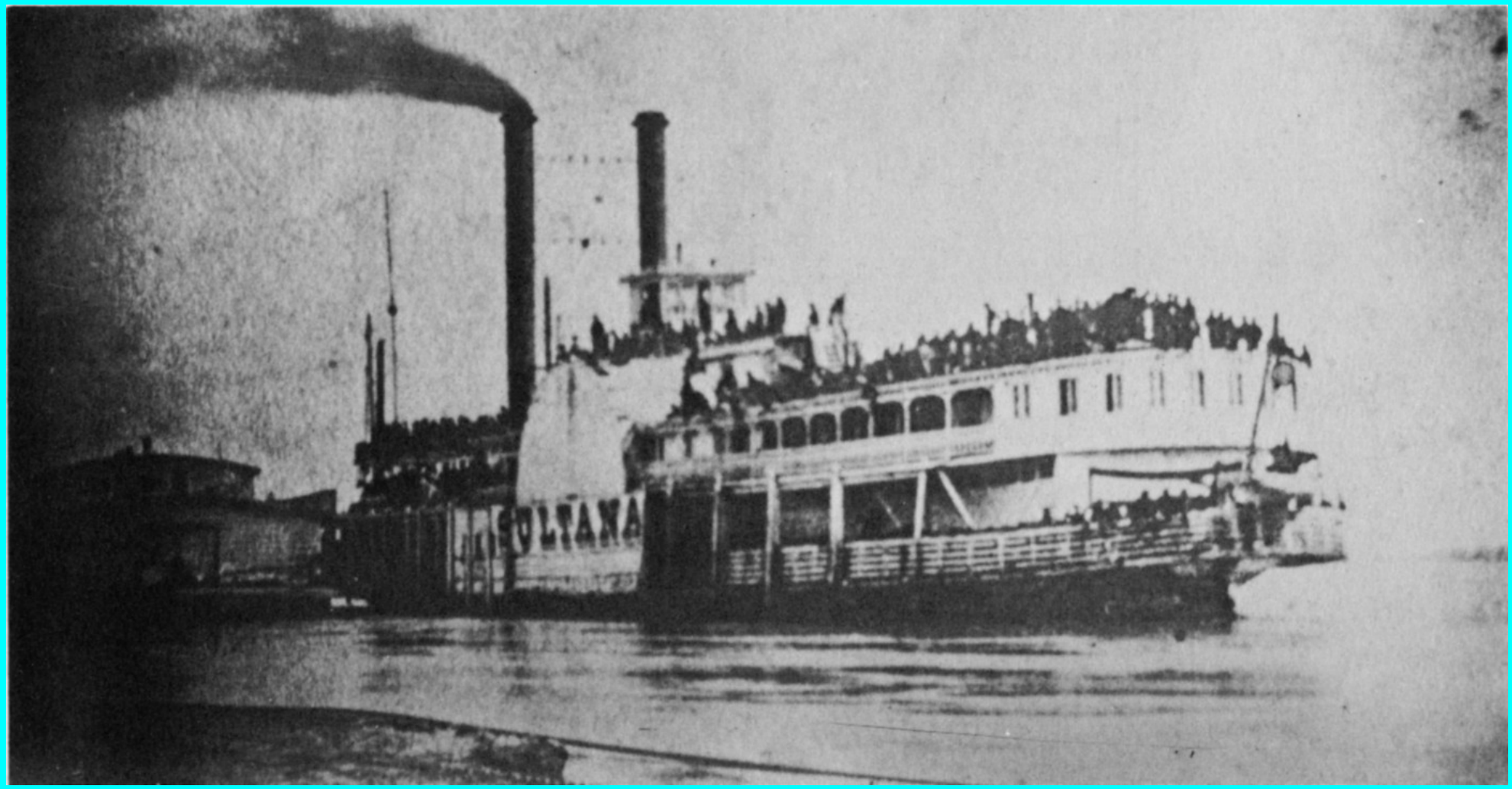


Engines on *Delta Queen*

Explosion of *Moselle* 1838 – 81 Killed



Sultana Explosion & Fire
27 April 1865 – 1500 Lives Lost



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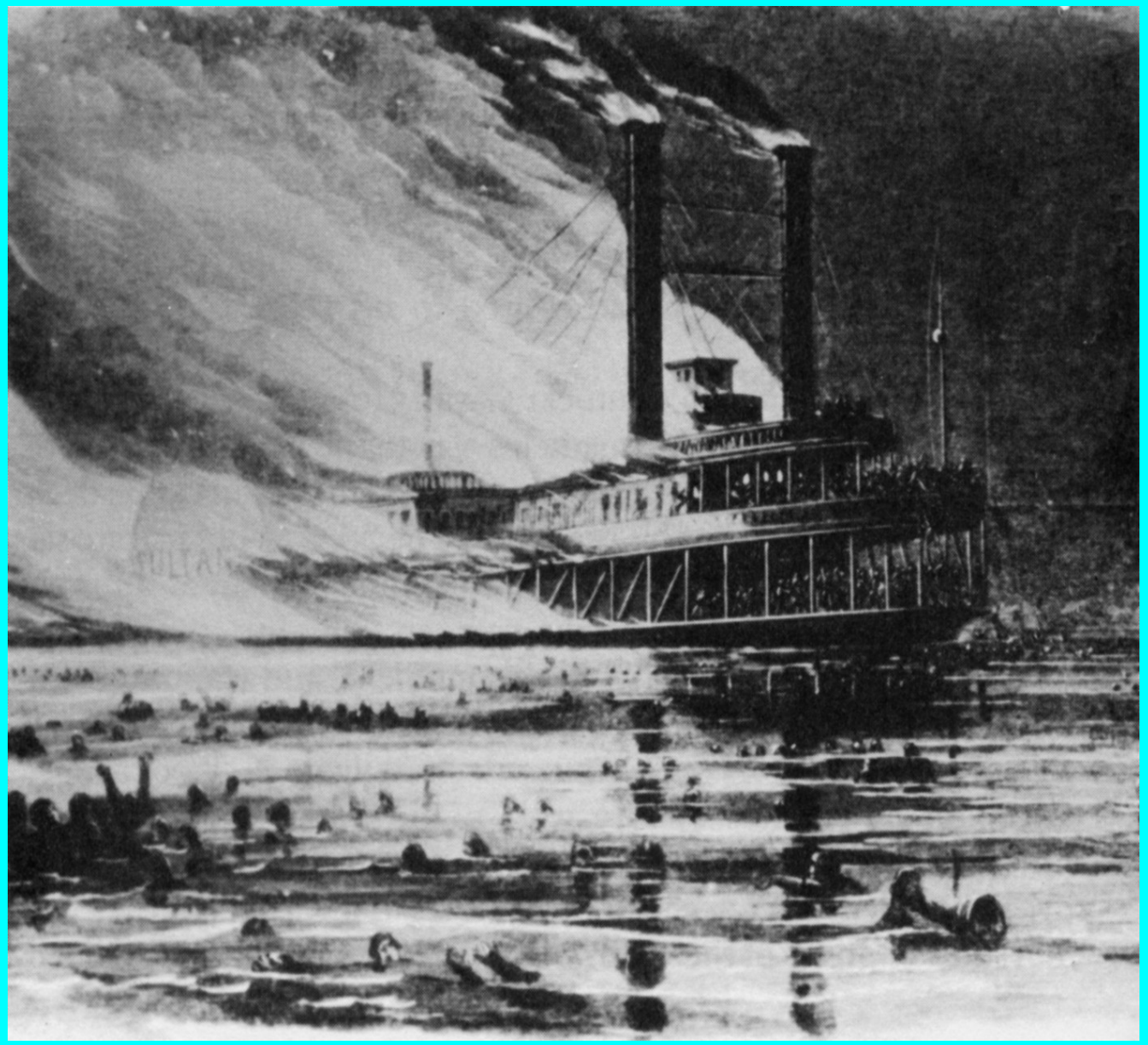
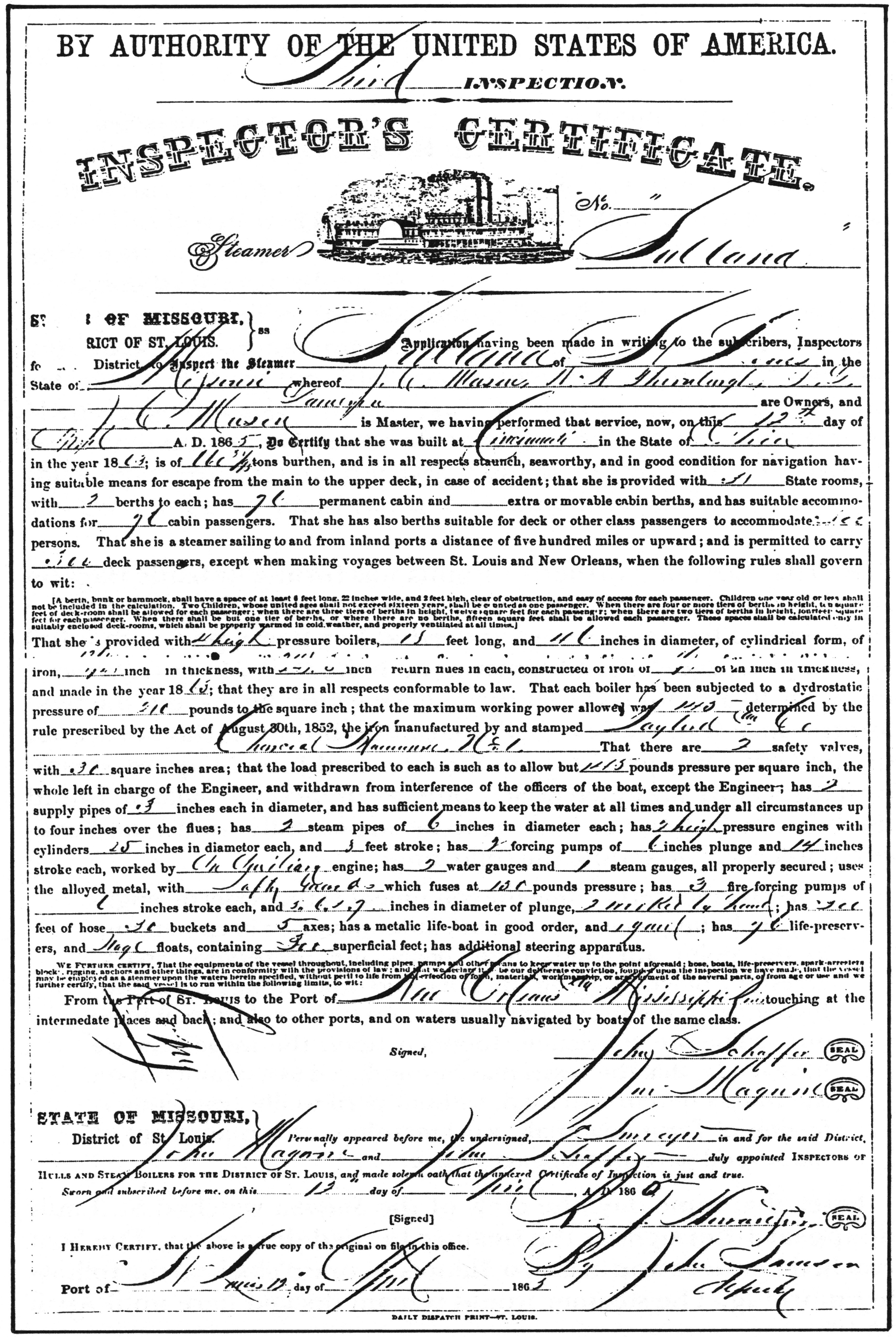



BY AUTHORITY OF THE UNITED STATES OF AMERICA.

Third INSPECTION.

INSPECTOR'S CERTIFICATE.

No. "

Steamer Sultana

STATE OF MISSOURI, DISTRICT OF ST. LOUIS. } ss

Application having been made in writing to the subscribers, Inspectors for the District, to inspect the Steamer Sultana of St. Louis in the State of Missouri whereof J. C. Mason, W. A. Thornburgh, ______ are Owners, and J. C. Mason is Master, we having performed that service, now, on this 12th day of April A. D. 1865, Do Certify that she was built at Cincinnati in the State of Ohio in the year 1863; is of 1719 tons burthen, and is in all respects staunch, seaworthy, and in good condition for navigation having suitable means for escape from the main to the upper deck, in case of accident; that she is provided with 38 State rooms, with 2 berths to each; has 76 permanent cabin and ______ extra or movable cabin berths, and has suitable accommodations for 76 cabin passengers. That she has also berths suitable for deck or other class passengers to accommodate ______ persons. That she is a steamer sailing to and from inland ports a distance of five hundred miles or upward; and is permitted to carry 300 deck passengers, except when making voyages between St. Louis and New Orleans, when the following rules shall govern to wit:

[A berth, bunk or hammock, shall have a space of at least 6 feet long, 22 inches wide, and 2 feet high, clear of obstruction, and easy of access for each passenger. Children one year old or less shall not be included in the calculation. Two Children, whose united ages shall not exceed sixteen years, shall be counted as one passenger. When there are four or more tiers of berths in height, ten square feet of deck-room shall be allowed for each passenger; when there are three tiers of berths in height, twelve square feet for each passenger; when there are two tiers of berths in height, fourteen square feet for each passenger. When there shall be but one tier of berths, or where there are no berths, fifteen square feet shall be allowed each passenger. These spaces shall be calculated only in suitably enclosed deck-rooms, which shall be properly warmed in cold weather, and properly ventilated at all times.]

That she is provided with 4 high pressure boilers, 18 feet long, and 46 inches in diameter, of cylindrical form, of ______ iron, ______ inch in thickness, with ______ inch return flues in each, constructed of iron of ______ of an inch in thickness, and made in the year 1863; that they are in all respects conformable to law. That each boiler has been subjected to a hydrostatic pressure of 210 pounds to the square inch; that the maximum working power allowed was 145 determined by the rule prescribed by the Act of August 30th, 1852, the iron manufactured by and stamped ______ Charcoal Hammered ______ That there are 2 safety valves, with 30 square inches area; that the load prescribed to each is such as to allow but 145 pounds pressure per square inch, the whole left in charge of the Engineer, and withdrawn from interference of the officers of the boat, except the Engineer; has 2 supply pipes of 3 inches each in diameter, and has sufficient means to keep the water at all times and under all circumstances up to four inches over the flues; has 2 steam pipes of 6 inches in diameter each; has 2 high pressure engines with cylinders 25 inches in diameter each, and 8 feet stroke; has 2 forcing pumps of 6 inches plunge and 14 inches stroke each, worked by Doctor engine; has 2 water gauges and 1 steam gauges, all properly secured; uses the alloyed metal, with Safety Guards which fuses at 180 pounds pressure; has 3 fire forcing pumps of ______ inches stroke each, and ______ inches in diameter of plunge, 2 worked by hand; has 300 feet of hose 30 buckets and 5 axes; has a metalic life-boat in good order, and 1 yawl; has 76 life-preservers, and ______ floats, containing ______ superficial feet; has additional steering apparatus.

WE FURTHER CERTIFY, That the equipments of the vessel throughout, including pipes, pumps and other means to keep water up to the point aforesaid; hose, boats, life-preservers, spark-arresters blocks, rigging, anchors and other things, are in conformity with the provisions of law; and that we declare it to be our deliberate conviction, founded upon the inspection we have made, that the vessel may be employed as a steamer upon the waters herein specified, without peril to life from imperfection of form, materials, workmanship, or arrangement of the several parts, or from age or use and we further certify, that the said vessel is to run within the following limits, to wit:

From the Port of St. Louis to the Port of New Orleans on Mississippi River touching at the intermediate places and back; and also to other ports, and on waters usually navigated by boats of the same class.

Signed, John Shaffer (SEAL)
Wm. Maguire (SEAL)

STATE OF MISSOURI, District of St. Louis. Personally appeared before me, the undersigned, ______ in and for the said District, John Maguire and John Shaffer duly appointed Inspectors of Hulls and Steam Boilers for the District of St. Louis, and made solemn oath that the annexed Certificate of Inspection is just and true.

Sworn and subscribed before me, on this 12 day of April A. D. 1865

[Signed] ______ (SEAL)

I HEREBY CERTIFY, that the above is a true copy of the original on file in this office.

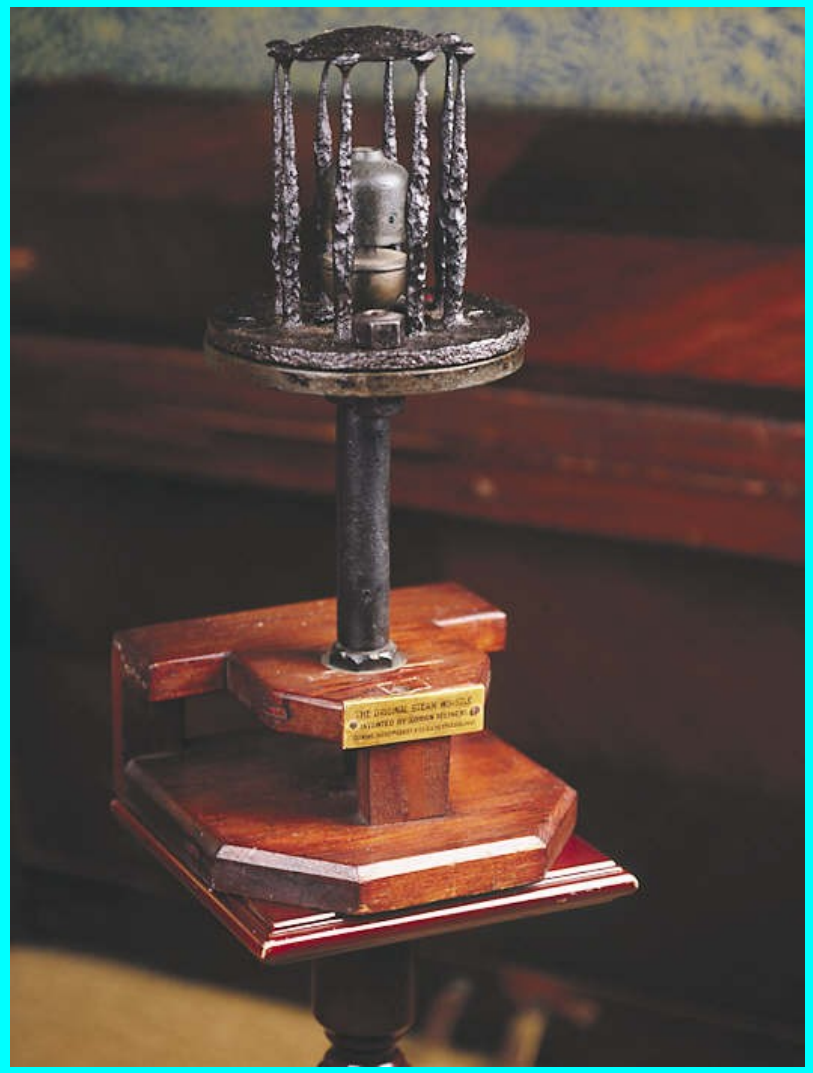
Port of St. Louis 19 day of April 1865

By John ______ Deputy

DAILY DISPATCH PRINT—ST. LOUIS.

The Sultana was inspected on April 12, 1865, at St. Louis. The certificate certified that the vessel could be employed as a steamer on the Mississippi River without peril to life. (National Archives)

Steam Whistles

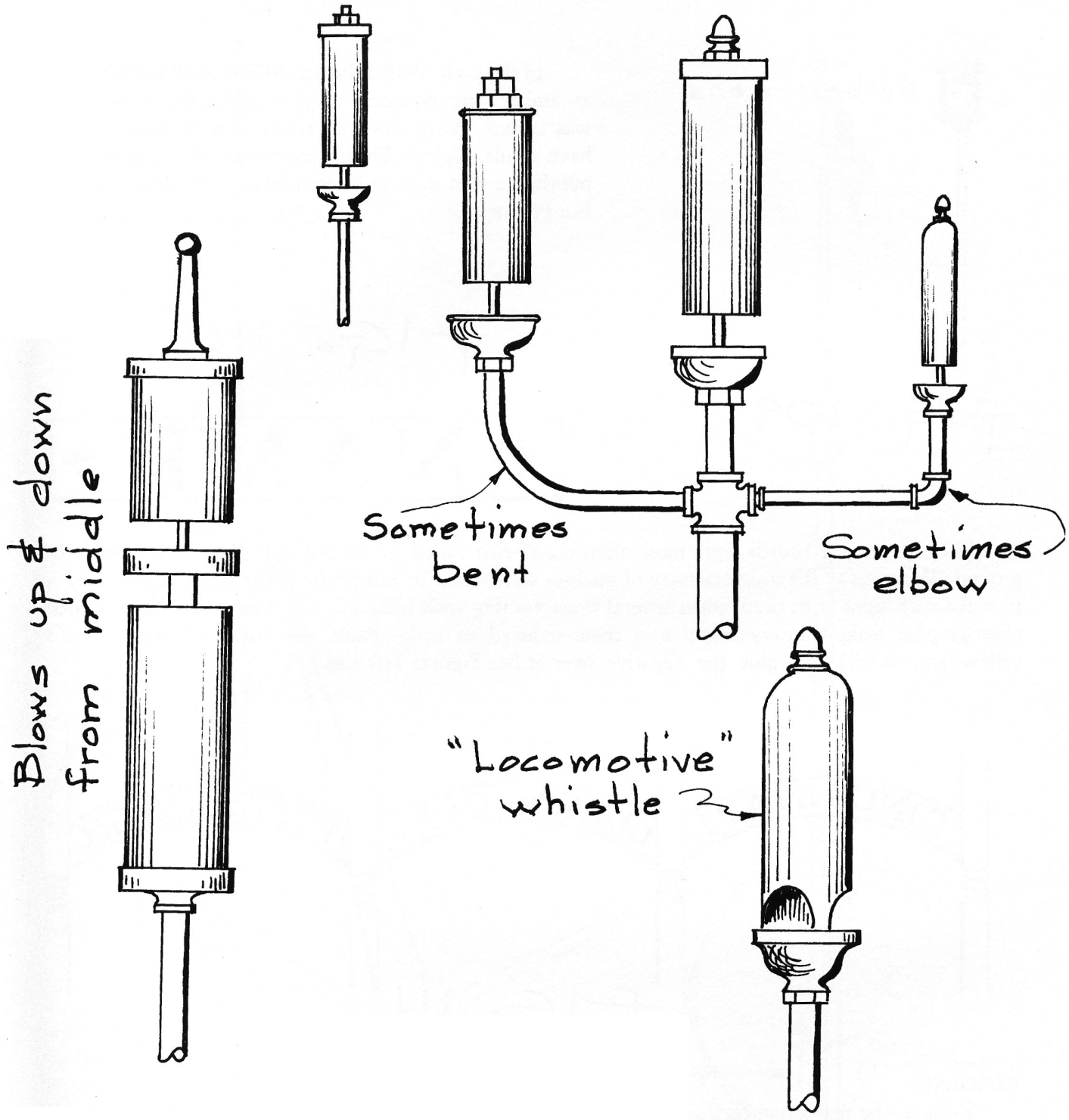


Early example in the museum at Cyfarthfa Castle.

- Adrian Stephens (1795 – 1876) British engineer - Invented the steam whistle about 1833.
- Born in the Penzance area of Cornwall and moved to Merthyr Tydfil, Wales, in 1827 to work at the Dowlais ironworks. The purpose of his invention was to act as a warning device on the boilers.

Riverboat Whistles

- Stephens did not patent the device, and it was adopted by the Liverpool & Manchester Railway after it had been seen in operation at Dowlais in 1835.
- According to *Way's Packet Directory*, the 1844-built REVENUE had the first steam whistle installed on a steamboat. Other sources mention the MINGO CHIEF in the same year.


Blows up & down from middle
Sometimes bent
Sometimes elbow
"Locomotive" whistle

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