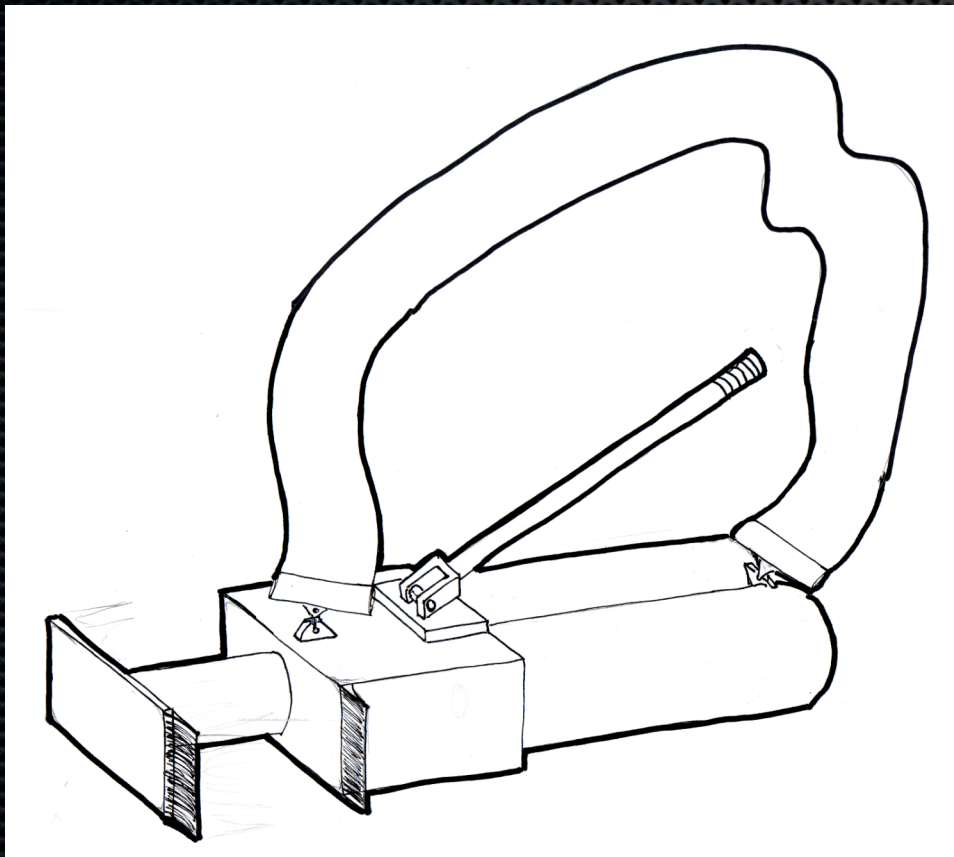


Automatic Battering Ram



Pink A

Market

Number of fire stations in U.S

–50,000

Estimated cost of traditional battering ram

–\$300

Total market

–\$15 million

Video: Problem

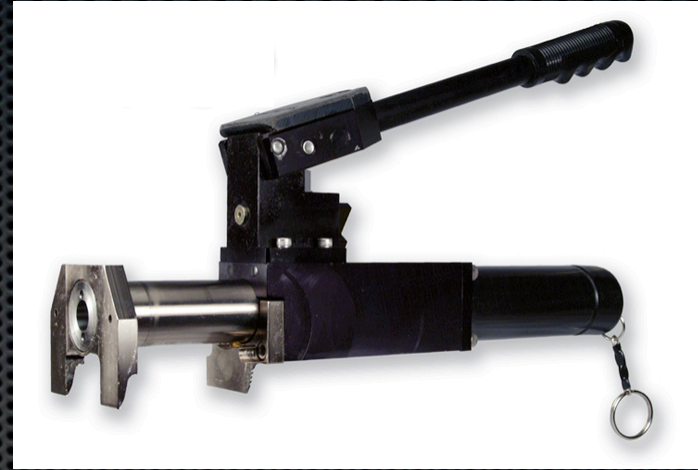


Created with Flip4Mac WMV Demo
www.Flip4Mac.com

Benchmarking



Halligan Bar



Hydra-Ram



Traditional Battering Ram

Benchmarking Results

	Fatal Funnel	Time	Size	Ease of Use
Traditional				
Hydra-Ram				
Halligan Bar				

Key problems to address:

- Fatal Funneling
- Time/Efficiency

Automatic Battering Ram

Solves all 4 issues effectively

- Fast and Efficient
- Small and Light
- Avoids Fatal Funneling
- Easy to use

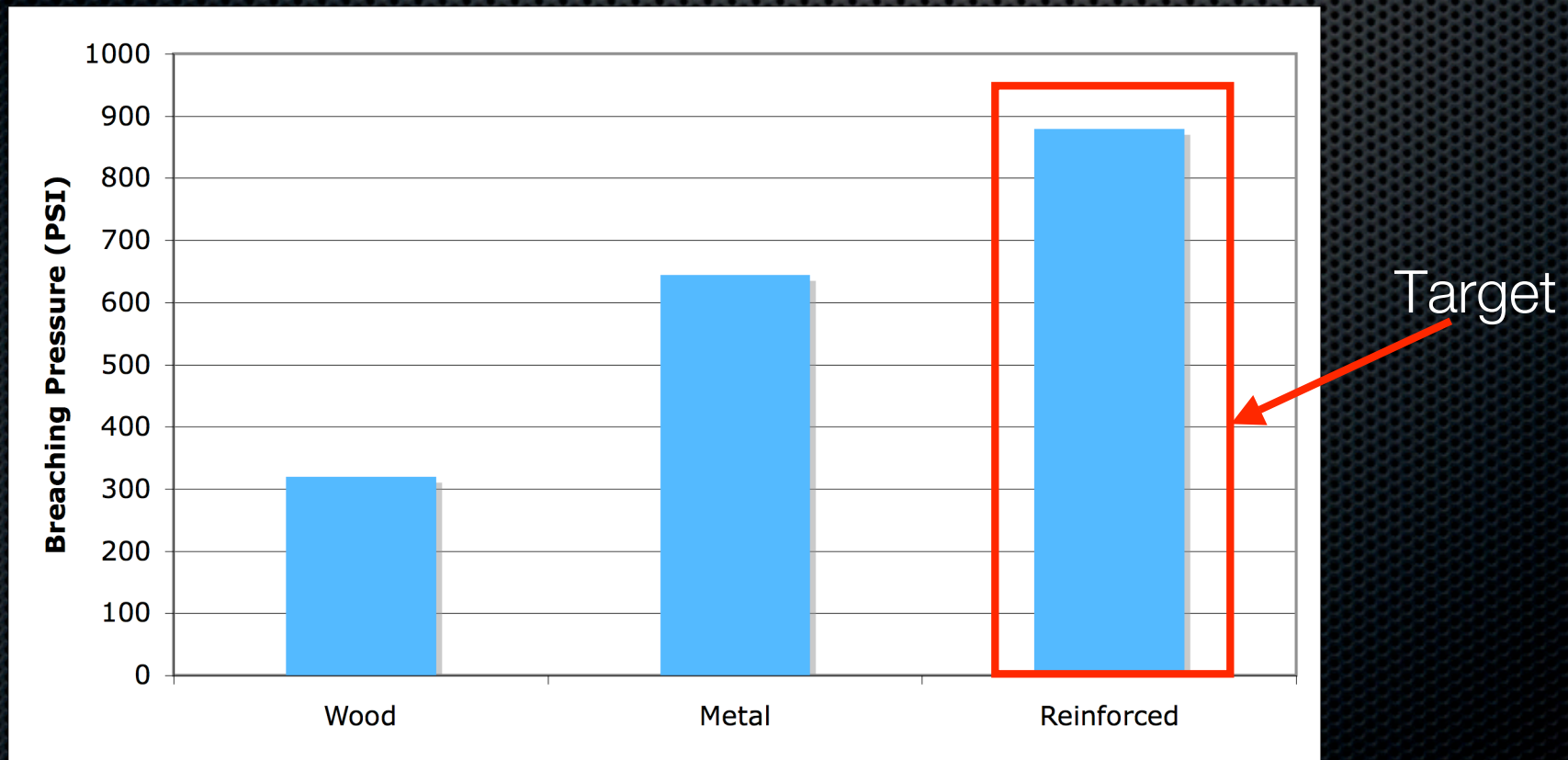
Demonstration

Sketch Model Takeaways

- Double-sided blades
- Strong blades to support large moment arm
 - Resist 15N-m bending moment
- Blades tapered for easy insert
- Strong recoil just from a spring

Pressure to Breach a Door

Assuming a 3in² piston cross-sectional area



U.S. Patent 6877988

Calculated Feasible Methods

Hydraulic

- Pump and accumulator

Pneumatic

- Hand pump, valve, piston/cylinder
- Directly from a cartridge

Spring-Actuated

- High pressure air to highly compressed spring