Westinghouse Brakes
The Problem: Rapidly and reliably stopping trains

Source: https://i.redd.it/g29ydt199mtx.jpg
Westinghouse’s first air brake (1869)
Imperfections

• Slow transfer of air pressure to the rearward cars in long trains substantially increased the time necessary to stop the trains
• A break in the chain of couplings between the cars would make it impossible to set the brakes on any of the cars
Auxiliary reservoir

Source: http://www.robinsonlibrary.com/technology/railroad/equipment/airbrake.htm
Block Diagram of Basic Air Brake Equipment

Locomotive

- Equalising Reservoir
- Driver's Brake Valve
- Main Reservoir
- Compressor

Train car

- Angle Cock
- Brake Pipe
- Hose
- Coupled Hoses Between Vehicles

- Auxiliary Reservoir
- Triple Valve
- Brake Cylinder
- Wheel
- Brake Block
Schematic Diagram of Air Brake System on Vehicle in Release Position
Schematic Diagram of Air Brake System on Vehicle in Application Position
Schematic Diagram of Air Brake System on Vehicle in Lap Position
Both Westinghouse and Boyden develop improvements designed to redirect some of the air from the brake pipe to the auxiliary reservoir in an emergency.
Source: “Train Accident Art,”
https://fineartamerica.com/art/train+accident?page=2
Westinghouse Quick-action Triple Valve is a photograph by Sheila Terry which was uploaded on May 11th, 2013.