

THE HOT BLAST METHOD OF IRON PRODUCTION

This process was patented by James Beaumont Neilson in 1828. It involved the supply of hot air to the blast furnace where the fuel, ore and limestone flux were burnt to produce iron. This was an advance on the old method of supplying cold air as the higher temperatures now possible removed the need to coke the coal used as fuel. The output of iron per furnace was also increased thus giving lowered overhead costs. The innovation was quickly taken up by Scottish ironmasters using local coal and blackband ironstone, an iron ore discovered by David Mushet in 1801.

The diagram represents a typical hot blast furnace. Fuel, ore and limestone were fed into the top of the furnace. The lower down the furnace the higher the temperature became. As the iron melted the impurities of both it and the fuel combined with the limestone to form a waste product known as slag. The tuyeres (G) supplied hot air to the combustion process. Finally the molten iron and slag would be drawn off from separate tapping holes at the base of the furnace, the slag being lighter sitting on top of the iron. Hot gases were drawn from the furnace top via a dust catcher to the air heating stove chamber Q. They were then mixed with air and ignited, the heated gases then passed through a chequerwork of regenerative brick in chamber P. The bricks were thus heated to c. 1000°F. While one heating stove was brought up to temperature another was cooled by blowing fresh air through it. This was then fed at hot air to the furnace.

HOT BLAST FURNACE. CIRCA 1900.

