

The North

Section 1: The Industrial Revolution in America

Section 2: Changes in Working Life

Section 3: The Transportation Revolution

Section 4: More Technological Advances

Section 1: Industrial Revolution in America

Overview:

The Industrial Revolution

Textiles & the Water Frame
Samuel Slater's designs

Mass Production

Interchangeable Parts
Eli Whitney's guns

War of 1812 as catalyst for American Industry

- **Industrial Revolution** – period of rapid growth in using machines in manufacturing and production that began in the mid-1700's
- **Textiles** – manufactured cloth
- **Richard Arkwright** – invented the water frame (thread spinning machine)
- **Samuel Slater** – brought secret manufacturing designs to America
- **Technology** – the tools used to produce items or to do work
- **Eli Whitney** – inventor who created process to mass produce guns
- **Interchangeable parts** – parts of a manufactured machine that are identical
- **Mass production** – the efficient production of large numbers of identical goods

New Machines lead to the Industrial Revolution

- Most people at the beginning of the 1700s were farmers, who made most of what they needed by hand.
- Skilled workers, such as blacksmiths, carpenters, and shoemakers, made goods by hand in the towns.
- People began using machines to make the manufacturing process more efficient.
- The **Industrial Revolution**, a period of rapid growth using machines to make goods, arose in Great Britain in the mid-1700s.

Textile Industry

- The first breakthrough in the Industrial Revolution was in how **textiles**, or cloth goods, were made.
- **Richard Arkwright**, an Englishman, invented a spinning machine in 1769 called the water frame, which replaced hand spinning.
- The water frame used flowing water as a source of power.
 - Could produce dozens of cotton threads at the same time
 - Lowered the cost of cotton production and increased the speed of textile production



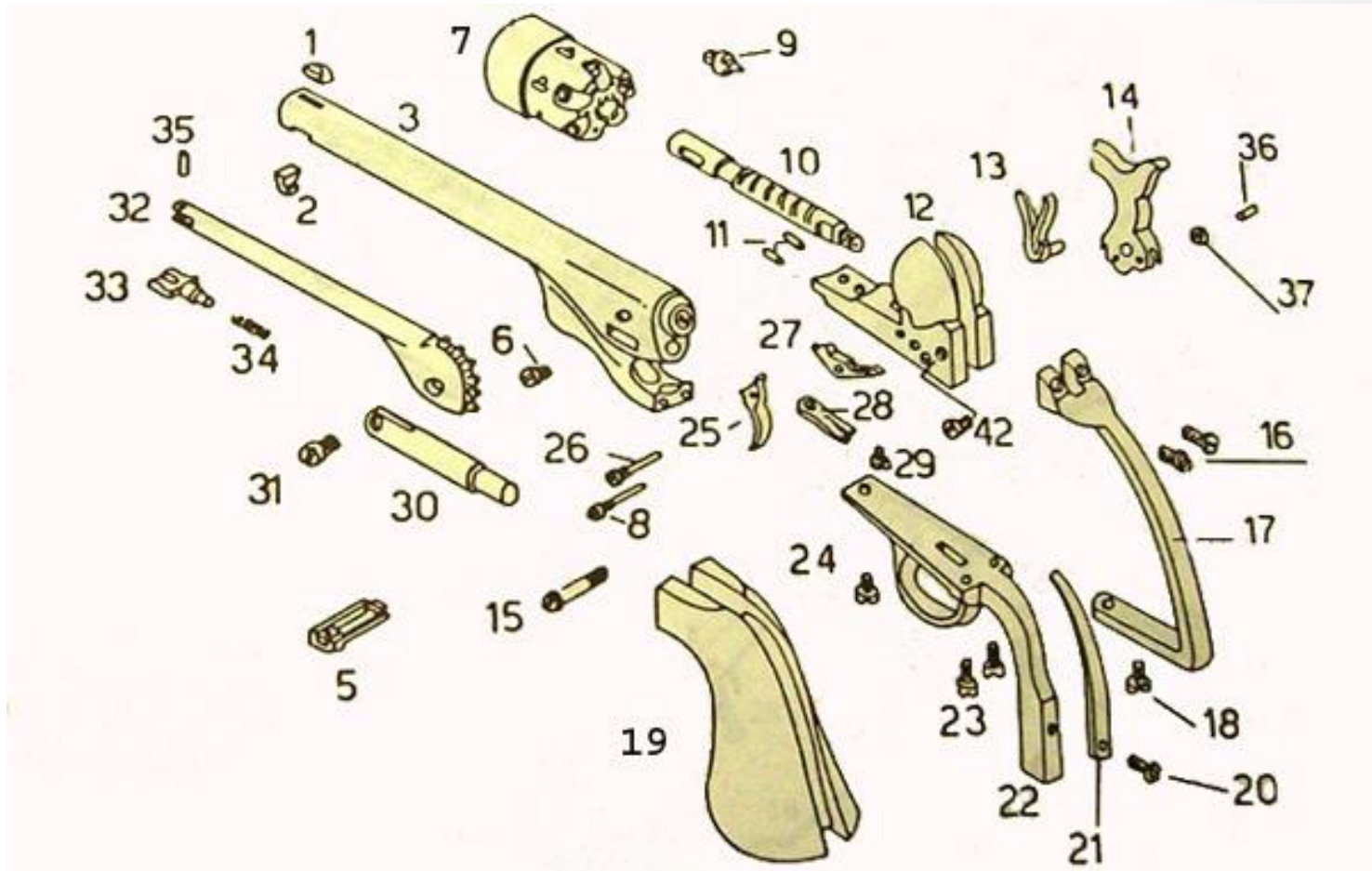
WATER FRAME



- Merchants built textile mills near rivers and streams.
- Great Britain soon built the world's most productive textile manufacturing industry.
- **Samuel Slater** smuggled the secrets of textile mill manufacturing from Great Britain to the United States.
- The textile industry arose in the Northeast, introducing the Industrial Revolution to the United States.

Manufacturing Breakthroughs

- U.S. factories needed better **technology**, or tools, to manufacture muskets.
- Inventor **Eli Whitney** developed musket factories using water-powered machinery.



- Whitney introduced the idea of **interchangeable parts**, or parts of a machine that are identical, to make musket manufacturing easier.
- Interchangeable parts sped up the process of **mass production**.

Elements of Mass Production

- Mass production techniques allow manufacturers to efficiently create more goods for the marketplace
- **Mass Production** requires the use of:
 - **Interchangeable parts** – make all parts identical
 - Machine tools – machine to make interchangeable parts
 - Division of labor – work on one item is divided among several people

Improvements during War of 1812

- Lower British prices on manufactured goods made it difficult for American manufacturing to grow.
- American manufacturing was limited to cotton goods, flour milling, weapons, and iron products.
- The War of 1812 cut off trade with Great Britain, allowing manufacturing in the United States to prosper and expand.
- Americans realized that the United States had been relying too heavily on foreign goods.

Section 2: Changes in Working Life

OVERVIEW:

Types of mill organization

Rhode Island System
Lowell System

Rise of Trade Unions

Strikes improve mill
conditions

Sarah G. Bagley -
activist

- **Rhode Island System** – Slater's strategy for hiring families and dividing factory work into simple tasks
- **Francis Cabot Lowell** - created a system for factory work that revolutionized manufacturing
- **Lowell System** – textile mills employed young unmarried women from local farms. Included loom that both spun thread AND weaved cloth in the same mill
- **Trade Unions** – groups that tried to improve pay and working conditions
- **Strikes** – workers who refuse to work until employers meet their demands
- **Sarah G. Bagley** – labor Union activist who lobbied for a 10 hour work day

Mills Change Workers' Lives

- Factory jobs usually involved simple, repetitive tasks done for low pay.
 - Could not find workers because of the simple work and the fact that other jobs were available
- The mill industry filled jobs by hiring whole families, and paying children low wages.
 - Built housing for workers and provided a company store
- Samuel Slater's strategy of hiring families and dividing factory work into simple tasks was called the **Rhode Island system.**



Lowell System

- **Francis Cabot Lowell** created a new system of mill manufacturing in 1814, called the **Lowell system**.
- The Lowell system involved
 - Employing young, unmarried women, who were housed in boardinghouses
 - Providing clean factories and free-time activities for its employees
 - Having mills that included both spinning thread and weaving in the same plant





Workers Organize to Reform Working Conditions

Deteriorating Working Conditions

- Employees worked 12-to-14 hour days in unhealthy conditions.
- Craftsmen's wages dropped in competition against cheap manufactured goods.
- Wages of factory workers dropped as they competed for jobs.

Trade Unions Formed

- Craftsmen formed **trade unions** to gain higher wages and better working conditions.
- Factory workers also formed trade unions.



- Labor unions staged protests called **strikes**, refusing to work until employers met their demands.

Labor Reform Efforts

- Millworker **Sarah G. Bagley** helped lead the union movement in Massachusetts.
- Bagley's union campaigned to reduce the 12-to 14-hour workday to a 10-hour workday.
- Union workers won some victories, as several states passed 10-hour workday laws.
- In other states the workday remained long and child labor prevailed.

Section 3: The Transportation Revolution

OVERVIEW:

Steam boats

Robert Fulton
Clearmont

Gibbons v. Ogden

interstate trade

Steam Train

Peter Cooper
Tom Thumb

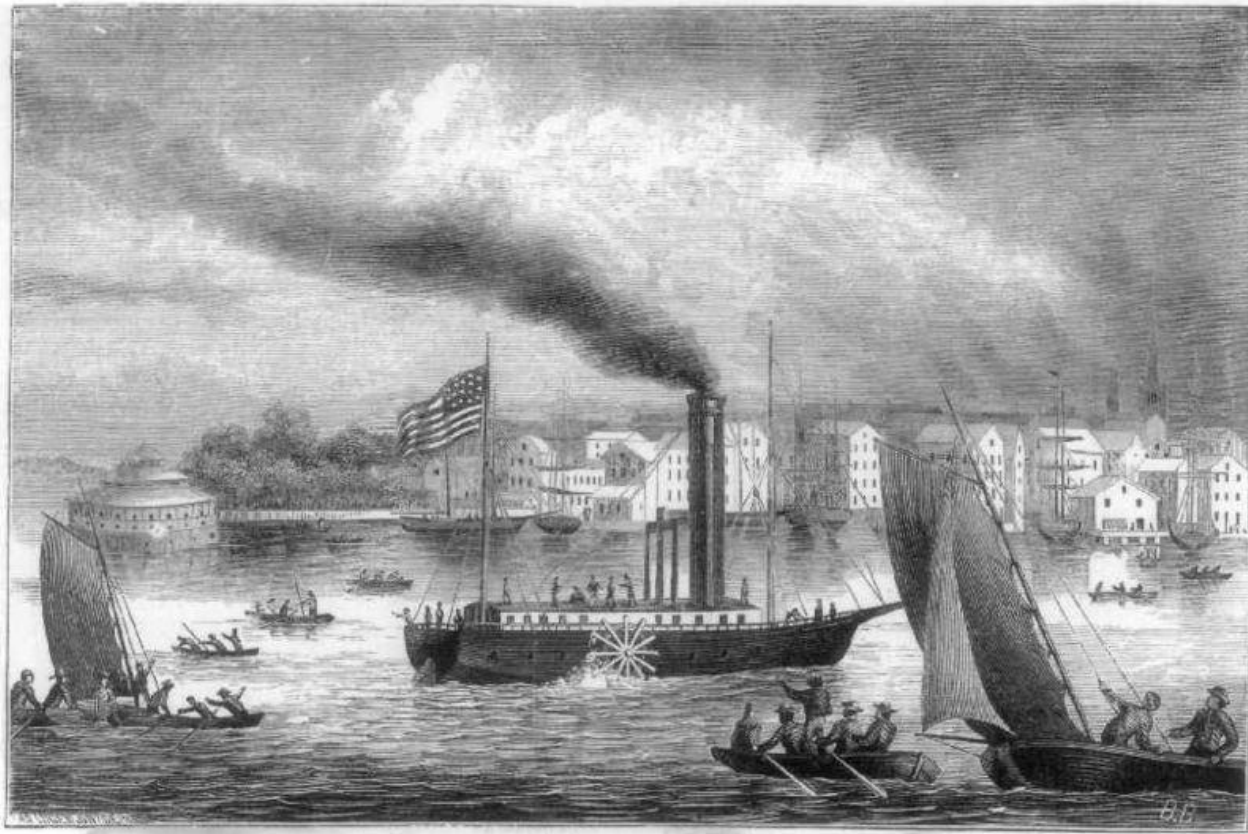
Coal, Steel & Railroads

- **Transportation Revolution** – period of rapid growth in speed and convenience of transportation
- **Robert Fulton** – designed the steamboat
- **Clermont** – first full-sized commercial steamboat
- **Gibbons v. Ogden** – ended waterway monopolies and confirmed Federal government regulation of inter-state trade
- **Peter Cooper** – built the steam-powered locomotive *Tom Thumb*

The Transportation Revolution Affects Trade and Daily Life

- The 1800s gave rise to **Transportation Revolution**: period of rapid growth in new means of transportation
- Transportation Revolution created boom in business by reducing shipping costs and time
- Two new forms of transportation were steamboat and steam-powered trains
- Goods, people, and information were able to travel rapidly and efficiently across the United States.

The Steamboat



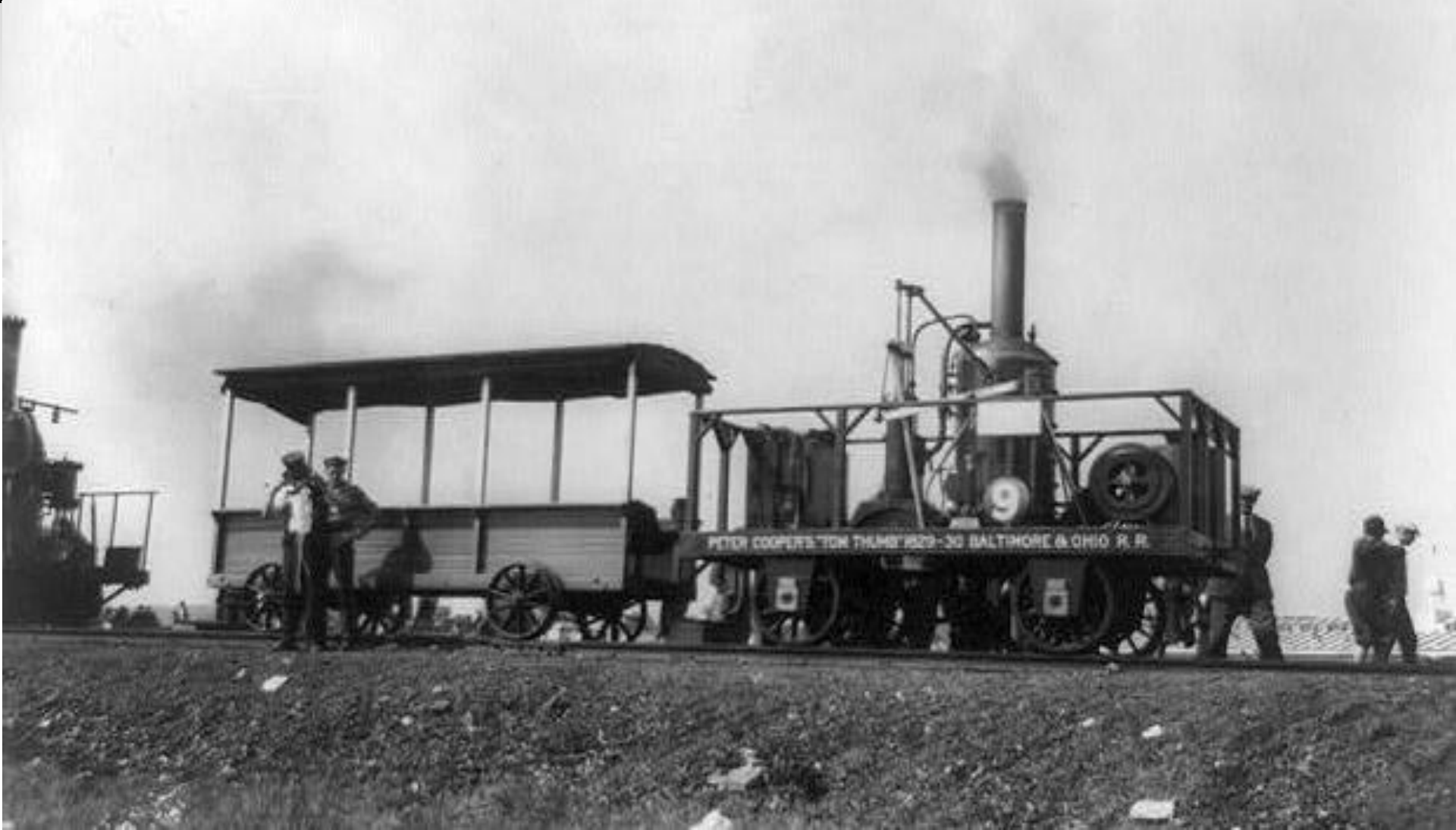
- **Robert Fulton** invented the steamboat, testing the ***Clermont*** in 1807.
- Steamboats increased trade by moving goods more quickly and more cheaply.
- More than 500 steamboats were in use by 1840.

Gibbons v. Ogden

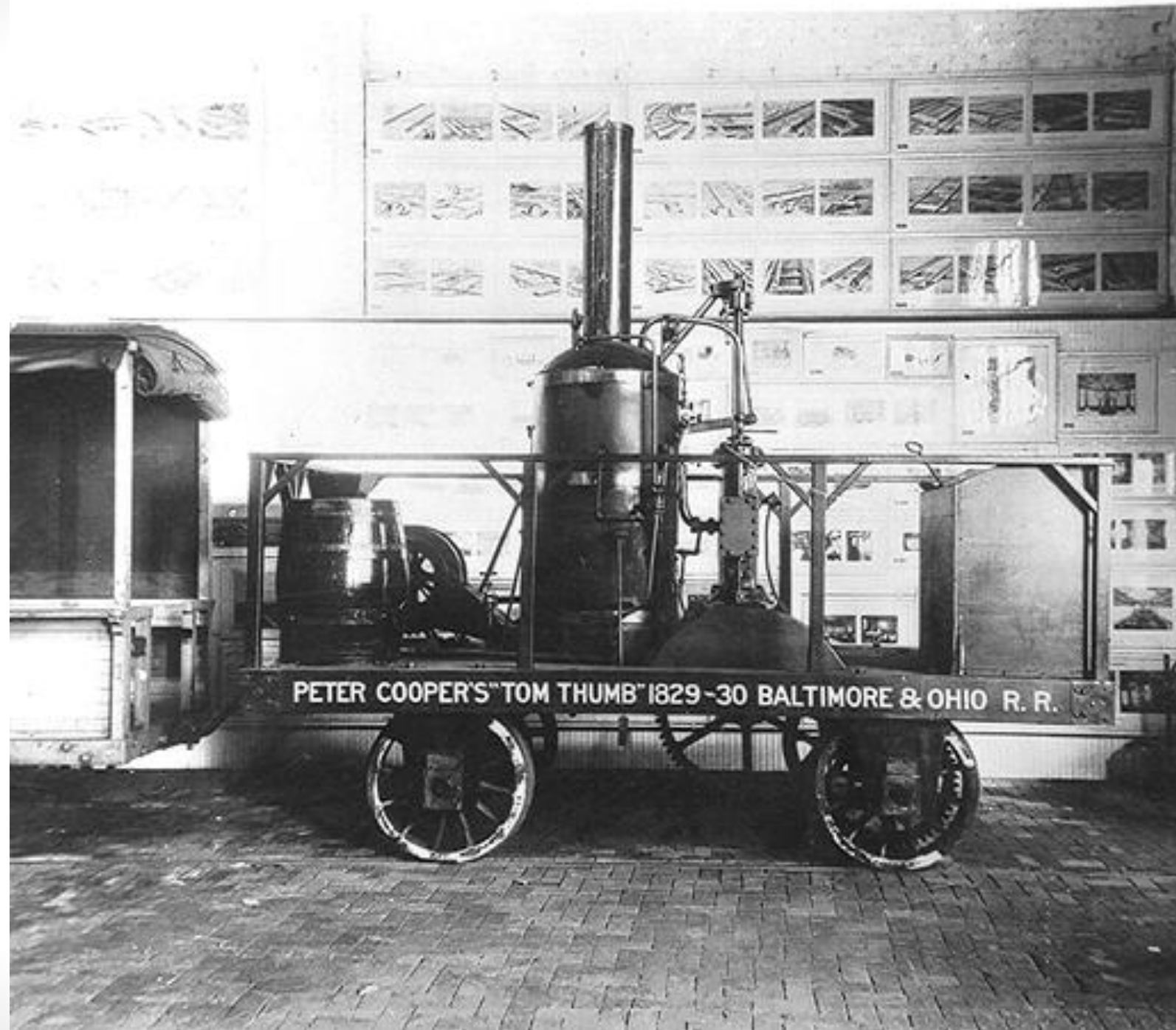
- **Gibbons v. Ogden** (1824): The Supreme Court reinforced the federal government's authority to regulate trade between states.
 - Gibbons argued that a federal license meant he could use New York waterways without another license.
 - The Supreme Court agreed with Gibbons.

Railroads

- Steam-powered trains had been developed in Great Britain, but it took 30 years for the idea to catch on in the United States.
- About 30,000 miles of railroads linked American cities by 1860.
- The U.S. economy surged as railroads moved goods cheaply to distant markets.



■ **Peter Cooper** raced his ***Tom Thumb*** locomotive against a horse in 1830, proving its power and speed despite losing because of a breakdown near the end of the race.



PETER COOPER'S 'TOM THUMB' 1829-30 BALTIMORE & OHIO R. R.

Transportation Revolution Brings Changes to Life and Industry

- People in all areas of the nation had access to products made and grown far away.
- Railroads contributed to the expansion of the nation's borders.
- Railroads helped the lumber industry grow
 - leading to large-scale deforestation.
- Cities and towns grew up along railroad tracks.
 - Chicago, which became a transportation hub.

Railroads helped create the coal industry.

- Coal replaced wood as a source of fuel as trains grew bigger.
 - Coal was less expensive
 - Burned longer & at more even temperature
- Coal, shipped cheaply on trains,
 - became the main fuel in homes
 - Helped the emerging steel industry.

Section 4: More Technological Advances

Communications

Samuel Morse' telegraph

Farm Equipment

John Deere's plow

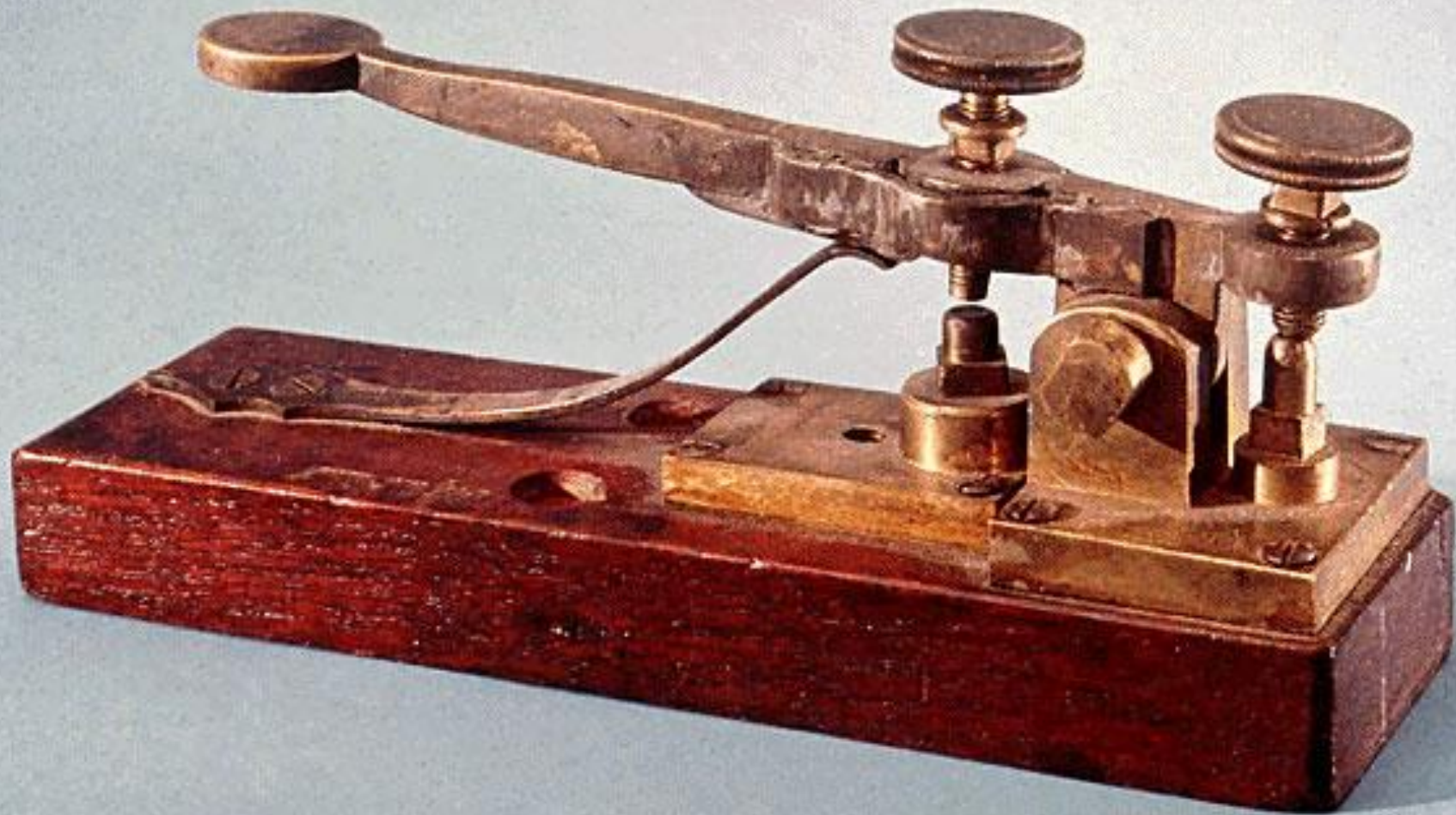
Cyrus McCormick's
harvester

Singer & the Sewing Machine

- **Samuel F. B. Morse** – invented the telegraph
- **Telegraph** – device that could send information over wires across great distances
- **Morse Code** – combinations of dots and dashes that represent each letter of the alphabet
- **John Deere** – designed the steel plow
- **Cyrus McCormick** – invented the mechanical reaper
- **Isaac Singer** – perfected the sewing machine

The Telegraph

- In 1832, **Samuel F. B. Morse** perfected the **telegraph**—a device that could send information over wires.
 - The device did not catch on until the 1844 **Democratic National Convention**, when the nomination was telegraphed to Washington.
- The telegraph grew with the railroad; the first transcontinental railroad line was completed in 1861.



International Morse Code

1. A dash is equal to three dots.
2. The space between parts of the same letter is equal to one dot.
3. The space between two letters is equal to three dots.
4. The space between two words is equal to seven dots.

A	• —
B	— • • •
C	— • — •
D	— • •
E	•
F	• • — •
G	— — •
H	• • • •
I	• •
J	• — — —
K	— • —
L	• — • •
M	— —
N	— •
O	— — —
P	• — — •
Q	— — • —
R	• — •
S	• • •
T	—

U	• • —
V	• • • —
W	• — —
X	— • • —
Y	— • — —
Z	— — • •

1	• — — — —
2	• • — — —
3	• • • — —
4	• • • • —
5	• • • • •
6	— • • • •
7	— — • • •
8	— — — • •
9	— — — — •
0	— — — — —

- A Morse associate created **Morse code** to communicate messages over the wires.
 - Morse code turned pulses of electric current into long and short clicks.
 - Clicks, also called **dots and dashes**, were arranged in patterns representing letters of the alphabet.

Shift to Steam Power

- The shift from **water power to steam power** allowed owners to build factories anywhere.
- Factories were shifted closer to cities and transportation centers.
- Cities became centers of industrial growth.

Other Devices Make Life Easier

- New inventions like John Deere's steel plow and McCormick's mechanical reaper inventions allowed farmers to plant and harvest huge crop fields, helping the country prosper.



- **John Deere** designed a **steel plow** in 1837 that replaced the less efficient iron plow.

Cyrus McCormick developed a mechanical reaper in 1831, which quickly and efficiently harvested wheat.

- McCormick used a new method to encourage sales, advertising.

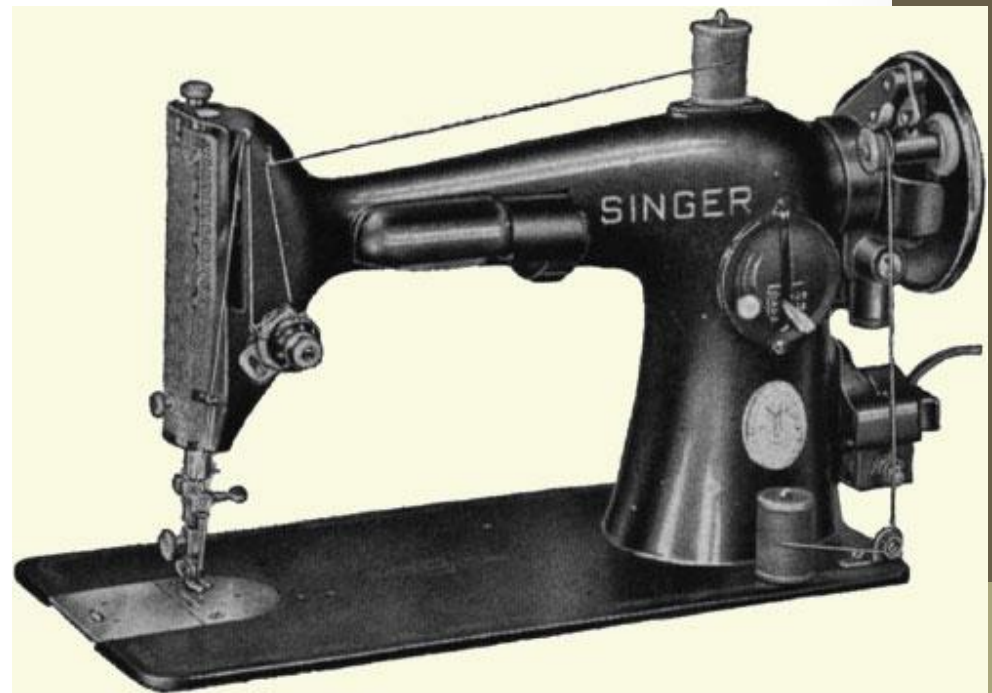


STATE HISTORICAL SOCIETY OF WISCONSIN

- He also allowed people to buy on credit and provided repairs and spare parts for his machines.

New Inventions in American Homes

- The sewing machine, invented by Elias Howe and improved by **Isaac Singer**, made home sewing easier.



- Ice boxes and iron cook stoves improved household storage and preparation of food.
- Mass-produced goods, such as clocks, matches, and safety pins, added convenience to households.