

Coal Mining and the Victorians

The Flame Safety Lamp

The problem

One of the problems faced by miners was finding a safe source of light to use underground. In early mining, miners used candles for light, but this was very dangerous. Methane is a gas found with coal that can explode if it comes into contact with a flame or spark, and so using candles underground led to explosions.

The solution

A scientist called Sir Humphry Davy began investigating this problem. He realised that passing the burning flame through a fine wire mesh would stop it lighting explosive gases. He invented a lamp called a flame safety lamp. It used a piece of metal gauze, much like you would find on a sieve, to stop the naked flame from coming into contact with explosive gases in the mine. The gauze allowed oxygen to get to the flame to keep it burning, but prevented the flame from touching the highly explosive gases found in the coal mine.



A Modern Safety Lamp

There were problems with the first safety lamps invented by Sir Humphry Davy. Miners were encouraged to work in deeper and more dangerous gassy seams, where draughts might prevent the lamp from working effectively, and damaged gauzes could also cause explosions. The lamp's dim flame made it difficult to work with, tempting miners to open it, and allowing the explosive gases to come into contact with the flame.

The solution was to use a combination of glass and gauze. The glass allowed more light out, while the gauze was protected by a metal casing that prevented it from being damaged but still allowed oxygen in.