The Comfort Makers

Brian Roberts

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

Woodcut: Ventilating Machines (Wind Collectors) for Mines, Germany. De Re Metallica, Georgius Agricola [51]. 1556. From 13, p. 201.
The Comfort Makers

Easy to Carry,
Just Invert the Footrails.

Advertisement: Moore’s Air Tight Heater.
Joliet Stove Works, Illinois, USA.
The Metal Worker, 3 July 1897, p. 9.
About the Author

Brian Roberts, C.Eng., is a consultant in Surrey, England. He has been chief engineer for two major U.K. design-contractors and technical director of an air-handling unit manufacturer. He has been an ASHRAE member since 1973 and has served on ASHRAE committees and contributed to *ASHRAE Transactions*. Mr. Roberts is also a European Engineer (Eur. Ing.) and a Fellow of CIBSE. In the U.K., he has served on technical committees of CIBSE, the Heating and Ventilating Contractors’ Association, the Building Research and Information Association, and the British Standards Institution. He has coauthored a textbook on air conditioning and a history of building services, written some 70 technical and historical papers, lectured extensively, and is the author of the CIBSE Centenary book, *The Quest for Comfort*. He is chairman of the CIBSE Heritage Group, is CIBSE Hon. Librarian, and in 1994 was awarded the CIBSE Silver Medal.

*Steam Engine (Aeolipile) by the Greek engineer Hero [1], c. 50 AD. From 2, p. 64.*
The Comfort Makers contains information on 270 pioneers who have contributed to our knowledge of heating, ventilating, refrigeration, and air conditioning over two millennia. The story is told in a series of mini-biographies with over 100 portraits and some 40 contemporary illustrations and advertisements.

These pioneers were engineers, architects, and scientists. Some were manufacturers of heating, ventilating, and cooling equipment or were controls specialists. Others were designers or installers. The biographies include many people famous in the HVAC&R field; others are virtually unknown. A number are world-famous for notable achievements in science or other areas and are included because of a particular contribution, often largely unrecognized, to the development of comfort engineering. These include doctors, writers, civil engineers, mathematicians, soldiers, horticulturists, a U.S. president, a Bavarian count, statesmen, ironmongers, philosophers, an artist, a curate, a cardinal, an abbott, a railway engineer, a meteorologist, and others from many walks of life or fascinating backgrounds.

To these are added the founders, organizers, and early presidents of some of the institutions, societies, and associations that helped establish the comfort industry: the American Society of Heating and Ventilating Engineers (1894), the American Society of Refrigerating Engineers (1904), and the Institution of Heating & Ventilating Engineers in London (1897).

Today, we take for granted comfort at home, at work, and at play. The Comfort Makers reminds us of just some of the people and organizations that made this possible.
# Table of Contents

Acknowledgments .................................................................................................................. ix
Introduction ............................................................................................................................. xi
The HEAT MAKERS .................................................................................................................. 1
The VENTILATORS ................................................................................................................... 21
The COLD MAKERS ............................................................................................................... 33
The AIR CONDITIONERS ......................................................................................................... 43
The COMFORT CONTROLLERS ............................................................................................... 55
The COMFORT PIONEERS .................................................................................................... 63
Some COMFORT ARCHITECTS .............................................................................................. 81
The COMFORT DESIGNERS ................................................................................................. 93
The COMFORT INSTALLERS ................................................................................................. 103
The COMFORT ORGANIZATIONS ......................................................................................... 111
Index of Biographical Entries ............................................................................................... 127
Bibliography .......................................................................................................................... 135
Introduction

As ancient civilizations moved away from the warmer climates, the heating industry was born. This book contains information on 270 comfort makers who have contributed to our knowledge of heating, ventilating, refrigeration, and air conditioning over two millennia.

These pioneers were engineers, architects, and scientists. Some were manufacturers, designers, installers, or control specialists. The biographies include many people famous in the HVAC&R field; others are virtually unknown. A number are world-famous for notable achievements in science or other areas and are included because of a particular contribution, often largely unrecognized, to the development of comfort engineering.

The comfort makers are the personal choice of the author. There are many others deserving of recognition, but not overlooked are the founders and early presidents of some of the institutions, societies, and associations who helped to organize the comfort industry.

This book is a companion to the ASHRAE Centennial (1994) publications *Heat & Cold: Mastering the Great Indoors* and *Proclaiming the Truth* and to the CIBSE Centenary (1997), book *The Quest for Comfort*. These have been extensively cross-referenced in the biographical entries as readily accessible sources of additional information and matching illustrations.

Count Rumford [15]. From 105, fig.1.
The S. M. Howes Company

STEEL RADIATOR FURNACE.

POINTS
Extremely Low Price.
First-class Manufacture.
All Practical Selling Features.

FULL CONVERTIBLE FLUE in
Top Radiator.
STEEL PLATE driven into Cup
Joints.
No possible chance for gas to
escape.
Extra Large Combustion
Chamber.
Large Doors. Solid Front Shield.
Sectional Fire Pot and Dome.
Castings Extra Smooth
and Perfectly Fitted.
Dust Flue, Water Pan, etc.

SIX SIZES:
16, 18, 20, 22, 24 and 26 inch Fire Pots.

IN EVERY WAY
JUST WHAT THE
TRADE WANTS.

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40, 42, 44 and 46 Union Street,
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EFFICIENT, ECONOMICAL, AND DURABLE.

Prices and Particulars on Application.

The “Marlor” STEAM HEATER.
Reg. No 273,408

PLAN.

Makers of all patterns of
RIVETED AND WELDED BOILERS
FOR ALL PURPOSES.

The LARGEST STOCK in the Kingdom.
The most complete Catalogue in the Trade
post free on receipt of Trade Card.

The “Marlor” HOTWATER BOILER.
Reg. No. 271,532

Sectional Elevation

Sectional Elevation

10. Advertisement: Steam Heaters and Boilers.
Lumby, Son & Wood, Halifax, founded 1858.
Domestic Engineering, March 1897, p. 77.
Graham and Fleming, Halifax. The company was founded in 1854.
Heating & Hot Water. Walter Jones (President IHVE, 1899), 1894, p. v.

KIELEY'S WATER-SEAL SYSTEM OF STEAM HEATING
AND AUTOMATIC RETURN OF CONDENSATION.

By the use of this System a large saving of Fuel and a Noiseless Working Apparatus is guaranteed.
The specialties mentioned on opposite page are required to obtain this system.

KIELEY & MUELLER, 7 to 11 West 13th Street, New York.


De Re Metallica. Georgius Agricola, 1556. From 13, p. 204.

Buffalo Fan System of Heating and Ventilating.
For Schools, Churches, Theatres, and all Public and Industrial Buildings.

Buffalo Forge Company
ENGINES
For Electric Light and Power Service.

- Simplicity of Design.
- Durability of Construction.
- Close Regulation.
- Smooth Cool Running at Sustained High Speed.

Horizontal, Vertical, Simple, Compound, Belted, Direct-Connected.

Buffalo Forge Company,
BUFFALO, N.Y., U.S.A.

Buffalo Forge Co., Buffalo, New York State.
Heating & Ventilating Buildings, Rolla C. Carpenter (President ASHVE, 1896), 1910, p. 3.
Figs. 2 and 3 from a drawing of unknown origin found in a second-hand bookshop. The apparatus has similarities with the Lightfoot cold-air machine of 1886.
(B.M. Roberts Collection)
20. Advertisement: Ice Refrigerating Machines.
York Manufacturing Co., York, Penn.
Ice and Refrigeration, October 1891, inside back cover.
Buffalo Air Washer
AND HUMIDIFIER

Humidifies and cools to any desired degree. It also dehumidifies, by condensation, air containing too much moisture.

Scientifically adapted to perfect Humidity conditions of Textile Mills.

BUFFALO AIR WASHER

ADJUNCT TO
Buffalo Fan System of Heating and Ventilating

1. Apparatus and engineering features originated by us.
2. Individual steam connections to each coil.
3. Coil base that gives hot heater pipes always — no cold ones.
4. Uniform wheel proportions throughout all fan sizes.
5. Proportion method of duct calculation.
6. Tempering coils in air supply.

BUFFALO FAN SYSTEM APPARATUS
 Blow through type with thermostatic control. Single duct system. Air Washer and Humidifier on inlet side of fan.

SEND FOR CATALOG NUMBER 97

Buffalo Forge Company
Buffalo, N.Y.
Heating and Ventilating Engineers

THE CANADIAN BUFFALO FORGE CO., MONTREAL, QUEBEC

21. Advertisement: Buffalo Air Washer. Buffalo Forge Company, Buffalo, N.Y. The spray-type air washer was developed by Willis Carrier as part of his system for dew-point control of humidity. Engineering Reveiw, June 1906, p. xii.
The Weather Vein

ADVENTURES OF
The Mechanical Weather Man
THE MACARONI CASE

The Mess. Flour and Water
are in an awful mood
The men who make
corn bread
have their hard work "Checked. No good."

They take it to their Foreman,
"What makes the stuff so bad?"
He says "If you'll just come with me,
to show you I'll be glad."

They write the other people
and ask them please to tell
What makes their goods so wonderful
and how they dry so well.

The answer came back quickly
in writing you can see
The partners said it humbly
and made happy.

They quickly phoned to Carrier
to come and tell them how
To make their plant a modern one
as fast as things allow.

"Our dryers, sir, is hopeless,
the goods will check and ruin.
In spite of all that I can do
we're losing every hour."

"We either want too slowly,
which means the stuff, just so,
Or else we dry so rapidly
we crack it, if we know."

The partners then examine,
some goods the detest say
Is just the kind they're hunting for,
the best in every way.

And with his usual promptness
Mr. White, the sales man
"We'll have Electric dryers here
within a little while."

"Mark" kept his word and shortly
their dryers were complete,
With automatic instruments
to register the test.

And now when Flour and Water
their finished goods inspect,
They smile at competition
for their goods have no equal.
TEMPERATURE REGULATION.

THE JOHNSON SYSTEM OF TEMPERATURE REGULATION

has been in public use since 1885 with ever-increasing favor, and is now used in all classes of buildings where heating is required. This is the original and perfectly developed system and is applicable to every kind of heating device.

THE HUMIDOSTAT controls the humidity of rooms within 2%, thus securing health, comfort, and economy. The only device made securing these results. Address

Johnson Temperature Regulating Company,
240 FOURTH AVENUE, NEW YORK CITY.

GOLD or SILVER
WHICH SHALL BE THE STANDARD?

People cannot agree, but everyone agrees that both gold and silver can be saved by using a HEAT REGULATOR to control any style of heating plant, and maintain automatically an EVEN TEMPERATURE.

Well informed people agree also that there is but one "STANDARD" Regulator, which was FIRST and is still BEST. Sold by Heating Trade generally. No Agencies.

SEND POSTAL FOR DISCOUNT AND TERMS.

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Electric Heat Regulator Co.
Twenty-sixth Street and A Ave.
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89-91 Centre St., NEW YORK CITY.


The Powers Regulator Company demonstrates temperature control technology in the 19th Century. (Courtesy of Landis & Gyr Powers.)

28. **Section and Plans: St. George’s Hall, Liverpool, 1854.**

_The Mechanical Ventilation and Warming of St. George’s Hall, Liverpool._

_The Heating and Ventilating Magazine, October 1907._
Annual Maintenance of Apparatus
Working all day and night in Winter
Night only in Summer.

Fuel for 200 days and nights £ 2 6
Warming and Ventilation for 20 Tons per 108. 0 0
heating apparatus
Fuel for Steam Engine 24 hours
365 days including service of 94 Tons. £ 7 0 0
Baths
Two Sirs at 50½ per week £ 15 0 0
Furnaces Repair & Paint Workings £ 3 0 0

£ 43 9 0 0

Cost of Warming: The number of beds in the Hospital being
and Ventilation 588 will show taking into consideration the service
per bed per annum of the Baths and Ventilation and Warming of
the other rooms, that the cost would be about
£ 3 0 per bed per annum.

Cost of the Apparatus: From the best of my judgment I consider that the
cost of the apparatus for carrying out my proposed plan
will not exceed the sum of
£ 69 2 8 0

This sum would include all personal supervision of
the Work during the erection of the Building and supplying
all the necessary apparatus, Steam Engine Boiler, Fans,
Heating, Heating apparatus, &c, Ventilating for Exhale
and Inhale, Regulating Valves, Indicating Trials to it,
exclusive of all Brickwork for the formations of Engine
Rooms, Air chambers and Flues and Channels.

General Remarks: This is in a few words the plan I should propose
for the Ventilation and Warming of the new St. Thomas

Ventilation and Warming of St. Thomas's Hospital, Lambeth, London.
Submitted by the engineer W.W. Phipson, dated 20 November 1865.
The scheme was not adopted. (CIBSE Heritage Group Collection)
Schemes and Estimates submitted free of charge for installations of
Warm Air, Low Pressure Hot Water or Steam Apparatus.

PERFECT EFFICIENCY GUARANTEED.

JOHN GRUNDY,
... Heating and Ventilating Engineer,

MANUFACTURER AND PATENTEE OF

“HELIOS” and “SIRIUS” Smoke Consuming Grates for Chimney Pieces.
“HESTIA” slow and Quick Combustion Portable Warming and Ventilating Stoves.
“CALORIFER” and the well-known “GRUNDY” Smoke Consuming Central Fresh
Warmed Air Heating Apparatus for Public Buildings and Private Dwellings.

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Makers of Boilers, Ward Stoves,

Radiators, Ventilators, & Ranges.

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The well-known firm of HAMPTON & SONS, Pall Mall East, London, S.W.,
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Mr. JOHt GRUNDY, 30, Duncan Terrace, London, N.

write:

Nov. 5th, 1908.

Dear Sir,

In response to your letter of the 3rd inst., we have much pleasure in stating
that your Heating Apparatus is used with great success at our Depositories at
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Apparatus installed into our additional blocks of Depositories now in course of
erection. We are of opinion that for safety, hygienic and all useful purposes, your
mode of heating is the best. We have no trouble in working the apparatus, which
is simple and very efficient. We have pleasure in giving you this testimonial,
and wish you the success your system deserves.

Yours truly,

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W. HAMPTON, Managing Director.

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Factory: THE TYLDESLEY IRON WORKS, nr. MANCHESTER.

Telegram — “JOHN GRUNDY,” LONDON. National Telephone — No. 552, KING’S CROSS.

John Grundy, City Road, London. (Grundy was the first President of IHVE, 1898.)
Heating by Hot Water, Walter Jones, 1904, p. xv.
FORTY YEARS OF AIR CONDITIONING PROGRESS
INDIA FINDS NEW BENEFITS
TREMENDOUS AID TO INDUSTRIAL PRODUCTION

In 1915 the Carrier Corporation was established, with Willis H. Carrier as its head. He had looked into the future and had seen air conditioning as a major industry—"a vital function in the scheme of things influencing life, business, and industry." (Continued on page 7)

CARRIER AIR-CONDITIONING
THE KEY TO BIGGER PRODUCTION AND BETTER LIVING IN INDIA
Typical CARRIER Installations
A. I. E., Bombay, Calcutta, Delhi, Madras.
GRAMOPHONE CO., D淡水, Bombay.
TOBACCO MANUFACTURERS, Bombay, Chmala.
H. H. & FUSE FACTORIES, Kirkko.
GANESH FLOUR MILLS, Cawnpore, Delhi, Lyallpur.
H. J. POSTER & CO., Bombay.
TATA SONS, Bombay, Calcutta, Jamshedpur.
COUNCIL, CHAMBERS, Bombay, Calcutta, Delhi.
AIR FORCES INDIA, Lahore, Amhala, Peshawar.
L. W. HOSPITALS, Lahore, Japour.
KODAK LTD., Bombay, Lahore, Madras.
FILM STUDIOS, Bombay, Poonam, Madras.

MORE THAN 100 COTTON MILLS

Carrier Air Conditioning

CARRIER AIR-CONDITIONING HAS BEEN INSTALLED IN OVER 500 OFFICES AND HOMES IN BOMBAY AND CALCUTTA ALONE

by

Volkart Brothers
Bombay, Calcutta, Madras, Karachi, Lahore

32. Advertisement: Carrier Air Conditioning by Volkart Brothers, Bombay. The Kaiser I-Hind newspaper, 18 May 1941. (CIBSE Heritage Group Collection)
To the Institute of Heating and Ventilating Engineers

Whereas,

The American Society of Heating and Ventilating Engineers is assembled in its 35th Semi-Annual Meeting, and

Whereas,

For the first time in its history the Society is meeting outside the limits of the United States, and

Whereas,

This most successful and delightful event is being held under the auspices of the Ontario Chapter and within the confines of the British Empire; therefore be it

Resolved:

That the greetings of this Society be extended to the members of the Institution of Heating and Ventilating Engineers of Great Britain; and be it further

Resolved:

That as an additional mark of our esteem these greetings be personally conveyed and delivered to the President of the British Institution of Heating and Ventilating Engineers by the President of this Society Mr. Thornton Lewis.

June 26, 1929

President

Secretary

33. Greeting from ASHVE to the Institute (sic) of Heating and Ventilating Engineers. From the 35th Semi-Annual Meeting held in Ontario, Canada, signed by ASHVE President Thornton Lewis, 26 June 1929. Proclaiming the Truth, ASHRAE, 1994, p. 82.

(left to right, from top row) John S. PALMER [244]  Robert E. ATKINSON*
Walter JONES [240]  Chas MASON  Walter YATES [74]
A.B. SIMPSON [247]  A.B. TAYLOR  J.L. SAUNDERS

This composite picture includes nine of the first ten IHVE Presidents, plus two later Presidents. The exception is David Nesbit* [268] whose portrait is on the title page.


(*Nesbit and Atkinson were the first and second U.K. engineers, respectively, to join the ASHVE.)
35. Portraits of the first ten Presidents of ASHVE.
Proclaiming the Truth, ASHRAE, 1994, p. 4.
JONES & ATTWOOD, TITAN WORKS, STOURBRIDGE.

Heating Specialists and Consulting Engineers.

We manufacture at the Works illustrated above. Heating Appliances of every description.

Estimates for Heating by High Pressure, Low Pressure, or Steam.

Plans and Specifications prepared for the Trade by trained Experts.

1,000 Boilers from 50 to 5,000 feet Heating Power always in stock.

Radiators, Pipes, Valves, and other Fittings in great variety.

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Inspection invited. Orders promptly executed. Success guaranteed.

Medals awarded 1875, 1881, and 1904.

Telegrams - "HEAT." Telephone - No. 10.

JONES & ATTWOOD, STOURBRIDGE CATALOGUES FREE.


Jones & Attwood, Stourbridge. Mr. Walter Jones (second IHVE President, 1899) was a pioneer investigator into the causes of boiler explosions.

Heating by Hot Water, Walter Jones, 1904, p. xxxii.
bien sûr, vous pouvez continuer à travailler comme cela...

mais si vous voulez augmenter le nombre de vos contrats d'entretien et rendre le travail de vos compagnons agréable, utilisez le matériel SEREI

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nettoyage des foyers de chaudières par simple pulvérisation sans effort – sans poussière

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aspirateur de suies industriel robuste et puissant

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