

N. 648 (220) 12718 W4
- March 12, 1890

- Empire Theatre -
Ventilation

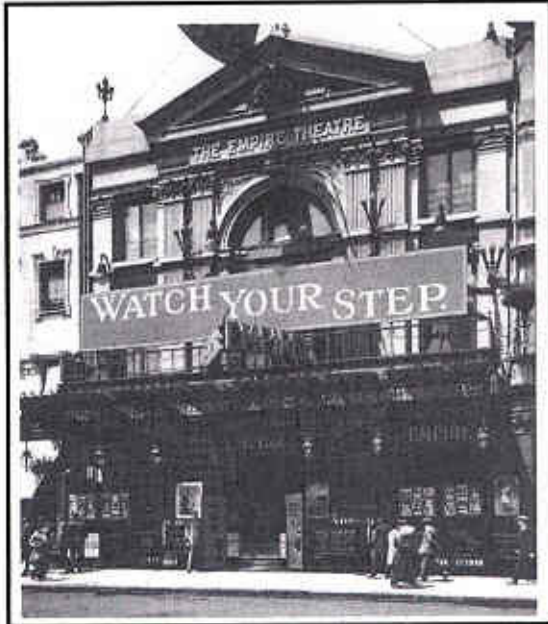
Instructions for management

1st - attention to be paid to the Gas Engine, and Fans, and seeing for driving same, that they are kept in proper working order, all working parts being kept clean and well lubricated, and any defect that may be found to be reported at once to the Manager.

2nd - The casings of the Fans and Fan blades to be cleaned and painted once a year if found necessary.

Operating & Maintenance Instructions

Where the instructions, often hand-written, for the engineering services of a particular building can be found, these are extremely important to the understanding of the system being examined. Typically, they will detail the plant as installed and provide information on the types and capacities of the main items of equipment. Victorian examples often also give advice on hours of operation, opening and closing of windows, and operation of the gas lighting



New South Wales
Ventilation & Heating

Instructions as to management of Apparatus.

Description The Heating Apparatus is a Low-pressure Steam with all parts of construction guaranteed to the Works continuously.

The indication of the steam over the Building is in a distinct whistle, and a signal lamp is fixed near Boiler indicating the several floors worked from each source.

The Heating is by direct radiators and all the Radiators are fitted with regulating valves and self-acting air valve.

The efficient working of the apparatus will much depend upon the intelligent action by the Engineer in charge, who should by the use of the thermometer, regulate the temperature, regulate the economy thus for burning to obtain the required heat and ventilation of the Building.

Remarks A registering thermometer must be fixed outside the Building

Opposite page

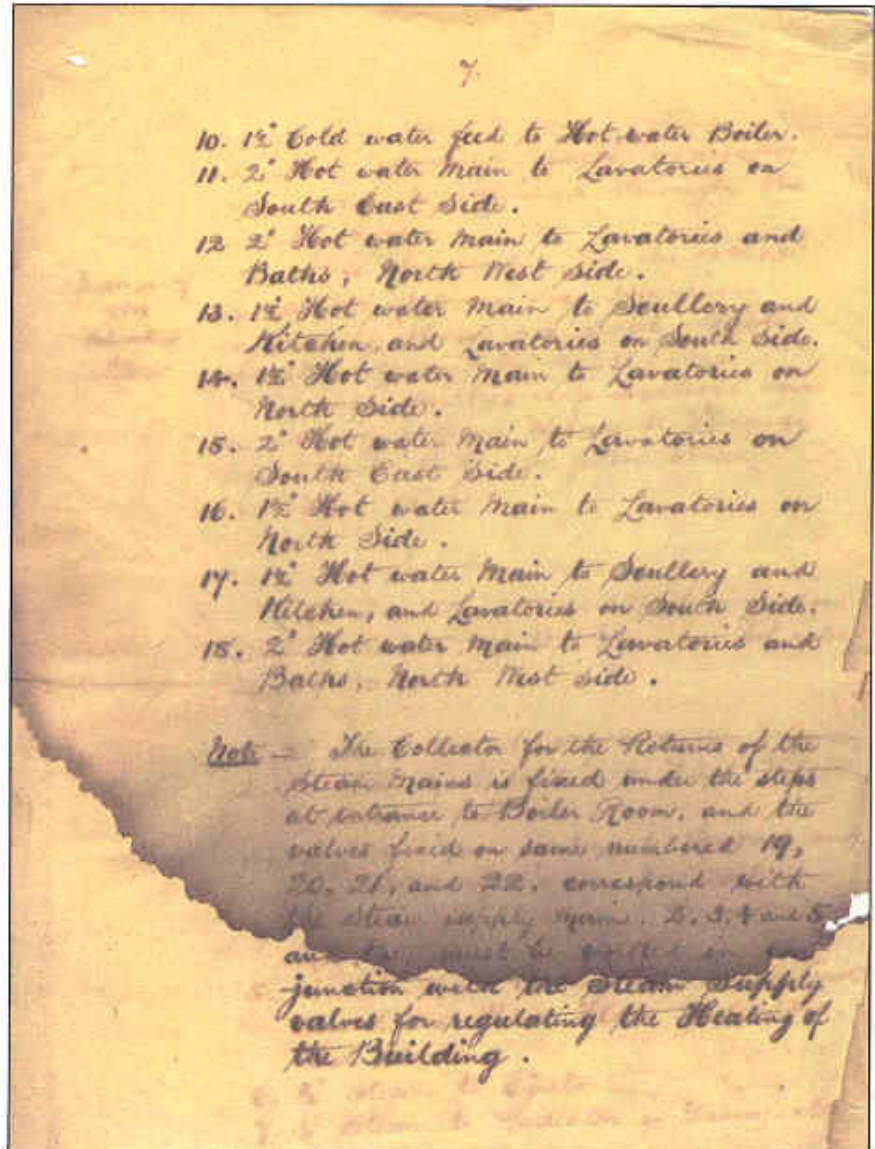
Left Instructions for Management, written by Wilson Phipson, dated 12 March 1890, for the operation and maintenance of the ventilation at the Empire Theatre, Leicester Square, London. They show the plant had fans, driven by gas engines, and that the theatre had both electric and gas lighting [PC/49]

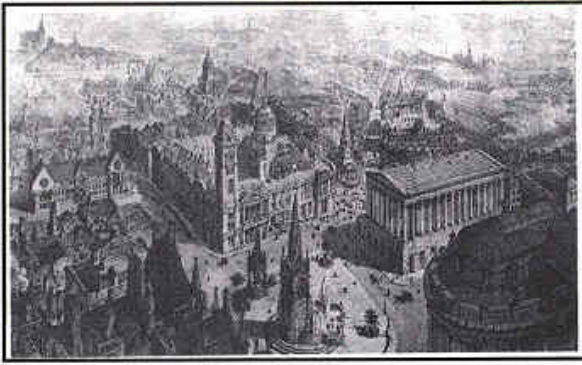
The Empire Theatre, 1915 [Eric de Maré]

Right Instructions as to Management of Apparatus (steam radiators, stoves and cross-ventilation by opening windows), written by Phipson, undated (late 1880s) for a new, unnamed French Hospital [PC/45]

This page

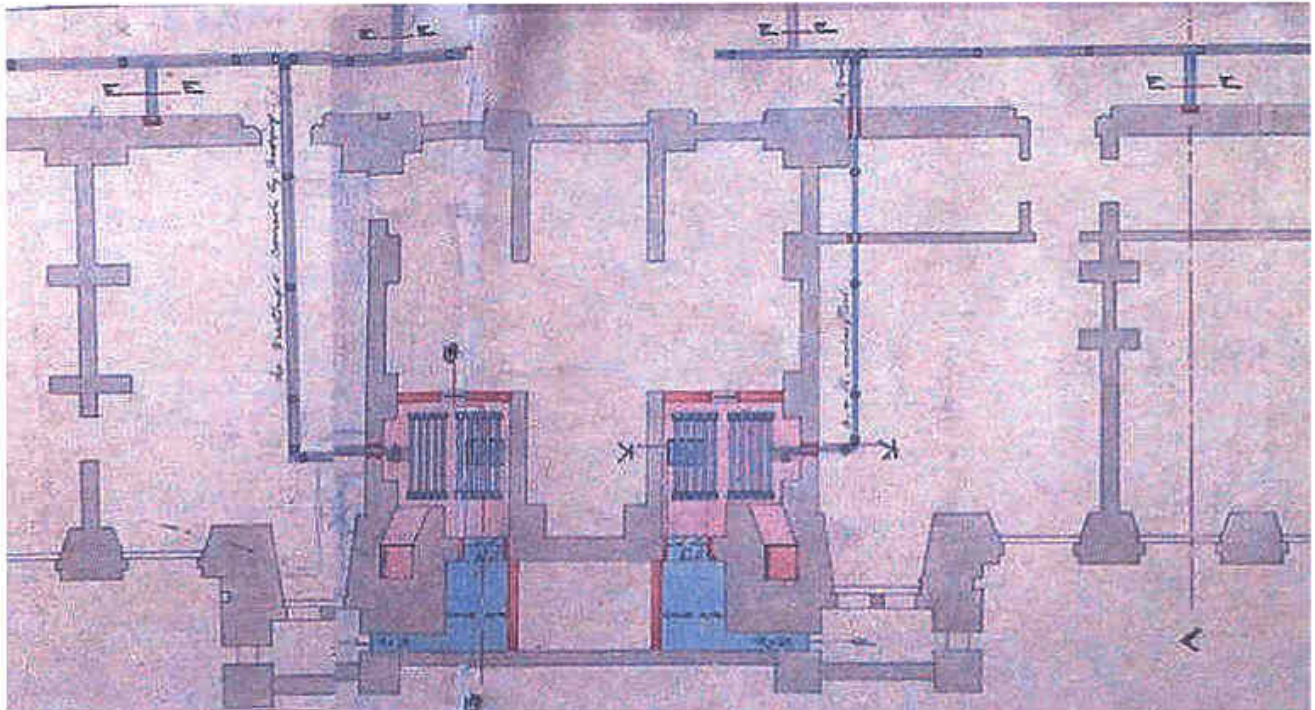
Extract of the Instructions for the same unnamed French Hospital with a schedule of valves, listing valve number and function [PC/45]

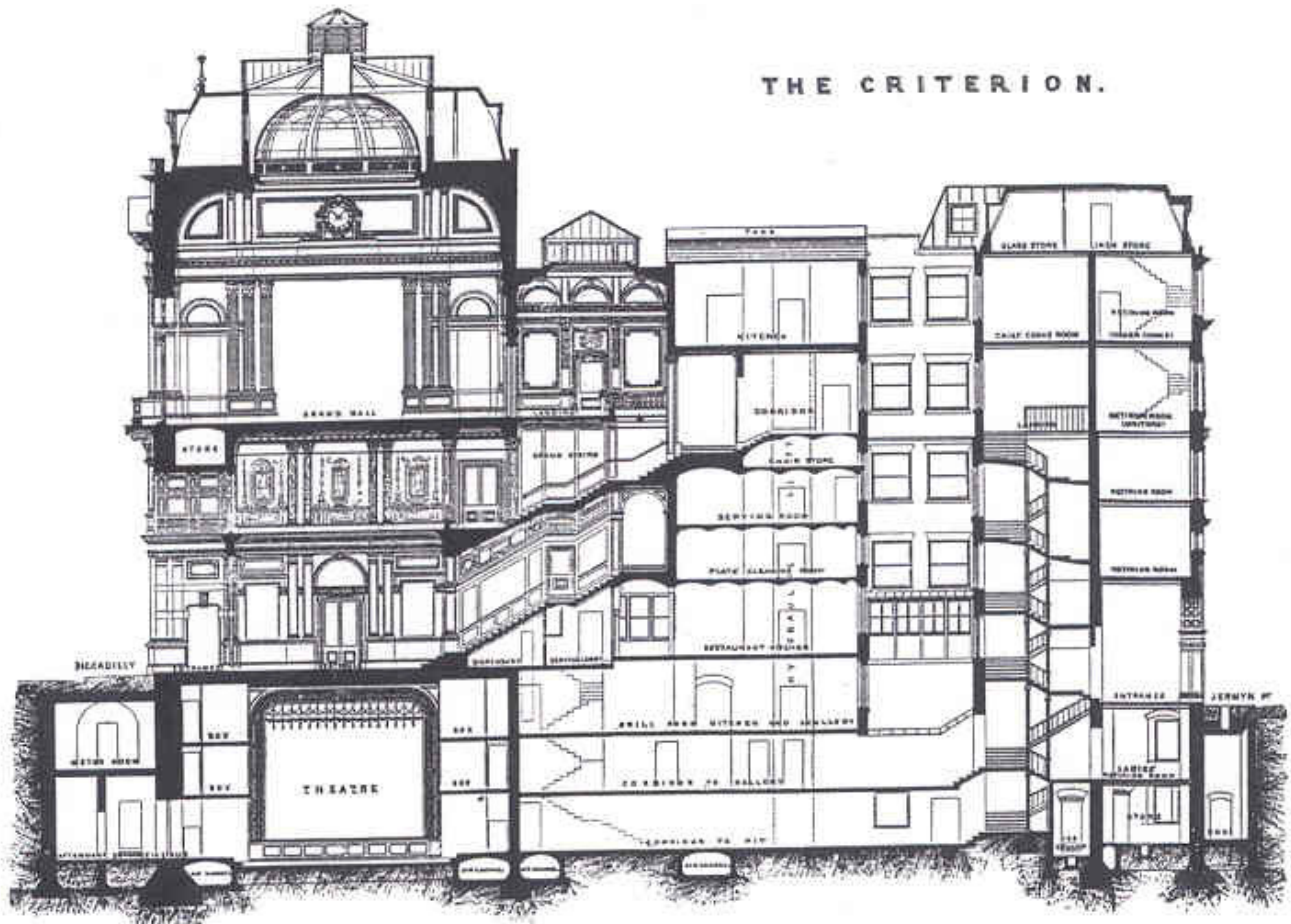




Drawings

Architectural plans and sections and views of buildings are a useful source of background information when investigating historic building engineering services. However, there is no substitute for finding either the original services scheme drawings or good, clear copies of them. Unfortunately, engineering drawings, either in original or copy form, are extremely rare.





The Criterion Theatre & Restaurant London, 1870-4. Wilson Phipson provided warm air ventilation for the basement theatre, the system being upgraded in 1884.

Opposite
 Top Chamberlain Square, Birmingham, c.1900, showing the Council House (centre) and the Town Hall (right), both Phipson projects [Birmingham Public Libraries]
 Btm Detail from the Phipson drawing (front cover of this book) showing the heating & ventilating scheme for the Birmingham Council House, 1875 [BLRC.45/2]



Record Photographs

Contemporary photographs of building interiors may reveal, on close inspection, details of buildings services, such as radiators, heating pipework and lighting arrangements. Modern photographs may help understand the building and show features such as windows and courtyards which influenced lighting and ventilation systems design.

Prudential Assurance, Holborn Bars, London, 1905 [RCHM]

Above *Clerks Office, Woods Hotel block*

Clerks Office, Greville Street block

Right *Cashiers Office*

Opposite page

Top l-r *Royal Holloway Sanatorium, Egham, 1879-84 [NMR BB83/5908]*

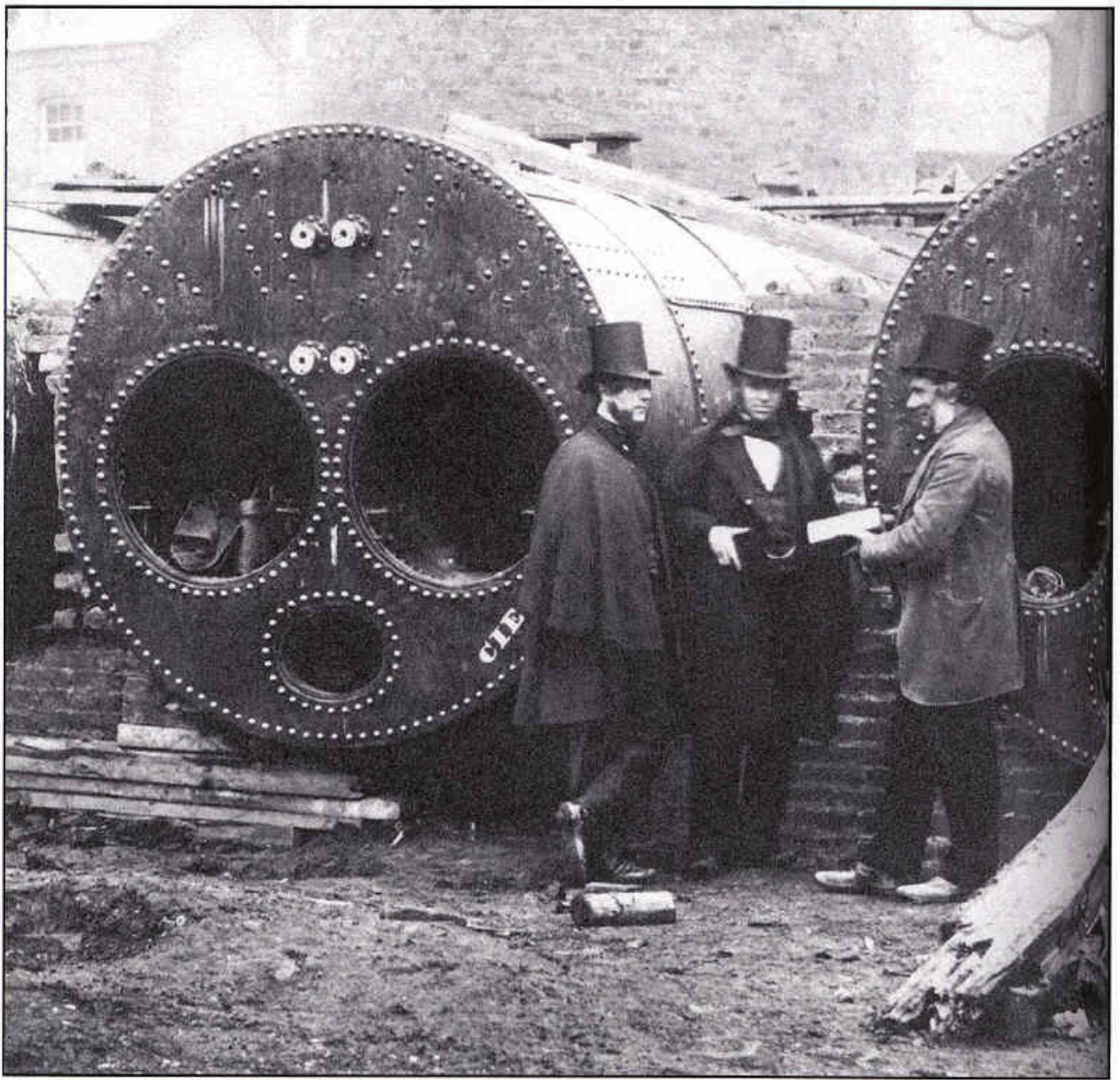
Natural History Museum, S Kensington, 1870-81 [PRO 30/1007]

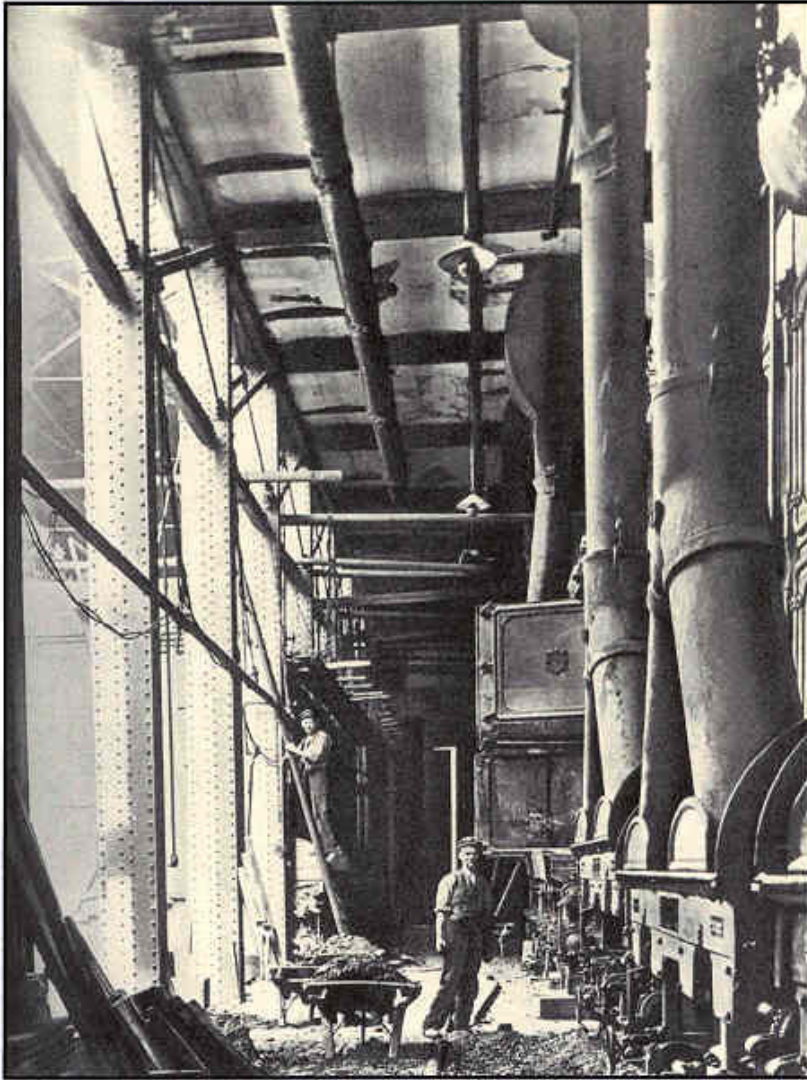
Btm l-r *Royal Holloway College, Egham, 1879-87*

Liverpool Royal Infirmary, 1885-9. Note the circular radiator [Liverpool RO]

Wilson Phipson was the engineer for the projects on both pages.

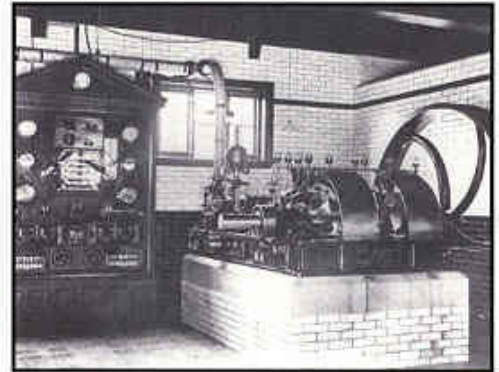




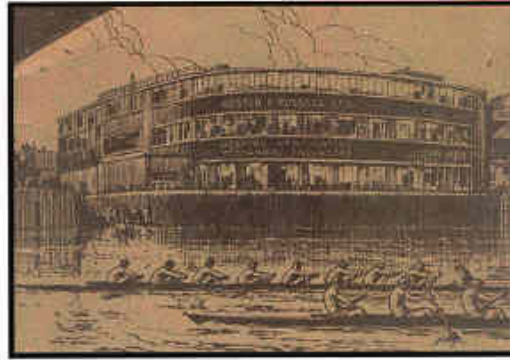
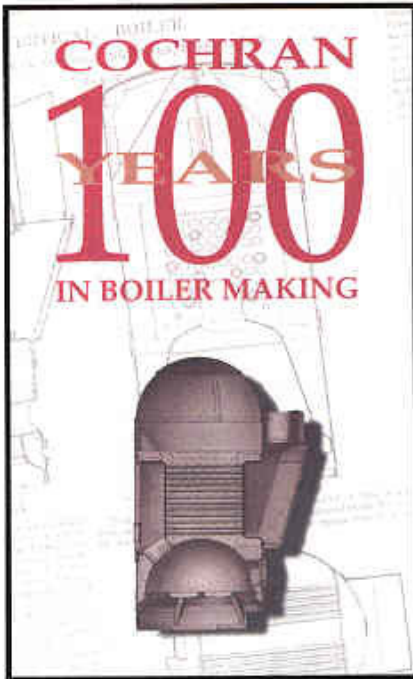


Opposite page
*Engineers supervising the installation of
boilers for the International Exhibition,
London, 1862 [V&A Museum]*

Left
*Boiler house of the City of London
Electric Lighting Company, Bankside,
London, c1890s [Guildhall Library]*



*Electricity generating plant at
Paddockhurst, Sussex, c.1897
[Country Life]*



Ashwell & Nesbit Ltd

1879-1969

Company Histories

The published history of a company can be a rich source of information on its products, people, its clients, projects and all sorts of activities.

UK companies engaged in building services with their history in print include Fred G Alden, Ashwell & Nesbit, Cochran, Colt Group, Drake & Gorham, Drake & Scull, Garton & King, Gas Light & Coke Company, Haden, How Group, Rosser & Russell, John Thompson, and J Roger Preston & Partners. Information on other organisations is available in books which are semi-biographical, relating the story of the founder and the company itself: *Henry Lea* (Hoare Lea & Partners), *Oscar Faber*, and *Mr Copperad* (Basil Tanner).

Similarly, there are American books covering companies working in the UK market. Examples include Honeywell, Johnston and Lennox, all of which have issued centenary publications. Biographies include those on Willis Carrier, John Gorrie, Joseph Nason and Warren Webster.

1886

1961

**DRAKE
& GORHAM**

Some account
of the
first 75 years...



George Haden



James Haden

HADEN 1816-1991

Haden celebrate this year the foundation of their Company 175 years ago, when in 1816 George and James Haden first started work on their own in the town of Trowbridge, Wiltshire. The Industrial Revolution had gathered momentum during the latter half of the 18th century and by 1816 it was well advanced, so that men were able to exploit the inventions of earlier generations by applying them to quite new uses, a formula for success that the Company follows to this day.

The two brothers were very different in personality. From his letters to his father George appears as somewhat pious but he was the more dynamic of the two brothers, and probably the better business manager.

James, a bachelor, was possibly of a less dedicated temperament, although like George he worked extremely hard.



Trowbridge Works



*Part of the introductory page of "Haden: A Short History of The Company, 1816-1991."
However, the picture is not of the Haden Trowbridge Works, but is of the Boulton & Watt
Soho Manufactory, Birmingham, the mistake probably due to the fact that G & J Haden was
originally established as the West Country agent for Boulton & Watt steam engines.*

2481 Form B. 41 2
The Institution of Civil Engineers, *1878*

ESTABLISHED BY CHARTER IN 1801 - INCORPORATED BY ROYAL CHARTER, MAY 2, 1878
 25, GREAT GEORGE STREET, WESTMINSTER, S.W.

12 Dec 1878
 We, whose names are hereunto subscribed, submit to the Council of THE INSTITUTION OF CIVIL ENGINEERS, the propriety of transferring *Wilson Weatherley Phipson* of *1 Salisbury Street, Strand, W.C.* from the class of ASSOCIATE, in

Candidates and Successors and Address in full.

which he was elected on the 12 day of *January* 1878, to the class of MEMBER, because for 3 years (1856-58) he was an external pupil of the *Bank of the Thames at Paris*; his (for 2 years, 1858-60) was a sub-contractor under *W. Van Steen*, building & rebuilding towers, and was employed in connection with several hospitals and other public buildings in France and in Holland; and since 1859 has been in practice on his own account, and has designed and carried out the heating and ventilating arrangements at many important public buildings, as the *Royal Albert Hall, the Theatre Francaise, the Alexandra Theatre, Newcastle, Glasgow, the National Provincial Bank of England (London), the Bank of the North of England, the Bank of the Middle East, and the Bank of the East of India, London, Birmingham, Cambridge, Ipswich, Cardiff, the Victoria Hotel, the Royal Marine Barracks, Westport, &c.*

The qualifications of the Candidate must be distinctly specified according to the spirit of Arts 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, of the By-Laws (See the NEXT Page).

Witness our hands this *21st* day of *December* 1878

Signatures of at least TEN MEMBERS of the Institution, from Personal Knowledge of the Professional Career, and from a full conviction of the Qualifications of the Candidate.

<i>W. Anderson</i> <i>William Houston</i> <i>C. F. Varley</i> <i>R. A. Morrison</i> <i>Edward Lester</i>	<i>J. W. Easton</i> <i>Charles William Gregory</i> <i>Charles Humphrey</i> <i>Edw. Birch</i> <i>John Inman</i>
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The Council of THE INSTITUTION OF CIVIL ENGINEERS, meeting on the *Twenty-sixth* day of *February* 1878, transfer *Wilson Weatherley Phipson* from the class of ASSOCIATE to the class of MEMBER.

To be filled up by the Council.

Read for the first time *10 Feb 1878*
 Passed by the Council *26 Feb 1878*
 Signed, *W. H. Bacon* Chairman.
 Candidate's circular submitted prior to transfer to member, *26/2/1878*

INSTRUCTIONS FOR FILLING UP THE FORM ARE ANNEXED.

W W Phipson's Application (Form B) for Transfer to Member of the Institution of Civil Engineers. Passed by the Council 26 February 1878 [ICE Archives]

Business Associations

One method of researching building services systems of historic interest and locating additional information is to find out as much as possible about the business relationship between the parties involved.

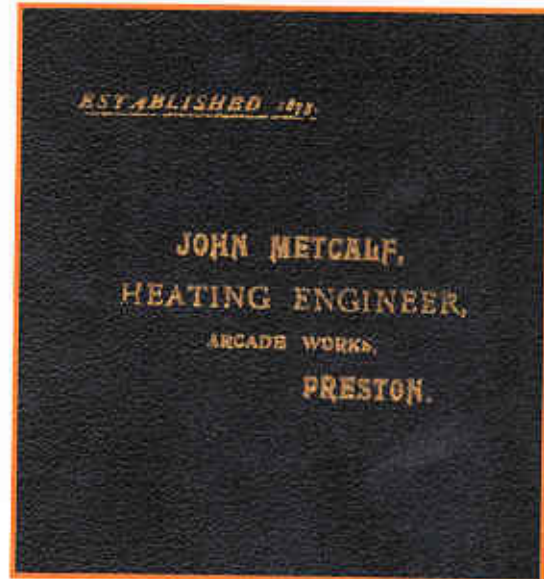
For example, the client may have required a particular type of building to operate his business, say, banking. He may have regularly employed a certain architect, who then became accustomed to his client's requirements. In turn the architect may have engaged a particular services designer. The designer may have favoured a particular form of heating, say, hot water and preferred certain boiler or radiator manufacturers, or one installer in preference to others. There may be a link to a builder, and so on.

Where information is lacking on the system under review then following business association links may at least open up some avenues of research and probable results.

By way of example, Phipson worked for the architects John Gibson, T Marsh Nelson and Alfred Waterhouse. When starting out Phipson worked with Nelson (a friend of his Father) on Rothschild's Piccadilly mansion (1862), Rothschild's Bank in St Swithin's Lane (also 1862) and then the Junior United Services Club in Regent Street (1868). Gibson was Architect to the National Provincial Bank of England and Phipson designed services for their banks at Bishopsgate in London (1863-5), Newcastle-upon-Tyne (1872) and Piccadilly, London (1877). He also worked with Waterhouse in London on the Natural History Museum (1877-80), The National Liberal Club (1885-7) and the Prudential in High Holborn (1878-91); also on the Liverpool Royal Infirmary (1866).

We also know that Phipson tended to use certain suppliers: Fraser & Fraser for boilers, Benham for kitchen equipment and Longden for radiators.

Other associations may be geographical or religious. G & J Haden began in Trowbridge in 1816 and went from installing steam engines to making heating stoves and then installing heating systems. Many early installations by Haden were for West Country churches, and several others were by the Bristol-based contractor Vincent Skinner (1880). John Metcalf, established as a heating engineer in Preston (1873) heated numerous Catholic churches, convents and schools throughout the country. It is possible to compile a database of such links.



Catalogue of John Metcalf, Preston, c.1900

NOTICE OF REMOVAL.

SKINNER & BOARD,

Horticultural Builders, Ironfounders,

AND

Hot-Water Apparatus Manufacturers,

STOKES CROFT, BRISTOL.

(Patentees "Venetian" Orchard Houses).

January, 1894.

DEAR SIR OR MADAM,

We beg most respectfully to inform you that in consequence of the death of our senior partner, Mr. VINCENT SKINNER, we have removed our business from above address to more extensive and central premises situated in

RUPERT STREET, BRISTOL.

We shall be most happy to receive the continued favour of your esteemed orders, which shall have our usual prompt and careful attention.

We beg to enclose herewith our circular of Hot-Water Heating and Horticultural Building, and to submit to your notice our New Patent "Venetian" Orchard House, which we are now erecting, and for which we are receiving the highest commendation, both for its simplicity and adaptability for all kinds of fruit culture.

We shall be most happy to quote you for the same, to any dimensions, or for any other kind of Horticultural Building, or Hot-Water Heating you may require.

Yours faithfully,

SKINNER, BOARD & Co.

1816/27 1035

Removal notice issued by heating engineers Skinner Board of Bristol in 1894

LONGDEN & CO.
PHOENIX FOUNDRY, SHEFFIELD.

SOLE MAKERS OF
THE "SUNBEAM" PATENT RADIATORS.

Prepared either for steam or hot water.
 All joints are screwed.
 No India-rubber or other packing used.
 10,000 Radiators of our make in use in Great Britain.
 Made in circular and other forms.



Trade **SUNBEAM.** Mark.

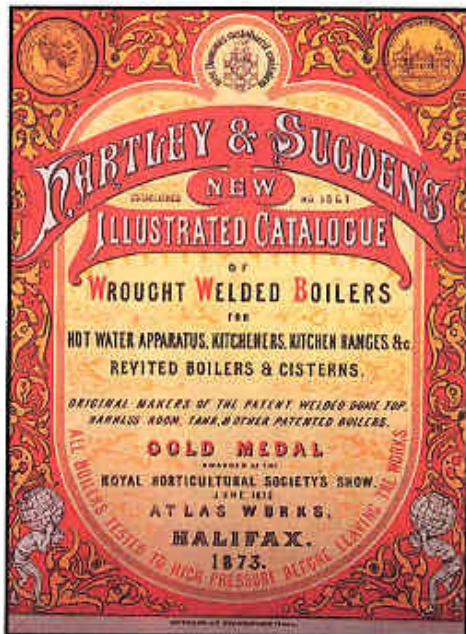
LONDON OFFICE: 447 OXFORD STREET, W.

These Radiators are used in the following places:—
 New Town Hall, Sheffield; National Portrait Gallery, Edinburgh; Natural History Museum, South Kensington; New Assize Courts, Birmingham and Nottingham; Guildhall, Gloucester; Howe Town Hall; Ventnor Royal Hospital for Consumption; Polytechnic Institute, Regent Street, London; St. Paul's Schools, West Kensington, London; Coats' Memorial Church, Paisley; and many other public and private edifices.

Opposite page
 Top *Useful Hints on Ventilation, 1850*
 Btm *Practical Ventilation and Warming, 1881*

Left and below
Longden & Co, Sheffield, Radiators, 1897
Hartley & Sugden, Halifax, boiler catalogue, 1873.
Lumby, Son & Wood, Halifax, boilers, 1890

Textbooks, Catalogues & Advertisements
 Contemporary books dealing with building services, written by experts in their field, together with manufacturers' catalogues and trade advertisements are an important tool in identifying systems and equipment.



HARTLEY & SUGDEN'S
 NEW
ILLUSTRATED CATALOGUE
 OF
WROUGHT WELDED BOILERS
 FOR
 HOT WATER APPARATUS, KITCHENERS, KITCHEN RANGES &c
 REVIVED BOILERS & CISTERNS.

ORIGINAL MAKERS OF THE PATENT WELDED DOMED TOP
 BARRILL'S ADDON, TANK, & OTHER PATENTED BOILERS.

GOLD MEDAL
 AWARDED AT THE
 ROYAL HORTICULTURAL SOCIETY'S SHOW
 JUNE 1873

ATLAS WORKS,
HALIFAX.
1873.

ALL BOILERS TESTED TO HIGH PRESSURE ACCORDING TO THE WORKS

LUMBY, SON, & WOOD, LIMITED,
 MANUFACTURERS AND IMPORTERS OF
WROUGHT WELDED AND RIVETED BOILERS,
For Hot Water Heating Apparatus, Kitchen Ranges, &c.
FIRE & BURGLAR-PROOF SAFES.



Patent "Gold Medal Excellence" Boiler,
 The most Economical and Efficient system.



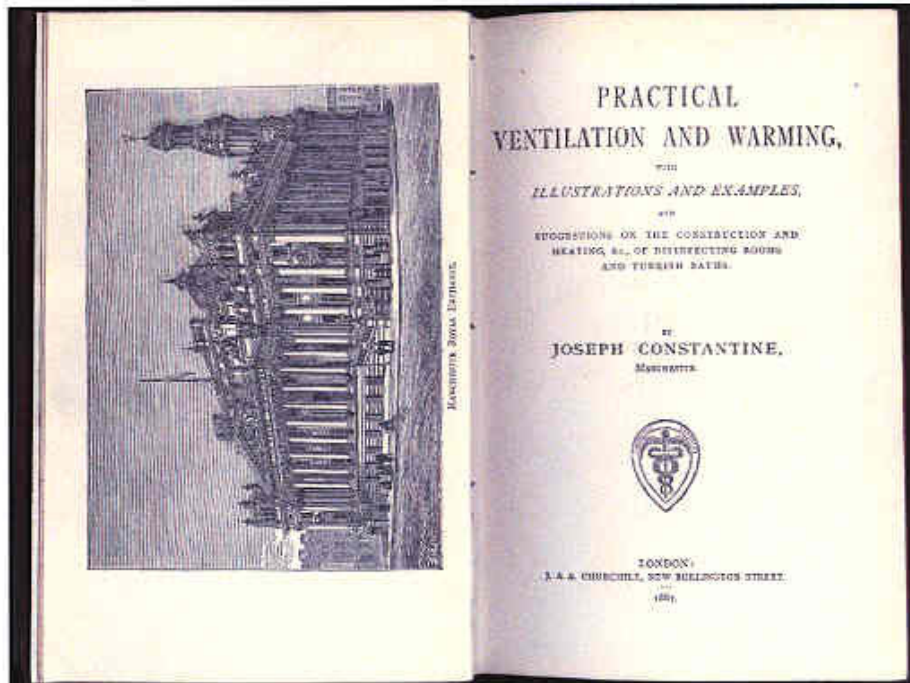
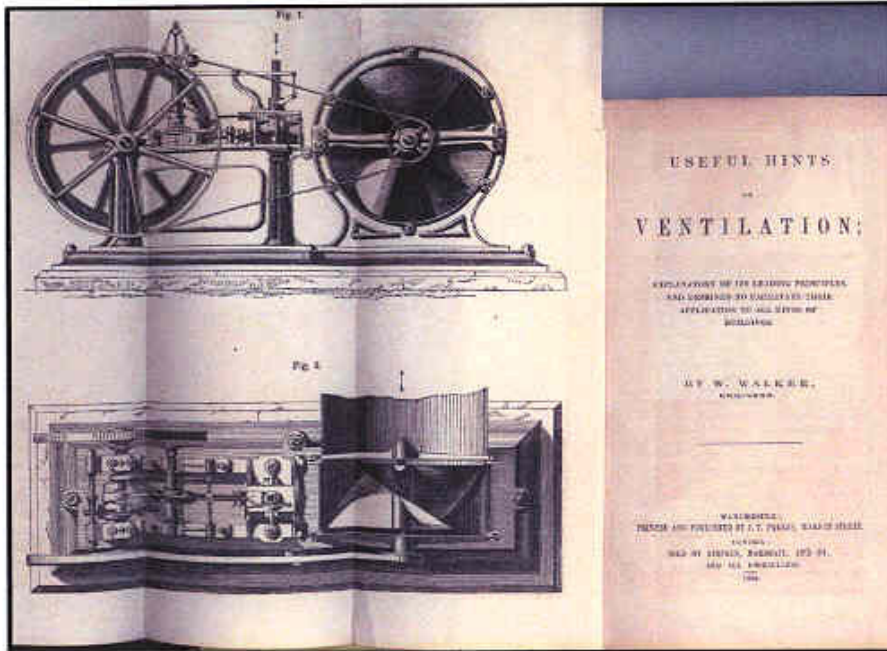
"Firebray" Boiler,
 For heating one work of Greenhouses.



The "Colossal" Boiler, and also the Best Boiler of the Boiler Works Co.

Gold Medal for Boiler, Paris, 1875. Gold Medal, Paris, 1878. Gold Medal for Boiler, 1878. Gold Medal, Paris, 1889
 (The only Gold Medal ever awarded at an International Exhibition.)
 The Oldest & Largest Makers in the World. Medals awarded whenever exhibited.

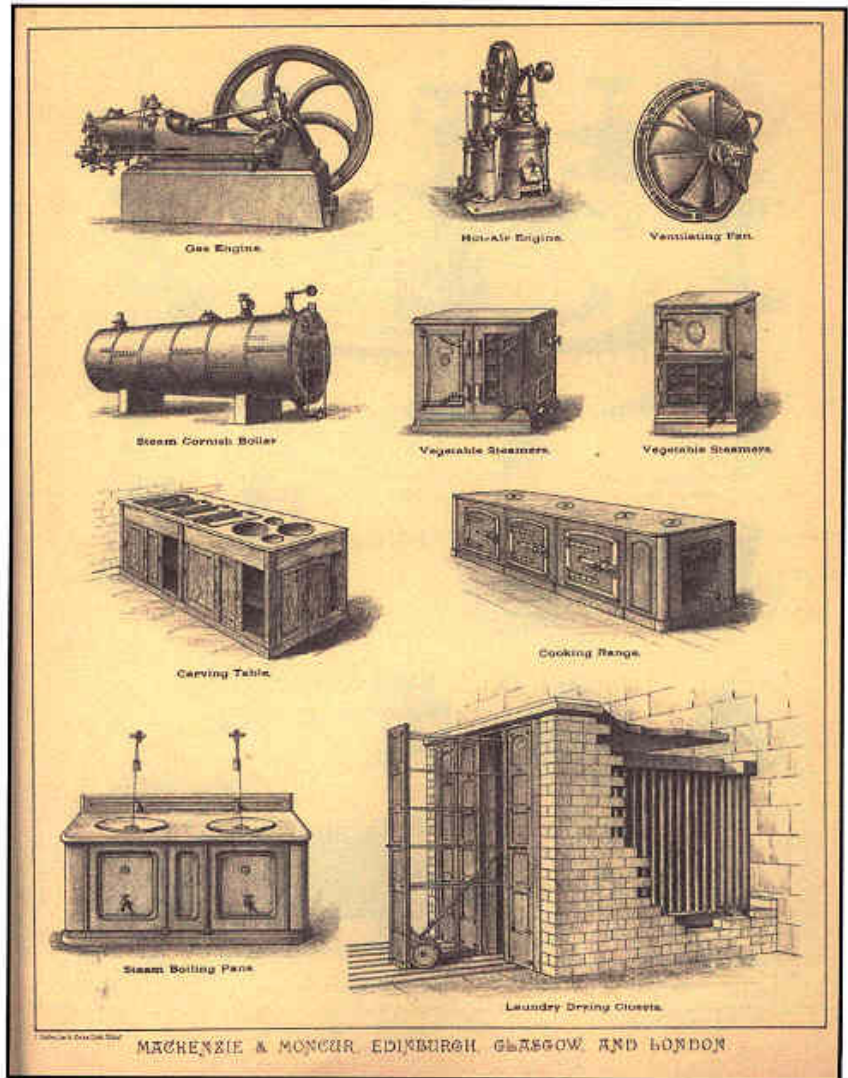
WEST GROVE WELDED BOILER & SAFE WORKS,
 JOHNSTON'S
 "LUMBY," HALIFAX. H. A. L. I. P. A. S.





Catalogue of Mackenzie & Moncur, Heating & Ventilating Engineers, 1900

Mackenzie & Moncur catalogue page showing engines, fan, boiler and kitchen equipment



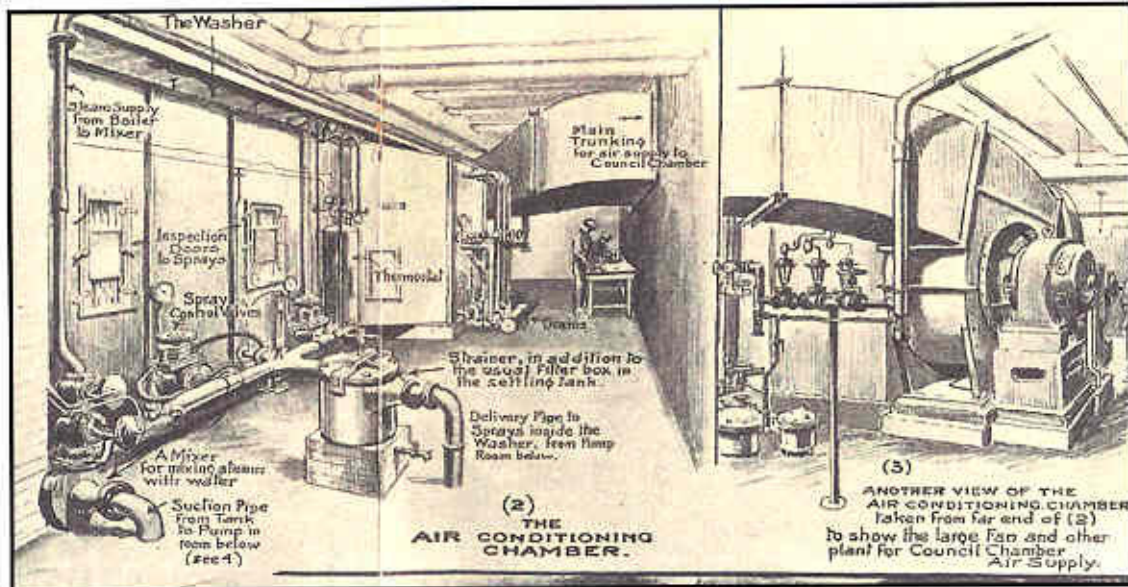


First IHVE Summer Meeting, Stourbridge, 1899 [CIBSE]

Institutions and Societies

The archives and libraries of various professional institutions, learned societies and trade organisations can be a useful source of information and illustrations relating to building engineering services. Organisations specialising in this branch of engineering date only from the close of the 19th century. Before this building services records may feature as a very small part of more broadly based institutions. The very earliest organisations include the Worshipful Company of Plumbers (1365) and the Worshipful Company of Tallow Chandlers (from c.1300, Grant of Arms 1456). Next came the Royal Society (1660). There is then a gap until the Royal Institution (1799), the Royal Institute of British Architects (1837), the Institution of Mechanical Engineers (1847), the Institution of Gas Engineers (1862) and the Institution of Electrical Engineers (1880). An important institution as regards building services is the Institution of Civil Engineers (1818) as a number of important heating and ventilating engineers were members.

Specialised building engineering organisations include the Sanitary Institute (1876), the Institution of Heating and Ventilating Engineers (1897), the Institute of Refrigeration (1899, originally the Cold Storage and Ice Association), the Institute of Plumbing (1906) and the Illuminating Engineering Society (1909). The IHVE and the IES are now amalgamated as the Chartered Institution of Building Services. The CIBSE includes the Society for Light and Lighting, the Society of Public Health Engineers, and the CIBSE Heritage Group (1973). Early UK trade organisations are the Plumbers Company (1886), the Electrical Contractors Association (1901) and the Heating and Ventilating Contractors Association (1904). Information relating to UK systems, equipment and buildings is also available from the American Society of Heating and Ventilating Engineers (1894) and the American Society of Refrigerating Engineers (1904), now combined as the American Society of Heating, Refrigerating and Air Conditioning Engineers.



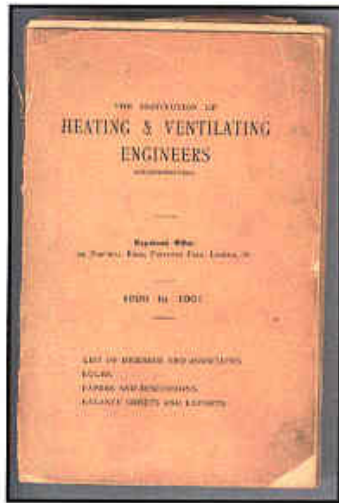
London County Hall, Westminster, Council Chamber Air Conditioning
Scientific American, November 1922, pp.328-9

Transactions, Proceedings, Journals & Magazines

Some building engineering information is available in early scientific, engineering and building publications: *Philosophical Transactions* (1660), *ICE Proceedings* (1818), *The Illustrated London News* (1842), *The Builder* (1843) and *The Engineer* (1856). Early news about the IHVE appeared in *The Ironmonger* and *Domestic Engineering and Estate Engineer* (subtitled *A monthly journal published in the interests of the Heating, Ventilating, Lighting and Cleaning Industries*). This was supplanted by the *IHVE Proceedings* (1901-33), which then continued as the *IHVE Journal*. *The Illuminating Engineer* (1908) was adopted as the journal of the IES, later (1936) becoming two publications, *Light & Lighting* and the *IES Transactions*. Early trade magazines include *Heating & Ventilating Engineer* (1927), *The Steam Engineer* (1931) and *Electrical Times* and *Electrical Review* (both over a hundred years old). Later titles include *Heating & Air Treatment*, *Plumbing* and *Electrical Design*.

Numerous articles in the American press relate to UK building services. Publications include *Scientific American* (1845, originally titled *The Advocate of Industry and Enterprise, and Journal of Mechanical and Other Improvements*), *The Journal of the Franklin Institute* and *Harper's Weekly*. At the close of the 19th century there was *Domestic Engineering*, *The Metal Worker*, *Engineering Review*, *Manufacturer and Builder*, *Ice & Refrigeration*, *Cold Storage & Ice Trade Journal*, *ASHVE Transactions*, *The Heating & Ventilating Magazine* and *American Electrician*. Later came *Heating, Piping and Air Conditioning* (1929), which originally incorporated the *ASHVE Journal*. Other magazines include *Air Conditioning*, *Heating & Ventilation* and *Actual Specifying Engineer*.

Many of the titles mentioned are no longer published.



First issue of the IHVE Proceedings, 1901. An index of Proc.IHVE and the IHVE Journal can be found in the 1971 IHVE Guide (Blue) Book

Right
An 1897 issue of the US magazine Domestic Engineering, the year of the founding of the IHVE. Note the recycling hole (top left corner) with the instruction "Well, I'll be hanged."

WELL, I'LL BE HANGED

DOMESTIC ENGINEERING

PLUMBING . . HEATING . . LIGHTING . . VENTILATING

Whole (March 1897) 34 CLARK ST., CHICAGO, MARCH, 1897 Vol. 11, No. 3

NEW YORK, BOSTON, MINNEAPOLIS, DENVER
AMERICAN RADIATOR CO.
CHICAGO, ILL. ST. LOUIS, MO.

STANDARD RADIATORS

Combining
BEAUTY AND EFFICIENCY

MADE IN ALL HEIGHTS
SINGLE, TWO & THREE
COLUMN, 70'S


WATER AND STEAM

BEST FOR CONDENSING

Standard Radiator Co.

CHICAGO, ILL. ST. LOUIS, MO. BUFFALO, N.Y.





E. W. BLATFORD & CO. CHICAGO

ESTD. 1854 1890

A POWER STATION

TELEPHONE MAIN 1940.
TELEPHONE MAIN 3507.

RAYMOND LEAD CO.

CHICAGO

Our extensive production helps make possible an ever-widening range of the best radiators of the Domestic Engineering Co. The experience of our engineers in every part of the world is here and evidence of the value and utility of our products. We produce our radiators in the most modern and complete works. GREATEST VARIETY, LOWEST PRICES, PROMPT AND RELIABLE SERVICE.

JENKINS BROTHERS MANUFACTURERS OF Valves, Discs, Packing, Water Cocks
Washers, Automatic Air and Pump Valves. We also manufacture all
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO.

BUFFALO VENTILATING FANS

CHICAGO, ILL. ST. LOUIS, MO. BUFFALO, N.Y.

NEW YORK, BOSTON, PHILADELPHIA, CHICAGO.

F. E. CUDELL'S
Patent Sewer-Gas and Back-Water Trap

For Wash Basins, Sinks, Baths and Wash Tubs.
WEST CLEVELAND, OHIO.

BUFFALO FAN SYSTEM
OF HEATING AND VENTILATING

CHICAGO, ILL. ST. LOUIS, MO. BUFFALO, N.Y.

FARNAN
BRASS WORKS, CLEVELAND, OHIO

TO PRODUCE BY THE HIGHEST METHOD, RELIABLE OF FLUCTUATING PRICES.

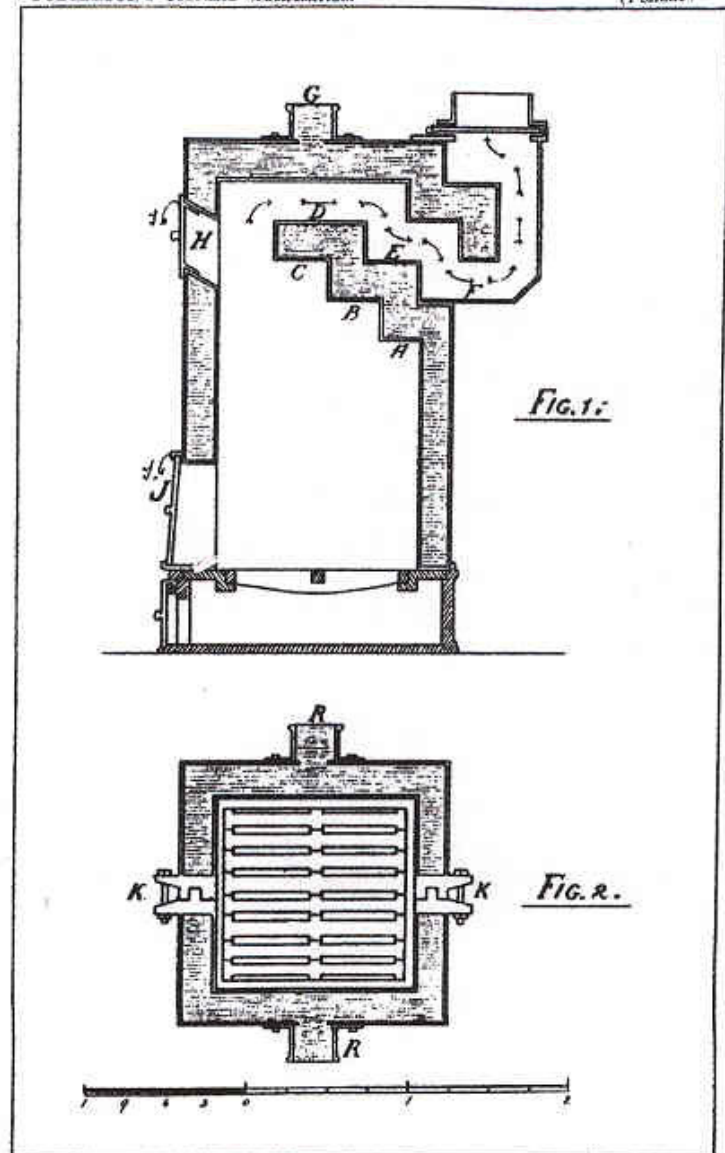
OUR AIM
TRUTHS AN ACTUAL TEST OF 200 POUNDS . . . BEST METAL

PRESSURE REGULATING AND BACK PRESSURE VALVES FOR UTILIZING EXHAUST STEAM FOR HEATING PURPOSES. T. KIELEY, 7-11 West Thirtieth Street, New York



Patents

A useful source of drawings and details of construction of building engineering services equipment and systems is the UK Patent Office (which holds details of early British Patents). Similarly, records of the United States Patent Office may be consulted.



[This Drawing is a reproduction of the Original on a reduced scale.]

N^o 5182



A.D. 1894

Date of Application, 13th Mar., 1894—Accepted, 30th June, 1894

COMPLETE SPECIFICATION.

An Improvement in Boilers for Heating Greenhouses and other Structures.

I, THOMAS POTTERTON, of "Norman Hurst," 122 Cavendish Road, Balham in the County of Surrey, Hot Water Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 Usually the flue from an independent hot water boiler passes away at the top, there being a clear way to same directly over the fire, by which much of the heat is conducted away and wasted. My invention relates to a boiler by which I avoid this waste of heat, as I shall describe in accompanying drawings.

10 Fig. 1 is a vertical section, and Fig. 2 is a sectional plan of a boiler according to my invention.

I make the boiler in two sections, right and left hand, which are bolted together K K, each part having zig-zag projections A. B. C. over fire. The top part of each section is made parallel to the part over the fire, thus forming a zig-zag flue D. E. F.

- 15 A feed hole H, and clinker door J are provided in front. A flow pipe G from top of each section, and return pipe R from side of each section, provide for water circulation. These two parts are made so that these pipes may have the same or independent circulation.

20 Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

A boiler having zig-zag projections over fire, and constructed to a form a zig-zag flue, to act substantially and for the purpose set forth.

Dated this 13th day of March 1894.

25

THOMAS POTTERTON.

Further Reading

Some modern information sources

Billington, N S & Roberts, B M 1982 *Building Services Engineering: A Review of its Development*, Pergamon Press, Oxford (an illustrated history)

Donaldson, B & Nagengast, B 1994 *Heat & Cold: Mastering the Great Indoors*, American Society of Heating, Refrigerating and Air Conditioning Engineers, Atlanta, GA, USA (an illustrated history of heating, ventilating, refrigeration and air conditioning, published for their centenary)

Richardson, R & Thorne, R 1994 *The Builder Illustrations Index 1843-83*, Hutton & Rostron, Guildford (45 years of cross-references to articles in *The Builder*)

Roberts, B M 1997 *The Quest for Comfort*, privately published for the CIBSE Centenary (a selective pictorial history of all building engineering services)

Roberts, B M 2000 *The Comfort Makers*, American Society of Heating, Refrigerating and Air Conditioning Engineers, Atlanta, GA, USA (270 mini-biographies of pioneers of heating, ventilating, refrigeration and air conditioning)

Roberts, B M & Yunnice, P G 2001 *The Magic of Hot Water*, Andrews Waterheaters, Wednesbury (a pictorial history of domestic hot water services)

Thevenot, R 1979 *A History of Refrigeration Throughout the World*, International Institute of Refrigeration, Paris (detailed history, not illustrated)

Additional information is available on the website of the CIBSE Heritage Group at www.hevac-heritage.org



Ewart's Copper Ventilators, c.1900

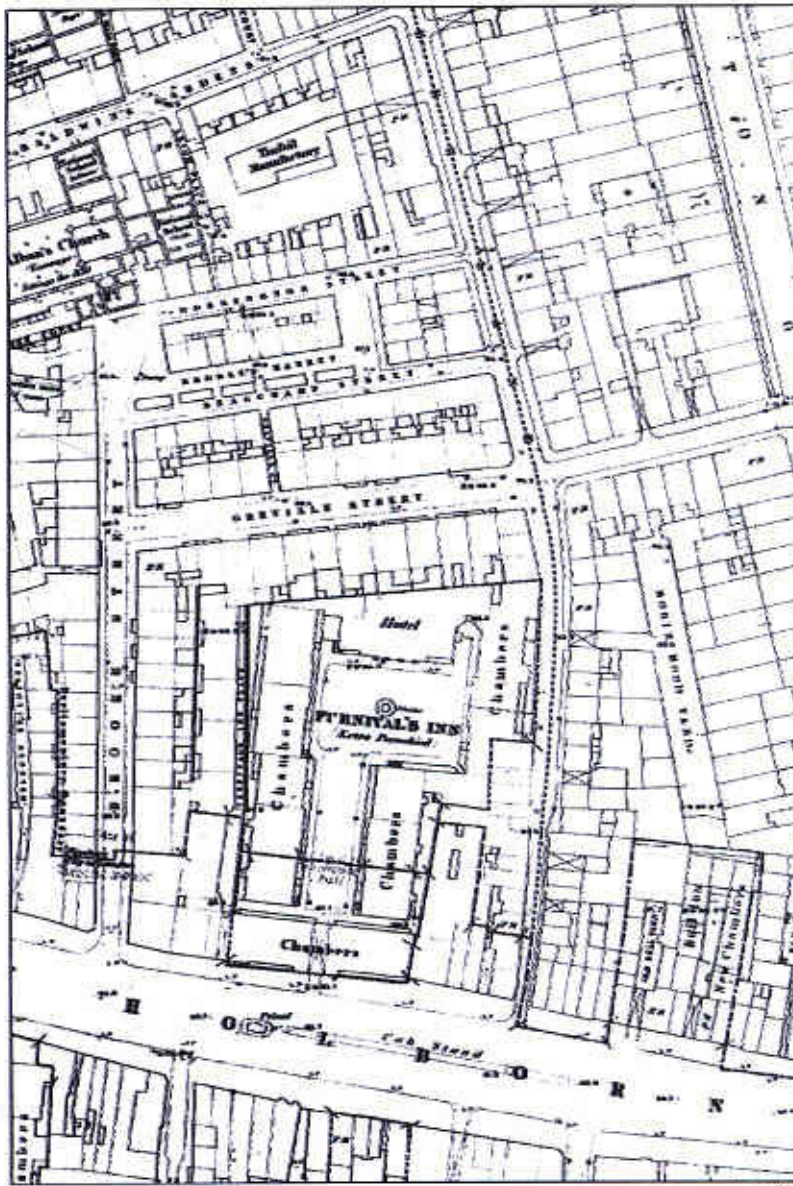
Cover Illustrations

Front *Heating & ventilation scheme, Birmingham Council House, 1875* [BLRC.45/2]

Inside front *Phipson sketch for service ducts Halifax Baths, 1891* [PC/18]

Inside back *Prudential, Holborn Bars site OS 1872* [London Borough of Camden, Local History Library]

Back *Extract from Phipson Operating Instructions for Empire Theatre, Leicester Square, 1890* [PC/49]



Prudential, Holborn Bars 1872

3.—In the Summer months the Fans to be worked from 3.0^o clock in the afternoon till the house closes. This will apply from June 1st to September 30th For the remaining months. Judgment is necessary, as the time of starting will much depend upon the External Temperature but as a rule, the Fans should be in full operation 1/2 an hour or an hour before the admission of the Public.
1

Extract from Phipson's Operating Instructions for the Empire Theatre, Leicester Square