

Air Conditioning

A short illustrated history of the machine that changed indoor life.



A printing problem. A humidity breakthrough.
A loop that moves heat.

Inside: the 1902 turning point, a labeled cooling cycle,
a short timeline and sources to keep exploring.

The problem was more than heat.

BROOKLYN, NEW YORK / 1902

At the Sackett-Wilhelms printing plant, changing humidity changed the dimensions of paper. When a sheet shifted between passes through the press, its colored impressions could fall out of alignment. A comfortable worker was not the only goal: a dependable product needed dependable air. [1]



Misaligned colors



Aligned colors

Schematic: changing paper dimensions can shift registration.

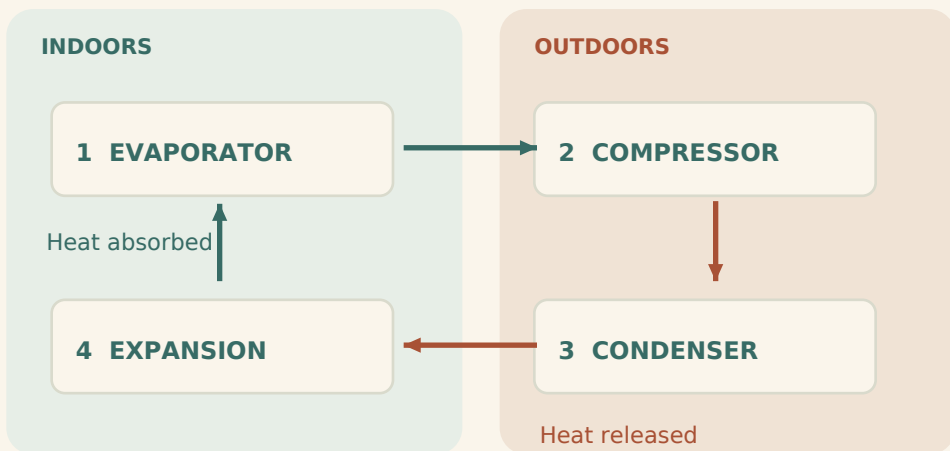
Willis Carrier, working for Buffalo Forge, developed a 1902 system that cooled air and removed moisture. It became an important milestone in modern air conditioning. That does not make 1902 the beginning of every kind of cooling. [1]

Long before it, people used building design, moving air and stored ice. Mechanical refrigeration also had earlier pioneers. In 1834 Jacob Perkins patented a closed vapor-compression system; John Hague demonstrated a machine in 1835. [2]

The distinction to keep: cooling, refrigerating and controlling the condition of air have connected histories, with many contributors.

It moves heat.

A simplified vapor-compression cycle in cooling mode. The refrigerant travels in a sealed loop; room air does not flow through the outdoor coil. [3]



1. Absorb. At the indoor coil, refrigerant evaporates while taking in heat from room air.
2. Compress. The compressor uses energy to raise the vapor's pressure and temperature.
3. Release. At the outdoor coil, hot refrigerant releases heat and condenses into liquid.
4. Expand. The expansion device lowers pressure; the cold mixture returns to the indoor coil.

Heat released outside = heat removed inside + energy used by the compressor. The outside unit must dispose of both.

Three stops in a much longer story.

1834 / 1835**A cycle takes physical form**

Perkins patents a closed vapor-compression system; Hague demonstrates it the following year. [2]

1902**Control the air, steady the paper**

Carrier tackles a printing plant's humidity problem, an important modern-AC milestone. [1]

1925**Comfort reaches the cinema**

New York's Rivoli Theatre installs Carrier air conditioning, an example of cooling spreading into public life. [4]

One question to test your understanding

Why does the outdoor unit release more heat than the room loses?
Because it also releases the energy used by the compressor.

Sources & further reading

1. ASME - Willis Haviland Carrier
2. ASME - The Perkins Vapor-Compression Cycle
3. U.S. DOE - Home Cooling 101 / cycle analysis
4. Carrier - How Air Conditioning Changed the World

Sources checked 25 October 2026. This is a selected overview, not an exhaustive invention chronology. Illustrations are original interpretive artwork from the episode; the diagram is schematic. Free for personal reading and sharing unchanged with credit.

Watch the Air Conditioning episode on YouTube