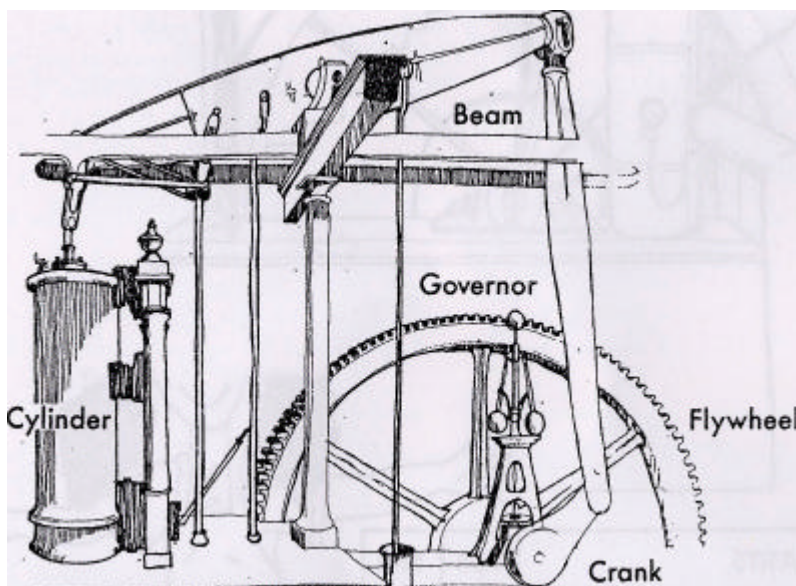


Haydock Beam Engine

This beam engine was built in about 1830 and powered machinery in a joiners' shop at Haydock Colliery, Lancashire, from about 1860 until the 1950s. It may have started its life pulling trains up slopes on the Liverpool and Manchester Railway at the Edge Hill Tunnel. Early locomotives were not powerful enough and had to be assisted up the incline by a continuous rope driven by a stationary beam engine. A clue to this engine's possible railway origins is its ability to be driven in reverse as well as forwards.

The beam engine was invented by Thomas Newcomen in 1712 to pump water from coal mines. It got its name from the large wooden beam, which rocked up and down in a see-saw action. Its technical design was greatly improved by James Watt and others. Watt increased the efficiency and devised a means of converting the vertical pumping action to rotary action to drive a flywheel. The beam engine was one of the earliest types of steam engine and set the standard from which all other steam engines were developed. In common with many steam engines of this period, beam engines incorporated decorative architectural features, such as classical columns and urns. Most of the engines powering textile mills between 1790 and 1860 were of this type.



The working cycle of the engine begins when steam from a boiler is alternately admitted and exhausted from the top and bottom of the cylinder in turn, under the control of a slide valve. When steam enters from the bottom of the cylinder, it forces the piston inside upwards. When it enters from the top of the cylinder, it forces the piston downwards. This up-and-down reciprocal motion is converted to the rotary motion of the flywheel by the beam and crank. The exhausted steam is

sucked into a condenser beneath the engine. Cold water is sprayed into the condenser, cooling the steam, which condenses back into water.

To control the speed of the engine, there is a centrifugal governor, which is driven from the main shaft. This varies the amount of steam that is admitted to the piston cylinder. If the engine runs too fast, the spheres of the governor are thrown outwards by centrifugal action. This closes the steam valve to cut off the steam from the boiler and hence slow the engine down.

Technical Data

Engine type	Single cylinder condensing beam engine
Manufacturer	Unknown
Date of manufacture	c. 1830
Operator	Richard Evans Colliery, Haydock, Lancashire
Rating	150 horsepower
Speed	20 rpm
Cylinder	25-inch (635-mm) bore; 5-foot (1.52-metre) stroke
Valve type	D-shaped slide-valve
Flywheel	Peripheral gear meshing into a wooden toothed pinion; weighs 7 tons; 16 ft (4.88 m) in diameter.

For more information:

- Read* Smallwood, V. *Bellerophon, Haydock to Haworth*. Keighley, UK: Vintage Carriage Trust, 1986.
Simm, Geoff. *Richard Evans of Haydock: A Study of a Local Family*. Newton-le-Willows, UK: Simm, 1988.
Hayes, G. *Beam Engines*. Princes Risborough, UK: Shire Publications, 2003.
- Visit* The Science Museum, London.
How Steam Engines Work: www.masteam.btinternet.co.uk