

The Great Invention | Inventors | James Nasmyth (1808 - 1890)

James Nasmyth was born in Edinburgh in 1808. His father was interested in civil engineering and architecture and encouraged his son to share these interests with him. Whilst at school James was friendly with a boy whose father owned an iron foundry, which James visited on Saturday afternoons. James began exploring the development of the steam-engine at the age of 15 by building his own models and selling them.

In 1829 he took a working model plus drawings of a small steam engine to London to show Henry Maudslay the famous tool maker and engineer. Maudslay was impressed by his skill and took him on as an apprentice.

Maudslay died suddenly in 1831 and by the end of the year James returned to Edinburgh to produce his own engineering tools.

He moved to Manchester in 1834 to set up his own tool making business, his works, known as the Bridgewater Foundry, were beside the canal and the Liverpool-Manchester railway. It was here that he designed and built his famous steam hammer, described as *one of the most perfect of artificial machines and noblest triumphs of mind over matter that modern English engineers have yet developed*.

In 1837 the Great Western Steam Co. asked James Nasmyth to supply specific tools that were required to build the engines of the **Great Britain** steamship. They were experiencing problems in forging the enormous paddle-shaft of the vessel. By 1838 Francis Humphries the engineer for the company had written to him stating

I find there is not a forge-hammer in England or Scotland powerful enough to forge the paddle-shaft of the engine for the Great Britain! What am I to do?

Nasmyth invented a steam hammer where the lift was of sufficient height to produce the force of blow required for such an undertaking and where the direction could be controlled to give the necessary accuracy. Unfortunately for Nasmyth, Brunel changed the design of the engine and neither the shaft or hammer was required. He then could not find any forgemaster in Great Britain to take up the production of the hammer.

Eventually the designs and manufacture of his steam hammer was taken up by the Creusot Iron Works in France, who had been shown his designs when they were visiting England.

In 1840 James Nasmyth secured the patent for his design and went into production for his own hammers in Edinburgh. By using the hammer, production costs could be reduced by more than 50 per cent and at the same time the quality of the forging was improved. The hammer could be used to forge the iron plates for war ships or simply to hammer a nail.

Orders came flooding in for the wrought iron ordnance of Armstrong, Whitworth and Blakely. It is very doubtful whether such weapons could ever have been made had the steam hammer not been invented.

In 1845 Nasmyth applied the same principle to the production of a pile-driver used in constructing bridges, quays and harbours and for piling the foundations of all kinds of masonry. It was used in the construction of the naval dockyards at Devonport and for the great high level Bridge in Newcastle.

James Nasmyth retired in 1856 and died in 1890.