

Industrial Growth

(1865-1914)

Railroads Spur Industry



1st Telephone



Today's Telephone



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Alexander Graham Bell

Alexander Graham Bell Shows off his invention called the telephone in 1876

How has the telephone changed since Bell's creation?

In 1876 the United States celebrated its one-hundredth birthday. America held a giant exhibition showing off its industrial progress. In the past, industrial growth lagged behind the Europeans. By 1900, things would change and Americans would produce more goods than any other country in the world.

Workers celebrate the completion of the Transcontinental Railroad



Photo: National Parks Service

Completion of the world's first transcontinental railroad was celebrated here where the Central Pacific and Union Pacific Railroads met on May 10, 1869.



[Click on the picture to learn more](#)

In the Civil War railroads helped move troops and equipment to the battlefronts. It showed the importance of railroads. Most railroad lines ran only 50 miles and were not connected with each other. Trains ran on tracks of different sizes or gauges. In 1866, the railroads of the south decided to adopt the same gauge-distance between the rails of the railroad. That means that 13,000 miles of track had to be changed so all the trains can run on the same track.

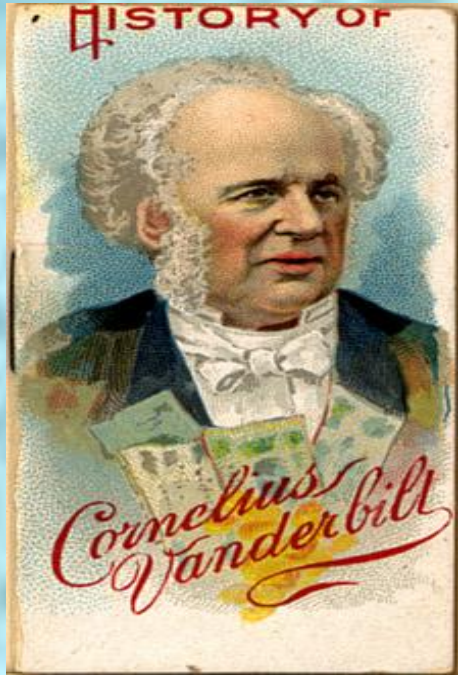
Once the tracks were all connected they formed a network or a system of connected railroad lines. Other improvements in the railroad included:

1. Railroad trains could travel faster. A six-week trip on wagon would take six days on a train.

2.Sleeping2.Sleeping and dining cars were added on trains.

3. Individual rail car brakes would avoid train car accidents.





Railroad Abuses

As railroads grew, they looked for other ways to become more efficient. Many railroad companies consolidated, or combined.

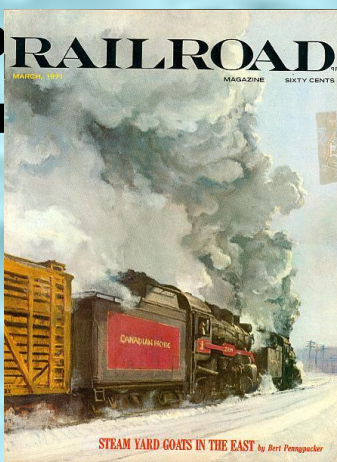
Cornelius Vanderbilt, a son of a poor farmer, earned his fortune in the steamship lines. He then began buying up railroad lines. Soon afterwards Vanderbilt bought the New York Central Railroad. Soon afterwards Vanderbilt bought the New York Central Railroad. At the time of Vanderbilt's death, he owned 4,500 miles of track and linked New York with the Great Lakes region. By the time of his death he controlled 4,500 miles of track connecting New York City and the Great Lakes Region.



Click on the mansion to
learn more

Soon there were too many railroad lines in some parts of the country. There were not enough people to use the trains so the companies could not make a profit. This created a cutthroat competition. Soon there were too many railroad lines in some parts of the country. There were not enough people to use the trains so the companies could not make a profit. This created a cutthroat competition (predatory pricing predatory pricing and heavy predatory pricing and heavy promotion predatory pricing and heavy promotion to eliminate predatory pricing and heavy promotion to eliminate or undermine their rivals) for passengers to ride railroad lines. To win business; railroads offered rebates, or discounts to their largest number of customers. They forced small railroad companies to go out of business. Cutthroat competition meant that the railroad owners would create programs to try to get people to ride their railroad lines!

So RAILROAD companies had ate, or cor bu



2 tickets to Penn Station



What is the name of this railroad station? 6

Railroad owners soon realized that cutthroat competition was hurting even larger lines. They looked for ways to end the competition. One method was pooling. In a pool, several railroad companies agreed to divide up the business in one area. They then fixed the prices at a high level.

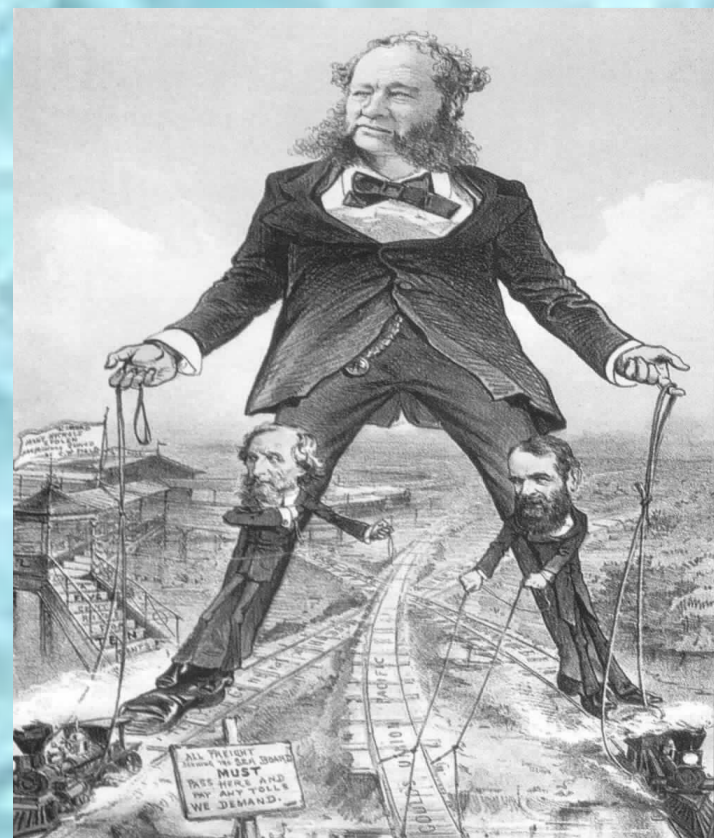


[Click on the picture to learn more](#)

Here is a political cartoon taken from a newspaper in 1879. This cartoon shows Vanderbilt towering over his railroad empire.

**Cornelius Vanderbilt once said,
*“What do I care about the law?
Hadn’t I got the power?”***

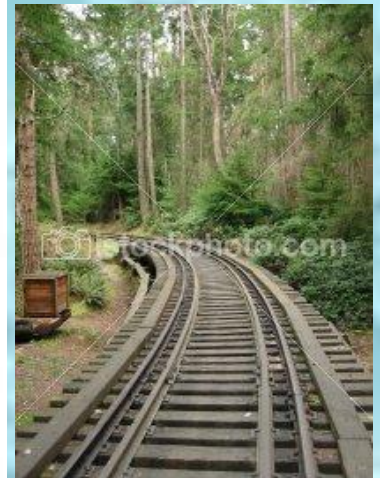
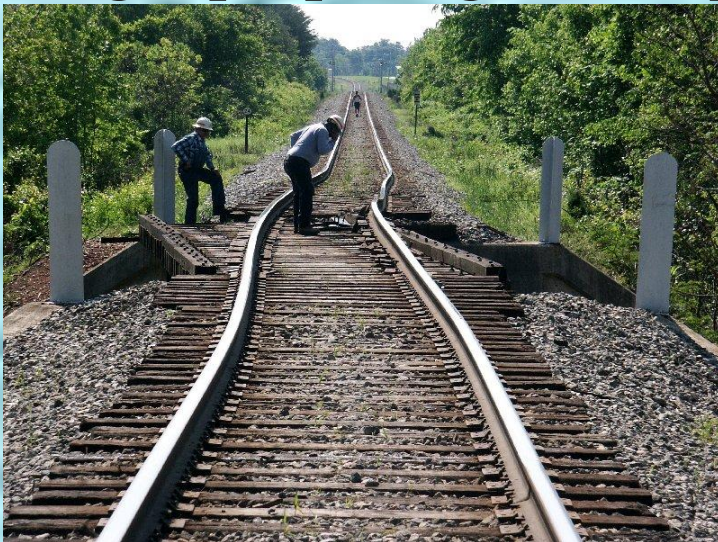
**What did Vanderbilt mean
by his statement?**



[Click on the picture to see another political cartoon](#)

Railroads Fuel the Economy

Steelworkers Steelworkers turned millions of tons of iron into steel for tracks and engines. Railroads helped the lumber industry because lumberjacks cut down whole forests to supply the wood for railroad ties. Miners sweated in mine shafts digging up coal to be used by the railroad engines. New towns grew where the railroad lines crossed. Railroads opened every corner of the country to settlement and growth. It brought people together, especially in the West.



2. The Rise of Big Business

In the late 1850's William Kelly and Henry Bessemer In the late 1850's William Kelly and Henry Bessemer discovered a new way to make steel. It was called the Bessemer Process. It enabled steel makers to produce strong steel at a very low cost. As a result railroads laid lines of steel that would not rust easily and would last a long time.





With this development of the Bessemer process, steel mills With this development of the Bessemer process, steel mills sprang up all over the country. Pittsburgh became the steel capital of ~~The steel~~ the country. The steel mills brought jobs and prosperity to Pittsburgh. It also brought thick black smoke that covered the land called soot. The steel production made the rivers turn yellow from the pollution.

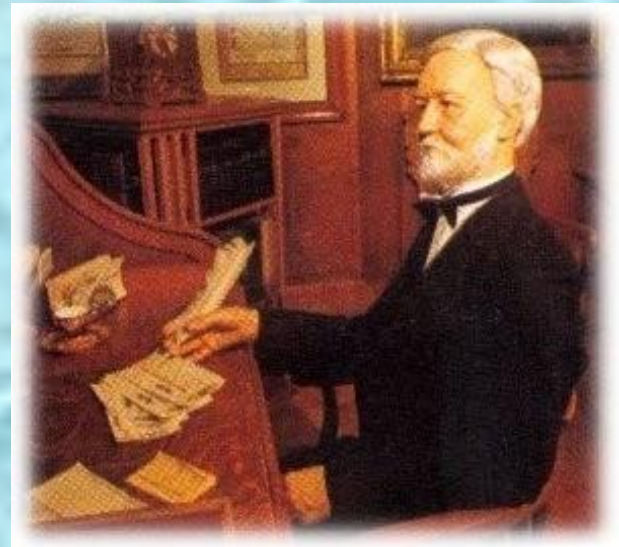
Click on the picture to learn more



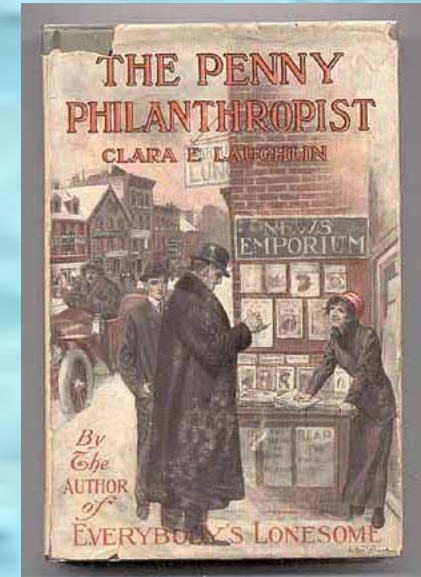
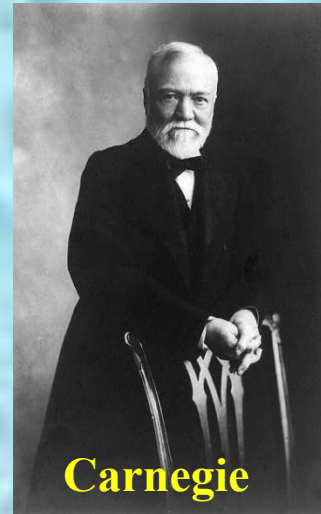
With this development, steel mills sprang up all over the country. Pittsburgh became the steel capital of the country. The steel mills brought jobs and prosperity to Pittsburgh. It also brought thick black smoke that covered the land called soot.

Andrew Carnegie made his fortune in the steel industry. In the 1870's he became familiar with the **Bessemer Process**. After borrowing money he built a steel mill in his hometown in Pennsylvania. Within a short time, Carnegie was earning huge profits from his steel mill.

With the money he made, or profits, he bought out the rival iron mines, which provided the iron to make **steel**. He improved the process of turning raw materials into steel. This process of changing raw materials into a finished product is known as, **vertical integration**.



Carnegie also bought out steamship lines and warehouses. Soon Carnegie controlled all the steamship lines and warehouses. By 1900, Carnegie produced more steel than any country in the world.



Carnegie was a [philanthropist](#); he believed the rich had the duty to improve society so he gave \$60 million dollars to build public libraries. He donated millions of dollars to other charities.



Madame C.J. Walker was also a great philanthropist. Click on the picture of her to learn more.

Many people considered Carnegie a [Robber Baron](#). A Robber Baron was a person that became rich through an unethical means.

As railroads enabled big factories to produce items cheaper, many small local factories closed. When many local factories closed, big factories increased their products or output.

Companies such as Montgomery Ward As railroads enabled big factories to produce items cheaper, many small local factories closed. When many local factories closed, big

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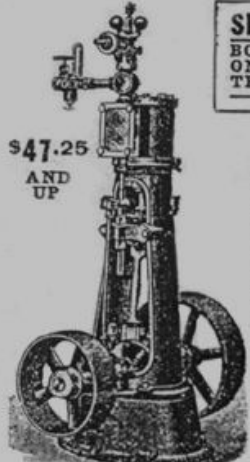
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STEAM ENGINES

SPECIAL NOTE WHEN YOU ORDER A VERTICAL ENGINE AND A BOILER TOGETHER THEY WILL BE MOUNTED ON SEPARATE BASES UNLESS YOU TELL US THAT YOU WANT THEM MOUNTED ON A COMBINED BASE.

Kenwood Vertical Steam Engines.

These engines are of the center crank type with throttling governor, perfect in design, thoroughly well built and of the best of materials. They are low and compact, combining great strength and rigidity, are nicely finished and handsomely painted. Every point which could add to the strength and durability of the engine has been carefully considered and adopted. They are the best plain side valve vertical steam engines which can be built, are up to date in every particular and give perfect satisfaction to every user. We guarantee that they will give you equality as perfect satisfaction, or they can be returned at our expense, and we will promptly return your money. These engines are sold under our regular free trial terms, excepting that we allow thirty days' trial on them instead of ten days. Each engine is furnished with governor, governor belt, governor pulley, oil cups, throttle valve, cylinder lubricator, belt pulley and fly wheel, and is complete, ready to start. Steam and exhaust pipe is not furnished unless a boiler is ordered with the engine, and foundation bolts or rods are not furnished by us under any circumstances. Shipped from factory in Southwestern Michigan.



\$47.25 AND UP

Catalogue Number	Horse Power	Size of Cylinder, inches	Diameter of Shaft, inches	Size of Fly Wheel, inches	Size of Belt Pulley, inches	Steam Pipe, inches	Exhaust Pipe, inches	Revolutions, Per Minute	Weight in Pounds	Price
32K4801	1 1/2	4x3 1/2	1 1/4	13x3 1/2	6x3	1/2	1/2	400	250	\$ 47.25
32K4802	2	4x4	1 1/2	16x4 1/2	10x4	1/2	1/2	350	325	59.50
32K4803	4	5x4 1/2	2	18x4 1/2	12x4 1/2	1	1	350	350	65.75
32K4804	4	5x5	2	17x4 1/2	12x4 1/2	1	1	325	300	75.90
32K4805	5	5x6 1/2	2 1/4	20x6	14x6 1/2	1 1/2	1 1/2	250	750	99.50
32K4806	6	6x6	2 1/2	24x6	16x7	1 1/2	1 1/2	200	1250	116.75
32K4808	8	6x8	3	26x6 1/2	18x6	1 1/2	1 1/2	200	1500	138.00

NOTE OUR REDUCED PRICES

Many expanding businesses became corporations. A corporation is a business that is owned by investors. A corporation sells stock, or shares in the business to investors, who are known as stockholders. A corporation is a business that is owned by investors. A corporation sells stock, or shares in the business to investors, who are known as stockholders to build a new factory or buy new machines. In return for their investment, stockholders hope to receive dividends, or the corporation's profit.



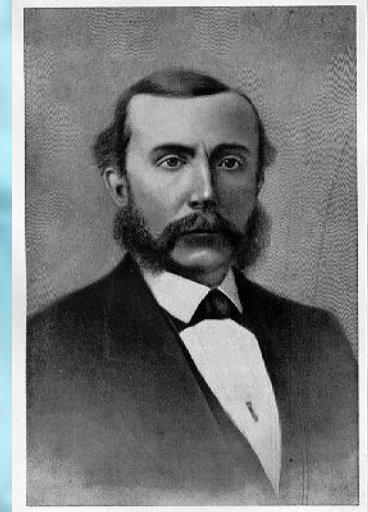
[The stock market](#)

Oil Boom

In 1859, Americans discovered a valuable resource called oil in Pennsylvania. This product called oil could be used to power railroad trains and machines.

At the age of 23, David D. Rockefeller purchased his first oil refinery. He used his profits to buy other oil refineries. In 1865, Rockefeller purchased a company called the Standard Oil Company.

His company dominated the oil industry. He lowered his prices on oil to drive other oil companies out of business. When he drove other oil companies out of the business he created a monopoly. A monopoly is a company that controls all or nearly all the business of an industry.



Many Americans argued that the great leaders of giant corporations were abusing the free enterprise system. In a free enterprise system, businesses are owned by private citizens. Congress answered this argument by passing the Sherman Antitrust Act. The Sherman Antitrust Act banned the creation of a monopoly. The act did not work.



3. Inventions That Changed the Nation

The Patent Office had never seen a year like 1897. Averages of nearly 60 patents, or licenses for new inventions, were being generated every day. The United States had become the land of invention. These inventions made life easier in American homes. There were inventions and improvements in every area. Some of the inventions were:

A shoe-making machine invented by Jan Matzeliger

A device for refining oil invented by Elijah McCoy

An air brake for railroad engines invented by Granville Wood



Speeding up Communication

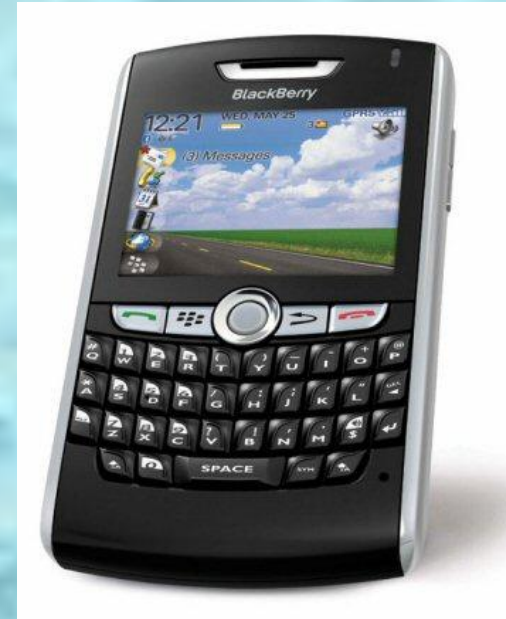


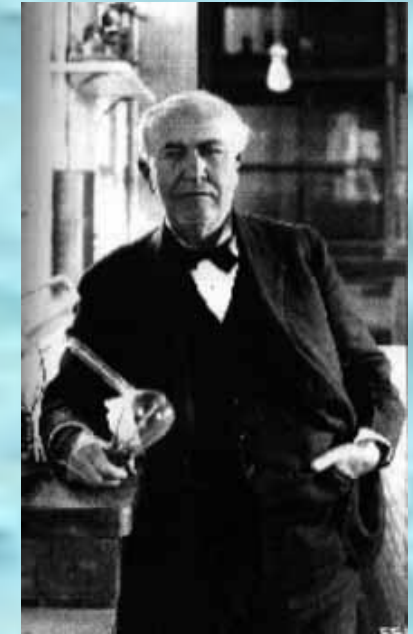
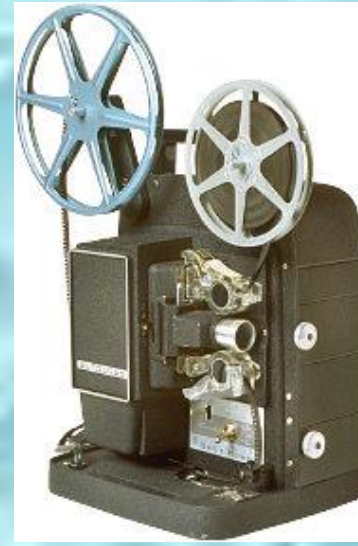
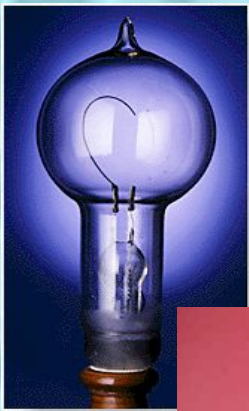
Better communication was important to American businesses. The [telegraph](#) Better communication was important to American businesses. The telegraph helped quicken communication. [Samuel Morse](#) Better communication was important to American businesses. The telegraph helped quicken communication. Samuel Morse invented the telegraph. Morse's invention speeded up communication in the United States. It took weeks to get a message to Europe to arrive by boat. In 1858, [Cyrus Field](#) completed the layout for an underwater telegraph cable across the Atlantic Ocean. It wasn't until 1866, that the cable was completed and the first message was sent to Europe.

The

Telephone

In 1876, [Alexander Graham Bell](#) In 1876, Alexander Graham Bell, a teacher of the deaf, invented the first [telephone](#) In 1876, Alexander Graham Bell, a teacher of the deaf, invented the first telephone. Bell started the company called the [Bell Telephone Company](#) and made millions with his invention of the telephone. People no longer had to go to a telegraph office

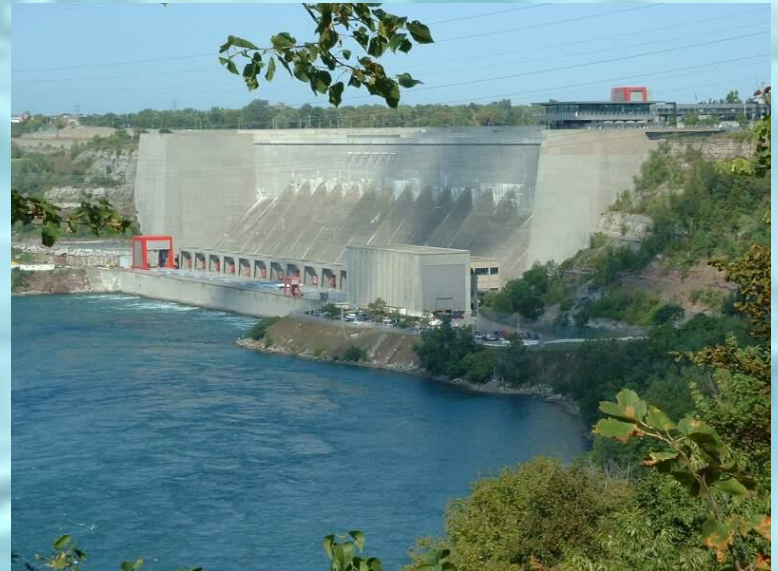
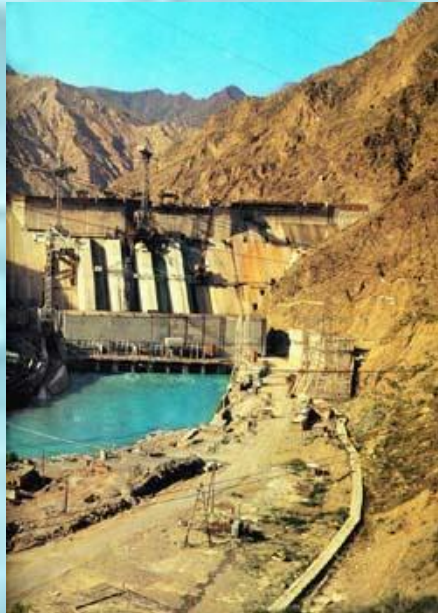




Electric Power

In 1876, Thomas Edison In 1876, Thomas Edison opened a laboratory in New Jersey. Edison has a new approach to inventing. He turned inventing into a system. He had teams of people refine his ideas and come up with an invention. Thomas Edison invented the light bulb, In 1876, Thomas Edison opened a laboratory in New Jersey. Edison has a new approach

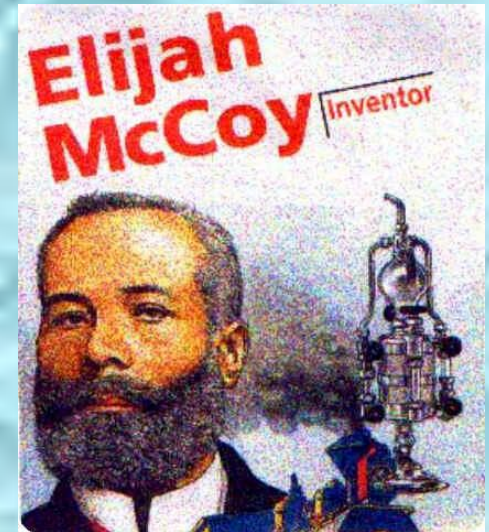
One of Edison's most important inventions was the creation of and electric power plant in 1882. Within a year Edison's invention was supplying electric power to homes and more power plants were built. Steam powered engines were soon replaced with safer electric motors.



African American Inventors

Many African Americans contributed to the flood of inventions.

Elijah McCoy created a special device that oiled engines automatically in 1872. This device was widely used on railroad engines.



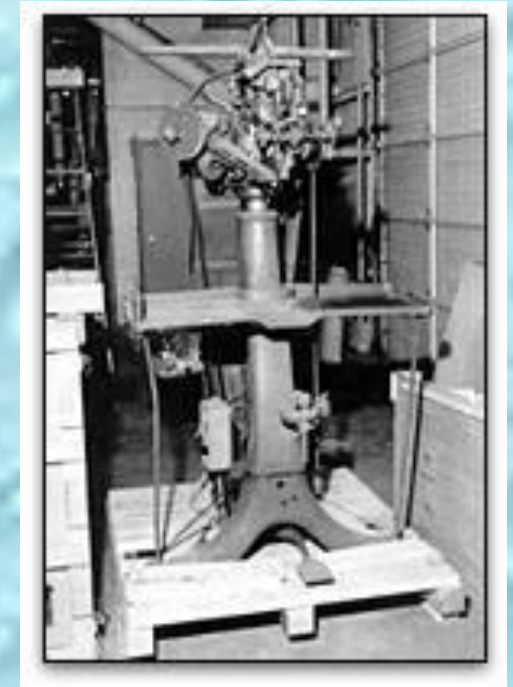
Granville T. Woods found a way to send telegraph messages between moving trains.



GRANVILLE T. WOODS.



Jan Matzeler Jan Matzeler invented a machine that made shoes by machine. When an inventor created a new invention he registered it with the American government so no one else could create the same machine. This was called a **patent**.



Because of racial prejudice Because of racial prejudice, many African Americans had trouble getting patents for their inventions. When an inventor created a new invention he registered it with the American government so no one else could create the same machine. This was called a patent.



Other inventions were created for everyday use. Here are a few of them:

Christopher Sholes Christopher Sholes perfected the typewriter in 1868.

George Eastman George Eastman invented the lightweight Kodak Camera in 1888.

Gustavus Swift Gustavus Swift introduced refrigeration to the meat industry in the 1880's. As a result meat could be shipped across the country. Americans now



The Automobile

No single person invented the [automobile](#). Europeans produced motorized vehicles as easily back as the 1860's. Americans began building cars in the 1890's. However, only the wealthy could afford them.

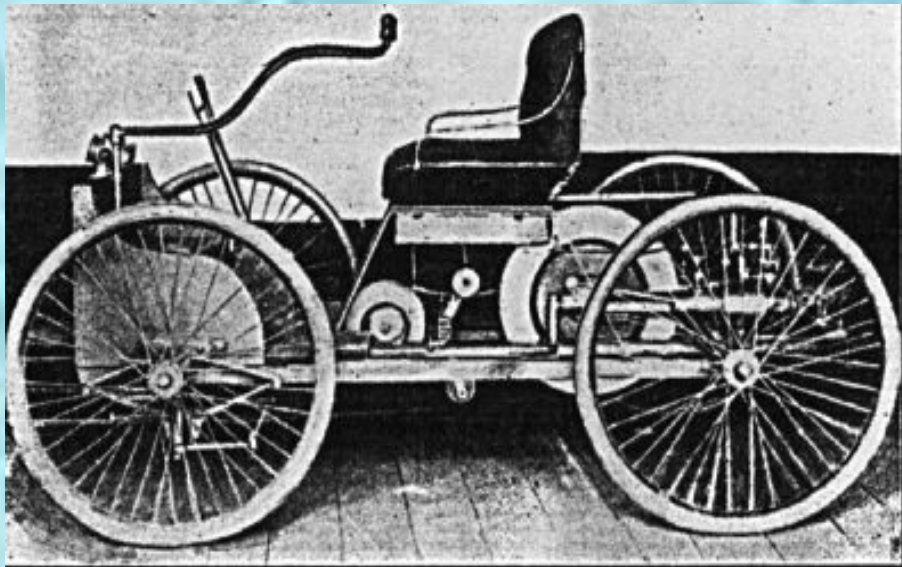
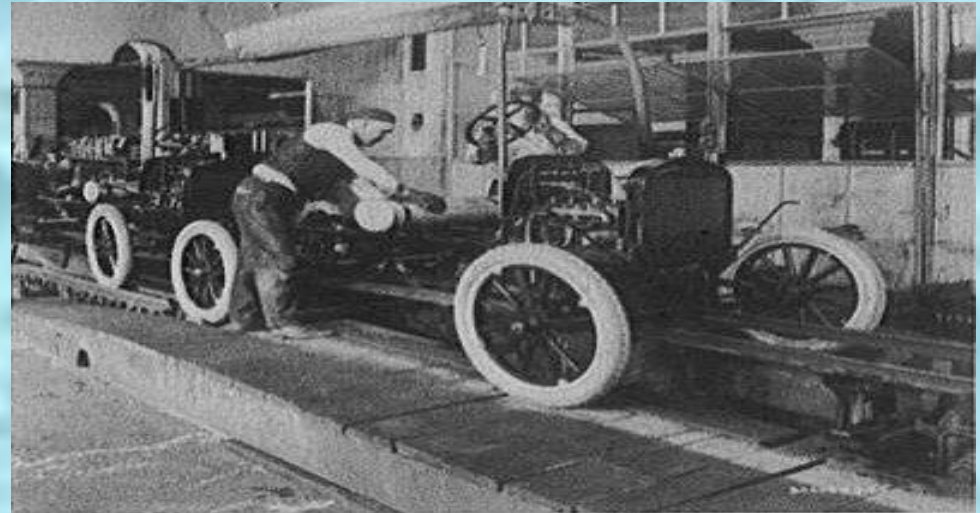
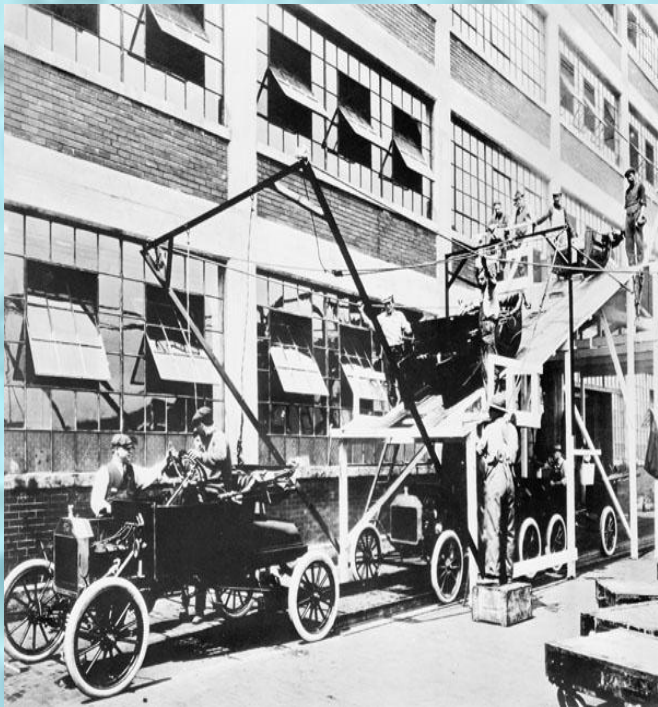


PHOTO COURTESY OF KETTERING/GMI ALUMNI FOUNDATION, COLLECTION OF INDUSTRIAL HISTORY

Henry Ford Henry Ford revolutionized auto making. He wanted to build an automobile that **everyone** could afford. In 1913 he introduced the **assembly line**. On the assembly line car frames edged along a moving belt. Workers added the parts as the cars passed by. Soon other industries adopted his idea.



Henry Ford's assembly line allowed the **mass production of cars. Mass production means making large quantities of a product quickly and cheaply. Because of mass production, Ford could sell his cars at a lower price than the other automakers could.**

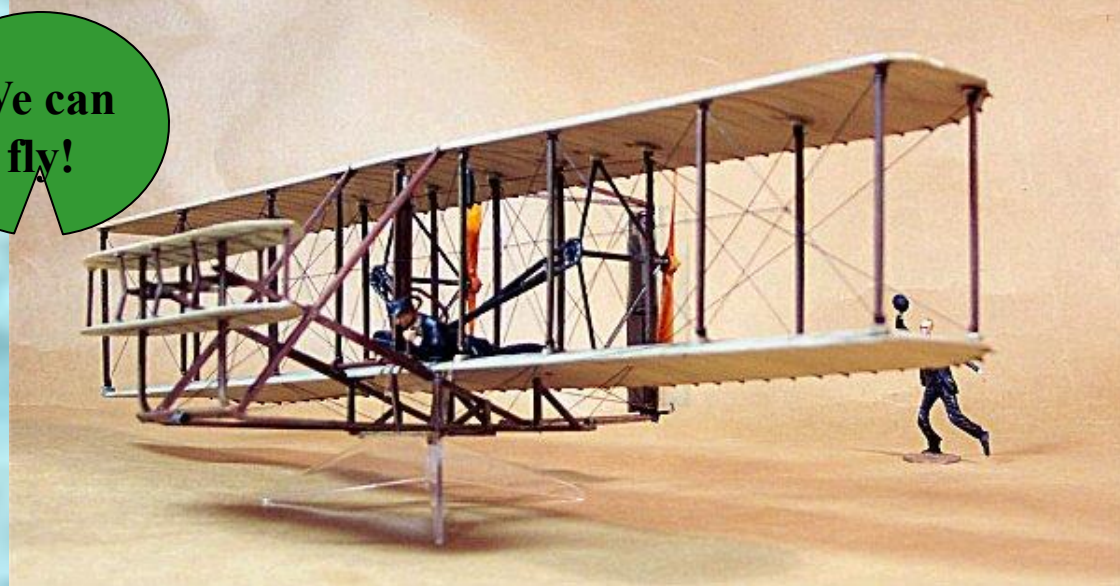
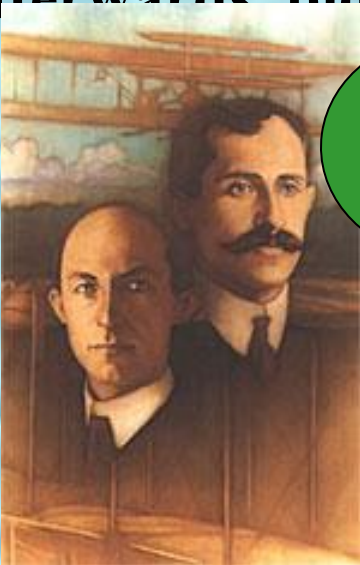


Cars became very popular. Slowly attitudes changed and “**horseless carriages**” or cars were accepted by the American people. In 1900, only 8,000 Americans owned cars. By 1917, more than 4.5 million autos were chugging along American roads.

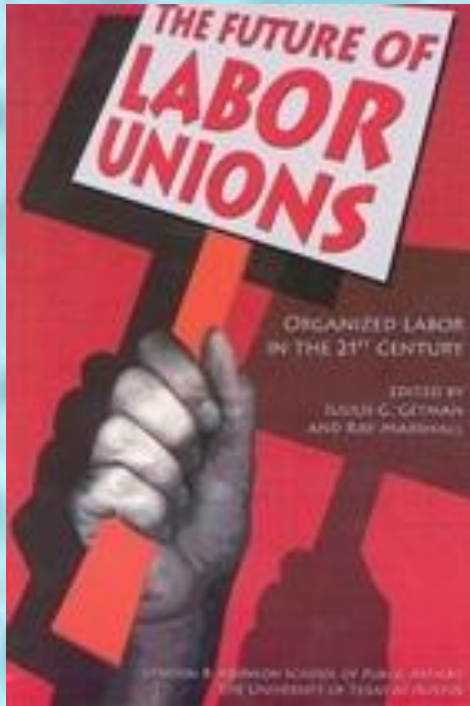


The Airplane

In Ohio, two bicycle mechanics, [Orville and Wilbur Wright](#) In Ohio, two bicycle mechanics, Orville and Wilbur Wright were experimenting with another new method of transportation, flying. The Wright brothers tested hundreds of designs. Finally, on December 17, 1903, they were ready to test their first “flying machine.” At [Kitty Hawk](#), North Carolina a plane powered by a small engine stayed in the air for 12 seconds and 120 feet. Soon afterwards pioneers built better planes and made longer flights.



4. The Rise of Organized Labor



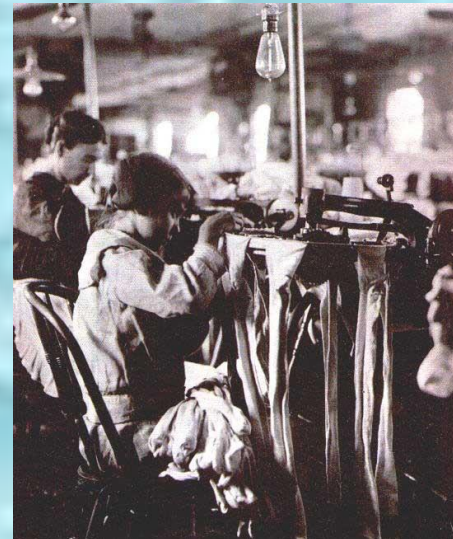
The factories of 1800 drew workers from many different backgrounds. Millions of immigrants coming to the United States from Europe and Asia in the late 1800's also found job and factories. During the 1870's to 1880's, the friendly relationship between the worker and boss declined. In giant factories workers did not chat with their employers.

African American, immigrants, women, and children were paid less than native-born white men were.

Factories were filled with dangerous conditions. Owners spent little time to improve the safety and comfort of workers. Some workers were killed or seriously injured on their jobs in factories. Here are some of the problems workers faced:

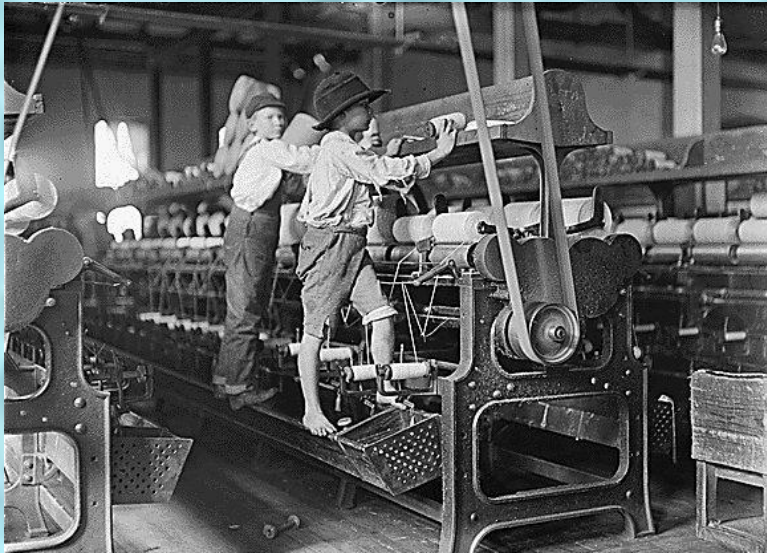
- **Textile workers inhaled dangerous lung-damaging dust and fibers.**
- **Coal miners had “cave ins” that buried workers.**
- **Steelworkers were injured by red-hot vats of steel.**

I would rather be in school



In 1900, two million children under the age of 15 worked throughout the country. Many factory owners hired children to work for lower wages, or pay.

Children did many hazardous jobs. They worked in textile mills, coalmines, tobacco factories, and garment workshops. Working children could not attend school.



Workers organize

Low wages, long hours, and unsafe and unhealthy conditions threatened a worker's well being. Workers tried to band together to win better conditions. In 1869, workers formed a union called the [Knights of Labor](#). They held secret meetings because employers fired workers that met and joined unions. In 1879, the union let women, blacks, immigrants, and unskilled workers join the union. The goals of the Knights of Labor included a shorter workday, an end to child labor, and equal pay for women and men.

There were a number of riots against the McCormick Harvester Company for their terrible conditions against workers. The Knights of Labor did not believe in strikes. On May 3, in a riot, police killed 4 people. The next day in protest, a bomb exploded killing a police officer. Police then shot bullets into a crowd and killed 10 more people. Membership in the Knights of Labor dropped sharply because of these incidents.

American Federation of Labor (AFL)

The Knights of Labor failed in trying to help workers, but this did not stop the labor movement. In 1886, Samuel Gompers The Knights of Labor failed in trying to help workers, but this did not stop the labor movement. In 1886, Samuel Gompers formed a new union called The American Federation of Labor.

Workers did not join the AFL directly. You first had to have your own union. The AFL stressed higher wages, shorter hours, and improved working conditions for members. The AFL used strikes to achieve its goals.

The AFL collected money from its member unions. Some of the money they collected provided for the families that went on strike. They were provided with paid so they could buy food.

The AFL's practical approach was very successful. In 1886 it was the most powerful union. In their first year they had 150,000 members. **African Americans, immigrants, and unskilled workers were not allowed to join the AFL.**



The Pullman Strike

Starting in the 1870's many workers went on strike. Owner felt free to crush unions in any way they could. The biggest strike was called the Pullman Strike. In 1894 George Pullman cut workers pay at his railroad factory. He did not lower rents for people paid for company owned houses.

Workers walked off the job in protest. The federal judge issued an **injunction** to the workers walking off the job. An injunction is a court order to do something. Leaders of the Pullman Strike were jailed for violating the injunction.

