

North of England Institute of Mining and Mechanical Engineers  
Nicholas Wood Memorial Library

# Miners safety lamps

## a guide to resources

### Introduction

This guide lists resources in the Institute Library dealing with lamps. Other libraries and archives may also have material, including technical, economic and social history journals with useful articles.

### What is a safety lamp?

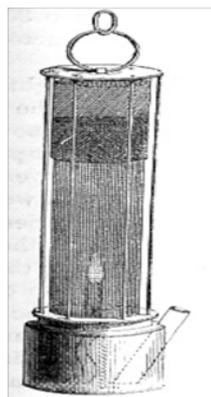
A safety lamp is one that does not cause an explosion in the presence of firedamp (methane and air).

Originally it was an oil-burning lamp in which the flame was surrounded by a metal gauze to distribute the heat over a large area so the temperature of the gauze was below the ignition temperature of the gas. Later electric lamps became the norm.

Additionally the colour and height of the flame in a flame safety lamp can indicate the presence of firedamp and maybe estimate the percentage in the air. Such lamps are still used in this way.



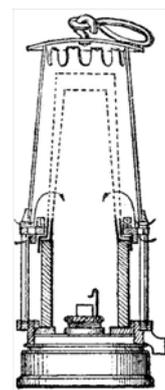
Clanny



Davy



Mueseler



Marsaut



Electric

### Some key dates

- 1813 Dr. William Clanny exhibited his lamp
- 1815 Humphrey Davy exhibited his lamp
- 1815 George Stephenson exhibited his lamp
- 1840 J.Mueseler exhibited his lamp in Belgium

1859 William Clark – first patent for electrical lamp  
 1870s J.B.Marsaut (France) double gauze design  
 1872 Coal Mines Regulation Act required locked lamps under certain conditions  
 1881 Joseph Swan exhibited his first electric lamp  
 1886 Royal Commission on Accidents in Mines – tested lamps and made recommendations  
 1887 Coal Mines Regulation Act – requirements on construction, examination, where used, etc  
 1889 John Davis and Co, Derby, were supplying portable electric lamps  
 1896 Coal Mines Regulation Act - requirements on provision by mine owners, where to be used, etc  
 1909 Cap (helmet) lamps introduced in Scotland  
 1911 Prize offered for best electrical lamp  
 1911 Coal Mines Act - requirements on examination, where can be used (including electrical), etc.  
 1920 Electrical lamp with built in accumulator  
 1924 Miners Lamp Committee – tests and recommendations

## Some histories

Rimmer, D & others *Clanny, Stephenson and Davy: commemorating the bicentenary of the miners safety lamps. 2015*

Pohs, H. *The miner's flame light book : the story of man's development of underground light.* c1995. This has a US emphasis.

Most books on mining history will have something on lamps, but there are some with substantial sections:

Galloway, R.L. *Annals of coal mining and the coal trade.* First series [to 1835] 1898; 420-439. Second series. [1835-80] 1904, 304-324.

Jones, A. V. and Tarkenter, R. P. *Electrical technology in mining: the dawn of a new age* 1993

Mining Association of Great Britain *Historical review of coal mining.* 1924, 150-169

Tarkenter, R.P. *The application of electricity to coal mining to about 1890, with a retrospective view from 1914.* MA thesis, Newcastle upon Tyne Polytechnic. 1983.

There is an extensive journal article:

Hardwick, F.W. & O'Shea, L.T. Notes on the history of the safety lamp *Transactions, Institute of Mining Engineers* **51** 1915-6, 548-724.

History from 1813 to 1913 with many types of lamps described and testing discussed in the UK and other European countries.

The *Transactions of the Newcomen Society* for the history of technology has an article on the early development:

Watson, W.F. The invention of the miners safety lamp: a reappraisal **70**(1) 1998-9, 135-141 "to settle the disputed features of the lamps of Clanny, Davy and Stephenson"

## Contemporary textbooks

Mining textbooks such as these below describe practice at the time of writing and may also have historical information.

Barnard, T.R. *Miners' safety lamps, their construction and care.* 1936.

Forster, G. *Safety lamps and the detection of fire-damp in mines.* 1914.

Foster, C.L.N. *A textbook of ore and stone mining* 1895, 3<sup>rd</sup> ed 1900, 4<sup>th</sup> ed 1901, 6<sup>th</sup> ed 1905  
 Ch XI Lighting

Hughes, H.W. *A text book of coal mining.* 5<sup>th</sup> ed 1904, 7<sup>th</sup> ed 1921. Chapter on lighting

Kerr, G.L. *Practical coal mining.* 5<sup>th</sup> ed, 1914. Ch XIV on lamps - descriptions and illustrations for flame and electrical.

Lupton, A. *Mining: an elementary treatise on the getting of minerals*. 1893, 1896, 1907.  
Section on lamps. Extracts from the 1893 edition at Durham Mining Museum:

<http://www.dmm.org.uk/educate/min-1100.htm>

Maurice, W. *Mine lighting papers*. c1930 – papers given to professional bodies, including How to choose an electrical mine lamp.

Pamely, C. *Colliery managers handbook*. 4<sup>th</sup> ed 1898, 690-735

Smyth, W.W. *A rudimentary treatise on coal and coal mining*. 1867, 4<sup>th</sup> ed 1875, 5<sup>th</sup> ed 1880

Chapter: Lighting of the workings

Statham, I.C.F. *Coalmining*. 1951. Includes lighting

Statham, I.C.F. (ed) *Coal mining practice*. 4 vols, 1958. Vol 3 has a chapter on lighting.

Wardle, W. *A comprehensive reference book on practical coal mining*. 2<sup>nd</sup> ed 1887, 3<sup>rd</sup> ed 1889

Chapter on lamps, showing many types with drawings.

Whitaker, J.W. *Mine lighting*. 1928. Some historical content.

## Other books and research reports

Marsaut, J.B. *Miners safety lamps: an investigation*. 1884.

Reports of the Committee upon safety lamps experiments made at Aldwarke Main Colliery  
Midland Institute of Mining, Civil and Mechanical Engineer. *Transactions of the Manchester Geological Society* **18**, 1884, 186.

Mines Department *Firedamp : how it can be detected and measured by means of the flame safety lamp* Safety pamphlets 4A, 4B, 4C, 1928- 36.

Platt, C. B. *The Testing of Flame Safety Lamps*. Safety in Mines Research Establishment  
Research Report 88, 1954.

National Coal Board *Beware firedamp: how to detect it with a flame safety lamp*. 5<sup>th</sup> ed 1982.

## Lamp descriptions, illustrations, manufacturers

Rimmer, D., Chedgy, G. & Dawson, M. *Miners lamps of John Davis & Son*. 2014

Rimmer, D. & others *Miners lamps of Joseph Cooke, incorporating Hall of Birmingham*, 2013

Wolf Safety Lamp Company *100 years of Wolf safety lamps*. 2012

The Library has some catalogues from suppliers in the late 19<sup>th</sup> and early 20<sup>th</sup> Centuries, mainly reproduced in recent years by the Miners Lamp Collectors Society:

Richard Johnson Clapham and Morris

W.E.Teale

William Best

John Mills

Wedgewood, A *Catalogue of the collection of miners' safety lamps at NEIMME*

Descriptions and illustrations. The majority of this lamp collection was stolen in the 1970s.

See also the textbooks noted above.

## Legislation

Regulation of Coal Mines Act 1872 - locking

Coal Mines Regulation Act 1887 - inspection

Coal Mines Regulation Act 1896 - examination

Coal Mines Act 1911 - use, where, approved

Coal and other Mines (Safety Lamps and Lighting) Regulations 1956 – maintenance, examination, locking

## Government reports

*Royal Commission on Accidents 1881-6.*

Preliminary Report, 1881 has lamp details/testing

Final Report, 1886 has recommendations.

There is a summary of the Final Report in Pameley, C. *Colliery managers handbook*. Various editions.

Home Office. *Testing of Safety Lamps Committee*. 1912

Home Office. *Miners Lamp Committee Memoranda* 1920-24. Various testing reports and a Final report.

Mines Inspectors reports

Lamps are sometimes mentioned in particular Inspector's reports, perhaps with figures, eg 1889 J Dickinson (N&E Lancs) brief comments and figures for lamps in use

1895 J Dickinson (N&E Lancs) comments only

1904 J.B. Atkinson (Newcastle) figures for locking methods for lamps

1904 J.S. Martin (Southern) remarks and figures for lamps in use

## Statistics

There are no regular statistics for lamps in use, but the Inspectors Reports have occasional summaries, eg 1911 Part 2 Labour has the number by district in broad types, eg one gauze, two gauze and a summary by kind:

Marsaut	220210	Patterson	15204	Donald	5487
Ackroyd and Best	117697	Byfold	14497	Park Lane	4359
Cambrian	88346	Wolf	14345	Electric	4298
Protector	77971	Baxendale	12038	Routledge and Johnson	3791
Clanny	62857	Thorneberry	11173	Others	3673
Museler	29837	Davis	7646		
Deflector	24241	Davy	6264		

It also has figures by methods of lighting.

(See also the Government reports section above)

*Miners Lamp Committee Final report*, 1924 has some comparative figures:

	Marsaut	total flame	electric
1912			10727
1914	395139	679572	
1923	402682	584261	327929

## Journals

### News

Contain news, meeting reports, government activity, letters, illustrations. Much material on safety lamps.

These have indexes only by volume, so for specific items you need a good idea of the date.

*Colliery guardian* 1858-1988 weekly

*Mining journal* 1835-1985 weekly

### Institutional, including regional, journals

These have the text and the - often extensive - discussion of papers presented to meetings of the particular institution.

There are subject indexes covering various periods for some of these.

*Institution of Civil Engineers, Proceedings* 1837-1935

No specific articles, but lamps are mentioned in other articles.

*Institution of Mechanical Engineers, Proceedings* 1847-1971

Example article: Bagot, A Construction and comparative merits of the safety lamps generally in use. 1879, 219-231.

*North of England Institute of Mining and Mechanical Engineers, Transactions.* 1852-1920

Example articles:

Wood, N On safety lamps for lighting coal mines **1** 1852-3, 301-322.

Swan, J.W. On an electric safety lamp with portable secondary battery **31** 1881-2, 117-119.

*Federated Institute of Mining Engineers, Transactions.* 1889-1898

(Proceedings from regional mining institutes)

*Institution of Mining Engineers, Transactions.* 1899-1960

Example article:

Reid, C.C. and Reis, A.V. The light given by various types of miners' lamps **76** 1928-9, 361-390.

*National Association of Colliery Managers – Minutes of Proceedings* 1889-1967

Example article:

Mills, F.P. Notes on improved safety lamps **33** 1936, 265-285.

*Chesterfield and Derbyshire Institute of Mining, Civil and Mechanical Engineers, Transactions* 1871-1889

Example article:

Teale, W.E. Answer to the criticisms of the protector lamp **4** 1876-7, 290-298.

*Manchester Geological and Mining Society, Transactions* **1** 1841 - **33** 1914

Example article:

Stopford, T.R. Some recent improvements in miners safety lamps **31** 1910, 326-9.

*North Staffordshire Institute of Mining and Mechanical Engineers. Transactions.* **3** 1878-79 – **14** 1899

Example article:

Teale, W.E. On safety lamps **2** 1875-8, 263-278.

*South Staffordshire and East Worcestershire Institute of Mining Engineers, Transactions* **1** 1875 - **16** 1890

Example article:

Hughes, H.W. Notes on safety lamps **16** 1889-90, 39-48.

*Mining Institute of Scotland, Transactions.* **1** 1880-81 – **42** 1922-23; **48** 1927-28 – **49** 1928-29

Example article:

Ashworth, J. Ashworth's improved safety lamp **7** 1885-86, 195-206.

*South Wales Institute of Engineers, Transactions.* **1** 1857-59 – **96** 1981

Example article:

Walker, S.F. Portable electric miners safety lamps **15** 1886-8, 134-142.

[Researchers in universities, or who are members of an engineering institution, may have free

access to online versions of the Civil and Mechanical Engineers proceedings. Some other journals may be available in full text through the Internet Archive - <http://archive.org>]

## Tracts

The Tracts are collections of pamphlets, reports, newspaper articles, journal articles, etc. bound together. Items are mainly, but not totally from the 19<sup>th</sup> Century.

The contents are included in the Institute Library catalogue, so searching by keywords will find such material.

There is a lot of early material on lamps, eg. leaflets, pamphlets, newspaper cuttings, etc relating to Clanny, Davy and Stephenson. Other examples are:

*Coal mines ventilation, and safety lights : being a critical, philosophical, and scientific exposition of this grossly perverted subject ...in a series of eight letters, severally addressed to the Editor of the Sunderland Herald* by Non-professional. 1836. (Tracts **35**, 447-538)

*Practical observations on the phenomena of flame and safety lamps*, by John Murray. 1836. (Tracts **67**, 125-176)

*Report of the South Shields Committee appointed to investigate the causes of accidents in coal mines: containing an examination of-safety lamps; ventilation; ..... 1843.* (Tracts **216**, 5-107)

## Patents

Information in patent specifications is often not available in any other form, yet can be crucial in looking at technical development, whether for a specific artefact, such as a lamp, or for more general trends.

The Institute Library does not have any patents relating to lamps, but Newcastle City Library does have a good historical collection of patent abstracts (also known as abridgements) and the associated author and subject indexes. A guide: *Historical patent searching* is available in the City Library Business and Intellectual Property Centre.

## Websites

*National Mining Memorabilia Association*

<http://www.mining-memorabilia.co.uk>

For collectors of memorabilia – lamps, badges, tallies, etc.

*The Flame Safety Lamp - Pitwork*

<http://www.dmm-pitwork.org.uk/html/garforth.htm>

*Miners Lamp.co.uk*

<http://www.minerslamp.co.uk/index.html>

Buys and sells lamps

*Miners Lamp Collectors Society*

<http://www.thebigmeet.org/index.html>

*Protector Lamp Company*

<http://www.protectorlamp.com/>

"Protector's Flame Safety Lamps have been in constant use since 1873 and the GR6S Garforth miners lamp is still the approved method of checking for firedamp in all UK coal mines. A modified version of this lamp has carried the flame for most Olympic and other torch relays over the last 30 years