Ephraim Shay and the Shay Locomotive

FOR299
PA Logging History

Greg Wiltsie

Shay Locomotive
Shay Locomotives

The Shay locomotive differed from other steam locomotives built during the same period in that it was a geared locomotive. The Shay had a normal boiler like other steam locomotives, but the boiler on the Shay was offset from the center of the frame to the left. On the right side of the locomotive, 2 or 3 cylinders were mounted vertically. These cylinders drove a driveshaft that was mounted at axle height. This driveshaft was connected with gears to each axle, which propelled the locomotive.

United States Patent for the Shay Locomotive

Patent number 242,992
Patented June 14, 1881
Shay Locomotive Classes

► Class A
  ▪ Two cylinders, two trucks, 6 to 24 tons
► Class B
  ▪ Three cylinders, two trucks, 10 to 80 tons
► Class C
  ▪ Three cylinders, three trucks, 40 to 160 tons
► Class D
  ▪ Three cylinders, four trucks, 100 to 150 tons

Shay Locomotive History

• Built in Lima, Ohio by the Lima Locomotive Works

• Locomotive designed by Ephraim Shay

• Design was a geared steam locomotive

• Built between 1878 and 1945
Shay Locomotive History

- 2,768 locomotives in four models were built
- Only 115 Shay locomotives survive today
- Oldest surviving locomotive, number sn-122, was built in 1884 and is located in Redding, California
- Last built locomotive, number sn-3354, built in 1945, is still operational in Cass, West Virginia
- Weights ranged from 6 tons to 160 tons

Surviving Shay Locomotives in PA

There are five surviving Shay locomotives located in Pennsylvania

- Number sn-1799
  PA State RR Museum, Strasburg
Surviving Shay Locomotives in PA

• Number sn-2317
  Steamtown Nat. Historic Site, Scranton

Surviving Shay Locomotives in PA

• Number sn-2598
  PA Lumber Museum, Galeton
Surviving Shay Locomotives in PA

• Number sn-3118
  Foster Brook & State Line RR, Bradford

Surviving Shay Locomotives in PA

• Number sn-3299
  Private collection, New Centerville
Ephraim Shay and the Shay Locomotive

Ephraim Shay

- Born July 17, 1839
- Born in Sherman Township, Ohio
- Moved to Michigan in 1861 and enlisted in the 8th Missouri Volunteer Infantry, Company D, and fought in the American Civil War under the command of General Sherman in the Western Theater of the war
- Honorably discharged from the army in 1864
- Returned to Ohio after the war and married Jane Henderson on July 26, 1864
- Moved back to Michigan and operated a steam sawmill
- Around 1876, got an idea to use steam locomotives to move logs for the mill
- Worked with Lima Locomotive Works and built first loco in 1880 for a customer in Grand Rapids, Michigan
Ephraim Shay

- Shay started to file patents for his geared locomotive in 1881
- Built 4 Shays in 1881 and was up to 37 Shays in 1883
- Had a 34 page catalog, showing 5 different locomotive models, in 1884
- Shay locomotives were being shipped all over the world by 1890

Ephraim Shay

- Died April 19, 1916
- Shay was 76 years old when he died
- Died in Harbor Springs, Michigan
- Shay's wife Jane died on July 24, 1912
Ephraim Shay

- Shay built sleds with clear Maple runners for children's Christmas gifts, making over 400 over the years.

- Shay also built a hexagonal shaped house in Harbor Springs, Michigan in 1888.

- The house had six wings off of the central portion, with a tower on the top.

- Shay also built an all steel boat in 1891, that was 40 feet long and had a 6 foot beam, named the Aha.

Ephraim Shay and His Railroad


- Started his own railroad in town for experimentation purposes.

- Named the railroad the Hemlock Central.

- Also used as a sightseeing railroad, charging 25¢ per person to ride.
The Hemlock Central Railroad

- Railroad was a narrow gauge railroad - meaning rails were 30 inches apart

- Originally seven miles in length

- Extended by one mile in 1904

- Shay operated three locomotives built by him on the Hemlock Central

- Locomotives were normal Shay type, except for not having a frame, with the boiler providing the main support

- Cost $51,346 to build

- Railroad ceased operations in 1911 and was dismantled in 1912
Hemlock Central and Shay’s House

Ephraim Shay’s House Today