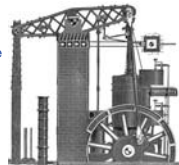


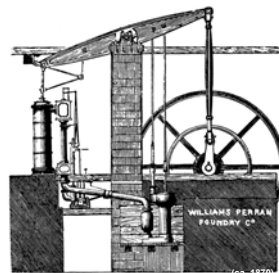
Lehigh Zinc and North America's Largest Steam Engine



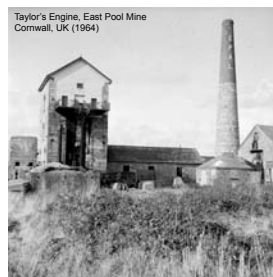
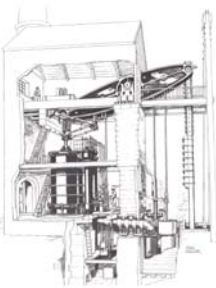
R. Damian Nance
Ohio University



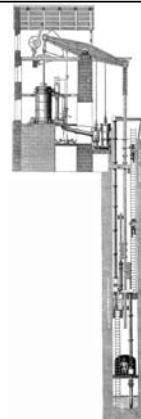
Rotative Beam Engine



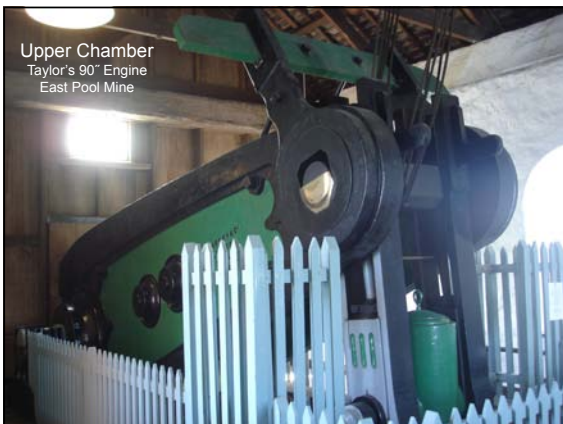
Cornish Pumping Engine



Single Acting Engine



Upper Chamber
Taylor's 90" Engine
East Pool Mine



Middle Chamber
Taylor's 90" Engine
East Pool Mine





Ueberroth Mine



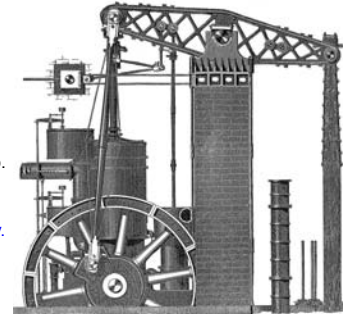
- 1853: Zinc works established in Bethlehem after zinc discovered in Saucon Valley
- 1860: Zinc works became Lehigh Zinc Company
- 1876: Lehigh Zinc plant was producing ~half U.S. annual consumption
- 1853-93: Mines raised >800,000 tons ore averaging 30% zinc

Pumping History

- Ueberroth Mine was notoriously wet and a series of larger pumps were erected to cope
- 1854: Shallow open pit drained by pumps capable of raising 200 gals/min
- 1861: Woodward pump installed
- 1863: 100 hp Corliss engine installed capable of raising 2500 gals/min from 65 feet
- 1866: 300 hp double-acting condensing horizontal engine (32-inch cylinder, 9-foot stroke) capable of raising 5700 gals/min from 132 feet installed by John West, company engineer
- All proved inadequate for the task as mine deepened.
- 1869: West called upon to design an engine capable of pumping 12,000 gals/min from a depth of 300 ft.

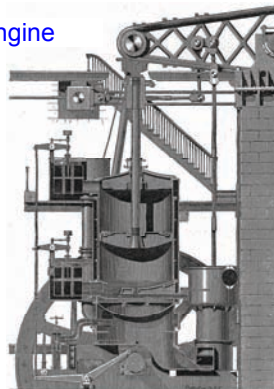
The "President"

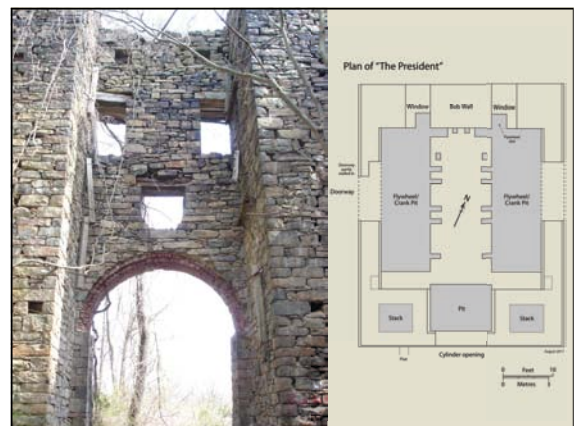
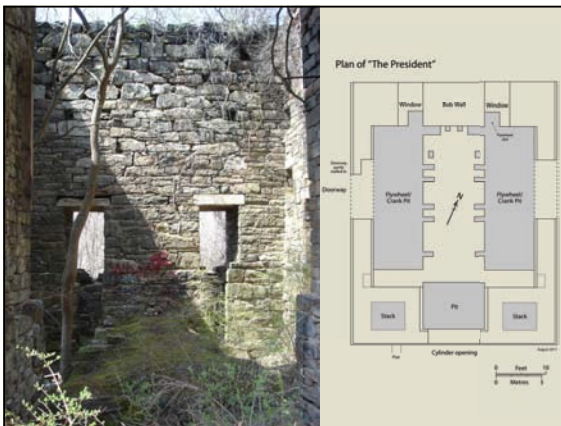
- Weighed 675 tons.
- 2 latticework beams.
- 110-inch cylinder.
- Built over 3 years by Merrick & Sons, Philly.
- Casting subcontracted to Lazell, Perkins & Co. Bridgewater, Mass.
- Pumps and boilers by I.P. Morris & Co., Philly.
- Run continuously from Jan. 1872 to Oct. 1876 (shaft 240 feet deep).



Double Acting Engine

- Double-acting condensing engine (power strokes drove beams up and down) with two sets of valve nozzles.
- Worked pump rods in shaft and two massive flywheels inside house.
- Three-story house with air pumps and condenser on ground floor, second floor near top of cylinder, and third level with beams.







Crowns Shaft, Botallack Mine
Pumping engine house (1836 - left)
Winding engine house (1862 - right)

