

Skyscrapers, Elevators, and Escalators

As cities flourished, land became expensive to buy. The solution was to build up, but there were problems with tall buildings: People could not walk up too many stairs, and the weight of the materials was too much to support. So builders could not build more than sixteen stories.

William Jenney (1832-1907) solved the weight problem by inventing very strong cast-iron columns and beams. He is called the "father of the skyscraper." His first **skyscraper** was completed in 1885 and was ten stories high. It had a steel frame that could support its height and the weight of the stone walls. The most famous skyscraper, even though it is no longer the tallest, is the Empire State Building in New York City. It was finished in 1931 and has 102 floors.

Early **elevators** were very dangerous: if the cable broke, the car went crashing to the ground. In 1854, Elisha Otis (1811-1861) invented a safer elevator. His elevator had an automatic safety device. The car moved

between guide rails that had metal levers (or claws) to spring out and stop the car if the cable broke. In 1857, the first public elevator began operating in New York City. It was steam-powered, could hold six people, and moved at forty feet per minute. Modern elevators travel at 1,700 feet per minute!

Siemens Brothers made the first electric elevator in 1880. It had a passenger car that was pulled up and down by steel cables that looped around a pulley attached to a motor. This was the beginning of the modern elevator.

The **escalator** was invented by Jesse Reno in 1891. It was a sloped walkway that moved and had a grooved tread so passengers would not slip. Next, George Wheeler designed an escalator with folding steps. Otis Elevator Company showed the escalator in 1900 at the Paris Exhibition and added the grooved tread, which is the escalator used today.

Exercise:

1. Why were early elevators dangerous? _____

2. How are elevators helpful? _____

3. What modern invention did elevators help make possible? _____

4. Who is the "father of the skyscraper" and why? _____

