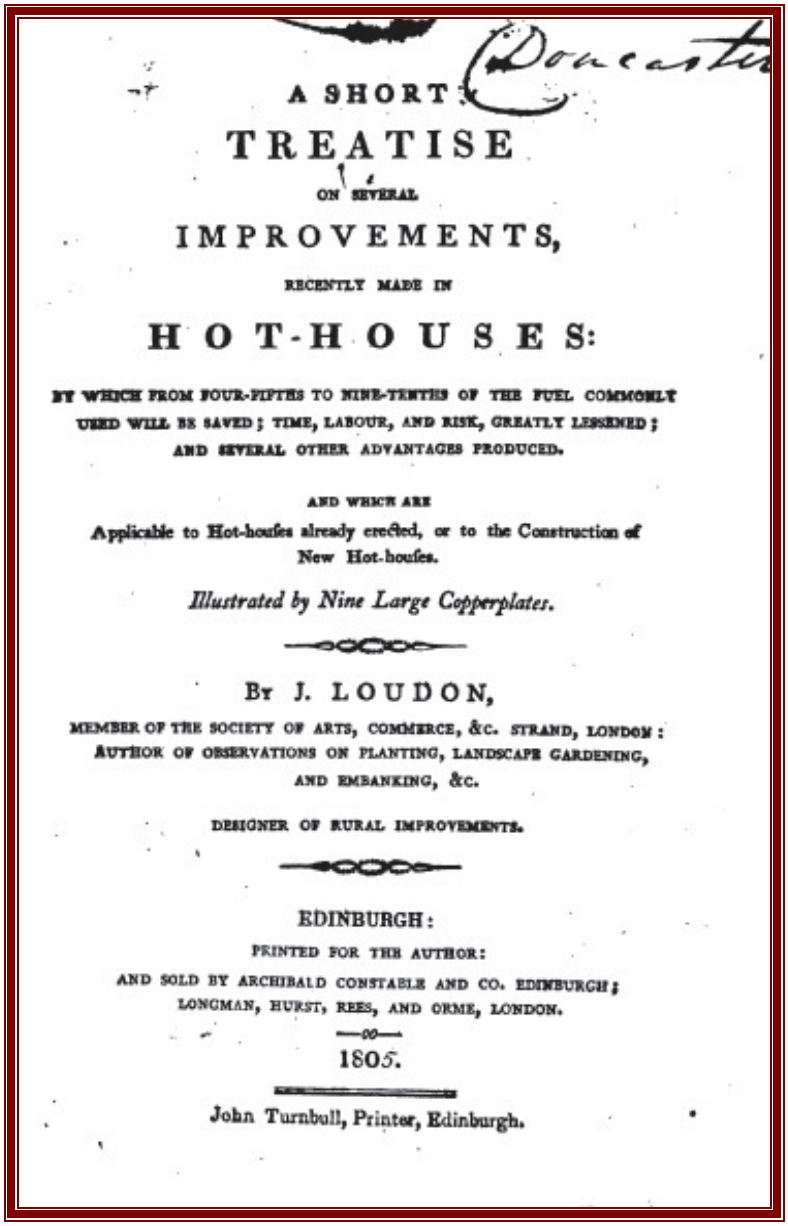
# JOHN CLAUDIUS LOUDON
# 1783-1843

*Pioneer of the design of hothouses and their heating*

**[190] John Claudius LOUDON** **1783-1843**

Scottish landscape gardener, architect, and builder of glasshouses. Prolific author on horticultural topics. Foresaw the use of central steam heating in glasshouses, for country estates, baths, laundries, and the like. Loudon tested flue and insulation systems for his garden hothouses: *A Short Treatise on Improvements recently made in Hot-Houses*, 1805. He experimented with artificial climates for plants with controlled heating, ventilation, and humidification, including the use of weight-driven and clockwork fans: *Remarks on the Construction of Hot-Houses*, 1817.

*(Mini-biography from "The Comfort Makers," Brian Roberts, ASHRAE, 2000)*



A SHORT
TREATISE
ON SEVERAL
IMPROVEMENTS,
RECENTLY MADE IN
HOT-HOUSES:

BY WHICH FROM FOUR-FIFTHS TO NINE-TENTHS OF THE FUEL COMMONLY USED WILL BE SAVED; TIME, LABOUR, AND RISK, GREATLY LESSENED; AND SEVERAL OTHER ADVANTAGES PRODUCED.

AND WHICH ARE
Applicable to Hot-houses already erected, or to the Construction of New Hot-houses.

*Illustrated by Nine Large Copperplates.*

By J. LOUDON,

MEMBER OF THE SOCIETY OF ARTS, COMMERCE, &c. STRAND, LONDON: AUTHOR OF OBSERVATIONS ON PLANTING, LANDSCAPE GARDENING, AND EMBANKING, &c.

DESIGNER OF RURAL IMPROVEMENTS.

EDINBURGH:
PRINTED FOR THE AUTHOR:
AND SOLD BY ARCHIBALD CONSTABLE AND CO. EDINBURGH; LONGMAN, HURST, REES, AND ORME, LONDON.

1805.

John Turnbull, Printer, Edinburgh.

*(Google Books)*

# CHAP I.

OF THE

# FURNACE

AND

# FUEL-CHAMBER.

## SECTION I.

*Of the Furnace and Fuel-chamber formerly uſed.*

BEFORE the alterations were made, the furnace, as already mentioned, and as is generally done, was placed in a large maſs of brick work attached to the houſe. Its chamber or ſpace for containing the fuel, was

was *two feet* long, *eighteen inches* wide, and *eighteen inches* high.

The furnace-door, a ſingle plate of caſt iron, ten inches ſquare.

The floor, or bottom of the fuel-chamber, had five iron bars which formed a grate, fourteen inches long, and ten inches wide; having a dead or ſolid ſpace of four inches on the two ſides, and ten inches behind, or in the farther end of the chamber. Theſe dead ſpaces were intended for the purpoſe of making the fire burn ſlowly, and laſt long, agreeably to the principle recommended and practiſed by Mr Nicol *.

The aſh-pit was eighteen inches long, and ten inches wide, and without any door.

SECT.

* See The Forcing Gardener, 3d Edit. pub. 1802.

## SECTION II.

### *Deſcription of the improved Furnace, and Fuel-chamber.*

A FURNACE was made ſo far ſimilar to Count Rumford's that it had double doors, but different in all other reſpects: for,

1. The outer and inner doors were almoſt exactly of the ſame ſize, and conſequently, the ſides were nearly at right angles with the front, which is a very great advantage in fixing it in maſon work.

2. It contained one opening in each of its ſides, for the purpoſe of communicating with the air flue to be afterwards deſcribed.

3. It

3. It has a valve in the centre of the outer door: and,

4. It has four nobs or projections at the corners, which are for the purpoſe of fixing it in the building. Theſe and the other parts will be beſt underſtood from plate I. fig. 1.

The ſize of the furnace door uſed is *ſeven and a half inches*, which is ſufficiently large for this houſe, though too ſmall for general and convenient uſe.

A door ten inches ſquare, with a valve in it, was alſo got for the aſh-pit. See plate I. fig. 2.

The maſs of brick work, containing the old furnace and aſh-pit, being taken down, the bricks and the five metal bars were reſerved to be uſed in building up the new furnace.

It

It is worthy of remark here, that of all the old materials, the furnace door alone was not re-uſed; and this, not becauſe it would not anſwer, but merely to try the effects of one with a valve. But a furnace door with a valve in it, is by no means eſſentially neceſſary, and in general gentlemen who make alterations according to this plan, may very ſafely uſe the old furnace door as a door to the new aſh-pit, in place of ſending for a new one with a valve.

A large hole being made in the lower part of the wall of the houſe, the new aſh-pit and furnace were built under it, projecting ſo far into the houſe, as that the outer furnace door, and the door of the aſh-pit, were even, or "fluſh" as workmen term it, with the outer face of the wall.

The aſh-pit was made fourteen inches long, and ten inches wide: and,

The old bars were laid above it, form-

ing the grate, and chamber for the fuel. The furnace was then properly placed, and the grate built round, (except at the neck of the flue, which was of courſe kept open,) with bricks laid flat, that is "brick on bed," as ſhewn plate I. fig. 3.

This building was carried up twelve inches, and then arched over in the uſual manner. Over this arch was made another of the ſame thickneſs, preſerving a vacuity betwixt them of three inches, which vacuity joins with each ſide of the furnace door, in order to communicate with the holes or openings formerly mentioned, and as ſhewn in plate I, by figures 3, 4, and 5, which are tranſverſe and vertical ſections.

In examining theſe two ſections, ſome things will be ſeen which deſerve attention.

In

In figure 3, the contraction of the air vacuity at *g* and *b*, is made for the purpoſe of confining and ſtagnating the air, in order that it may be thoroughly heated before it paſſes along the air flue into the houſe.

The valve in the furnace door, and alſo the holes in each ſide, which communicate immediately with the vacuity, are alſo made ſmall, in order that a large body of cool air may never be admitted at once. For it is a fact, that were the vacuity, valves, and air flue, every where of equal width, the air would paſs rapidly through into the houſe ſcarcely heated at all; unleſs, perhaps, when the fire was very ſtrong and the furnace door red hot.

It may be obſerved here, that the arch over the air vacuity, can be ſupported upon the under one, by making the ends of two or three of the bricks project down and reſt upon

upon the top of it, as ſhewn in figure 4; or two or three pieces of brick or ſtone laid carefully upon the under arch, will ſerve the ſame purpoſe.

But there is no abſolute neceſſity for ſuch ſupports; the intention is merely to guard againſt the ſinking of the upper arch.

It is needleſs to add what every maſon or bricklayer knows, that theſe arches can eaſily be "thrown" or built, by filling the fuel-chamber with earth, or by laying in bricks or any ſuch looſe materials, which can be taken out as ſoon as the mortar hardens ſo as to leave the arch entire.

The arch above the vacuity can eaſily be made in the ſame manner.

In figure 5, the large chambers *i* and *z*, and the contraction at the beginning of the

the air flue *k*, are for the purpoſe above mentioned. There is no neceſſity for theſe chambers being in every caſe ſo large as ſhewn in the plate; although a proportion ſomewhat ſimilar, will generally be found preferable.

In figure 5 alſo, a ſmall receſs will be obſerved betwixt the grate and the flue, for the purpoſe of preſerving a portion of the fuel which ſhall burn ſlowly; and thus it is preſumed live-coals may be had from that receſs for twenty-four hours after the fire is kindled. Some may think that a plain dead ſpace larger than this receſs would ſerve equally well; but this on examination will appear an ill founded idea; for if we obſerve the dotted line, *m n* in the plate, it will appear that it could not preſerve the coals alive for a ſufficient length of time, unleſs the throat of the flue were made much more upright; which on the other hand would

preſerve

preſerve too much fuel, and very much prevent the heat either from paſſing through it into the air vacuity, or onwards into the ſmoke flue.

This improvement I did not think of when the furnace at Dickſons and Shade's hothouſe was built; but I now ſee from the fires then being ſometimes totally extinguiſhed in the mornings, that it will be a beneficial addition to the plan.

CHAP.

Fig. 1.

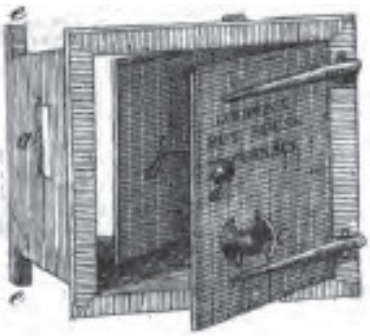


Fig. 3.

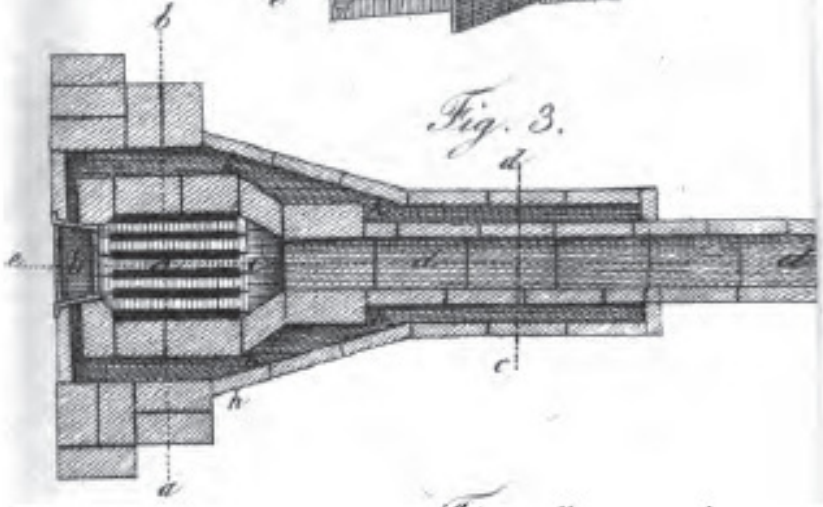
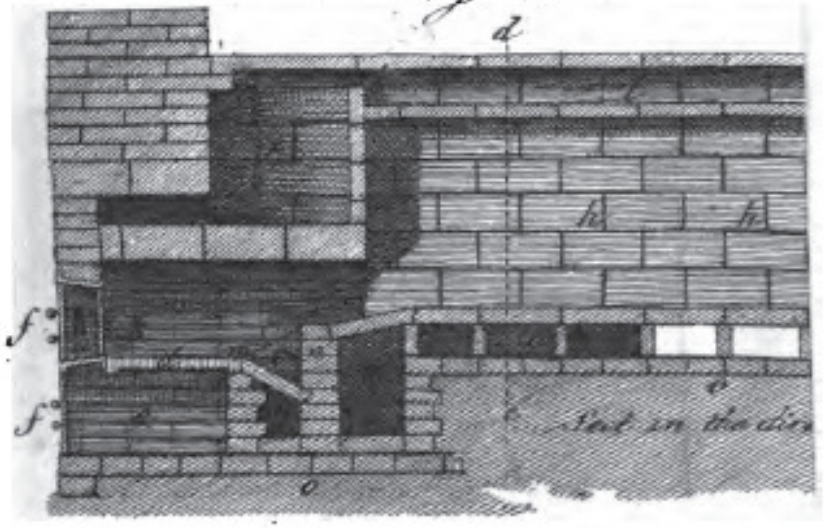
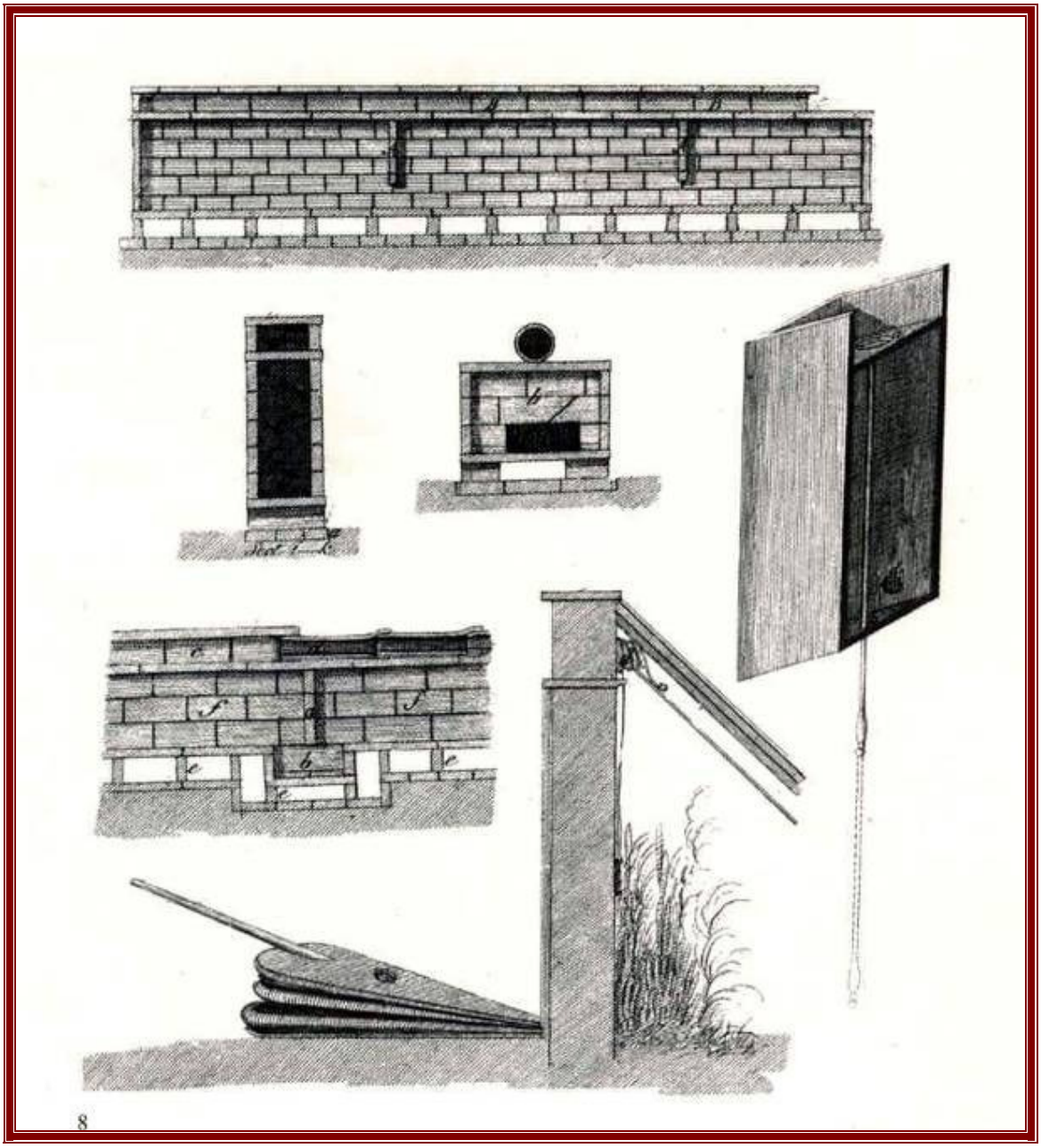


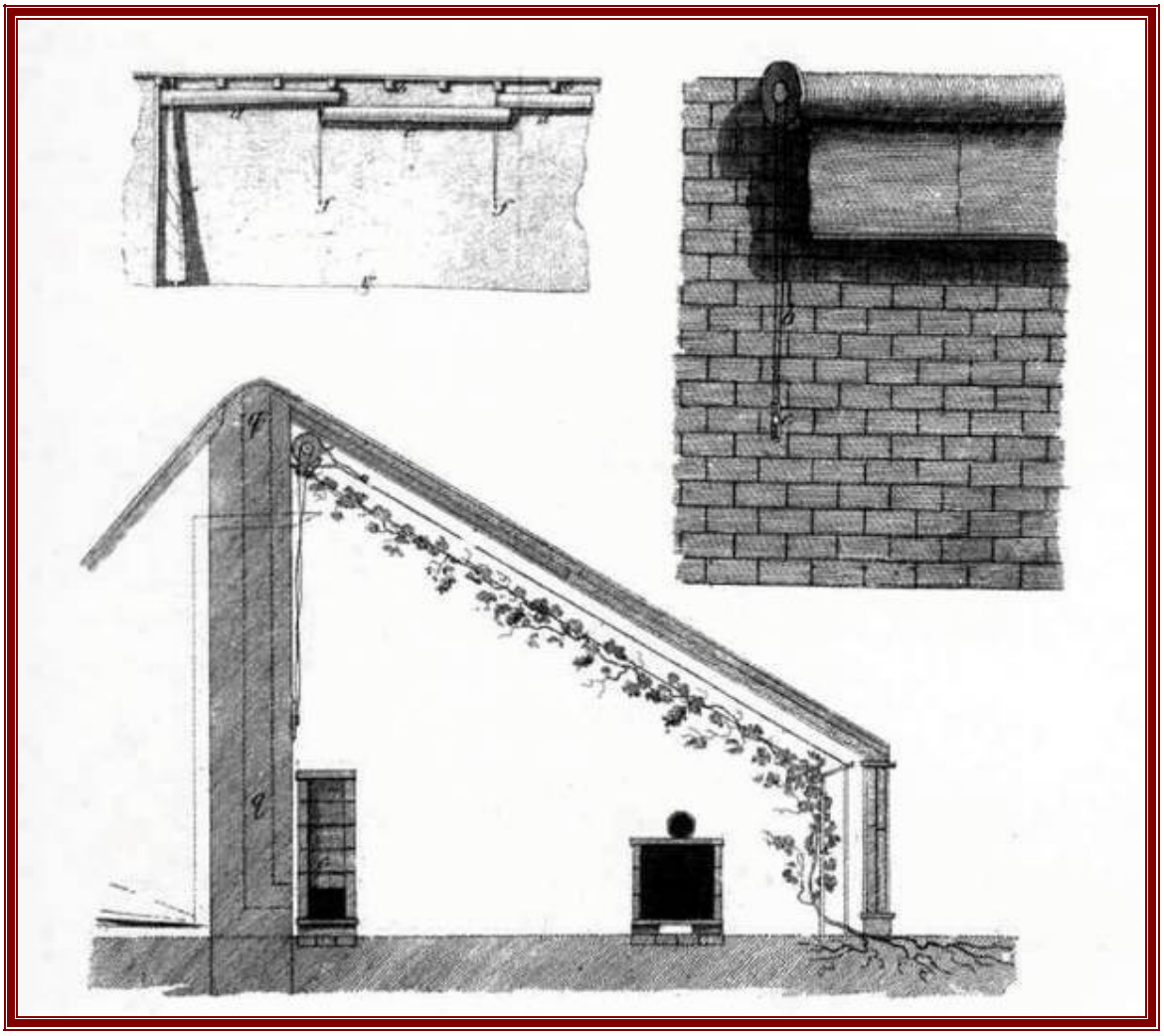
Fig. 5.



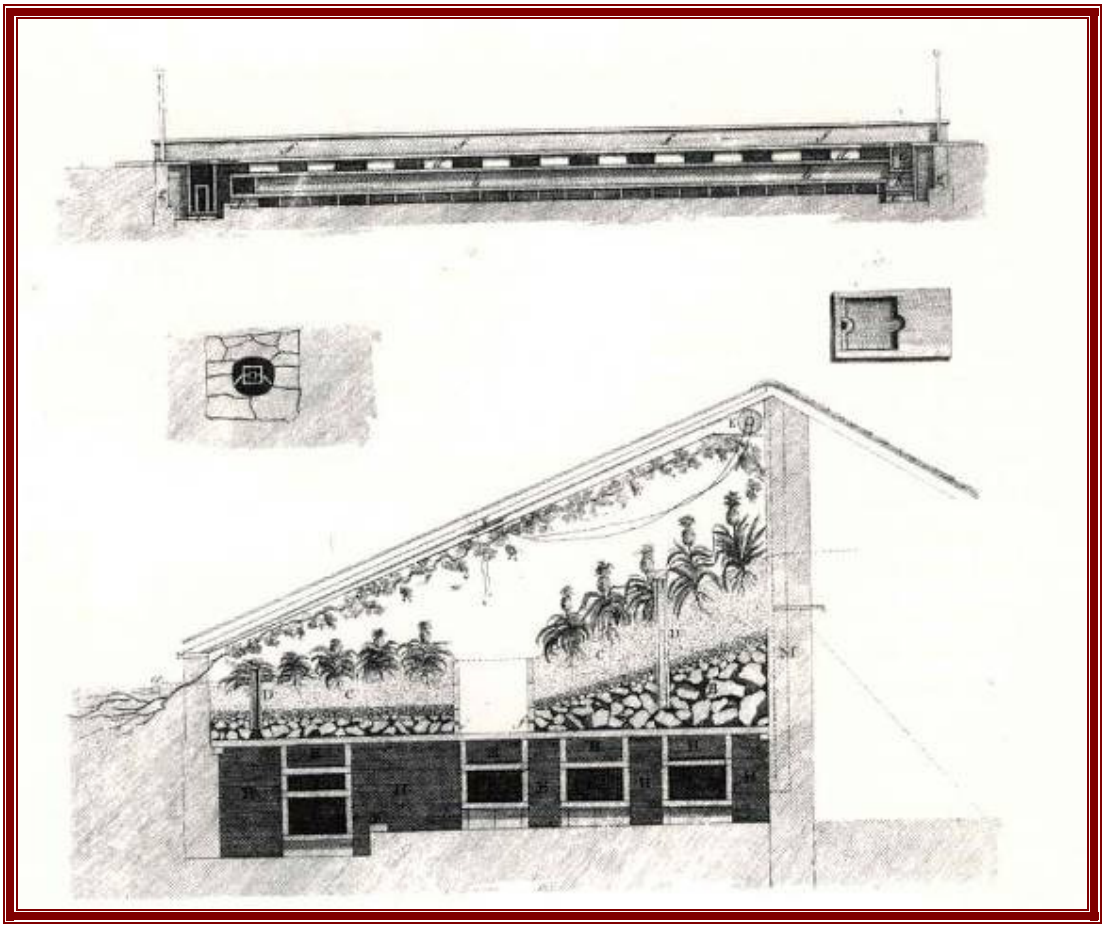
J. Loudon Del.




*Loudon's early smoke flue 1805*



*Loudon's system of night insulating blinds 1805*



*Loudon's design of 1805 with water filling the space around the flues to produce "moist heat"*

AN

# ENCYCLOPÆDIA

OF

# GARDENING;

COMPRISING THE

*THEORY AND PRACTICE*

OF

## HORTICULTURE, FLORICULTURE, ARBORICULTURE,

AND

## LANDSCAPE-GARDENING,

INCLUDING

**All the latest Improvements;**

A GENERAL HISTORY OF GARDENING IN ALL COUNTRIES;

AND A STATISTICAL VIEW OF ITS PRESENT STATE,

WITH SUGGESTIONS FOR ITS FUTURE PROGRESS, IN THE BRITISH ISLES.


By J. C. LOUDON, F.L.S. H.S. &c.

AUTHOR OF

"A TREATISE ON FORMING AND IMPROVING COUNTRY RESIDENCES."


ILLUSTRATED WITH

NEARLY SIX HUNDRED ENGRAVINGS ON WOOD

*BY BRANSTON.*


LONDON:

PRINTED FOR

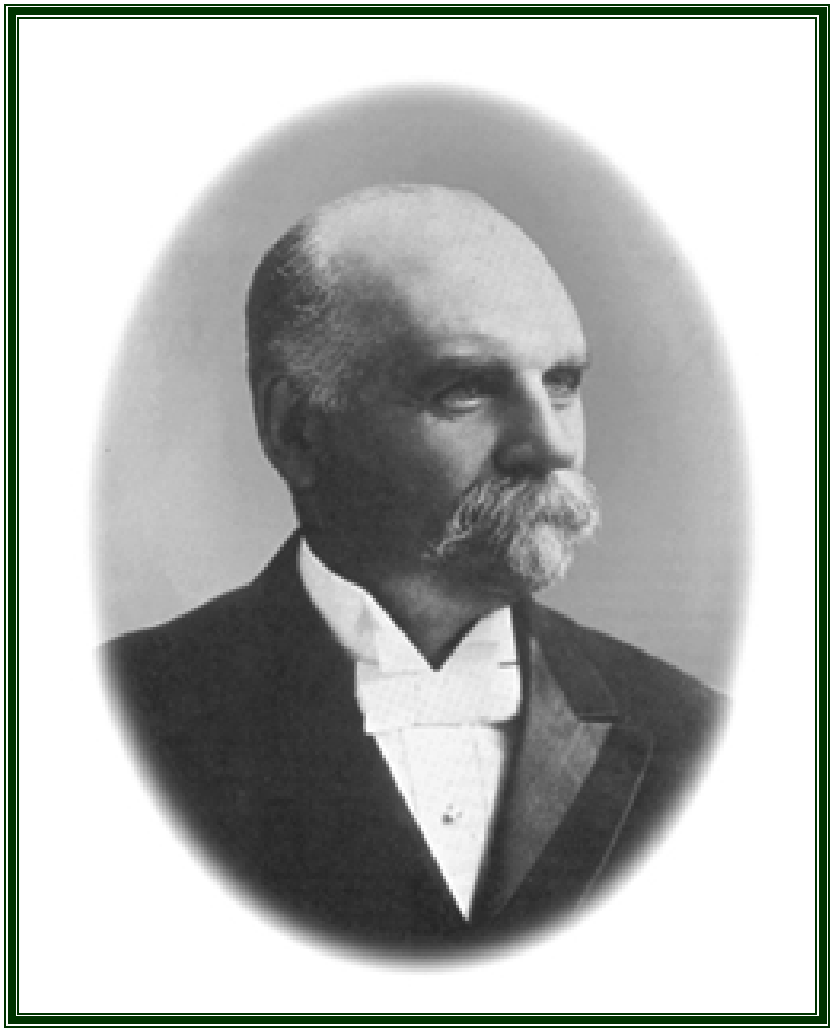
LONGMAN, HURST, REES, ORME, AND BROWN,

PATERNOSTER-ROW.

1822.


*(Google Books)*

# THADEUS SOBIESKI COLINCOURT LOWE 1832-1913



*Made one of the earliest $CO_2$ compressors*

**[85] Thaddeus Sobieski Coulincourt LOWE 1832-1913**

American constructor of balloons for the army, he made one of the earliest $CO_2$ compressors (USP 63,413: 1867) and used it to manufacture ice, first in Texas, later in Mississippi.

*(Mini-biography from "The Comfort Makers," Brian Roberts, ASHRAE, 2000)*

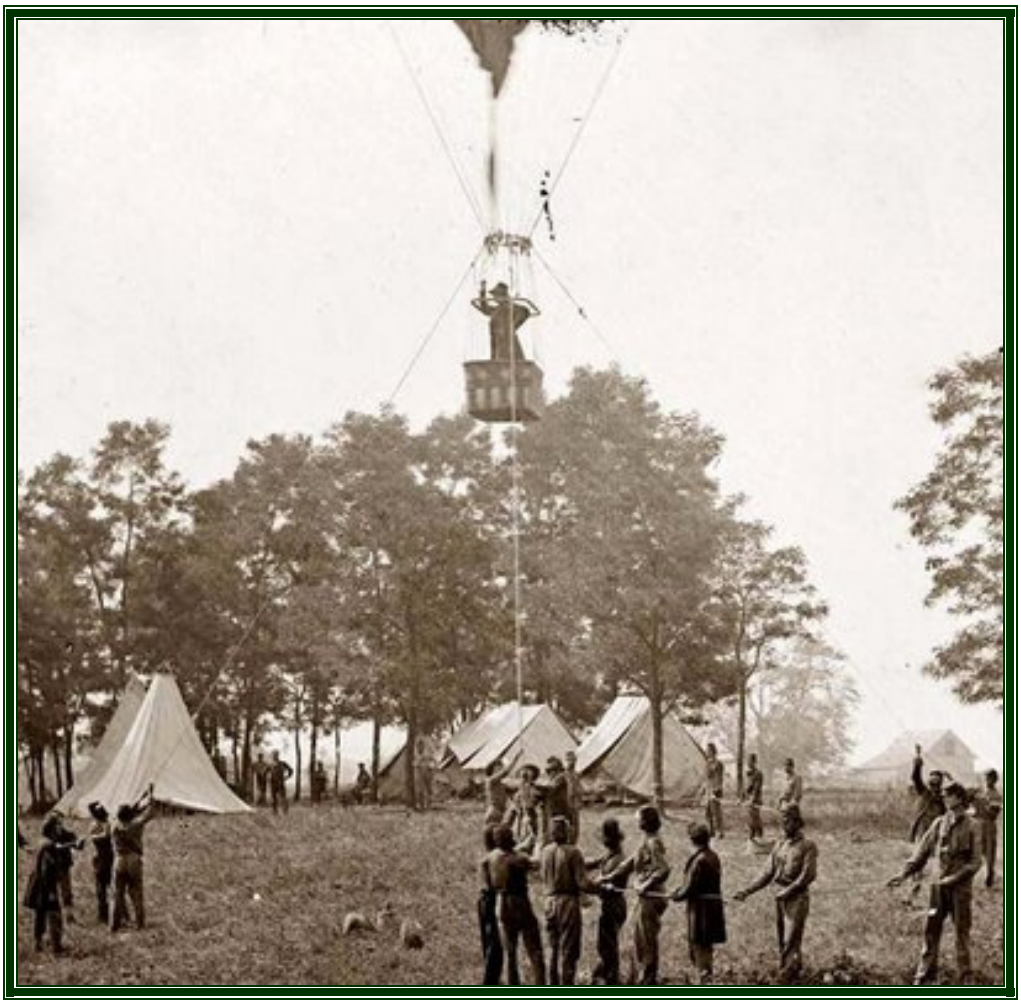
**LOWE Thaddeus Sobieski Coulincourt (1832-1913)**

Born at Jefferson, New Hampshire, U.S.A.

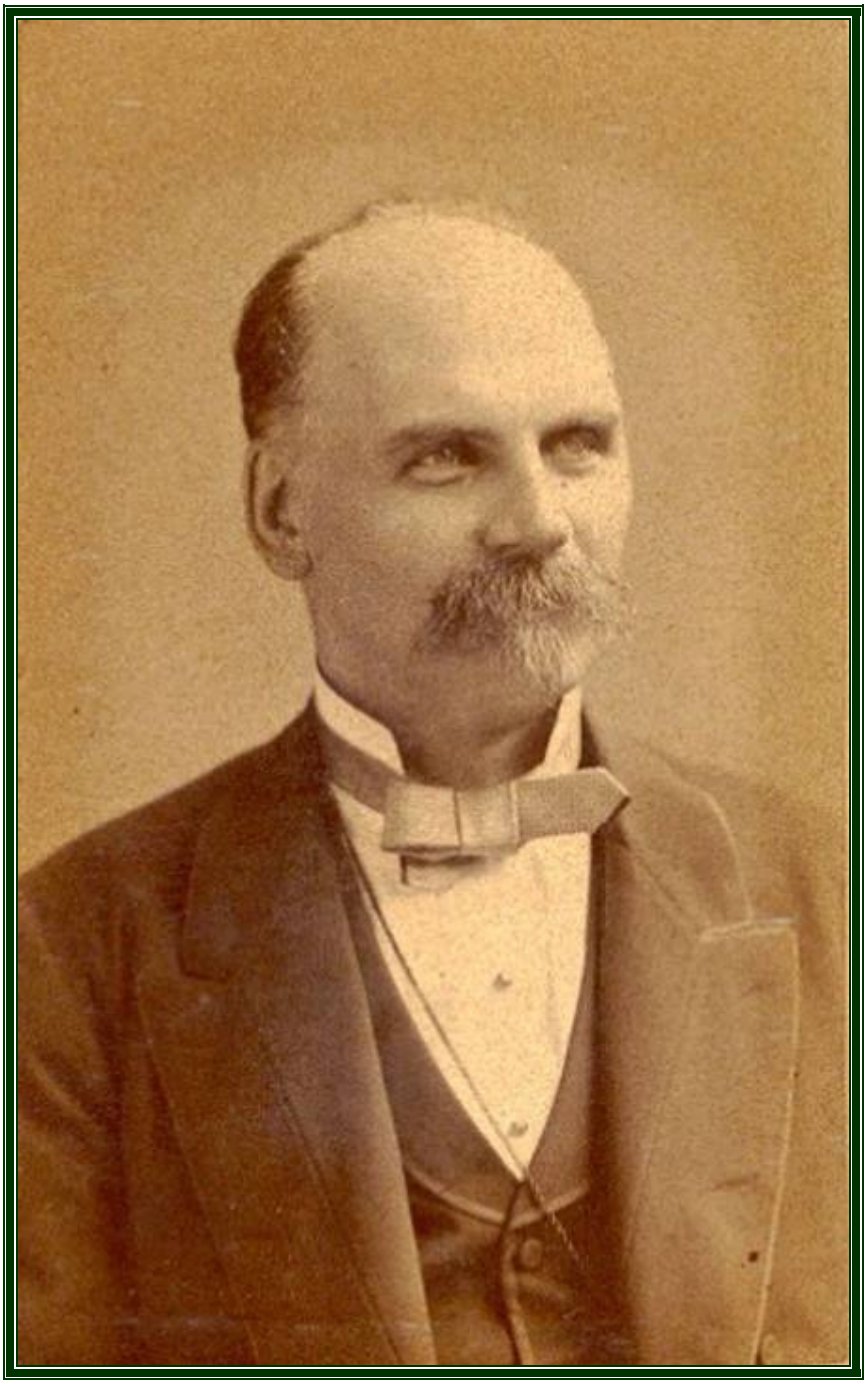
Above all interested in constructing balloons for the army, Lowe began, it seems, to make a carbon dioxide compressor in 1865 or 1866, and during the following years (1868 to 1869) began to use it to manufacture ice, firstly in Dallas, Texas, then in Jackson, Mississippi.

*(From "A History of Refrigeration," Roger Thevenot, International Institute of Refrigeration, 1979)*

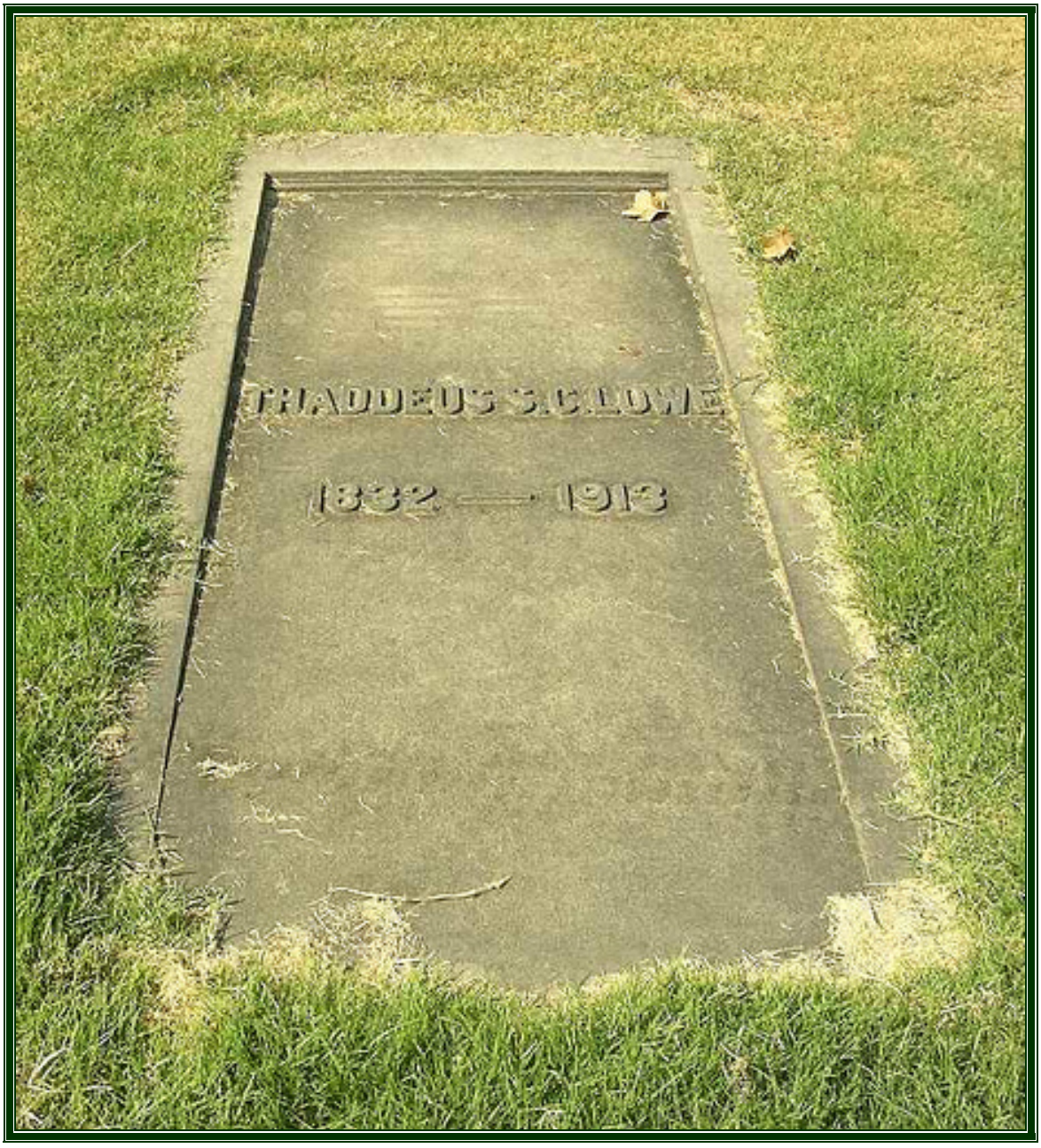
*No picture of his carbon dioxide compressor or ice-making machinery has so far been discovered*



*One of Lowe's observation balloons in use by the Confederate Army during the US Civil War*



*Portrait of Thaddeus S C Lowe*




*Grave of Thaddeus C S Lowe, Altadena, California*

# J IRVING LYLE
# 1874-1942

*One of the founders of Carrier Corporation*

**[100] J. Irving LYLE**

American engineer and businessman. Worked for Buffalo Forge where he met Carrier [101] who described him as, "The best salesman I ever knew." When the subsidiary Carrier Air Conditioning Co. was established (1908), it was Lyle who sought out the business opportunities. Later (1915) became Treasurer and General Manager of Carrier Engineering Corp. His commercial genius was the perfect complement to the engineering genius of Carrier. Lyle founded Aerofin Corp. (1923) to manufacture lightweight finned coils to the designs of Lawrence C. Soule. Also encouraged Carrier in the development of the centrifugal chiller and made the first "comfort job" sale to J.L. Hudson department store, Detroit (1924). He established Carrier Corp. in the rapidly expanding market for the air conditioning of movie theatres, including in New York: Rivoli (1925), Paramount (1926), and the Roxy (1927). Lyle also sold three centrifugals for the ice-skating rink at Madison Square Gardens (1925). President ASHVE (1917). First Chairman ASHVE Research Bureau Committee (1919). Lyle was an important half of the leadership that built Carrier Corp. "Carrier was the scientist, inventor, engineer; Lyle, the organizer, business man, executive."

*(Mini-biography from "The Comfort Makers," Brian Roberts, ASHRAE, 2000)*

**1917**

**ASHVE**

**J. IRVINE LYLE**

1874-1942

PLAINFIELD, NJ

*"[The government believed] that all business organizations, and especially all professional and technical societies should continue their work and...do everything possible to increase the industrial efficiency of the country as a whole...the members...entered into the spirit with the deepest and most sincere enthusiasm..."* (p. 319, *ASHVE Trans.*, 1917)

*President ASHVE in 1917)*

WHEN Willis Carrier presented his paper at the Buffalo Forge sales meeting in December of 1901, one of the audience was the friendly person he had met on the streetcar the morning he applied for a position. This man was Irvine Lyle, a graduate engineer who had grown up on a farm in Woodford County, Kentucky. He had attended the University of Kentucky, played football there, and was graduated in 1896 with a degree in mechanical engineering. Lyle was six feet two inches tall, stood erect, usually spoke in a low voice, but could be very firm indeed. He was once described by Carrier as:

> The best salesman I ever knew. He was serious and hard working. People liked him and trusted him. Because he believed in what he sold, he made prospective customers believe in it too.

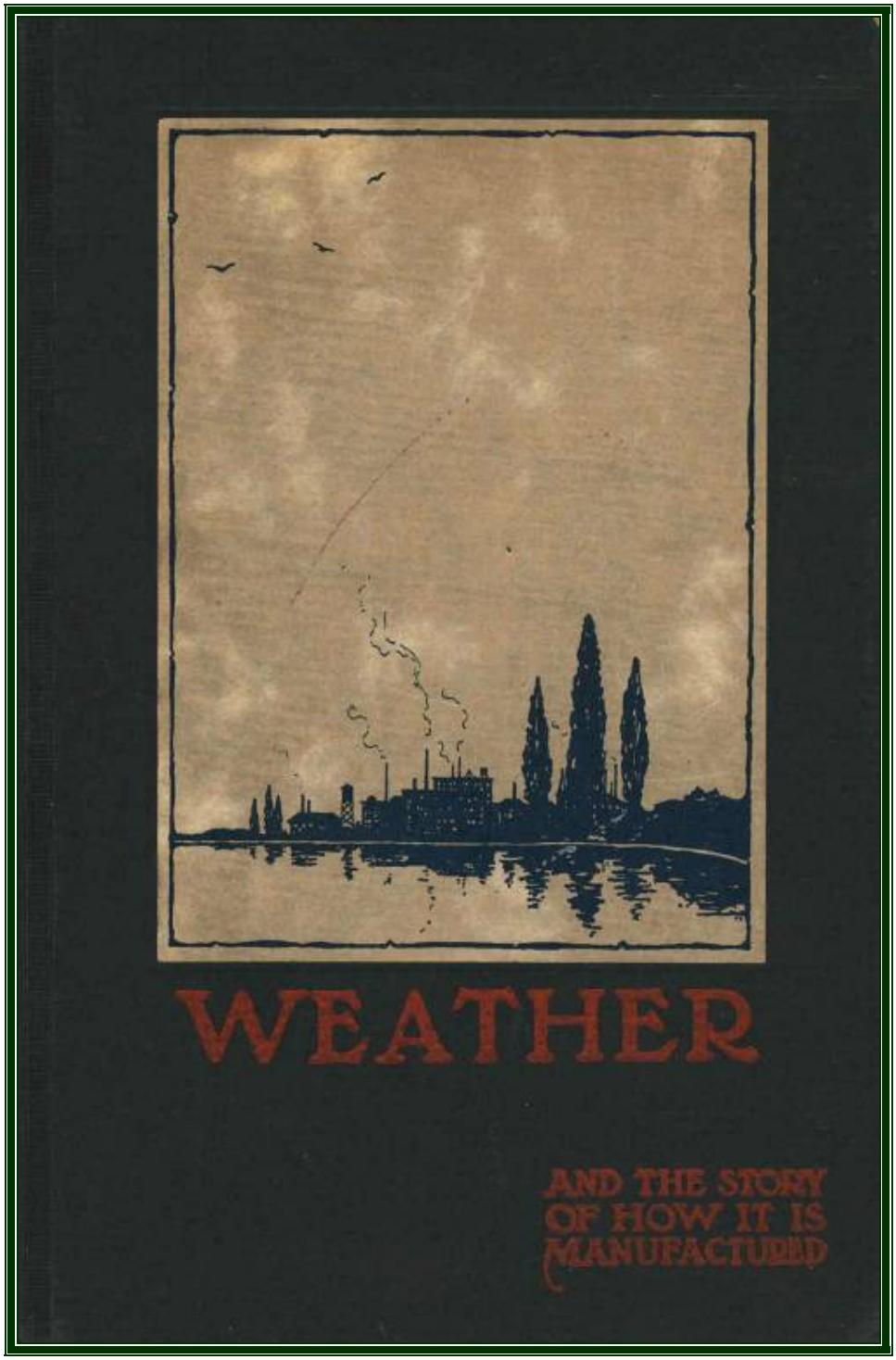
By the time of the sales meeting, Lyle was being transferred from Central New York with headquarters in Syracuse, to become manager of the New York office of the Buffalo Forge Company. Lyle heard Carrier read his paper. Apparently he was much impressed, for in the spring of 1902 he sent to the home office an inquiry from a New York consulting engineer with the request that the research work required be placed in Carrier's hands. The problem was essentially how to control humidity of air. It was a problem almost as old as man himself.

*(Extracts from "Father of Air Conditioning,*" Margaret Ingels, 1952)*

**Willis Haviland Carrier*

THE Carrier centrifugal refrigerating machine opened vast new fields to air conditioning. Prior to its introduction industrial plants comprised air conditioning's main market; most installations were made to condition air for products and processes, not for persons. The first sales of centrifugal machines to candy manufacturers and the like helped the company financially and enabled its engineers to develop refinements and improvements. But the sales represented no entry into the practically untouched market which Carrier, Lyle, and associates had visualized—comfort air conditioning.

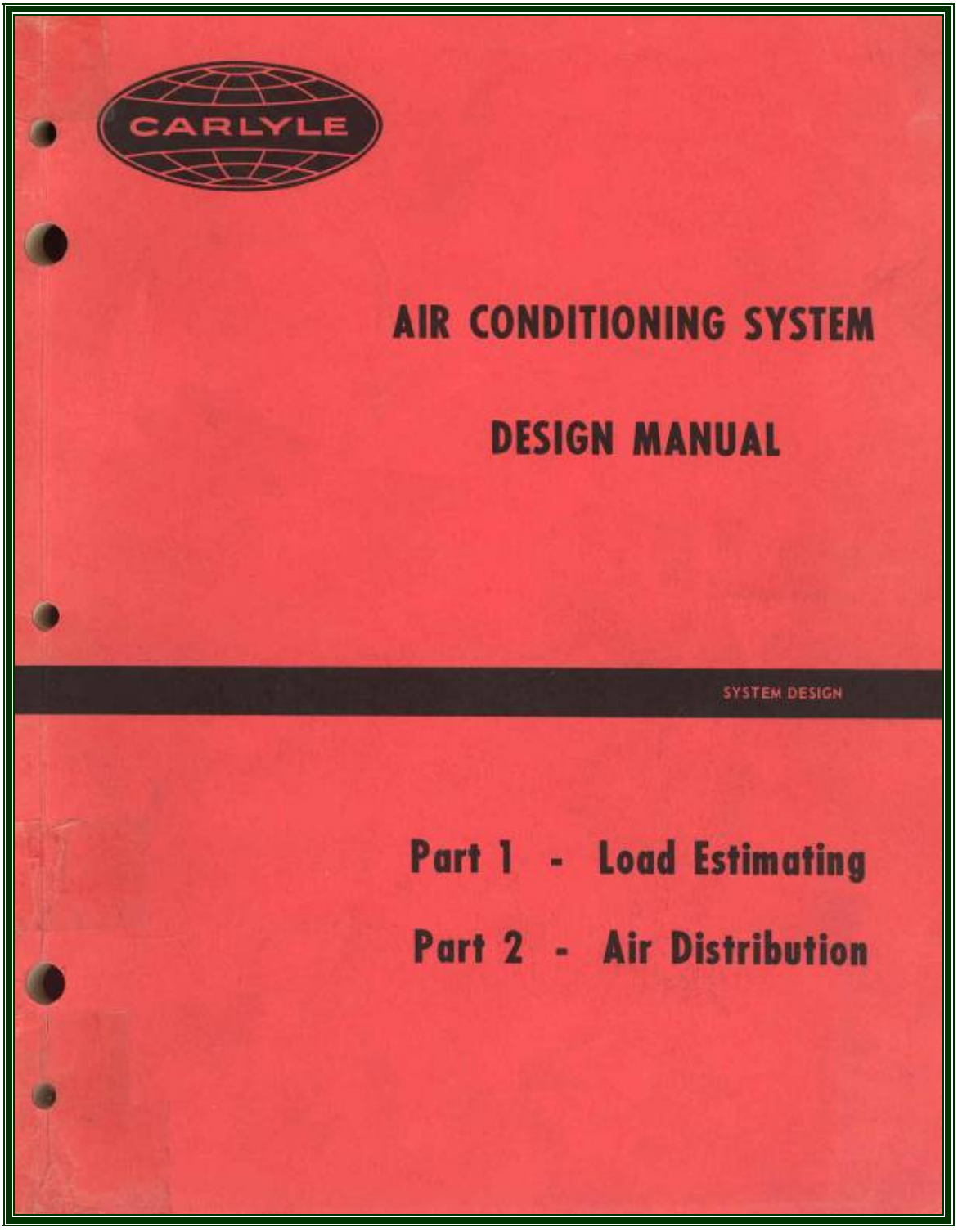
The door to this market was partially opened in 1924 when Irvine Lyle made the first "comfort job" sale of the centrifugal refrigerating system to the J. L. Hudson Company department store in Detroit. This store had found that on bargain days the ventilating system in its basement was of little help. Temperatures soared; customers fainted. The manager feared he would have to discontinue bargain sales unless he could keep temperatures down when the crowds poured in. Lyle persuaded him to install an air conditioning system using three centrifugal machines, each of 195 tons capacity. The result was a cool basement, increased sales, and in a few years the extension of air conditioning to other floors. This was the first air conditioning installation in the department store field and it began a relationship which has continued through the years.



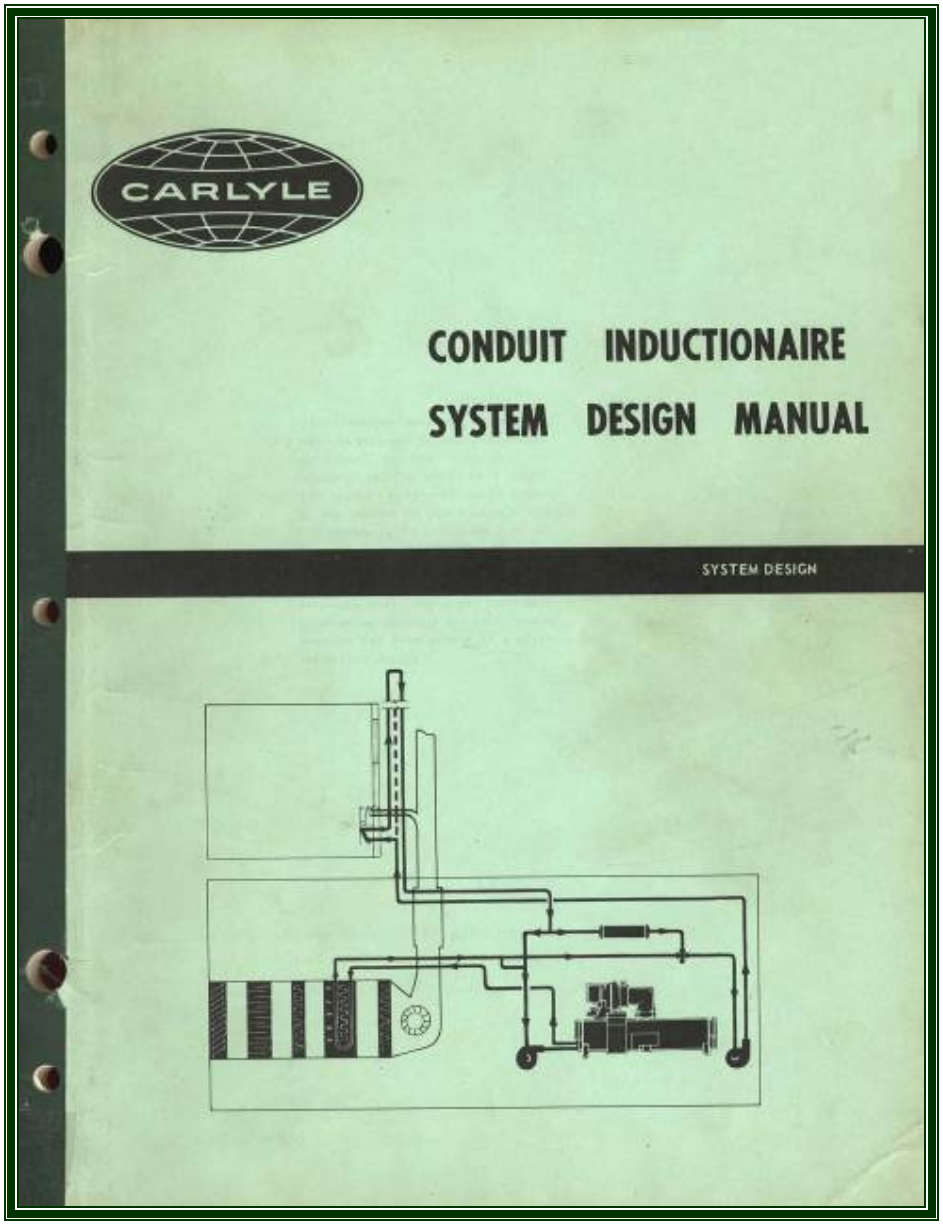

*Book from Carrier Engineering Corporation, 1919*
*(CIBSE Heritage Group Collection)*

J. IRVINE LYLE
Treasurer and General Manager

*Portrait from "Weather"*




*Catalogue Carlyle UK, 1962*
*(CIBSE Heritage Group Collection)*




*Catalogue Carlyle UK, 1963*
*(CIBSE Heritage Group Collection)*

*During the 1930's Depression, Carrier USA sold its 50% stake in the UK Company. So when it started up again in the UK during the 1960's it was unable to use the name "Carrier." It therefore adopted the trading name of "Carlyle" made up from the surnames of CARrier and LYLE.*

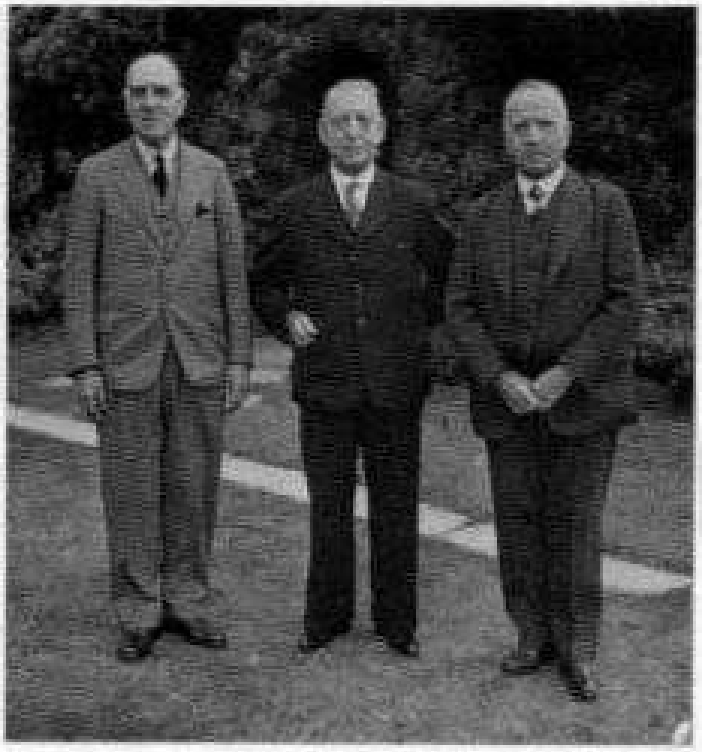
# EDMUND WILLIAM MAYNER
# 1862-1944

*Father of the IHVE*

**[238] Edmund William MAYNER** **1862-1944**

Mayner is regarded as "The Father of the IHVE." It was J. Kemsley, Secretary of the Institute of Sanitary Engineers (of which body Mayner was a Member of Council) who put forward a proposal to foster the heating and ventilating trades (1896). Mayner was largely responsible for setting up the IHVE. He was probably the first member and the first practicing engineer to join. He never occupied the Presidential Chair, preferring to hold the post of Chairman of an Executive Committee. It is almost certain that he recruited Walter Jones, David Nesbit, William Maguire, Louis Pearson, and George Crispin, all of whom came to be Chair after John Grundy, the first President. At the time, he was a member of the firm of Townsend, Tamplin & Makooski Ltd. of London and Redhill. Later, he was Works Manager with William Dibben & Sons Ltd. of Southampton and subsequently carried on business in Christchurch, Hants. His considerable efforts in the setting up of the Institution appear never to have been formally recognized during his lifetime.

*(Mini-biography from "The Comfort Makers," Brian Roberts, ASHRAE, 2000)*



Messrs. A. B. Potterton (Past President), E. W. Mayner and T. F. C. Potterton.

# 'Father' of the I.H.V.E. dies, aged 82

The I.H.V.E. has lost its oldest member and the first practising heating engineer to join its ranks by the death of Mr. Edmund William Mayner, which, we regret to announce, occurred last month at the age of 82.

Mr. Mayner had carried on business in Christchurch, Hants, for twenty years, having previously been Works Manager with William Dibben & Sons, Ltd., of Southampton. He had also held other posts in the Home Counties during his early career.

A notable local figure, Mr. Mayner took a keen interest in the welfare and organisations of his district. He was a Past President of the Christchurch Chamber of Trade, of which he was also a founder-member, and a former member of the Publicity Committee.

E. W. MAYNER

He had also acted as chairman of the committee which, before the war, organised the Hospital Carnival. In spite of his age, he took an active part in Civil Defence duties.

Mr. Mayner's early association with the I.H.V.E. is of great interest to members.

In 1896, a Mr. J. Kemsley put forward a proposal to found a society to foster the heating and ventilating trades. Mr. Kemsley was at that time Secretary of the Institute of Sanitary Engineers, of which body Mr. Mayner was a Member of Council.

Mr. Mayner approved the suggestion, and when the "Institute" as it was then called, was formally constituted in 1897, he joined it.

Records show that he was probably the first member and certainly the founder-member responsible for introducing the men who filled the office of President during its first few years of existence.

Mr. Mayner never occupied the presidential chair, preferring to hold the post of Chairman of an Executive Committee, but it is almost certain that he recruited Mr. Walter Jones, Mr. D. M. Nesbit, Mr. W. R. Maguire, Mr. (afterwards Sir) Louis F. Pearson and Mr. George Crispin, all of whom came to the Chair after Mr. John Grundy, the first President.

Mr. Mayner celebrated his golden wedding in 1935. At the funeral, the I.H.V.E. was represented by Mr. W. B. R. Cross (Member).

*Obituary JIHVE 1944*