Course Building Construction
Section: Plumbing

James Rumsey Technical Institute

How a Water Hammer Arrestor Works

What You Will Do

Learn what water hammer is, how it works, and why plumbers install them in homes.

Materials You Will Need

- Plastic bottle with cap
- Drinking straw or flexible tubing
- Water
- Bowl or sink
- Tape
- Spoon

What Is Water Hammer?

Water hammer is the banging or thumping sound that can happen when flowing water suddenly stops. Moving water inside pipes suddenly stops and creates a pressure shock wave.

Example:
Washing machine valve closes quickly
Dishwasher shuts off
Faucet closes fast

A hammer arrestor is a small plumbing device containing an air cushion or sealed chamber that absorbs the shock when water suddenly stops.

It helps:

- Reduce banging noises
- Protect pipes
- Protect valves/appliances
- Reduce vibration

Important Concepts

- **Momentum –** Moving water wants to keep moving.
- **Pressure Shock –** Sudden stop creates a force wave.
- **Cushioning –** Air chamber compresses and absorbs force.

Step 1: Understand Moving Water

1. Fill bottle halfway with water.
2. Quickly stop and shake it.
3. Feel the water slam forward inside.

That sudden movement is similar to water hammer in pipes.

Step 2: Build a Simple Arrestor Model

1. Put straw through cap opening (or tape straw to bottle opening).
2. Keep some air trapped in bottle above water.
3. Seal loosely enough to demonstrate movement.

Now shake again and notice the trapped air cushions movement.

Step 3: Compare Two Systems

Bottle A:

Filled almost completely with water

Bottle B:

Part water, part trapped air

Shake both quickly.

Which one feels harsher?

Usually the trapped air model softens the shock.

Step 4: Fast Valve Demonstration

1. Run water from faucet into a cup.
2. Shut it off quickly.

Imagine water rushing through pipes and suddenly stopping.

That pressure wave can cause noise.

Where Arrestors Are Commonly Used

- Washing machines
- Dishwashers
- Ice makers
- Quick-closing valves
- Commercial plumbing systems

Reflection Questions

- Why does moving water create force when stopped quickly?
- Why does trapped air reduce shock?
- Why might pipes bang more in older homes?
- Why would appliances need hammer arrestors?