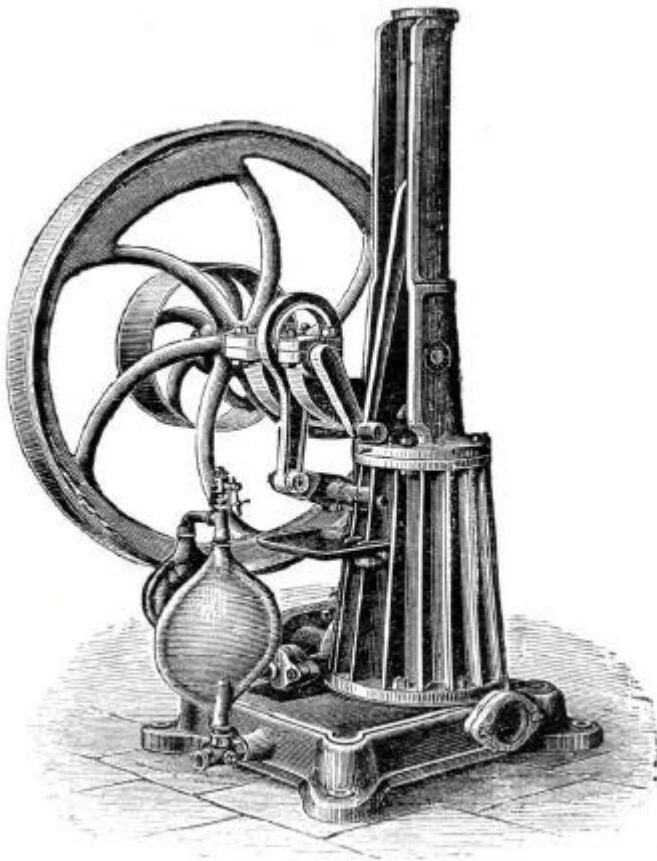


Bisschop Gas Engine

The engine on display in the Power Hall was one of about 2,000 made by J. E. H. Andrews of Stockport. Andrews began manufacturing this type of engine in the 1870s, after seeing the Bisschop engine on display at the Paris Exhibition. These engines were very simple to maintain and needed no oil lubricant or water for cooling. It was claimed by the makers that they could be managed by 'any boy or girl'. Although they were very heavy on fuel, they were very popular with small businesses, shops and even churches. They were used to power diverse machines, such as printing presses, sausage machines, coffee grinders, lathes and organ blowers. The engine in the Museum was used by a small company in Castleford, Yorkshire, to drive a lathe to make wooden rollers for clothes mangles.

Many engineers tried out the idea of an internal-combustion engine, where burning fuel and air inside a cylinder produced combustion gases, providing power as they expanded. In the 1860s, engineers solved the problems of obtaining a suitable fuel, a reliable ignition method and controlling the explosion were overcome. J. J. E. Lenoir, a Belgian engineer, produced a gas engine that showed that it was possible to make a working internal-combustion engine. However, since the Lenoir engine suffered from a low power output and high fuel consumption, many attempts were made to produce a more efficient design.



Alexis de Bisschop of Paris was one of those who attempted an improved design. In his engine of 1870, the working cycle begins when the piston rises, drawing a mixture of gas and air into the vertical cylinder. At half-stroke, a small pilot light, burning outside, is drawn in through a clack valve at the bottom rear of the engine. This ignites the fuel mixture and forces the piston upwards to produce the power stroke. The piston rod, which is connected via an arm to a crank, converts the vertical action of the piston to the rotational motion of the flywheel.

The Bisschop gas engine bridged the gap between the Lenoir engine and Nicolaus Otto's four-stroke engine. It had many advantages such as low cost, great simplicity, minimum floor space and the absence of water cooling. However, it was very inefficient and consumed 11 cubic feet of gas per hour under a full load. Therefore efforts to develop a more efficient engine continued, resulting in the Otto four-stroke gas engine.

Technical Data

Engine type	Single-cylinder vertical gas engine
Manufacturer	J. E. H. Andrews, Stockport
Date of manufacture	1882
Fuel type	Town gas
Rating	0.75 horsepower
Speed	75 rpm
Valve type	Clack valve
Ignition type	Flame sucked in through clack valve.

For more information:

Read Cummins, Lyle. *Internal Fire*. Lake Oregon, Oregon: Carnot Press, 1976.

Visit The Science Museum, London

Rusty Iron Workshop: www.rustyiron.com/engines/history