Hands On Learning
with Reading Museum Service

VICTORIAN FIRE AND LIGHT H39

Bryant & May Vesta Box



In 1827 John Walker, a chemist living in Stockton-on-Tees, discovered that if he coated the end of a stick with certain chemicals and let them dry, he could start a fire by striking the stick anywhere. These were the first friction matches. The chemicals he used were antimony sulphide, potassium chlorate, gum, and starch.

During the nineteenth century other mixtures were used by various manufacturers. In 1831, the Frenchman Charles Sauria added white phosphorus to remove the smell. These new matches had to be kept in an airtight box but were popular. Unfortunately white phosphorus caused phossy-jaw (see photograph below, right), an appalling jaw disease from which many workers died.



The safety match was invented in 1844 by the Swede Gustaf Erik Pasch and improved by Johan Edvard Lundström a decade later. Their safety is due to the separation of the combustible ingredients between the match head and a special striking surface; and the replacement of white phosphorus with red phosphorus. The striking surface was composed of powdered glass and red phosphorus; and, the match head was composed of antimony sulphide and potassium chlorate. The act of striking converted some of the red phosphorus to white by friction heat and this started the combustion of the match head.

This box was made by Bryant & May who had a factory in Stratford-le-Bow, London. It was designed to hold vesta matches - that is, a friction match that had a wax braided stem, rather than a wooden one. The rough panel on the base is for striking the match. Some examples (without the match-head) can be found inside the box. It probably dates from about 1900.

In 1903 George Roberts Sims produced a book called *Living London: Its Work and Play, Its Humor and Its Pathos, Its Sights and Its Scenes* which contains a description of a visit to a match factory. The author paints a rather rosy picture! Here is his description of one of the workers:

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She is a fine-looking girl. Quietly dressed and with an air of responsibility about her, she is a young mother. Her husband is employed at the soap works hard by, and though some one has to tend the babies during the day she is happy happy because there are two incomes to maintain the bairns in plenty. Her daily output is 2,500,000 match stems. Watch her. She has a cutting machine all to herself, and as the strands of wax flow into the frame she presses her thumbs at a certain spot, and behold a hundred stems are cut. Her thumbs never weary. The stems ready, up they go to the roof to be dipped. A man stands at a slab on which is spread the composition a thick paste. He takes a frame and presses it on to the slab, and in ten seconds you have 10,000 finished matches. If any one should suffer from the deadly "phossy jaw" this man should, for he has been dipping matches for a quarter of a century, but he breathes the air of Heaven the kindly proprietors, who do not look upon their employees merely as so many machines, lay stress on this and as a further precaution fans are kept going throughout the day to drive away the fumes.

In reality conditions were harsh. In 1888 there was a famous strike in the Bryant & May factory in London. The women workers there toiled for fourteen hours a day for a wage of less than five shillings a week. However, they did not always receive their full wage because of a system of fines, ranging from three pence to one shilling, imposed by the Bryant & May management. Offences included talking, dropping matches or going to the toilet without permission. The women worked from 6.30 a.m. in summer (8.00 in winter) to 6.00 p.m. If workers were late, they were fined a half-day's pay. Led by Annie Besant and Catherine Booth of the Salvation Army the match girls scored a famous victory.



The Bryant & May Strike Committee

Glass Light Holder

These little glass containers were made in a variety of shapes and held night-lights. They might be used simply as shades for the night-light, but were often used decoratively with many of them being strung up on a line for a party or an evening garden event.



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Bellows



Fire needs air and the stronger the flow of air the brighter the flame. Blowing on a flame through pursed lips or a tube is one way of increasing the supply, but is rather tiring! A set of bellows like this makes the job much easier. The name is derived from the Anglo-Saxon term for a bag. This set is intended for use with a domestic fire. The flap inside the hole acted as a valve, allowing air to be sucked in when the bellows were pulled open, but closing and thereby forcing the air out through the nozzle when the bellows were squeezed shut.

Candle Snuffer



Candles burn down at different speeds, depending on the material from which the candle is made. Beeswax begins to melt at 68°C, spermaceti (fat obtained from the head of some whales) at 55°C and tallow (fat from parts of the bodies of cattle, sheep, or horses) at 33°C. This means that tallow candles burn down much more quickly than ones made from beeswax or spermaceti.

Unfortunately, until the late nineteenth century most candles were made from tallow, the cheapest of these three materials. Tallow candles were notorious for burning quickly, with a dim light and producing lots of smoke. They produced smoke partly because of impurities in the material, but also because they burned quickly, leaving a thick wick projecting from the top of the flame. This increased the amount of smoke and the wick also tended to drop over the side of the candle, causing it to gutter. Guttering - excess tallow running down the sides of the candle - could waste half of the tallow making up the candle.

Candle snuffers like this example were designed to trim the excess wick off burning candles. This kept the candle burning brightly, reduced smoke, and saved the tallow. Despite the name, they were not intended to put the candle out! The excess piece of charred wick was known as snuff, hence the scissors which cut it off were known as snuffers. This pair must date to the Victorian period as the flat press, which carried the snuff into the box, is stamped with the words 'BY HER MAJESTYS ROYAL LETTERS PATENT'.

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Salsbury's Petroleum Anti-Candle



The use of candle light was probably at its peak in the mid-nineteenth century. Even at that date, however, gas had spread to all major urban areas as a means of domestic lighting. From the 1850s, too, kerosene and paraffin oil became available in large quantities. By the 1860s cheap paraffin lamps costing less than a shilling were flooding the market. Finally, by the end of the nineteenth century electricity was beginning to spread as a source of light.

The illustration below right shows a similar device to this Salsbury Anti-Candle. Its inventor was the Frenchman Charles-Joseph Pigeon (1838-1915). He patented his lamp in the early 1880s. As with the Salsbury Anti-Candle it has text stamped on the front which underlines the cheapness of using such an artificial candle - '12 hours good light for one half penny'. This was achieved by using benzoline, a petrol derivative, as fuel.

The Salsbury Anti-Candle used petroleum and, according to the text on the front, burned for 14 hours. The brass fitting on the top can be unscrewed to reveal a long wick. The chamber would be filled with petrol and the wick extended by turning the screw when needed. Despite the fact that the main body of this device was manufactured in London, the brass fittings are stamped with a French text: 'Bte. EN FRANCE S.G.D.G ET BELGIQUE'. 'Bte.' is perhaps short for '*Mis en boite*', that is, 'boxed' in English. The abbreviation SGDG in French means '*sans garantie du gouvernement*', in other words the device has not been guaranteed by the government - so if it blows up don't expect compensation! These early petrol-fuelled lamps were quite dangerous and one of the claims made by Charles-Joseph Pigeon was that his lamps would not explode. The Pigeon lamp on the right claims 'Absolute Security Guaranteed'.



The mixed English-French nature of this device is perhaps explained by the fact that it was made by Henry Salsbury and Son of Longacre, London. Salsbury and Son made lamps for high class horse-drawn carriages and early motor cars. Until about 1900 candle-powered carriage lamps were sometimes fitted to cars to enable them to get home if they were delayed by a breakdown. Some motorists fitted bicycle lamps but quickly found that these could not withstand the higher speeds and their flimsy construction was easily

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shaken apart. Towards the end of the nineteenth century the Frenchman Louis Bleriot (later to find fame as the first person to fly across the English Channel) who had been experimenting with acetylene gas lighting for a number of years, entered into a collaboration with Henry Salsbury to produce the first successful automobile lamp. These Salsbury-Bleriot acetylene lamps were made in London and distributed widely throughout Europe. The Anti-Candle is clearly not for use on a car, but the association of Henry Salsbury and Louis Bleriot helps to explain the mixture of French and English on it.

Gas Mantle



The first public street lighting with gas took place in Pall Mall, London on 27 January 1807. In 1812, Parliament granted a charter to the London and Westminster Gas Light and Coke Company, and the first gas company in the world came into being. A few years later, on 31 December 1813, Westminster Bridge was lit by gas.

By 1823 numerous towns and cities throughout Britain were lit by gas. Costing up to 75% less than lighting produced by oil lamps or candles helped to accelerate its development and deployment. By 1859, gas lighting was to be found all over Britain and 1000 gas works had sprung up to meet the demand for the new fuel. The brighter lighting which gas provided allowed people to read more easily and for longer.

The first gas lights simply consisted of openings in the gas pipes. Sometimes the holes were arranged so that the flames burned in different patterns, which had names such as the Rats-Tail and the Cockscomb. Quite soon, though, ornate coverings developed.

The development of electric lighting in the 1870s spurred experiments to increase the brightness of gas lighting. It was found that suspending a metal gauze coated in chemicals into the flame could dramatically increase the incandescence. This web was called a mantle. For example, in 1881 a platinum wire mantle was patented, although it quickly deteriorated with use. Later in the 1880s the German scientist Carl Auer von Welsbach developed a mantle made out of cotton fibre which was then coated with a cocktail of chemicals (99 % thorium dioxide and 1 % cerium dioxide). The cotton burned away when the gas was lit, but the fragile mesh of chemicals remained to increase the flame's brightness. This example of such a mantle probably dates from the early twentieth century.