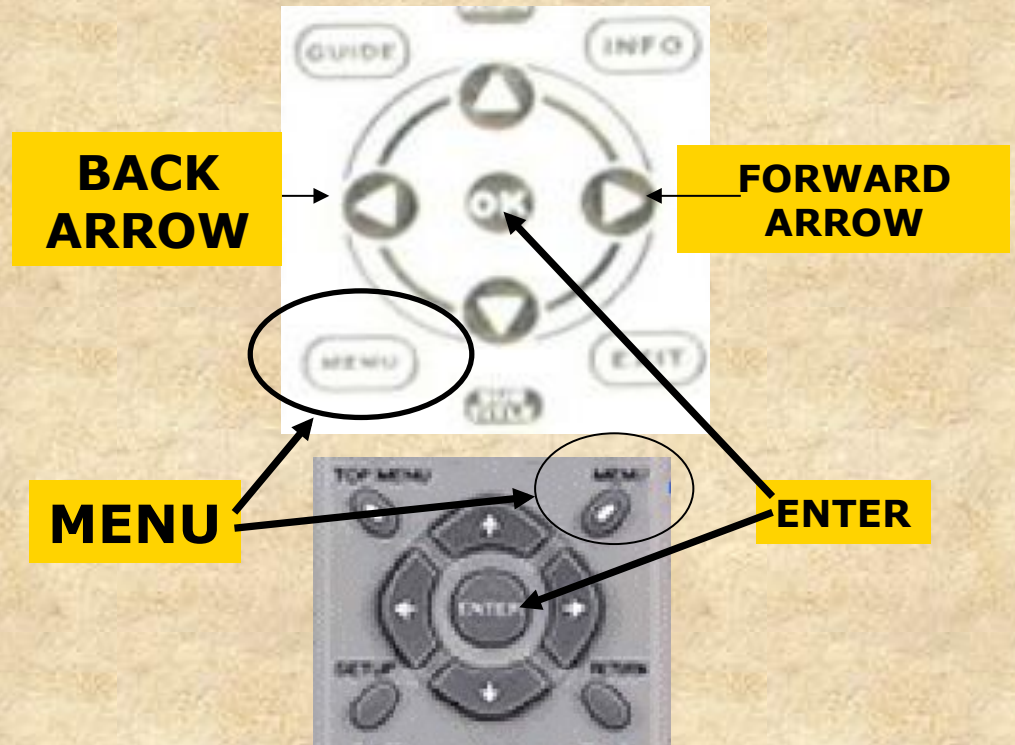


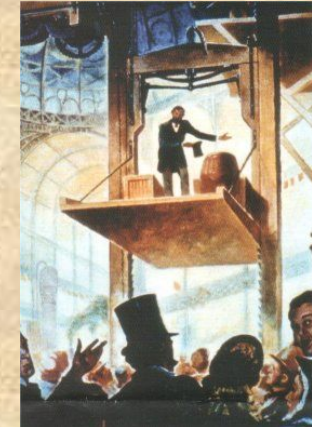
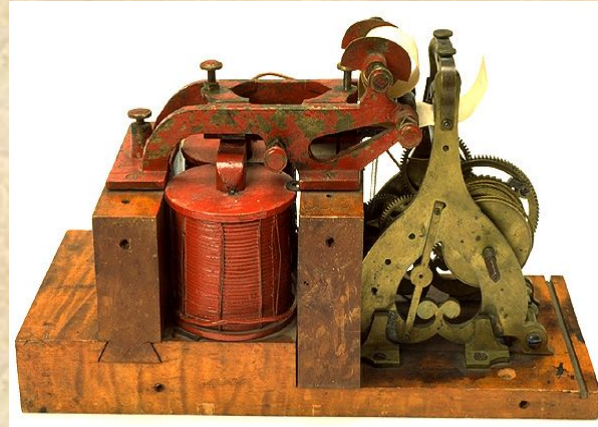
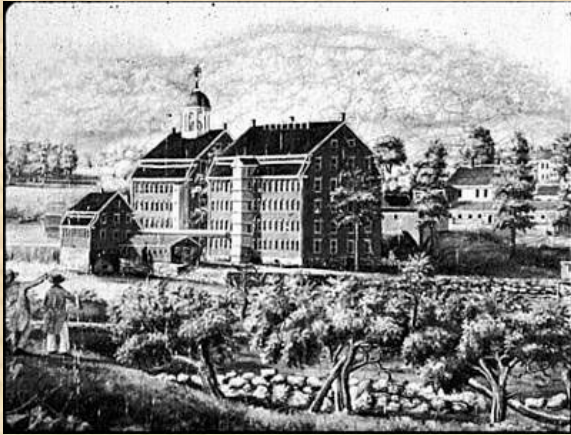
USING YOUR DVD REMOTE CONTROL

Press the MENU button on your remote to return to viewing options menu. If your remote has a TOPMENU button use it to return directly to viewing options first slide.

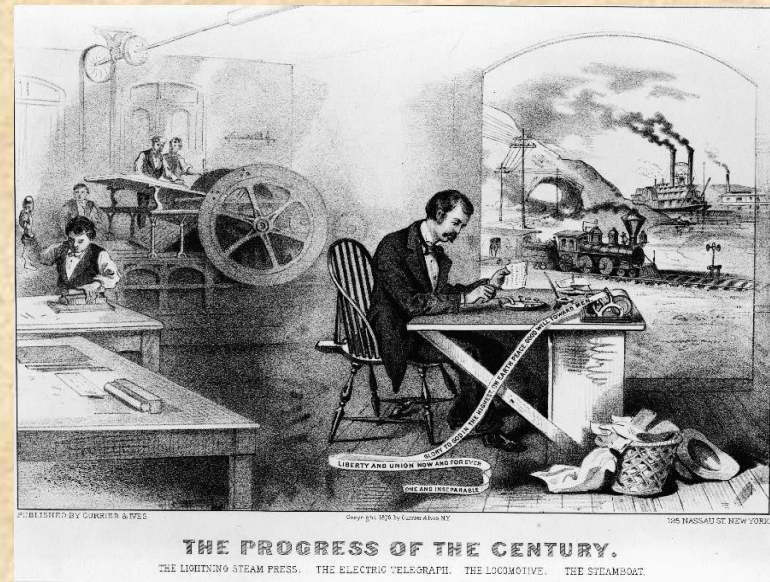
Press the ENTER (Sometimes called "OK") button on your remote to go to the next slide. To go backward, press the back arrow and then press ENTER. You will now go backward through the slides. TO go forward, press the forward arrow and then ENTER.



THE MENU BUTTON MAY BE LOCATED ANYWHERE NEAR THE ARROWS.



FIRST INDUSTRIAL REVOLUTION IN AMERICA: 1790-1860



PRODUCED BY

Multimedia Learning, LLC

<http://www.multimedialearning.org>

WRITTEN BY

HERSCHEL SARNOFF

&

DANA BAGDASARIAN

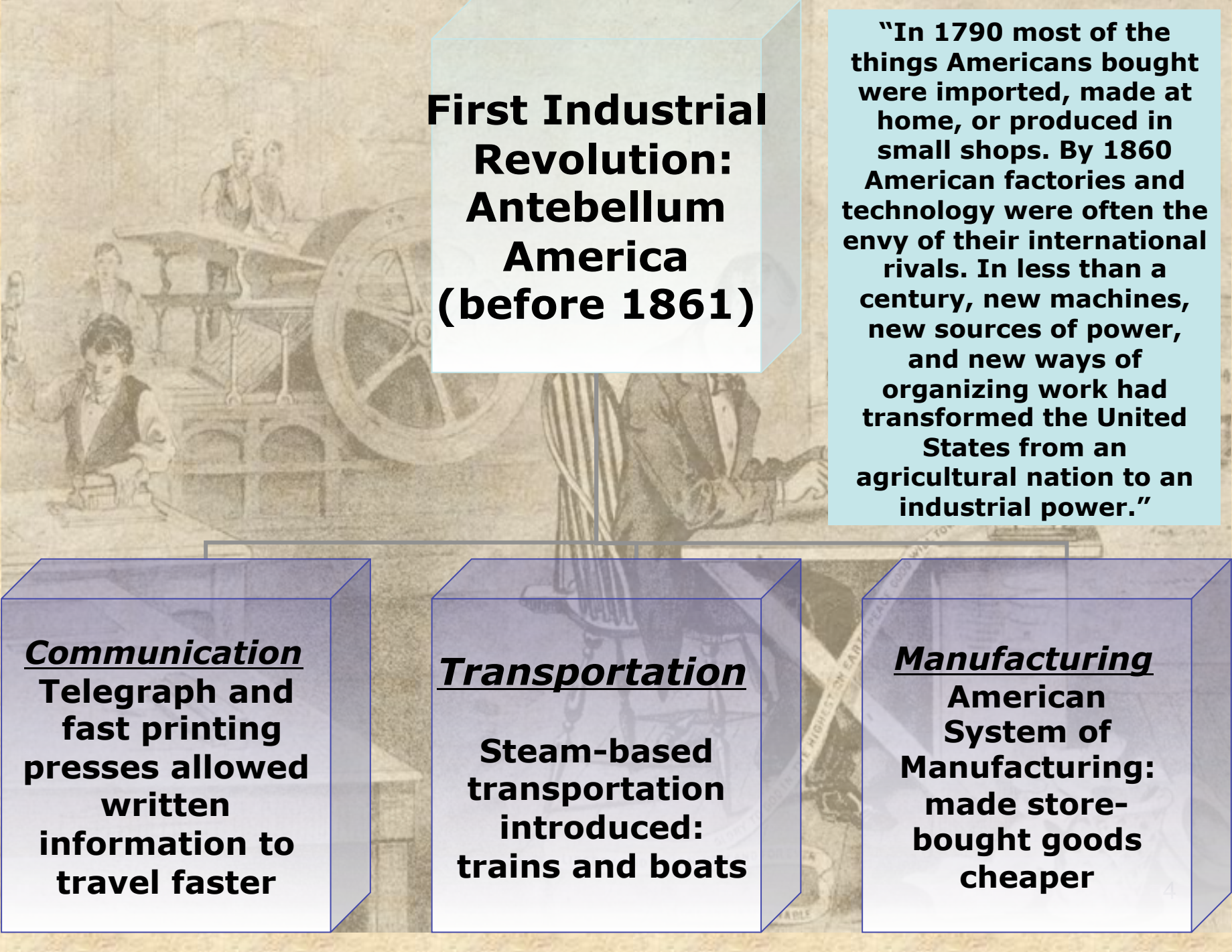
COPYRIGHT 2008

VERSION 1.0

CONTACT INFORMATION:

hsarnoff@gmail.com

danabag@gmail.com



First Industrial Revolution: Antebellum America (before 1861)

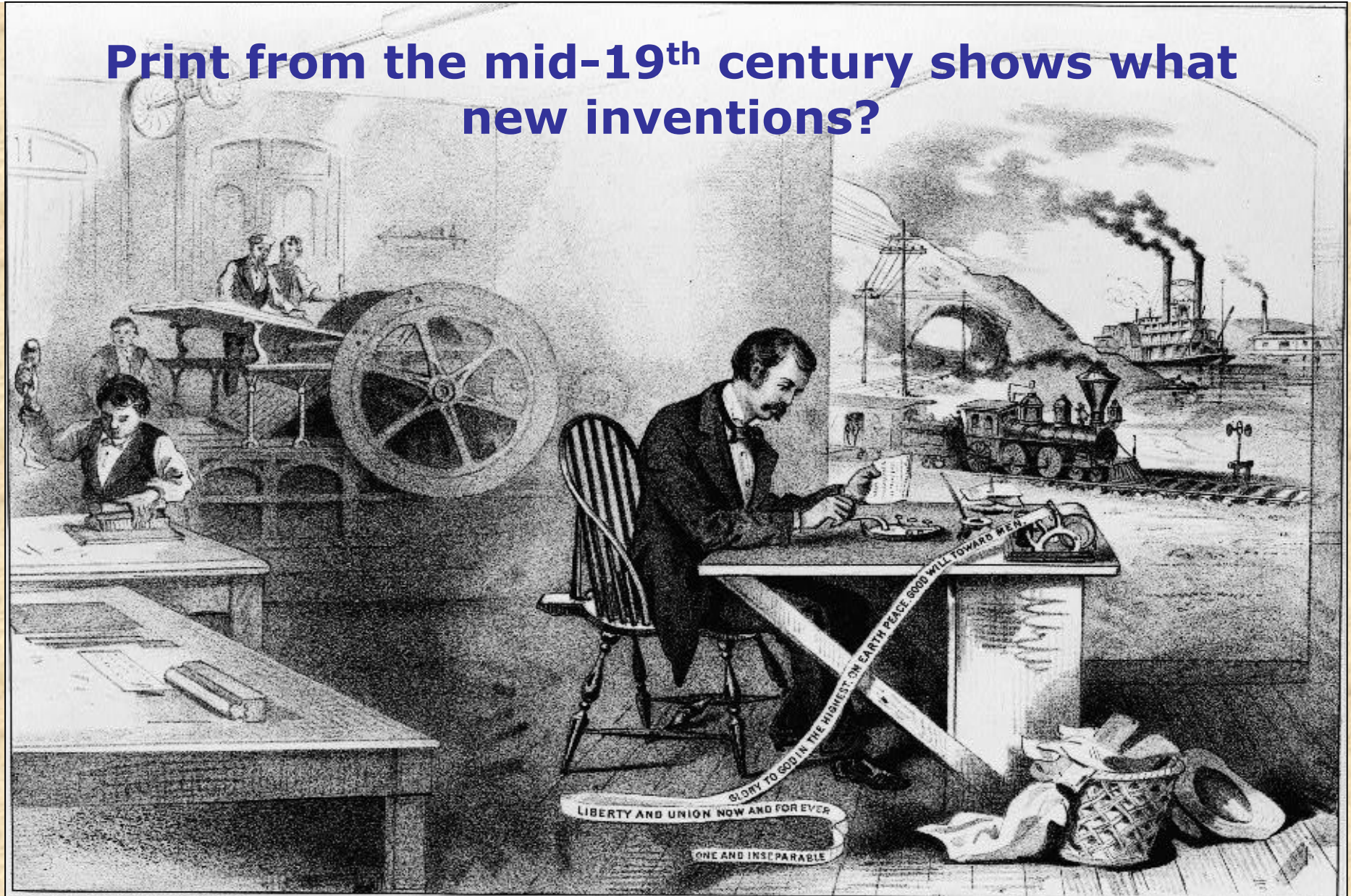
“In 1790 most of the things Americans bought were imported, made at home, or produced in small shops. By 1860 American factories and technology were often the envy of their international rivals. In less than a century, new machines, new sources of power, and new ways of organizing work had transformed the United States from an agricultural nation to an industrial power.”

Communication
Telegraph and fast printing presses allowed written information to travel faster

Transportation
Steam-based transportation introduced:
trains and boats

Manufacturing
American System of Manufacturing:
made store-bought goods cheaper

Print from the mid-19th century shows what new inventions?



PUBLISHED BY CURRIER & IVES

Copyright 1876 by Currier & Ives NY

125 NASSAU ST. NEW YORK.

THE PROGRESS OF THE CENTURY.

THE LIGHTNING STEAM PRESS. THE ELECTRIC TELEGRAPH. THE LOCOMOTIVE. THE STEAMBOAT.

Table of Contents

Roots of Industrial Revolution.....[Slide 7](#)

Industrial Revolution begins in U.S.....[Slide 27](#)

Advances in transportation.....[Slide 58](#)

North and South diverge economically.[Slide 118](#)

Factory system.....[Slide 127](#)


Inventors of the antebellum period.....[Slide 167](#)


Roots of Industrial Revolution


- ❖ **Impact of Agricultural Revolution**
- ❖ **Industrial Revolution defined**
- ❖ **Inventors and innovations from Britain**




The Agricultural Revolution

 **The Agricultural Revolution began in Britain during the 18th century.**

 **The Agricultural Revolution created a huge increase in food production with fewer farmers. This led to population growth, providing workers for the Industrial Revolution that followed.**

 **There were many factors that caused the Agricultural Revolution, including: the enclosure system, new agricultural tools and inventions, use of fertilizers and nitrogen-fixing crops, and the development of agrarian capitalism.**

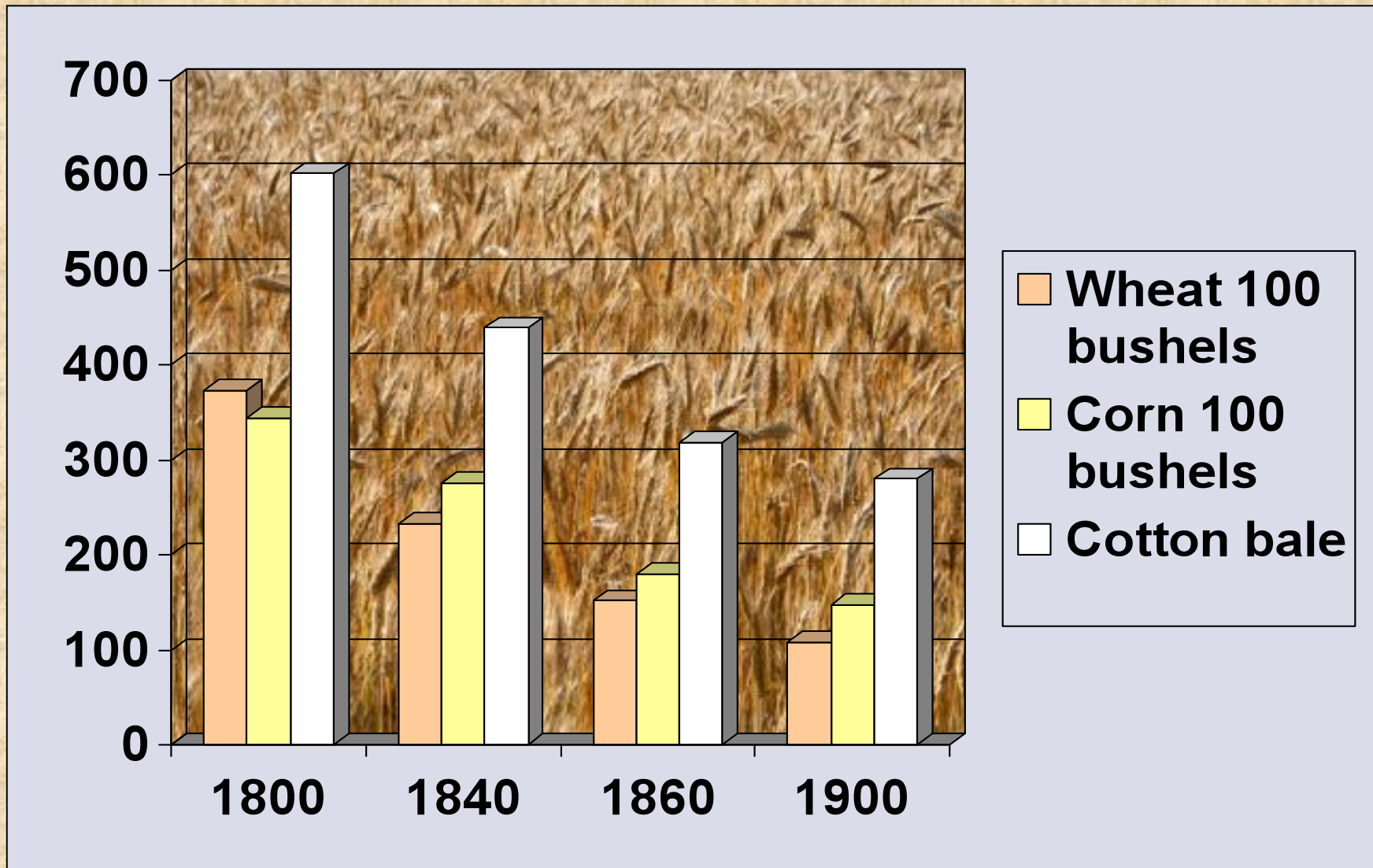
 **The Agricultural Revolution directly contributed to the Industrial Revolution because there was now surplus food to feed workers in the new factories. No longer would the majority of the population earn their living from farming.**

18th-century grist mill, where grain is ground into flour.



The Glade Creek Grist Mill by Gabor Eszes

Chart shows the reduction in the number of labor hours needed to produce crops as a result of the Agricultural Revolution



The Industrial Revolution started in Great Britain during the 18th century

A series of inventions for the textile (cloth and cloth products) industry led to the creation of factories. Previously much of the work was done in homes or small workshops.

Key inventors were:

🇬🇧 John Kay

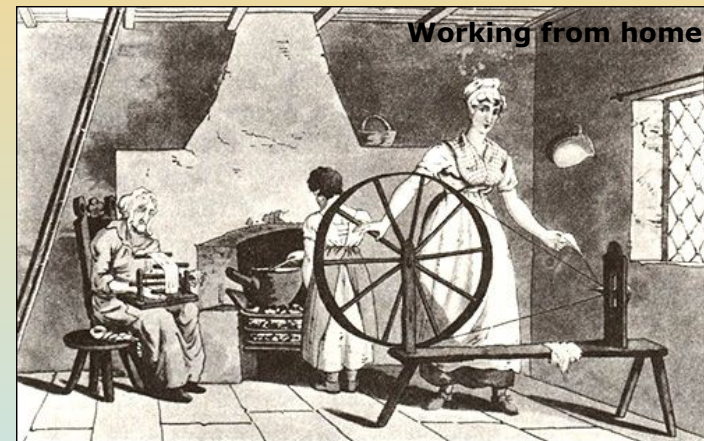
🇬🇧 James Hargreaves

🇬🇧 Richard Arkwright

🇬🇧 Samuel Crompton

🇬🇧 Edmund Cartwright

🇬🇧 Thomas Savery, Thomas Newcomen, James Watt



Why do you think textiles were the first mass-produced item of the Industrial Revolution?

Industrial Revolution defined



Beginning in the late 18th and early 19th centuries, power-driven machinery was invented to manufacture goods.



This fundamentally changed the ways agriculture, manufacturing, and transportation were done.



The Industrial Revolution had a profound effect on socioeconomic and cultural conditions in Britain and later spread throughout Europe, North America and eventually the world.



The Industrial Revolution is a major turning point in human history, comparable to the invention of farming or the rise of the first city-states. Almost every aspect of daily life and human society was transformed.

Steps in making fiber and wool into cloth/ textiles:

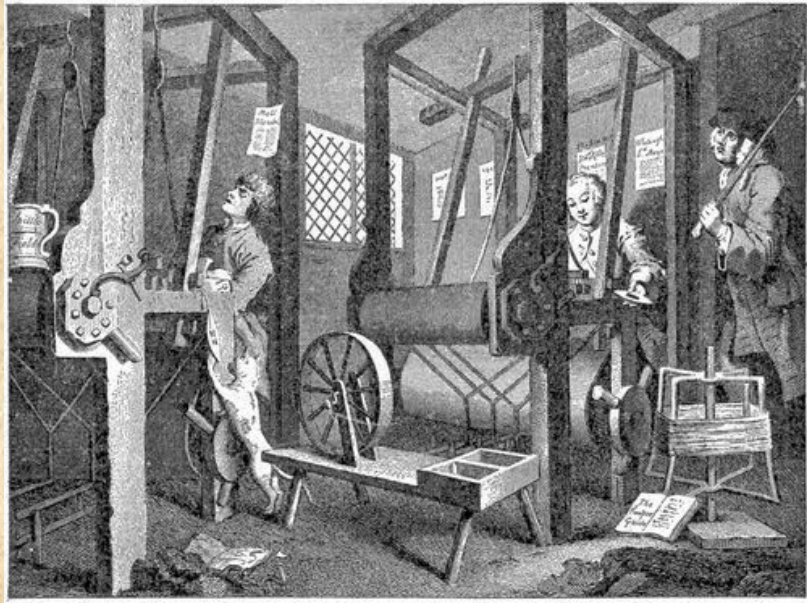
1. Harvest and clean the fiber or wool
2. Card and spin into thread
3. Weave the thread into cloth
4. Sew the cloth into final products like clothes, blankets, rugs, handkerchiefs



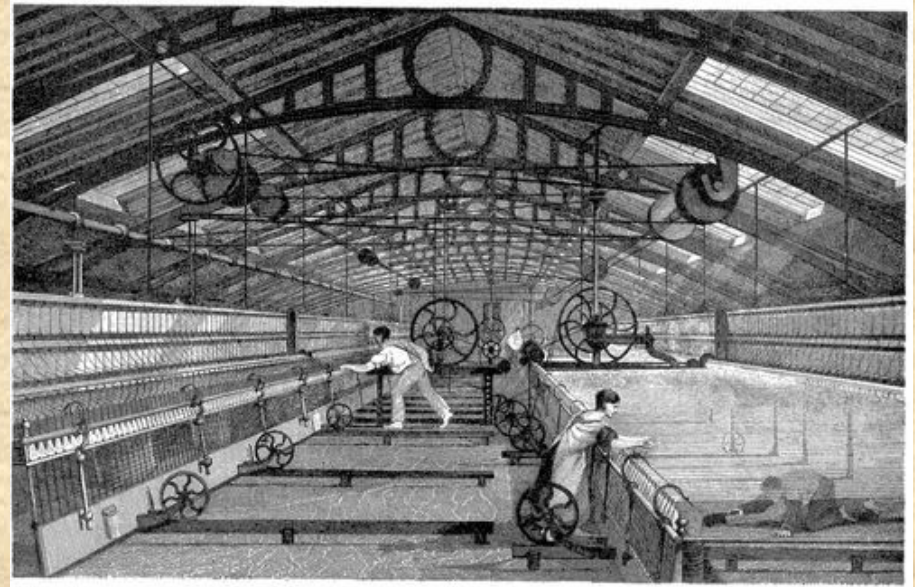
**19th-century carding
machine**



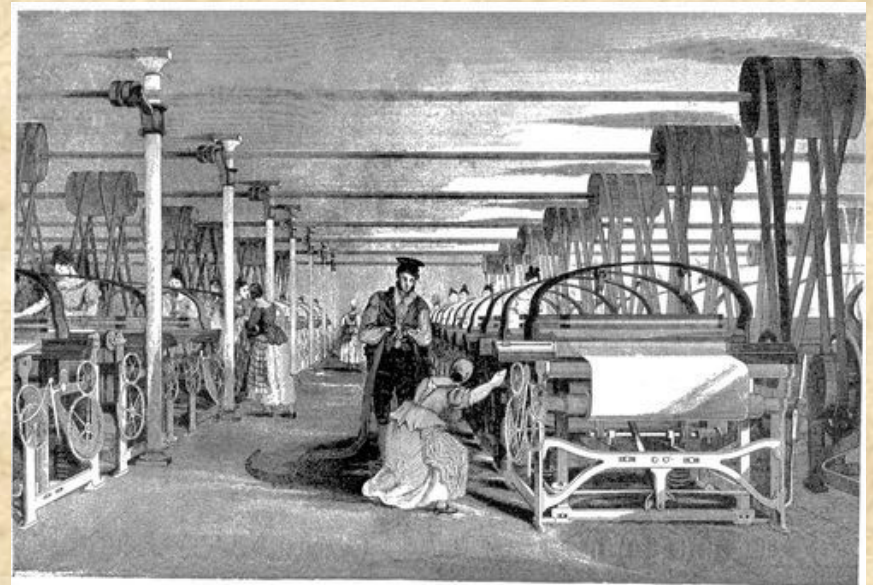
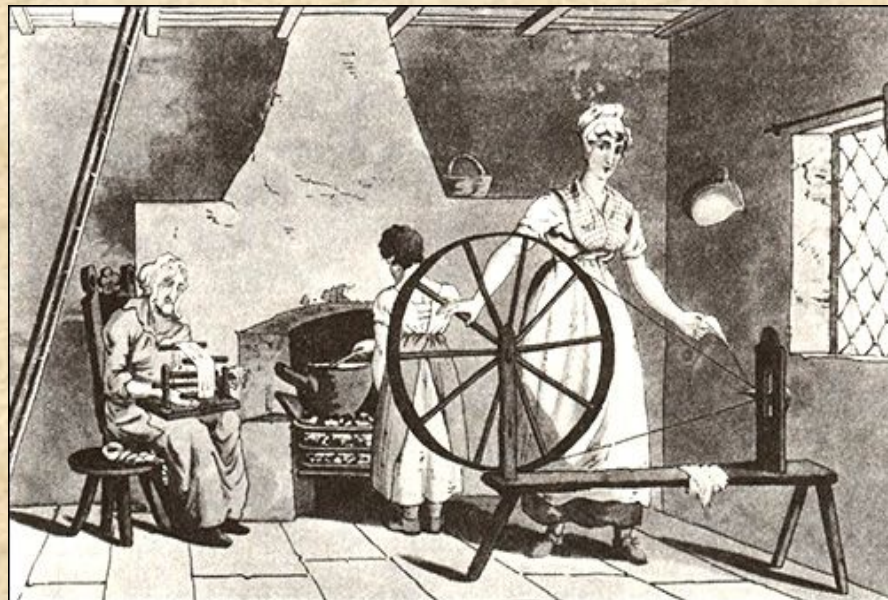
Home weaving machine







Before

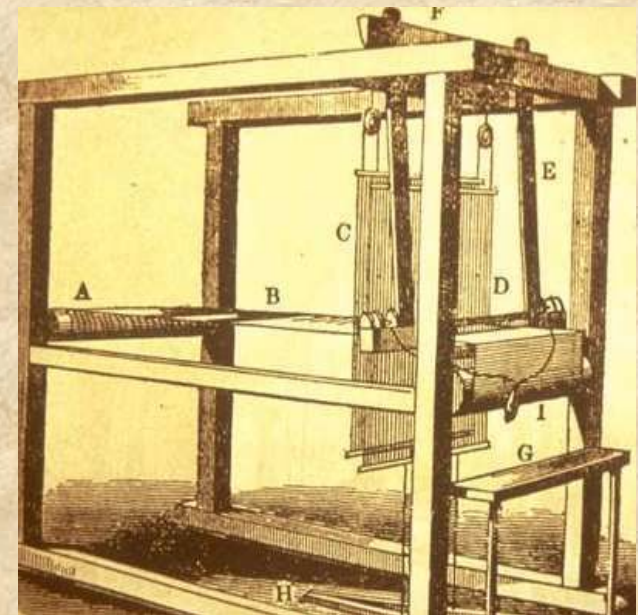
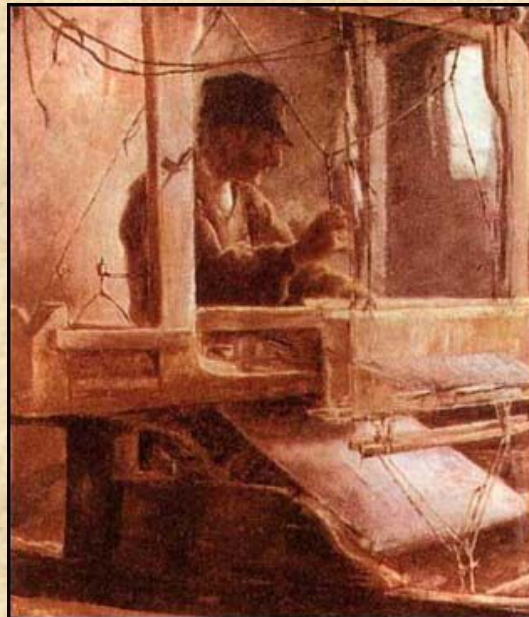


After



John Kay (1704-1764)

-  Invented the *flying shuttle* in 1733.
-  Flying shuttles improved looms and greatly increased the output of weavers.
-  Some weavers who feared the flying shuttle would put them out of work damaged Kay's home and workshop.
-  His invention, however, was a great success with the textile industry and was soon copied, ruining Kay financially.



James Hargreaves (1720-1788)



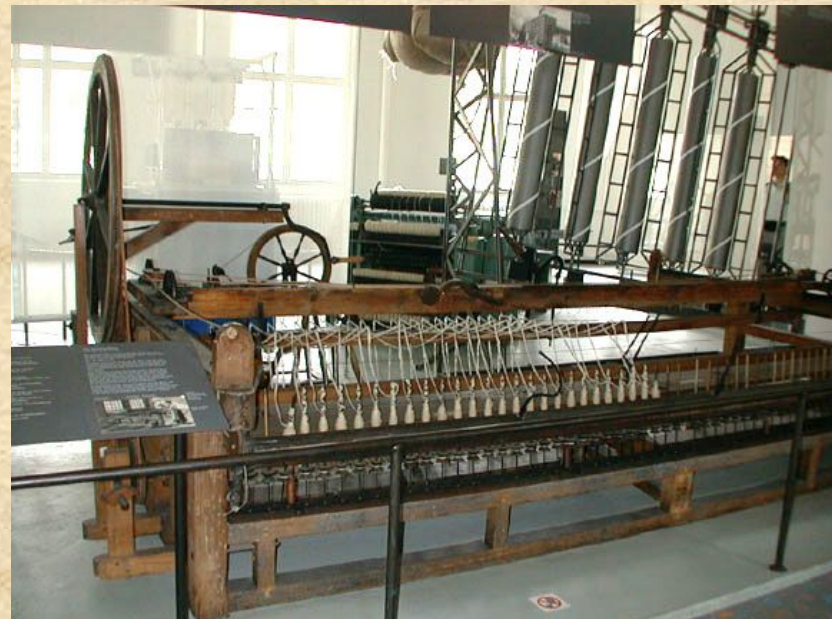
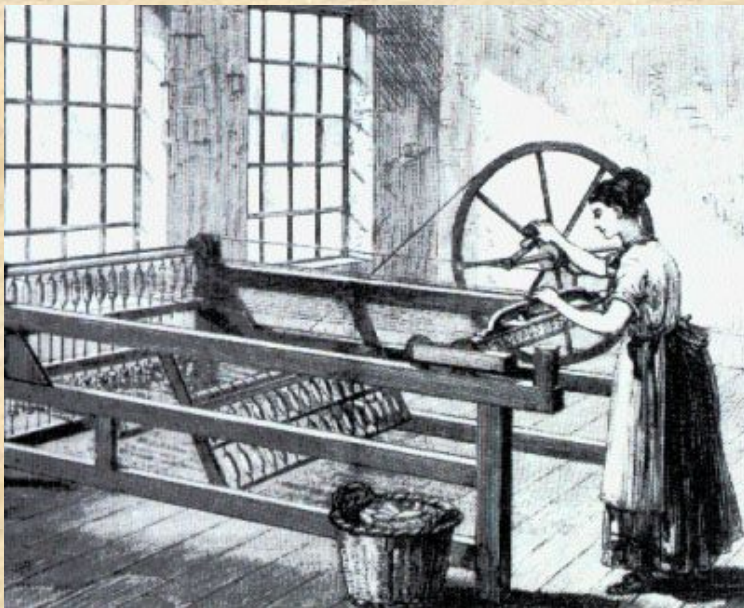
Given credit for the invention of the *spinning jenny*. Many scholars believe that the original inventor was Thomas Highs and that Hargreaves was responsible for making major improvements to Highs' invention.



The *spinning jenny* enabled one person to do the work of eight spinning wheels.




Like John Kay, Hargreaves' home and workshop were attacked and his invention was copied and improved upon.






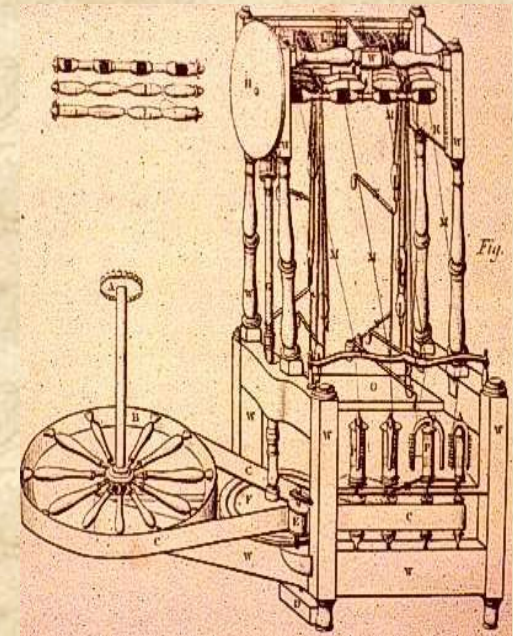
[Spinning jenny demonstration, click to view](#)

Richard Arkwright (1732-1792)

 Built the first water-powered cotton-spinning mill in 1771.

 His invention, known as the *water frame*, began the process that moved textile production from home to factory.

 He became very wealthy, and members of his family married into British aristocracy.



Samuel Crompton (1753-1827)

Invented a machine that combined Hargreaves' *spinning jenny* with Arkwright's *water frame* in 1779.

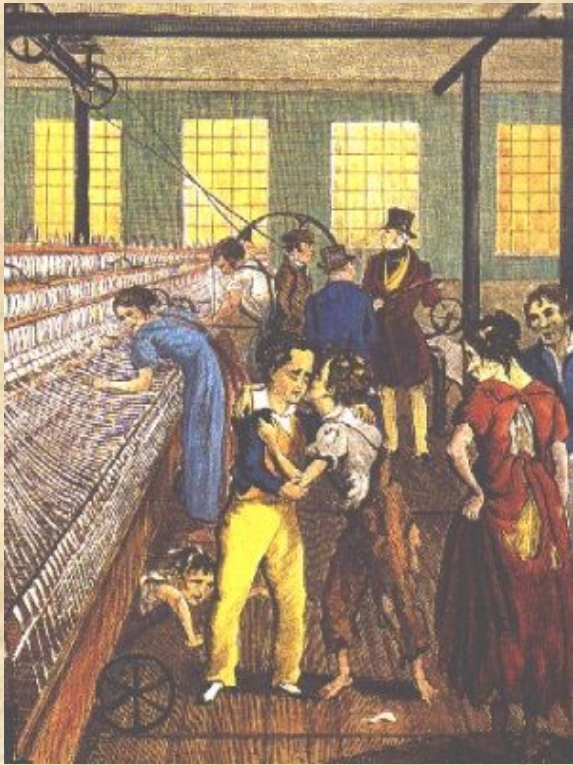
His invention, the *spinning mule*, had a great impact on the spinning industry. It could produce stronger and finer yarns, and when powered by steam engines could spin thousands of spindles at once.

Crompton also faced danger from machine-breakers and had to hide his machine for a time.



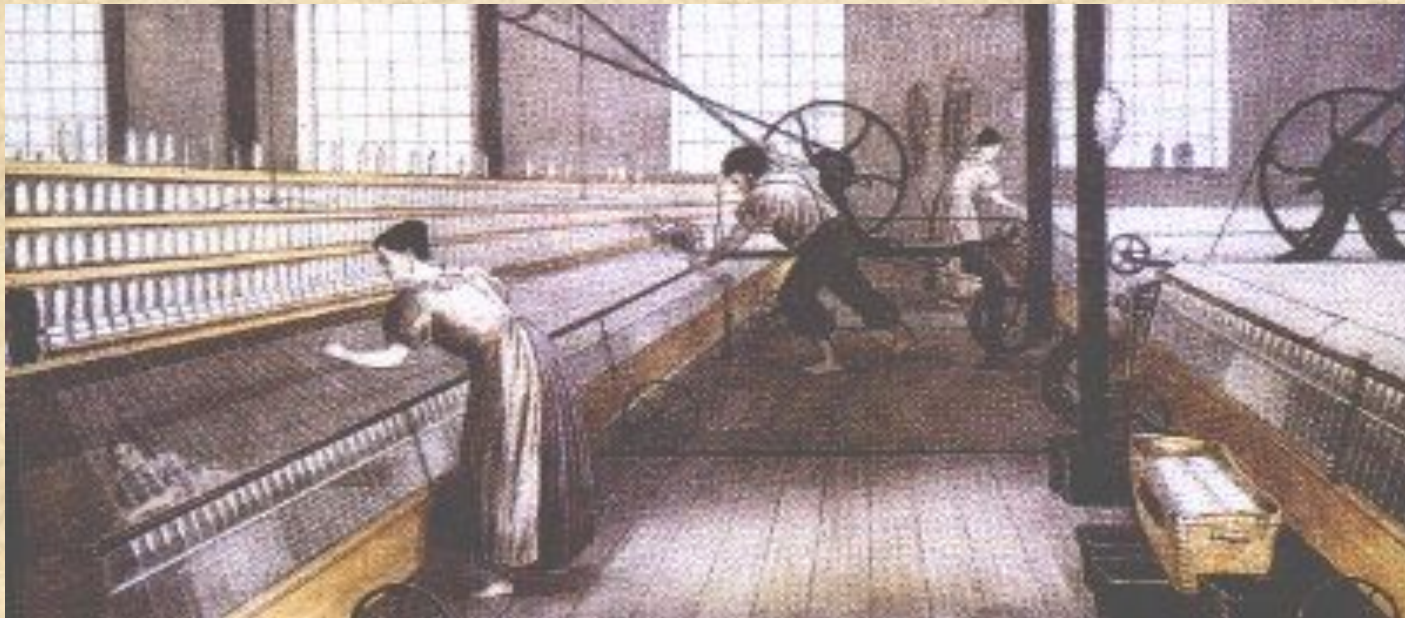


Click to see how a *spinning mule* machine works



**The *spinning mule* in
1840.**

**Notice that women and
small children worked
in factories, often
under hazardous
conditions.**



Edmund Cartwright (1743-1823)



Inspired after viewing the water frame, he invented the *power loom* in 1787, which used steam engines to power a mechanical weaving machine.



Made very little money from his invention because the factory that installed his machines was destroyed by workers who feared losing their jobs.



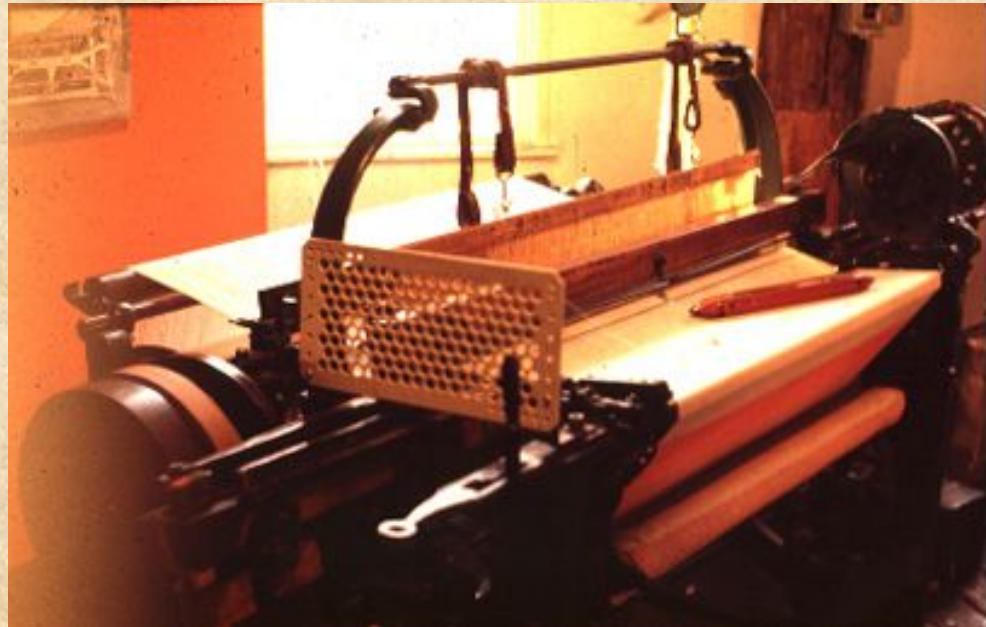
Later his invention was copied by many mill owners.



To show their appreciation for his invention, the British Parliament gave him a large sum of money in 1809.



Library of Congress



Steam Power



Using water as a power source had various disadvantages: the factory had to be built near running water and the water wheel could not work during freezing weather.



The steam engine allowed factories to be built anywhere because they did not need flowing water.



The first successful steam engines were developed by Thomas Savery and Thomas Newcomen in the early 18th century.



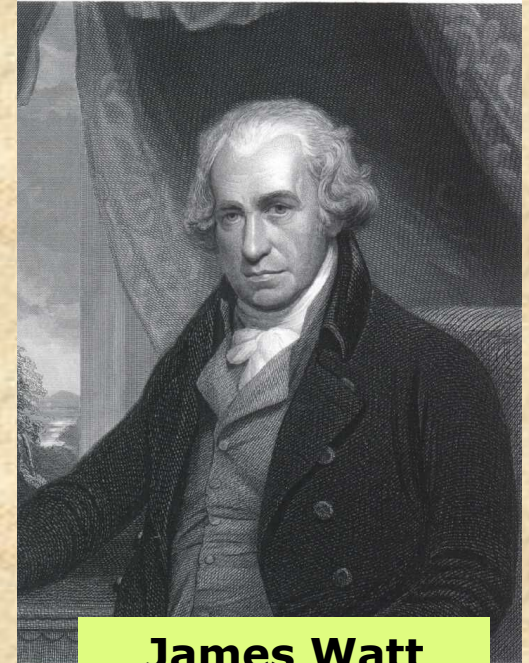
In 1781, James Watt developed a compound steam engine after improving the earlier Newcomen engine in 1769.



In 1790, steam-powered textile factories were built.

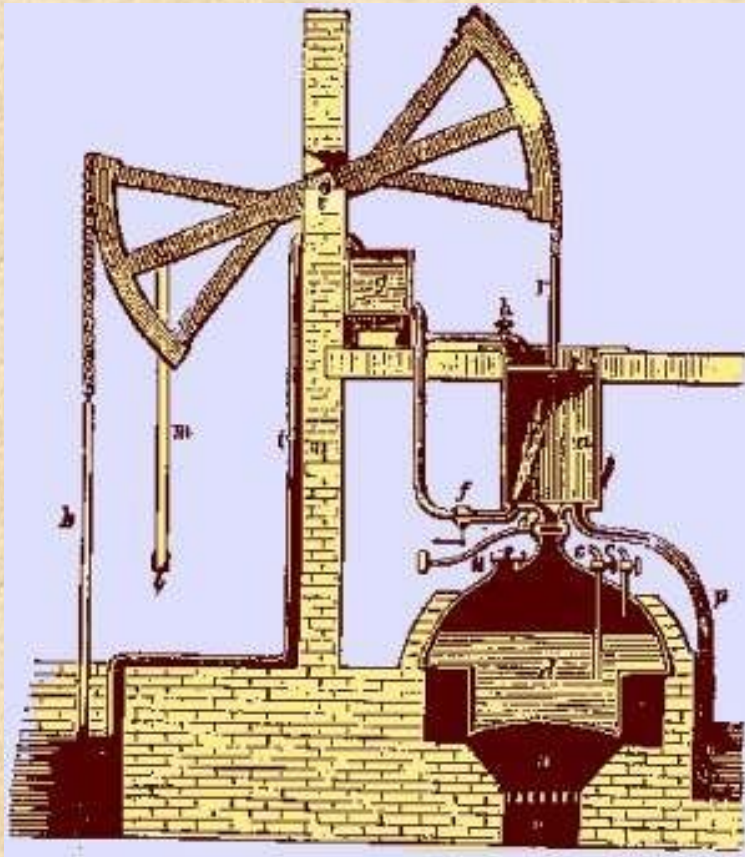


Thomas Savery

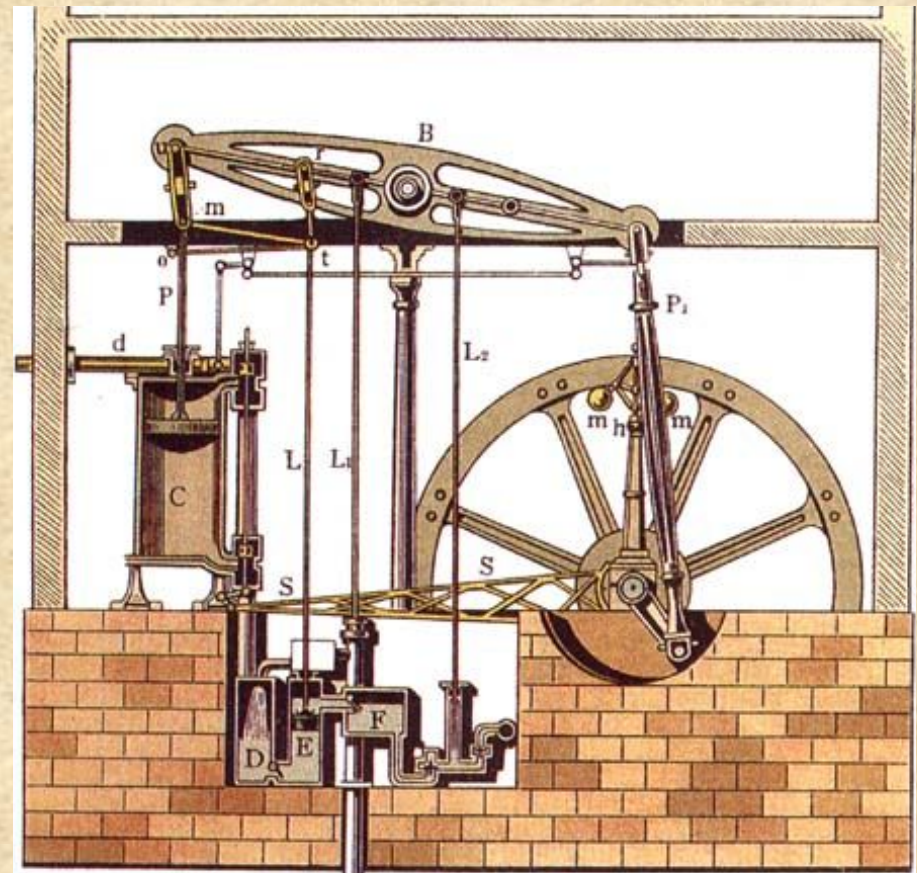


James Watt

The steam engine was crucial to the progress of the Industrial Revolution. For the first time, a portable power source could be used to power factories anywhere, freeing them from the limitations of water power. By the early 19th century, steam engines were used for land and sea transport.



Newcomen steam engine, 1705



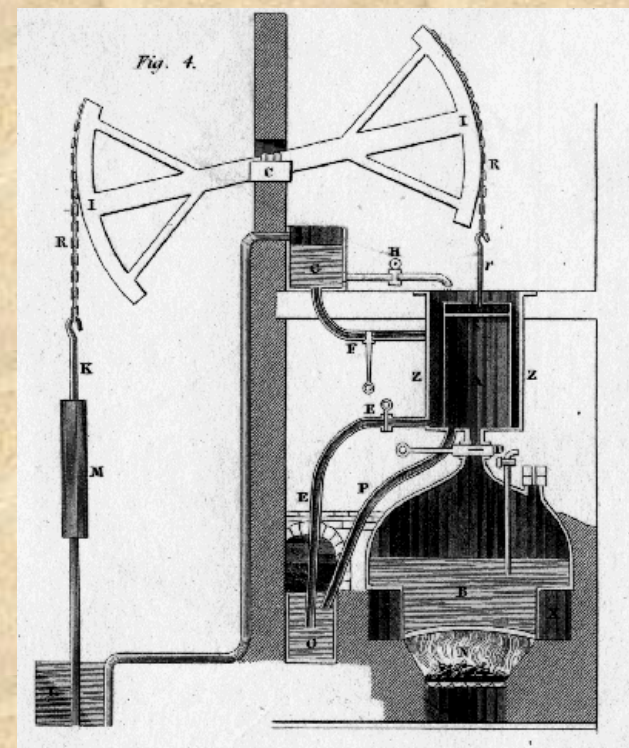
Watt's steam engine, 1784



Watt steam engine

The *Quarterly Review of London* wrote in 1830 about steam engines:

“Unlike muscle power, it never tired or slept or refused to obey. Unlike waterpower, its immediate predecessor, it ran in all seasons and weathers, always the same. Unlike wind, it responded tractably to human will and imagination: turning on and off, modulating smoothly from the finest delicacy to the greatest force, ever under responsive control. It is impossible to contemplate, without feeling exultation, this wonder of the modern art.”



THE INDUSTRIAL REVOLUTION COMES TO AMERICA

- ❖ **Early inventors: John Fitch, Oliver Evans, John Stevens**
- ❖ **Samuel Slater**
- ❖ **Eli Whitney**
- ❖ **John H. Hall**



18th-century American inventors and innovators timeline

1784: Oliver Evans built an automated milling plant.

1786: John Fitch built a model steam-powered boat operated by six pairs of mechanical oars.

1787: John Fitch made a first successful trial of his steamboat on the Delaware. In 1790, he began passenger service from Philadelphia with an improved steamboat.

1789: Samuel Slater escaped England in disguise and arrived in New York with spinning-machine technology.

1790: Slater, Brown, and Almy opened the first water-powered cotton-spinning mill on Blackstone River at Pawtucket, Rhode Island. Often called the beginning of the American Industrial Revolution.

1792: George Anschutz opened America's first blast furnace in Pittsburgh.

1793: Eli Whitney patented the cotton gin.

Oliver Evans (1755-1819)



Evans' most important invention was an automated grist mill (place where grains are ground into flour).



Made improvements in the textile industry.



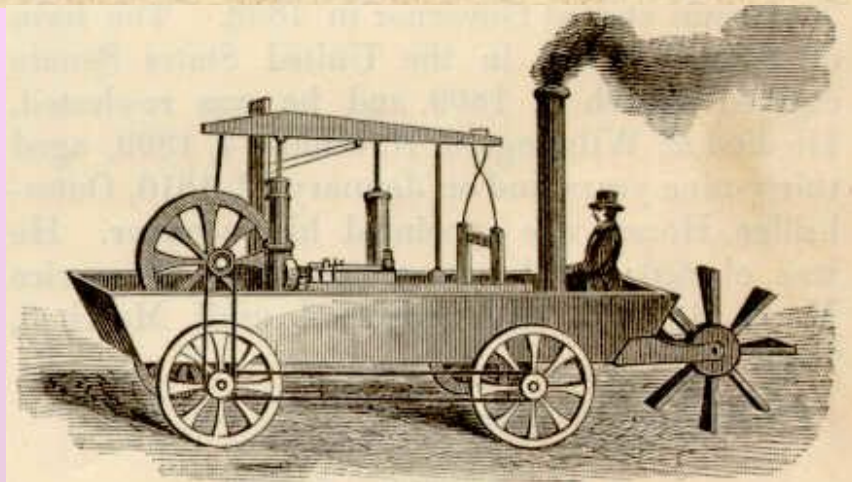
Developed and improved a high-pressure steam engine.



Designed several land and water vehicles that used his high-pressure steam engine for propulsion.



Like most early American inventors, he was ahead of his time and could not find backers for his advanced mechanical projects.

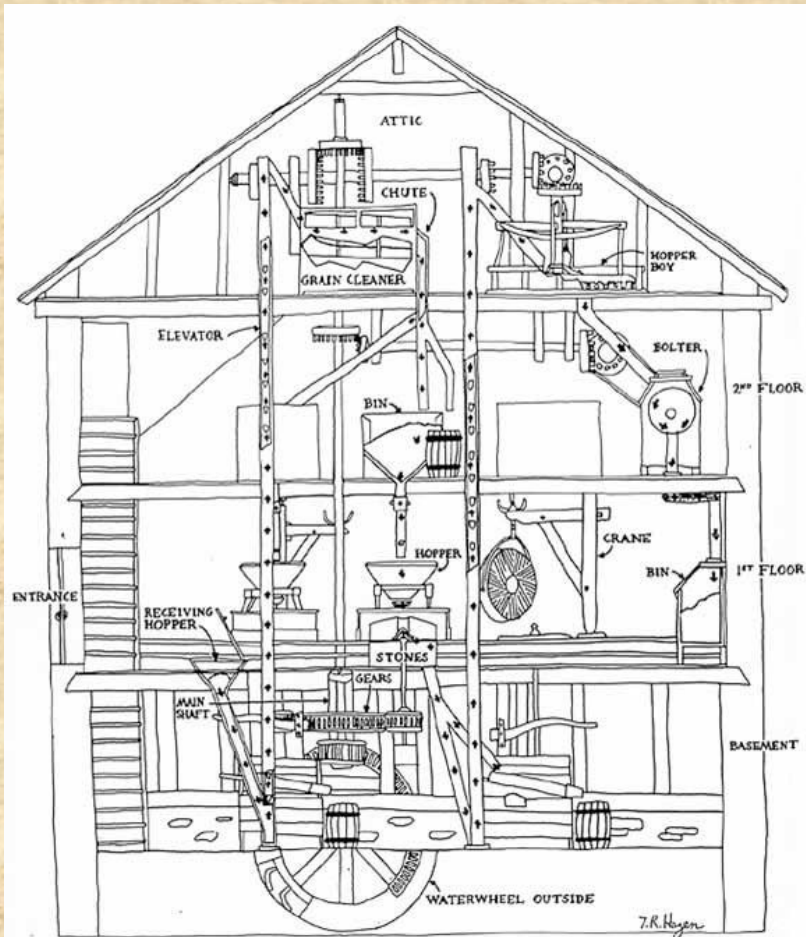


OLIVER EVANS' STEAM CARRIAGE.

Oruktor Amphibolos: Evans' steam dredge

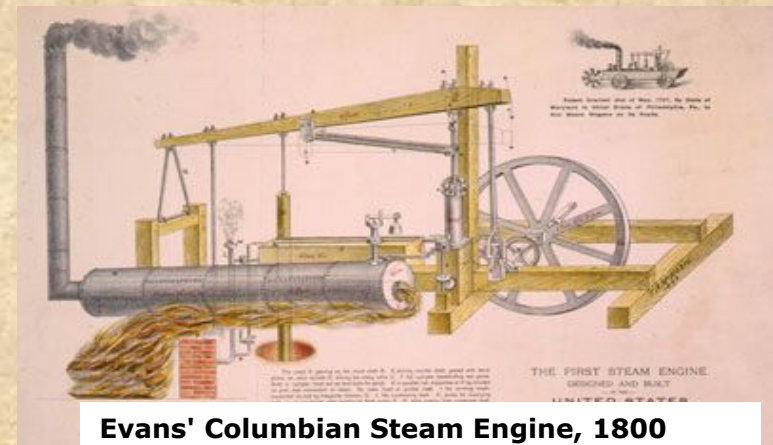


Oliver Evans



“The time will come when people will travel in stages moved by steam engines from one city to another, almost as fast as birds can fly, 15 or 20 miles an hour.... A carriage will start from Washington in the morning, the passengers will breakfast at Baltimore, dine at Philadelphia, and sup in New York the same day.... Engines will drive boats 10 or 12 miles an hour, and there will be hundreds of steamers running on the Mississippi....”
Oliver Evans, 1800

His most important invention was an automated grist mill, which operated continuously through the use of bulk material handling devices including bucket elevators, conveyor belts, and Archimedean screws.



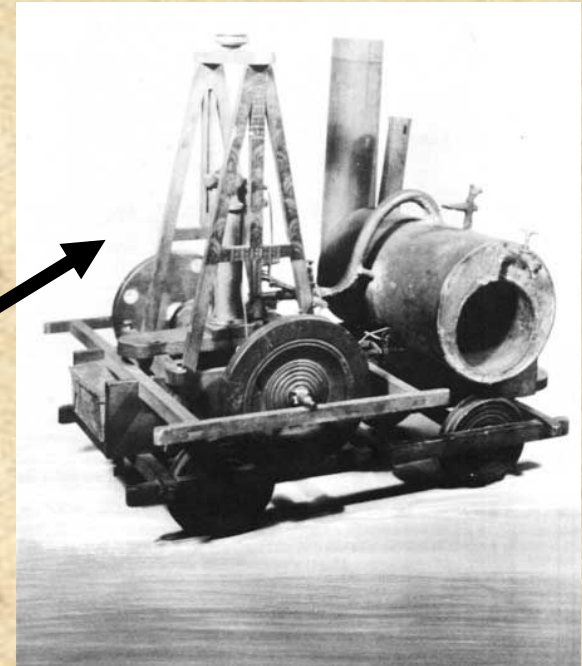
Evans' Columbian Steam Engine, 1800

John Fitch (1743-1798)

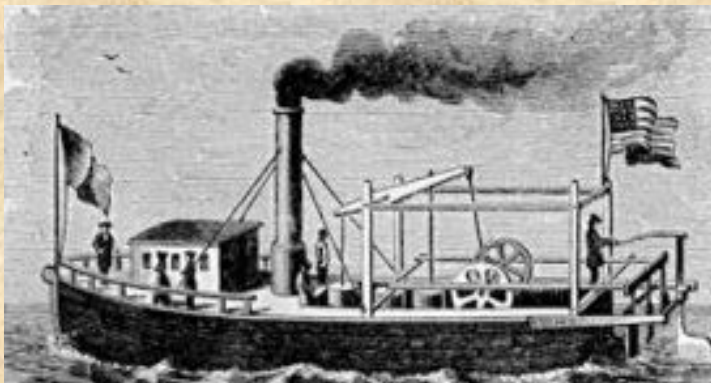
 **Skilled craftsman and inventor who built the first steamboat in America in 1786.**

 **He also invented a small steam locomotive and demonstrated it to George Washington and his cabinet.**

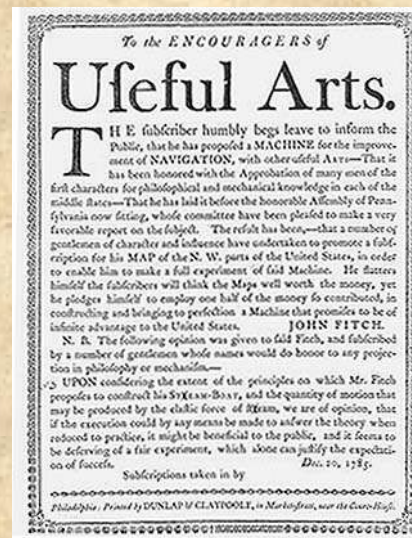
 **Fitch was ahead of his time and an agricultural U.S. was not ready for his inventions.**



Fresco of John Fitch

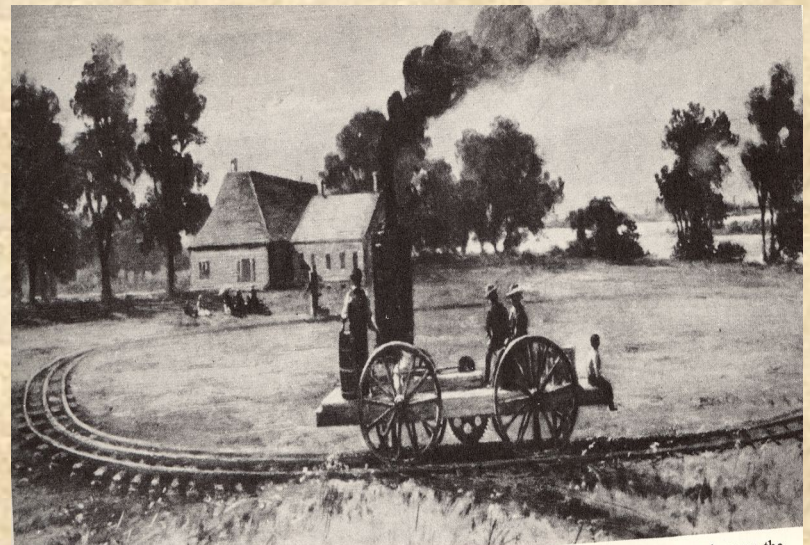
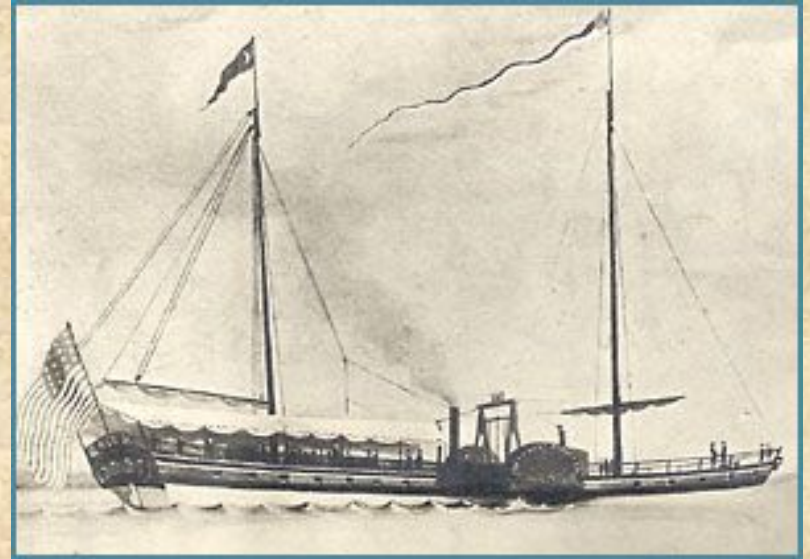


Fitch's steamboat and announcement handbill asking for money from investors.



John Stevens (1749-1838)

- Z Stevens was a wealthy, socially prominent inventor.**
- Z He encouraged Americans to develop steam power for use on both land and water.**
- Z His ship, the Phoenix, was the first steamboat to travel the ocean.**
- Z In the 1820s, he built a small train on his estate in New Jersey that ran on circular tracks reaching speeds of twelve miles per hour.**
- Z His sons became railroad pioneers, making many improvements to railroad technology.**



Samuel Slater (1768-1835)

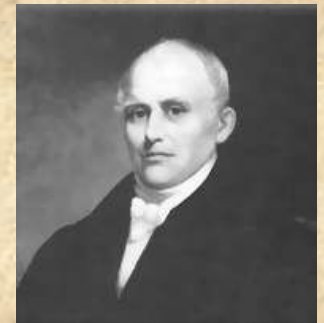
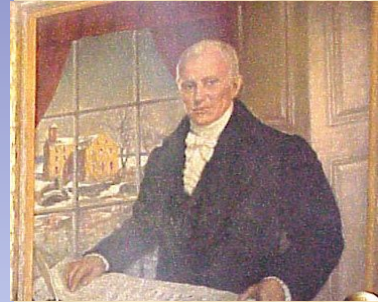
“Father of the Industrial Revolution in the U.S.”

■ **Born in England in 1768. He was apprenticed to a partner of Arkwright’s for eight years, during which time he became superintendent of the cotton mill and learned how the Arkwright machines and mill operated.**

■ **In 1789, Slater decided to emigrate secretly to America. The British government had laws forbidding skilled mechanics from leaving.**

■ **While the textile industry was long established in Great Britain, it was just starting in America. Slater believed he could become wealthy in America's infant textile industry.**

■ **Slater was not the first immigrant with textile experience, but he was the first who knew how to build and operate textile machinery.**





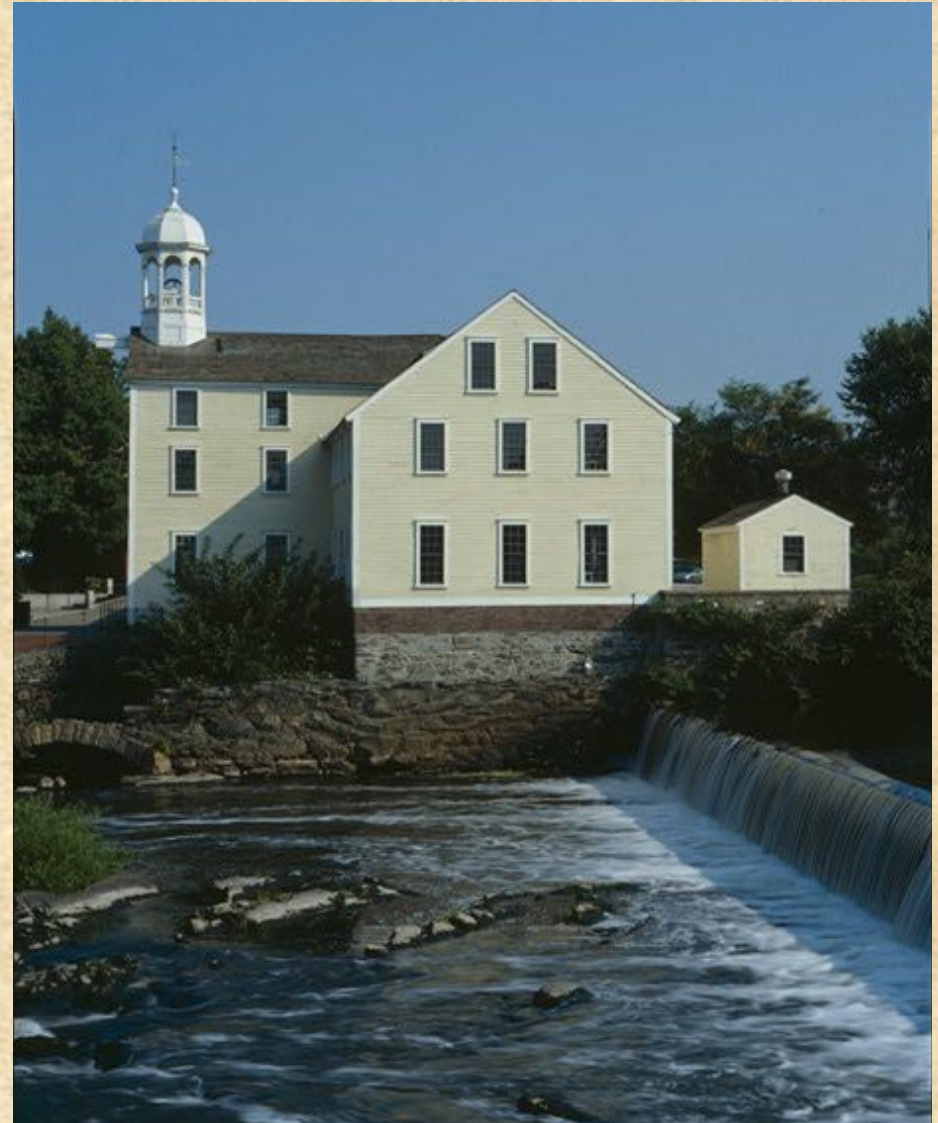
By 1790, Slater and his partners built one of the first factories in America on the Blackstone River in Rhode Island.



In 1793, they built Slater Mill, the first American factory to successfully produce cotton yarn with water-powered machines.



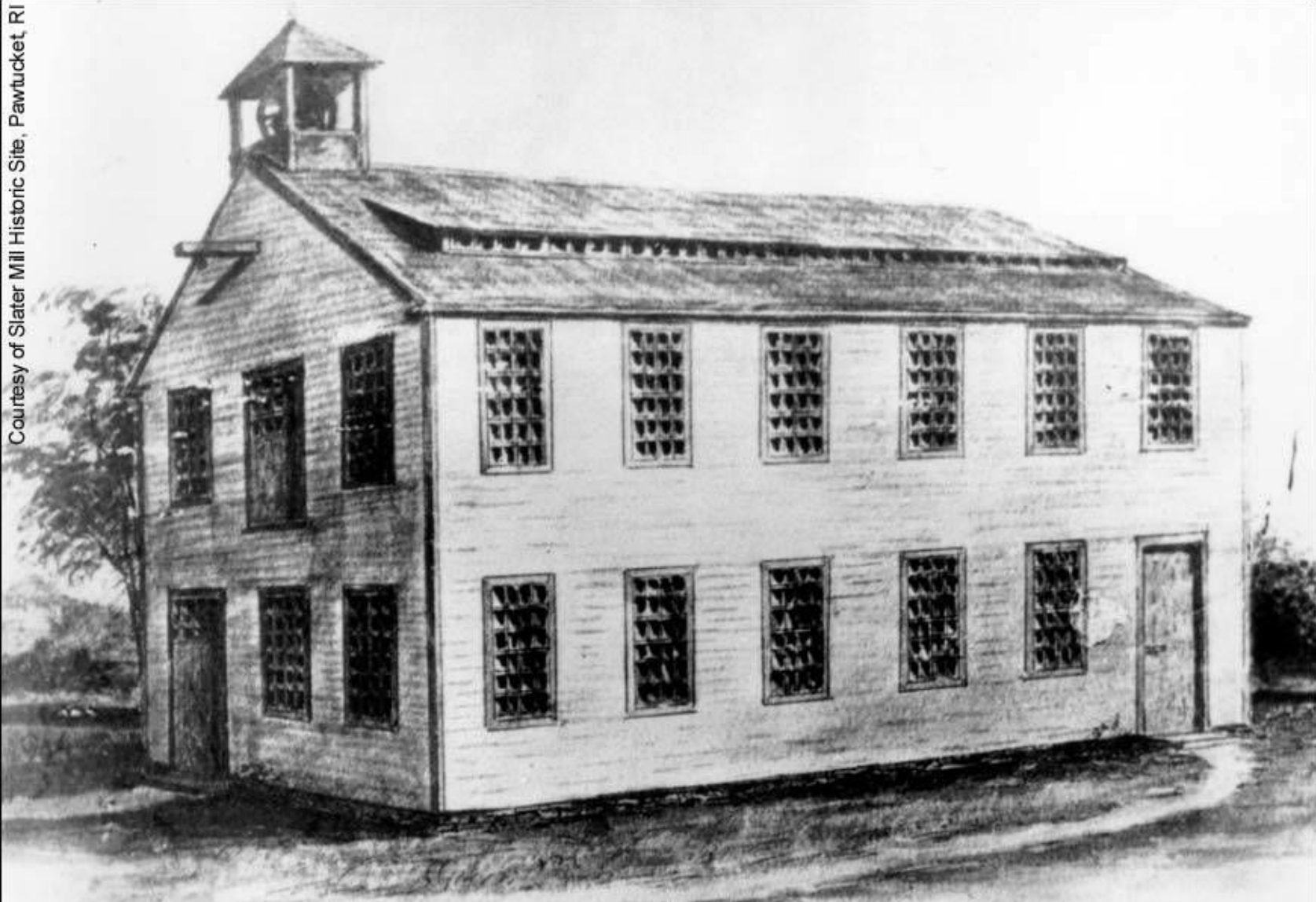
Within a few years there were hundreds of mills/factories turning out cotton yarn.



**Water power demonstration website:
you must be on the internet.**

<http://www.nps.gov/lowe/photosmultimedia/waterpower.htm>

Courtesy of Slater Mill Historic Site, Pawtucket, RI



The Old Slater Mill, Pawtucket Rhode Island. ∞

Built by Samuel Slater in 1793, and in which was first introduced in America the spinning of Cotton by machinery.



CARDING, DRAWING, AND ROVING AS IT WAS IN SAMUEL SLATER'S EARLY MILLS
(From an old engraving)

**Slater's mill
replaced this
with this**

Inside Slater Mill



Slater Mill today




Eli Whitney (1765-1825)


- * American inventor and entrepreneur**
- * Invented the cotton gin**
- * Popularized the system of interchangeable parts**
- * His innovations greatly impacted American history**



Cotton gin

 Cotton is an ancient crop first grown in both South America and India over 6,000 years ago.

 Only rare sea island or long-staple cotton could be grown profitably before Eli Whitney's invention.

 Short-staple cotton, a species that could be grown in wider areas, was unsuitable because it contained hundreds of seeds that had to be removed by hand.

 Eli Whitney invented a machine that mechanically removed seeds and made short-staple cotton a viable crop.



Sir

Germanstown Nov. 16. 1793.

Your favor of Octob. 15. inclosing a drawing of your cotton gin, was received on the 6th inst. The only requisite of the law now uncomplied with is the forwarding a model, which being received your patent may be made out & delivered to your order immediately.

As the state of Virginia, of which I am, carries on household manufactures of cotton to a great extent, as I also do myself, and one of our great embarrassments is the clearing the cotton of the seed, I feel a considerable interest in the success of your invention for family use. permit me therefore to ask information from you on these points, has the machine been thoroughly tried in the ginning of cotton, or is it as yet but a machine of theory? what quantity of cotton has it cleared on an average of several days, & worked by hand, & by how many hands? what will be the cost of one of them made to be worked by hand? favorable answers to these questions ~~would~~ would induce me to engage one of them to be forwarded to Richmond for me. wishing to hear from you on the subject, I am Sir

P.S. is this the machine adver-
tised the last year by Pearce
at the Patterson Manufactory?



Mr. Eli Whitney. Connecticut. New Haven.



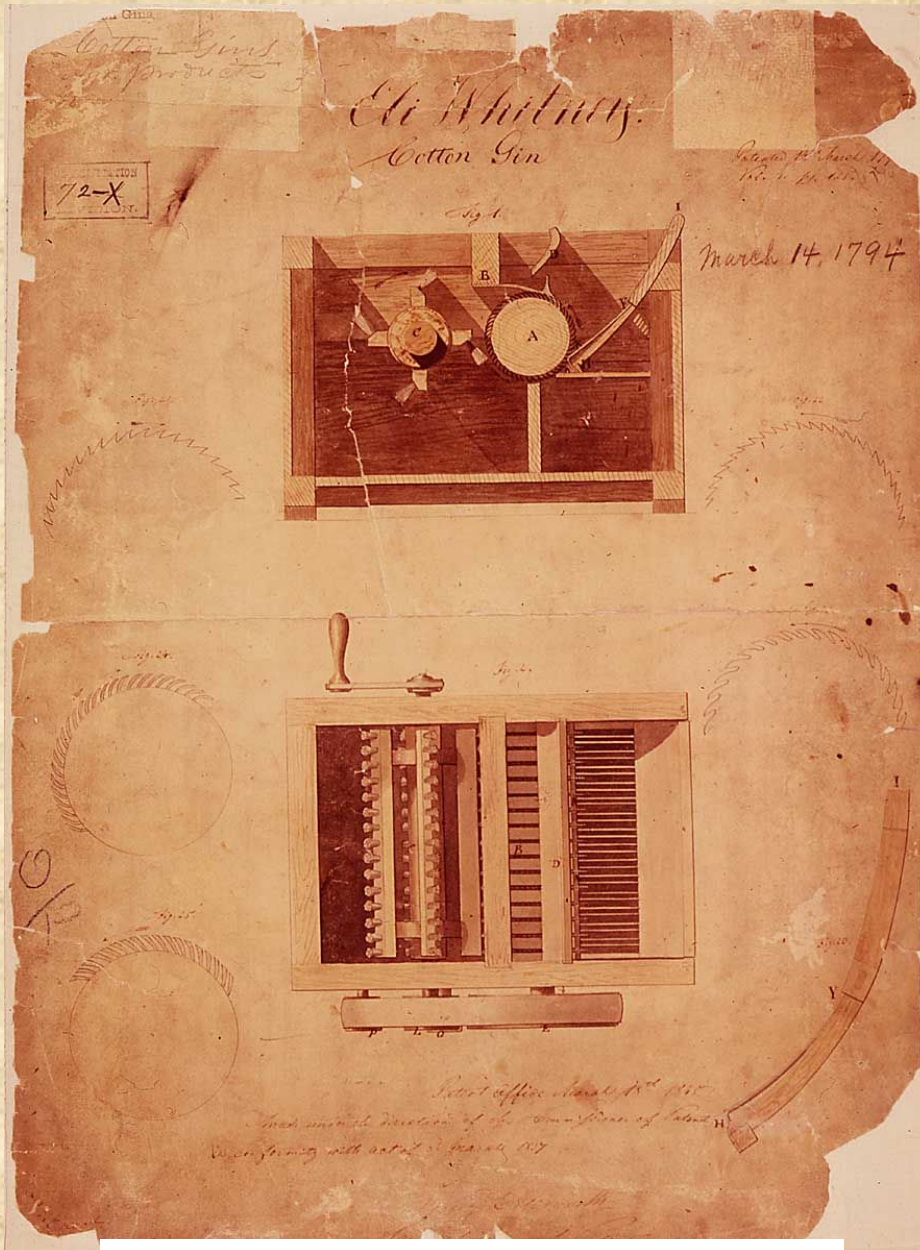
Jefferson's letter of November 16, 1793, is a reply to Whitney's application to the federal government for a patent for his invention.



Jefferson gives Whitney the requirements to obtain a patent, and asks for more information because he is interested in purchasing a gin for his plantation in Virginia.

Yale University Library

Whitney's patented cotton gin was soon copied by many others. He spent years and thousands of dollars trying to uphold his patent.



Whitney's original patent application drawing



An original model of an Eli Whitney cotton gin on display in the National Museum of American History.

Role of the cotton gin in preserving slavery



When Whitney invented his machine, the South was at a turning point regarding slavery.



The high cost of maintaining slaves made the crops produced by slave labor, such as tobacco, indigo, and rice, less profitable.



The cotton gin changed this by making short-staple cotton the most profitable cash crop. Cotton production required cheap labor, and the demand for slaves exploded.



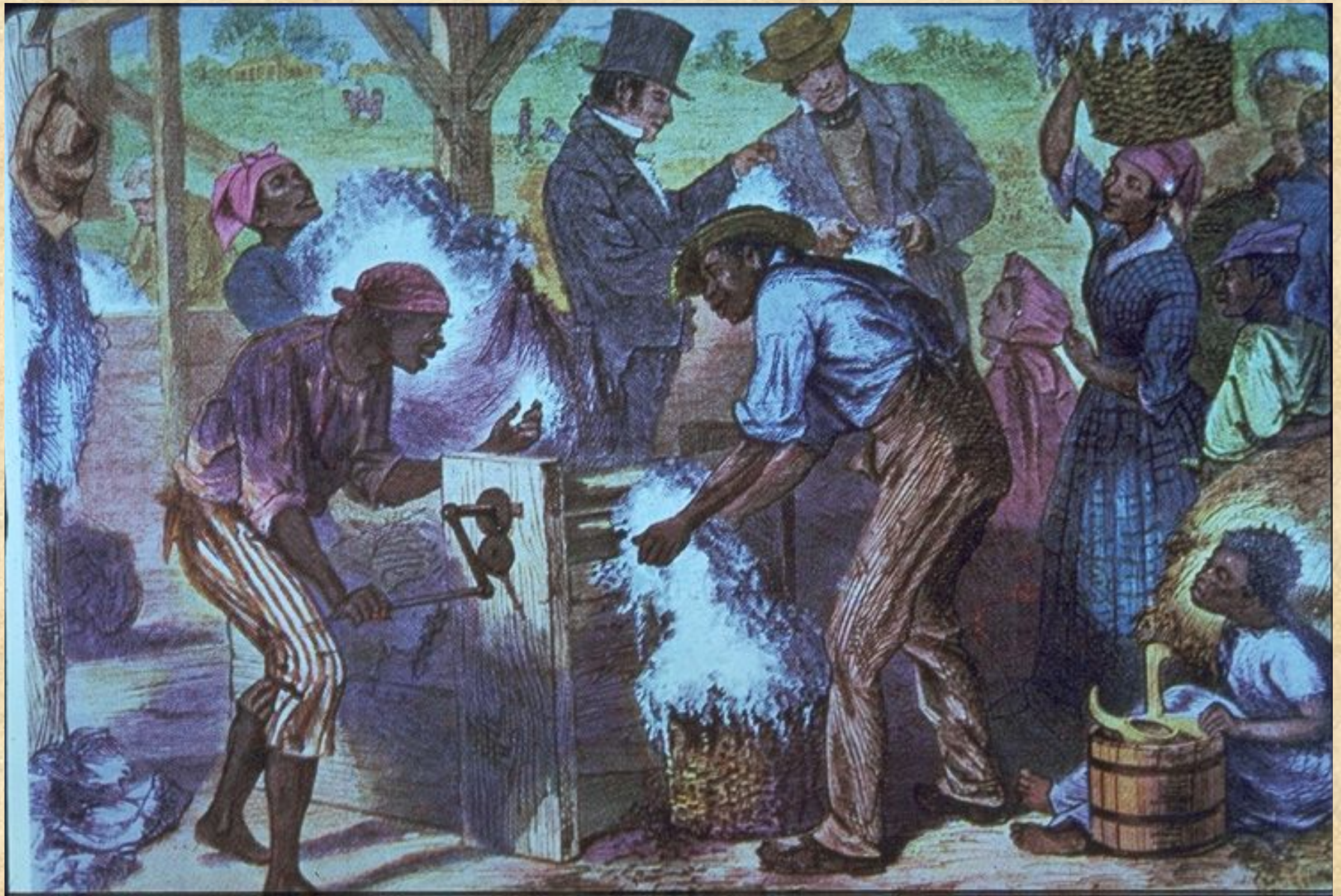
Slavery became a permanent fixture; few, if any, southerners spoke out against it.

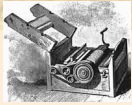


Slavery was the backbone of the prosperous economic system in the South.



It is estimated that in the 11 southern slave states income derived from slave labor ranged from 17% to over 30%.

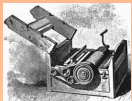




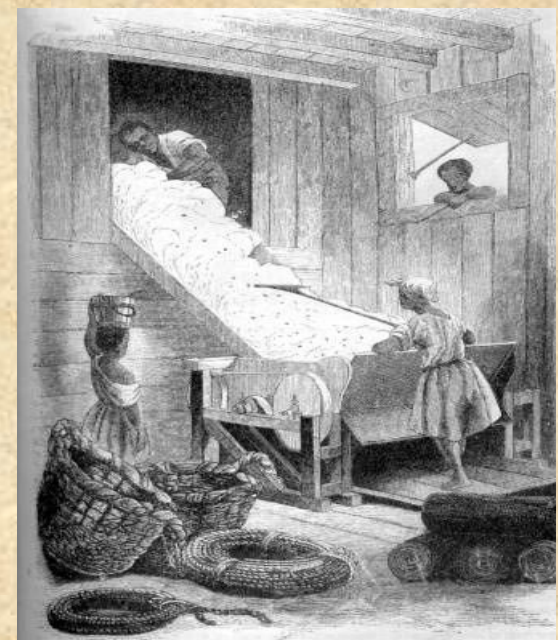
Whitney and his partner set up cotton gins throughout the South.



Instead of charging money, Whitney took two-fifths of the crop farmers brought in to be ginned. Farmers, angry at the high price, began making their own versions of the cotton gin.

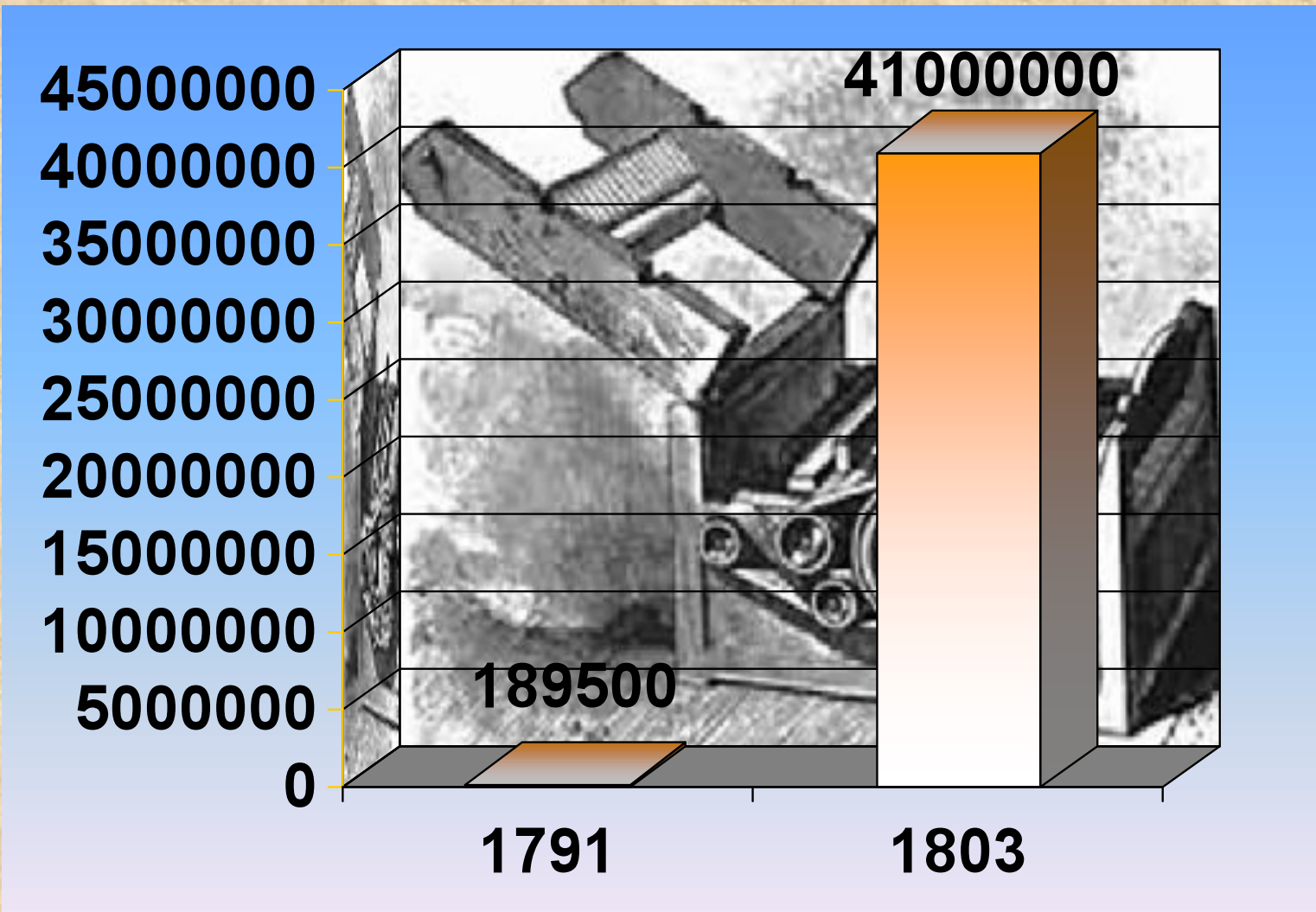


After a long and largely unsuccessful struggle, Whitney gave up defending his patent and returned to New Haven, Connecticut, in 1798.





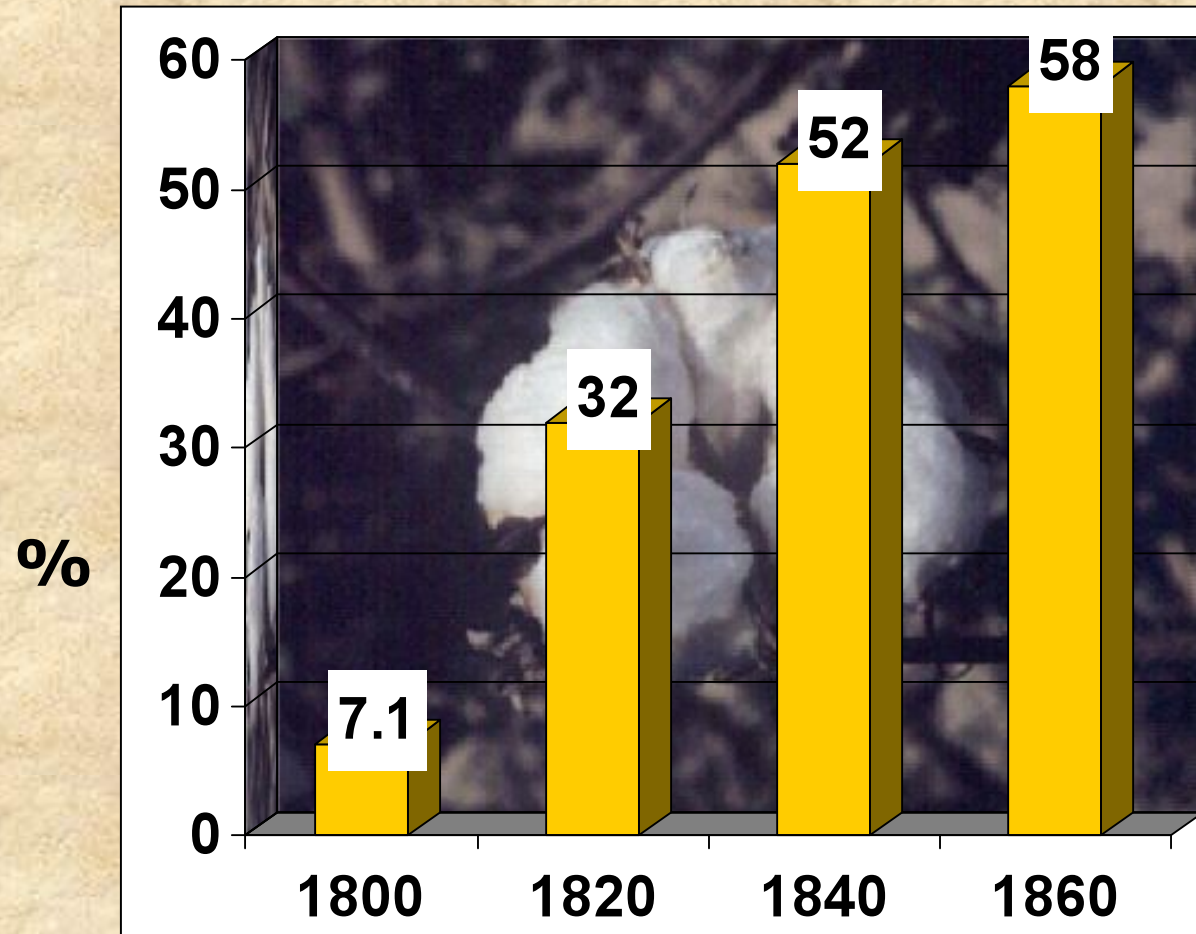
Cotton exports, in pounds, before and after invention of the cotton gin



Growth in number of slaves after invention of the cotton gin



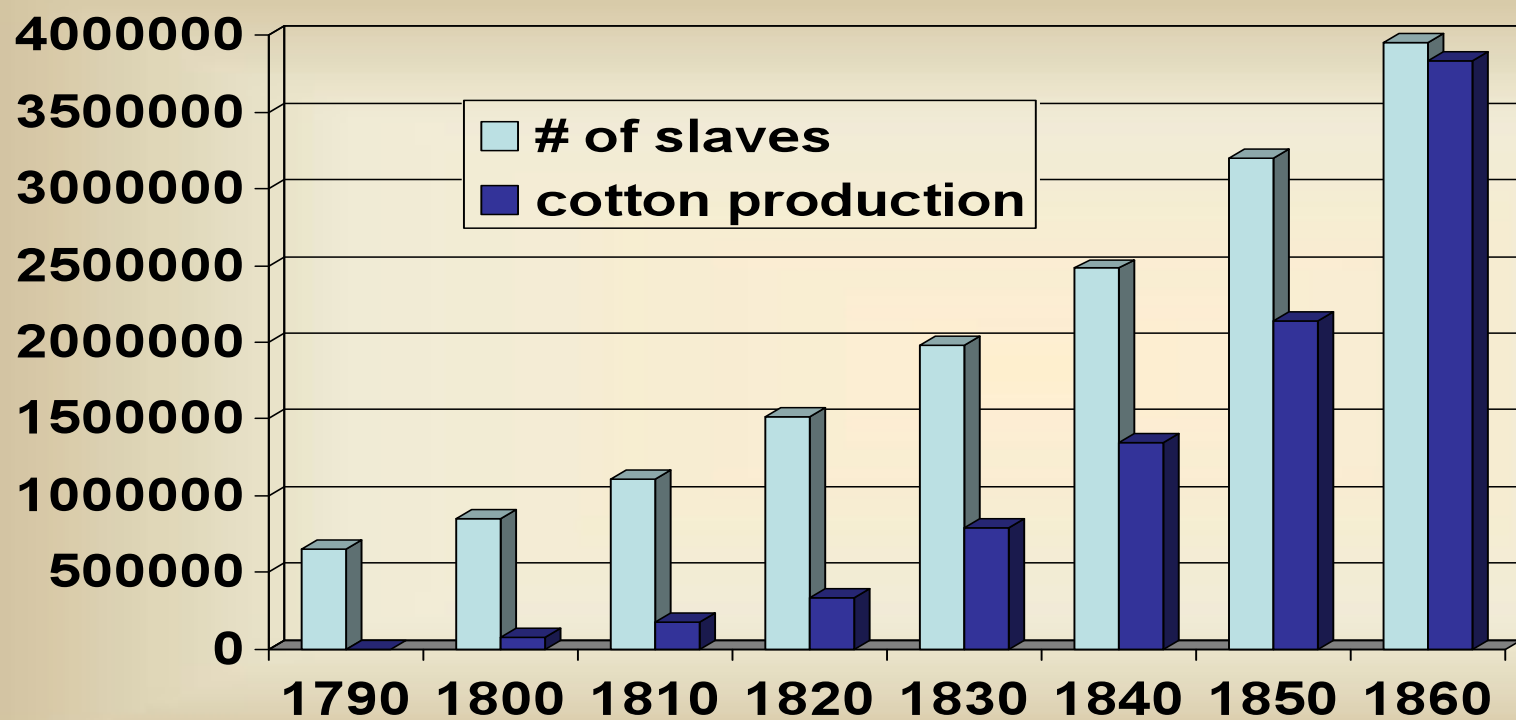
Cotton as % of U.S. exports, 1800-1860



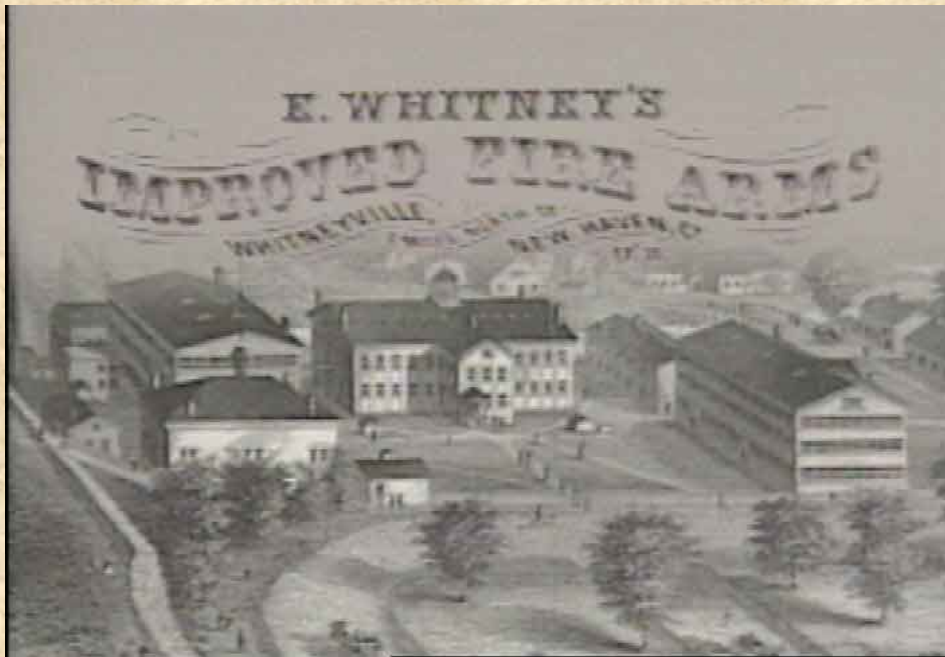
By 1850, America was growing three-quarters of the world's supply of cotton. The majority of southern cotton was shipped to New England or exported to Great Britain where it was turned into cloth.

Note: In 2005, the U.S. was still the world leader in cotton production.

Growth of cotton production (bales) and slave population



ELI WHITNEY and The American System of Manufacturing





As the Napoleonic wars broke out in Europe, Whitney knew that the U.S. army would need a new source for muskets to arm its soldiers.



Traditionally, muskets had been made one at a time by skilled craftsmen. No two muskets were alike, and parts from one would not fit another.



Whitney proposed to produce muskets with interchangeable parts. He demonstrated his procedure to government officials, who gave him a contract.



The contract called for Whitney to produce 10,000 muskets in two years.



It took Whitney eight years to fulfill the contract. A second contract called for him to produce 15,000 muskets, which he accomplished in two years.



He invented a new system using high-precision tools to manufacture parts. The parts could be assembled by any unskilled worker, and were entirely interchangeable.

Whitney's arms factory. It was later sold to Winchester Repeating Arms Company, and is today a museum.

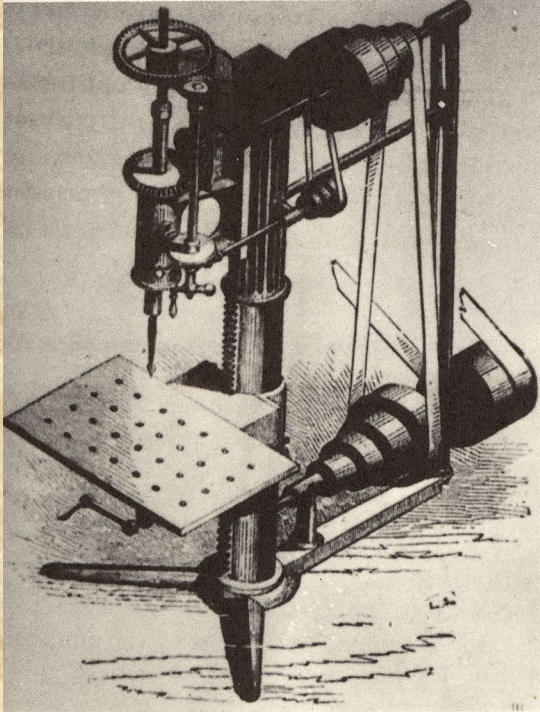


Whitney's musket

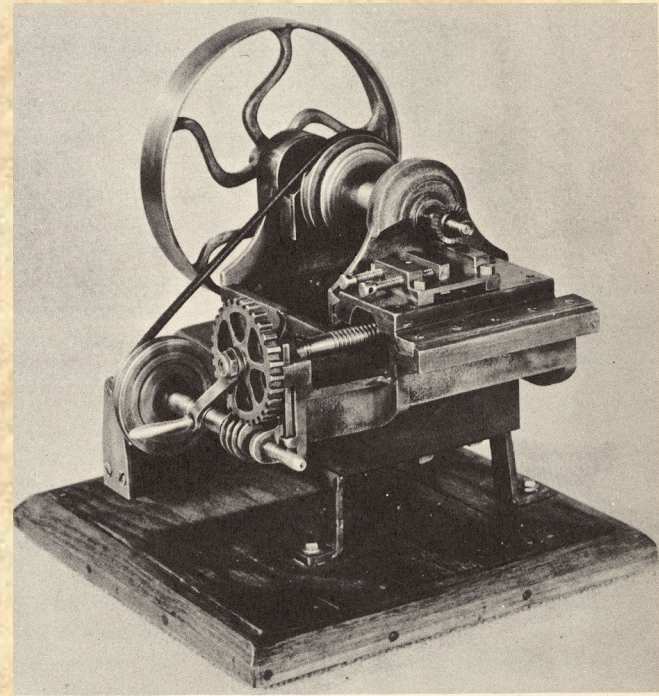
The U.S. government complained that Whitney's muskets were more expensive than those of other manufacturers. Whitney showed them, through an early use of the now-common business practice of cost accounting, that his were not over-priced.



Whitney had to invent new machines to fulfill his contract. Some historians credit him with creating the "American System of Manufacturing." This system involves the use of power machinery, interchangeable parts, and a division of labor. Whitney came up with new ideas about manufacturing and made a lasting contribution to the Industrial Revolution in America.

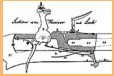


Power-driven drill press

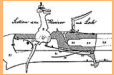


Milling machine

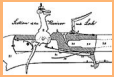
John H. Hall: his development of interchangeable parts laid a solid foundation for the American System of Manufacturing and mass production



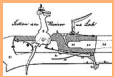
In 1819, Hall was given a contract by the U.S. Department of War to produce 1,000 of his patented breech-loading rifles.



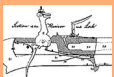
He built his workshops at Harpers Ferry, Virginia.



Hall spent the first years creating precision machinery for making rifles with interchangeable parts.



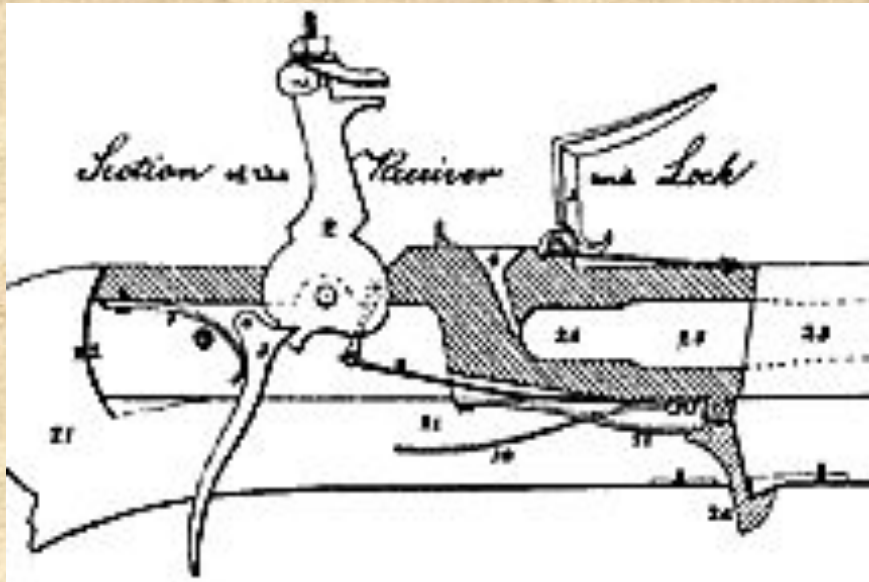
He spent the next two decades perfecting precision machines that were the models for modern milling machines.



Hall's inventions and innovations allowed unskilled workers to perform tasks that were traditionally done by skilled craftsmen, paving the way for factory production.



Harpers Ferry



Detail of a Hall rifle receiver and lock



Advances in transportation



Creation of national markets



Roads and turnpikes*



Canals*



Steam power



Early railroads



Clipper ships



***Turnpikes are roads that charge money (tolls) to users. Canals are man-made waterways.**

Creation of national markets

Problems with early overland transportation methods held back the American economy because:



Costs were extremely high



Travel speed was very slow



Service was irregular with uncertain shipping schedules



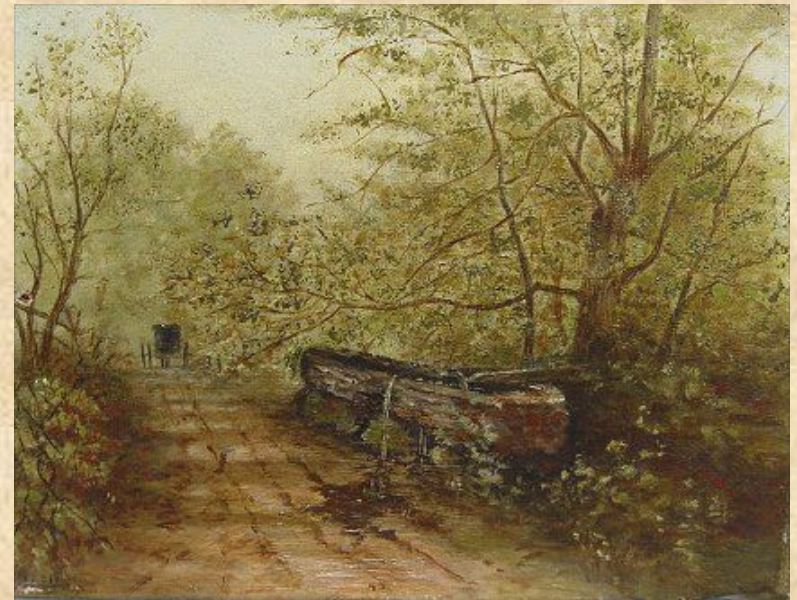
Roads were crude and wagon transport could destroy or damage fragile goods



Goods needed to be located near oceans or rivers in order to be profitably transported to other parts of the nation



Most early business was only local





Road transportation vehicles





Amerikaanischer Postwagen

An American stage coach such as was used between New York and Philadelphia about 1790. It followed the canvas covered "Flying Machines." 8vo. Lith. Col. Dutch.

Early scheduled transportation companies

Providence and Philadelphia Packets.



THE following vessels have commenced running as a line of Packets between the above ports:

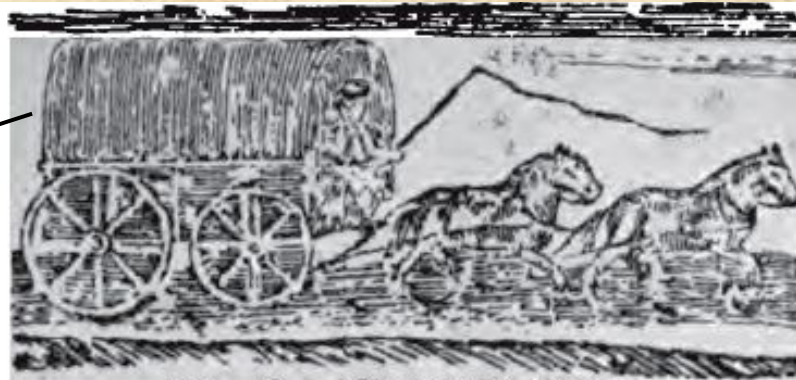
Schr. Herald, Ahira Hall, master
 Messenger, Edward Hall, do
 Domestick, David Hall, do
 James Burrill, Abner Hall, do

All excellent vessels, and well commanded, one of which is expected to sail every week from this port. The captains have the privilege of acting as their own pilots. For freight or passage apply on board, or to

ROYAL EARNUM.

May 23.

50.—Travel between widely separated towns on the Atlantic coast was undertaken by water when possible. The method was preferable to jolting over the bad roads. Regular lines of sailing packets were established to accommodate the business, and even after the general adoption of steamboats they successfully fought, for a time, the competition of the new mechanical vessels. Advertisement of a packet line in 1825.



To the PUBLIC.

THE FLYING MACHINE, kept by John Mercereau, at the New-Blazing-Star-Ferry, near New-York, sets off from Powles-Hook every Monday, Wednesday, and Friday Mornings, for Philadelphia, and performs the Journey in a Day and a Half, for the Summer Season, till the 1st of November; from that Time to go twice a Week till the first of May, when they again perform it three Times a Week. When the Stages go only twice a Week, they set off Mondays and Thursdays. The Waggons in Philadelphia set out from the Sign of the George, in Second-Street, the same Morning. The Passengers are desired to cross the Ferry the Evening before, as the Stages must set off early the next Morning. The Price for each Passenger is *Twenty Shillings*, Proc. and Goods as usual. Passengers going Part of the Way to pay in Proportion.

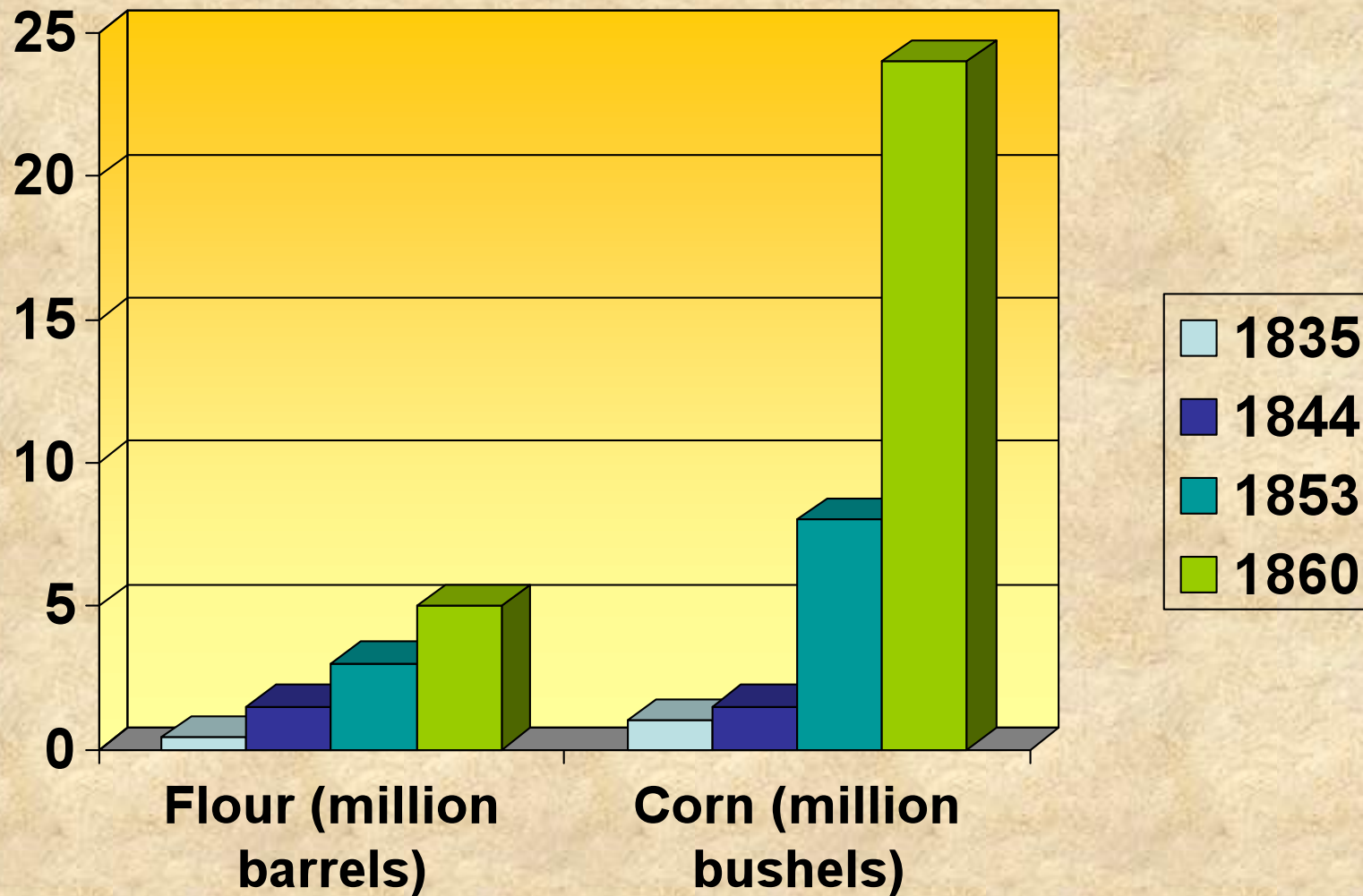
As the Proprietor has made such Improvements upon the Machines, one of which is in Imitation of a Coach, he hopes to merit the Favour of the Publick.

JOHN MERCEREAU.

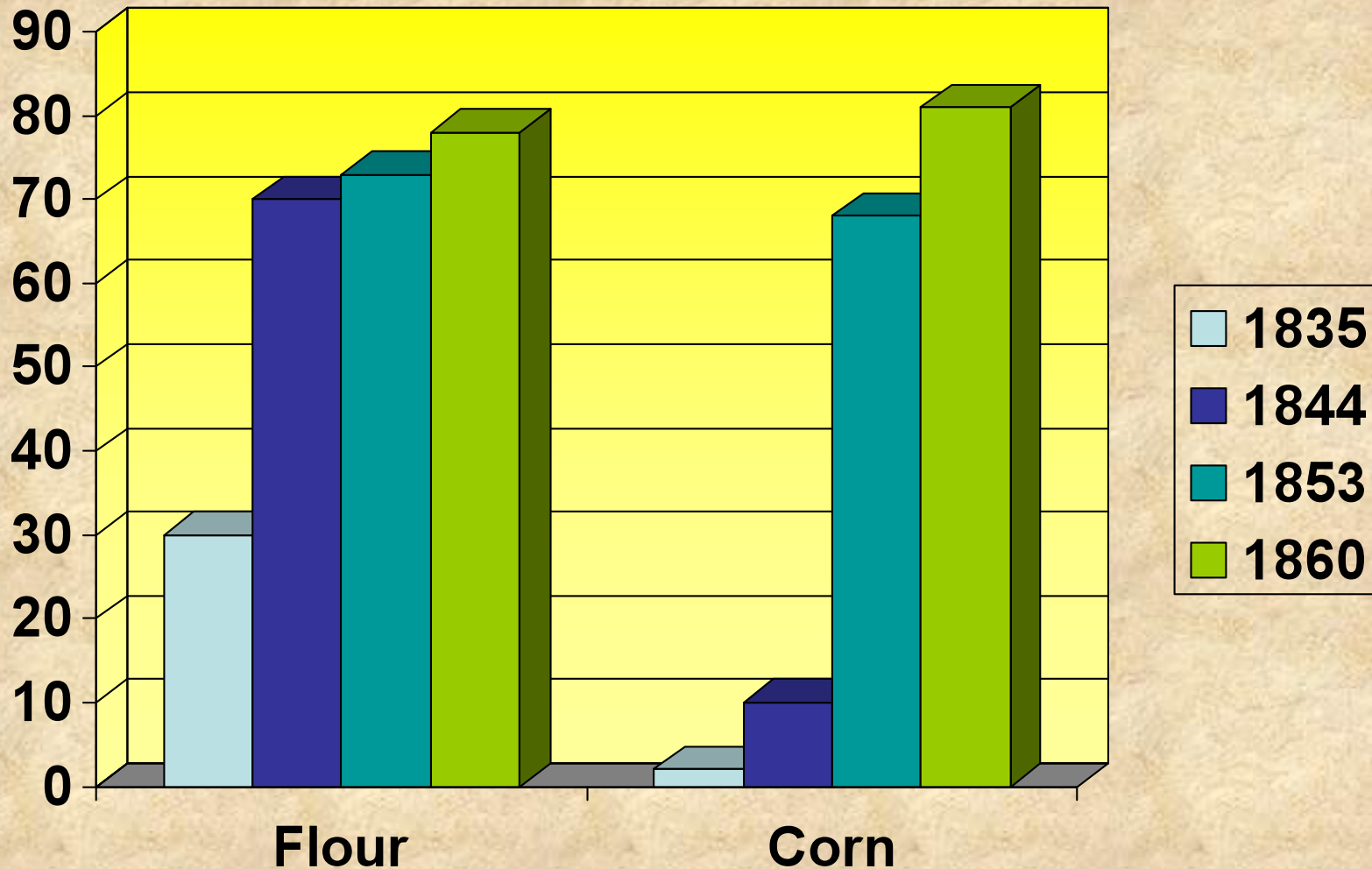
Mercereau's stage wagon, in 1771, reduced the time between Philadelphia and New York to a day and a half. In celebration of the achievement he advertised his conveyance as "The Flying Machine."

Grain production for export from the western and upper southern states: 1835-1860.

Chart shows the effects of transportation advances from 1835 to 1860.



% of export grain sold to the eastern states from the western and upper southern states





Recommendations of the Report

- 1- From north to south along the Atlantic coast, an inland waterway from Massachusetts to North Carolina and a great turnpike road from Maine to Georgia.**
- 2 - From east to west, the improvement of the four great Atlantic rivers and the construction of parallel canals connected with the western rivers by turnpike roads across the Allegheny Mountains.**
- 3 - In a north and northwesterly direction, the development of inland navigation between the Atlantic seacoast, the Great Lakes and the St. Lawrence River. Secretary Gallatin estimated that a sum of 20 million dollars, spread over a period of ten years, would be required to complete this program.**
- 4. His plan would not be adopted until the 20th century.**

1808: Gallatin's Road and Canal Report

Albert Gallatin, Secretary of the Treasury Department, on April 4, 1808, presented a report "respecting roads and canals," at the request of the United States Senate, which became the mold from which was cast our subsequent national transportation policies. Secretary Gallatin urged "early and efficient aid of the Federal Government" in order to "shorten distances, facilitate commercial and personal intercourse, and unite, by a still more intimate community of interests, the most remote quarters of the United States."

(U.S. Department of Transportation)



1809: The Natchez Trace, an early road westward.



Poor interior transportation in the 18th and early 19th centuries prevented the full economic development of the nation.



The cost of moving goods was very expensive, the speed was slow, and there was no regular scheduled transportation service. The lack of reliable transportation was an obstacle for farmers in the west because they could not easily sell their surplus crops.

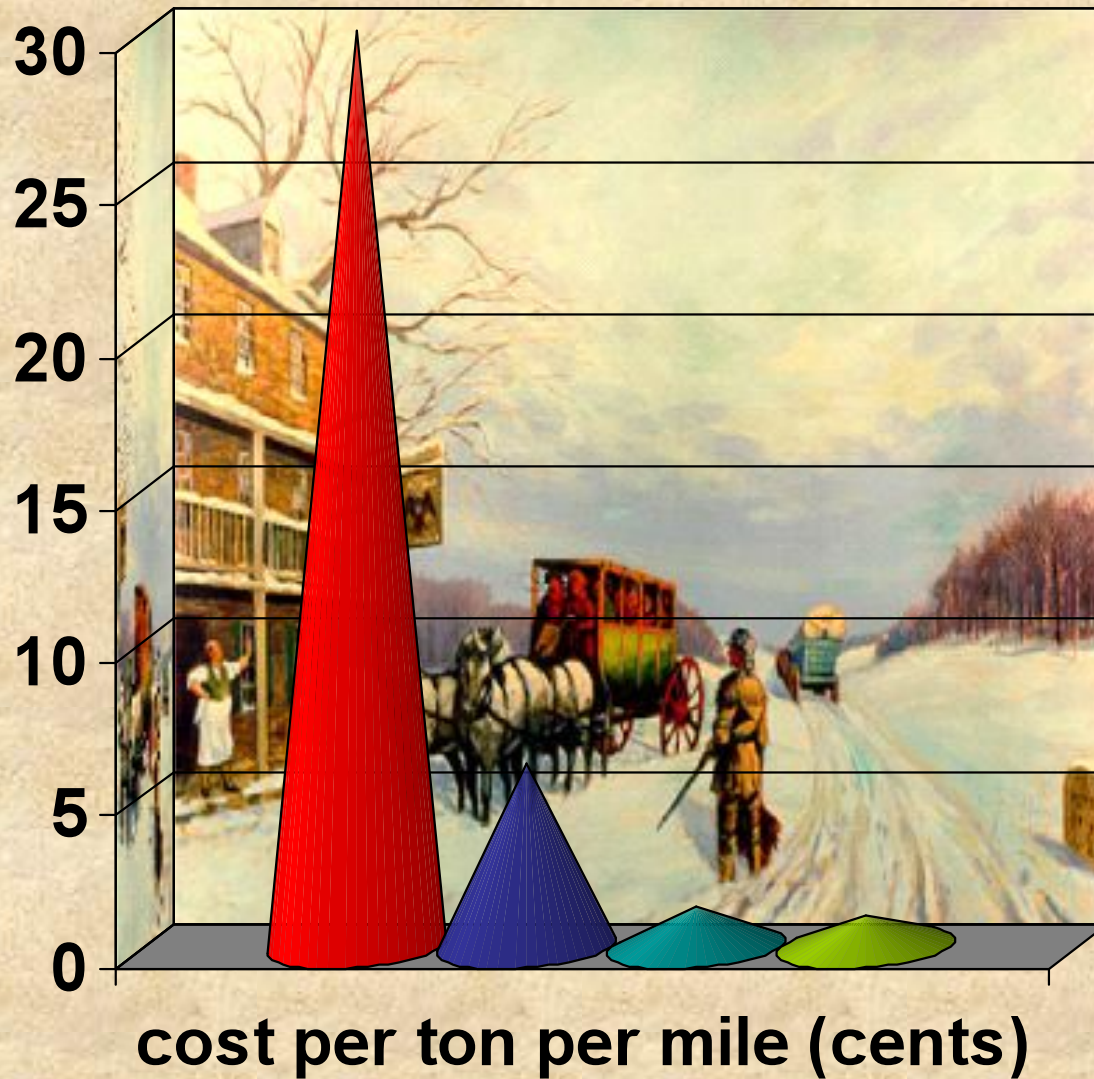


Meanwhile, ocean transportation, international and coastal, flourished and helped make the nation prosperous between 1789 and 1807.



Jefferson's 1807 Embargo damaged international trade and led to calls for improvements in internal commerce.

Cost of moving one ton of goods one mile in the early 19th century



- road
- river upstream
- river downstream
- ocean

30 cents = \$5.00 in 2006 money


Early Roads


- Most roads were primitive, barely-cleared trails that were impassable in bad weather.
- In swampy areas, corduroy (log) roads were constructed. They protected wagons from the mud and swamps but were very uncomfortable for passengers.
- In 1811, the federal government funded a road from Cumberland, Maryland, to Wheeling, Virginia.
- This road was known as the National Road or Pike and was later extended into Illinois.





Conestoga wagons on the National Pike in 1840

Turnpikes

 The first paved long-distance road was built in 1775, linking Philadelphia with Lancaster, Pennsylvania.

 It ran for sixty-two miles and was a commercial success.

 It was built with private funds.

 This began an era of organized road improvements.



Federal Highway Administration-commissioned painting by Carl Rakeman depicting a tavern along the turnpike road.



By 1815, toll roads linked major northeastern cities.



Most of the roads in the Northeast were built by private road construction companies.



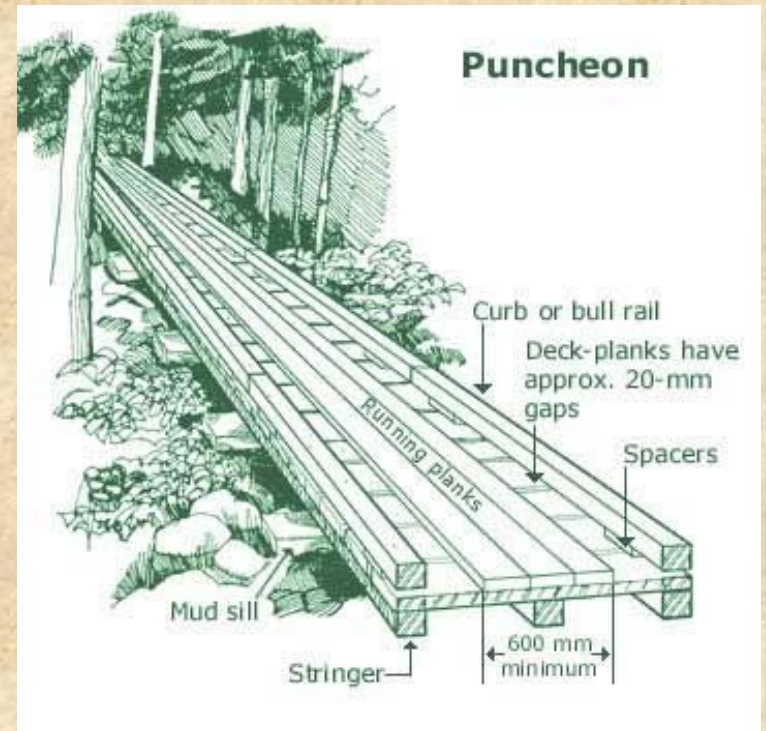
Outside the Northeast, state governments financed much of the road construction.



Most toll roads were financial failures; they charged high tolls, and many travelers avoided them.



In the 1840s plank roads began to be built. They consisted of eight-foot-wide wooden planks laid on cleared ground. They were expensive to maintain and few were built after the 1850s.



The first macadam (stone-filled) surface in the United States was between Hagerstown and Boonsboro, Maryland. By 1822, this section was the last unimproved gap in the great road leading from Baltimore on the Chesapeake Bay to Wheeling on the Ohio River. Stagecoaches using the road in winter needed five to seven hours of travel to cover 10 miles.

In 1830, after five years of work, the 73-mile National Road (Pike) became the second American road to be built on the "McAdam principle."

(painting by Carl Rakeman)





Road transportation vehicles



Canal Era





Many Americans wished to duplicate the financial success of the English Bridgewater Canal of 1761.



A proposal to construct a canal was pushed through New York state government by the governor, De Witt Clinton.



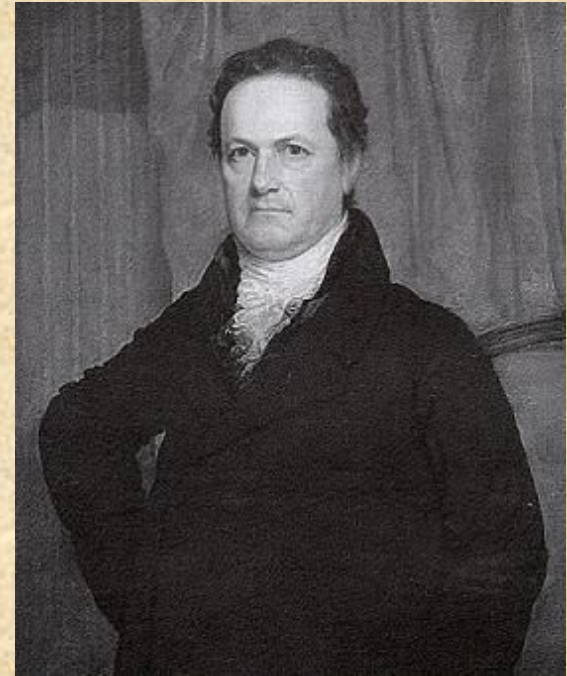
The planned canal would be 363 miles long, 40 feet wide and 4 feet deep. 83 locks had to be built to deal with the different water levels.





Many thought the idea crazy and called it "Clinton's Ditch" or "Clinton's Folly."




Construction began in 1817 and was completed in 1825.




 **The Erie Canal was a financial success.**

 **The canal linked New York City, by the Hudson River in the east and the Great Lakes in the west, all the way to the Ohio River.**

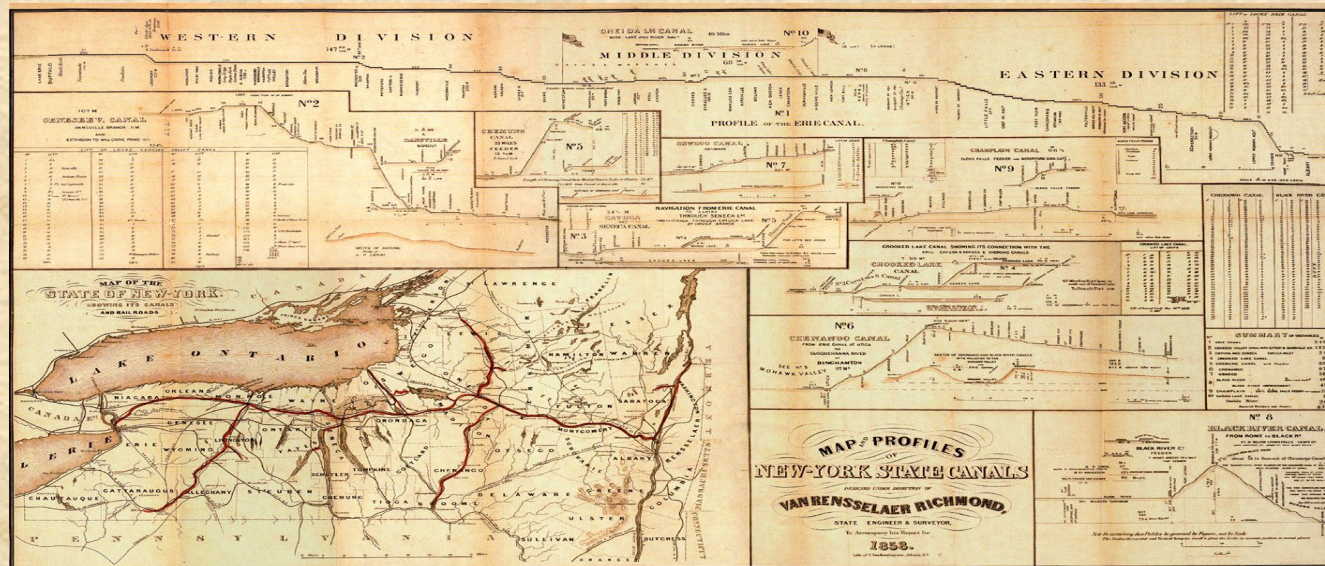
 **The success of the Erie Canal cemented New York City as the greatest commercial center of the United States.**

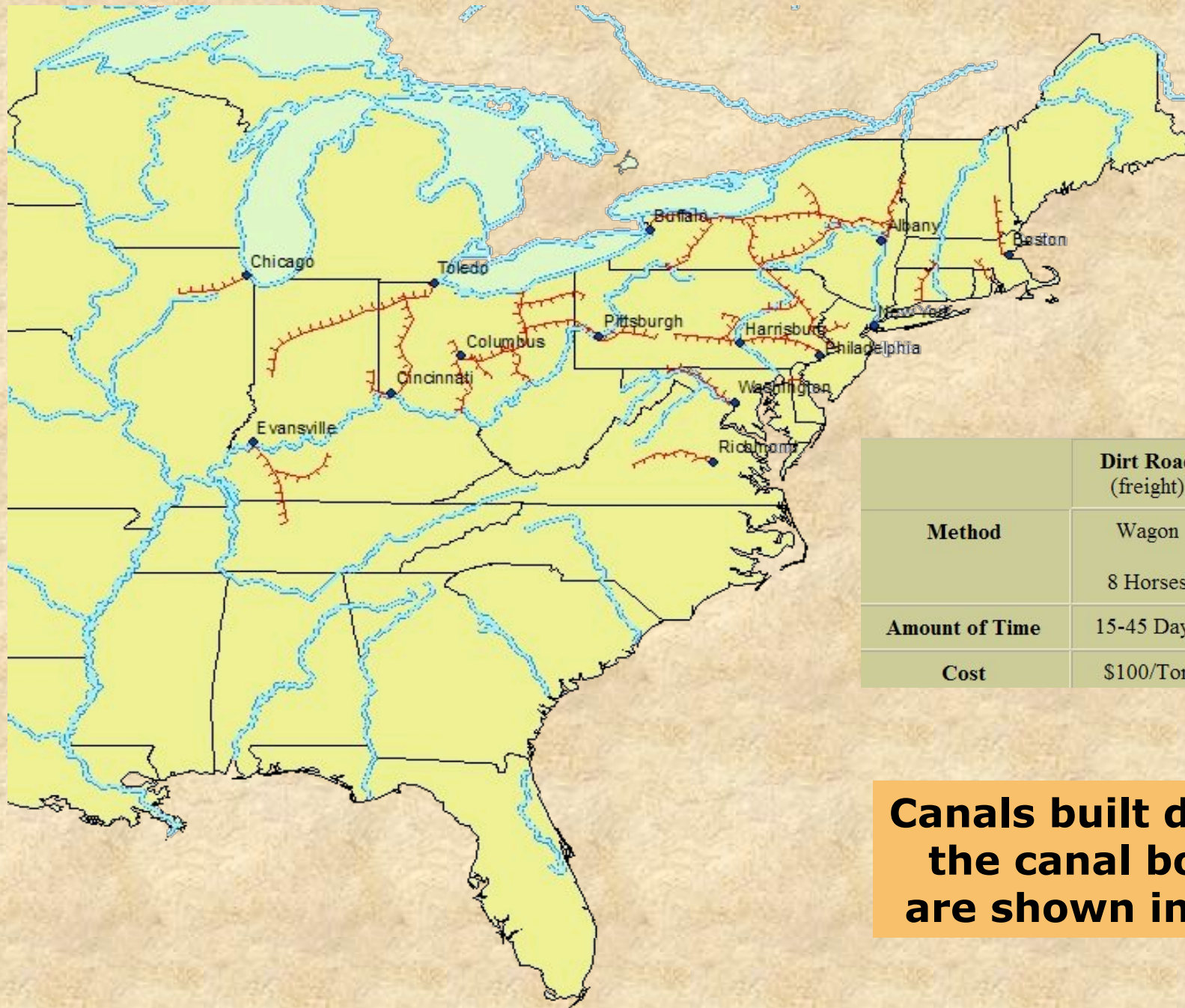
 **Average freight costs from Buffalo to New York City fell from 19 cents per ton per mile in 1817 to 2 to 3 cents during the 1830s.**

 **The success of the Erie Canal led to a "canal boom," with over 4,254 miles built before the boom ended in 1860. Most of the canals were financial disasters.**



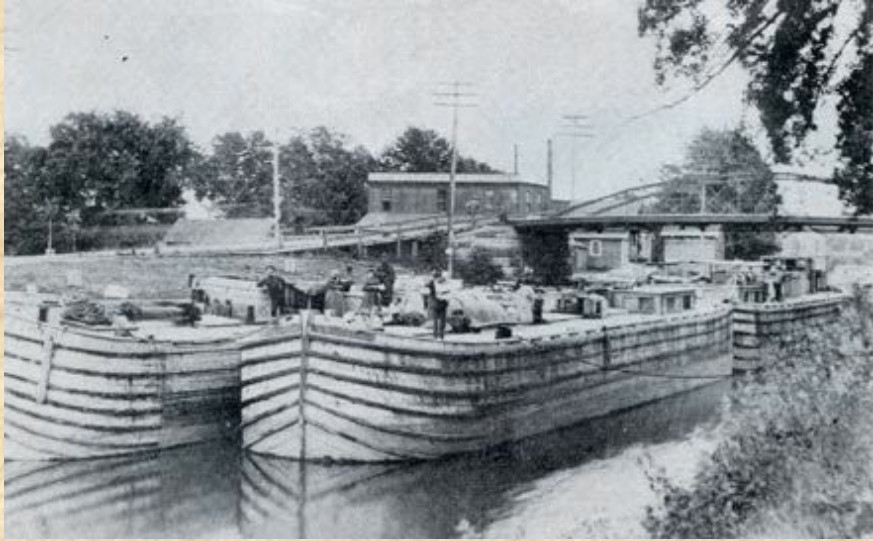
Opening the Erie Canal, 1825

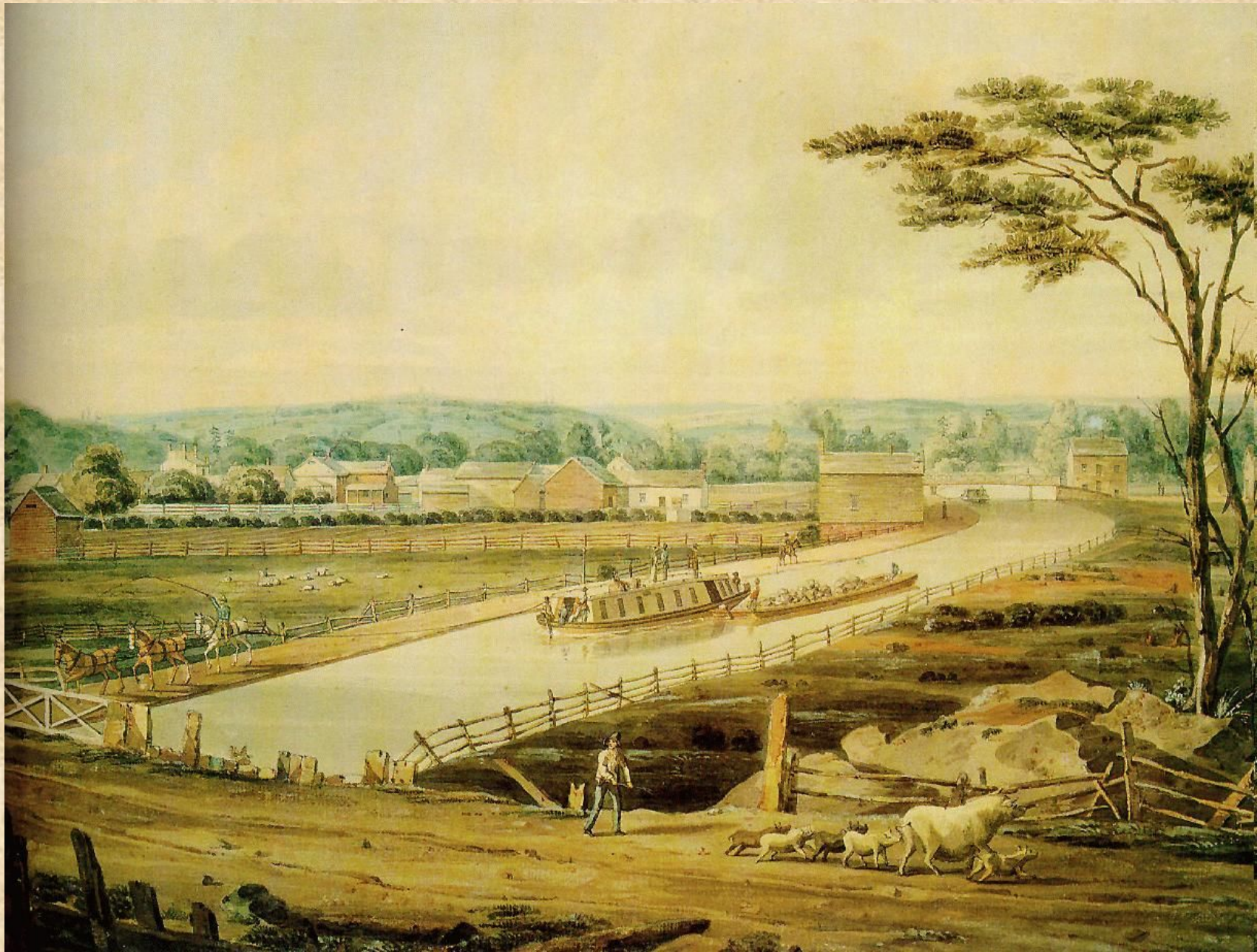


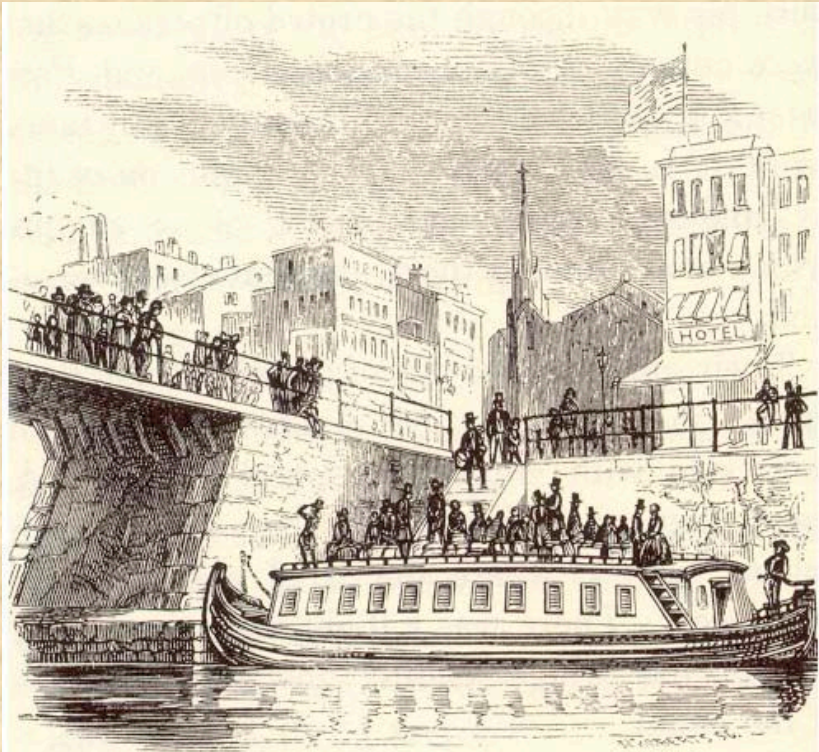


| | Dirt Road (freight) | Canal (freight) |
|-----------------------|---------------------|-----------------|
| Method | Wagon | Line Boat |
| | 8 Horses | 2 Mules |
| Amount of Time | 15-45 Days | 9 Days |
| Cost | \$100/Ton | \$6/Ton |

Canals built during the canal boom are shown in red.



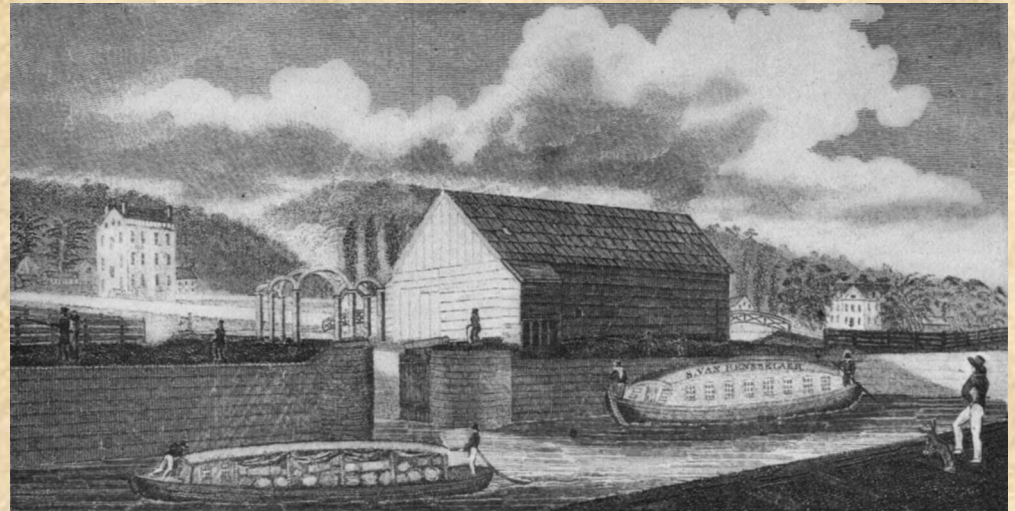


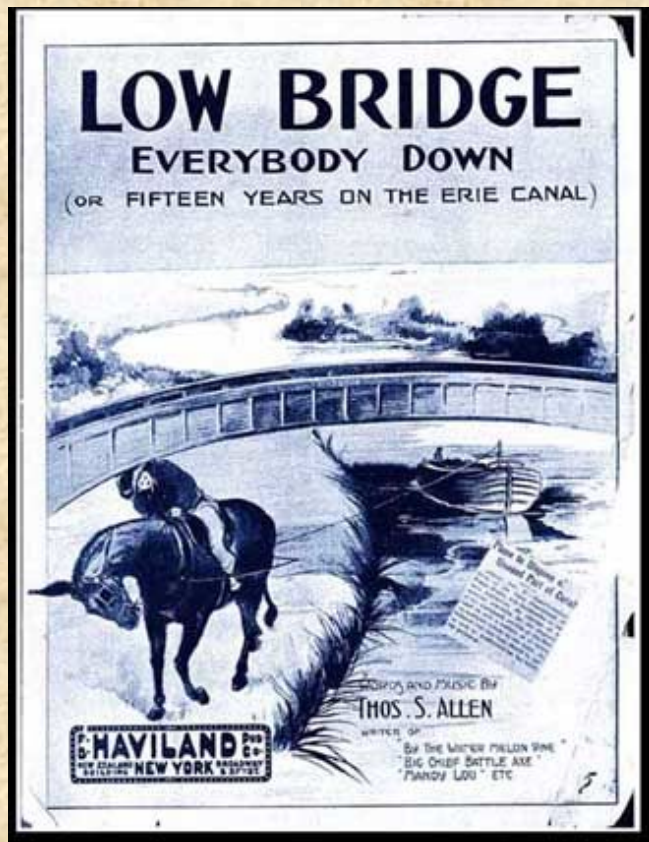


THE PACKET BOAT.



ALONG THE C.&O. CANAL





1913 and modern version

(On next page) of the song see
Speaker Notes for additional
lyrics



Click

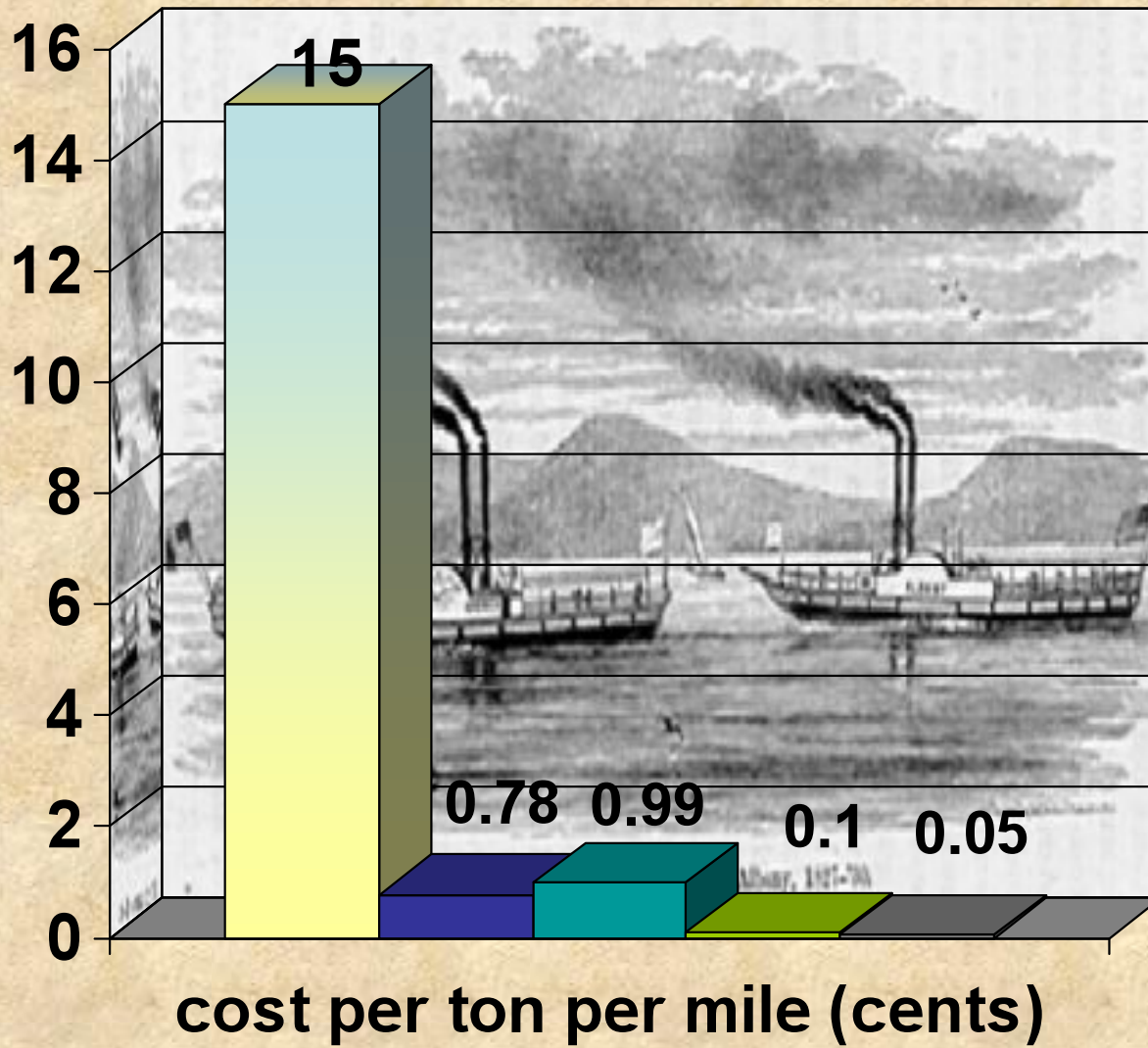
"Low Bridge"
By Thomas S. Allen

I've got an old mule and her name is Sal
Fifteen miles on the Erie Canal
She's a good old worker and a good old pal
Fifteen miles on the Erie Canal
We've hauled some barges in our day
Filled with lumber, coal, and hay
And every inch of the way we know
From Albany to Buffalo

Chorus:

Low bridge, everybody down
Low bridge for we're coming to a town
And you'll always know your neighbor
And you'll always know your pal
If you've ever navigated on the Erie Canal
We'd better get along on our way, old gal
Fifteen miles on the Erie Canal
'Cause you bet your life I'd never part with Sal
Fifteen miles on the Erie Canal
Git up there mule, here comes a lock
We'll make Rome 'bout six o'clock
One more trip and back we'll go
Right back home to Buffalo

1860 cost to transport one ton one mile in cents (15 = 15 cents)




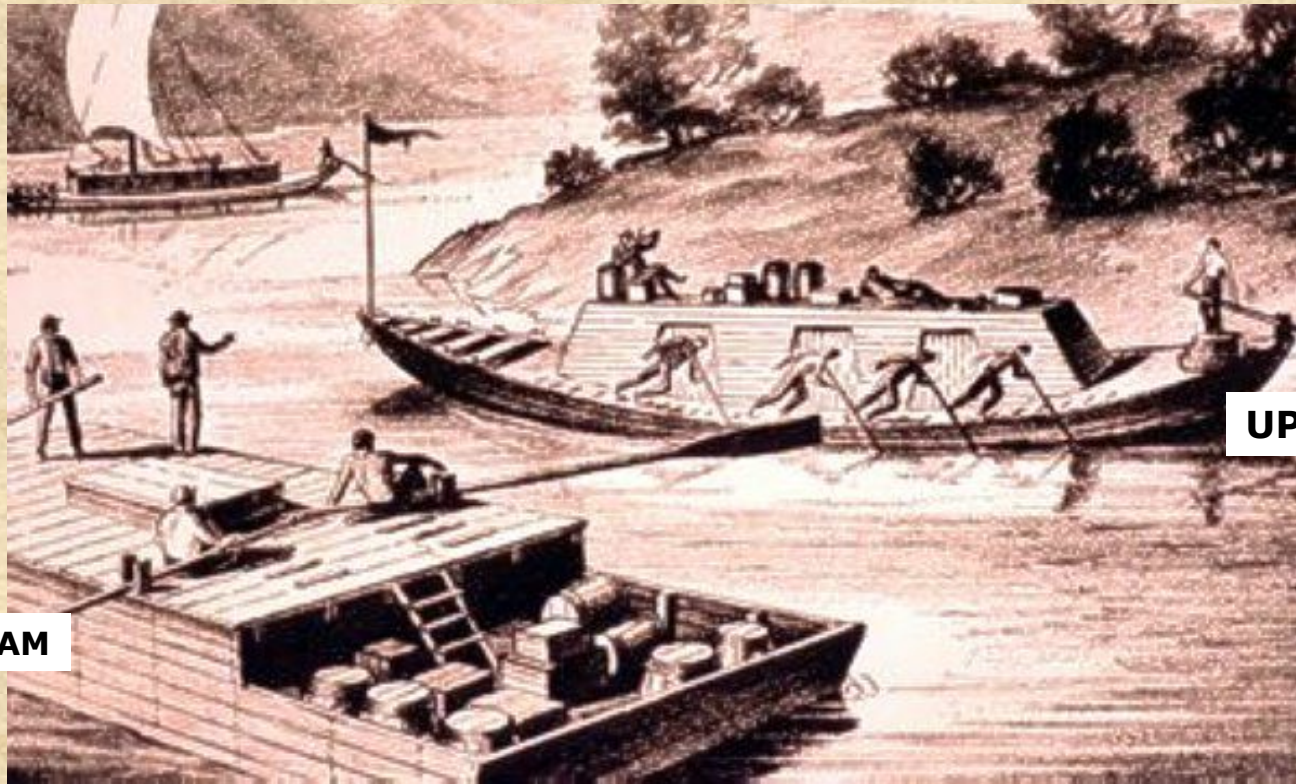
Erie Canal: Dady Brothers: click tp hear

- road
- river
- erie canal
- great lakes
- ocean

River transportation

 Before the invention of the steamboat, most river transportation was downstream.

 Navigation upstream was done by rafts and flatboats (keelboats). They were very slow as they had to be pulled or poled. At most they could travel 15 miles per day.

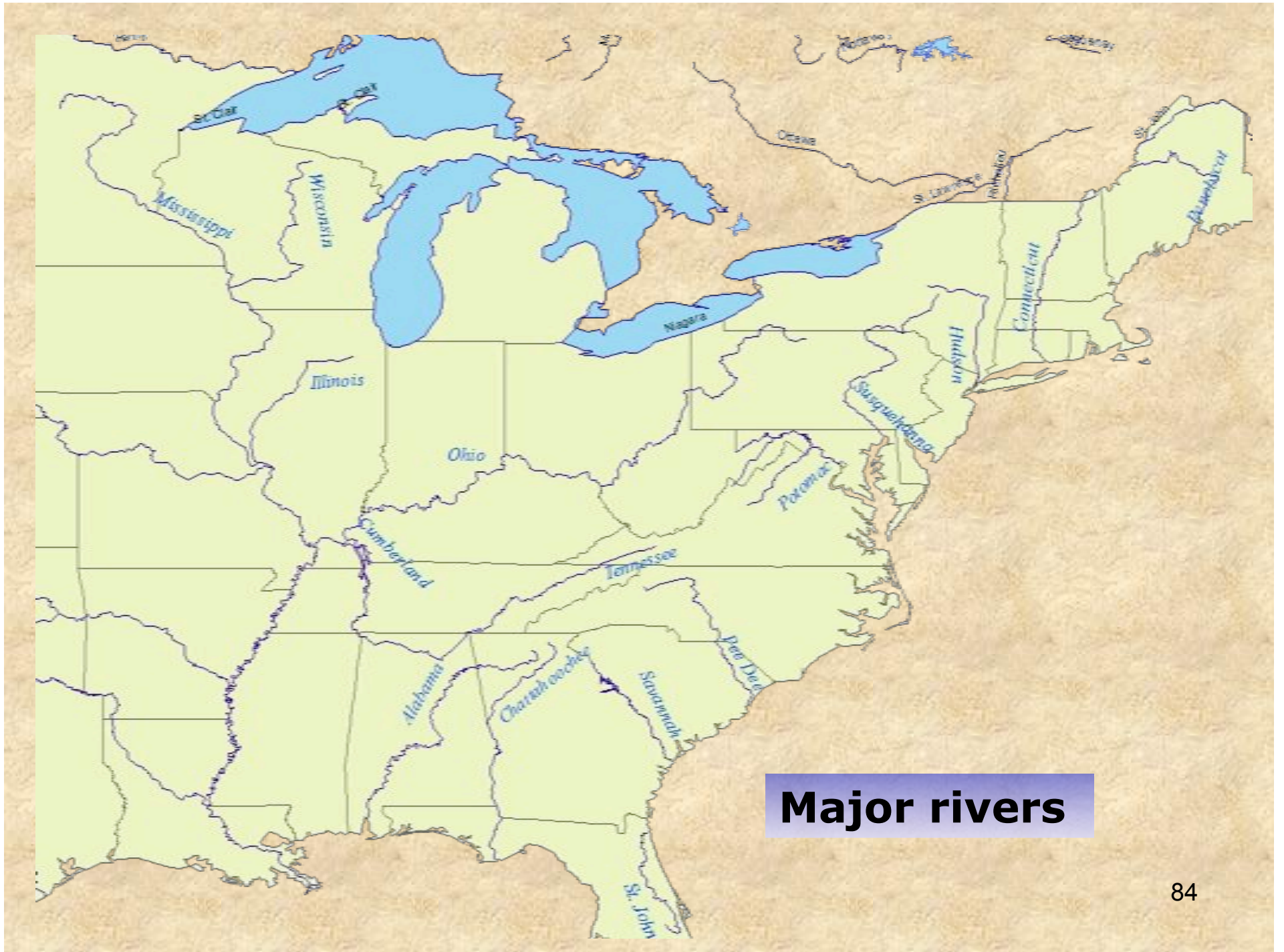


DOWNSTREAM

UPSTREAM

**10-minute movie on flatboats which shows
river transportation prior to steamships**







Major rivers


Robert Fulton

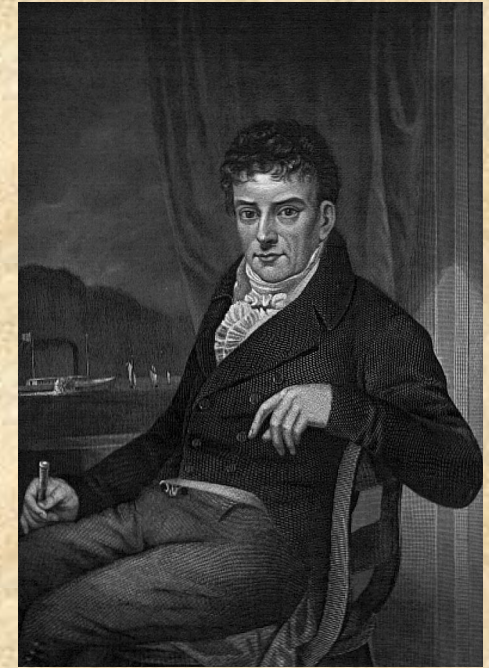
 Fulton constructed his first steamboat in France in 1803.

 In the U.S. in 1807, he built the steamboat *Clermont*.

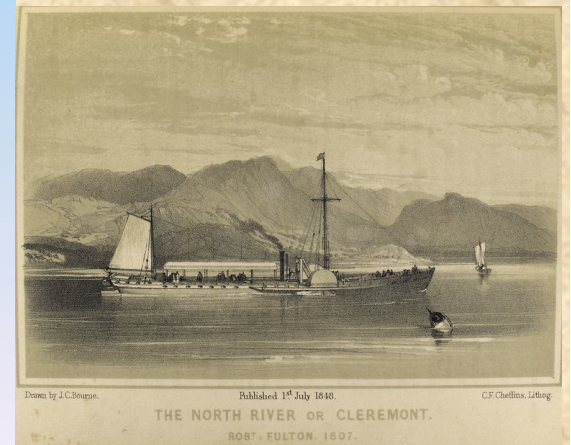
 The *Clermont* was the first steamboat used as a regularly scheduled commercial transport ship.

 Robert Fulton patented his steamboat design and constructed several more, including the world's first steam warship in 1814.

 The New York state legislature gave Fulton the sole right (monopoly) to run steamboats in New York. This led to the famous 1824 Supreme Court case, *Gibbons v. Ogden*, which struck down Fulton's monopoly and made it illegal for state governments to regulate interstate commerce.

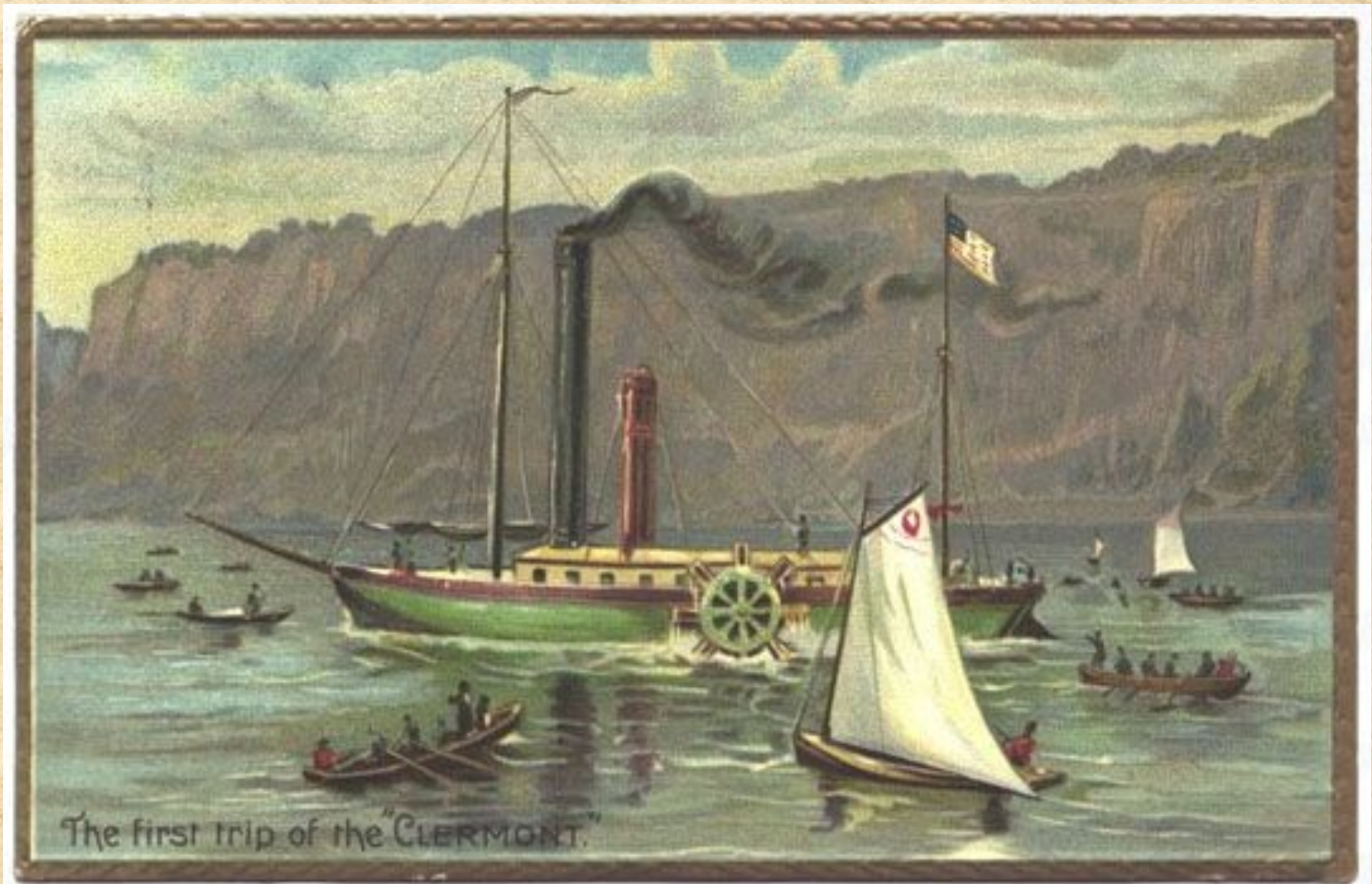


Robert Fulton

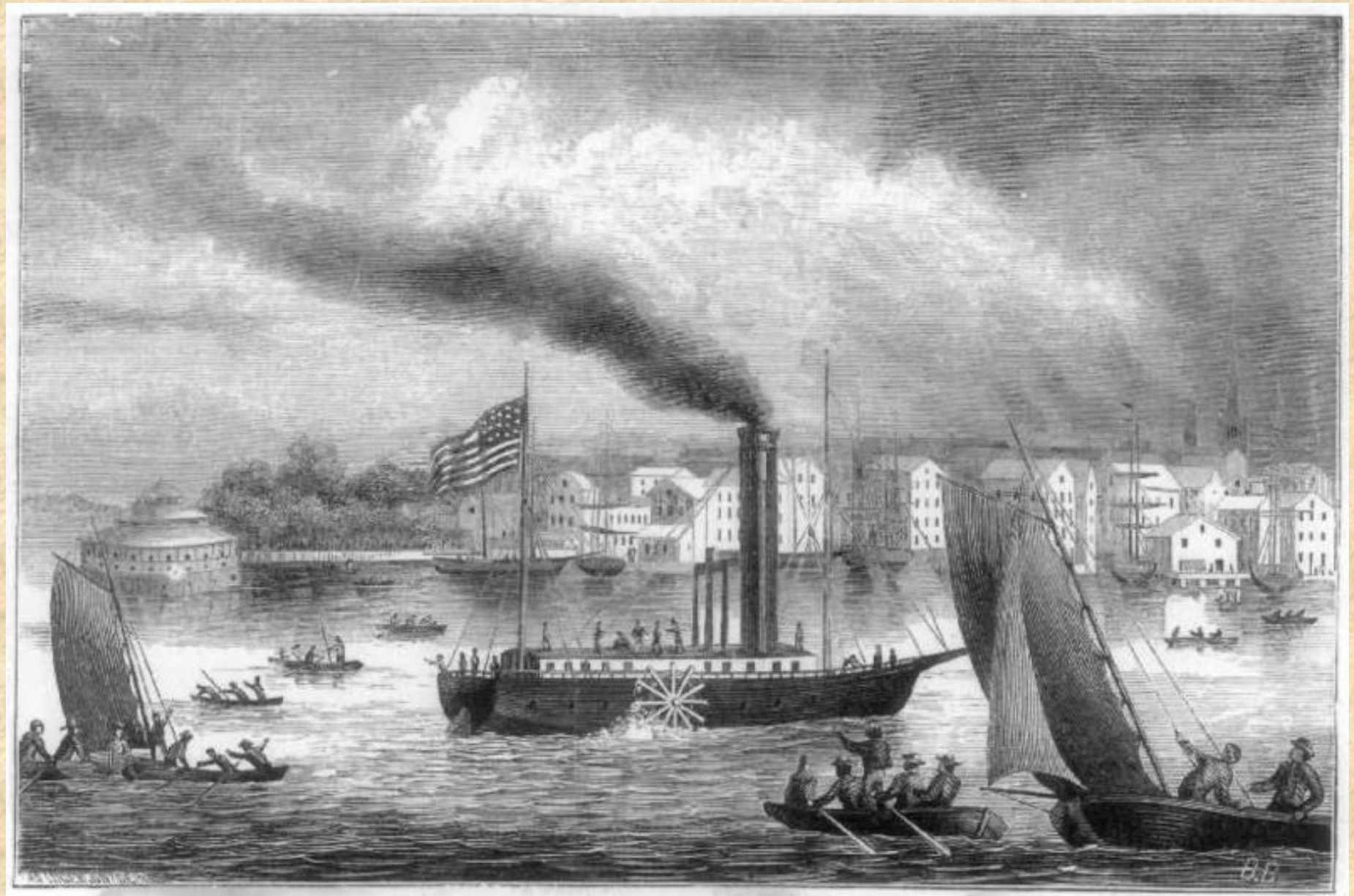


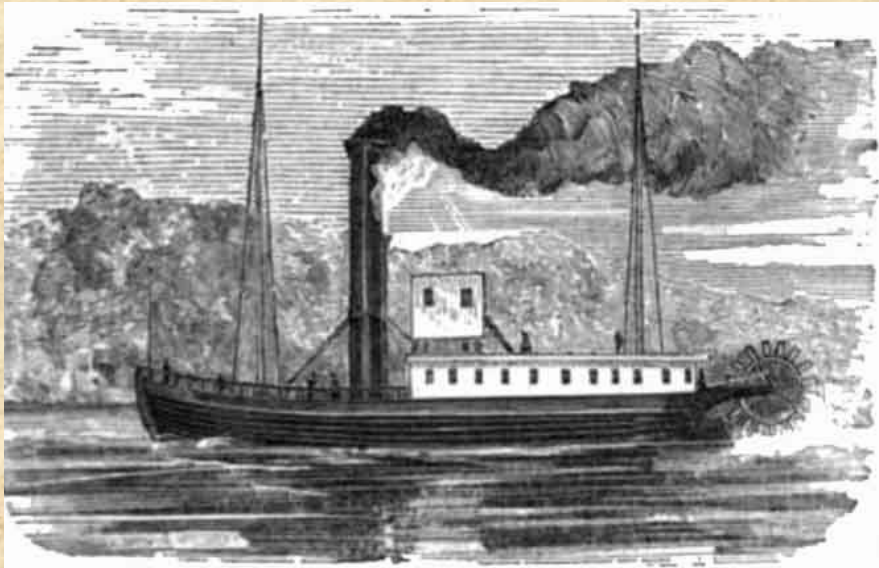
Clermont

Clermont, 1807



Another view of the *Clermont's* first voyage





The *Enterprise* in 1815



Henry Shreve



In 1811, Fulton and several partners built the *New Orleans*, the first steamboat to steam on the Mississippi River.



In 1814, Henry Shreve designed a flat-bottom steamboat, the *Enterprise*, for the shallow waters of the western rivers.



The *Enterprise* was the first steamboat to make a return trip from New Orleans to Louisville, Kentucky.



Within a few years there were hundreds of steamboats carrying cargo and passengers up and down all navigable western rivers.

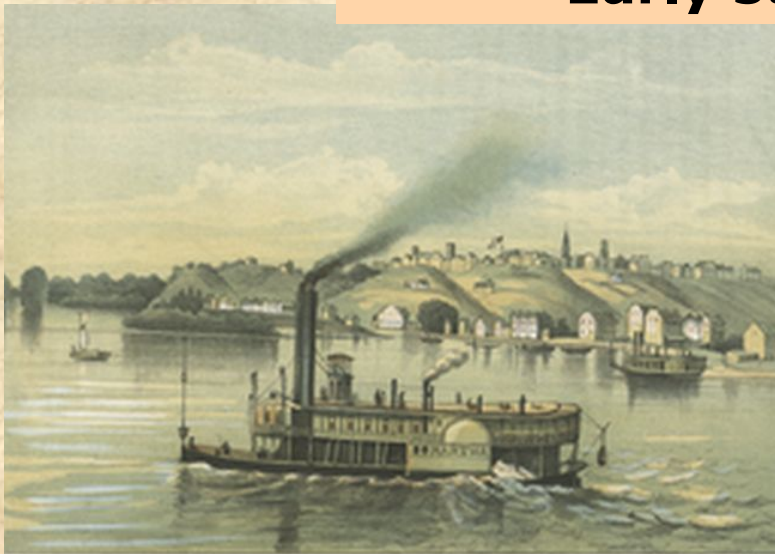


H. Lewis pinx. Lith. Just. Arns & C^o Düsseldorf.
CAIRO . MOUTH OF THE OHIO . CAIRO AN DER MÜNDUNG DES OHIO .



H. Lewis pinx. Lith. Just. Arns & C^o Düsseldorf.
MUSCADINE, JOWA . MUSCADINE, IN JOWA .

Early steamboats at river ports



H. Lewis pinx. Lith. Just. Arns & C^o Düsseldorf.
QUINCY, Illinois .



H. Lewis pinx. Lith. Just. Arns & C^o Düsseldorf.
MEMPHIS . TENNESSEE . DIE STADT MEMPHIS . TENNESSEE .

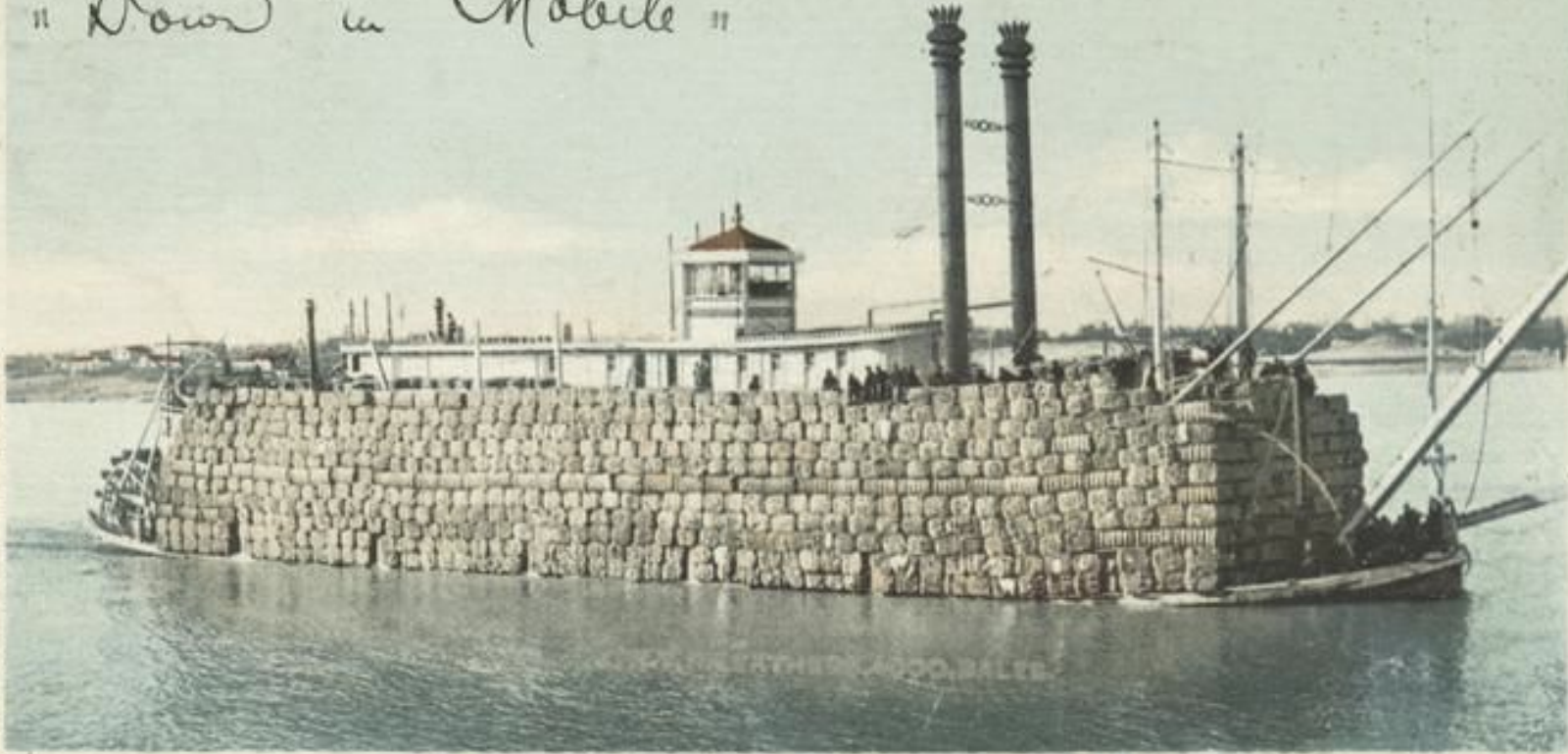
01-4-662





Steamboat horns: click

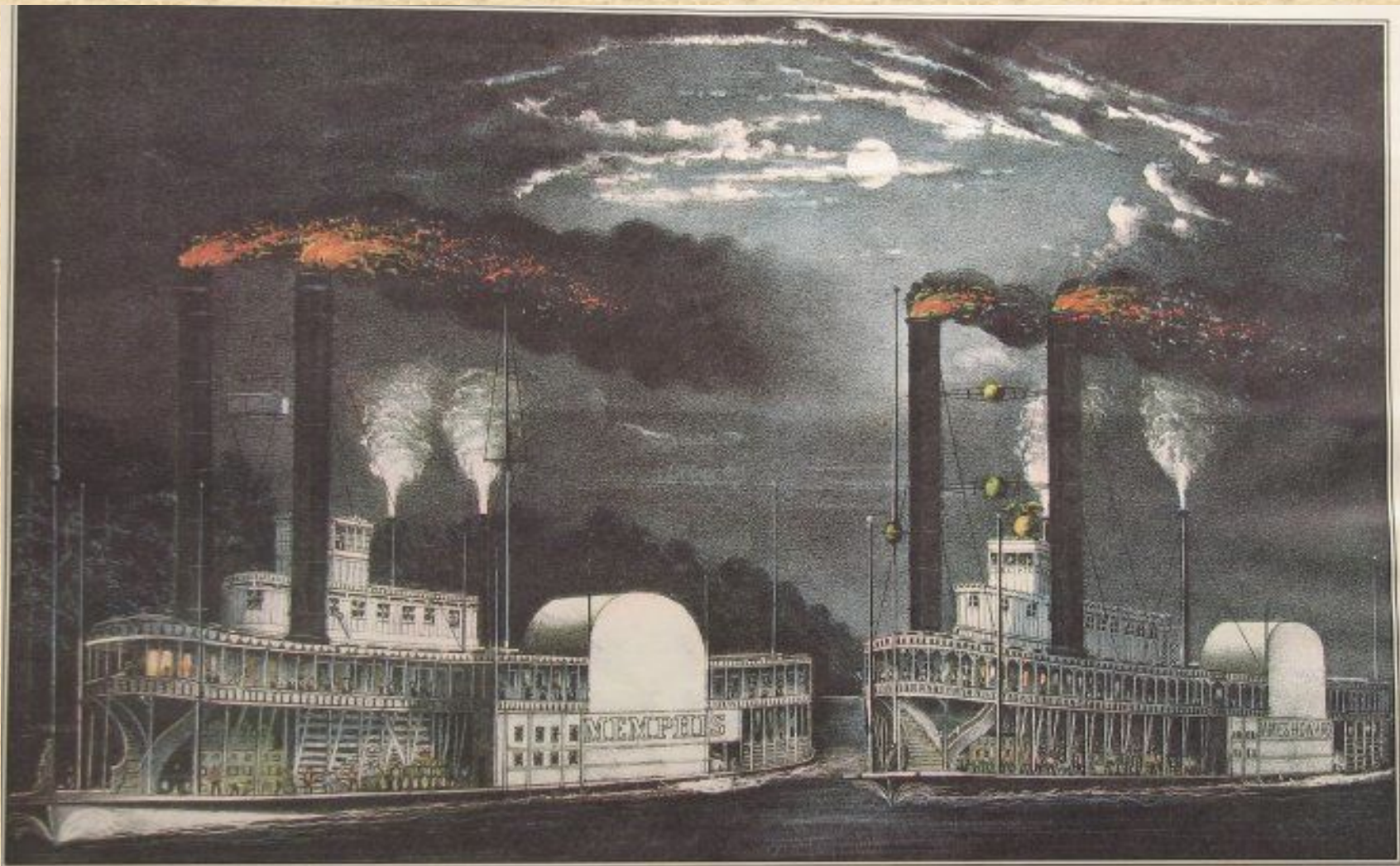
"Down in Mobile"



DETROIT PHOTOGRAPHIC CO., PUBLISHERS.

7036: MISSISSIPPI RIVER PACKET WITH LARGE LOAD OF COTTON.

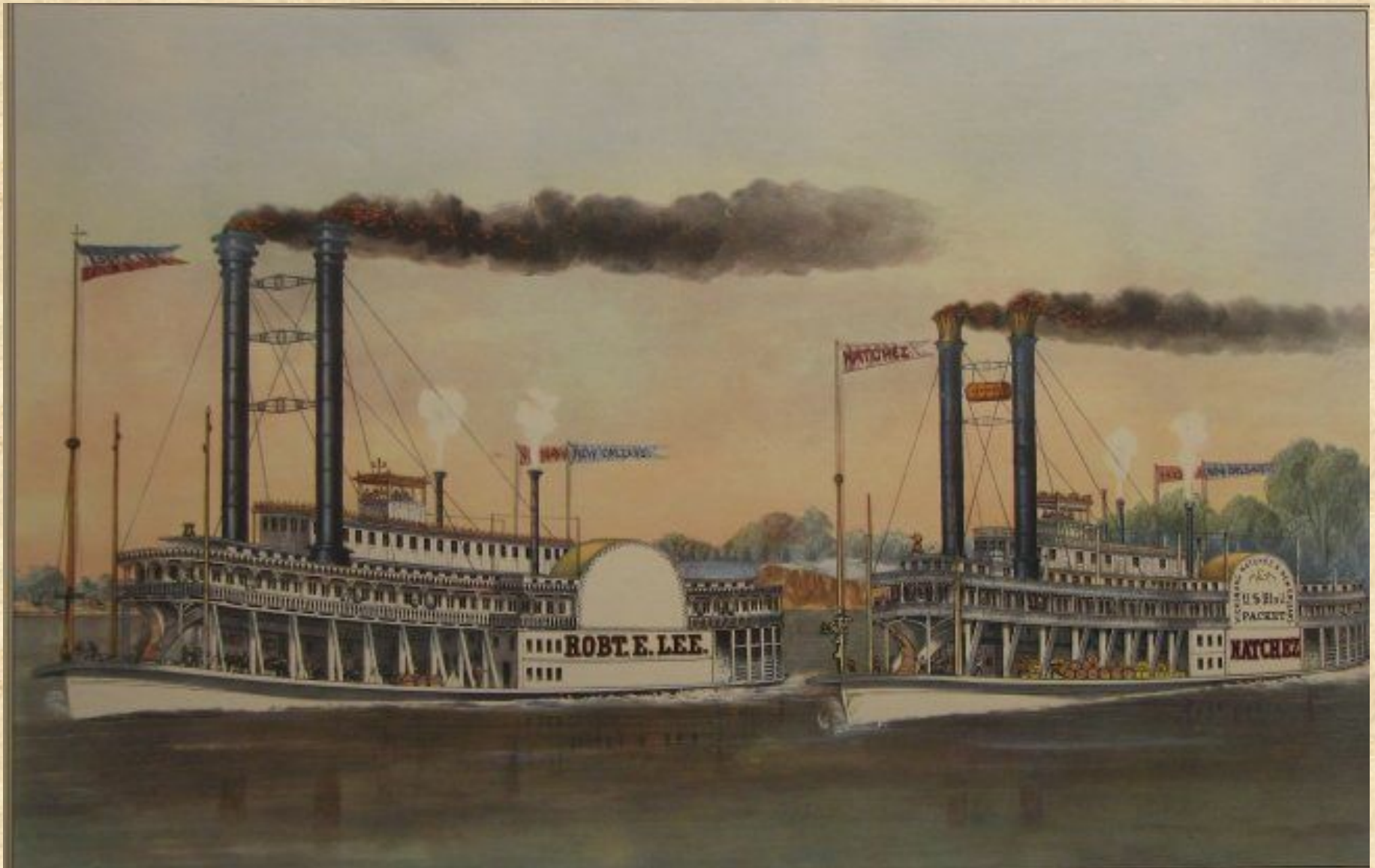
Well "good by" ! Here's my ferry.



REPRODUCED FROM LIFE BY CURRIER & IVES.

MIDNIGHT RACE ON THE MISSISSIPPI.

Steamboat race between the *Memphis* and the *James Howard* in 1877.



**“THE GREAT RACE ON THE MISSISSIPPI
FROM NEW ORLEANS TO ST. LOUIS 1210 MILES. Between the Steamers Robt. E.
Lee Capt. J.W. Cannon and Natchez. Capt. T.P. Leathers.
Won by The R.E. Lee. Time: 3 Days 18 Hours 30 Minutes.” (Currier & Ives)**



The Stevens family were inventors who designed successful steamboats, including the *Phoenix*, the first steamboat to travel on the ocean.



Colonel John Stevens



Edwin A. Stevens



Robert L. Stevens

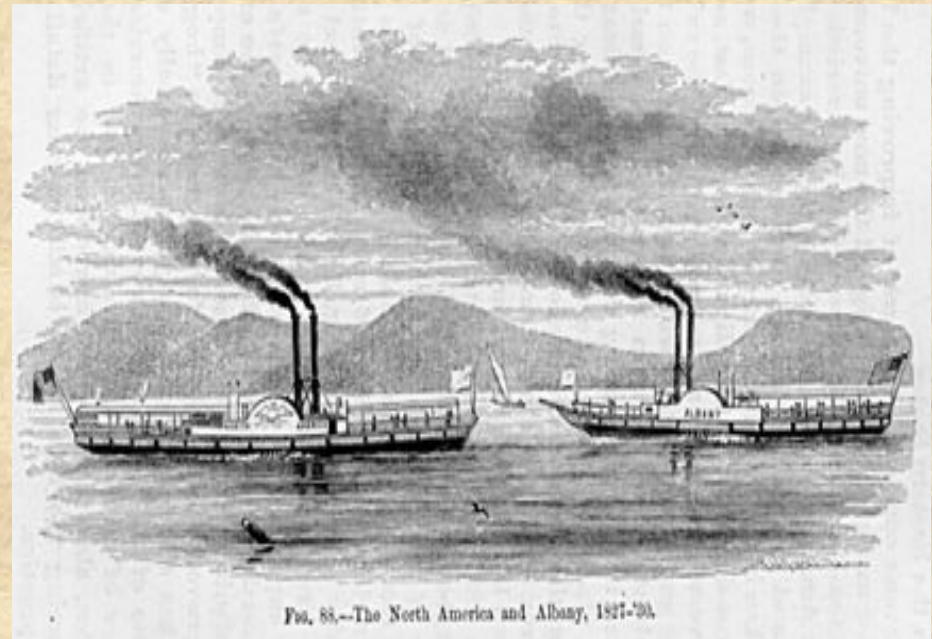
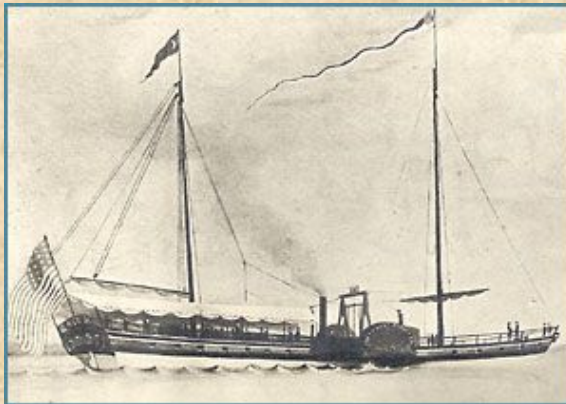
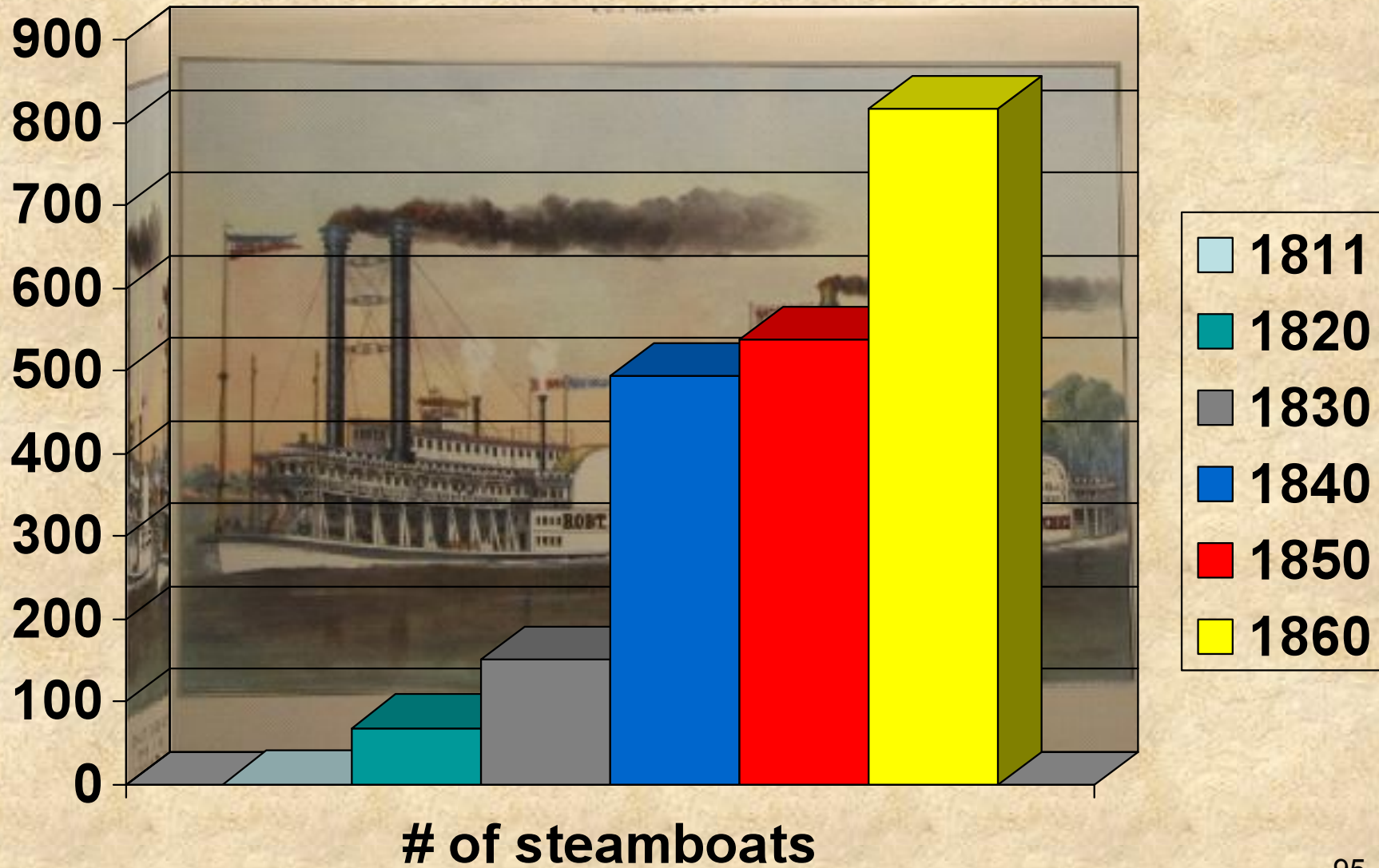


FIG. 88.—The North America and Albany, 1827-'30.

Growth in the number of steamboats on western rivers, 1811 to 1860



Early railroads



Railroads were the most important factor for economic growth in the second half of the 19th century. The foundation for this was laid in the antebellum period (before the Civil War, 1861-1865) when early railroads tended to duplicate existing steamboat and canal routes.



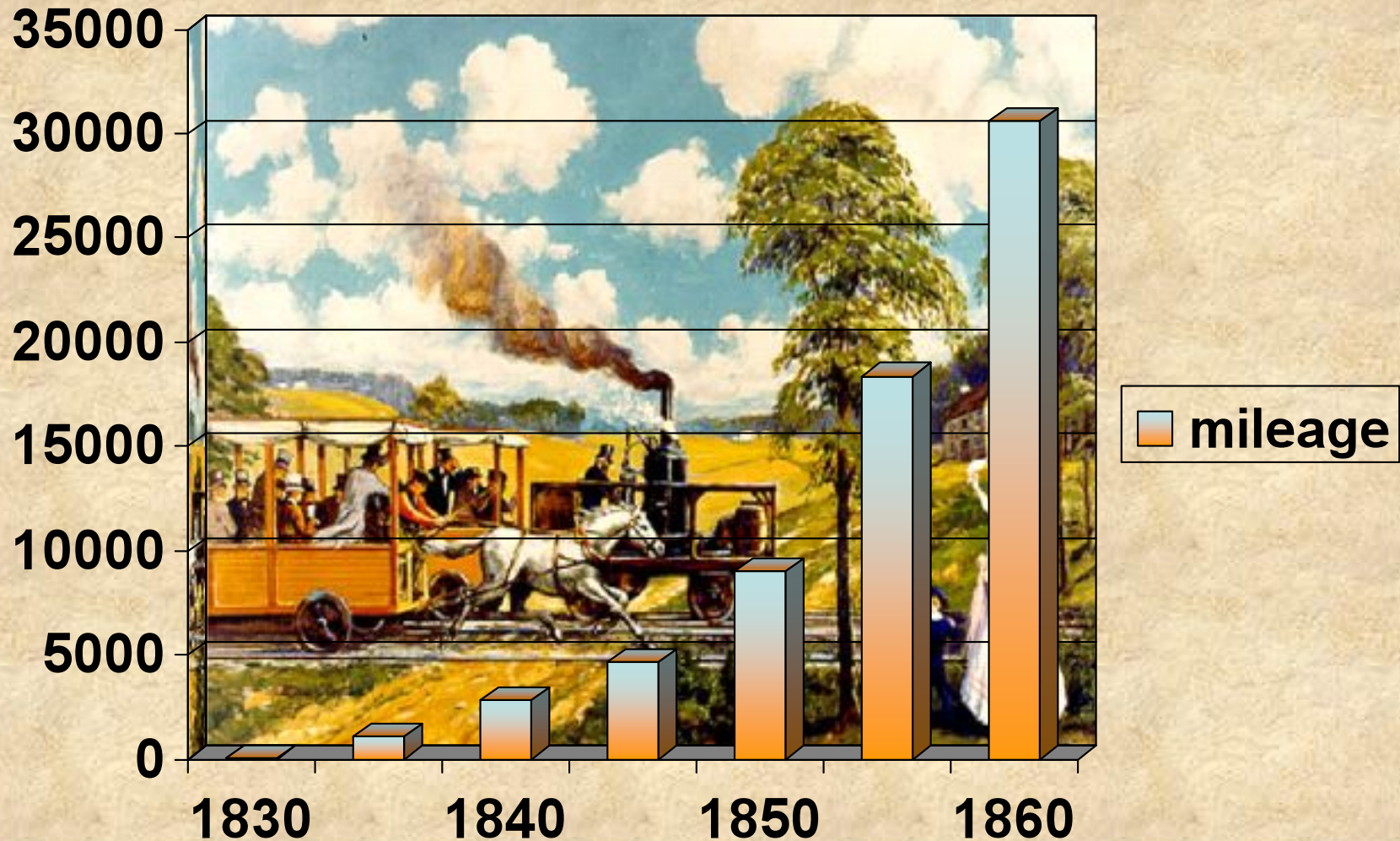
Railroads had several advantages over steam and canal boats:

First was their speed. Early freight trains could run between 10 and 30 miles per hour, much faster than water transportation in canals or steamboats.

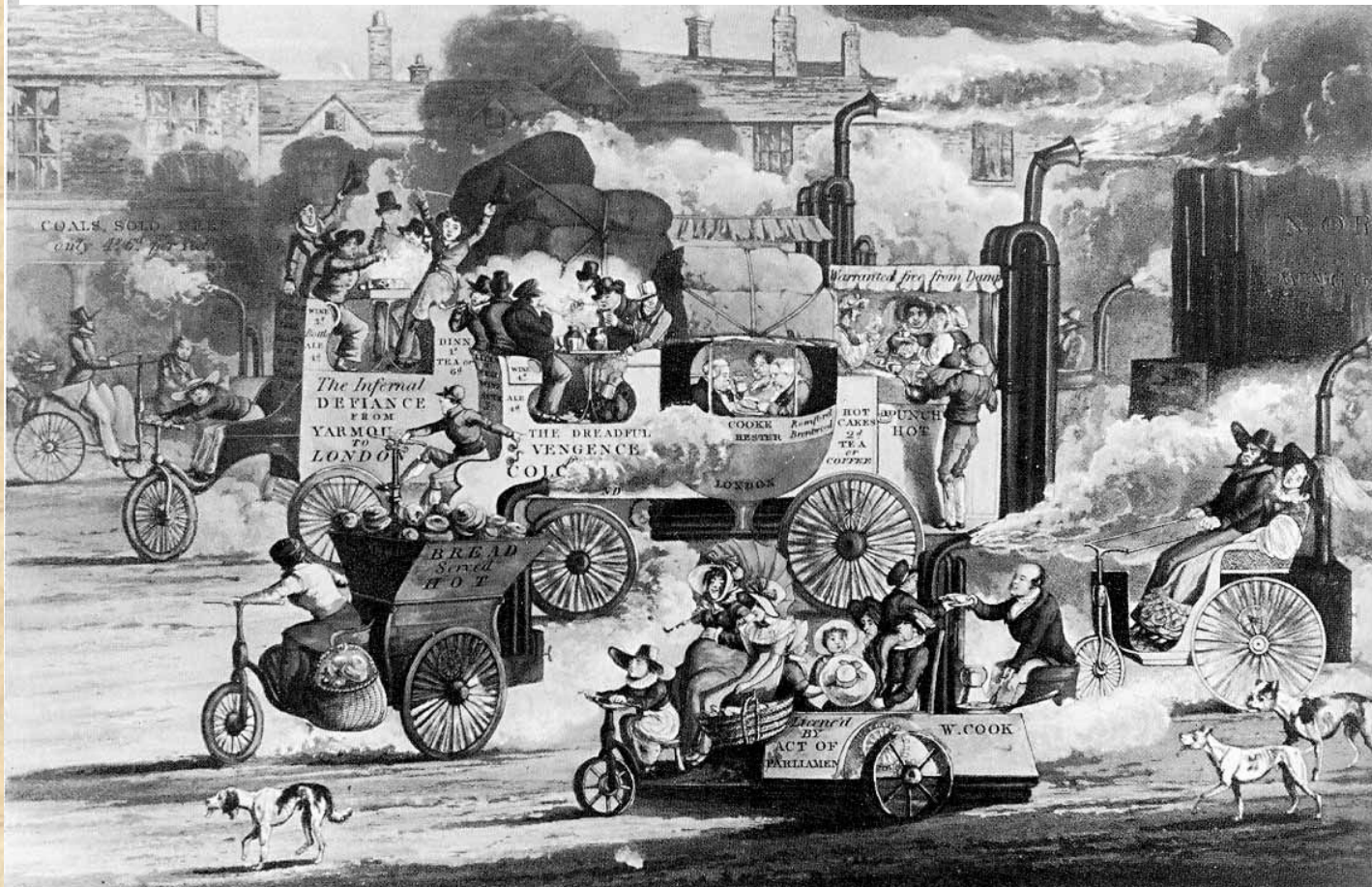
Second, they could travel over manmade (straight) routes rather than having to follow natural waterways. This resulted in shorter travel time. They could be built in rugged terrain and cost only a fraction of the cost of canal construction.

Third, they could travel year round in any climate and were not affected by freezing temperatures.

Railroad construction: 1830-1860



English road using "steam coaches," an early potential competitor to rail-bound steam trains.

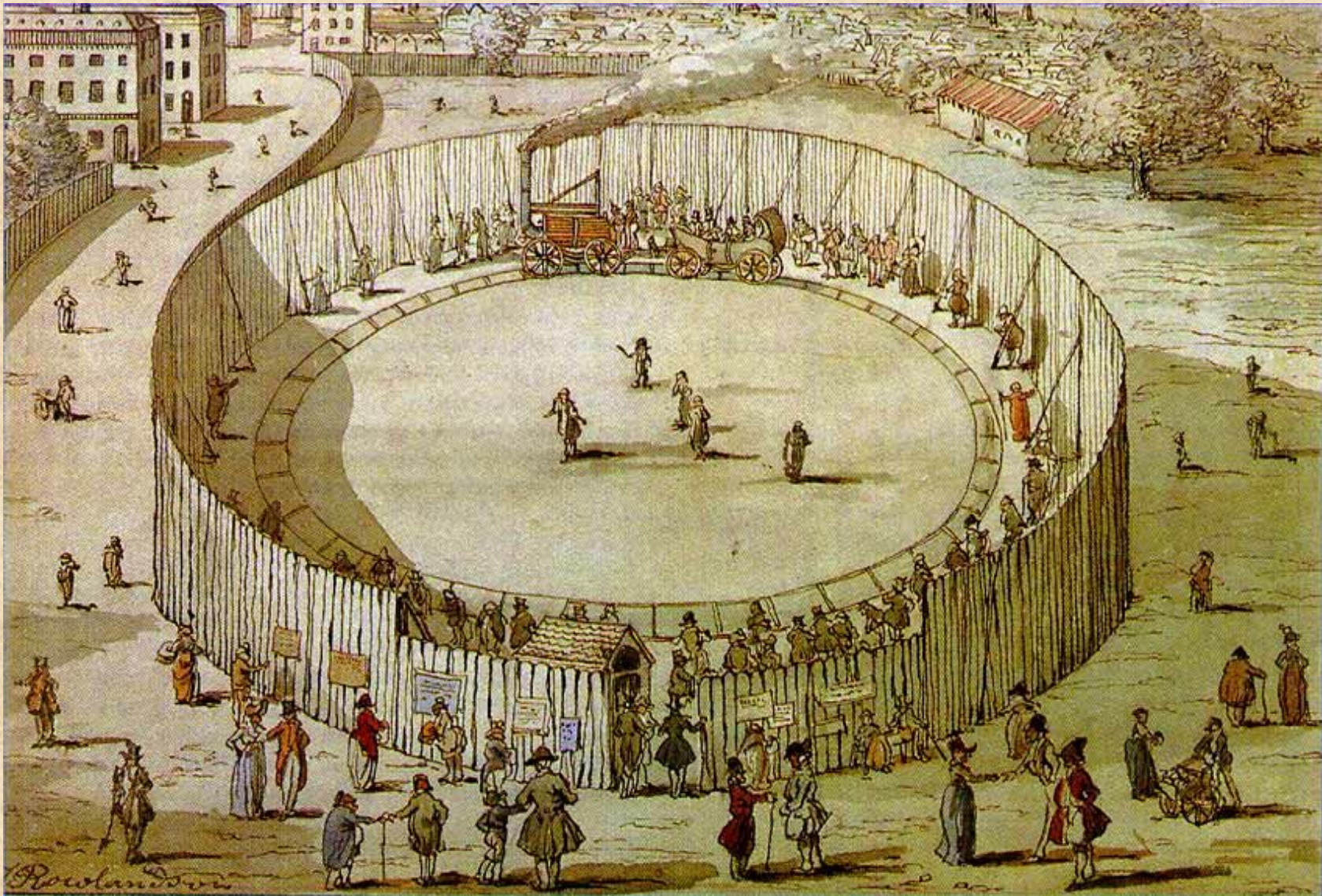


The two large steam coaches are named "The Infernal Defiance -- From Yarmouth to London" and "The Dreadful Vengeance -- Colchester, London."

On the rear of the coach in front is a banner proclaiming "Warranted free from Damp." The small delivery wagon has "Bread served Hot" on its side, and the service station proclaims "Coals Sold Here: only 4s. 6d. per Pound(?)."

As Paul Johnson has documented in his book *The Birth of the Modern*, the early British railroad companies were at pains to avoid any possible competition from free-running steam coaches (which may not have been too practical anyway...).

Richard Trevithick built the first working steam locomotive



Trevithick's steam locomotive as an attraction for paying customers in London's Euston Square: watercolor by Rowlandson, 1809.



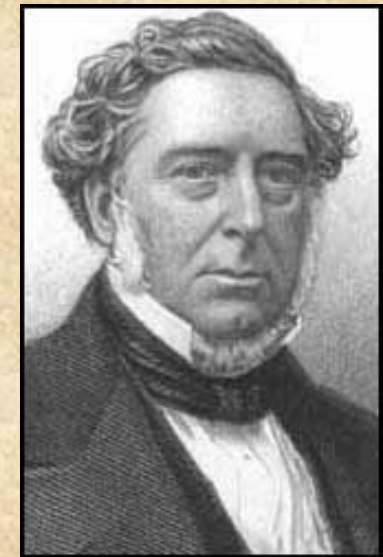
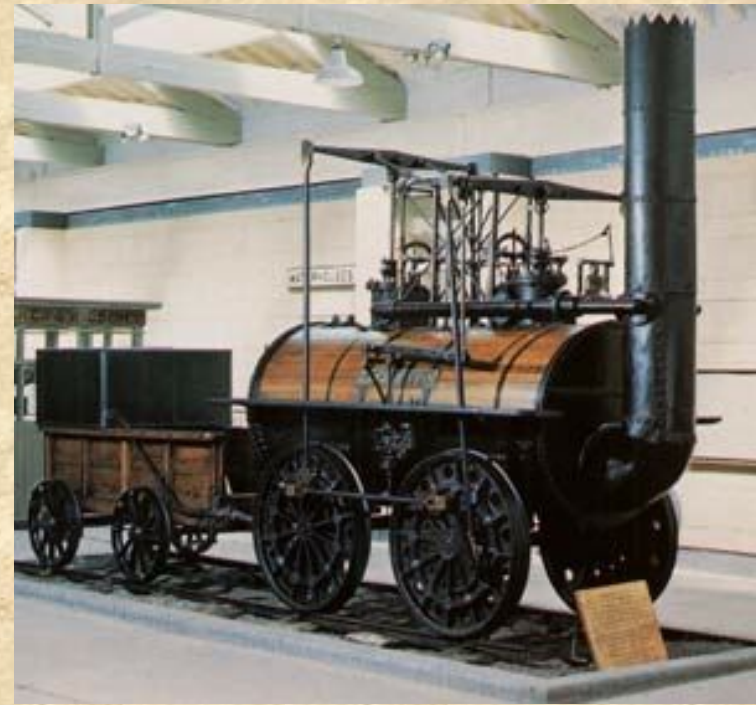
The Englishman George Stephenson is credited with designing the *Blucher*, one of the first steam locomotives, in 1814.



In 1821, he and his son Robert began construction on the *Stockton and Darlington Railway*, which opened in 1825.



The engine, named *Locomotion #1*, hauled an 80-ton load reaching a speed of 24 miles per hour.



George (left) and Robert Stephenson

Peter Cooper



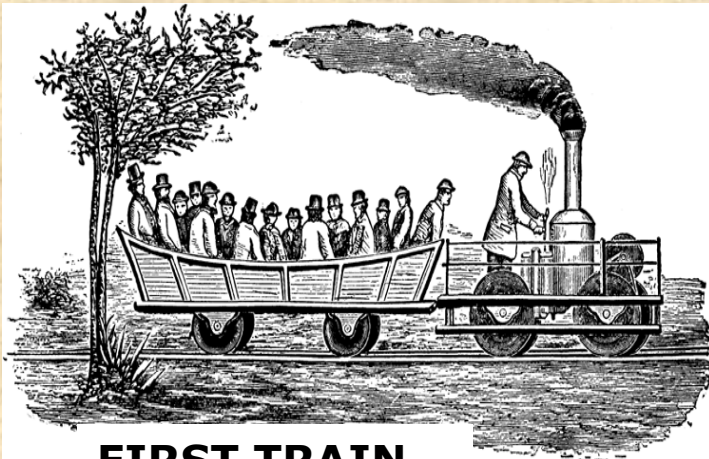
Peter Cooper was an American inventor, politician, industrialist, and philanthropist.



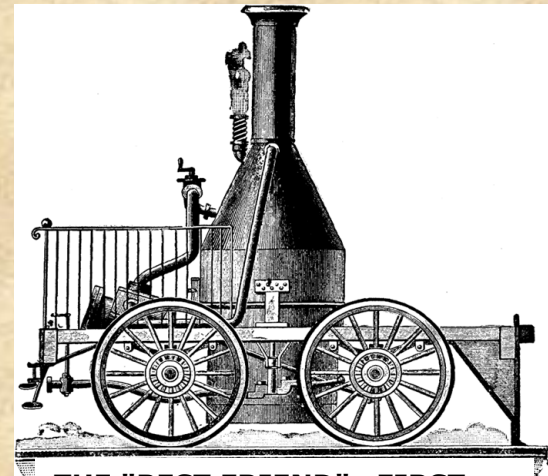
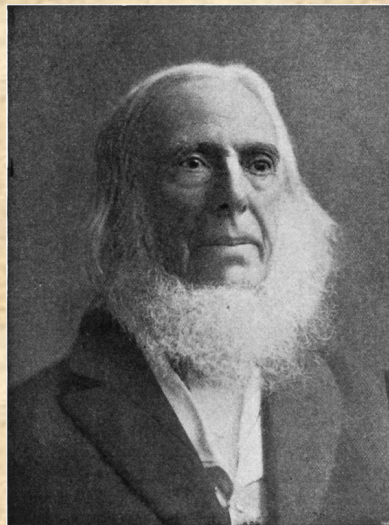
He built the first steam-powered railroad locomotive in the U.S.



His locomotive was named *Tom Thumb* and was used successfully on the Baltimore and Ohio Railroad starting in 1830.



**FIRST TRAIN
IN AMERICA.**

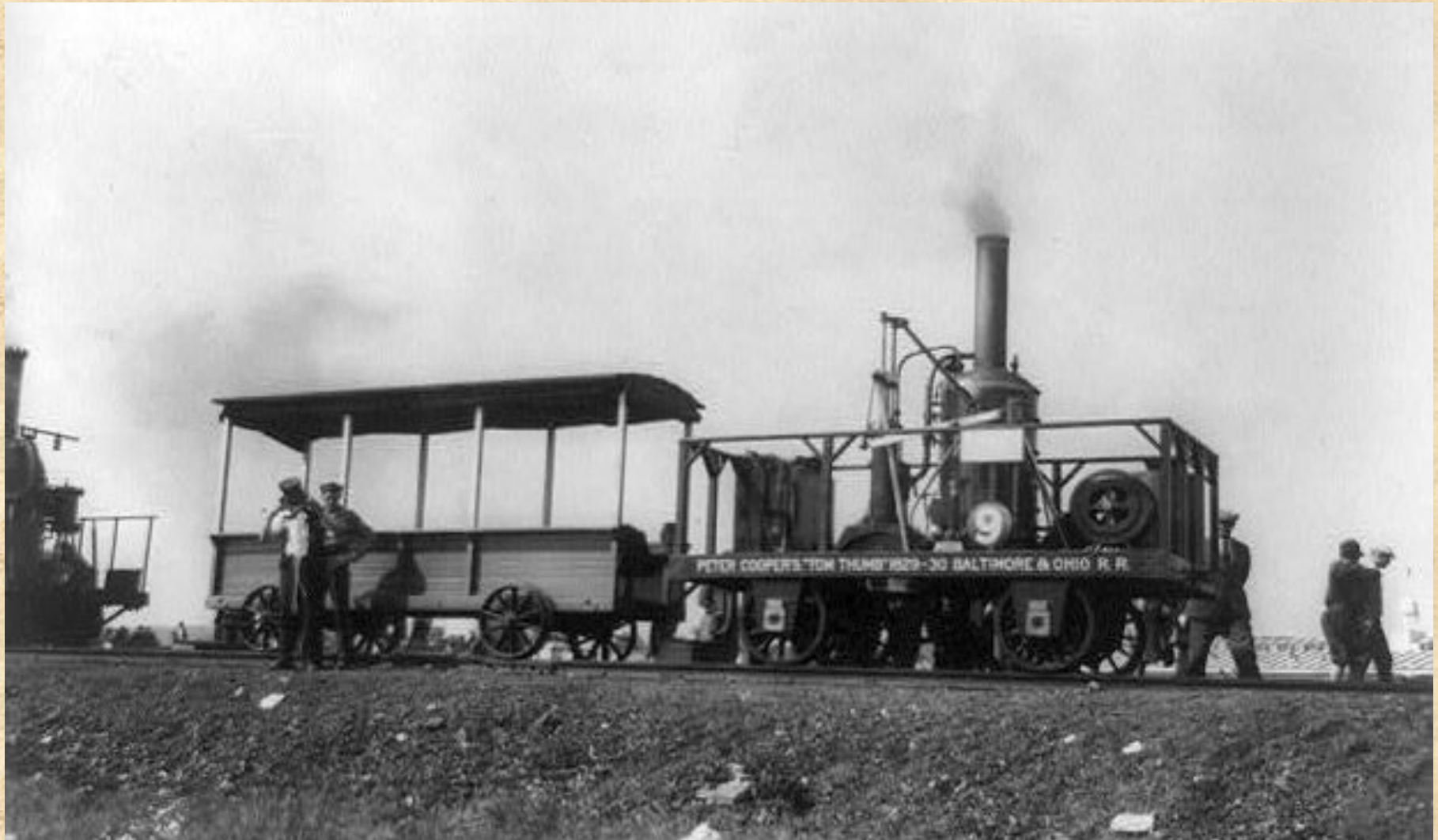


**THE "BEST FRIEND"—FIRST
LOCOMOTIVE BUILT IN
AMERICA. BUILT BY PETER
COOPER.**

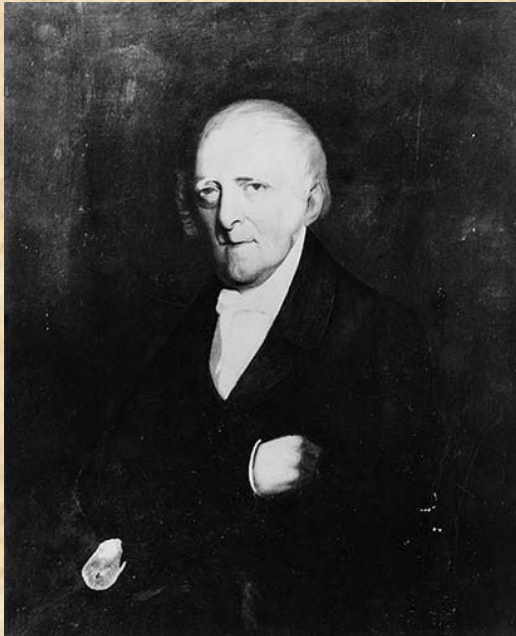
The first steam engine to operate on a commercial track in the United States, the *Tom Thumb* became famous for its race against a horse-drawn car on August 25, 1830, from Ellicott's Mill to Baltimore. The horse won the race when the engine broke down.



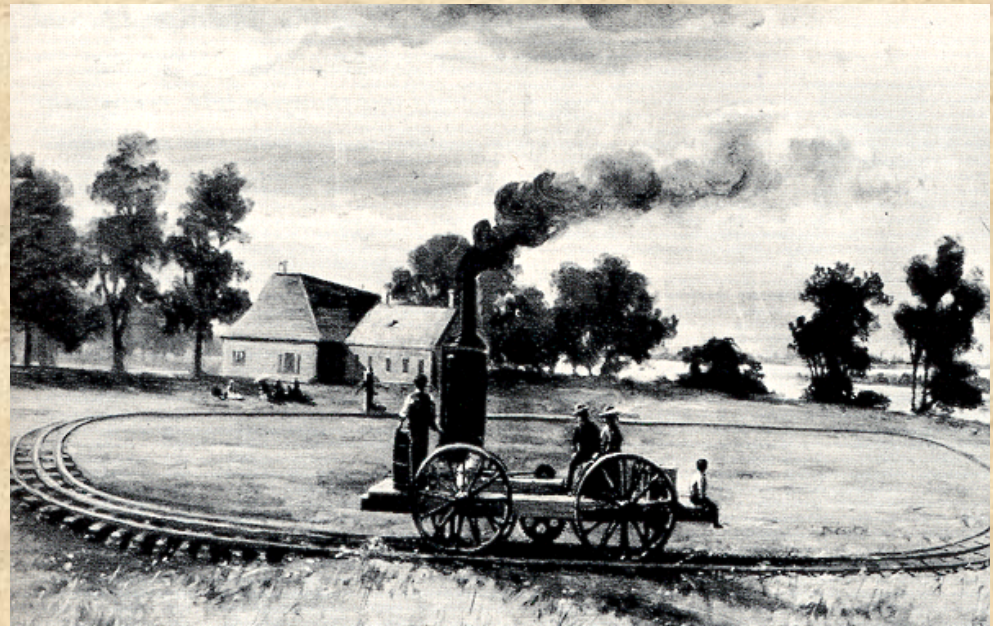
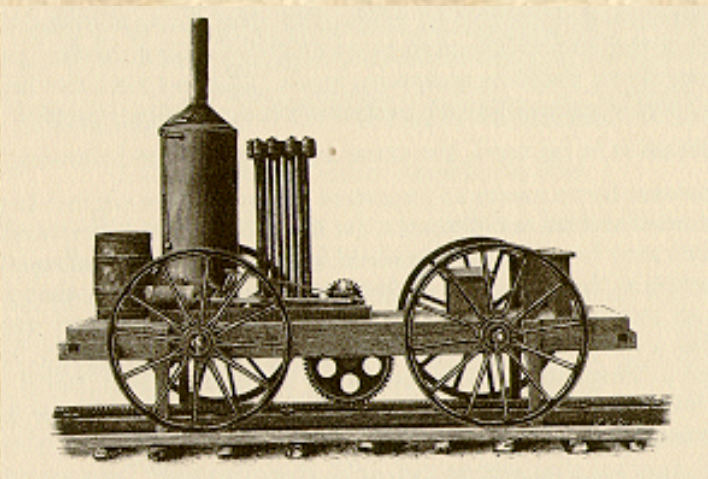
Peter Cooper's steam engine, *Tom Thumb*



John Stevens



John Stevens became interested in steam locomotion in the 1780s. He established the world's first steam ferry, and later built the first operating steam locomotive in the United States.

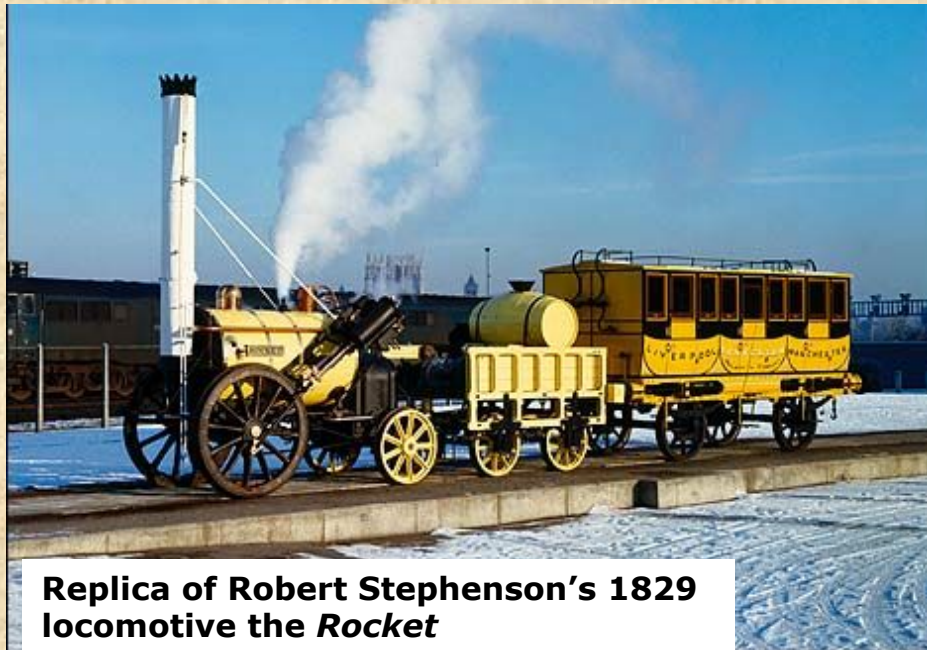




Painting of the opening of the Stockton & Darlington Railway, 1825

RAPID, SAFE, AND CHEAP TRAVELLING
By the Elegant NEW RAILWAY COACH,

THE UNION,
Which will COMMENCE RUNNING on the STOCKTON and DARLINGTON RAILWAY, on MONDAY
the 16th day of October, 1825,
And will call at Yarm, and pass within a mile of Middleton Spa, on its way from Stockton to Darlington, and vice versa
FARES. Inside 1½d.—Outside, 1d. per Mile. Parcels in proportion.
No gratuities expected by the Guard or Coachman.
N.B. The Proprietors will not be accountable for any Parcel of more than £5. value, unless entered and paid for accordingly.
The UNION will run from the Black Lion Hotel and New Inn, Stockton, to the New Inn, Yarm, and to the Black Swan
Inn, near the Croft Branch, Darlington; at each of which Inns passengers and parcels are booked, and the times of starting may
be ascertained, as also at the Union Inn, Yarm, and Talbot Inn, Darlington.
On the 19th and 20th of October, the Fair Days at Yarm, the Union will leave Darlington at six in the morning for Yarm,
and will leave Yarm for Darlington again at six in the evening; in the intermediate time, each day, it will ply constantly be-
tween Stockton and Yarm, leaving each place every half hour.



Replica of Robert Stephenson's 1829 locomotive the *Rocket*

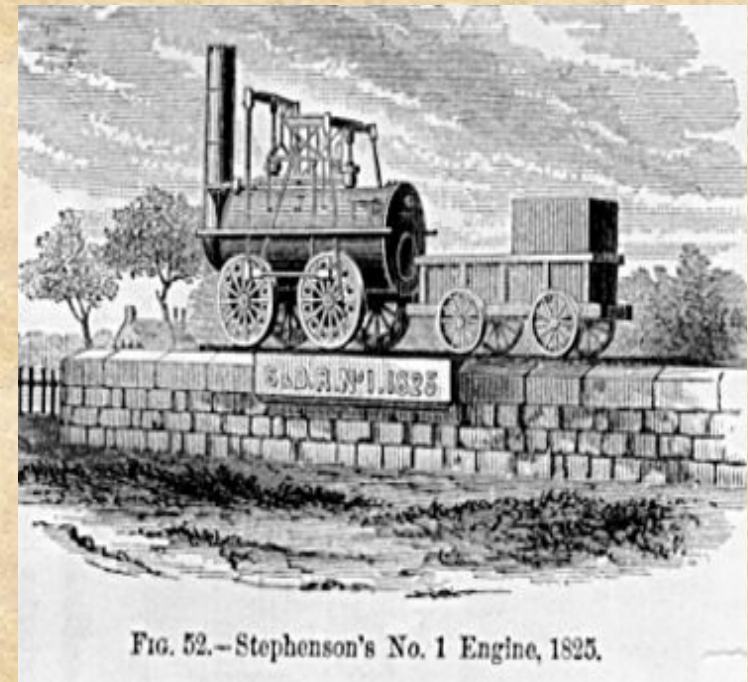
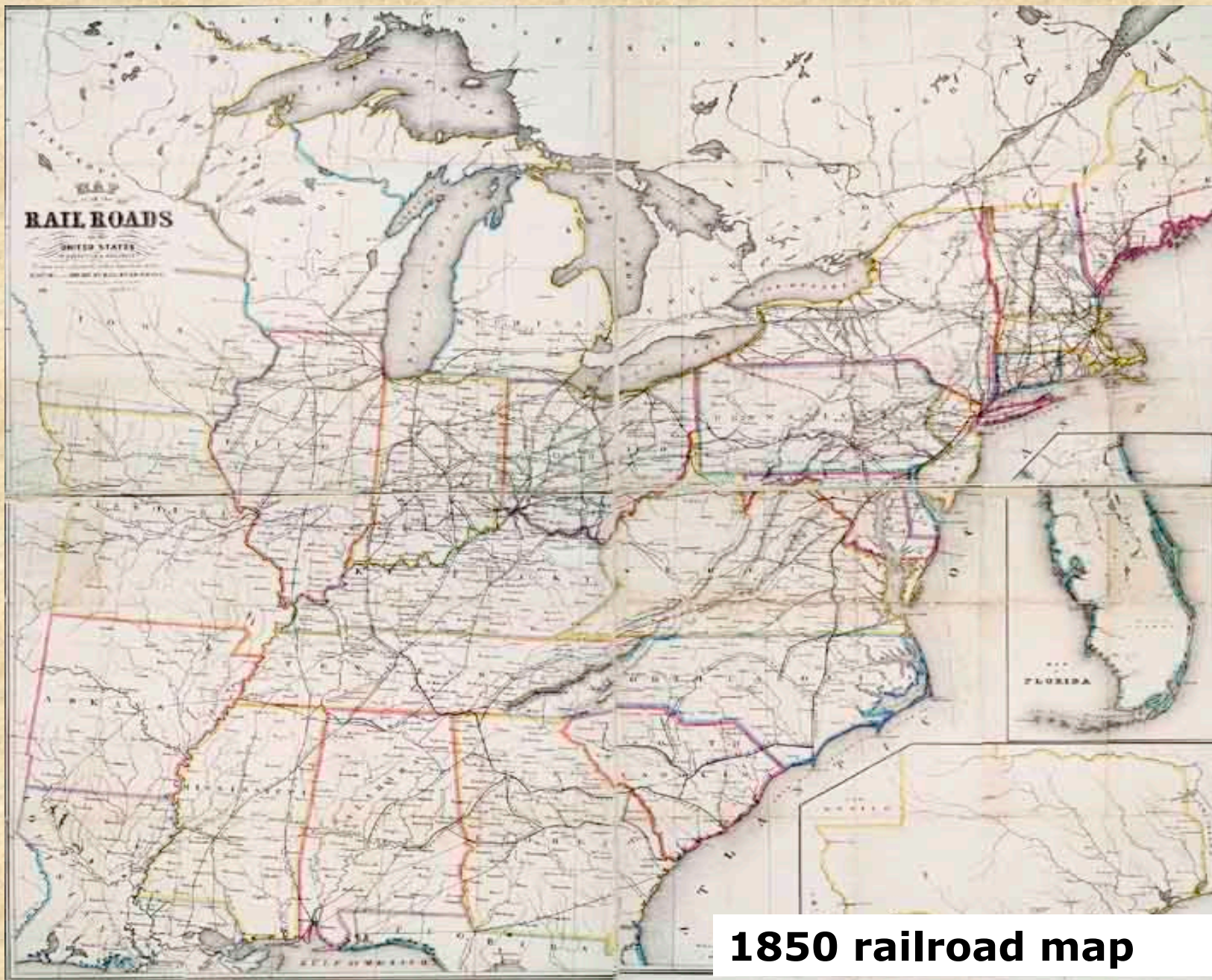
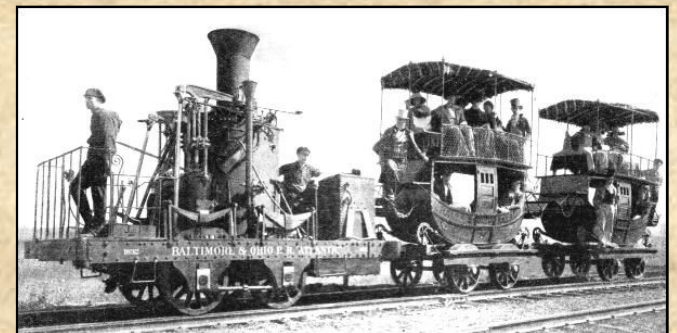
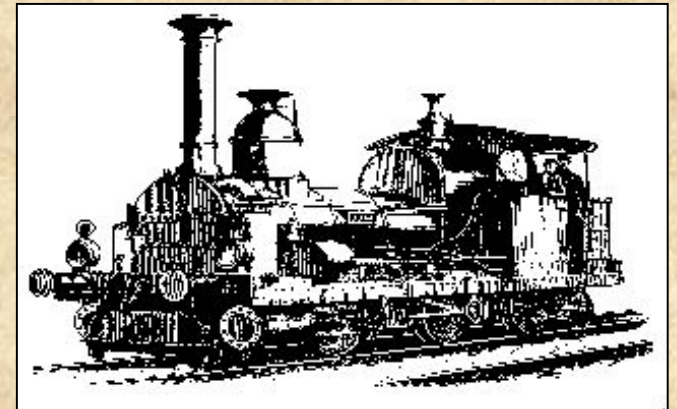
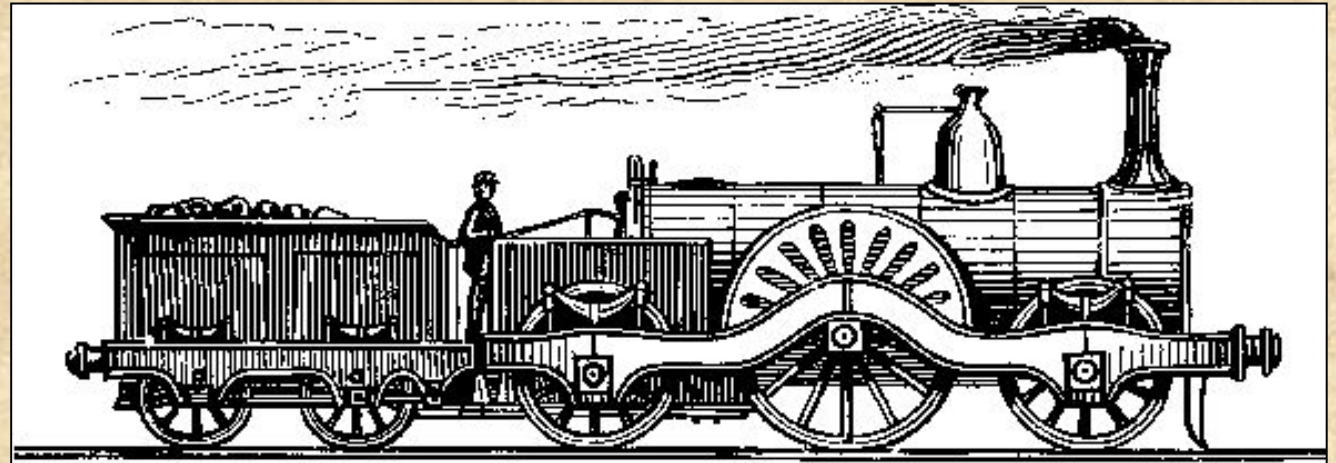


FIG. 52.—Stephenson's No. 1 Engine, 1825.

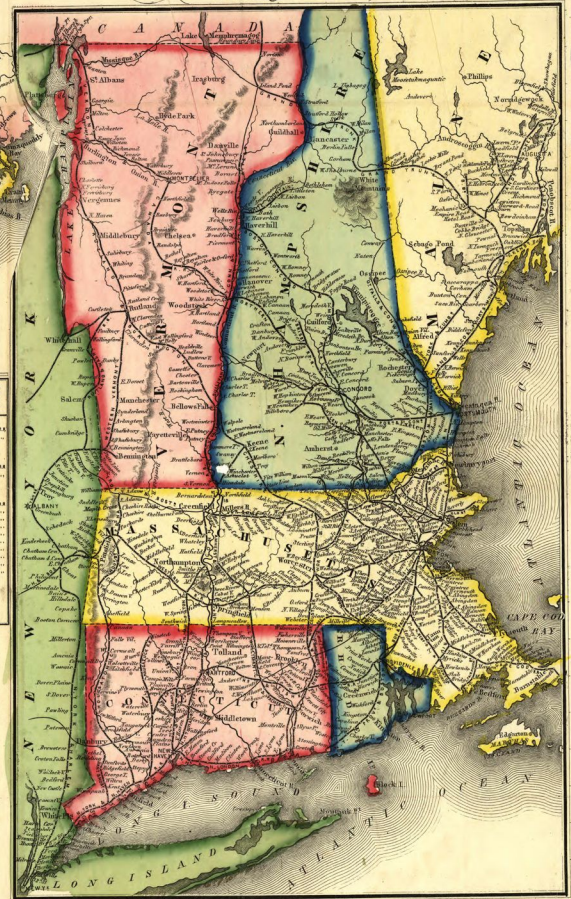
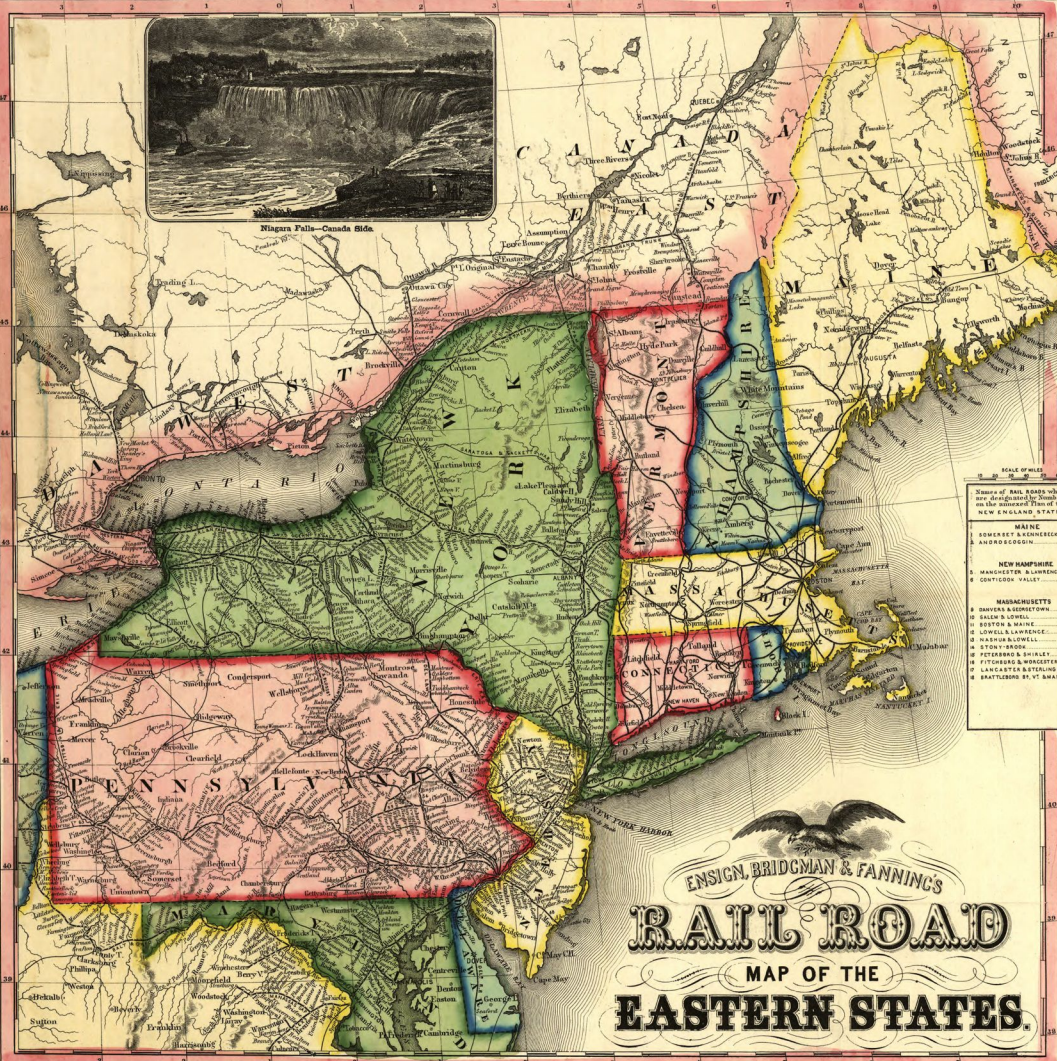


1850 railroad map

Early trains



Plan of the
NEW ENGLAND STATES,
 on an
 Enlarged Scale.



ENSIGN, BRIDGMAN & FANNING'S
RAIL ROAD
 MAP OF THE
EASTERN STATES.

Published by
ENSIGN, BRIDGMAN & FANNING
 156 William St. New York 1856.



The first railroad charter in North America was granted to John Stevens in 1815.



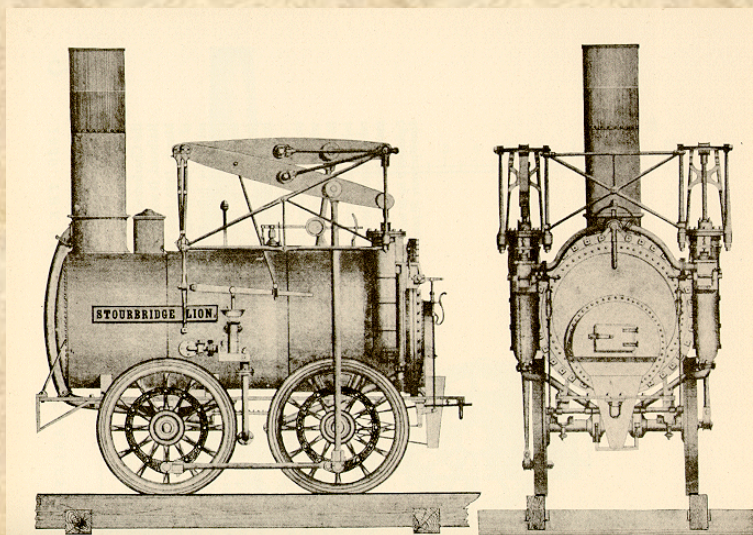
The first locomotive, the *Stourbridge Lion*, came from England in 1829. Within a few years most locomotives were made in American factories.



The Baltimore and Ohio Railroad was opened in 1830. It used horsepower until an American-made locomotive came into service in 1831.



Railroads faced competition from existing canals. It wasn't until the early 1840s that railroads were proven to be a faster and cheaper method of transporting agricultural and other commodities.



**Mathias Baldwin
(1795-1866)
built the "Old
Ironsides"
engine to carry
passengers on
the new
Philadelphia,
Germantown,
and Norristown
Railroads. His
Baldwin
Locomotive
Works would
manufacture
more
locomotives than
any other
company in the
world.**





Lith. by J. Denneman 1841

Printed by E. Wherry in Baltimore

The PASSENGER and BURDEN TRAINS of this Company,

ARE NOW RUNNING,

DAILY, BETWEEN

Baltimore & Wrightsville,

The termination of the *Philadelphia & Columbia Rail-Road*; connecting with that Road and with the *Pennsylvania State Canals*, at *Columbia*.

This Line of Rail-Road is constructed in the most permanent and substantial manner, with the heaviest Rail used in the United States!! The Cars and Locomotives are of the best quality.

The Hours of Departure and Arrival

Of the PASSENGER TRAINS, at present, are as follows, viz:

Leave BALTIMORE at 9 A. M. arrive at YORK, at 1 P. M. | Leave WRIGHTSVILLE at 9 A. M. and 6 P. M., arrive at YORK, at 12 A. M. and 6 P. M. | Leave YORK at 6 A. M. and 2 P. M., arrive at WRIGHTSVILLE, at 7 A. M. and 2 P. M. | Leave YORK at 10 A. M., arrive at BALTIMORE, at 2 P. M.
In time for the Morning and Afternoon Trains to PHILADELPHIA. | In time for the Afternoon Trains for WASHINGTON and PHILADELPHIA.

PASSENGERS from the West, by taking the Stage at Harrisburg, for York, in the Morning, arrive in Baltimore to Dinner. Those going West, by leaving Baltimore at 9 o'clock A. M., arrive at Harrisburg the same Evening,—and take the Canal Boats the next day.

The FREIGHT LINES of Messrs. J. O'CONNOR & Co. and D. LEECH & Co. between BALTIMORE and PITTSBURG, run regularly on this route. PRODUCE and MERCHANDISE consigned by any other conveyance, to Mercantile Houses in WRIGHTSVILLE or COLUMBIA, will be forwarded to Baltimore in the Cars of the Rail-Road Company.

D. C. H. BORDLEY, Superintendent.

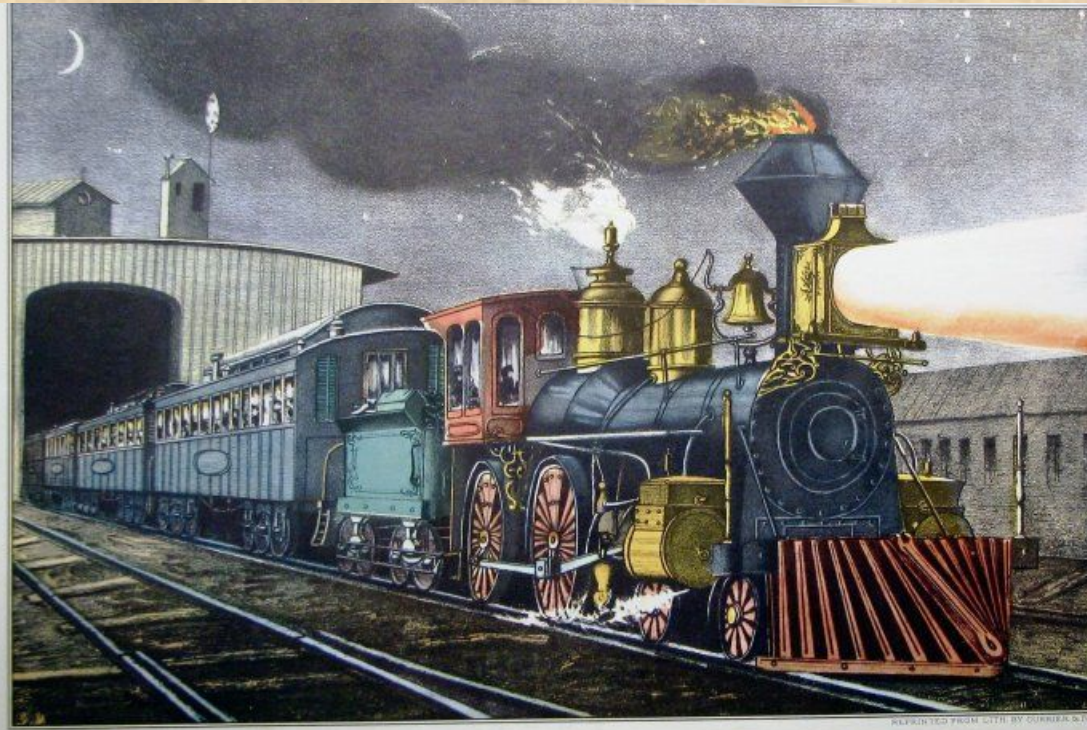
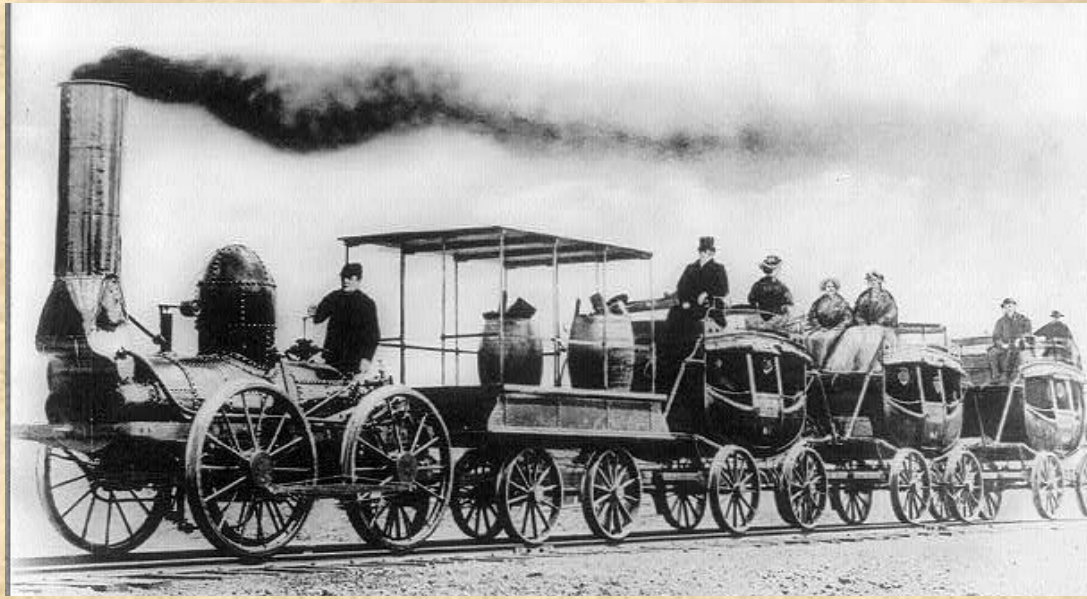
Transportation Office Baltimore and Susquehanna Rail-Road Co.,

BALTIMORE, June 1st, 1840.

Printed by LUCAS & DEAYER, corner of CALVERT STREET and LOVELY LANE, BALTIMORE.

1840 railroad advertisement





THE NIGHT EXPRESS: THE START.



Clipper ships



Clipper ships were small, fast cargo sailing ships built in the U.S. and later other places during the first half of the 19th century.



Their speed was two to three times faster than larger traditional merchant sailing vessels.



They were built to carry high-value, low-volume goods such as tea, coffee and spices, as well as passengers and mail.



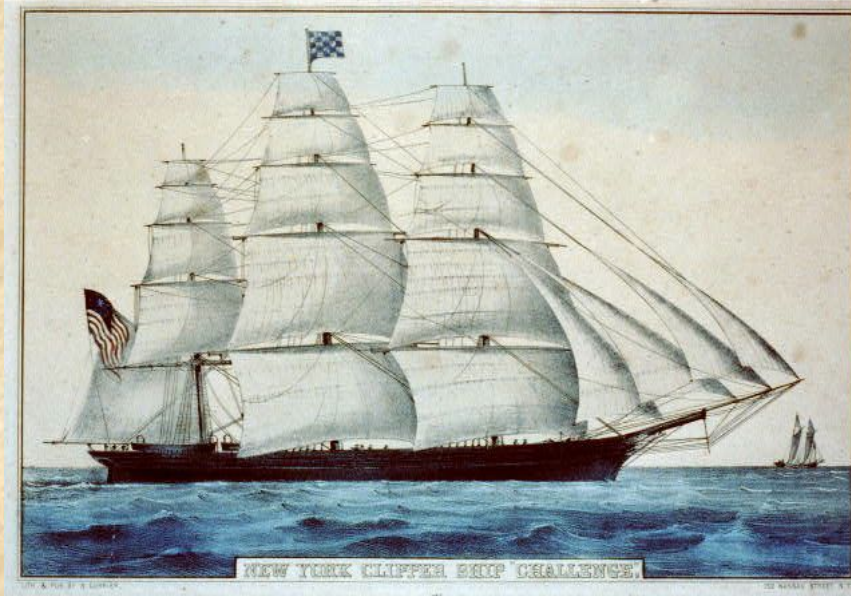
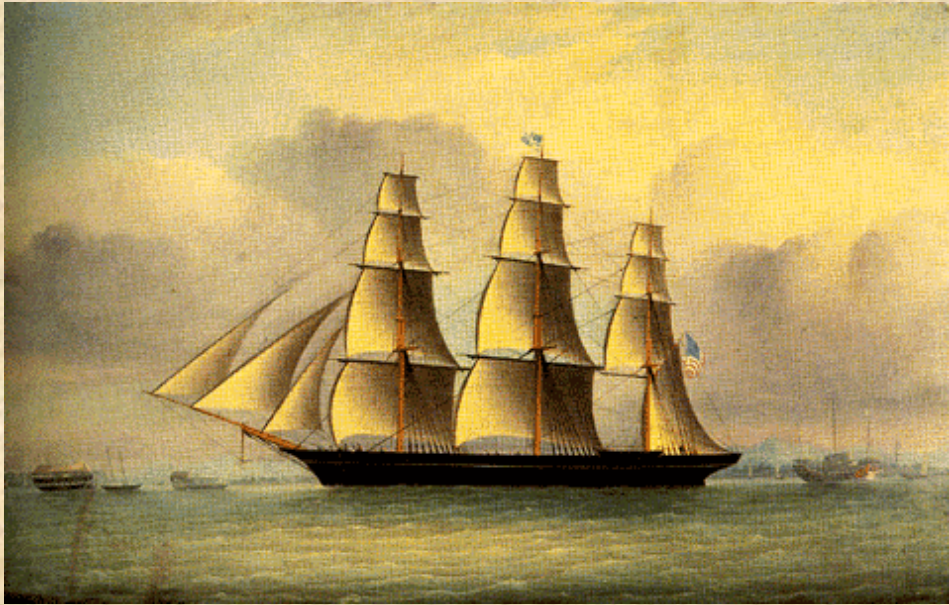
Donald McKay was the most successful clipper ship builder. One of his ships, the *Flying Cloud*, made the trip from New York to San Francisco, around South America, in 89 days.



Clipper ships offered the quickest way to California during the mid-19th-century gold rush.



Clipper ship construction declined rapidly after 1860 due to competition from steam-powered vessels.





Designed and built by the Messrs. W. & A. G. Hall, of the Royal Dockyard, Deptford, England.

LENGTH OF DECK... 120 FEET
 LENGTH OF HULL... 215
 BREADTH OF DECK... 30
 BREADTH OF HULL... 30

CLIPPER SHIP "DREADNOUGHT"

THE "DREADNOUGHT" WAS BUILT BY THE MESSRS. W. & A. G. HALL, OF THE ROYAL DOCKYARD, DEPTFORD, ENGLAND.

BUILT BY W. & A. G. HALL... 1851
 DRAWN BY... 1851
 TRADE MARK...
 BUILT BY CURTIS & TOMES...
 AT NEWBURY, MASS. 1851

The *Cutty Sark*, one of the last surviving clipper ships



Effects of the transportation revolution

- ◆ **Midwestern land sales boomed as farmers could profitably ship their crops to distant markets.**
- ◆ **Eastern farmers had to adjust their crop patterns to meet western competition.**
- ◆ **Cheaper foodstuffs from the west accelerated industrialization in eastern cities.**
- ◆ **Transport costs dropped dramatically.**
- ◆ **East-west transportation links united the east and west economically during the southern secession and the Civil War.**
- ◆ **A national market was created for goods that could now be shipped cheaply and efficiently.**
- ◆ **Due to the new markets, production increased to meet new national demand.**

North and South diverge economically

- ❖ **North industrializes**
- ❖ **South focuses on agriculture**
- ❖ **Slavery as a source of conflict**

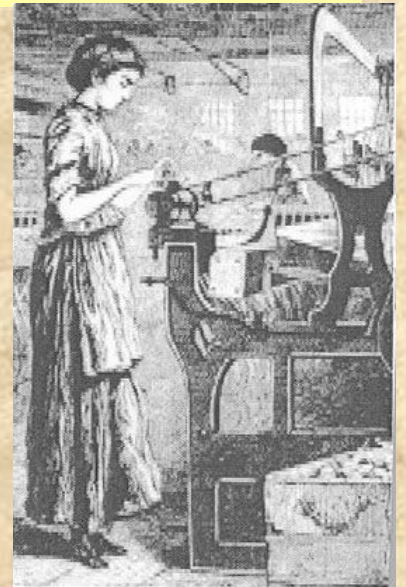


The Industrial Revolution ignited the northern economy and brought about a *"complete revolution in domestic life and social manners."*

In the northern states, innovation and personal freedom encouraged resourcefulness and experimentation. An atmosphere favorable to business growth encouraged the invention of new techniques. A chronic worker shortage led to the development of labor-saving machinery and the employment of women in early factories.



75 Young Women
From 15 to 35 Years of Age,
WANTED TO WORK IN THE
COTTON MILLS!
IN LOWELL AND CHICOPEE, MASS.



The economy of the northern states



“Yankee” ingenuity and inventiveness contributed to the massive growth of the economy



Economic expansion created a huge demand for labor that was filled by European immigration



Major inventions and innovations during the Industrial Revolution included canals, railroads, telegraphs, sewing machines, steamboats and many others



Transportation and communication revolutions changed the way business was done and made transactions faster



U.S. clipper sailing ships set speed records and captured markets until they were replaced by steam-driven iron vessels after the mid-19th century

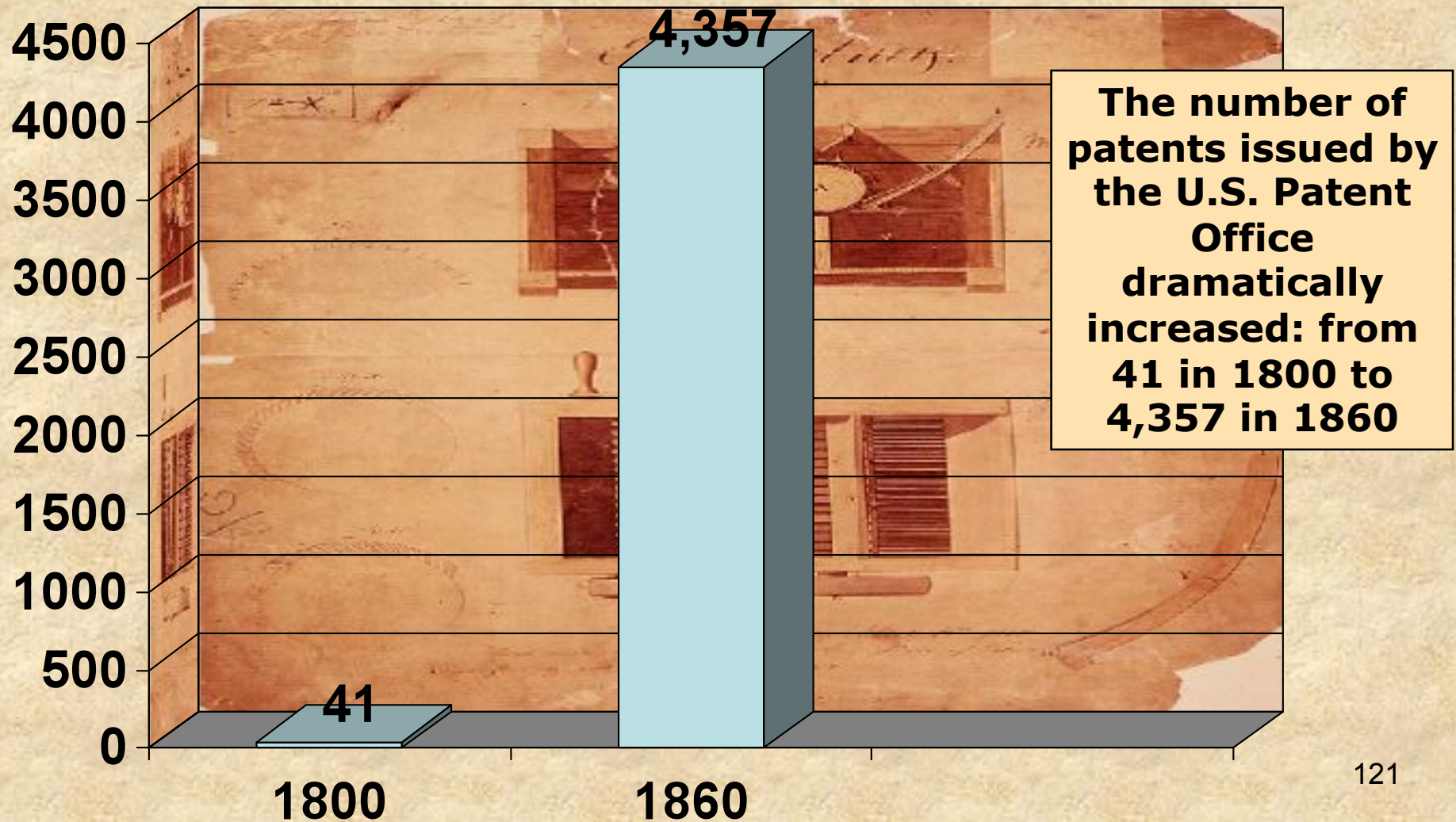


Financial and insurance industries developed to serve the new industrial corporations



American exports climbed as the demand for U.S. raw materials increased overseas

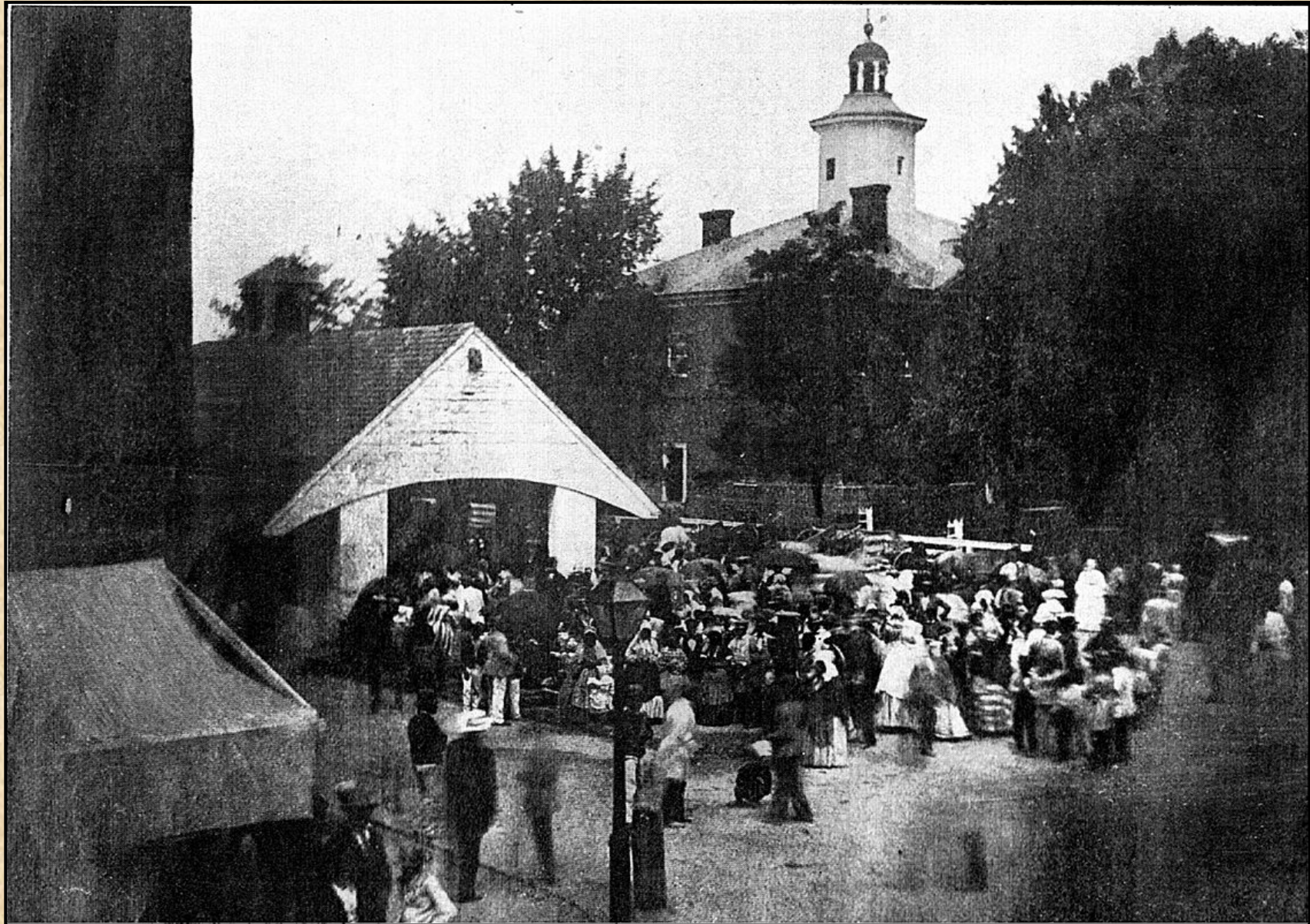
“Yankee ingenuity”: resourcefulness and experimentation led to the creation of whole new industries. A Yankee is someone who lives in the northern states, especially New England.



The South: an economy built on agriculture and slavery

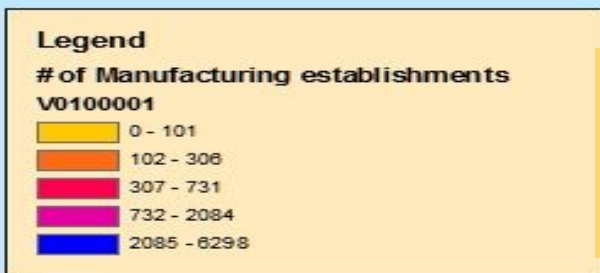
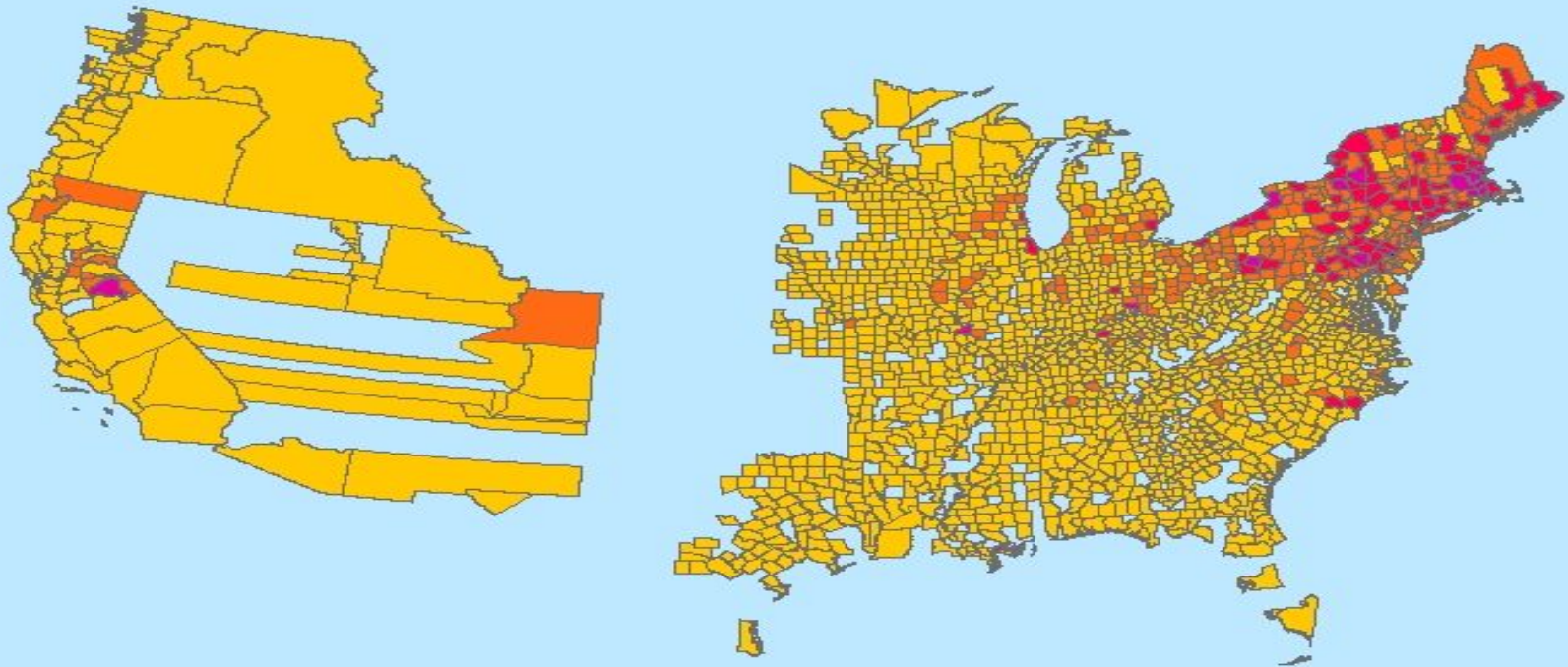


Photo of an actual slave auction



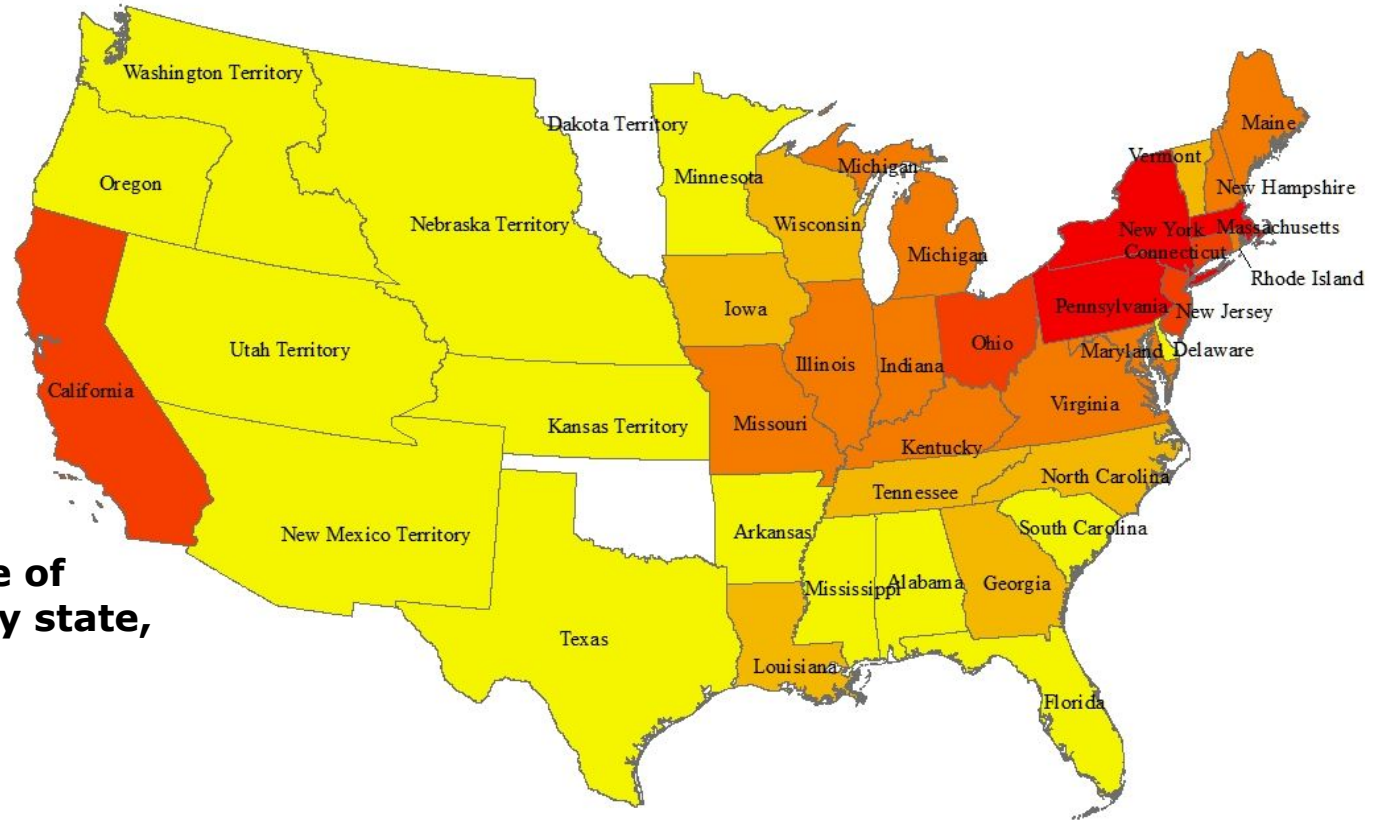
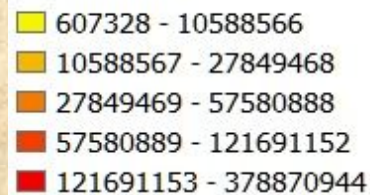
| Southern Society | % of Population | Attributes |
|---|---|---|
| Large slave plantation owners | Less than 1% of white families | 50 or more slaves, over 1,000 acres in property |
| Mid-size slave plantation owners | 3% of white families | 20-49 slaves, over 100 acres, most powerful group in the South |
| Small slave holders | 20% of white families | 1-19 slaves, mostly farmers and a smaller urban middle class |
| Non-slave owning whites | 75% of white families | Yeoman farmers and tenant farmers, some urban workers |
| Free blacks | 6% of blacks | Legal and social restrictions limited their opportunities |
| Slaves | By 1860, 1/3 of South's population | Majority worked on plantations |

Manufacturing establishment in 1860 by county



**Which part of the nation had
the most manufacturing
establishments?**

**Annual value of
manufacturing by state,
1860**



What is unusual about California's rank considering its geographical location in 1860? What factors caused California to have such a high annual manufacturing value?

Factory system

- ❖ **Definition of factory system**
- ❖ **New business organizations**
- ❖ **Francis Cabot Lowell and the Boston Associates**
- ❖ **Factory workers**
- ❖ **Lowell strike**
- ❖ **Early attempts at unionization**
- ❖ **Struggle for 10-hour workday**



Factory system defined



New way of organizing paid workers at a central location, to make goods in an efficient manner.



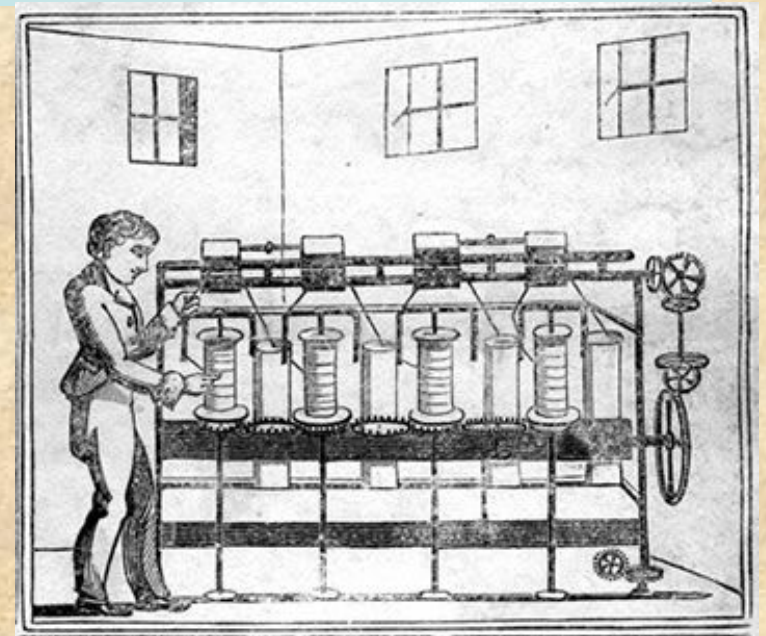
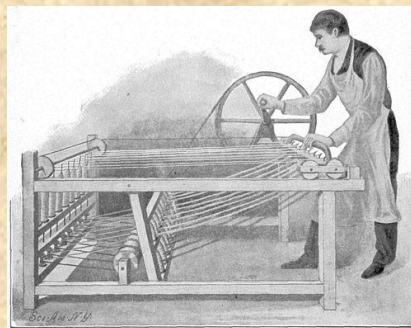
Before the factory system, most production was done in homes or small workshops.



The development of large, complex, expensive machines required workers to come to the machines to work.

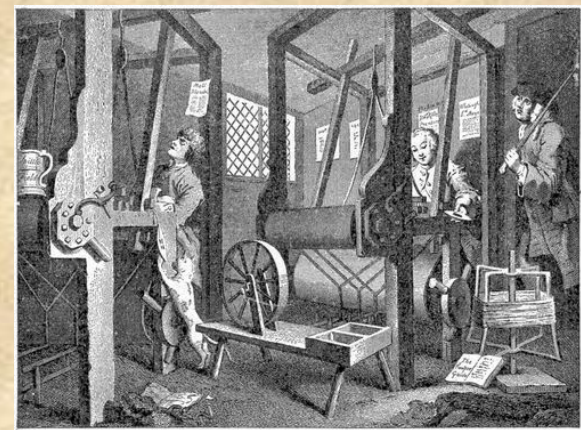
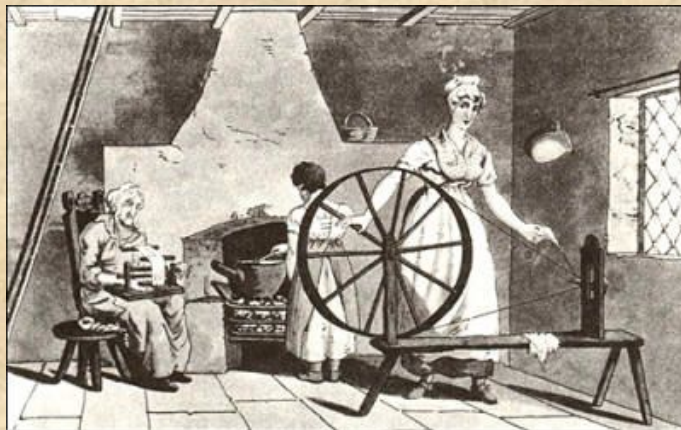


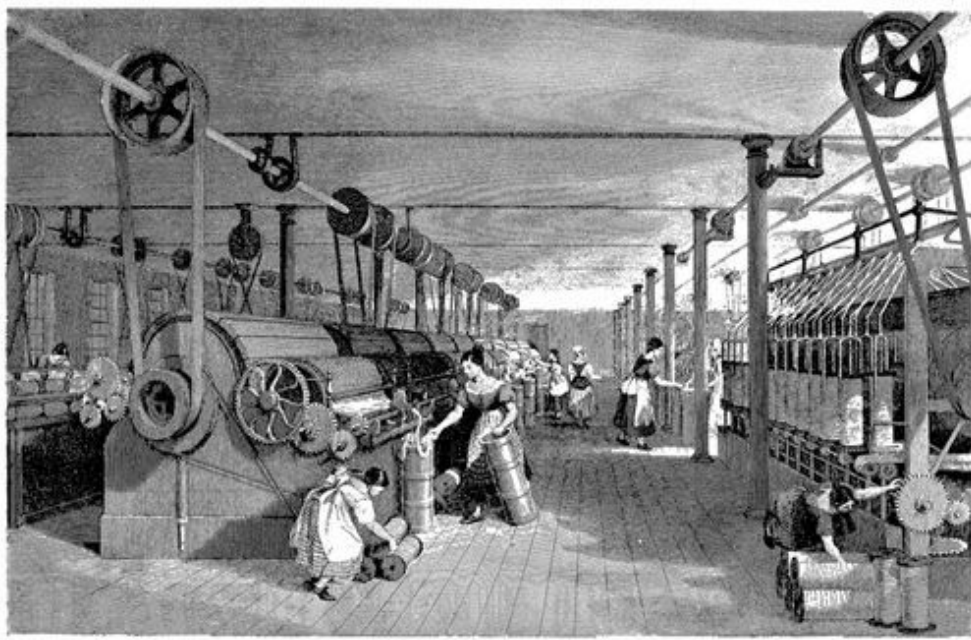
Factories displaced traditional artisans.



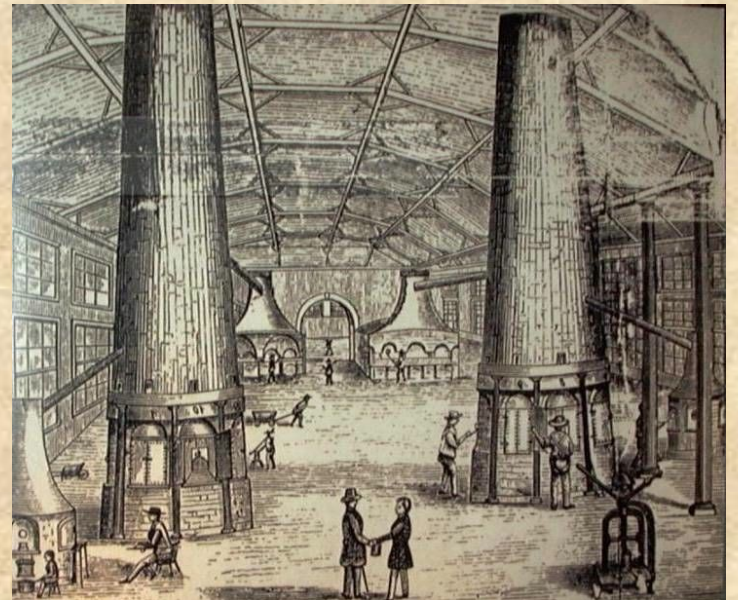


Images show examples of working from home, prior to the factory system





19th-century factories

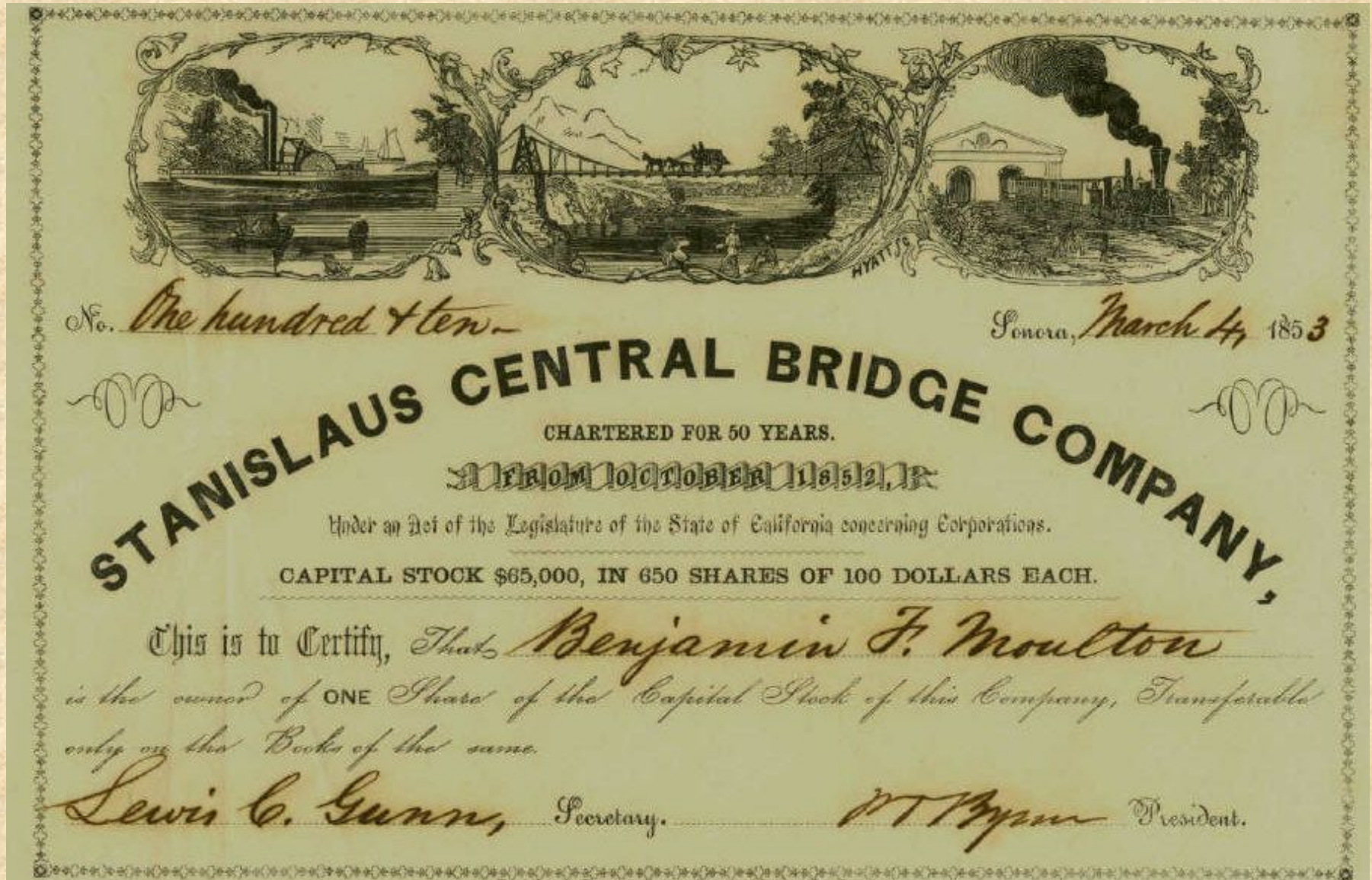


New Business Organizations

The rise of the corporate model for business organization was an important step in America's economic development.

| <u>Type of business organization</u> | <u>Definition</u> | <u>Advantages and Disadvantages</u> |
|--------------------------------------|---|--|
| Sole proprietorship | Easy to start; one person starts a business and gets the profits or losses individually | Liability, owners can lose all their assets. Hard to raise money, cannot sell stock. |
| Partnership | Easy to start; partners invest in the business and share the profits or losses | Liability, owners can lose all their assets. Hard to raise money, cannot sell stock. |
| Corporation | Harder to start; legal entity with a separate legal personality from its members | Members cannot lose their assets. Can raise money by selling stock. |

Corporations could raise money by selling shares or stock. Investors bought the shares hoping their value would rise.

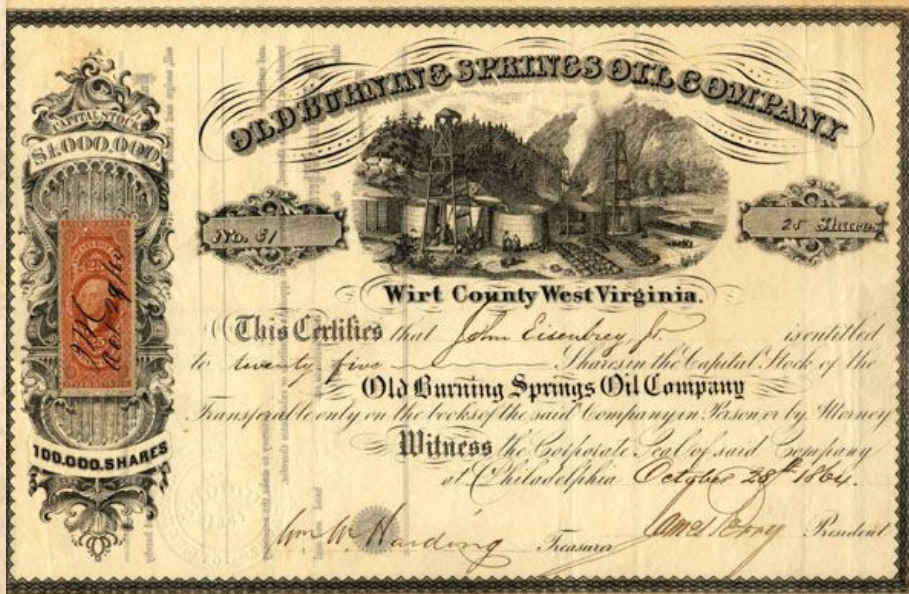





Corporations are considered “gifts” of a government to private businesses.


Corporations are granted perpetual life, diversified ownership, and limited liability for debts to the shareholders.


After the *Dartmouth College v Woodward* Supreme Court decision in 1819, corporations became the most important type of business organization in the U.S.





Francis Cabot Lowell and the Boston Associates

 In 1814, the wealthy and socially prominent Francis Cabot Lowell and several friends established the Boston Manufacturing Company (aka the Boston Associates) to invest their families' shipping fortunes in a new business.

 Their capital investment was \$400,000 (five million in 2005 dollars). At the time, this was the largest amount ever invested in manufacturing.

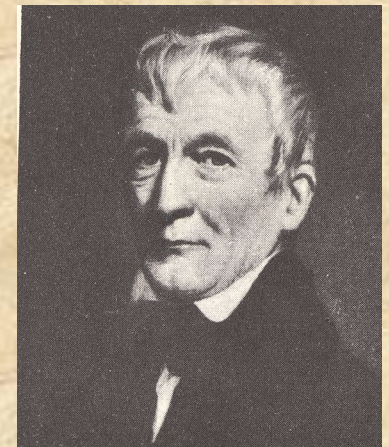
 Their first factory, in Waltham, Massachusetts, was the first in which all machines were driven by water power.

 For the first time, the power loom and other machinery permitted all the steps of cloth production to be carried out under a single roof.

 In 1822, the company bought land for expansion and named the new town Lowell after their partner who died in 1817.

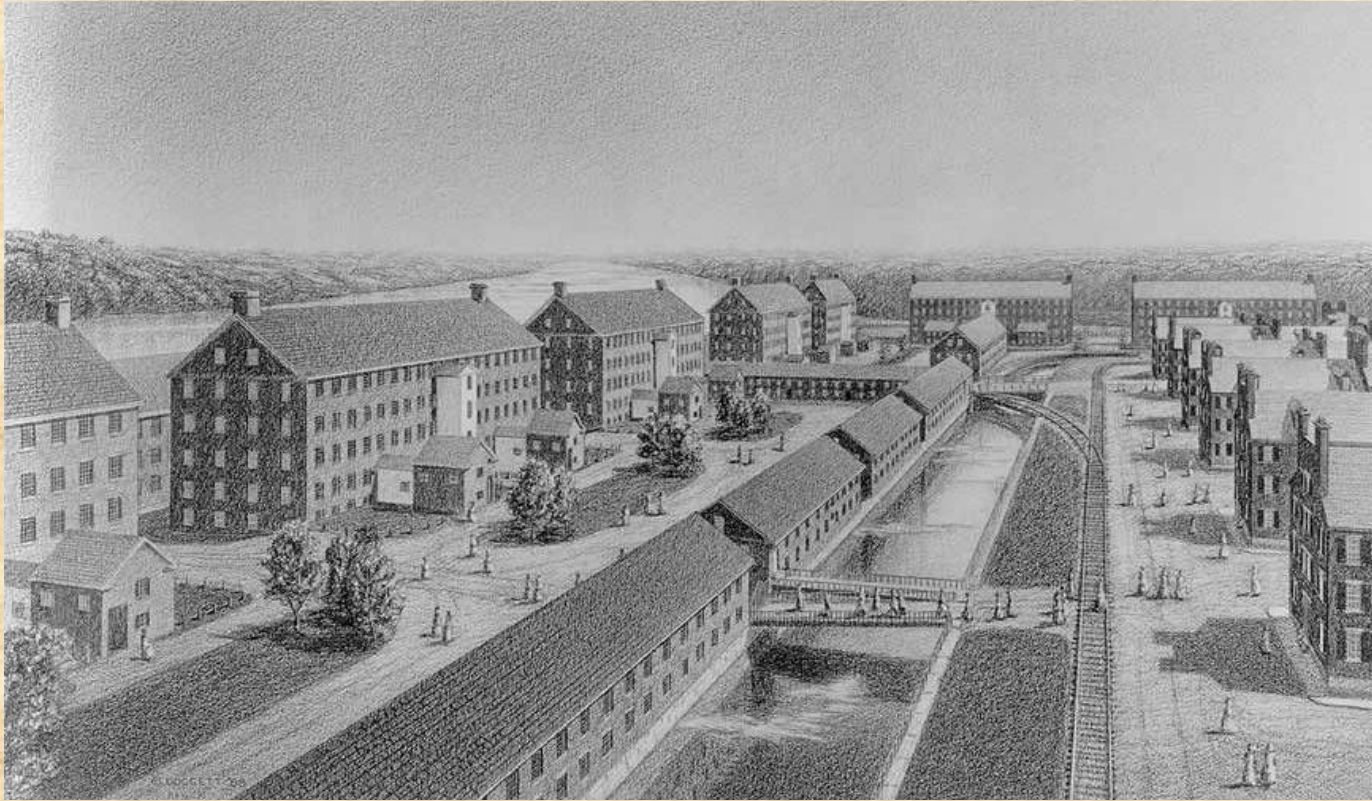


Lowell



Patrick T.
Jackson, Lowell's
brother-in-law
and founding
partner

Lowell, the textile factory town



**Early 20th-century
photograph of
Lowell**



The Boston Associates



First investment capital company in America. It had over 80 members, all of whom were related.



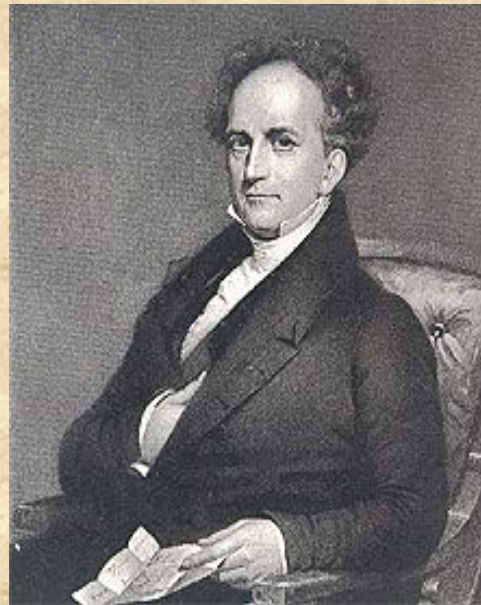
They established 31 textile companies in New England. They produced their textiles using materials from southern states. They named their business the Merrimack Manufacturing Company.



They invested their profits in railroads, banks and insurance companies. They were the biggest employers in New England with many thousands of workers.



Nathan Appleton

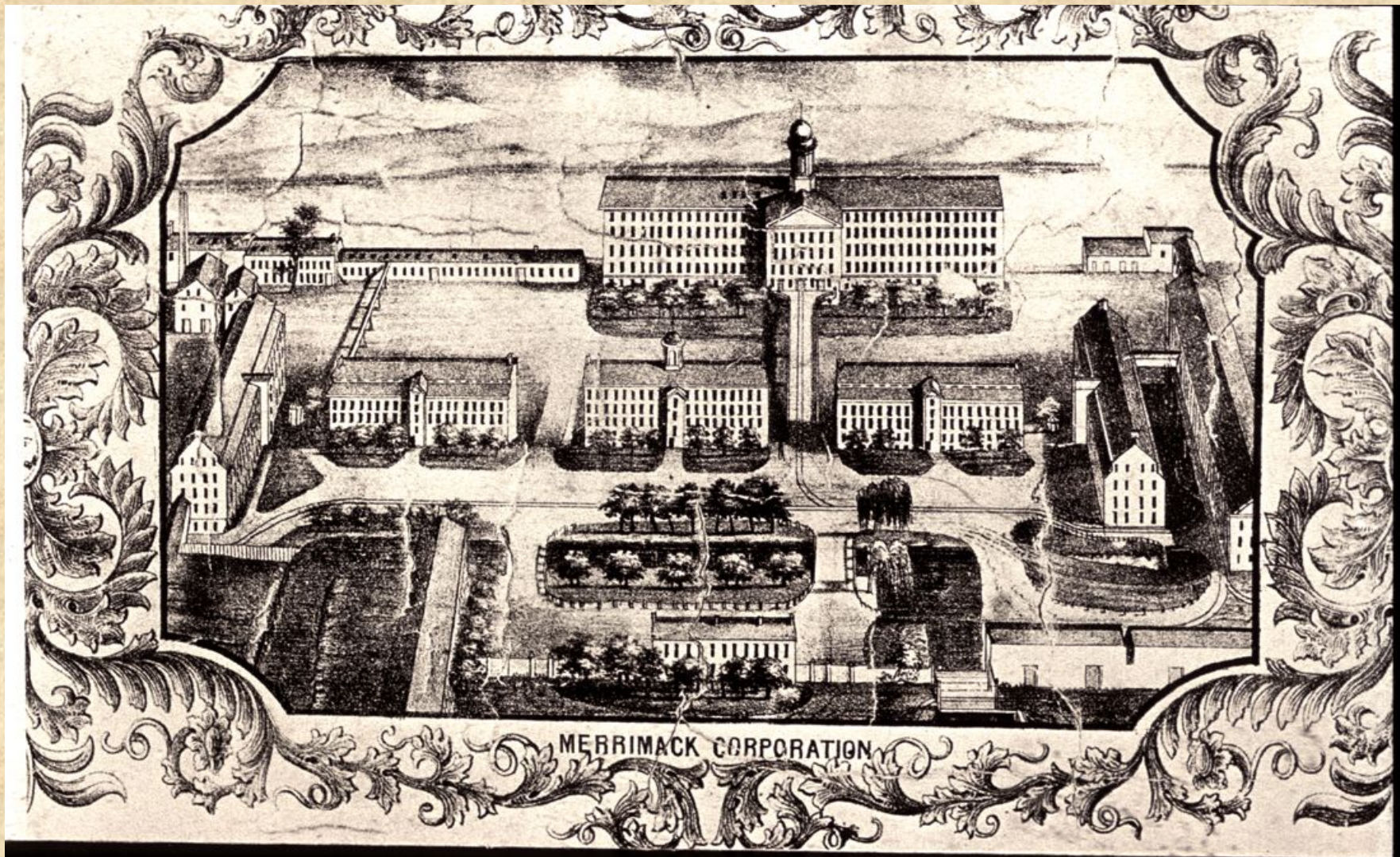


Abbot Lawrence



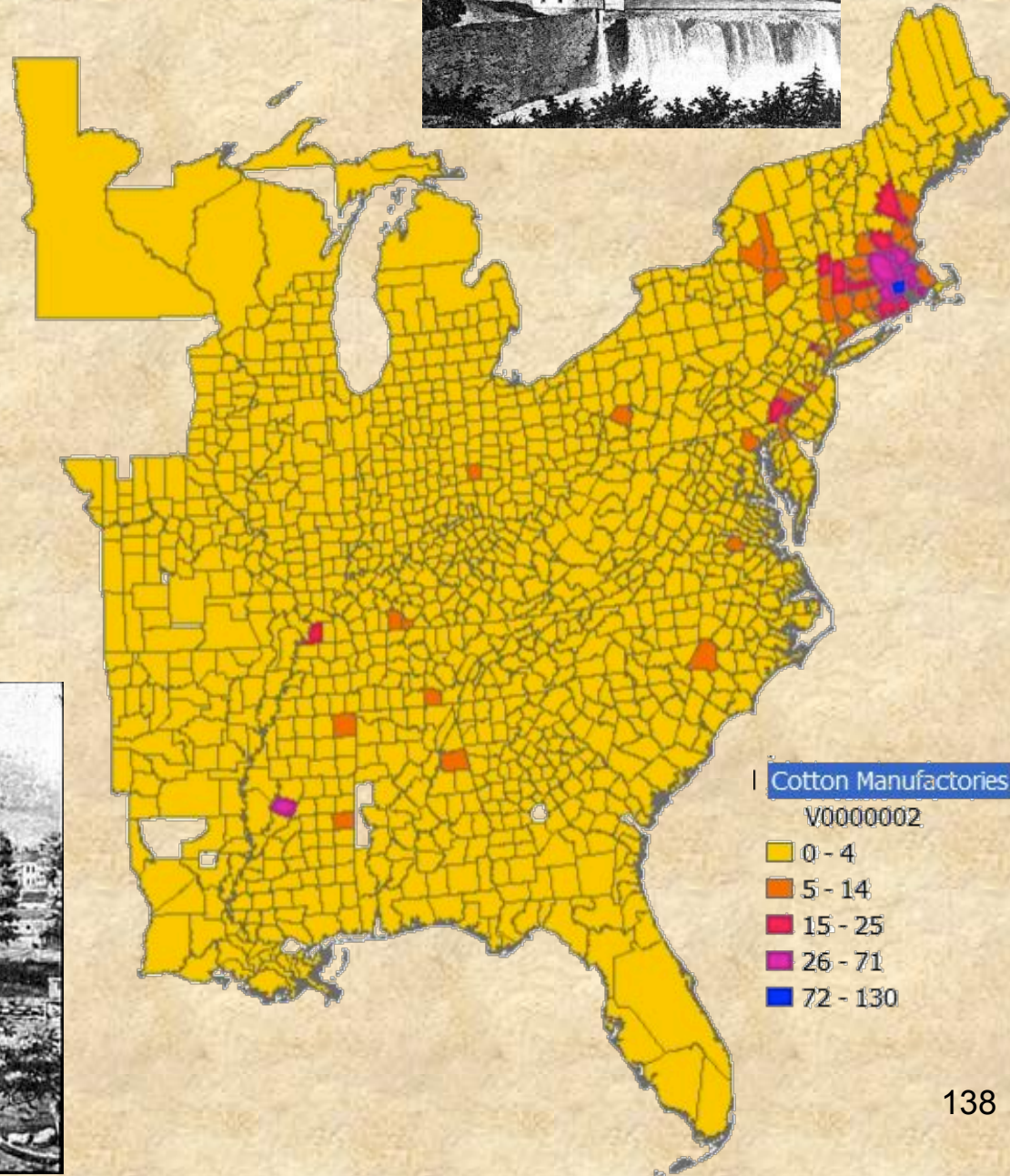
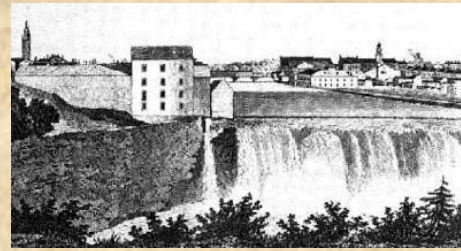
Amos Lawrence

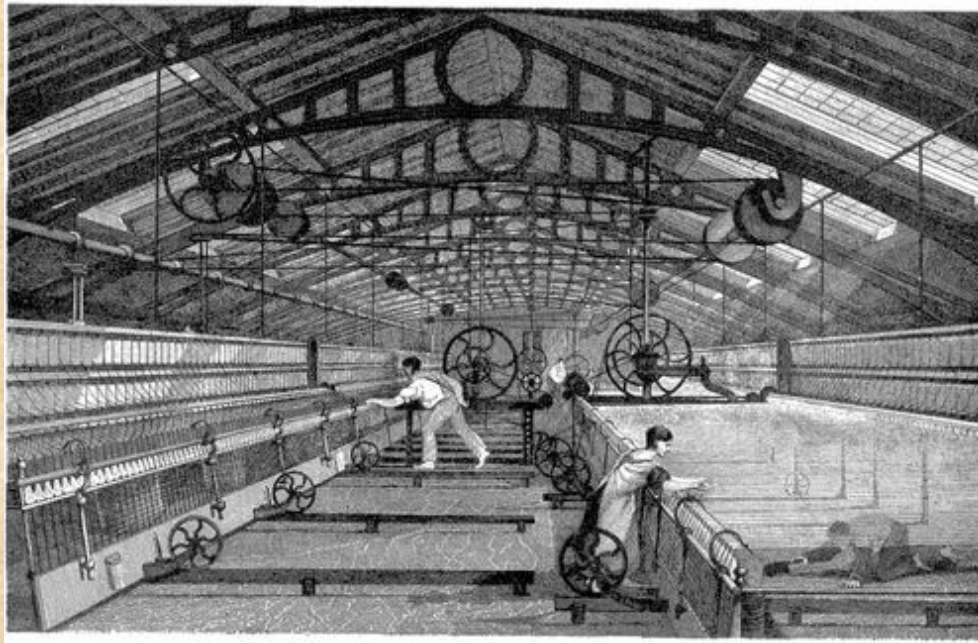
By 1850, the Boston Associates controlled 20% of the cotton production in the United States.



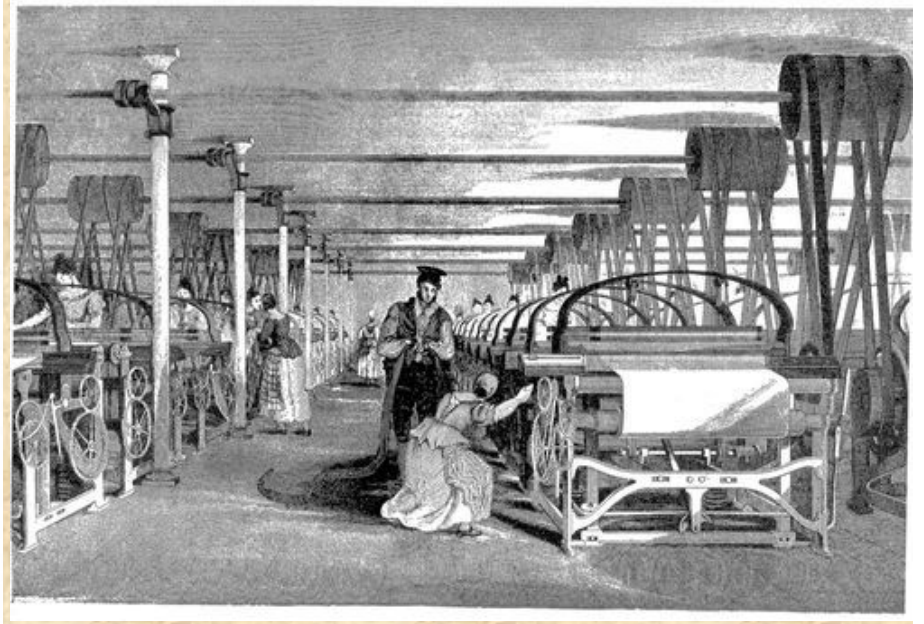
Cotton "Manufactories" in 1840 by county.

Note that the
majority of
cotton factories
were in the
Massachusetts
area.





Inside textile factories in 1835



A canal and factory town in 1827



A new class develops: factory workers

Thomas Jefferson warned his fellow Americans of the dangers of an industrialized society. He hoped the U.S. could remain an agriculture-based society.



Jefferson's agrarian vision of America



Jefferson's nightmare of an industrialized America

The new factories disrupted the traditional artisan labor system and eventually replaced it almost entirely.





Traditionally, most manufacturing was done by craftsmen working in their homes or small shops. They made the products and sold them.



The artisan system had developed three classes of workers: masters, journeymen, and apprentices.

| Master Craftsmen | Skilled Journeymen | Apprentices |
|--|--|---|
| Self-employed master craftsmen who owned their own businesses | Worked for master craftsmen, but owned their own tools. Hoped to save enough money to set up their own businesses | Usually young boys and teenagers who worked for a master while learning a trade or craft |

 The artisan system broke down as small shops were replaced by factories using unskilled laborers.

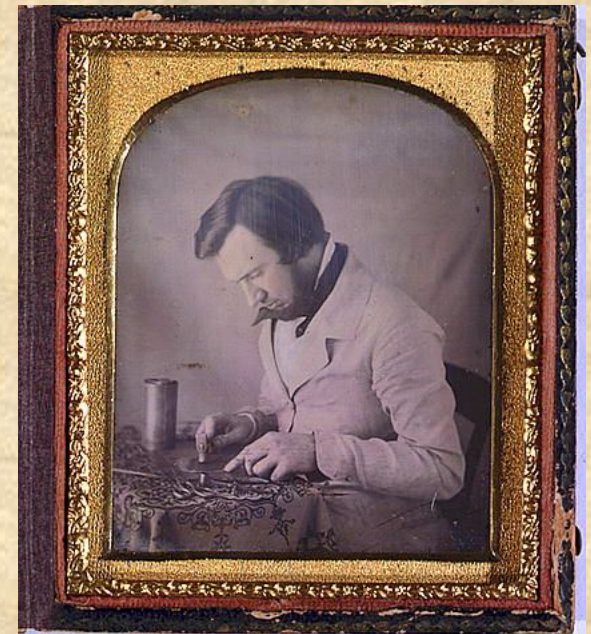
 The paternalistic (treating workers in a fatherly manner) attitude typical of the artisan system gave way to the view that workers were commodities just like lumber, iron or cotton. In this new view, workers were easily fired or replaced with cheaper laborers, and the boss/owner had no responsibility for their welfare.



blacksmith



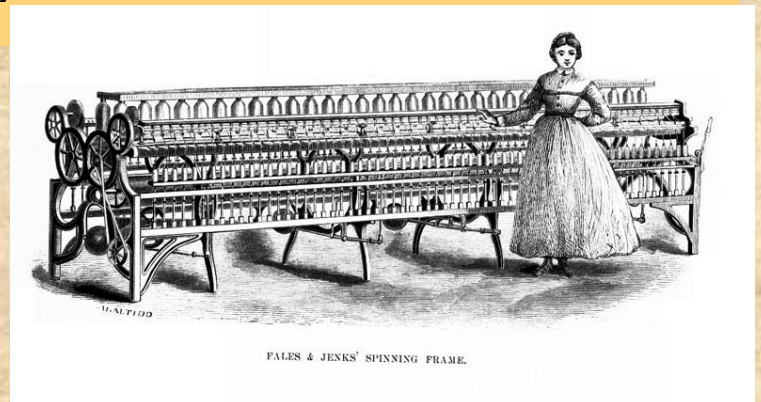
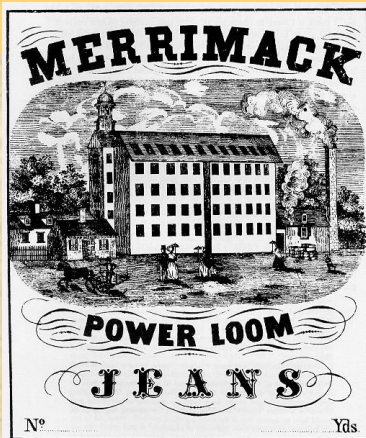
shoemakers



tin worker

Mid-19th-century account of factory work

“In the early factories, women and children were employed...more than in earlier forms of industry. Their labor was in greater demand than that of men. In 1839, of 31,632 employees in worsted mills, 18,416, or more than half, were under eighteen years of age, and of the 13,216 adults, 10,192 were women, leaving only 3024 adult men among more than 30,000 laborers. In 1832, in a certain flax spinning mill where about 1200 employees were engaged, 829 were below eighteen, only 390 above; and in the flax spinning industry generally, in 1835, only about one-third were adults, and only about one-third of these were men. The cheaper wages, the easier control, and the smaller size of women and children, now that actual physical power was not required, made them more desirable to employers, and in many families the men clung to hand work while the women and children went into the factories.”



“The early mills were small, hot, damp, dusty, and unhealthy. They were no more...than the cottages where domestic industry...but now the hours were more regular, continuous, and prolonged... All had to conform alike to the regular hours, and these were in the early days excessive. Twelve, thirteen, and even fourteen hours a day were not unusual.”



TIME TABLE OF THE LOWELL MILLS,

Arranged to make the working time throughout the year average 11 hours per day.
TO TAKE EFFECT SEPTEMBER 21st., 1853.
 The Standard time being that of the meridian of Lowell, as shown by the Regulator
 Clock of AMOS SANBORN, Post Office Corner, Central Street.

From March 20th to September 19th, inclusive.

COMMENCE WORK, at 6.30 A. M. LEAVE OFF WORK, at 6.30 P. M., except on Saturday Evenings.
 BREAKFAST at 6 A. M. DINNER, at 12 M. Commence Work, after dinner, 12.45 P. M.

From September 20th to March 19th, inclusive.

COMMENCE WORK at 7.00 A. M. LEAVE OFF WORK, at 7.00 P. M., except on Saturday Evenings.
 BREAKFAST at 6.30 A. M. DINNER, at 12.30 P. M. Commence Work, after dinner, 1.15 P. M.

BELLS.

From March 20th to September 19th, inclusive.

| Morning Bells. | Dinner Bells. | Evening Bells. |
|----------------------------------|--------------------------|------------------------------|
| First bell,.....4.30 A. M. | Ring out,.....12.00 M. | Ring out,.....6.30 P. M. |
| Second, 5.30 A. M.; Third, 6.20. | Ring in,.....12.35 P. M. | Except on Saturday Evenings. |

From September 20th to March 19th, inclusive.

| Morning Bells. | Dinner Bells. | Evening Bells. |
|----------------------------------|---------------------------|------------------------------|
| First bell,.....5.00 A. M. | Ring out,.....12.30 P. M. | Ring out at.....7.00 P. M. |
| Second, 6.00 A. M.; Third, 6.50. | Ring in,.....1.05 P. M. | Except on Saturday Evenings. |

SATURDAY EVENING BELLS.

During APRIL, MAY, JUNE, JULY, and AUGUST, Ring Out, at 6.00 P. M.
 The remaining Saturday Evenings in the year, ring out as follows:

| SEPTEMBER. | NOVEMBER. | JANUARY. |
|-------------------------------------|-------------------------------------|-------------------------------------|
| First Saturday, ring out 6.00 P. M. | Third Saturday ring out 4.00 P. M. | Third Saturday, ring out 4.25 P. M. |
| Second " " 5.45 " | Fourth " " 3.55 " | Fourth " " 4.35 " |
| Third " " 5.30 " | | |
| Fourth " " 5.20 " | | |
| OCTOBER. | DECEMBER. | FEBRUARY. |
| First Saturday, ring out 5.05 P. M. | First Saturday, ring out 3.50 P. M. | First Saturday, ring out 4.45 P. M. |
| Second " " 4.55 " | Second " " 3.55 " | Second " " 4.55 " |
| Third " " 4.45 " | Third " " 3.55 " | Third " " 5.00 " |
| Fourth " " 4.35 " | Fourth " " 4.00 " | Fourth " " 5.10 " |
| Fifth " " 4.25 " | Fifth " " 4.00 " | |
| NOVEMBER. | JANUARY. | MARCH. |
| First Saturday, ring out 4.15 P. M. | First Saturday, ring out 4.10 P. M. | First Saturday, ring out 5.25 P. M. |
| Second " " 4.05 " | Second " " 4.15 " | Second " " 5.30 " |
| | | Third " " 5.35 " |
| | | Fourth " " 5.45 " |

YARD GATES will be opened at the first stroke of the bells for entering or leaving the Mills.

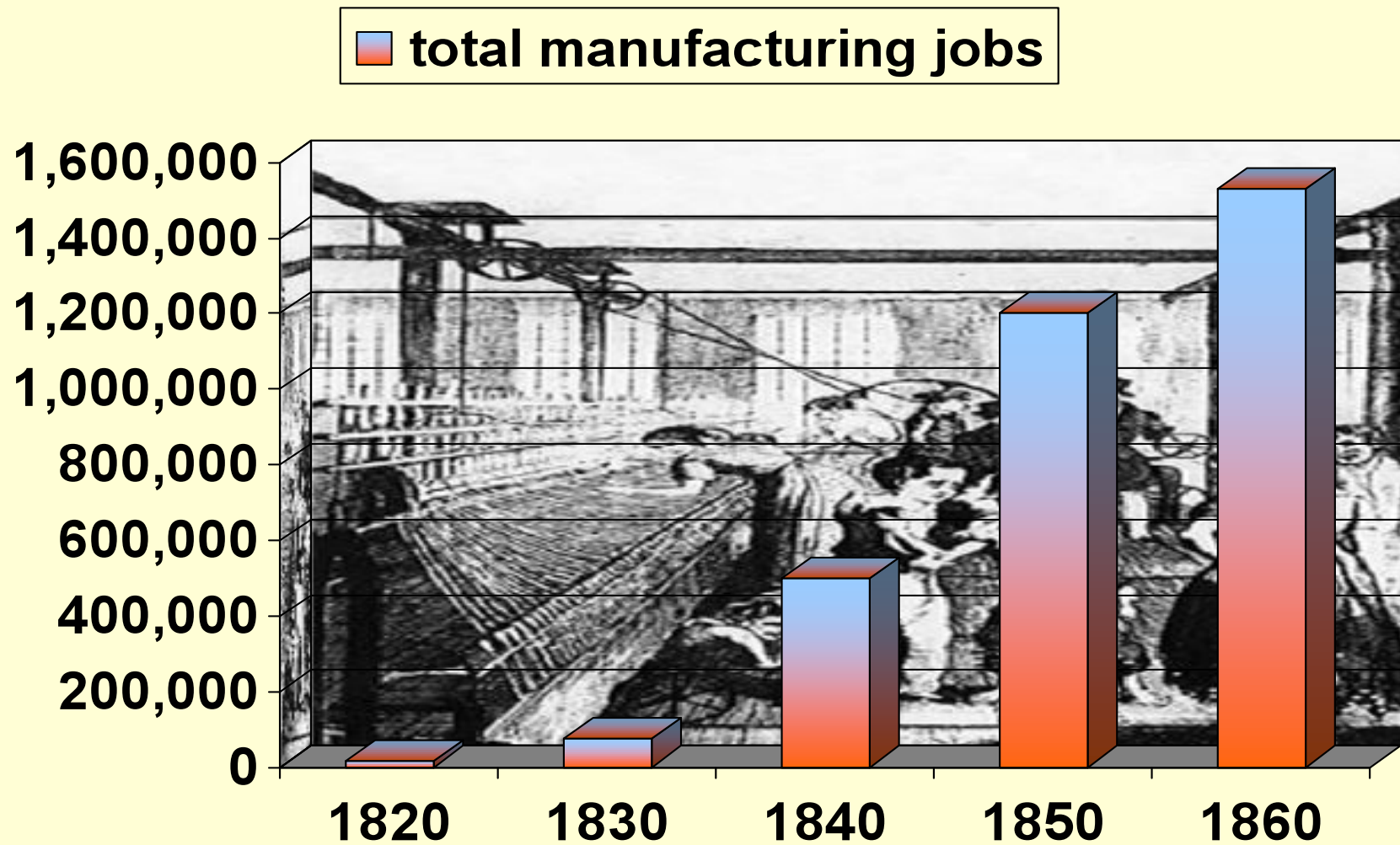
. SPEED GATES commence hoisting three minutes before commencing work.

Average workday
 was 11 hours per
 day

**Working conditions in 1846,
 from a report on Lowell Mills in
 Massachusetts:**

“Thus thirteen hours per day of
 close attention and
 monotonous labor are exacted
 from the young women in
 these manufactories. . . So
 fatigued—we should say,
 exhausted and worn out but we
 wish to speak of the system in
 the simplest language—are
 numbers of the girls, that they
 go to bed soon after their
 evening meal, and endeavor by
 a comparatively long sleep to
 resuscitate their weakened
 frames for the toils of the
 coming day.”

Growth in manufacturing jobs including textile factories, 1820-1860

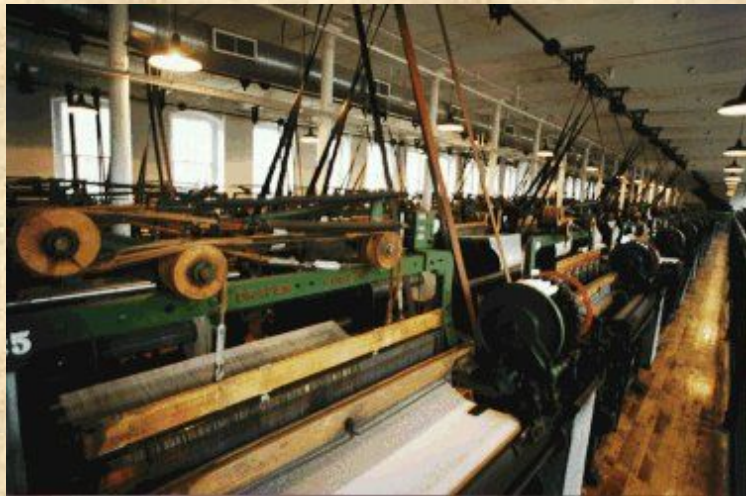
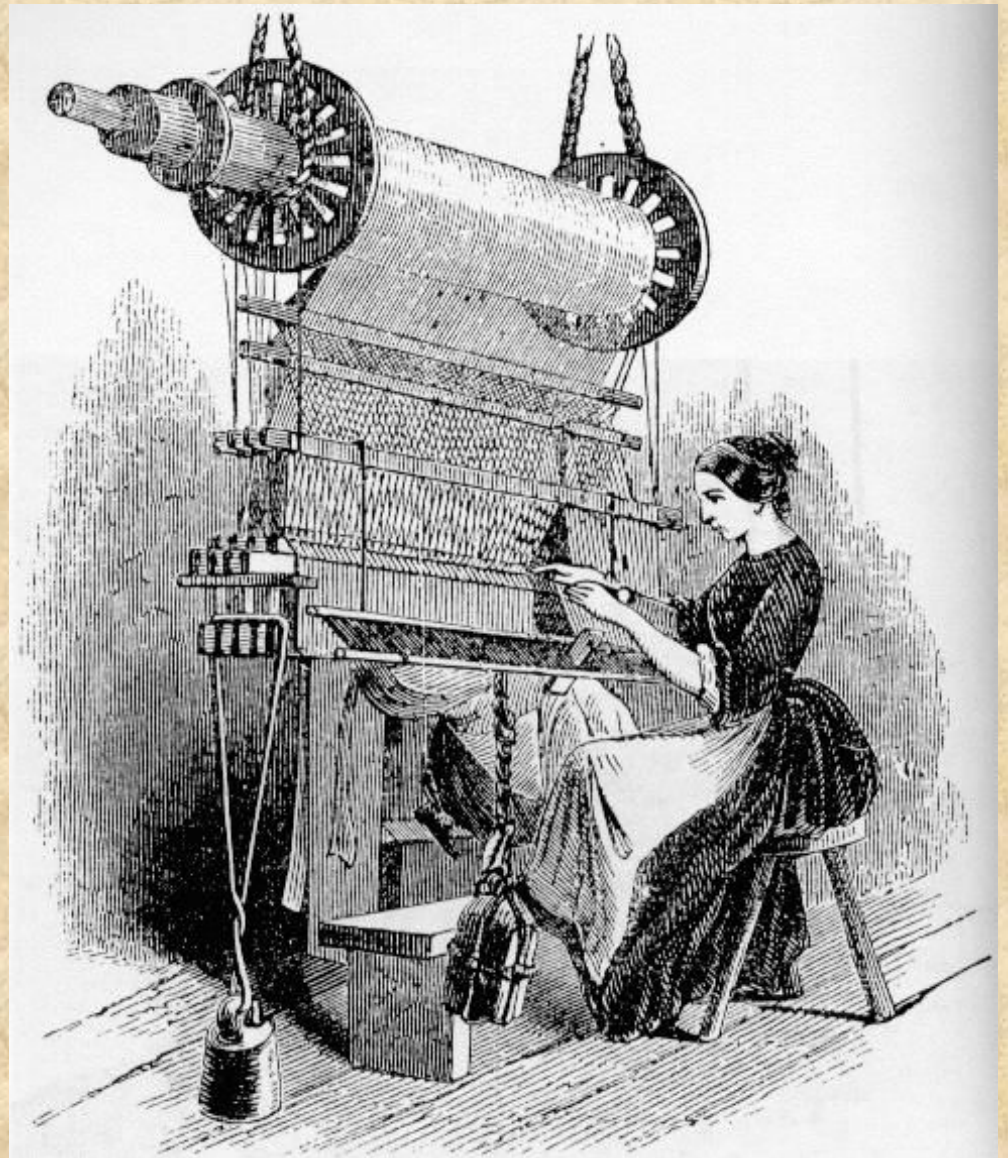


1836 Song Lyrics Sung by Protesting Workers at Lowell
Oh! isn't it a pity, such a pretty girl as I
Should be sent to the factory to pine away and die?
Oh! I cannot be a slave, I will not be a slave,
For I'm so fond of liberty,
That I cannot be a slave.

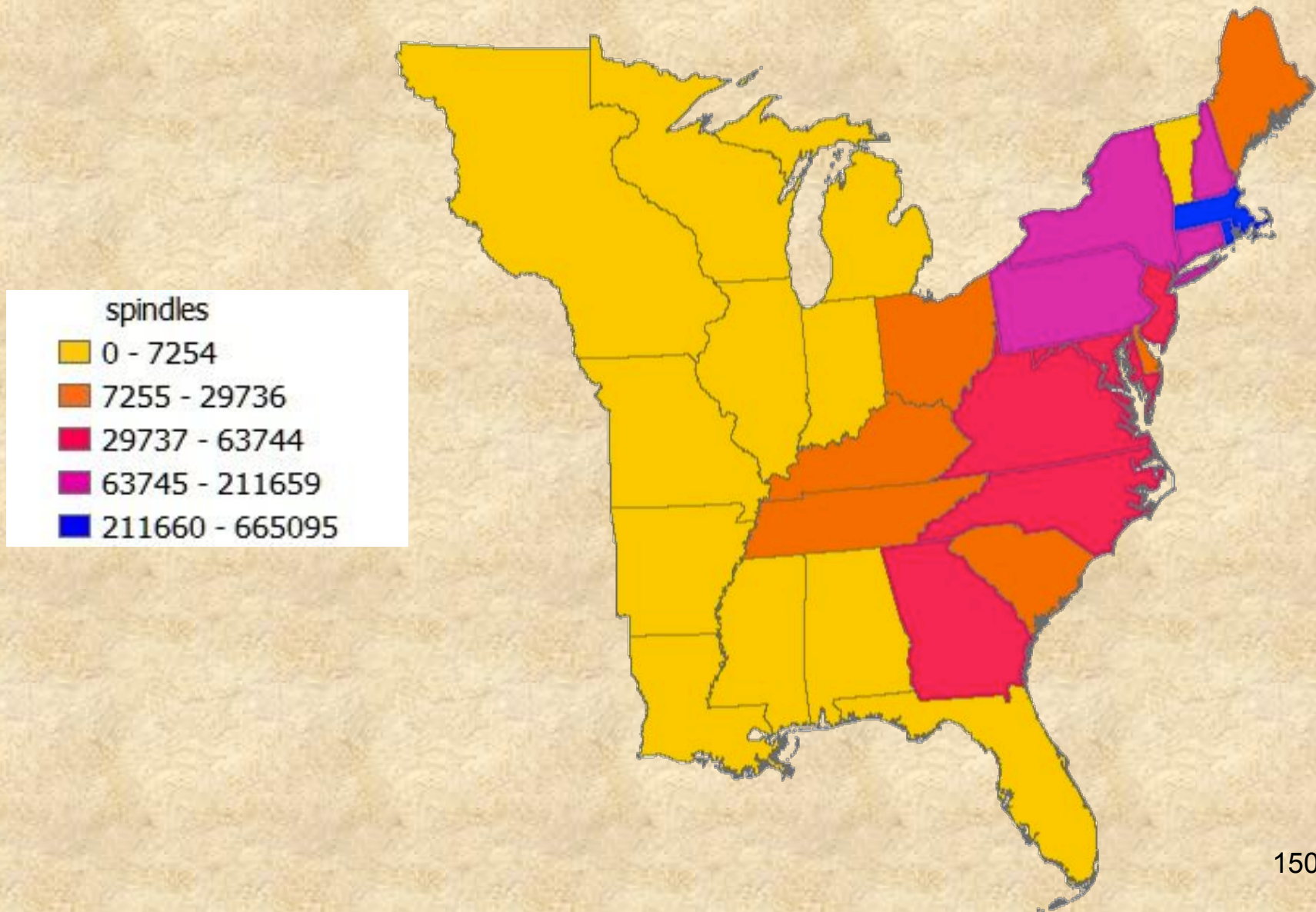


Lowell boarding houses





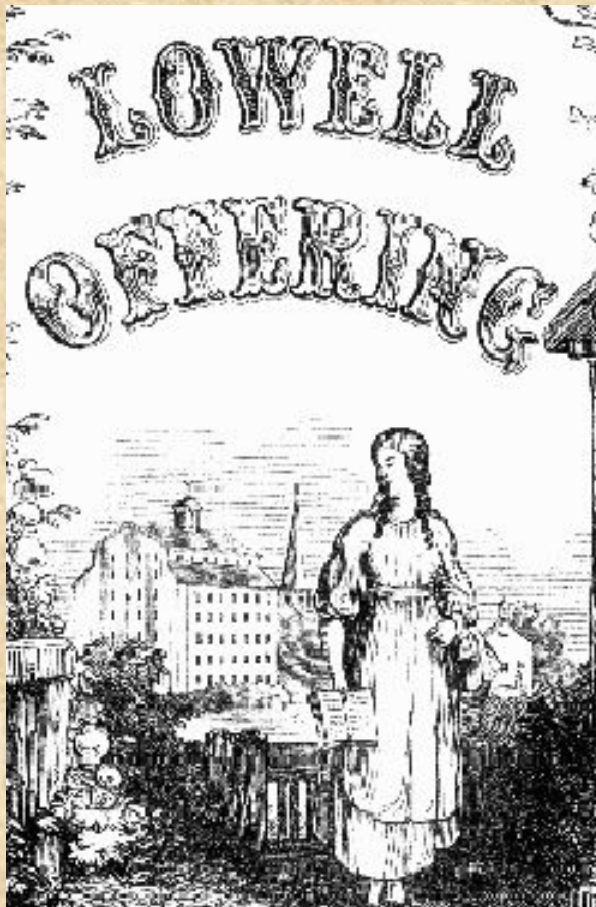
In 1840 the majority of cotton spindles (machines used in cotton factories) were in the northeastern states





“Urban factory work was a major occupation of native-born migrants from the countryside as well as immigrants. Sixty-four percent of Boston’s female industrial workforce was immigrant in 1860.

Women workers performed the same unskilled jobs in urban mills as in the rural mills, and were paid much less than men, who often performed skilled jobs. In Philadelphia in the 1830s, mill women made an average of \$2.25 per week compared to men’s average weekly earnings of \$6.50-\$7.00.”



Literary magazine put out by Lowell women in the early years

**THE
LOWELL OFFERING:**

A REPOSITORY
OF
ORIGINAL ARTICLES ON VARIOUS SUBJECTS,
WRITTEN
BY FACTORY OPERATIVES.

"Full many a gem of purest ray serene,
The dark, unfathomed caves of ocean bear;
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

No. 1. Price 6 $\frac{1}{2}$ cts.

THIS NUMBER WHOLLY WRITTEN
BY FEMALES EMPLOYED IN THE MILLS.

CONTENTS:

| | |
|--|---|
| <p>1. The Hemlock Broom, . . . Page 1.</p> <p>2. The Mother's Love, 2.</p> <p>3. Beauty of Leaves, 2.</p> <p>4. Woman's Proper Sphere, . . . 3.</p> <p>5. The blessings of Memory, . . . 4.</p> <p>6. Letter about Old Maids, . . . 4.</p> <p>7. Recollections of an Old Maid, No. I. 5.</p> <p>8. Autumn's Doings, 7.</p> <p>9. The Pleasures of Science, . . . 7.</p> <p>10. The Garden of Science, 8.</p> | <p>11. The Tomb of Washington, Page 9.</p> <p>12. Knowledge in Heaven, 9.</p> <p>13. Messrs. Birch and Spruce, . . 10.</p> <p>14. Beauty and Wealth, 11.</p> <p>15. Longings of the Spirit, 11.</p> <p>16. Divine Love, 12.</p> <p>17. Autumn Reflections, 12.</p> <p>18. Mount Auburn, 13.</p> <p>19. Thoughts on a Rainy Day, . . 14.</p> <p>20. Old Bachelor's Friend, . . . 15.</p> |
|--|---|

LOWELL, MASS.
PRINTED BY A. WATSON, 15 CENTRAL STREET.
For Sale at all the Bookstores; and by Tower, in the angle of Central and Gorham sts.;
and at Billings' Variety Store, Merrimack st. opposite Tremont Corporation.

TIME TABLE OF THE LOWELL MILLS,

Arranged to make the working time throughout the year average 11 hours per day.

TO TAKE EFFECT SEPTEMBER 21st., 1853.

The Standard time being that of the meridian of Lowell, as shown by the Regulator Clock of AMOS SANBORN, Post Office Corner, Central Street.

From March 20th to September 19th, inclusive.

COMMENCE WORK, at 6.30 A. M. LEAVE OFF WORK, at 6.30 P. M., except on Saturday Evenings.
BREAKFAST at 6 A. M. DINNER, at 12 M. Commence Work, after dinner, 12.45 P. M.

From September 20th to March 19th, inclusive.

COMMENCE WORK at 7.00 A. M. LEAVE OFF WORK, at 7.00 P. M., except on Saturday Evenings.
BREAKFAST at 6.30 A. M. DINNER, at 12.30 P. M. Commence Work, after dinner, 1.15 P. M.

BELLS.

From March 20th to September 19th, inclusive.

| <i>Morning Bells.</i> | <i>Dinner Bells.</i> | <i>Evening Bells.</i> |
|-----------------------------------|--------------------------|------------------------------|
| First bell,.....4.30 A. M. | Ring out,.....12.00 M. | Ring out,.....6.30 P. M. |
| Second, 6.30 A. M. ; Third, 6.20. | Ring in,.....12.35 P. M. | Except on Saturday Evenings. |

From September 20th to March 19th, inclusive.

| <i>Morning Bells.</i> | <i>Dinner Bells.</i> | <i>Evening Bells.</i> |
|-----------------------------------|---------------------------|------------------------------|
| First bell,.....5.00 A. M. | Ring out,.....12.30 P. M. | Ring out at.....7.00 P. M. |
| Second, 6.00 A. M. ; Third, 6.50. | Ring in,.....1.05 P. M. | Except on Saturday Evenings. |

SATURDAY EVENING BELLS.

During APRIL, MAY, JUNE, JULY, and AUGUST, Ring Out, at 6.00 P. M.
The remaining Saturday Evenings in the year, ring out as follows :

| SEPTEMBER. | NOVEMBER. | JANUARY. |
|-------------------------------------|-------------------------------------|-------------------------------------|
| First Saturday, ring out 6.00 P. M. | Third Saturday ring out 4.00 P. M. | Third Saturday, ring out 4.25 P. M. |
| Second " " 5.45 " | Fourth " " 3.55 " | Fourth " " 4.35 " |
| Third " " 5.30 " | | |
| Fourth " " 5.20 " | | |
| OCTOBER. | DECEMBER. | FEBRUARY. |
| First Saturday, ring out 5.05 P. M. | First Saturday, ring out 3.50 P. M. | First Saturday, ring out 4.45 P. M. |
| Second " " 4.55 " | Second " " 3.55 " | Second " " 4.55 " |
| Third " " 4.45 " | Third " " 3.55 " | Third " " 5.00 " |
| Fourth " " 4.35 " | Fourth " " 4.00 " | Fourth " " 5.10 " |
| Fifth " " 4.25 " | Fifth " " 4.00 " | |
| NOVEMBER. | JANUARY. | MARCH. |
| First Saturday, ring out 4.15 P. M. | First Saturday, ring out 4.10 P. M. | First Saturday, ring out 5.25 P. M. |
| Second " " 4.05 " | Second " " 4.15 " | Second " " 5.30 " |
| | | Third " " 5.35 " |
| | | Fourth " " 5.45 " |

YARD GATES will be opened at the first stroke of the bells for entering or leaving the Mills.

. SPEED GATES commence hoisting three minutes before commencing work.

FROM B. H. FENHALLOW'S
PRINTING ESTABLISHMENT,

WYMAN'S EXCHANGE, Cos.
MERRIMACK & CENTRAL STS.

TIME TABLE 1868. OF THE LOWELL MILLS,

Arranged to make the working time 66 hours per week. The STANDARD TIME will be marked at noon, by the BELL of the MERRIMACK MANUFACTURING COMPANY.

Breakfast,.....at.....6. A. M.
Commence Work,.....".....6.30 A. M.
Dinner,.....".....12 M.
Commence Work, after Dinner, at.....12.45 P. M.
Stop Work, except on Saturday Evenings, at....6.30 P. M.

BELLS.

Morning Bells.

Dinner Bells.

| | |
|-----------------------------|--------------------------|
| First Bell,.....4.30 A. M. | Ring Out,.....12.00 M. |
| Second Bell,.....5.30 A. M. | Ring in,.....12.35 P. M. |
| Third Bell,.....6.30 A. M. | |

Evening Bells.

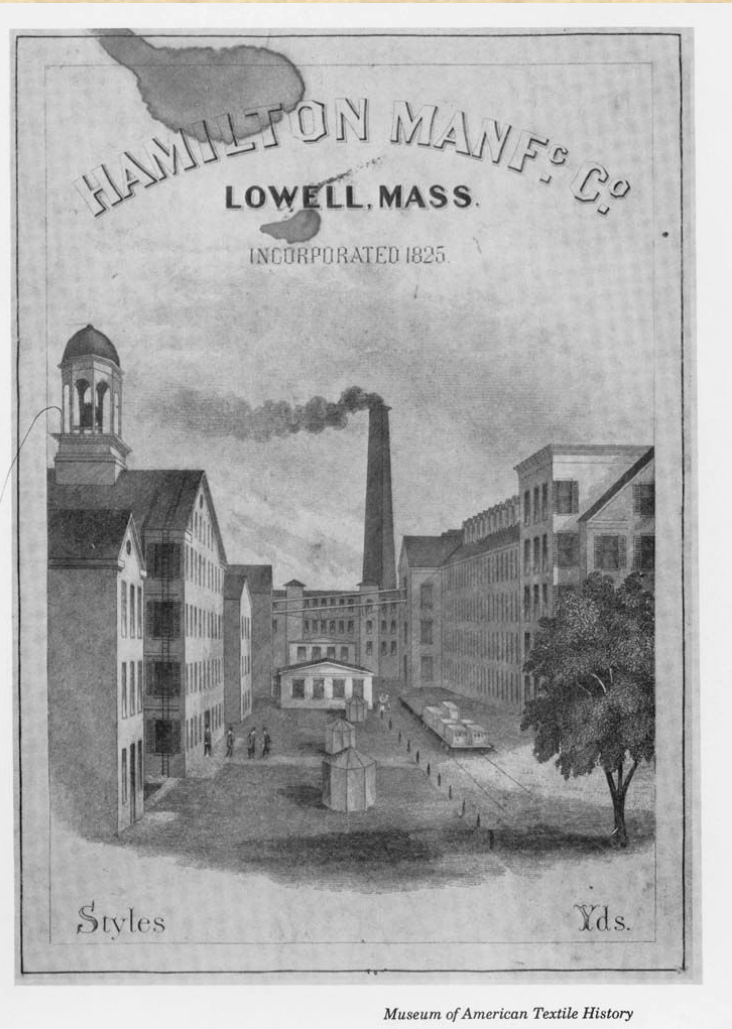
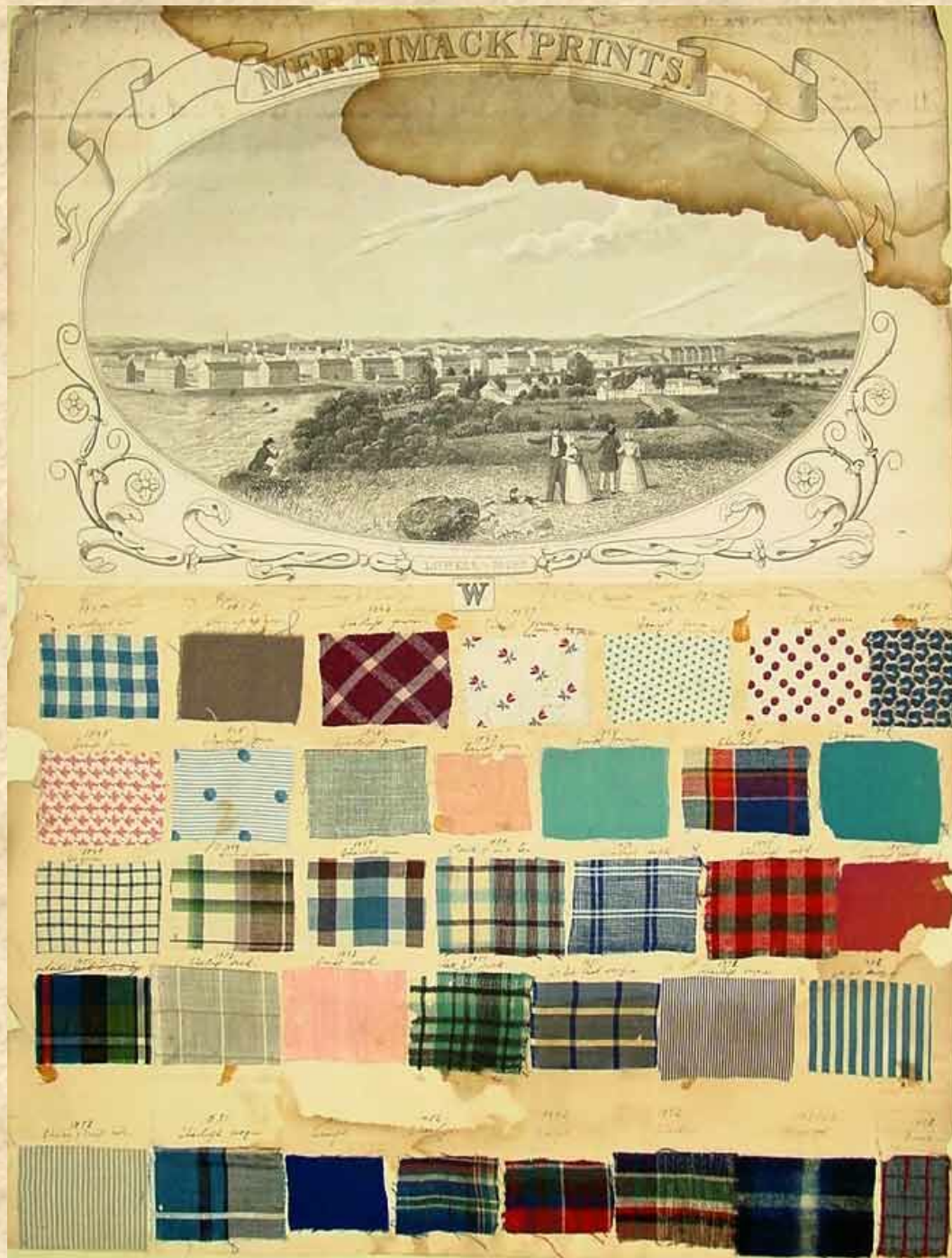
Ring Out,.....6.30 P. M.....Except on Saturday Evenings.

SATURDAY EVENING BELL, 5 P. M.

YARD GATES will be opened at the first stroke of the bells for entering or leaving the Mills.

Speed Gates commence hoisting three minutes before commencing work.

Textile samples from Lowell mills, late 1840s



21 Dec. 1845

"Dear Father

I received your letter on Thursday the 14th with much pleasure. I am well which one comfort is. My life and health are spared while others are cut off. Last Thursday one girl fell down and broke her neck, which caused instant death. She was going in or coming out of the mill and fell down it being very icy. Last Tuesday we were paid. In all I had six dollars and sixty cents paid \$4.68 for board. With the rest I got me a pair of rubbers and a pair of 50.cts shoes. Perhaps you would like something about our regulations about going in and coming out of the mill. At half past six [the bell] rings for the girls to get up and at seven they are called to the mill. At half past 12 we have dinner are called back again at one and stay till half past seven. I get along very well with my work. I can doff as fast as any girl in our room. If any girl wants employment I advise them to come to Lowell.

**This from,
Mary S. Paul" (1)**

5 Nov. 1848

"Dear Father

Doubtless you have been looking for a letter from me all week. I would have written but wished to find whether I would be able to stand it—the work I am now doing. It is very hard indeed and sometimes I think I shall not be able to endure it. I never worked so hard in my life but perhaps I shall get used to it. I suppose you have heard before this month that the wages are to be reduced on the 20th of this month. It is true there seems to be a good deal of excitement on this subject but I cannot tell what will be the consequence. The companies pretend they are losing immense sums every day and therefore are obliged to lessen the wages, but this seems perfectly absurd to me for they are constantly making repairs and it seems to me this would not be if there were really any danger of their being obliged to stop the mills. I expect to be paid about two dollars [about \$60.00 in 2006 dollars; male workers made \$170 a week on average] a week but it will be dearly earned.

**This from,
Mary S. Paul" (2)**



Job dissatisfaction led to a strike in Lowell in 1836



After the announcement of a wage cut, the workers decided to strike, shutting down the mills.



The mostly female crew assembled and listened to speeches from early labor reformers.



One of the girls declared that it was their duty to resist all attempts at lowering the wages. This was the first time a woman had spoken in public in Lowell, and the event caused surprise and consternation among her audience.



Besides the wage decrease, the corporation announced that the cost of room and board would now have to be paid solely by the workers. This, in addition to the cut in wages, would make a difference of at least one dollar a week; in 2006 dollars it would be about \$23.



Labor Reform

📖 Unions began to form after the Revolutionary War in cities such as Philadelphia and Baltimore.

📖 In the 1820s the Mechanics' Union of Trade Associations, the first to combine different types of unions, formed in Philadelphia.

📖 Its goals were not only higher wages and improved working conditions, but also free public schools, abolition of debtors' jail, and universal male suffrage.

📖 The union entered politics to secure its goals.

Preamble of the Mechanics' Union of Trade Associations (Philadelphia, 1828)

"We, the Journeymen Mechanics of the City and County of Philadelphia, conscious that our condition in society, is lower than justice demands it should be, and feeling our inability, individually, to ward off from ourselves and families those numerous evils which result from an unequal and very excessive accumulation of wealth and power into the hands of a few, are desirous of forming an Association, which shall avert as much as possible those evils with which poverty and incessant toil have already inflicted, and which threaten ultimately to, overwhelm and destroy us..."

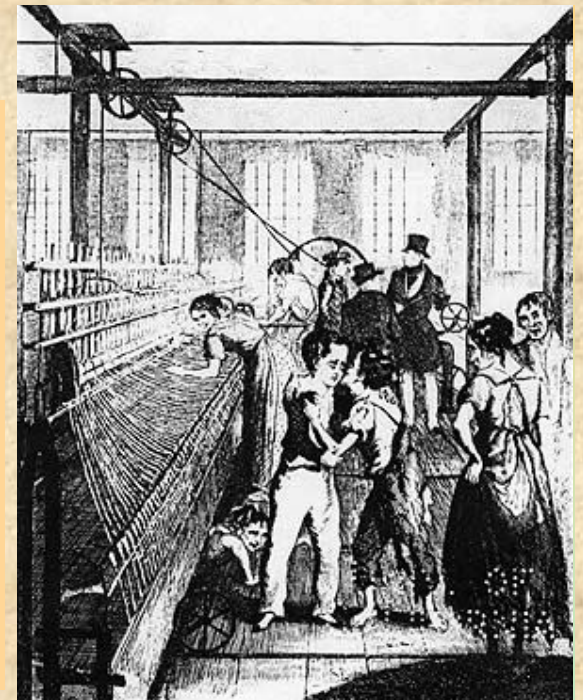
A family in debtors' prison



Up until the mid-19th century, a person could be put in jail if he or she could not pay back money owed. Early unions pushed to have debtors' jails abolished.



Child labor was widespread in the 19th and early 20th centuries; for example, in New England about 30% of workers were children under 16.



Unions

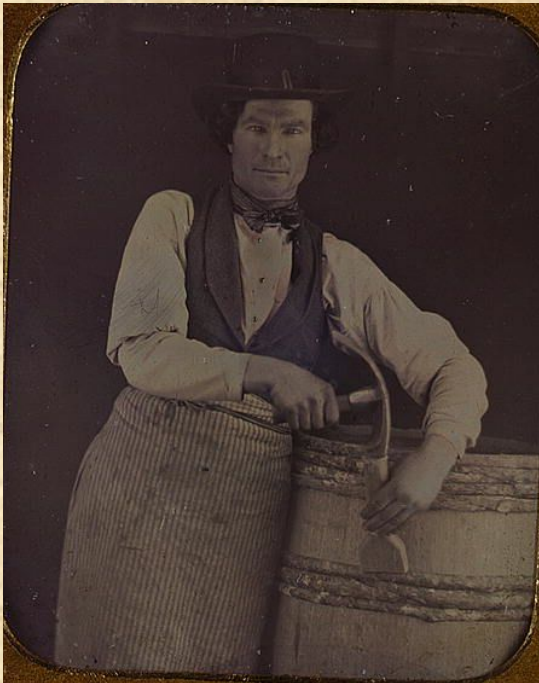
- **In the late 1820s, unions entered politics with the Working Men's Party. It was made up of craftsmen, skilled journeymen, and reformers who sought a 10-hour workday, free public education, abolition of debtor imprisonment, and an end to prison contract labor.**
- **The party ended in the 1830s, and several New York members joined the Locofoco Party, a radical faction of the New York State Democratic Party.**
- **Many of the early labor unions were destroyed by the economic collapse caused by the Panic of 1837. Nearly 30% of U.S. workers lost their jobs.**
- **Labor unions made a comeback in the 1840s and 1850s, but were again devastated by the economic crisis of the Panic of 1857.**
- **Unions came back strongly after the Civil War.**



Fireman



Carpenter



Cooper



Daguerreotypist

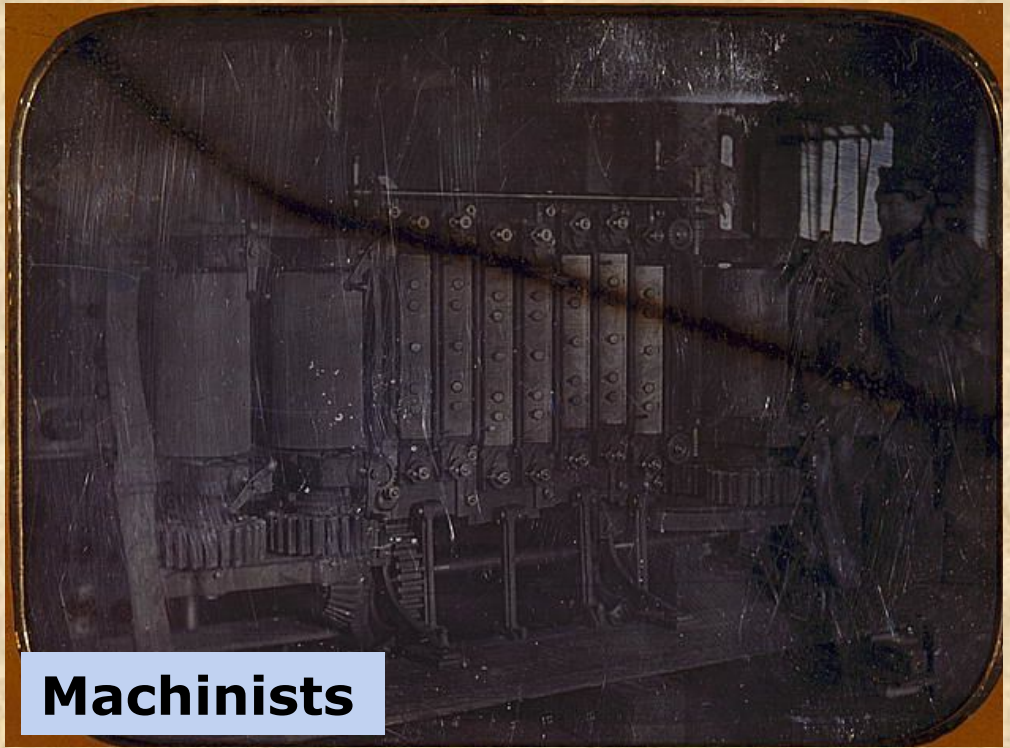
Major antebellum* labor accomplishments:

- ✂ In 1840, President Van Buren established a ten-hour workday for all federal employees.
- ✂ In 1842, the Massachusetts Supreme Court ruled in *Commonwealth V. Hunt* that labor unions were not illegal conspiracies.
- ✂ In 1842, children were prohibited from working over ten hours a day.
- ✂ In 1847, New Hampshire made ten hours the legal workday.
- ✂ In 1848, Pennsylvania passed a law to make 12 the minimum age for child workers.
- ✂ In 1848, Pennsylvania passed a ten-hour workday.

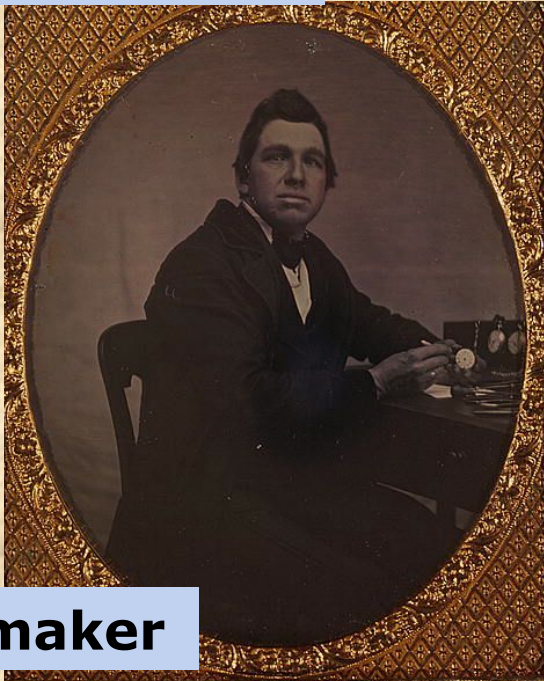
*period between the Revolutionary and Civil Wars



Latch maker



Machinists



Watchmaker



Peddler

Unions and strikes before 1860

Z The use of steam and water-powered machinery led to a factory system similar to England's, with great riches for the owners and grinding poverty for the workers.

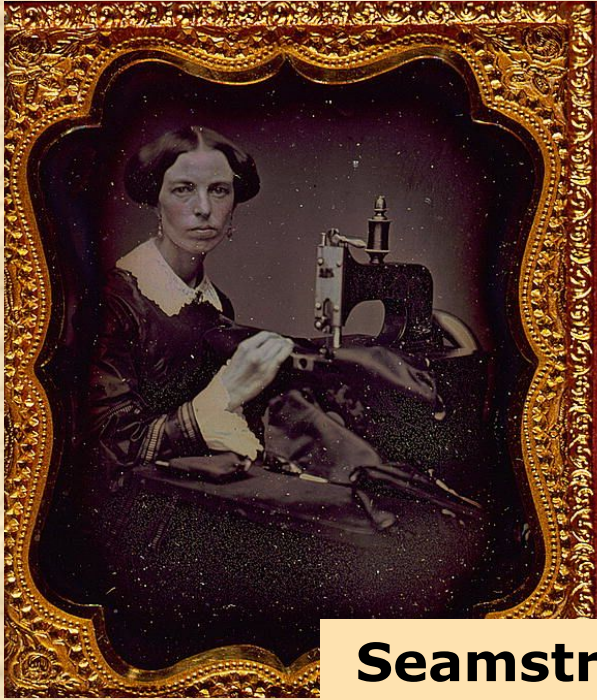
Z A series of strikes broke out in the early 1790s. The goals of striking workers were primarily higher wages and a shorter (ten-hour) workday.

Z Shoemakers in Philadelphia formed a short-lived craft union in 1792.

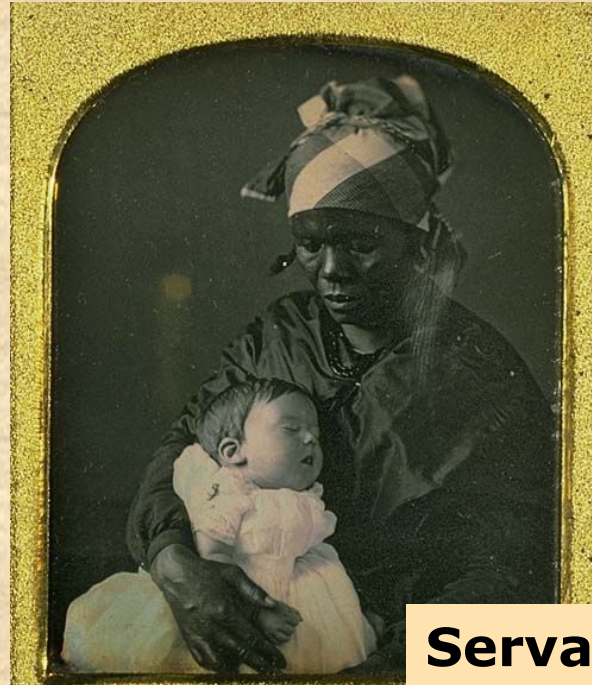
Z Printers in New York City carried out the first strike in 1794.

Z Other strikes soon followed in Philadelphia, where cabinet makers, carpenters and cordwainers (leather workers) struck for improved working conditions.

Z Several unions and labor organizations were convicted of conspiracy and "injury to trade" by hostile judges.



Seamstress



Servant nanny



Salesman



Stonecutter

The struggle for the ten-hour workday



One of the major goals of antebellum unions was a ten-hour working day.



The average working day ranged from a low of ten hours to a high of sixteen hours a day.



In 1791, Philadelphia carpenters went on strike for a ten-hour day.



Various workers' organizations, male and female, fought for the ten-hour day.



The unions' struggle for a shorter workday had some success when, in 1842, President Van Buren declared a ten-hour day for all federal employees.



New Hampshire and Pennsylvania passed legislation making ten hours the legal workday in the late 1840s.



After the Civil War, the eight-hour day became one of the new goals of organized labor.

INVENTORS OF THE ANTEBELLUM PERIOD



Jethro Woods



Cyrus McCormick



John Deere



Samuel Colt



Samuel F. B. Morse



Thomas Davenport



Charles Goodyear



Richard M. Hoe



Elias Howe



Isaac Singer



Elisha Otis

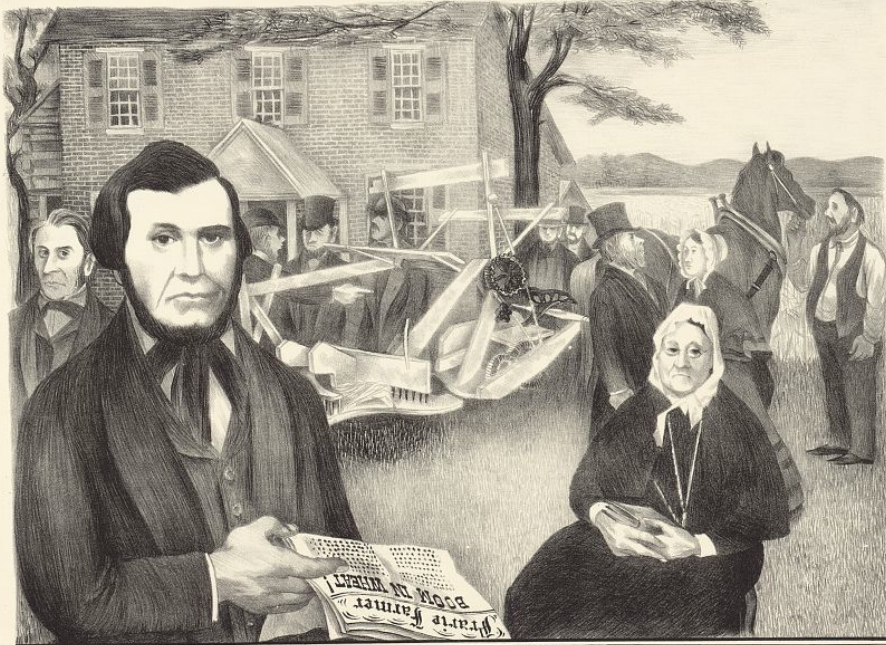


Edwin Drake

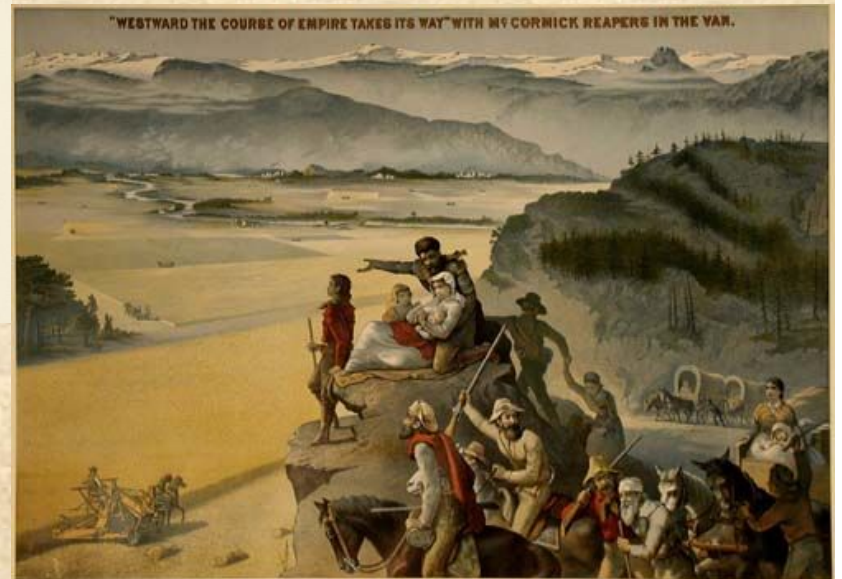


Cyrus Fields





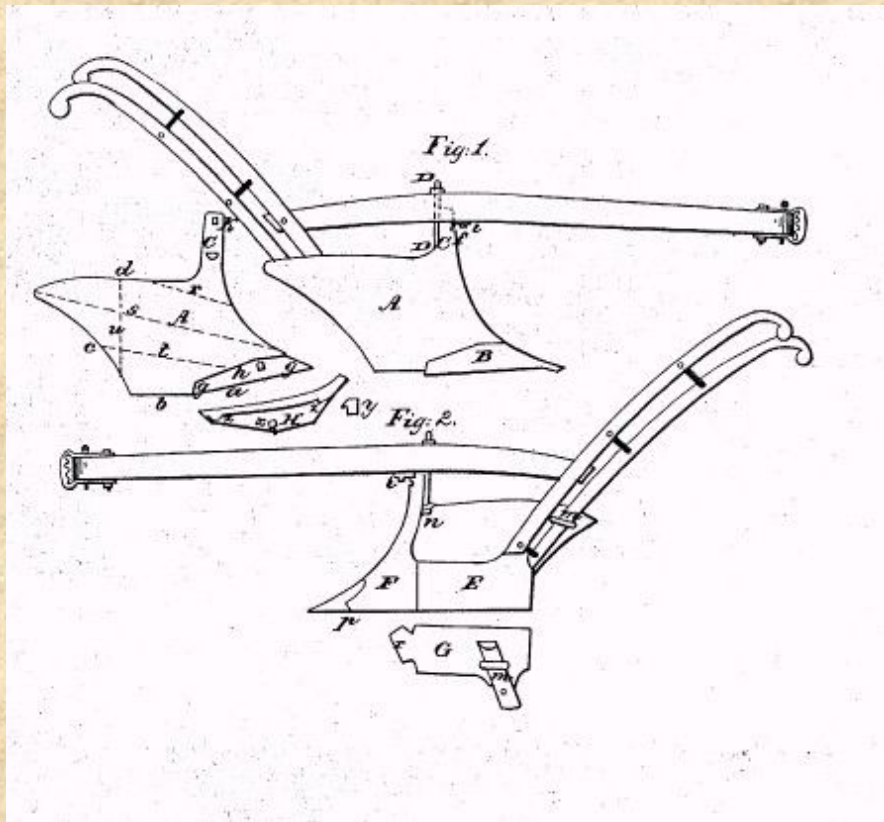
CYRUS McCORMICK'S REAPER



Cigar box featuring "Famous American Inventors." From left to right: Eli Whitney (cotton gin), Robert Fulton (steamboat), Thomas Edison (light bulb), Cyrus McCormick (mechanical reaper), Richard Hoe (automatic printing press).

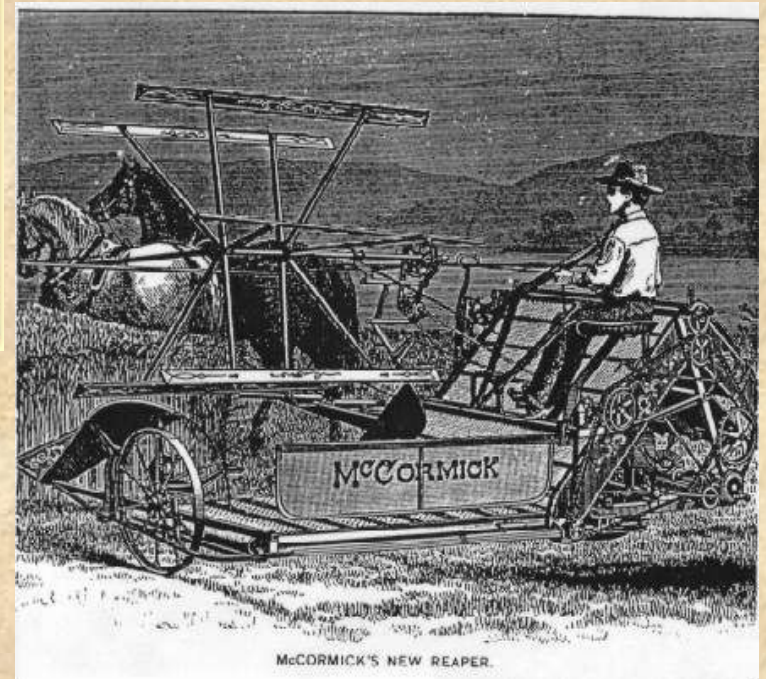
Jethro Woods

His 1819 plough was made of cast iron, but in three parts, so that a broken part might be replaced without purchasing an entire plough. This principle of standardization soon became widespread.



Cyrus McCormick

In 1831, at the age of 22, McCormick invented the first successful mechanical reaper, which later led to the harvesting machine industry. McCormick ushered in a new era of agricultural mechanization. Now fewer farmers could feed more people. This made it possible for millions of people to leave farms for jobs and careers in the new cities and factories.





**Five thousand years of reaping (harvesting):
3000 BCE to 1831 CE**



Cyrus McCormick



He is known as the “Father of Modern Agriculture.”



Building on the work of his father, McCormick invented a mechanical horse-drawn reaper in 1831.



Reaping is the process of harvesting a crop. It includes cutting grain or pulses (seeds or legumes) using a scythe, sickle or reaping machine.



The mechanical reaper increased the farmer’s yield by tenfold and allowed farmers to greatly expand land under cultivation.



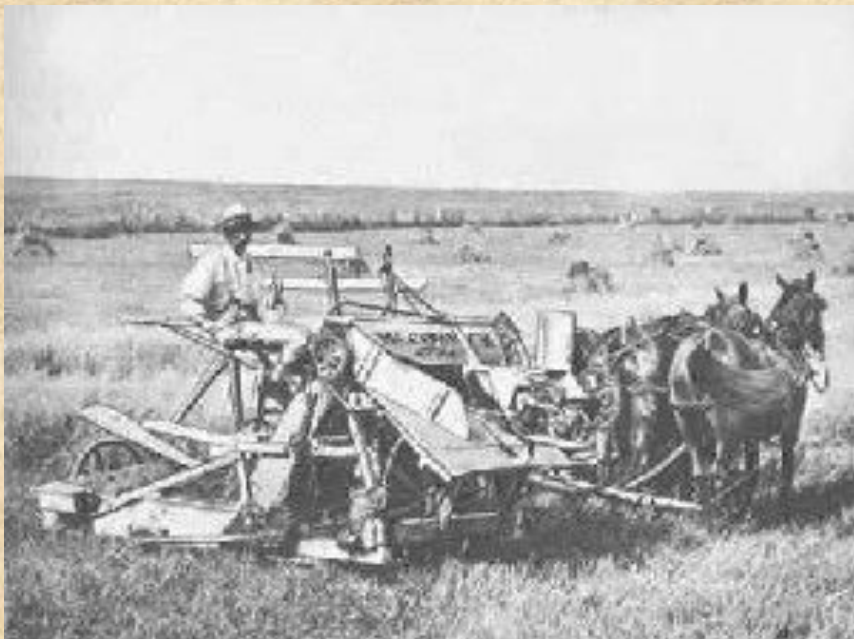
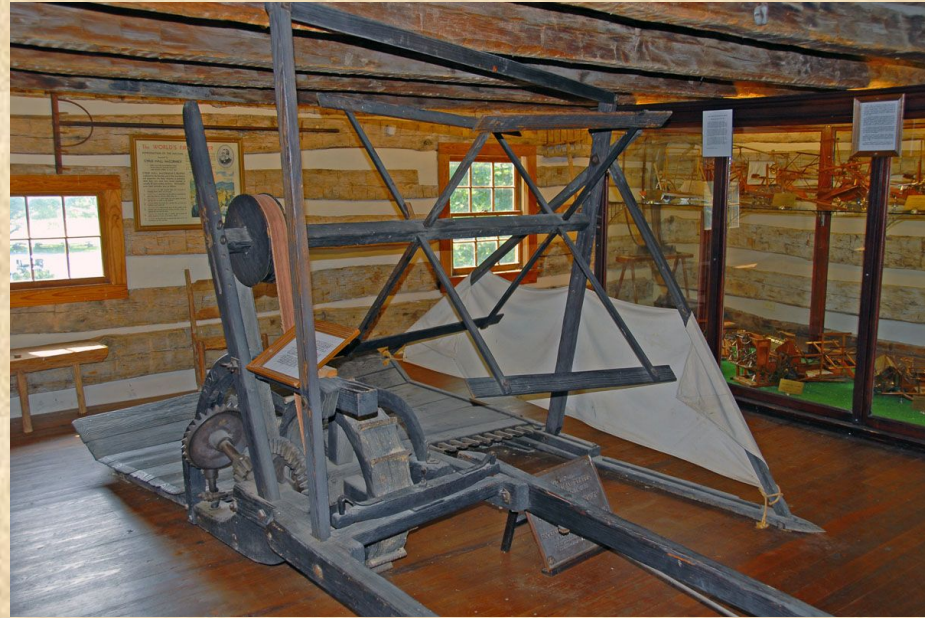
McCormick, after a slow start, became wealthy producing reapers and other mechanical farm implements in his Chicago factories.




His reaper played an important role in opening up western lands to farming.




**Cyrus
McCormick**




John Deere

 Deere knew that Jethro Woods' iron plows were not working well in the tough western prairie soil where farmers were now moving.

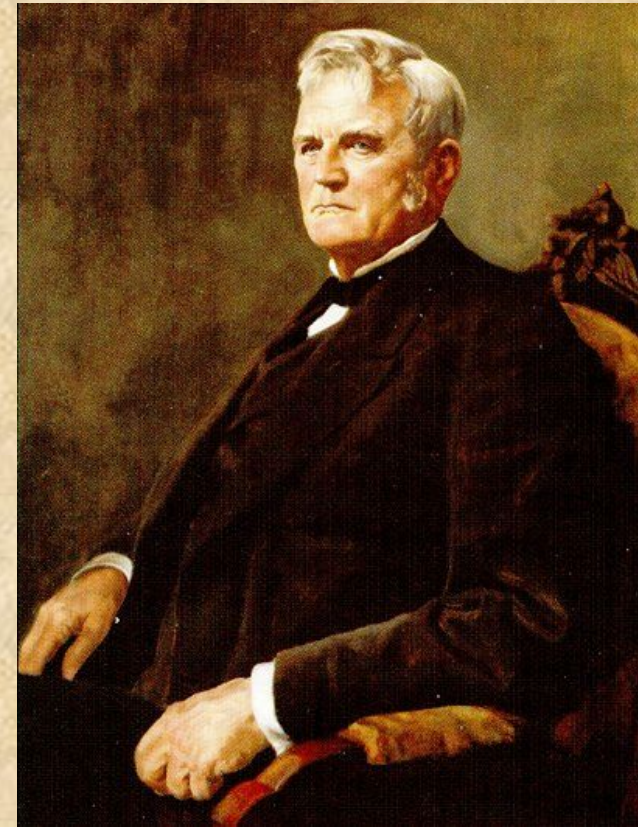
 In 1837, he invented a steel plow that easily moved through tough western soils.

 His plows were a commercial success. The company he founded is still a major player in the agricultural machinery industry.

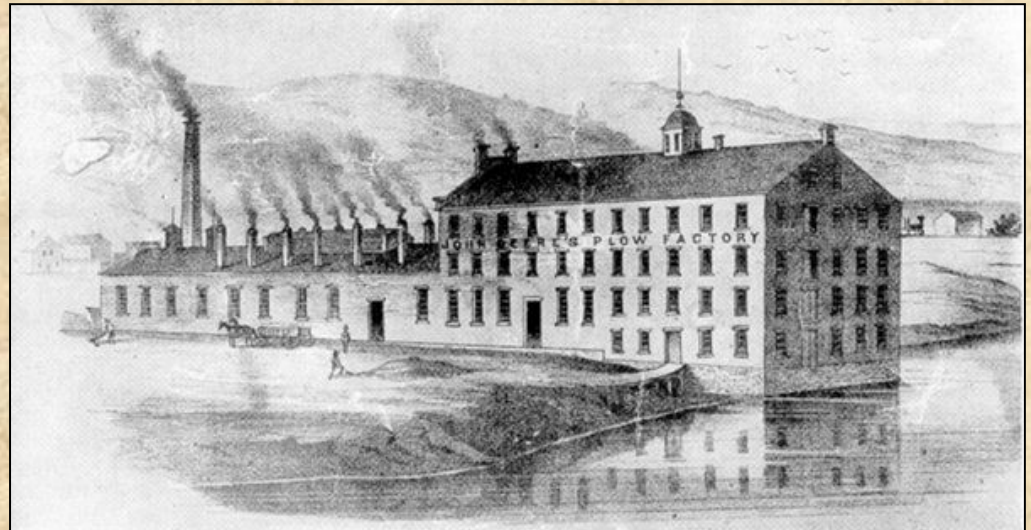
 John Deere plows moved across the continent in wagon trains, helping settle the far west and turn it into a rich agricultural farming country.



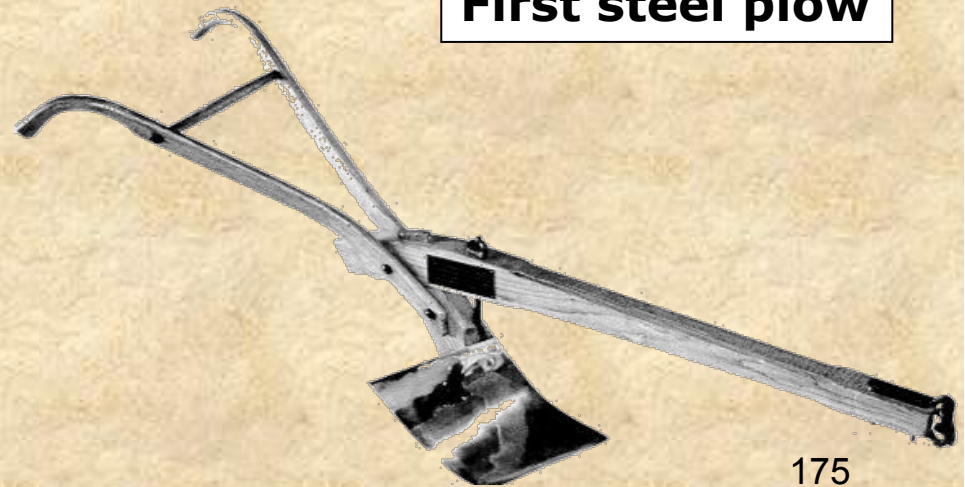
Deere's 1838
steel plow



John Deere invented a steel plow that could cut through land that in the past could not be cultivated with iron plows. He went on to build a large agricultural implement business.



John Deere's 1859 factory



First steel plow

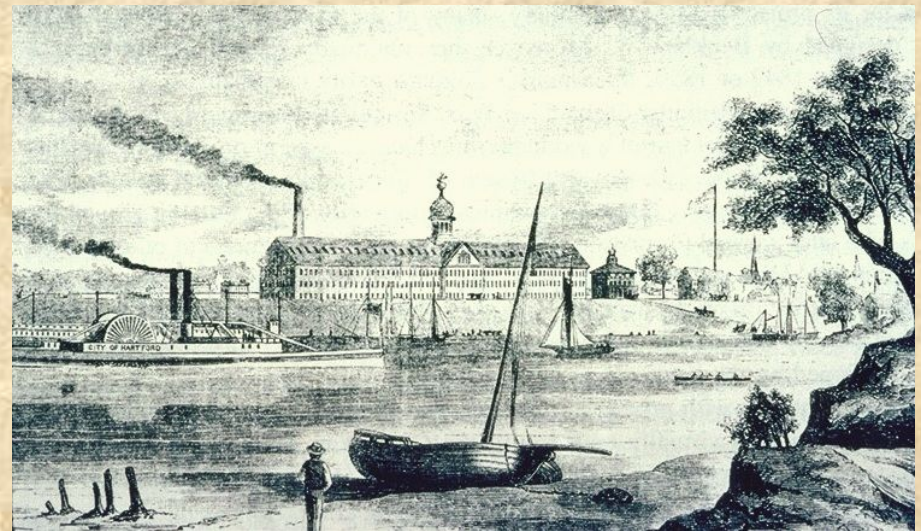
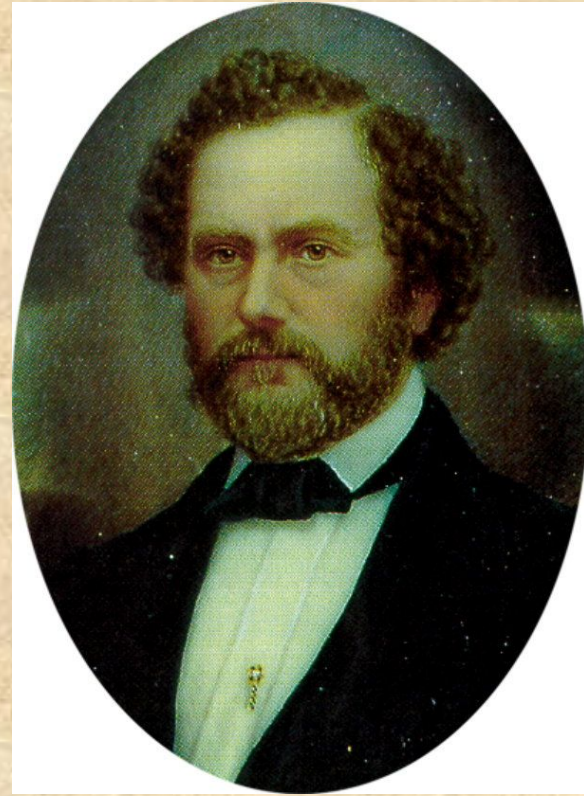
Samuel Colt



Samuel Colt constructed the first practicable multi-shot revolving-breech-loading pistol in 1836. With investors he began a company, but they were not successful until the outbreak of the Mexican War in 1846.



The war brought orders from the government for thousands of Colt revolvers. The new company, *Colt's Patent Fire-Arms Manufacturing*, was a success, and in the early 1850s Colt built the world's largest arms factory. Colt's pistols, before the 1860s, did not fire bullets; they were cap and ball weapons.






**Colt 1847 *Walker* pistol
used by Texas Rangers**





Samuel Colt


18-year-old Samuel Colt first experimented with pistol design while on a long sea voyage with missionaries in 1832.

Thomas Davenport

 In 1834-35, Thomas Davenport, with the aid of his wife Emily, invented the first electric motor.

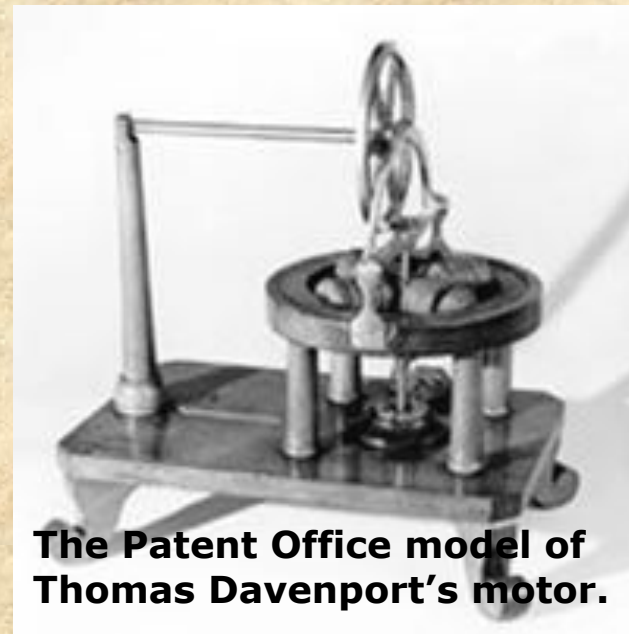
 In 1837 he received the first patent for a machine run by electricity.

 His electric motor was used to run lathes, drills and a printing press.

 His invention was ahead of its time; electricity as a power source would not come into play until the later part of the 19th century.

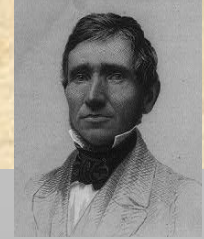


Thomas and Emily Davenport



The Patent Office model of Thomas Davenport's motor.

Charles Goodyear



Natural rubber was used for waterproofing and other applications; however, natural or “India” rubber had several problems that made it of little practical value.



In hot weather, rubber melted; and in cold weather, it froze and cracked.



Charles Goodyear, a small businessman and inventor, spent many years trying to develop a process that would make rubber a commercial product. His many failed experiments with dangerous chemicals almost ruined his health and caused his family to live in poverty.



Finally he discovered the *vulcanization* process that solved the problems with rubber, and patented it in 1844.



Unfortunately, he was not successful in marketing his vulcanized rubber and died in poverty in 1860.



He had no connection with the Goodyear Tire and Rubber Company which was founded in 1898.

THE ORIGINAL
RUBBER STORE,
UNDER GOODYEAR'S PATENT.
ESTABLISHED IN 1839.



Mechanic's Apron.



Fireman's Coat.

The Subscriber offers a large assortment of Rubber Goods at reduced prices.

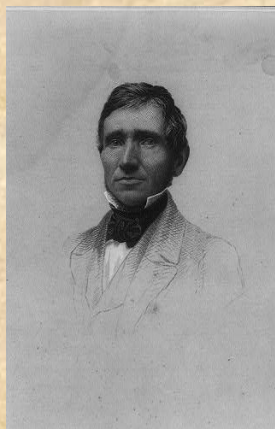
AMONG THE VARIETY OF WATER-PROOF AND AIR-TIGHT GOODS, ARE

| | | | | |
|--|--|--|---|---|
|  <p>Officer's Coat.</p> | <p>Air Beds and Pillows, Air Cushions for Chairs, Aprons for Ladies, Aprons for Bricklayers, Bathing Mats and Caps, Baptismal Pants, Carriage and other Cloths, Coats, Capes, and Cloaks, Caps and Sou'westers, Camp Blankets, Crumb Cloths, Cockhairs and Garden Hoses,</p> | <p>Drinking Cups and Canteens, Game and Fish Bags, Gun Covers, Gloves and Mittens, Horse Covers, Horse Boots and Penders, Hunting and Fishing Boots, Leggins, long and short, Life Preservers and Jackets, Ladies' Elastics, Overshoes, Overalls and Pants, Rubber Causse and Combs,</p> |  <p>Pen Coat.</p> | <p>Paper Bands, Parlor and Foot Balls, Seaman's Bags, Suspenders and Elastics, Syringes and Breast Pumps, Traveling Bags, Table Covers, Tobacco Wallets, Teething Rings and Toys, Wagon Covers, Undersheeting for Beds, Urinal Bags, &c., &c.</p> |
|--|--|--|---|---|

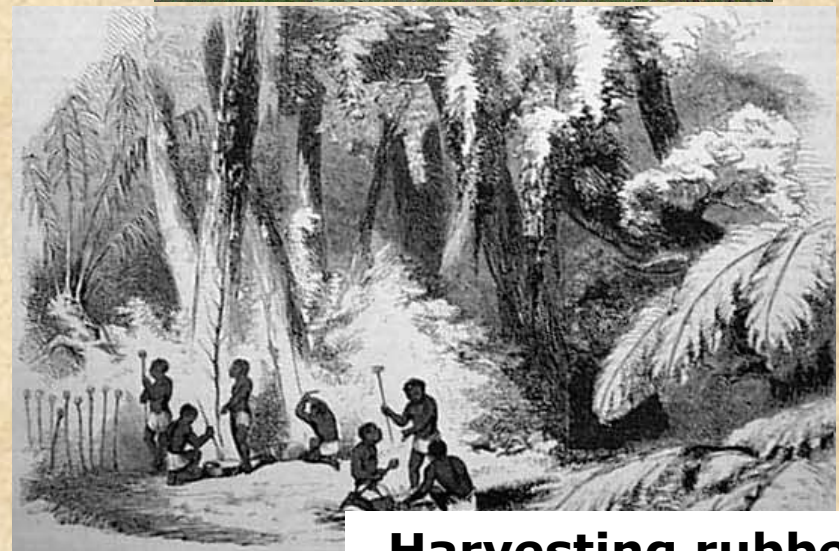
| | |
|--|---|
| <p>Horse Covers, Gents' Heavy Boots, Gents' Overshoes, Ladies' Boots, Ladies' Shoes, Misses' Overshoes, Boys' Boots, Youths' Boots, Heavy Black Rubber Coats, Heavy White Rubber Coats, Leggins,</p> | <p>Door Mats, Bathing Tubs, indented, Spitoons, Chest Expanders, India Rubber Pencils, Thimbles, Card Baskets, Ladies' Housing Chains, Ladies' Bracelets, Breast Pins, Ear Rings, Hair Pins, Crosses, and other India Rubber Ornaments.</p> |
|--|---|

N. B. A beautiful article of Gentlemen's silk Reversible Coats, weighing only 12 oz. Also, a superior article of Reversible Macintosh Coats.

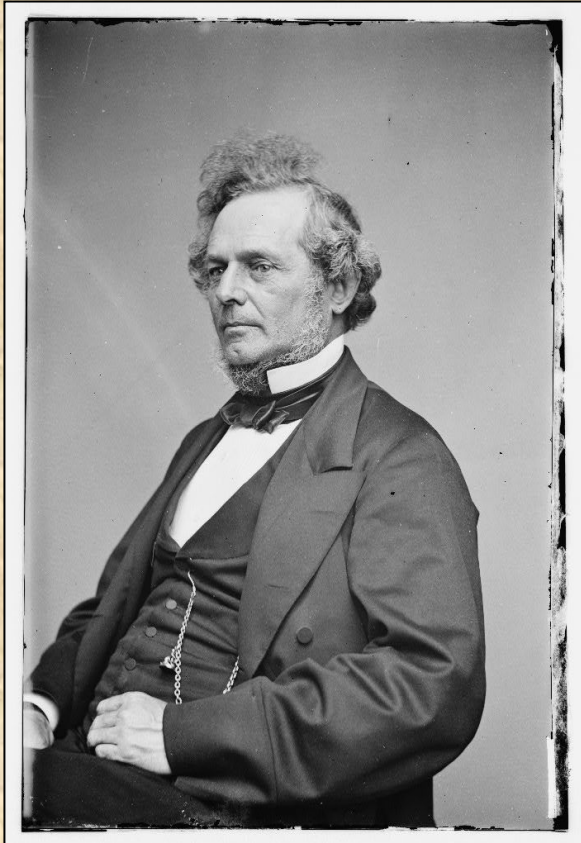
C. HAYES, 26 School St., Boston.
UNDER REV. A. A. MINER'S CHURCH.



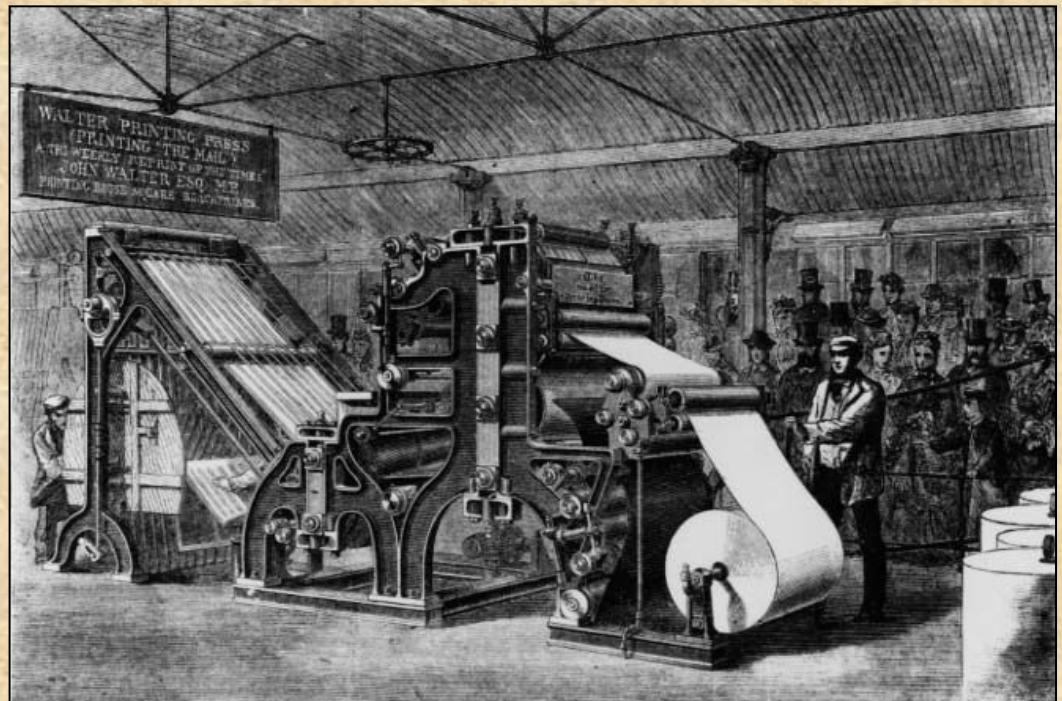
Charles Goodyear

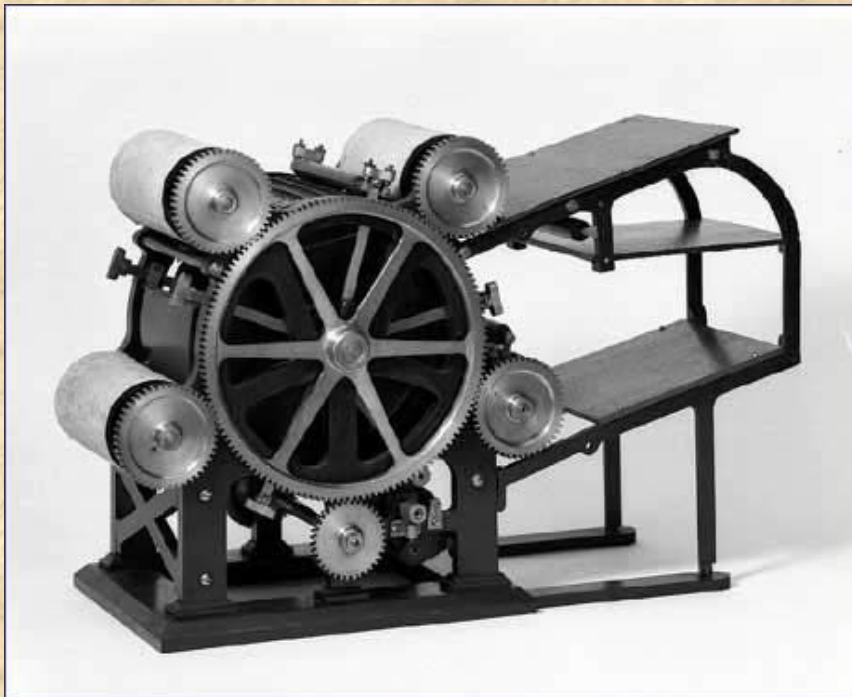
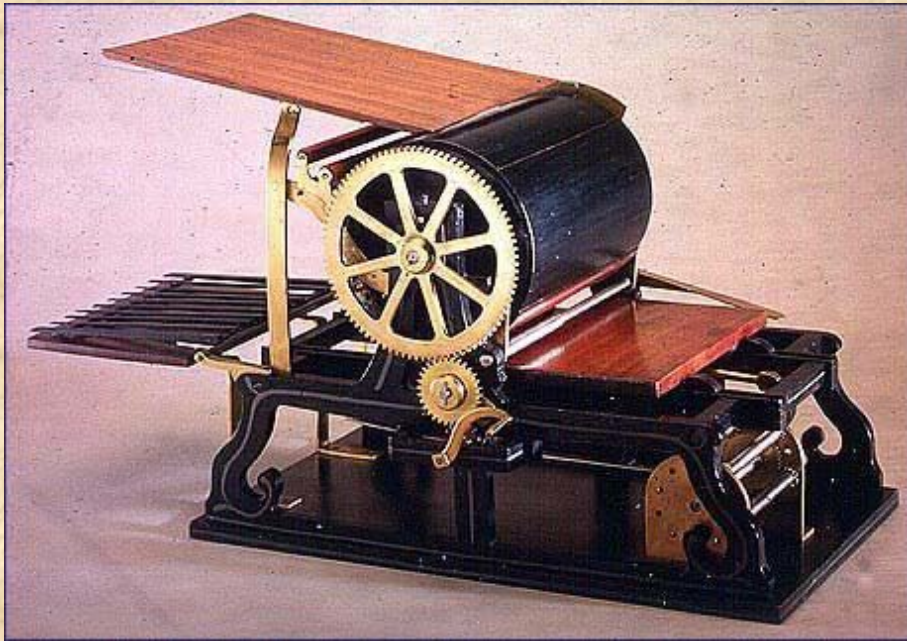


Harvesting rubber



In 1843, Richard Hoe invented the rotary printing press, which allowed much faster printing than the old-style printing press. With Hoe's design, more cylinders could be placed around the main cylinder, moving much faster in one direction. Some versions of the press were able to create up to 20,000 impressions per hour.





Hoe's rotary printing press revolutionized printing and made the modern newspaper industry possible.

1846 advertisement for Hoe's press

R. HOE & CO.

Manufacturers of Single and Double Cylinder Printing Machines, Washington and Smith Hand Presses, Self-Inking Machines, Steam Engines, Cast Steel Saws, Machinery, &c. &c. &c.

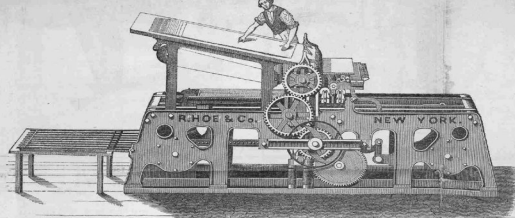
EVERY ARTICLE CONNECTED WITH THE ART OF

TYPOGRAPHY, COPPERPLATE AND LITHOGRAPHIC PRINTING AND BOOKBINDING,

ALWAYS ON HAND, OR FURNISHED AT SHORT NOTICE.

MANUFACTORIES, NOS. 29 & 31 GOLD STREET, AND CORNER OF BROOME AND SHERIFF STREETS, NEW YORK.

PATENT SINGLE SMALL CYLINDER PRINTING MACHINE.

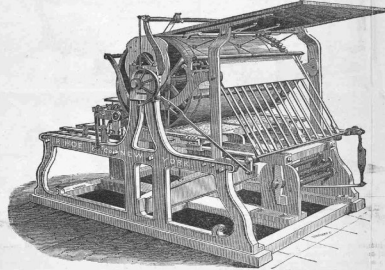


Our Single Small Cylinder Press has two or more revolutions of the cylinder to an impression, depending on the speed required, and is calculated for very expeditious Newspaper Printing, throwing off from 1500 to 2000 impressions per hour. It is constructed with our patent feed guides and sheet-flyer, and requires only one boy to put on the sheets, and may be driven by man or steam power. The present reduced prices of these presses will render them accessible to the greater part of the newspaper establishments throughout the United States and other countries.

SIZES AND PRICES.

| | | | |
|---------------------|--------------|---------------------|------------|
| No. 6, Bed 35 by 25 | \$1200 | No. 9, Bed 50 by 33 | 1900 |
| " 7, " 41 " 29 1/2 | 1600 | " 10, " 54 " 35 | 2100 |
| " 8, " 46 " 31 | 1750 | " 11, " 57 " 38 | 2300 |

PATENT SINGLE LARGE CYLINDER PRINTING MACHINE.

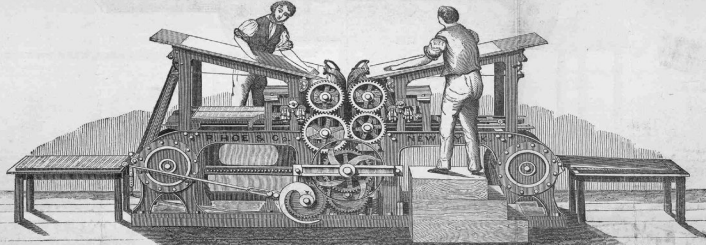


This Machine is particularly adapted to Book and fine Newspaper work. It has a perfect registering apparatus and sheet-flyer. One boy is required to lay on the sheets, and the press may be driven by man or steam power. With the same attendance it will print twice as fast as any bed and platen machine, and equally as well in every respect.

SIZES AND PRICES.

| | | | |
|---|--------------|-------------------------|--------------|
| Large Footcase, Bed 23 by 18 in. | \$ 850 | No. 2, Bed 46 by 31 in. | \$1950 |
| Medium, " 29 1/2 " 23 in. | 1300 | " 3, " 54 " 31 in. | 2100 |
| Super Royal, " 37 " 32 in. | 1450 | " 4, " 54 " 38 in. | 2500 |
| No. 1, Double Medium, " 41 " 32 1/2 in. | 1600 | " 5, " 57 " 38 in. | 2600 |

PATENT IMPROVED DOUBLE CYLINDER PRINTING MACHINE.



The Proprietors have also spared neither pains or expense in improving their Double Cylinder Press, and have made many important improvements in its construction. Great additional speed in Printing has been gained, at the same time particular attention has been paid to simplicity in its movements, with a view to ease and still greater durability. The addition of the patent sheet-flyer apparatus to this Press dispenses with the necessity of two boys to take off the sheets. The Press, therefore, now requires but two boys to attend it instead of four as formerly, and will print as fast as they can feed it, say from 2000 to 3000 impressions per hour, depending on its size. For simplicity, ease, great expedition, economy of labor, perfection of workmanship, strength of material, and consequent durability, this machine is altogether unequalled.

SIZES AND PRICES.

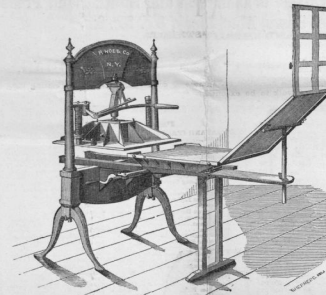
| | | | |
|---------------------|--------------|---------------------|--------------|
| No. 1, Bed 41 by 35 | \$3500 | No. 4, Bed 54 by 34 | \$3950 |
| " 2, " 44 " 31 | 2250 | " 5, " 57 " 35 | 3500 |
| " 3, " 46 " 33 | 3000 | | |

Each Cylinder Machine is furnished with Roller Moulds, Two Sets of Roller Stocks, Blankets and Band.

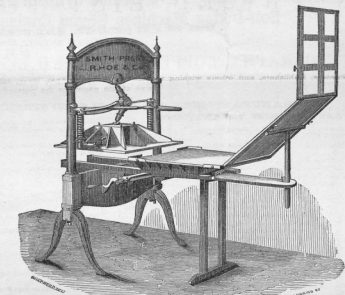
GEO. W. WOOD, Printer, No. 29 Gold Street.

HAND PRESSES, SELF-INKING MACHINES, HYDRAULIC PRESSES, &c., &c., &c.

PATENT WASHINGTON PRINTING PRESS.



PATENT SMITH PRINTING PRESS.

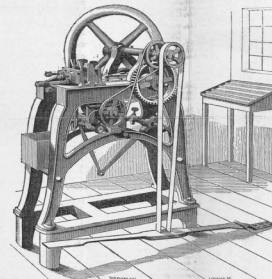


The celebrity which our Patent Washington and Smith Hand Presses have obtained, and their exclusive and constant use in almost every Printing Office in the United States and other countries, during the last twenty years, renders any remarks upon their superiority unnecessary. They are neat and elegant in appearance, peculiarly simple in principle, quick and powerful in operation, and combine in their construction every facility for the production of superior printing. Each press is thoroughly tried at the manufactory, and warranted for twelve months.

PATENT WASHINGTON AND SMITH PRESSES.

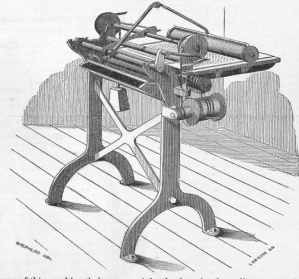
| | |
|--|--|
| MAMMOTH: Size of Platen 43 1/2 by 31 1/2 inches; Bed 48 by 32 1/2 inches | \$350 00 |
| IMPERIAL: No. 5, " 40 " 28 " " " 44 " 29 1/2 " " " 40 " 26 1/2 " " " 40 " 26 1/2 " " " 37 " 24 1/2 " " " 35 " 24 " " " 30 " 22 1/2 " " " 25 " 19 " " " 17 1/2 " 14 " " | 250 00 340 00 200 00 230 00 210 00 200 00 130 00 100 00 |

PATENT MACHINE CARD PRESS.



For Printing Cards and Small Circulars this Machine is not surpassed. It is worked by either a crank or treadle, and will print from 1000 to 1500 cards per hour in the best manner, and may be used also for printing note paper and small circulars. Its inking apparatus is self-acting. Price \$150.

PATENT SELF-INKING MACHINE.



By means of this machine the pressman takes the form by the ordinary operation of the press, and gives a perfect distribution of ink. They have been in very extensive use in this and other countries for many years, and their superior merits are universally acknowledged.

SIZES AND PRICES.

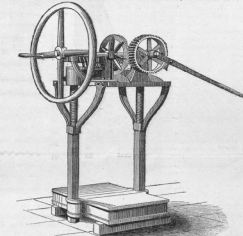
| | |
|----------------------|--------------------------|
| Footcase, . . . \$75 | Super Royal, . . . \$ 95 |
| Medium, " " 85 | Imperial, . . . 110 |

We also manufacture a superior inking machine for a hand press, driven by steam power, with two rollers to pass over the form, one or more times to each impression. The strongest inks may be used. The distribution is perfect and uninterrupted. Nothing can be better adapted for cuts and the finest work.

SIZES AND PRICES.

| |
|---|
| Medium, with Counter Shaft and Pulleys, \$150 |
| Super Royal, " " " 165 |
| Imperial, " " " 180 |

IMPROVED GEARED STANDING PRESS, WITH TWO SCREWS.



Many combination Screw Standing Presses have been offered to the trade, but we believe the above is more simple, strong and powerful, and less liable to get out of repair than any heretofore in use.

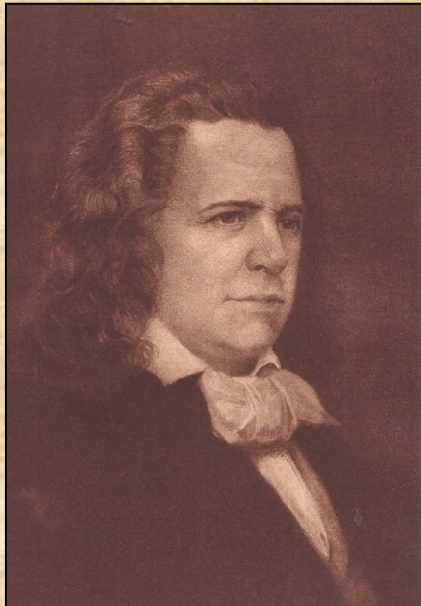
Double Medium Size, . . . \$350.

SIZES AND PRICES.

| | |
|--|---------------|
| 8 inch Ram, with Single Pump, Platen 25 by 28 inches | \$ 300. |
| 10 " " " " " 40 " 28 " " | 1000. |
| 12 " " " " " 45 " 32 " " | 1250. |

With separate cylinders, \$50 extra. Larger and smaller sizes to order. Also made to work by steam power, with one or more pumps.

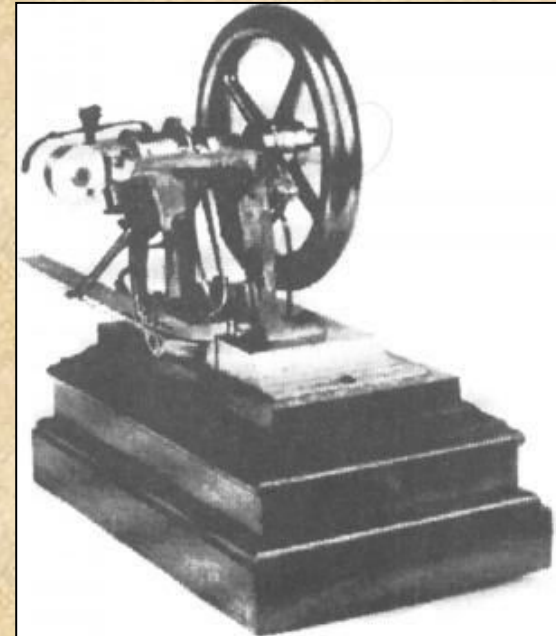
Elias Howe, Isaac Singer and the sewing machine



Elias Howe



Isaac Singer



Elias Howe invented the first practical sewing machine in 1845, but was unable to successfully market the product either in the U.S. or abroad. Upon his return from Europe, many designers modified his machine. The most successful of these was Isaac Singer, who was able to sell them commercially on a large scale.

Elias Howe

2 LEWIS COUNTY BUSINESS DIRECTORY.

WHAT ADVANTAGES
HAS
THE "ELIAS HOWE" MACHINE
OVER OTHERS?

First.—The public know it to be durable. A conclusive evidence in twenty years have not placed second-hand "HOWE" machines in the market. It cannot be sold of any other machine.

Second.—It contains the material for its own repair.

Third.—It has less wearing points than any other.

Fourth.—It draws a stitch as you do by hand; others do not.

Fifth.—You have perfect control over both threads; others have not.

Sixth.—It gives off thread in proportion to the thickness of fabric sewed, thereby avoiding slow motion over seams, dragging stitches and breaking of needles—a great objection to all other machines.

Seventh.—It sews a tight seam in casements, burying the thread on either side, and then a tissue paper, without change of tension.

Eighth.—The presser foot is easily swung out of the way, when you set a needle or put under work. It is not so with any other.

Ninth.—Many new machine companies have had their rise and fall—their machines once popular now scarcely known—others have made radical changes in order to exist; while the Howe Machine Company have adhered to the opinion of "Elias Howe, Master of Mechanics," ("The machine is mechanically correct; does not change,") built addition after addition to their factory, and to-day cannot supply the demand, although turning out six hundred machines a day—just a machine a minute.

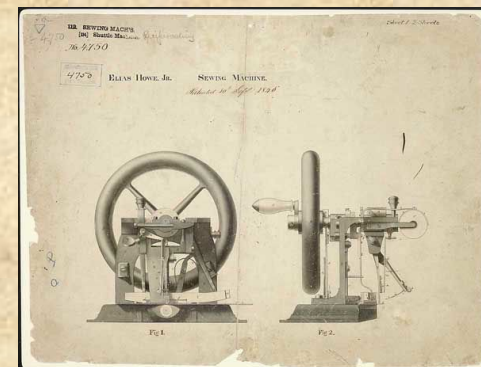
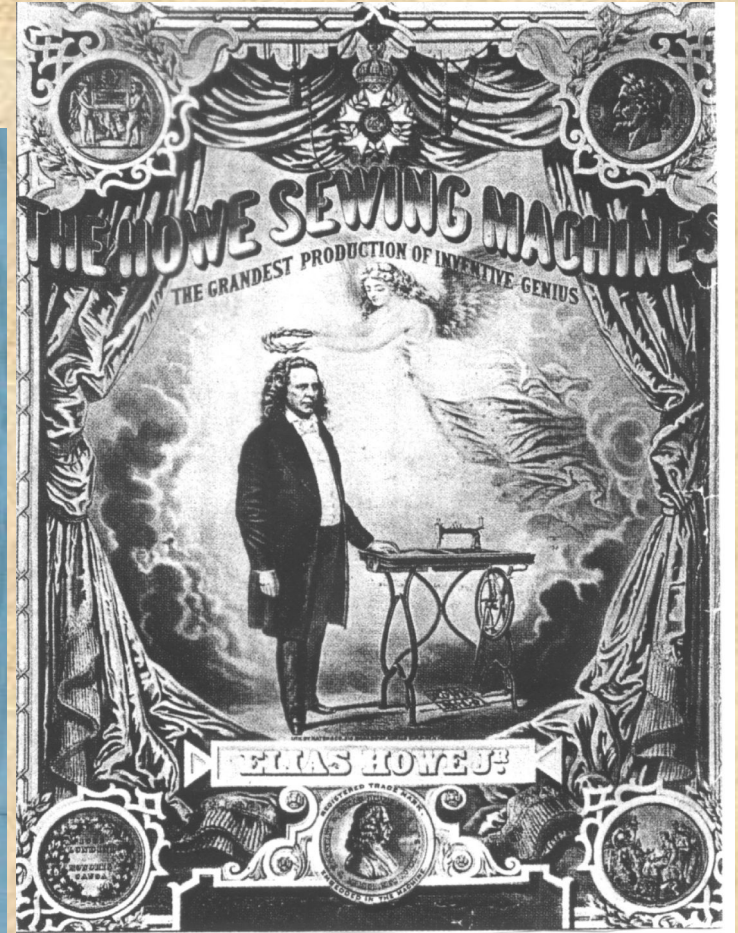
Principal Branch Office,
205 Genesee Street, Utica, N. Y.

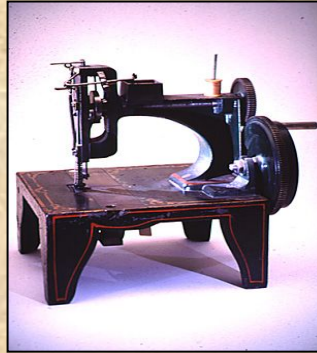
BRANCH OFFICE OF
E. BUTTERICK & CO.'S
Celebrated Patterns!
For Ladies', Misses' and Children's Garments.

NEW FASHION BOOKS.—*The Metropolitan, and Quarterly Designer, Ladies', Gents' and Boys' Fashion Plates.* Also E. Butterick & Co.'s Celebrated Shears and Scissors.

PATTERNS sent by mail on receipt of price and number. Illustrated Catalogues free, sent by mail on receipt of 2 cent stamp. Send for one.

ADDRESS,
Mrs. Eli Overton,
205 Genesee Street, - - UTICA, N. Y.





No. 11 July 24, '69

THE UNITED STATES
Sewing Machine Company

**TWELVE DOLLAR
FAMILY SEWING MACHINE**

Something Entirely New! Invented in 1869.

In the elegance and beauty of its finish, the wonderful simplicity of its construction, the certainty of its operation, and the quality of its work, it stands entirely without a rival in the Sewing Machine world.

FULLY WARRANTED FOR FIVE YEARS.

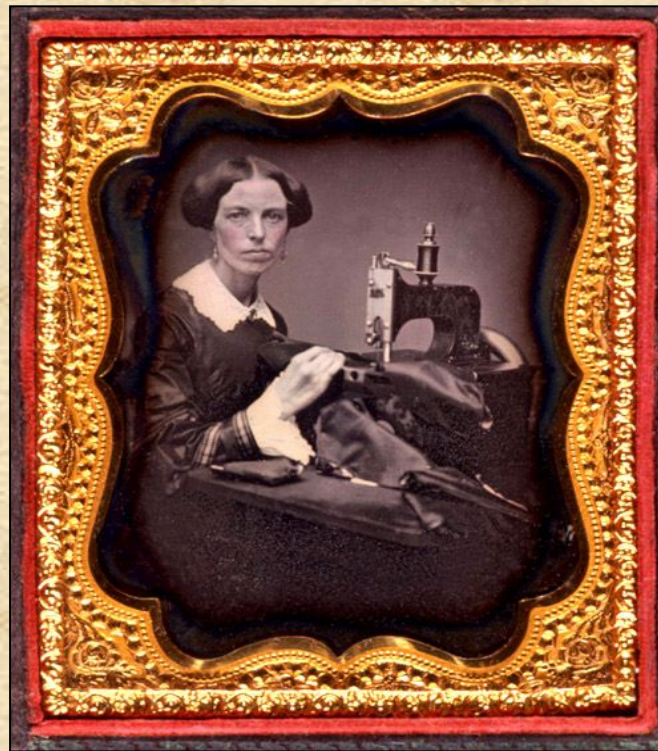
TEN REASONS

WHY THE UNITED STATES TWELVE DOLLAR FAMILY SEWING MACHINE IS SUPERIOR TO ALL OTHERS.

- 1st. They are the simplest Sewing Machines ever constructed, and are consequently less liable to get out of order than any other.
- 2d. They are very light or thread, run of iron, from the spool to the needle directly from the spool, without turning or twisting.
- 3d. Sewing Machine, in the common use of the needle, and in the most regular manner, and can be adjusted to sew all kinds of goods from the finest thread to the coarsest and of any color, with the same thread, and in the most perfect manner.
- 4th. They make the ordinary elastic hat with, as elastic as the most elastic hats, and are universally acknowledged to be the best for all family sewing.
- 5th. They are the most perfect sewing machines ever invented, and are the most perfect in the world.
- 6th. They have an upper feed like the highest quality of Wheeler & Wilson, Sewing, and they will run without noise at the rate of two thousand stitches per minute.
- 7th. They are not liable to get the dress of the operator, and do not have to be taken apart to be oiled.
- 8th. When any part of the machine gets out of order, it can be repaired in a few minutes, and it is not liable to get out of order in the wrong direction.
- 9th. A perfect course of Book Sewing, Old Law, Sewing, Dressing, etc., with full printed instructions, accompanies each machine, without extra charge, so that persons who never saw a sewing machine can learn to use it in less than half an hour.

At _____ State of _____
County of _____

Agent,



**"Now I can sew my clothes in half the time."
1853
Singer advertisement**

"If I pity those woe who stain their needle, for, when they lean upon it, it pierces, not their side, but their heart. . . . I think the needle has slain more than the sword of war."
HESY WARD BEECHER.


**GROVER & BAKER'S
CELEBRATED
Family Sewing Machines.**

The **E A S E** with which these machines can be operated is a distinguishable feature.


The Scientific American, Nov. 5th, 1850, says: "The machines manufactured by the Grover and Baker Sewing Machine Company are too well known by the public at large to need any recommendations at our hands, and we will simply add that we have had one of these in use in our family for some time past, and it is considered the most useful article in the house, next to the cradle, and no less indispensable than that."


Zion's Herald, Nov. 10th, 1850, says: "We would recommend to families and to those about to organize a homestead, to be sure and have a Family Bible, and also one of Grover & Baker's SEWING MACHINES."

**SALES ROOM IN BOSTON,
16 Summer Street,
495 Broadway,
NEW YORK.
730 Chestnut Street,
PHILADELPHIA.
181 Baltimore Street,
BALTIMORE.
58 West Fourth Street,
CINCINNATI.
AGENCIES THROUGHOUT THE WORLD.**

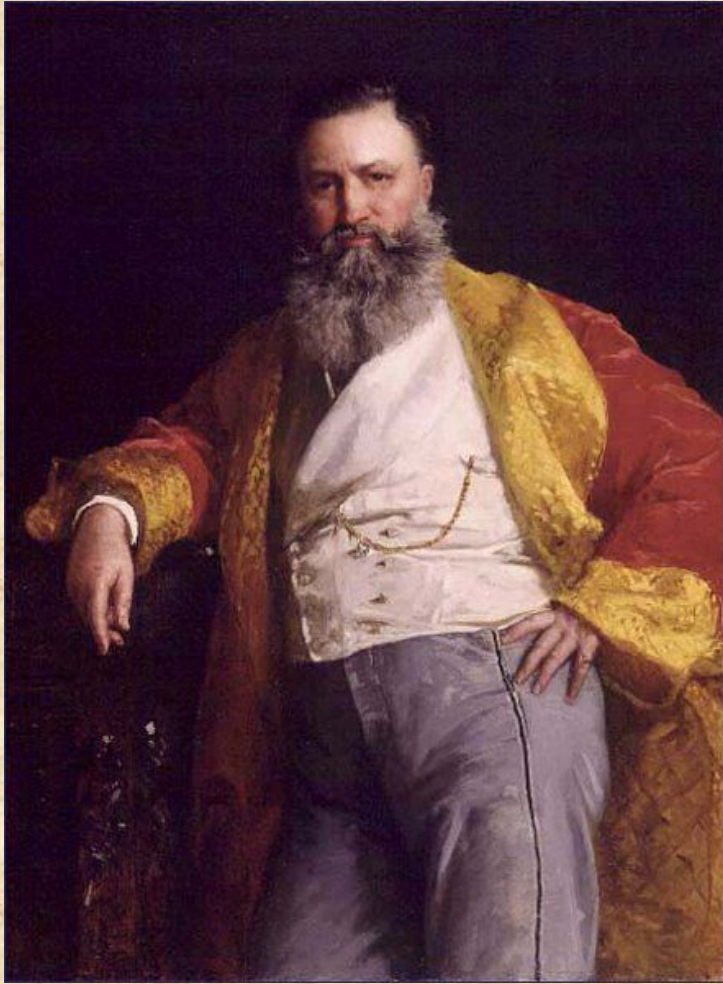
 **Isaac Merritt Singer was an actor, inventor and businessman who founded the Singer Sewing Machine Company in the mid-19th century.**

 **Although he did not invent the sewing machine, he was one of the first to mass-market it as a household appliance.**

 **Although Singer, Howe and several other manufacturers had originally fought over the sewing machine patents, they ultimately decided to cooperate, and machines were made by several companies.**

 **Singer's company was the most successful, since its installment plan allowed almost every household to purchase its own sewing machine. I. M. Singer & Co. expanded its business around the world.**

 **Singer became fabulously rich. He retired in 1863 to spend more time with his families and 18 children.**



Isaac Merritt Singer



An early Singer sewing machine





Singer 1851



One of Singer's rivals



Elisha Otis



Elisha Otis was a master mechanic who developed a safety brake that prevented elevators from crashing.



His company had financial problems until he demonstrated his safety elevator brake at the Crystal Palace Exposition, The U.S.'s first world's fair.



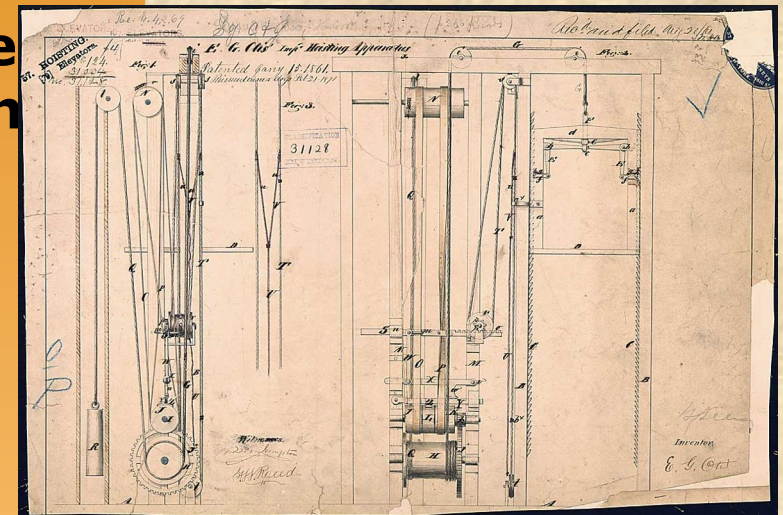
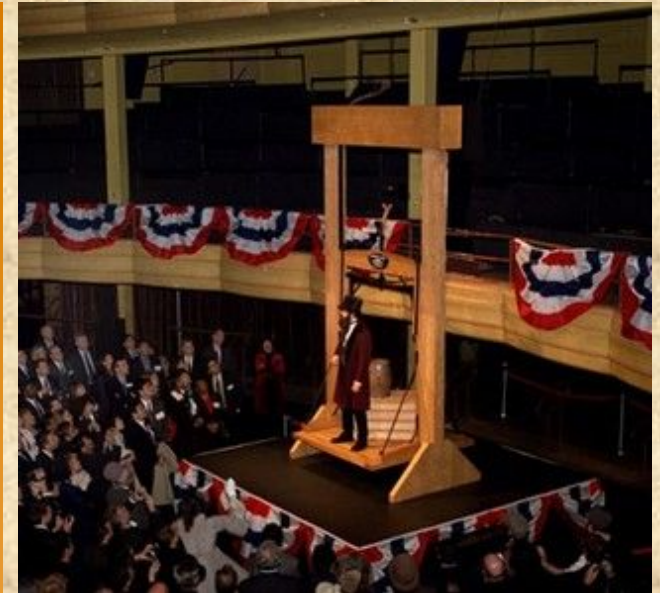
His business took off when he began constructing passenger elevators in 1857.



Otis died in 1861, but his sons greatly expanded the business.

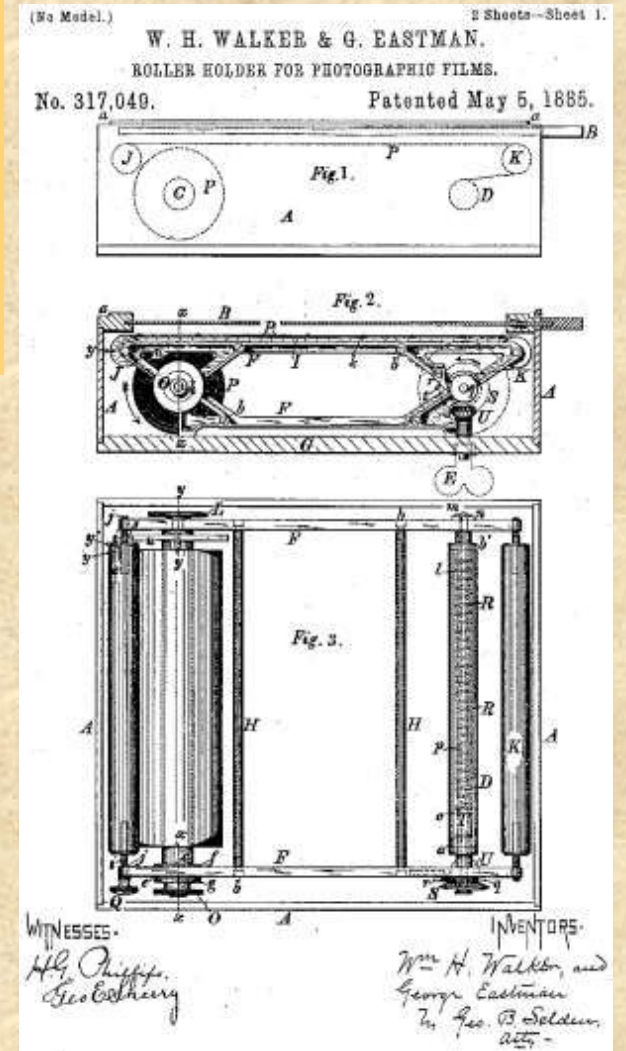
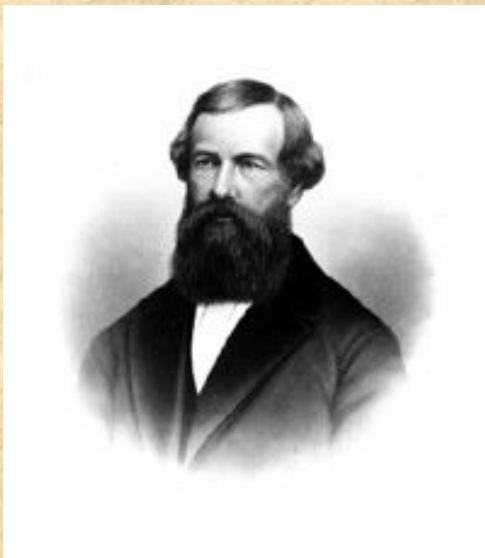


Otis's safety elevators are often credited for making possible the skyscrapers (tall buildings with many floors) that transformed America's cities.

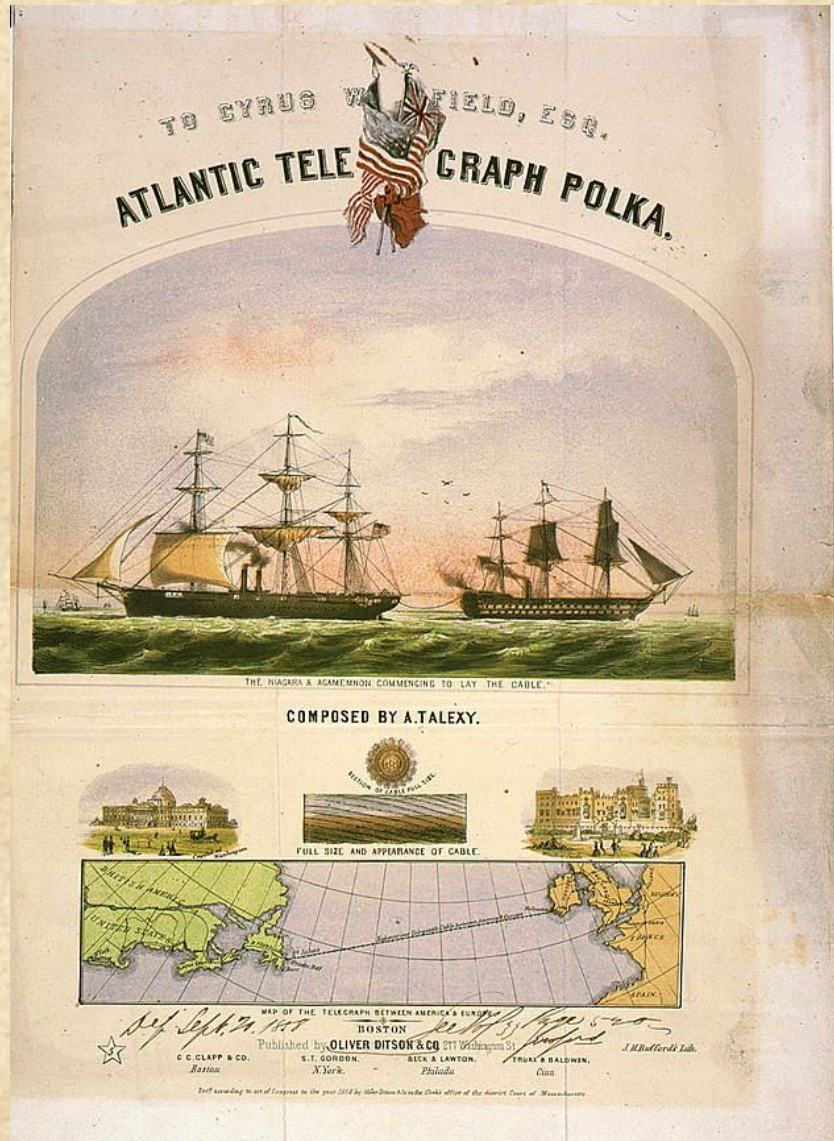




The elevator was a critical invention that made tall buildings possible. Before the elevator, buildings went no more than six floors high.



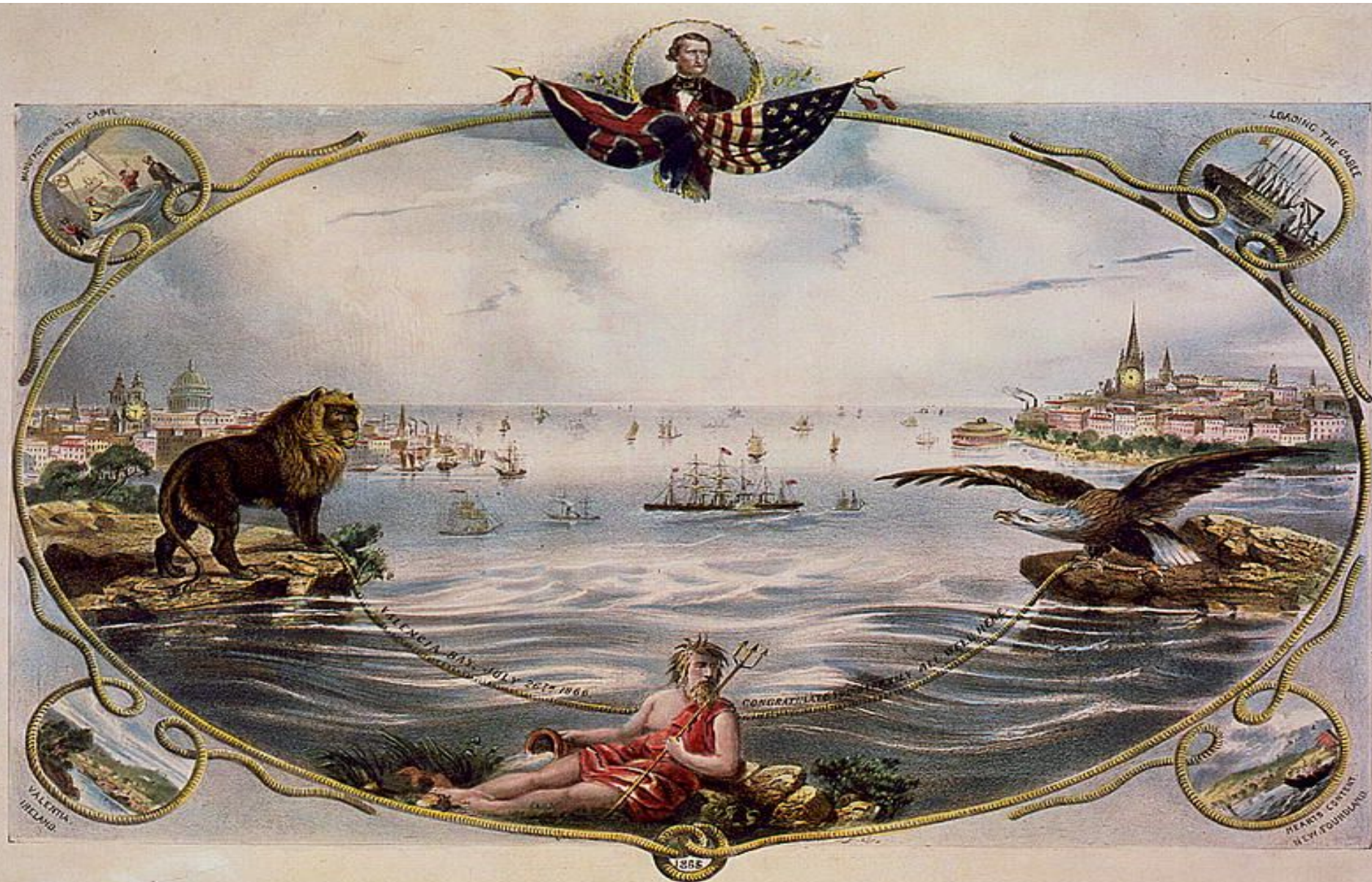
Transatlantic cable telegraph



The first cable crossed the Atlantic Ocean from Valentia Island, in western Ireland, to Newfoundland. The transatlantic cable connected North America with Europe, making communication possible in minutes rather than the usual days by ship. A stable connection was established in 1866 and more cables were laid down before the turn of the century.



Cyrus W. Field played a crucial role in coordinating the transatlantic cable telegraph



THE EIGHTH WONDER OF THE WORLD.

THE ATLANTIC CABLE.

Heart's Content, July 27th 1866.

I hope that it will prove a blessing to England, and the United States, and increase the intercourse between our Country & the Eastern Hemisphere.

Your faithfully
Cyrus W. Field.

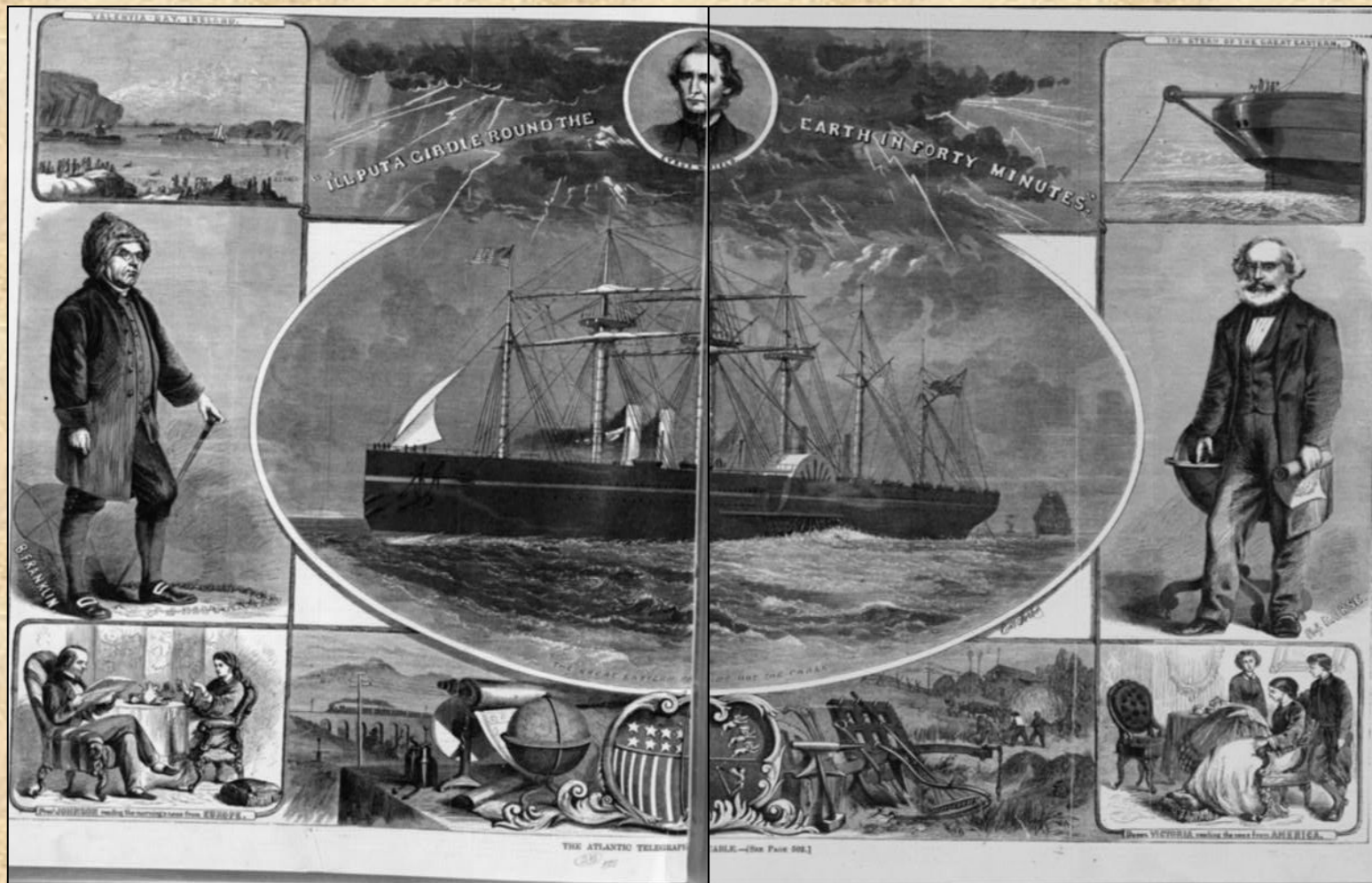
PRINTED BY EMMETT & FOSTER, 254 256 NASSAU ST. N.Y.

Washington, July 29th 1866.

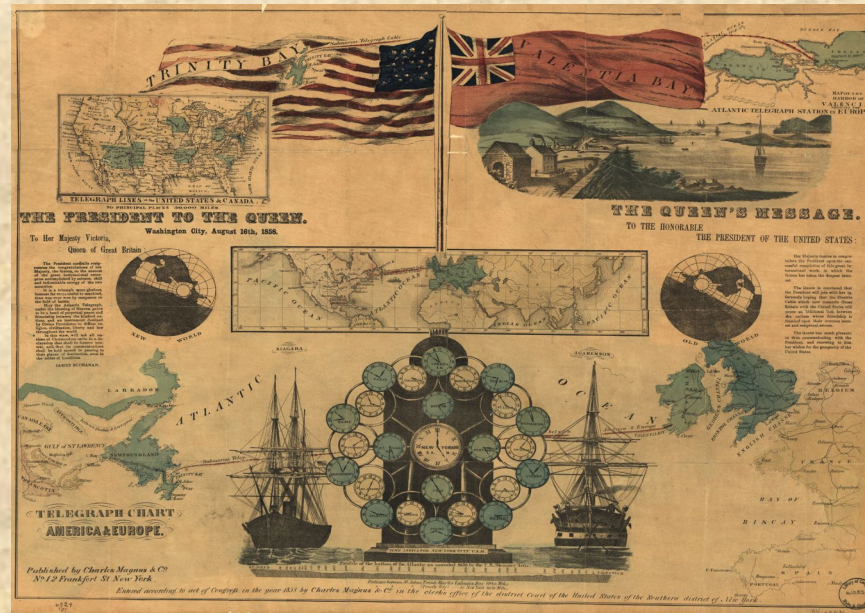
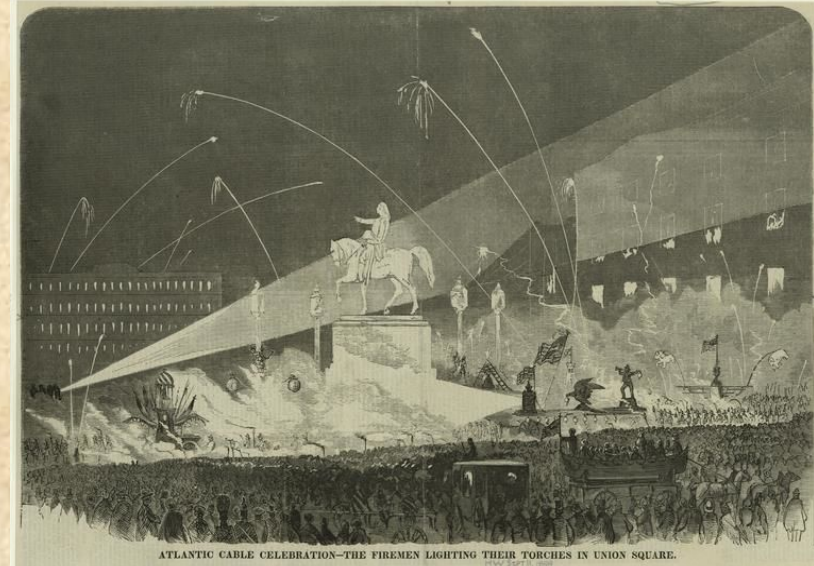
To Cyrus W. Field, Heart's Content:
May the Cable, under the sea tend to promote harmony between the Republic of the West and the Governments of the Eastern Hemisphere.

Andrew Johnson

This 1865 engraving includes scenes and people related to the laying of the Atlantic telegraph cable and the invention of the telegraph, including Benjamin Franklin, Cyrus W. Field and Samuel Morse. President Johnson is shown reading the morning news from Europe, and Queen Victoria reading the news from America, with the cable-laying ship in the center.



The completion of the transatlantic cable was celebrated as one of the great events of history.



Edwin Drake, "Father of the Petroleum Industry"



Petroleum had been known and used for thousands of years. However, it could only be obtained from naturally occurring oil seepages, and was rare.



In the 19th century, oil for lamps was obtained from sperm whales, which had almost been hunted to extinction. Petroleum, after being refined into kerosene, was found to be an excellent whale lamp oil replacement. The roadblock to widespread use was its limited supply.

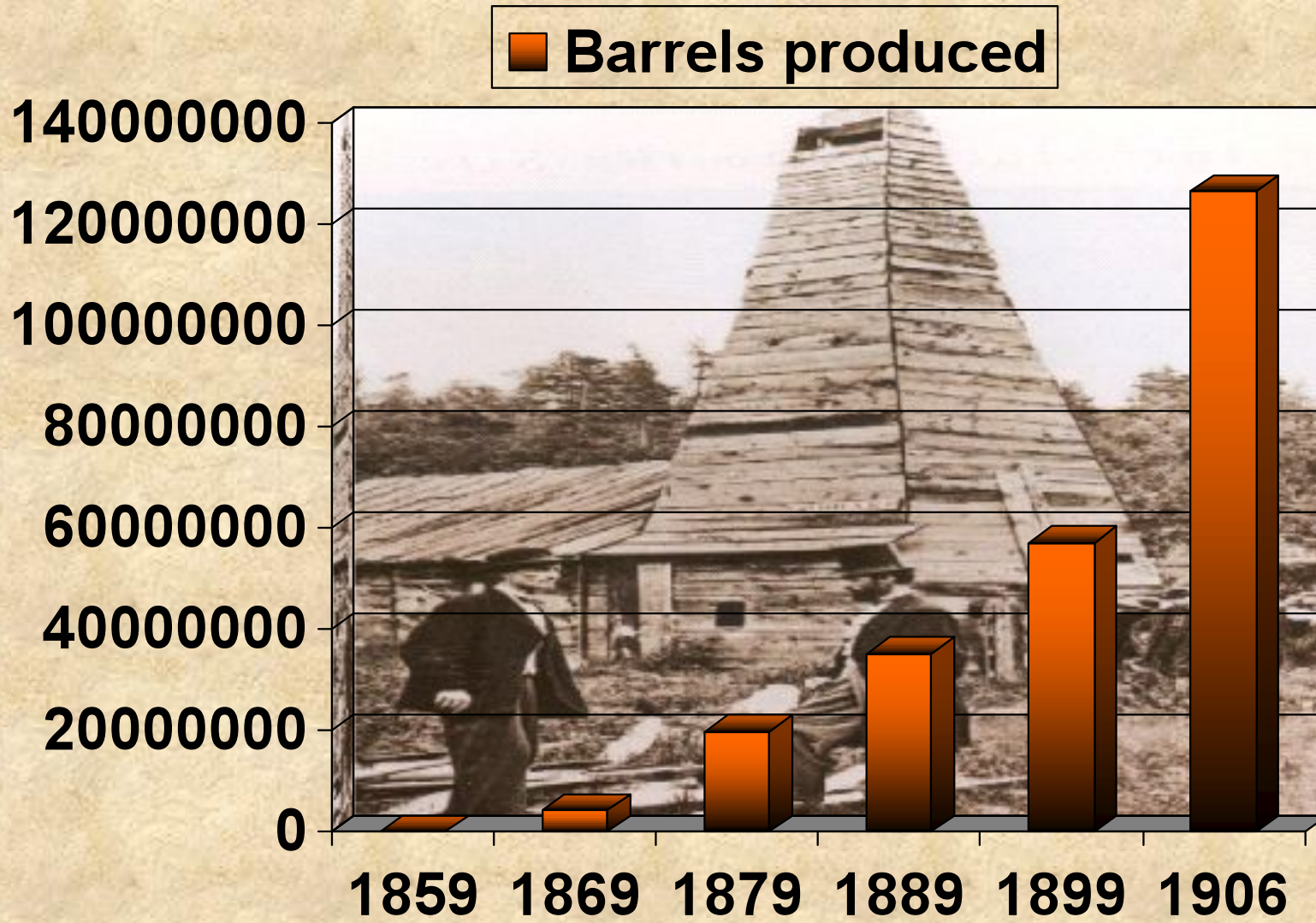


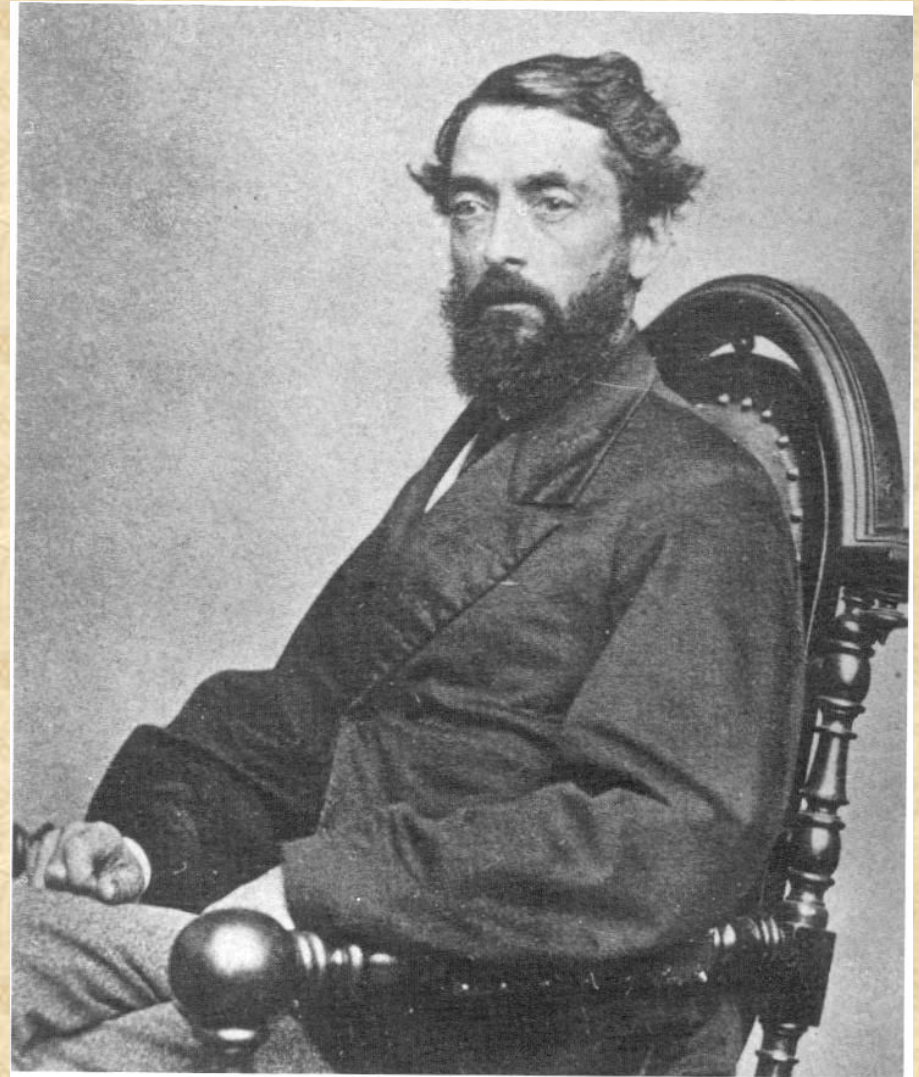
Drake came up with the idea of drilling through pipes driven into the ground. This prevented water seepage, and oil could now be successfully pumped out of underground deposits.



Unfortunately, Drake made nothing from his invention, and his family lived in near-poverty until the state of Pennsylvania gave him a \$1500-per-year pension in 1873.

Petroleum soon became the major source for lubricants and energy products.





Edwin Drake and early oil well.

Samuel F.B. Morse: Inventor of the telegraph



Morse, an artist, inventor and college professor, demonstrated in 1835 that signals could be transmitted by wire using electricity.



He received \$30,000 (\$800,000 in 2005 dollars) in 1843 from the government to build an experimental telegraph line between Baltimore and Washington D.C.



In 1844 the first message was sent between the two cities. In the following years, Morse and his partners expanded their lines to several other cities.



Soon several small telegraph companies were operating.

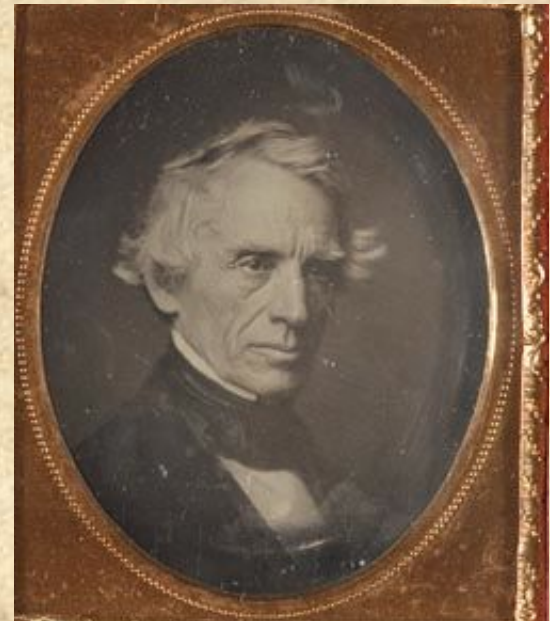


In 1861 the Western Union company built the first transcontinental telegraph system.

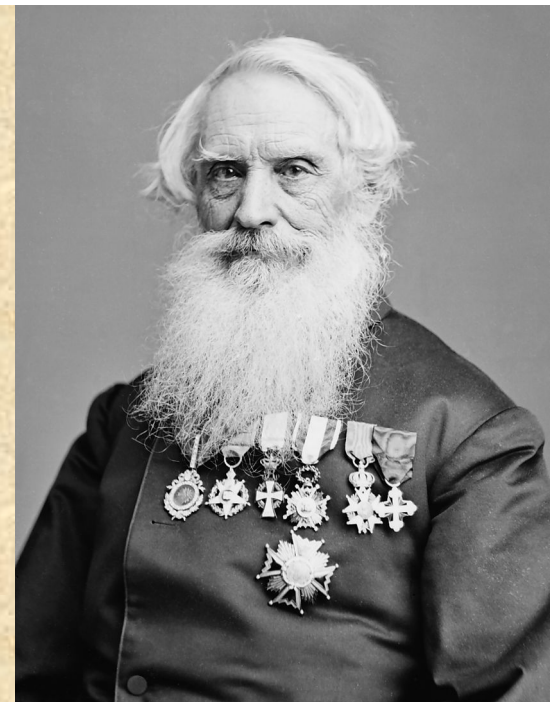


Until the invention of the telephone in 1877, the telegraph was the only long-distance method of communication.

**Painting by Morse of his daughter
Susan in 1837**



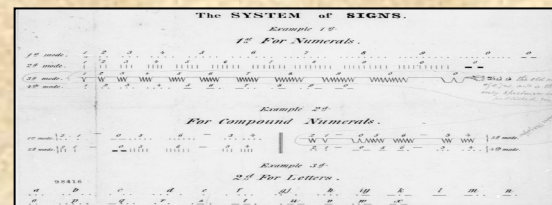
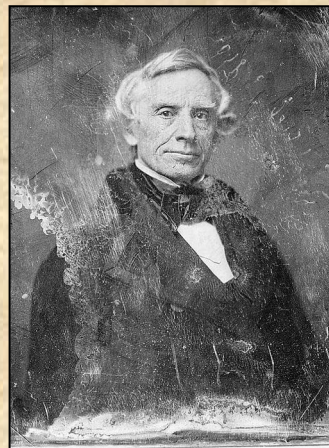
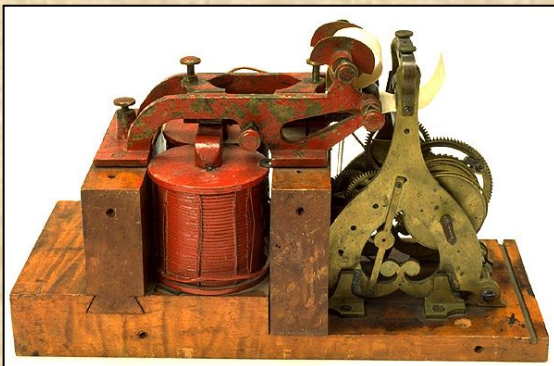
Samuel F.B. Morse



Samuel Morse



In 1835, Samuel Morse proved that signals could be transmitted by wire. He invented the Morse Code which used dots and dashes to transmit messages. In 1838 Congress funded construction of an experimental telegraph line from Washington to Baltimore, a distance of 40 miles. The first official message, "What hath God wrought?" opened the completed line on May 24, 1844.



Morse Code



BALTIMORE PATRIOT

AND
COMMERCIAL GAZETTE.

PUBLISHED DAILY AND TRI-WEEKLY BY
ISAAC MUNROE,
Baltimore street, second door from North

JOHN N. MILLINGTON, Printer.

BALTIMORE:
TUESDAY AFTERNOON, JUNE 11, 1844

Whig Nominations.

FOR PRESIDENT,
HENRY CLAY, of Kentucky.

FOR VICE PRESIDENT,
THEO. FRELINGHUYSEN,
OF NEW JERSEY.

FOR GOVERNOR OF MARYLAND,
THOMAS G. PRATT, OF PRINCE GEORGES.

ANOTHER TEXAS MESSAGE!
Reported for the Baltimore Patriot.

BY MORSE'S MAGNETIC TELEGRAPH.
WASHINGTON CITY, Tuesday, June 11, 1844.

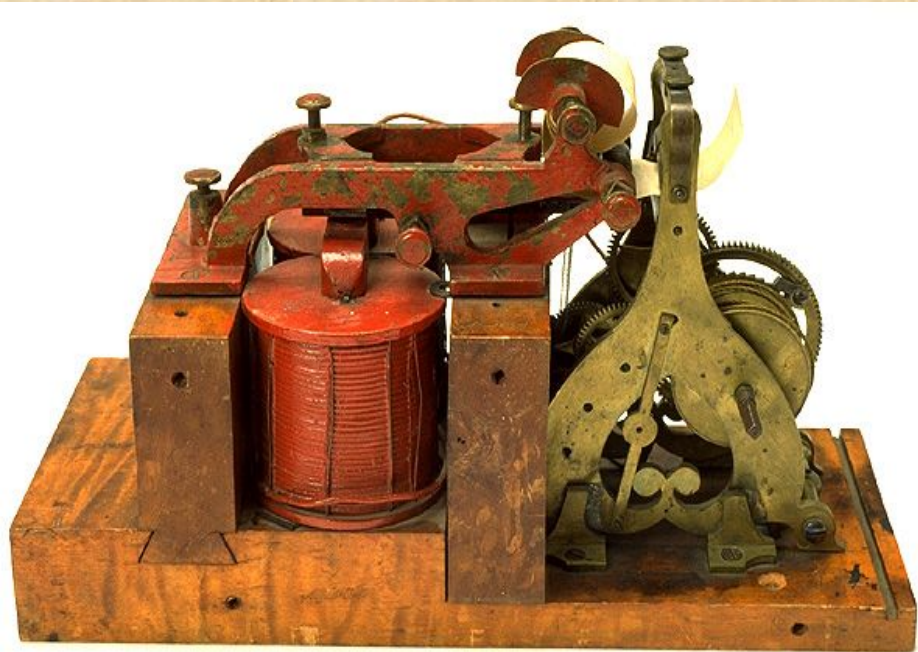
10½ o'clock, A. M.—In the House of Representatives a long message was received from the President in favor of the immediate annexation of Texas, and calling on Congress to pass a law for that purpose. Mr. KENNEDY, of Maryland, moved to lay it on the table—rejected, ayes 66, nays 118. It was then referred to the Committee on Foreign Affairs. Mr. ADAMS offered a resolution, denying the power of the President to place this country in a state of war with any foreign nation without the assent of Congress—Resolution not received.

1 o'clock.—In the House, Mr. ADAMS asked a suspension of the rules, in order to move the above resolutions—yeas and nays called, and the rules not suspended.

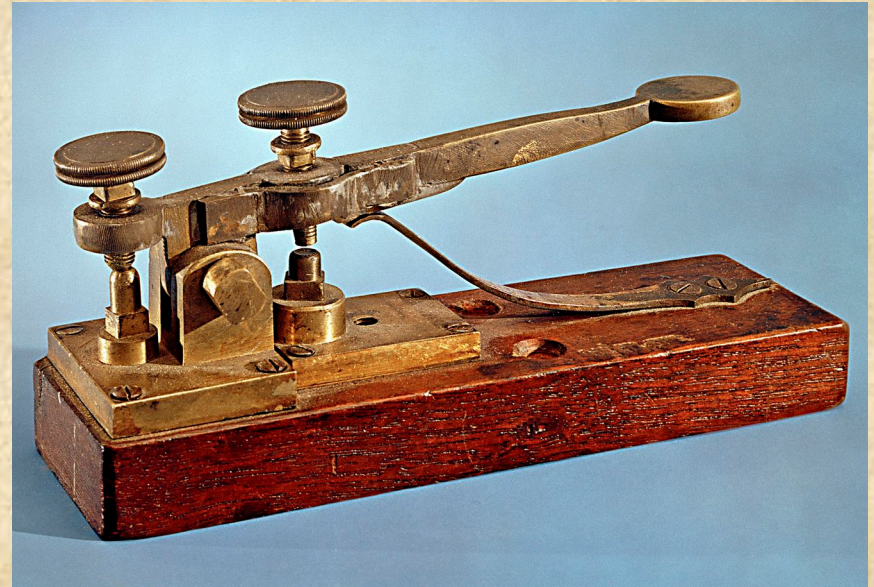
10 minutes past 1.—Mr. MILLER is speaking in the Senate on the District of Columbia Bill.

Word was sent up at 30 minutes past one o'clock that the Telegraph would be closed until 3 o'clock P. M., Professor Morse, who works the electric register in Washington, having been called before the committee to whom the subject of his Telegraph has been referred, for the purpose of giving them certain information.

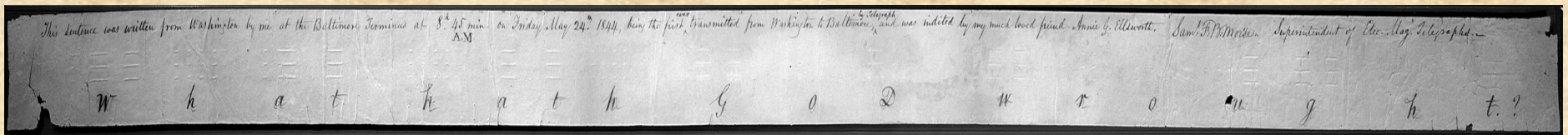
“Another Texas Message by Morse’s magnetic telegraph”: 1844



The original telegraph receiver used in Baltimore to receive the first telegraph message on May 24, 1844.

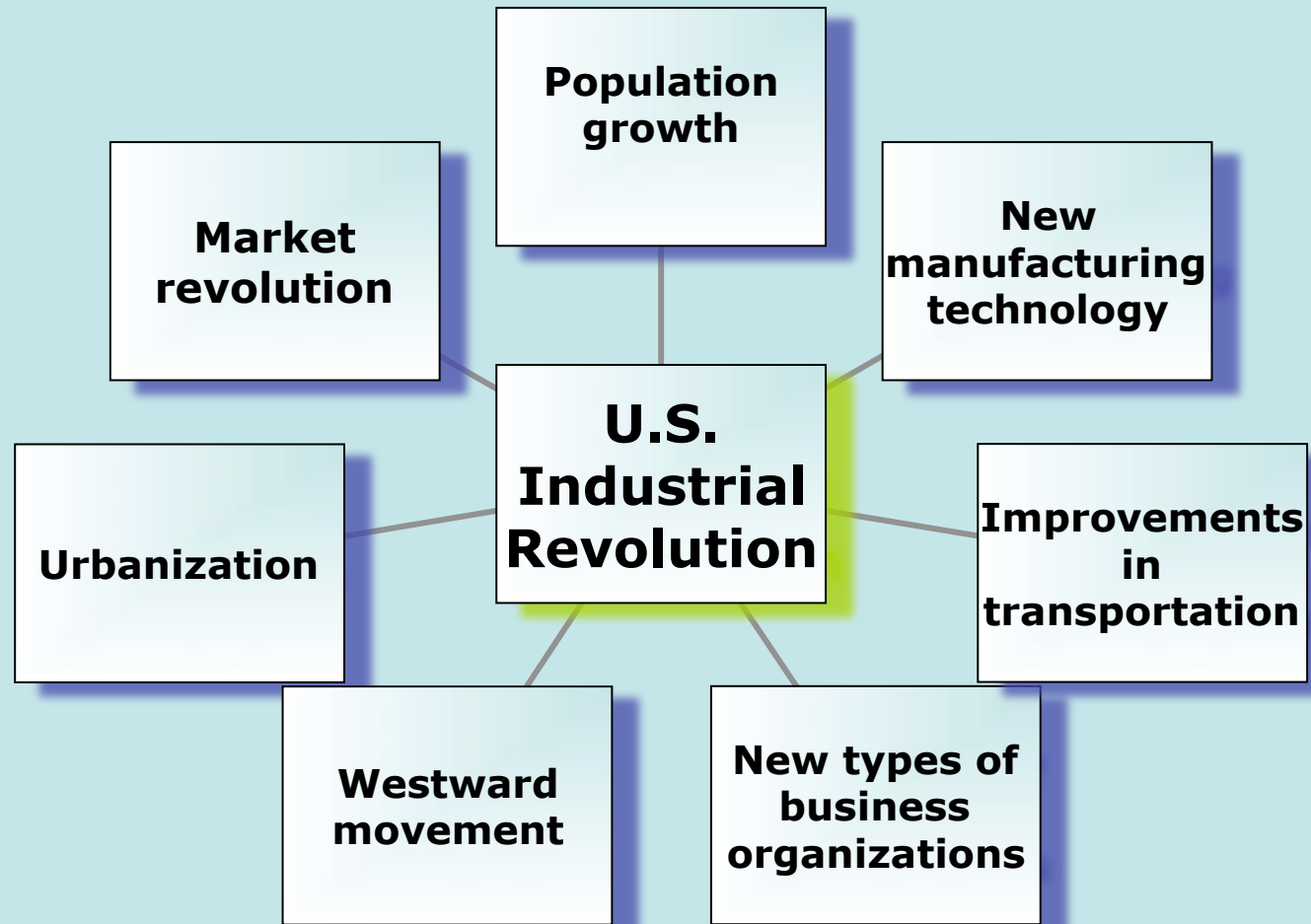


Early telegraph key, 1844-1845



First telegraphic message: "What hath God wrought?"

Major effects of the Industrial Revolution



U.S. History PowerPoint presentations

Colonization to Reconstruction: Early U.S. Review

Colonial Era

American Revolution

The New Nation: Washington to J.Q. Adams

First Industrial Revolution in America: 1790-1860

Slavery

Westward Movement

Expansion and Reform: 1820-1860

Causes of the Civil War

Civil War

Reconstruction

Miners, Ranchers, Farmers, and Native Americans: 1865-1900

Rise of Industrial America

Response to Industrialism

Immigration and Urbanization

America becomes a world power: Imperialism

The Progressive Era

The U.S. and World War One

1920's

Great Depression and New Deal: 1930's

Causes of World War Two

World War Two

1950's

1960's

Civil Rights Movement

Cold War: Truman to Kennedy

Cold War: Johnson to the fall of the Berlin Wall

Vietnam

Late History Overview: 1970s, 1980s, 1990s

Please visit our website which contains sample slides from all of our PowerPoint presentations:
www.multimedialearning.org

We send out monthly newsletters containing free downloads to subscribers. If you are connected to the internet simply click on the on the following link:

[Sign up to receive our email newsletter containing specials and free downloads](http://www.multimedialearning.org) If you are not on the internet, please visit our homepage at www.multimedialearning.org and sign up.

World History PowerPoint presentations:

Kingdoms and Empires in the Fertile Crescent: Sumer to Persia

Ancient Egypt: Neolithic to Roman Conquest

Aegean Civilizations

Ancient Rome

Medieval Europe

Black Death and other great pandemics

India, and Southeast Asia

History of Africa

Mesoamerican and Andean Civilizations

Islamic Civilization

China: Ancient Civilization to the Communist Revolution

The Conquest of Mexico

French Revolution

European Imperialism 1800-1914

Nationalism in Europe 1830-1914

Please visit our website which contains sample slides from all of our PowerPoint presentations:

www.multimedialearning.org

We send out monthly newsletters containing free downloads to subscribers. If you are connected to the internet simply click on the on the following link:

[Sign up to receive our email newsletter containing specials and free downloads](#) If you are not on the internet, please visit our homepage at **www.multimedialearning.org** and sign up.

HMS Historical Media, a division of Multimedia Learning, LLC, has 26 classroom ready historical simulation games available on various topics.