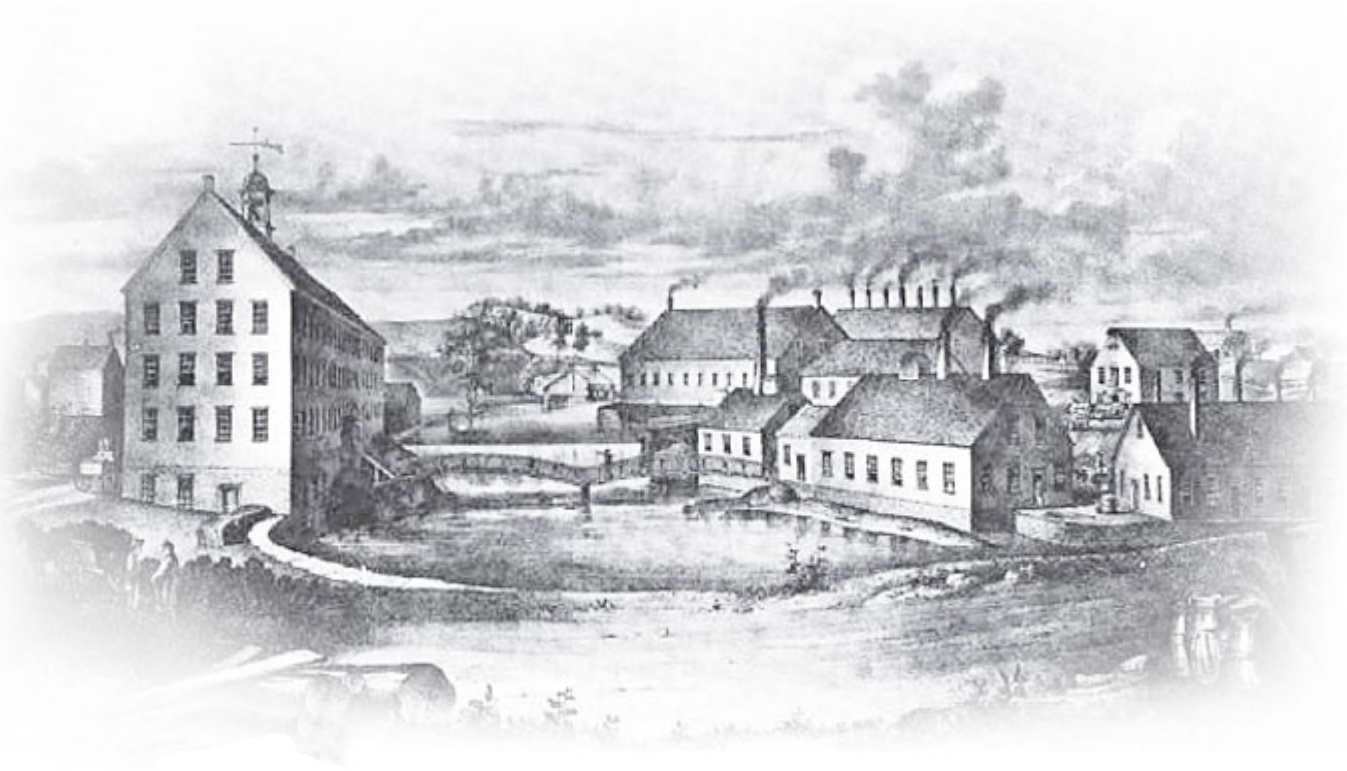
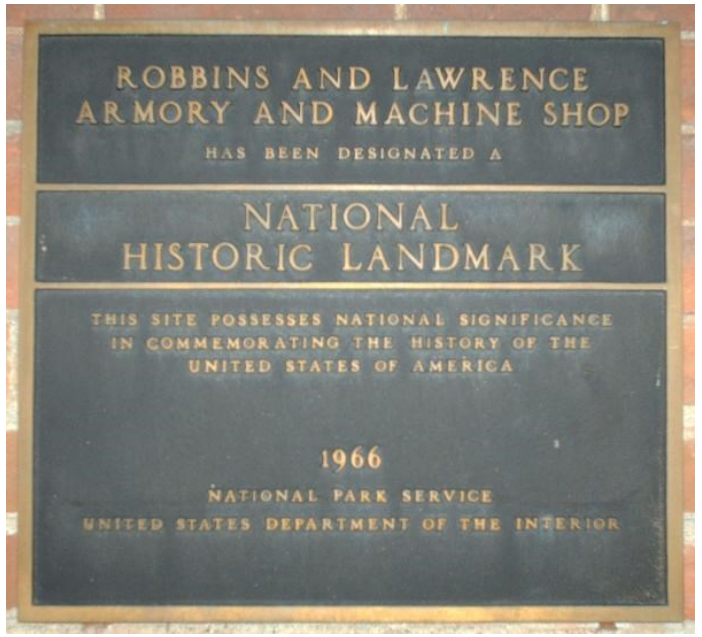
# American Precision Museum

Robbins and Lawrence Armory

The Birthplace of Interchangable Parts

Windsor, VT






Victor Prost and Emily Hanhauser

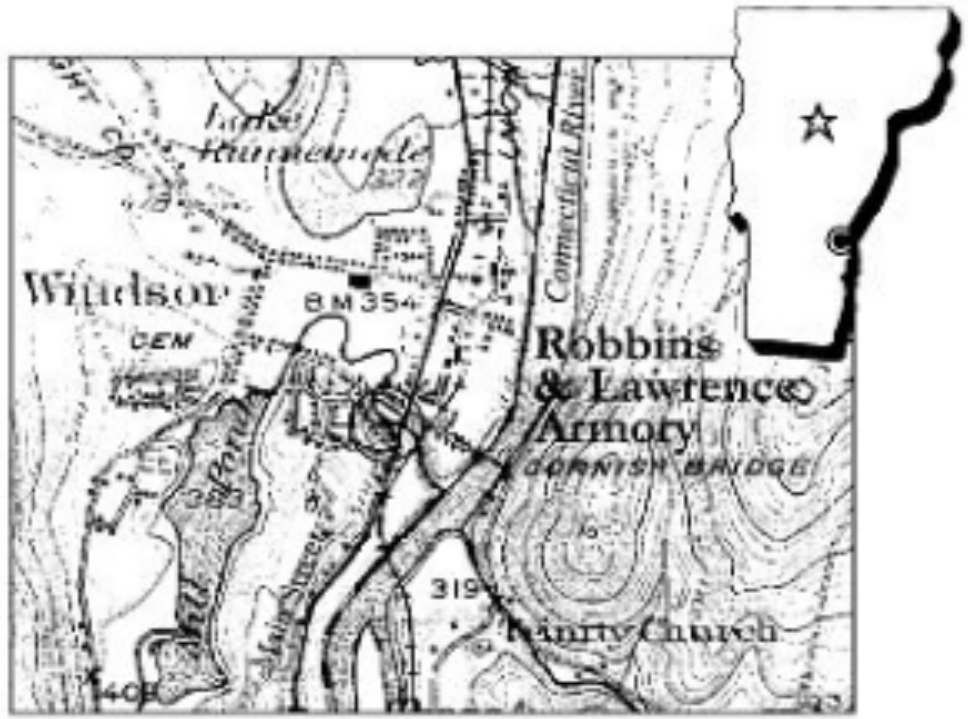
October 24, 2016

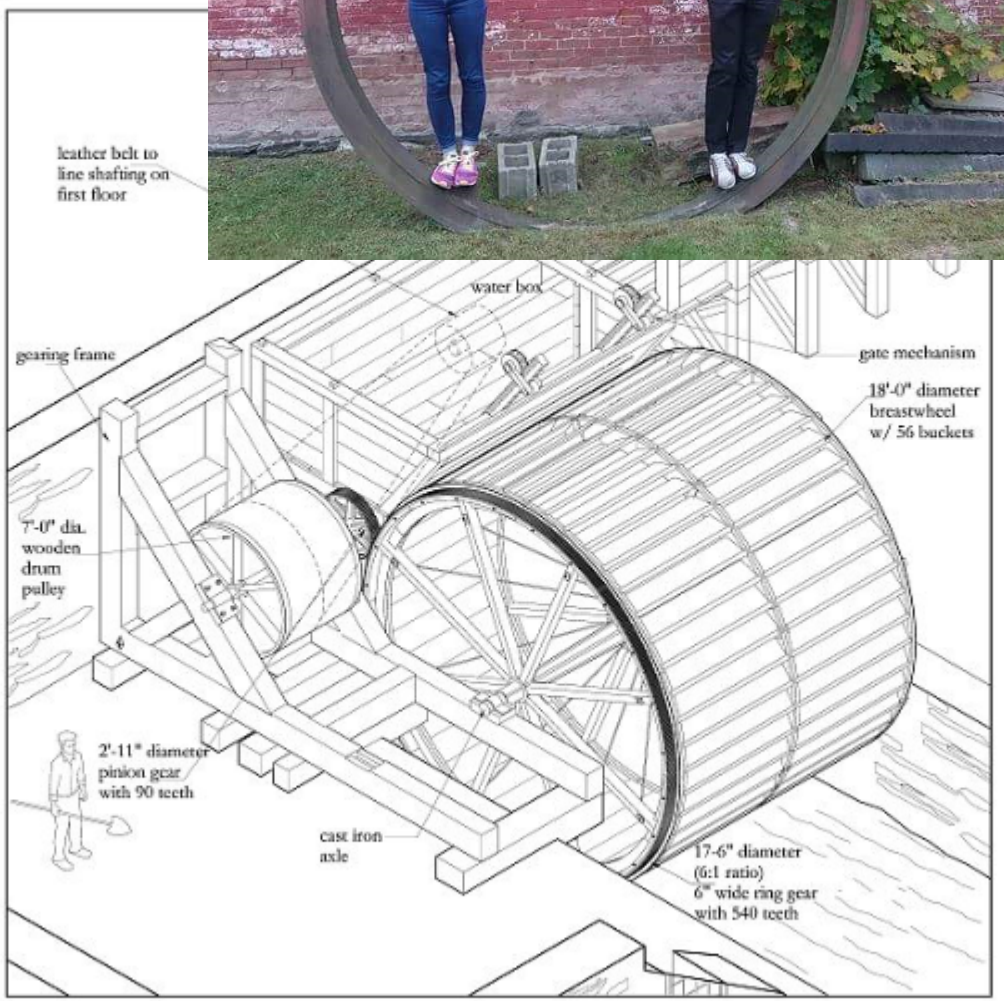
**1845** – Lawrence, Robbins and Kendall win government contract bid to produce 10,000 guns

- Custom gunsmiths/businessmen
- Previously 1-2 guns manufactured per week
- Contract to produce 2,000 guns/year over 5 years

**1846 –** Construction of armory in Windsor, Vermont on Mill Brook near the Connecticut river

- Entire factory powered by 18 foot water wheel



**1847** – Gun order deliver 18 months before schedule

- Guns had **fully interchangeable parts**, including lock parts (notoriously hard to make interchangeable)
- Accomplished with **custom build precision machinery**, including rifling machine, inlet cutter, gun stock lathe
- Staff of 150 machinists and factory workers

**1851** – Robbins and Lawrence exhibit Model 1841 rifle at the Great Exhibition in London

- Amaze attendees by taking apart 15 guns, dropping parts on the floor, picking up random parts and putting guns back together
- Win award for exhibit

**1854** – British Government orders 141 machines from Lawrence and Robbins for the British Armory at Enfield after a tour of New England factories to learn about the "American System"

**1862** – Armory producing 300 rifles/week; later would be 1000 rifles/week

- It is estimated that the majority of total 1.5 million model 1861 U.S. rifle muskets ordered for the civil war were produced using Lawrence and Robbin's machinery


# Influence of Robbins and Lawrence

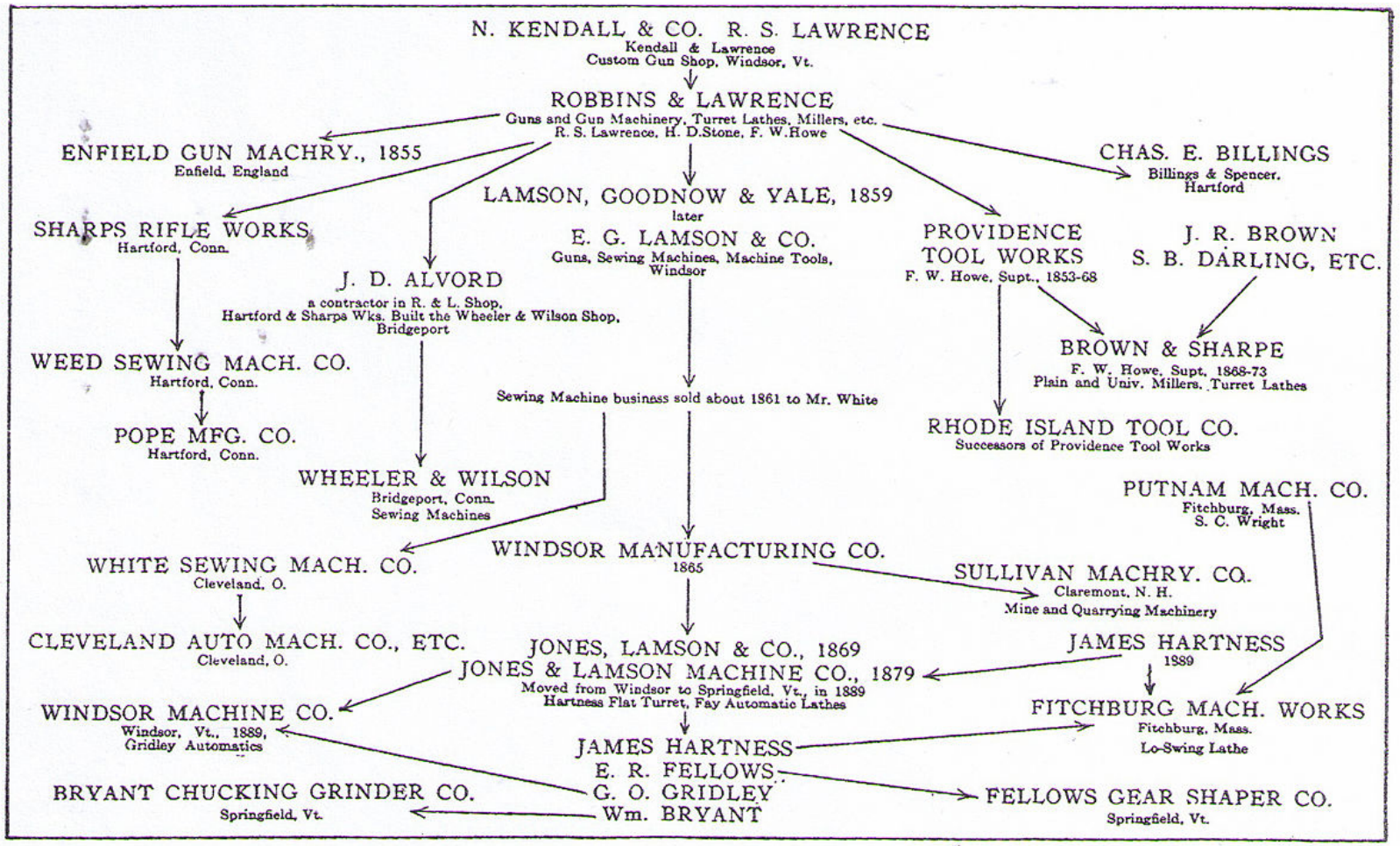
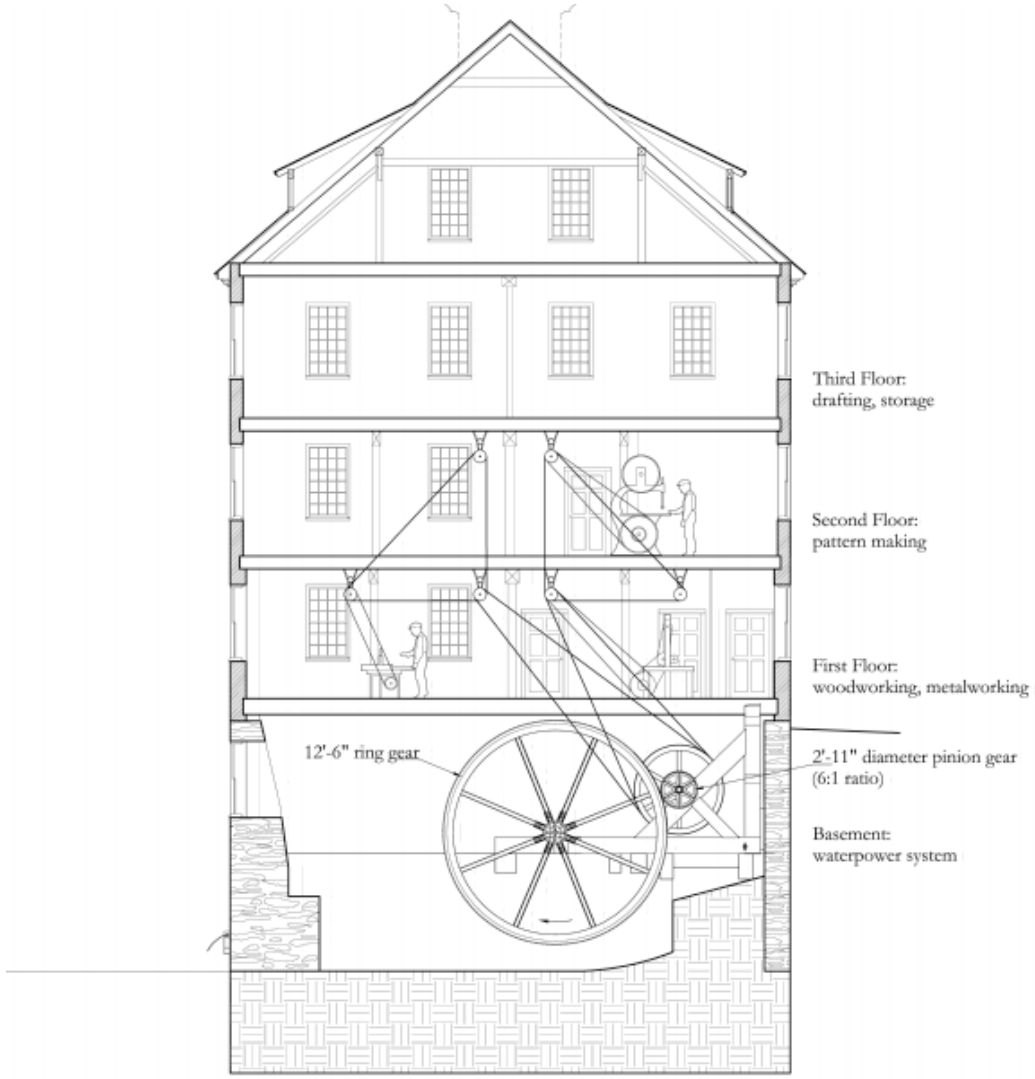


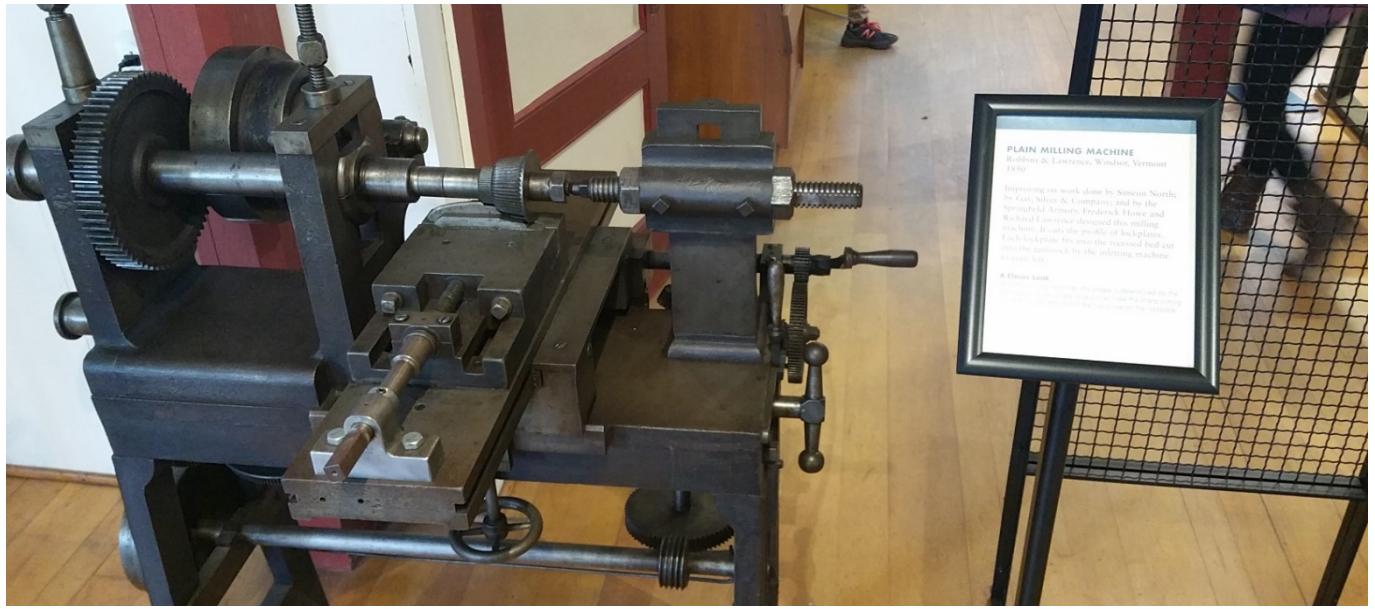

FIGURE 37. GENEALOGY OF THE ROBBINS & LAWRENCE SHOP

Start of the **"American System" of Manufacturing** – interchangeable parts, mechanization for production using semi-skilled labor

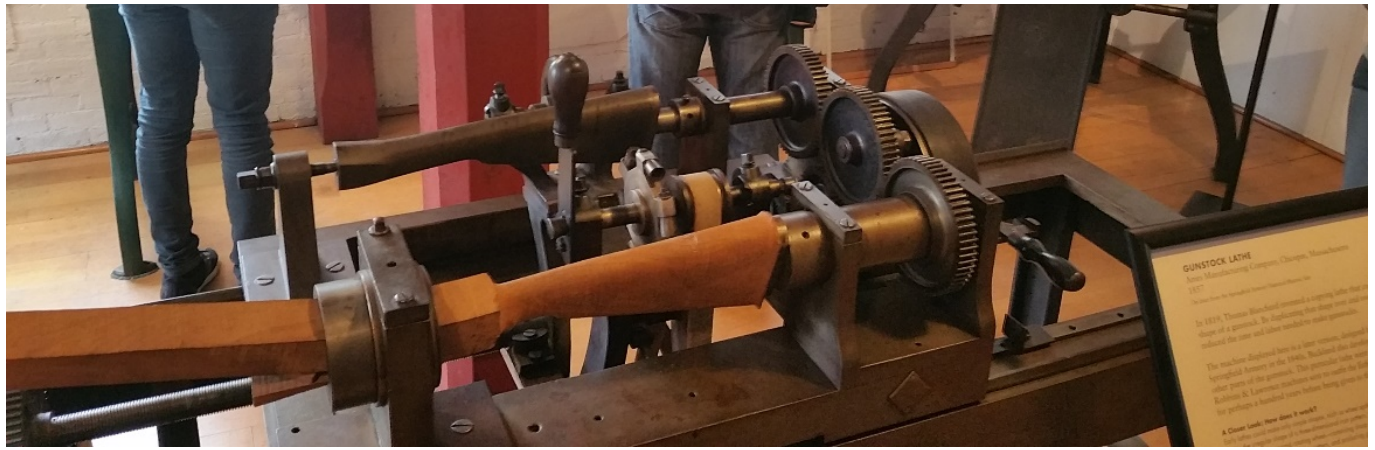

Third Floor:
drafting, storage
Second Floor:
pattern making
First Floor:
woodworking, metalworking
12'-6" ring gear
2'-11" diameter pinion gear
(6:1 ratio)
Basement:
waterpower system

# Inletting Machine - 1850

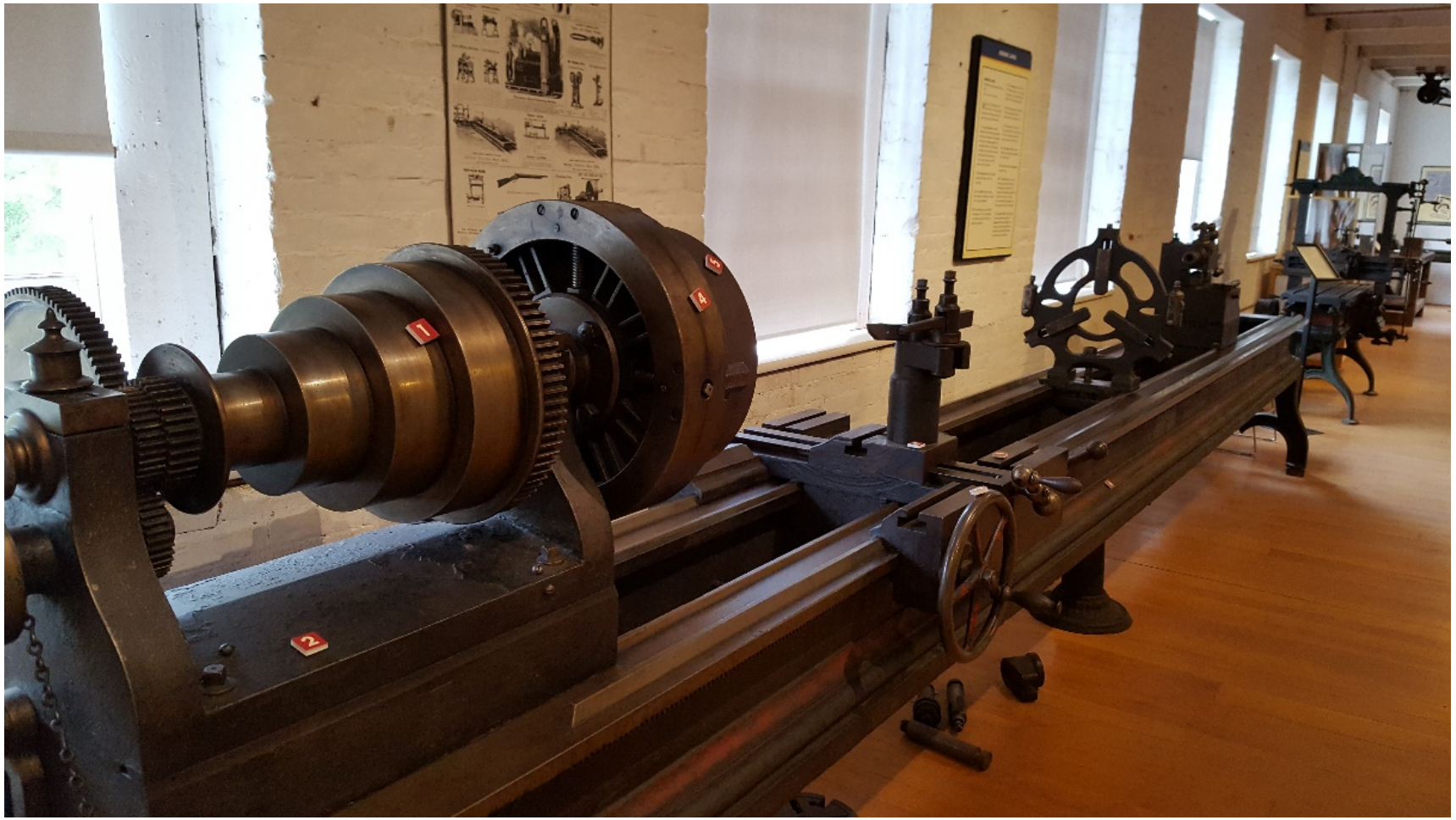
# Plain Milling Machine - 1850




# Gun Stock Lathe- 1857

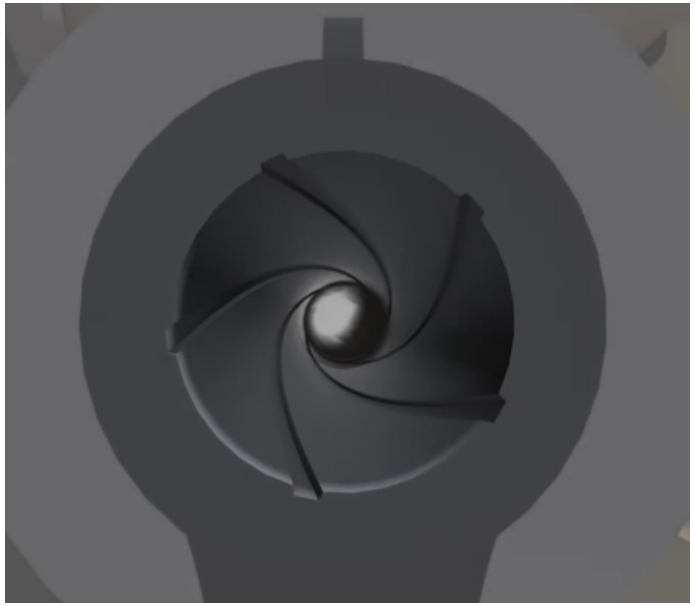


# 30ft long Engine Lathe - 1867

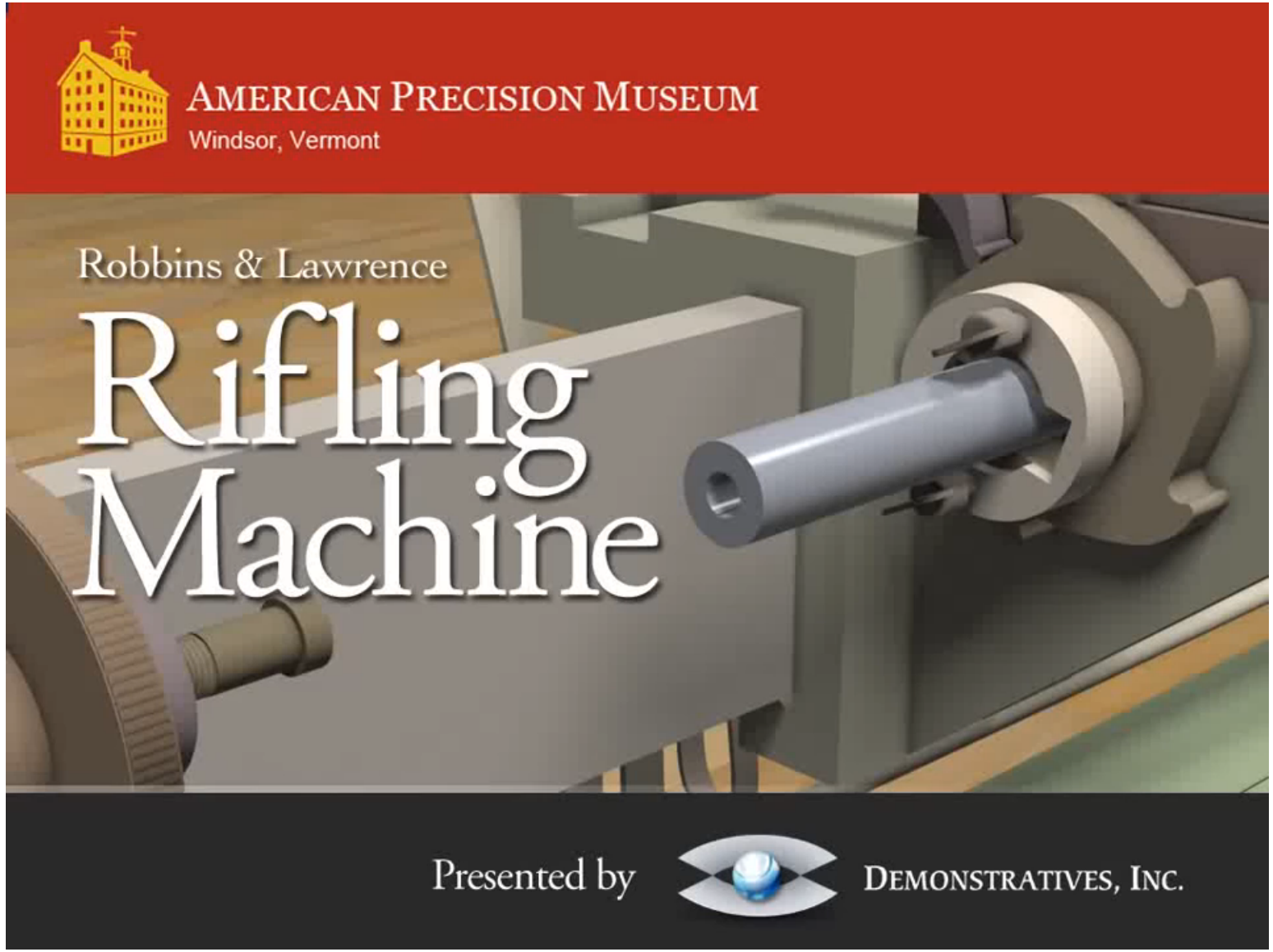


# Drill press - 1855

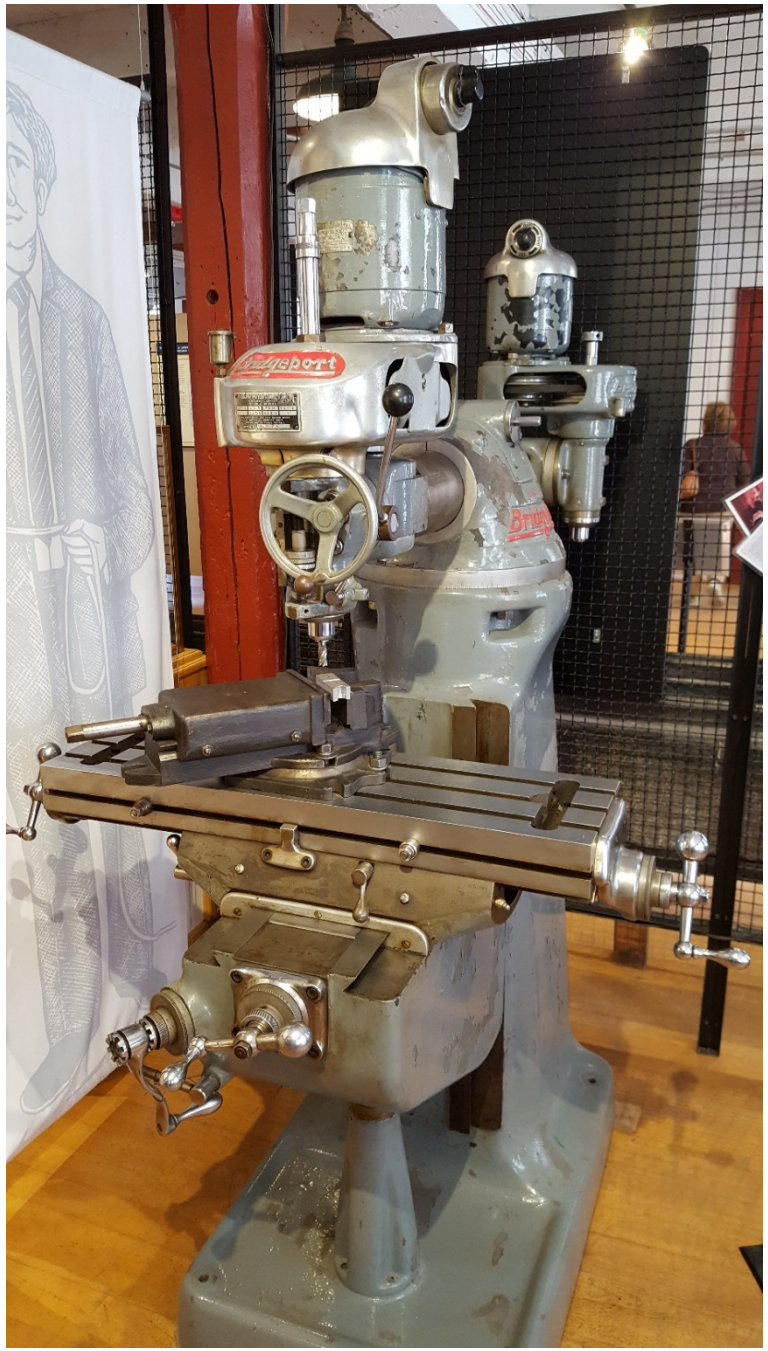
# RIFLING MACHINE- 1853

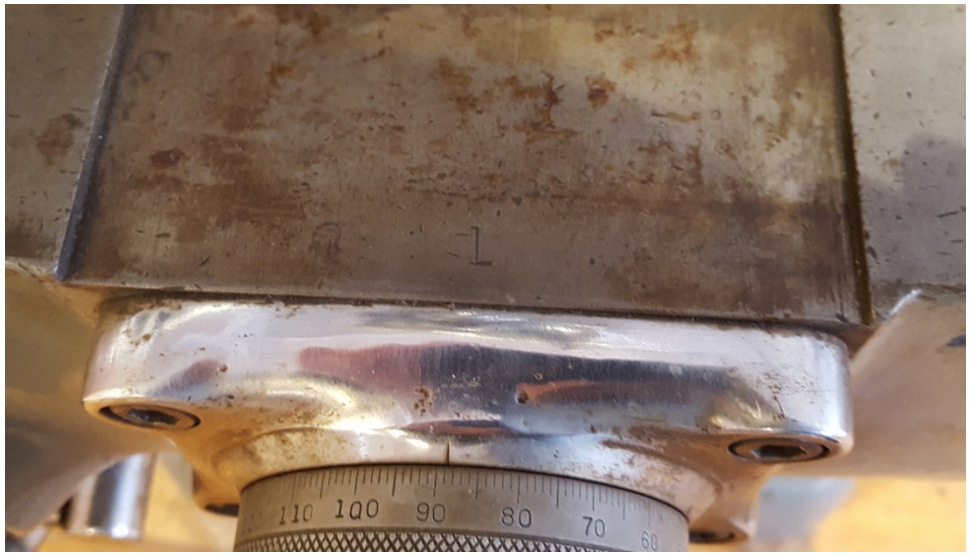
# RIFLING MACHINE- 1853



# GEAR MAKING MACHINE




# 1st Bridgeport Milling Machine - 1938




**« YOU SHOULD NOT INSPECT QUALITY IN THE PART BUT YOU SHOULD MANUFACTURE QUALITY IN THE PART »**

***HAROLD F. DODGE***