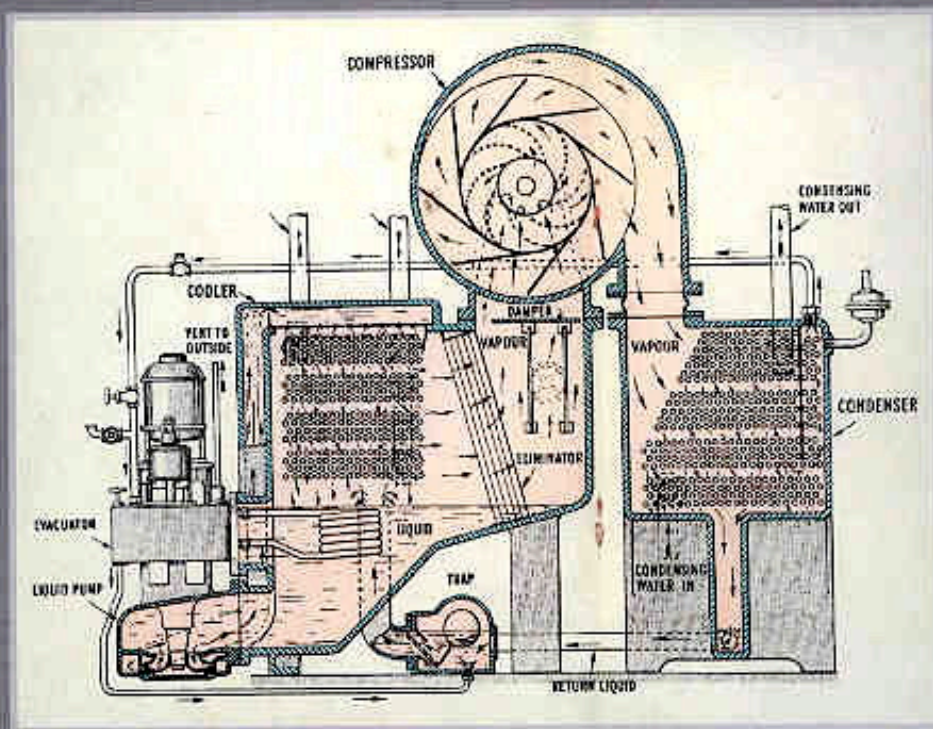


Industrial Refrigeration and Air Conditioning

Brian Roberts



VOLUME 1-Refrigeration

Industrial Refrigeration and Air Conditioning

VOLUME 1-Refrigeration

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Industrial Refrigeration and Air Conditioning

VOLUME 1-Refrigeration

Introduction

Industrial Refrigeration and Air Conditioning provides a selective picture history of a specialized part of the building engineering services industry. The story has been compiled from textbooks, catalogues, journals and other documents in the collections of the author and of the CIBSE Heritage Group.

Volume-1 Refrigeration charts the first one hundred years of this industry from 1834 when Jacob Perkins demonstrated the first vapour-compression cooling machine in London. Subsequent landmark events include the first cold-air machine in 1844, the absorption machine in 1859, and the centrifugal compressor of 1922.

Early efforts by pioneers in this field were directed to ice-making and then cold stores. Later, it was realized that industrial refrigeration had numerous applications for a variety of industries: brewing, film processing, processing and storage of meat, vegetables, dairy products and other foodstuffs, beverages and uses ranging from dam construction to laying of ice rinks.

Volume 2 Air Conditioning* deals with air conditioning for industrial applications while **The Story of Comfort Air Conditioning*** is available elsewhere.

**Separate electronic books on this website.*

About the Author

Eur Ing Brian Roberts CEng FCIBSE Life Member ASHRAE

Brian Roberts was born in Bristol in 1936 and entered the building engineering services industry in 1952 as a student apprentice with Brightside, during which time he gained both the Diploma and the Associateship of the National College. During his career Brian was Chief Air Conditioning Engineer of Brightside, Company Chief Engineer of Drake & Scull and Technical Director of Airpower. He has served on Technical Committees of the IHVE/CIBSE, HVRA/BSRIA, HVCA, ASHRAE and British Standards. Brian was awarded the CIBSE Silver Medal in 1994.

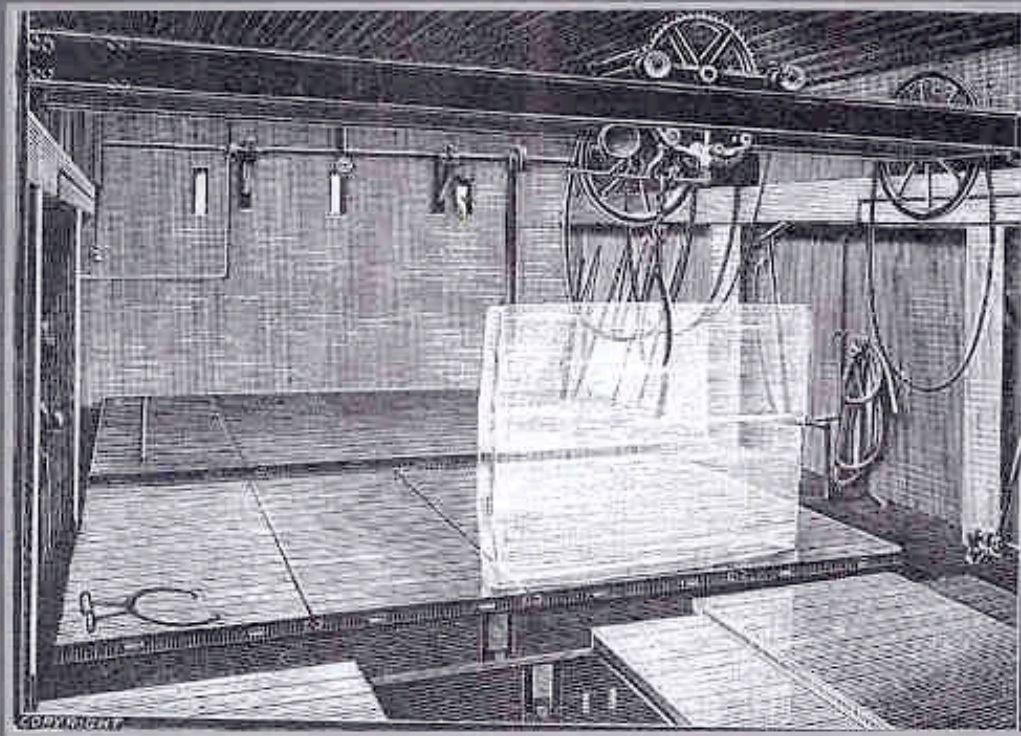
From 1982 he has been Chairman of the CIBSE Heritage Group. He has authored or co-authored a number of books: *Air Conditioning and Ventilation, Building Services Engineering – A Review of its Development, The Quest for Comfort (CIBSE Centenary), The Magic of Hot Water, The Comfort Makers, Building Services Heritage, HVCA @ 100, Hadens of Trowbridge* and various of the electronic books on the Heritage Group Website.

Acknowledgments

I must thank the past and present members of the CIBSE Heritage Group for their contributions over the years since its founding in 1973. In particular, I acknowledge the valuable help received from the late Archie Heard (my predecessor as Heritage Group Chairman and MD of Carrier UK), from Paul Yunnie (former long-serving Heritage Vice-Chairman who also served two terms as Chair of the ASHRAE Historical Committee), Bernard Nagengast (former Chair and then Consultant to ASHRAE Historical) and Stephen Loyd (BSRIA Librarian). There is also a special thanks to Frank Ferris (Heritage Webmaster) who has added this book and many other books and items to the Heritage website.

BMR
Tadworth 2006

Industrial Refrigeration and Air Conditioning



Part 1.1 Ice Making

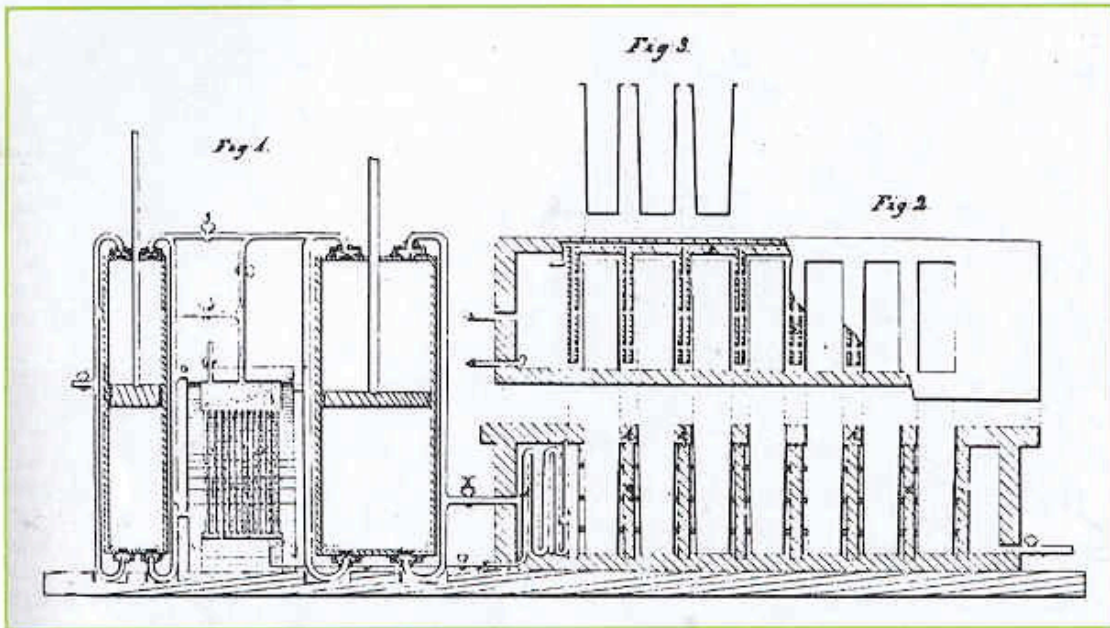
Part 1.1 Ice Making

Illustrations in following order

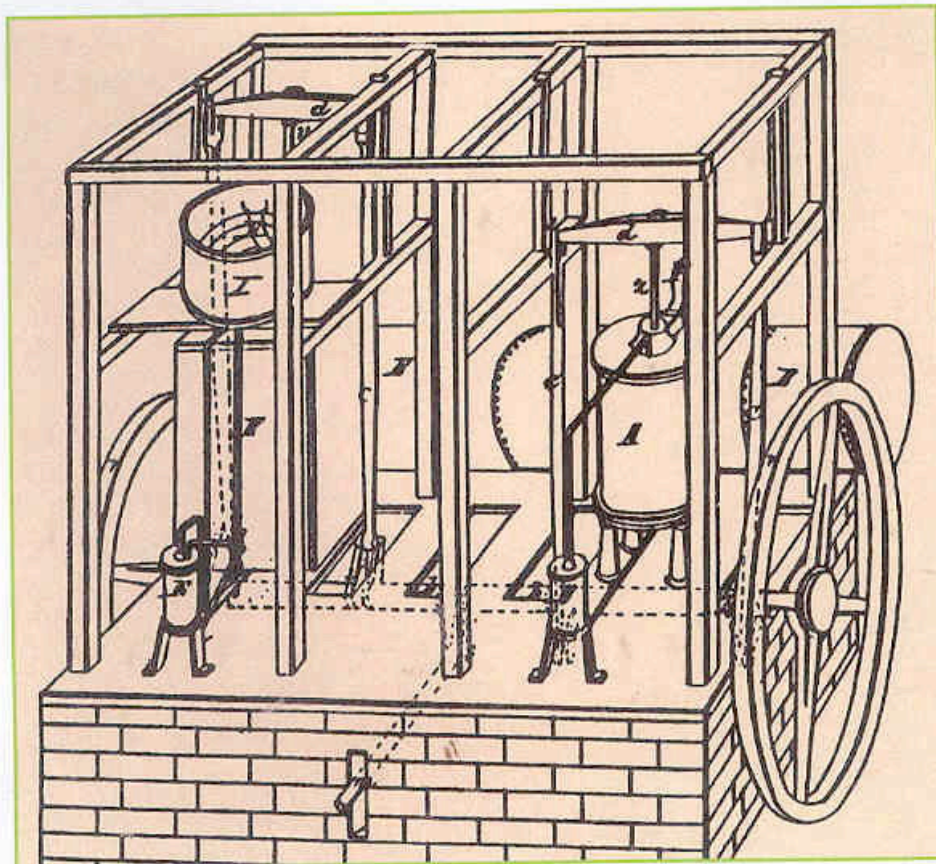
**Alexander Twining
Dr John Gorrie
James Harrison
Charles Tellier
Daniel Holden**

**Raoul Pictet
Boyle Ice Machine Company
York
Pontifex & Wood Ltd
Hill**

**Pulsometer Engineering Company Ltd
The Linde British Refrigeration Company
Liverpool Refrigeration Company
Ice-Making Plant
Lightfoot Refrigeration
Direct Expansion Ice Plant Company**

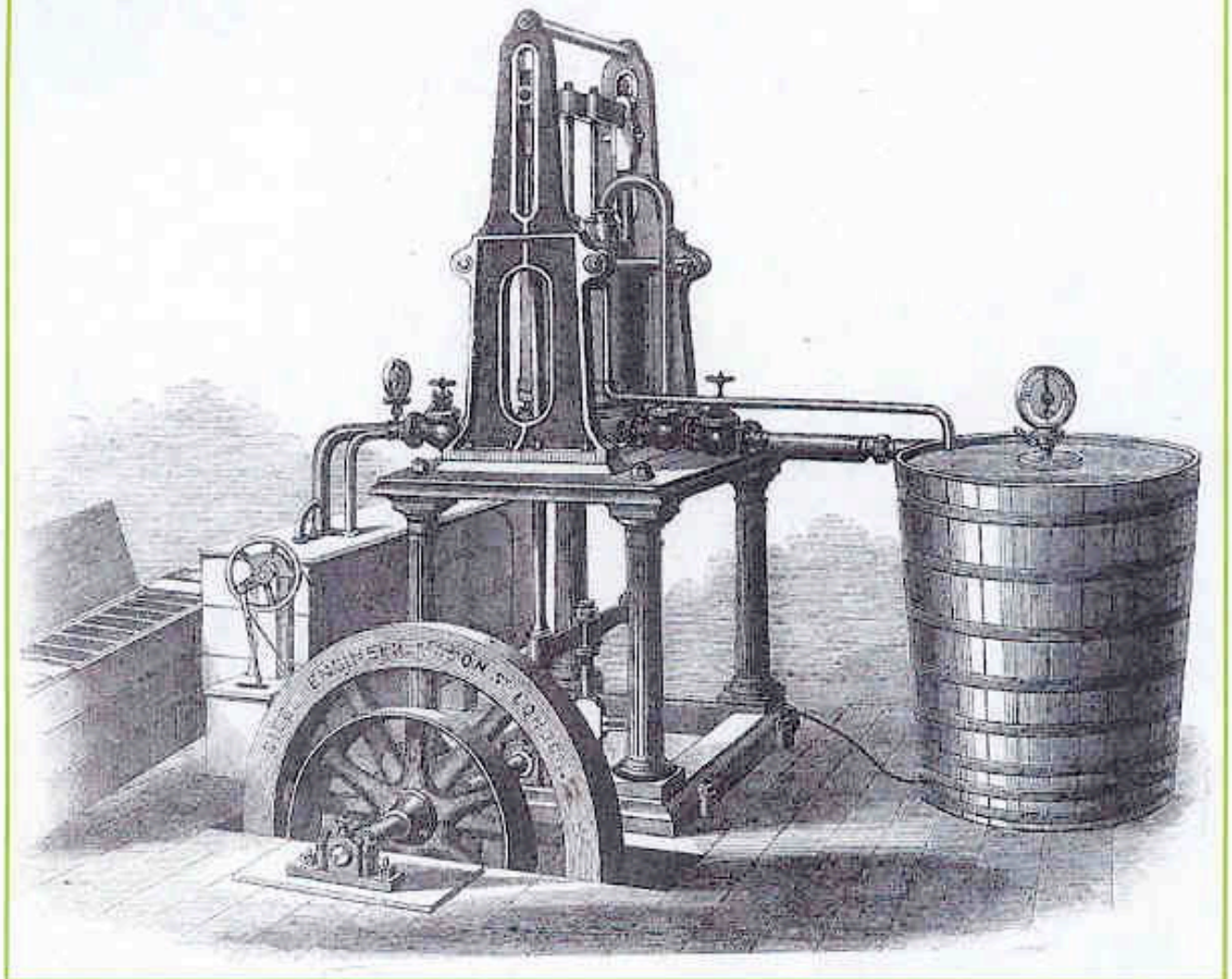


Alexander Twining's ice making plant [Patent of 1853, Heat & Cold, p.125]

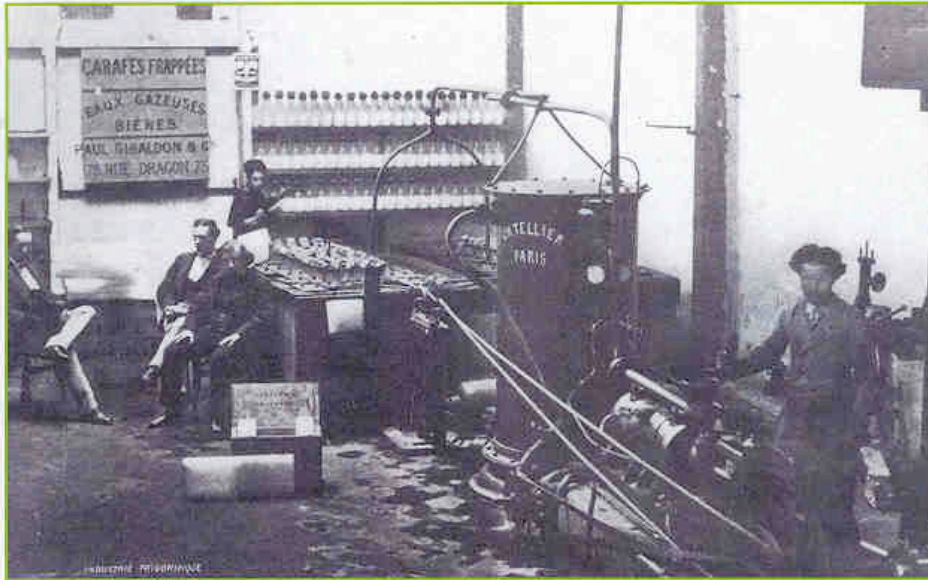


*Dr John Gorrie's refined ice making system, 1854
[ASHRAE Journal Show Guide, undated]*

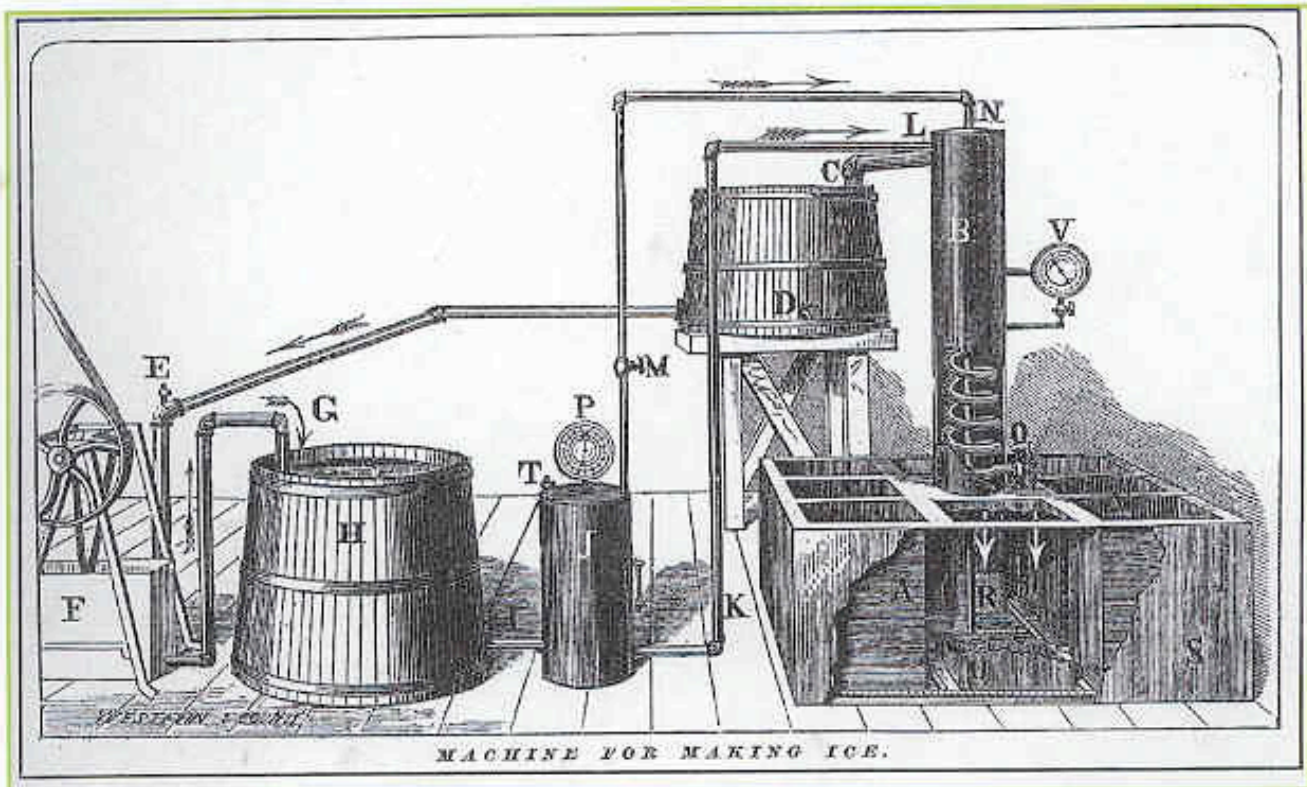
HARRISON'S ICE-MAKING MACHINE.



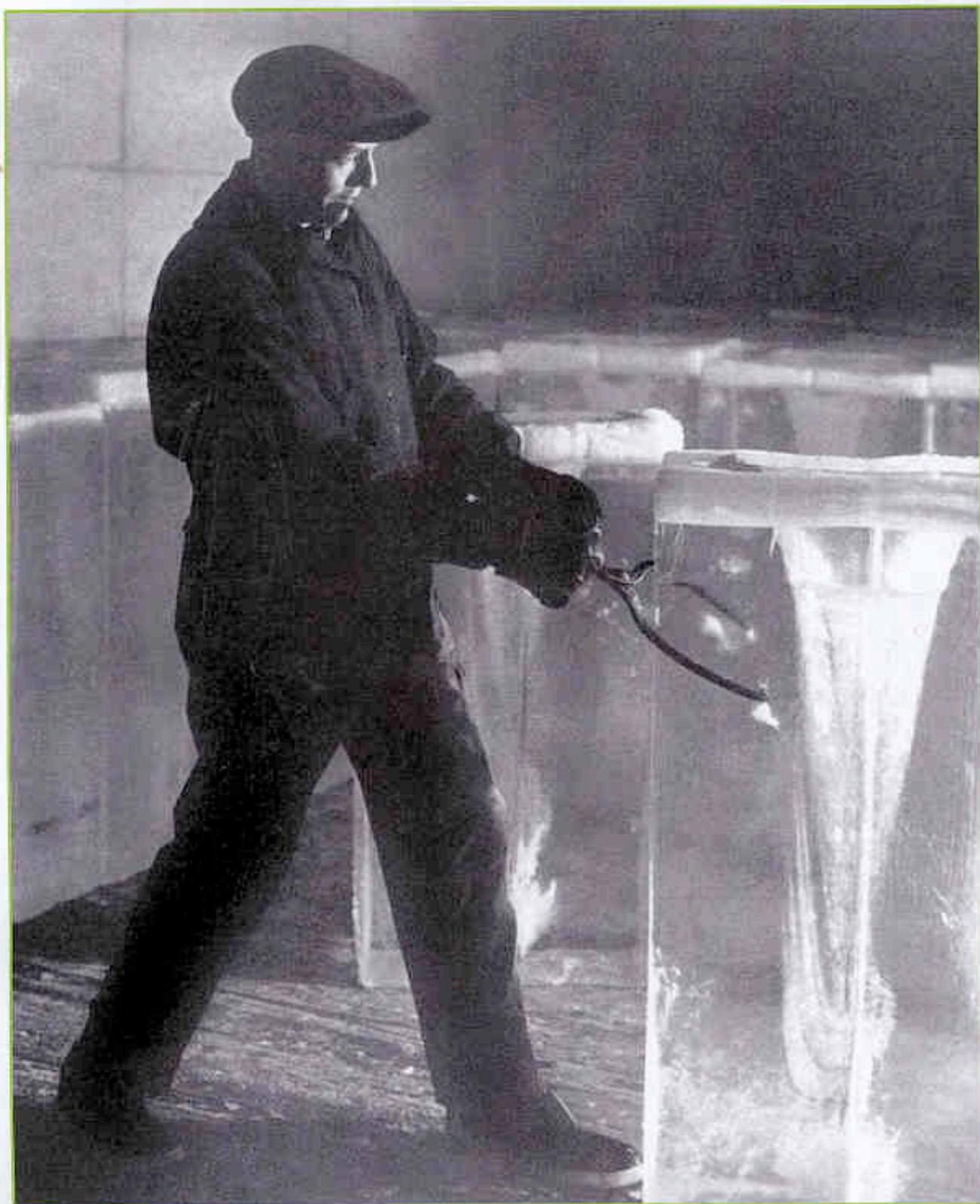
*James Harrison's ice making machine produced in collaboration with Daniel Seibe
[British Patent 2362, 1857, Heat & Cold, p.127]*



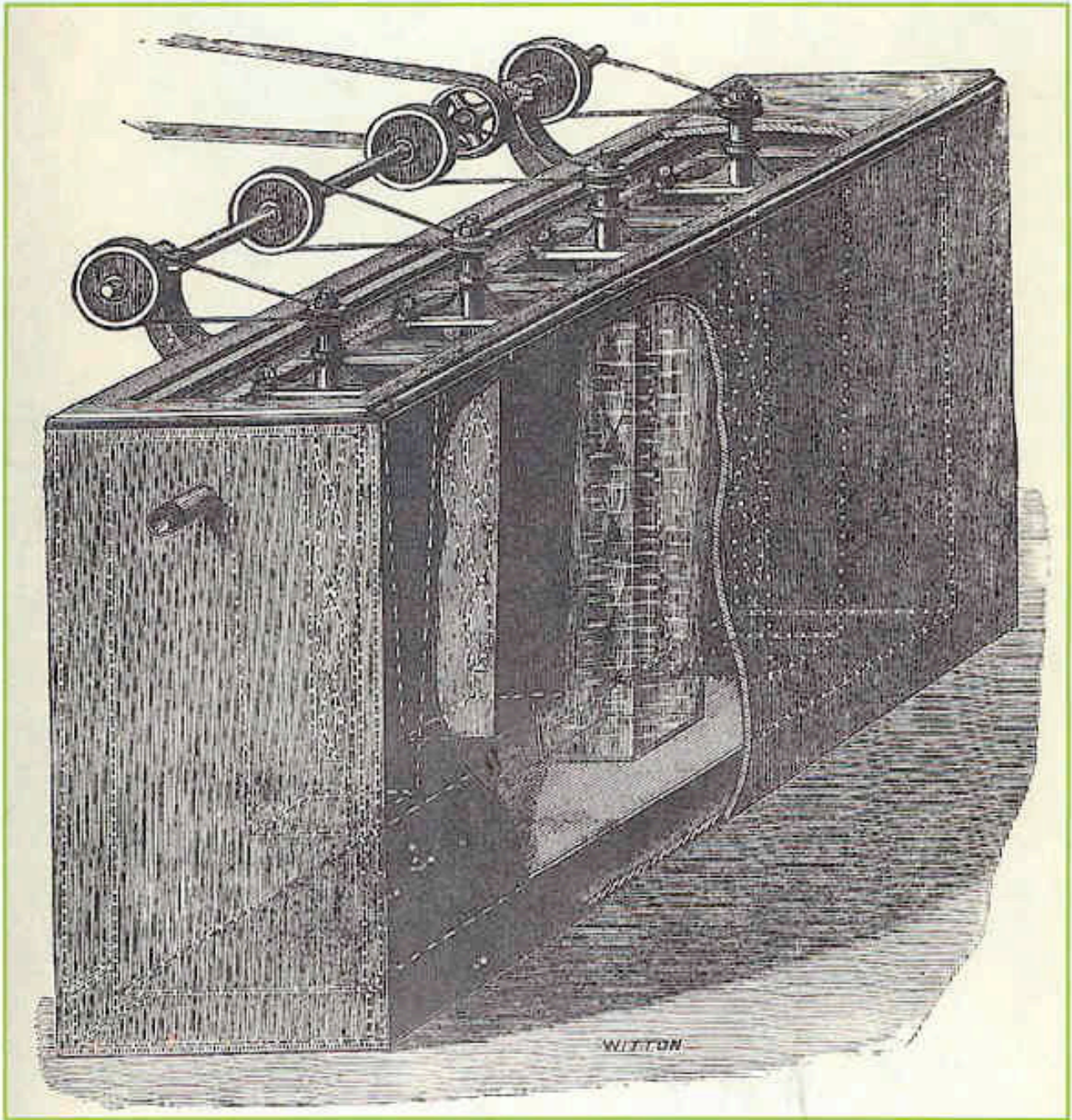
*Charles Tellier (seated, third from left) with his vapour-compression ice-making plant
[Built in Marseille in 1869, Heat & Cold, p.129]*



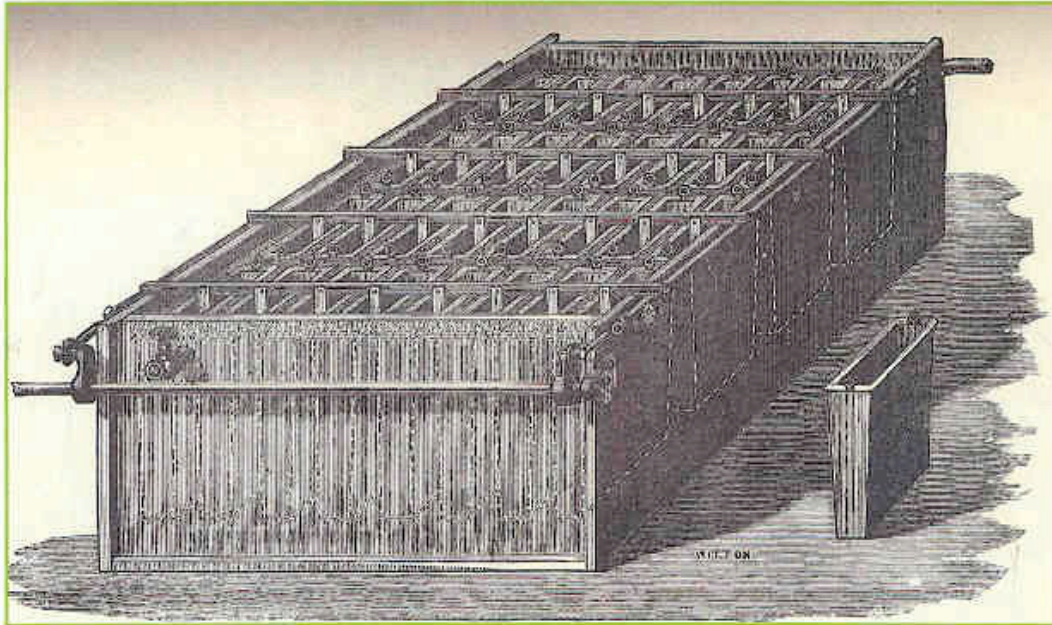
*Daniel Holden's ice-making machine, New Orleans, 1869
[The Manufacturer and Builder, December 1869]*



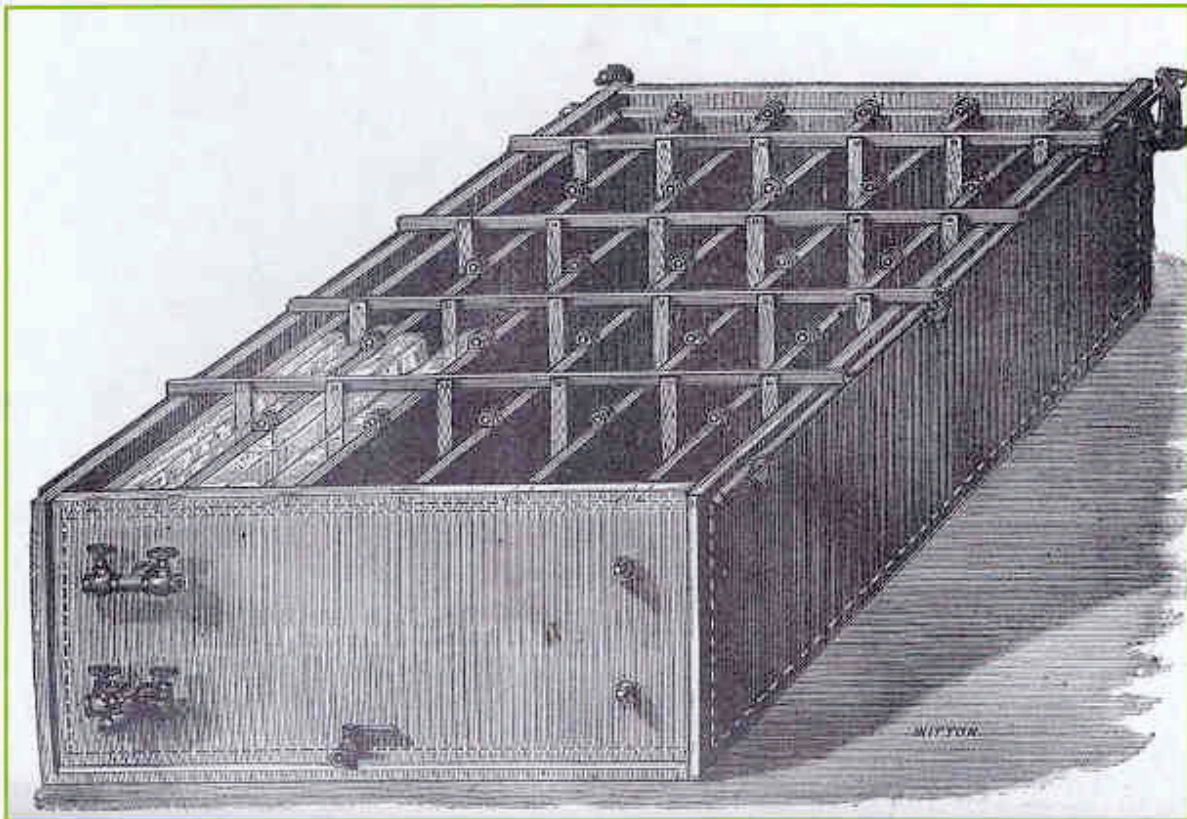
*Handling ice blocks, c.1900 (?)
[The Legend of York International, p.28]*



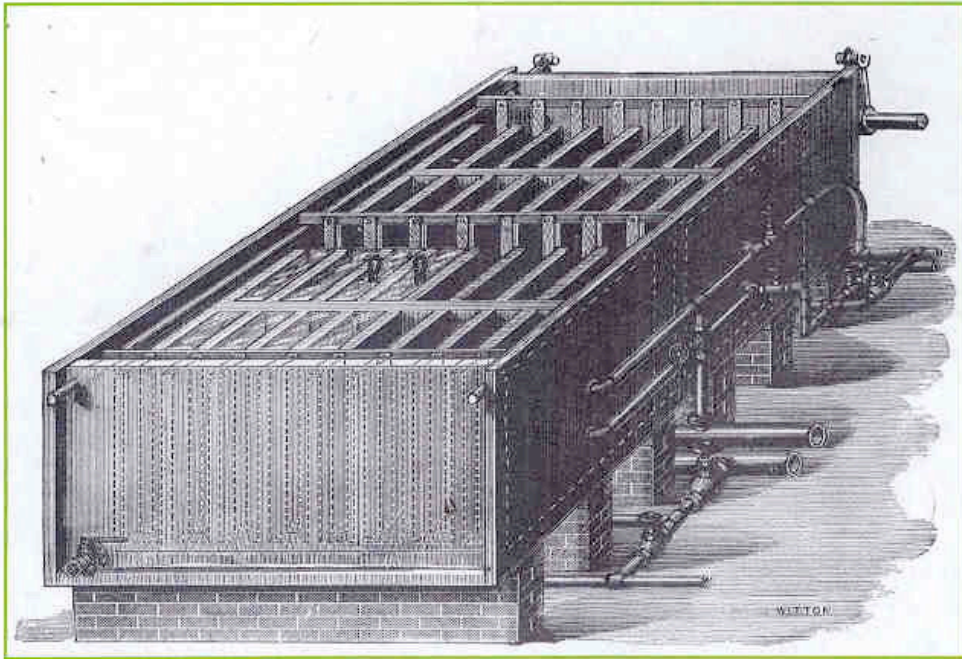
*Ice-making brine tank with moulds, Pontifex & Wood
[Refrigerating and Ice-Making Machinery, 1902, p.211]*



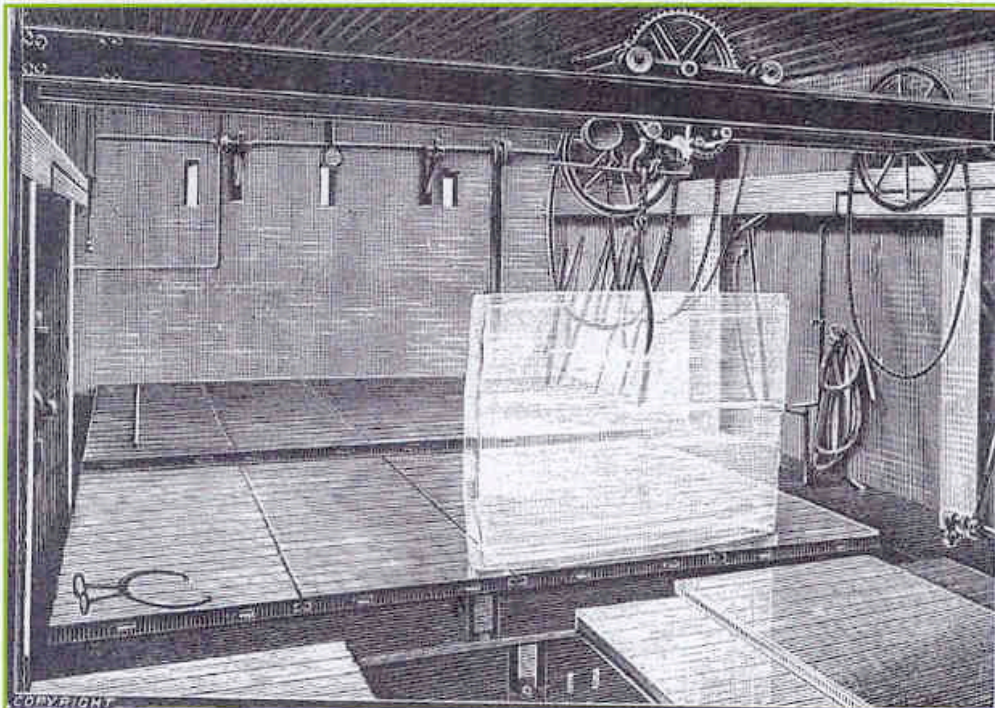
*Can ice box tank, Pontifex & Wood
[Refrigerating and Ice-Making Machinery, 1902, p.213]*



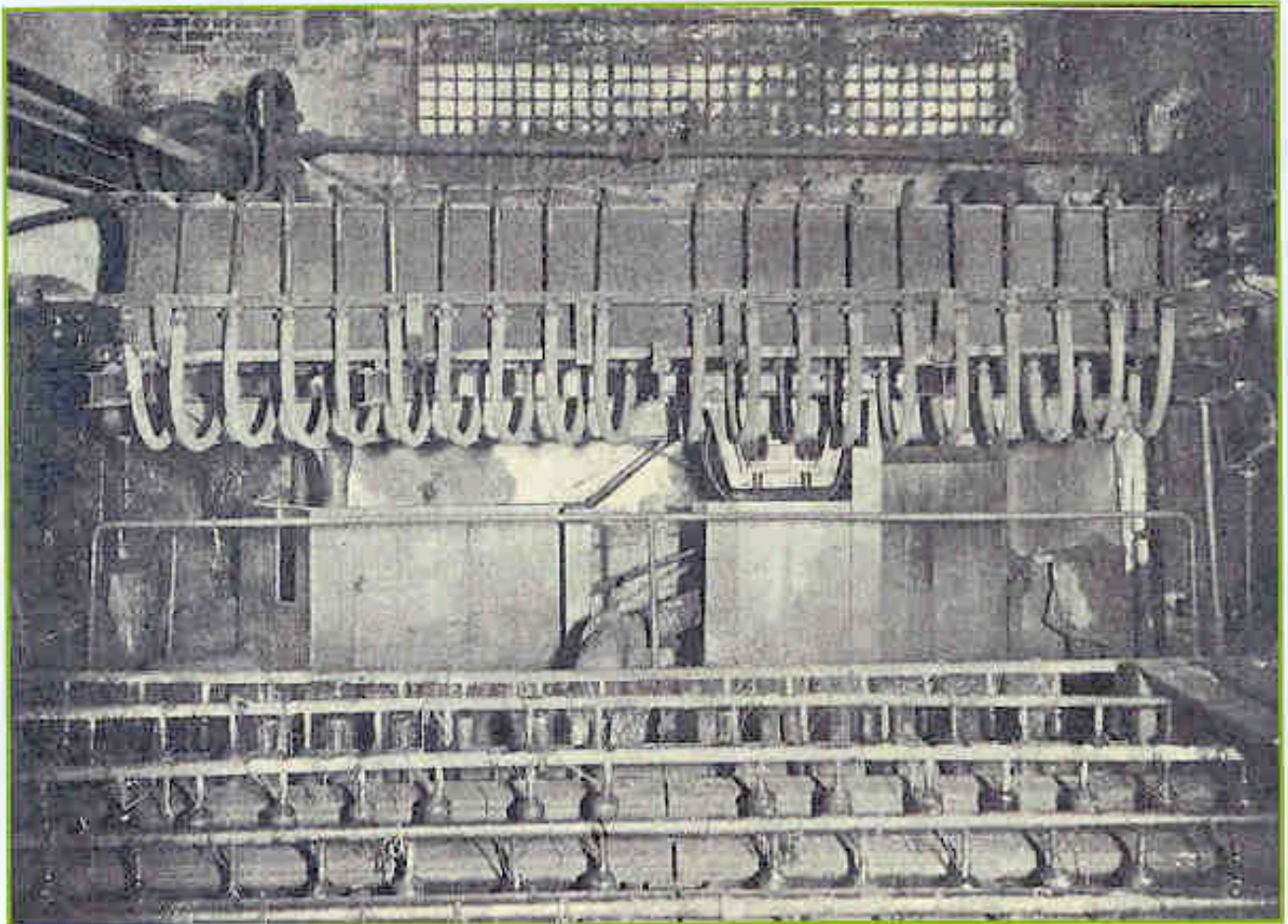
*Ice making tank on the wall or plate system, Pontifex & Wood
[Refrigerating and Ice-Making Machinery, 1902, p.216]*



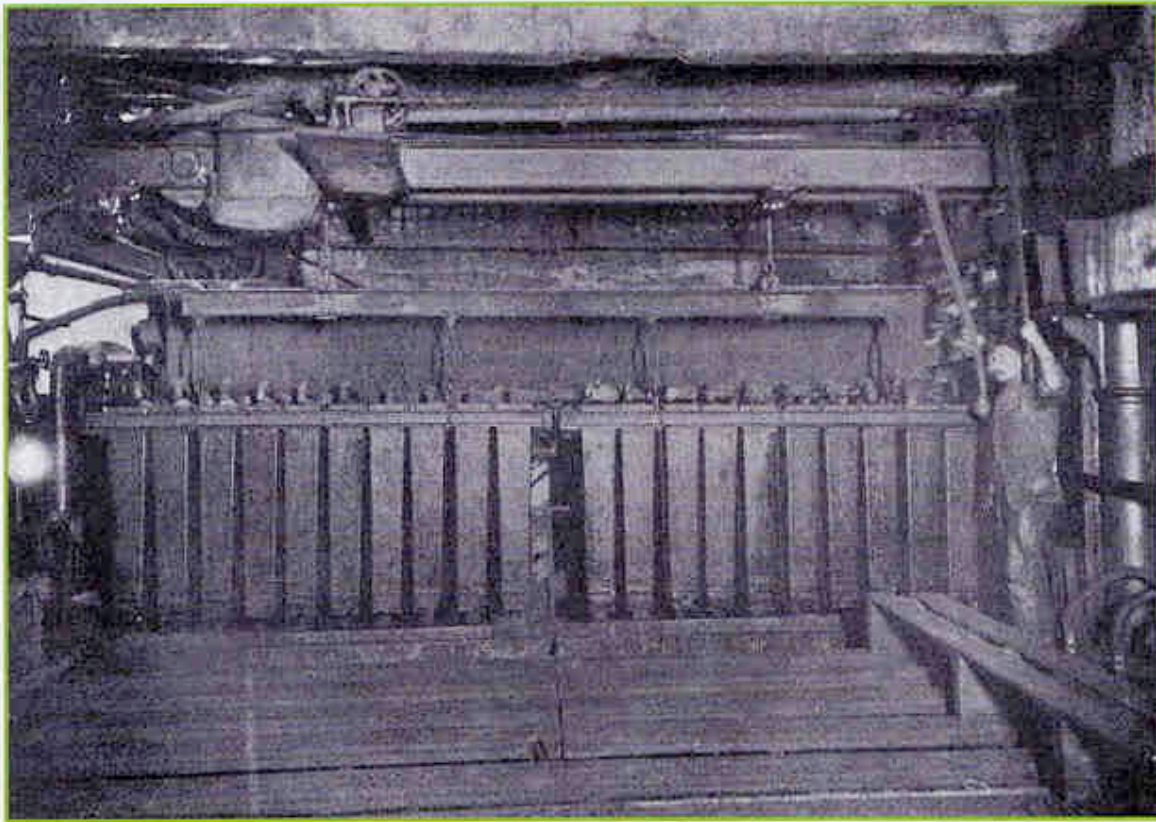
*Hill's method of making ice, British Patent No. 16253, 1899
[Refrigerating and Ice-Making Machinery, 1902, p.220]*



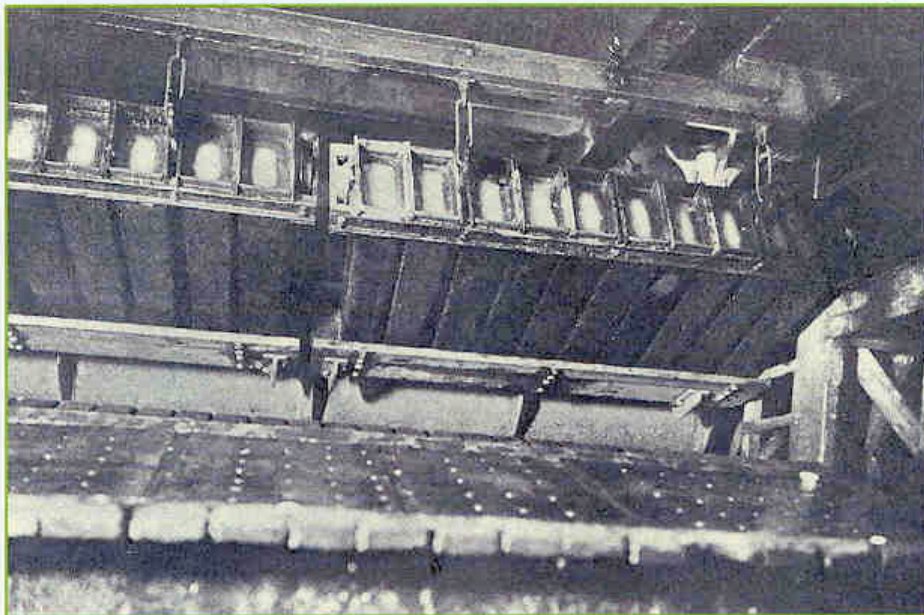
*Ice making tank producing 5 cwt blocks (8 ft x 6 ft x 8 inches)
with lifting mechanism, Pulsometer Engineering Company Ltd
[Refrigerating and Ice-Making Machinery, 1902, p.221d]*



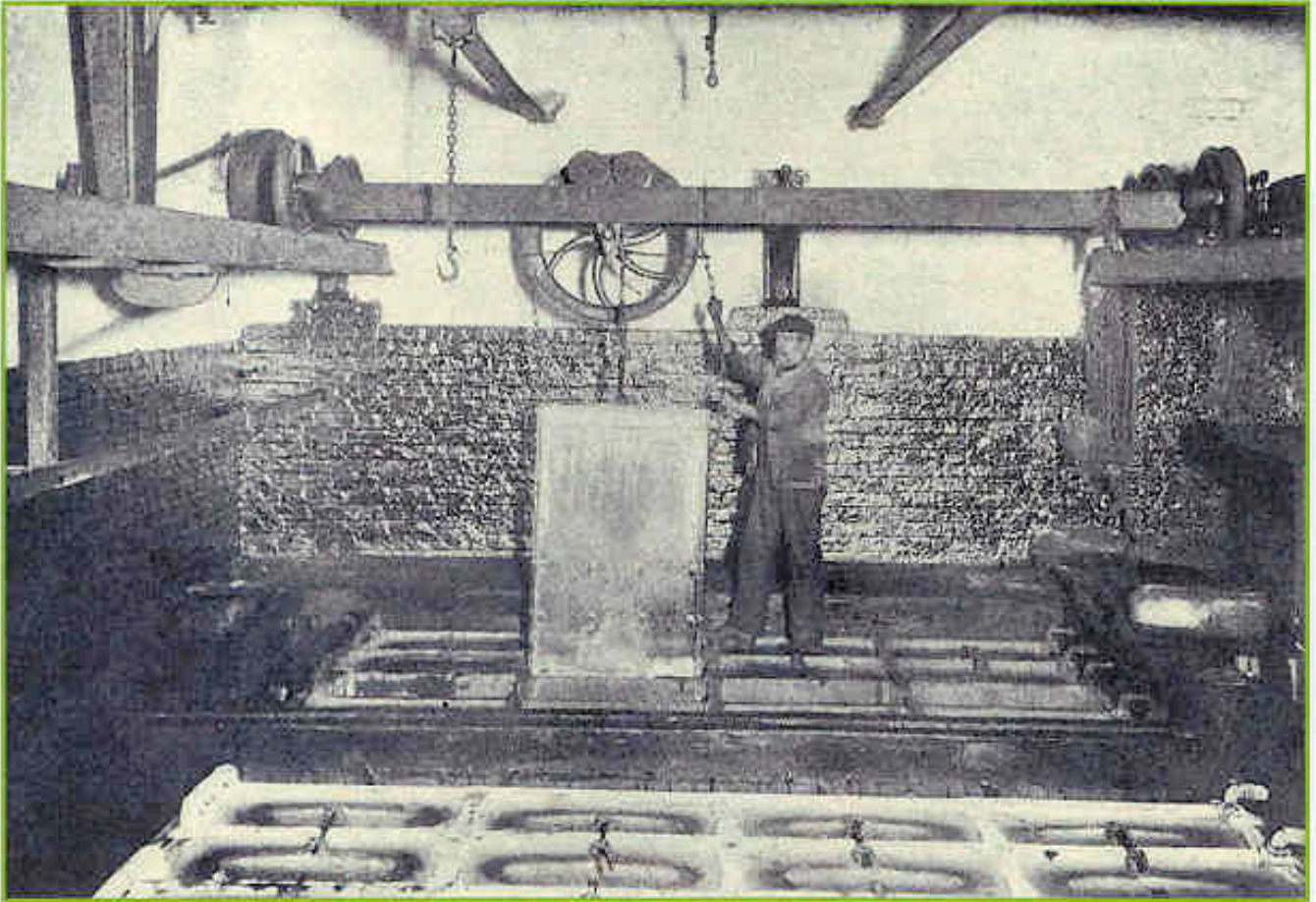
*Ice can system at the Liverpool Cold Storage and Ice Company,
Fitted by The Linde British Refrigeration Company
[Refrigeration, 1908, p.142]*



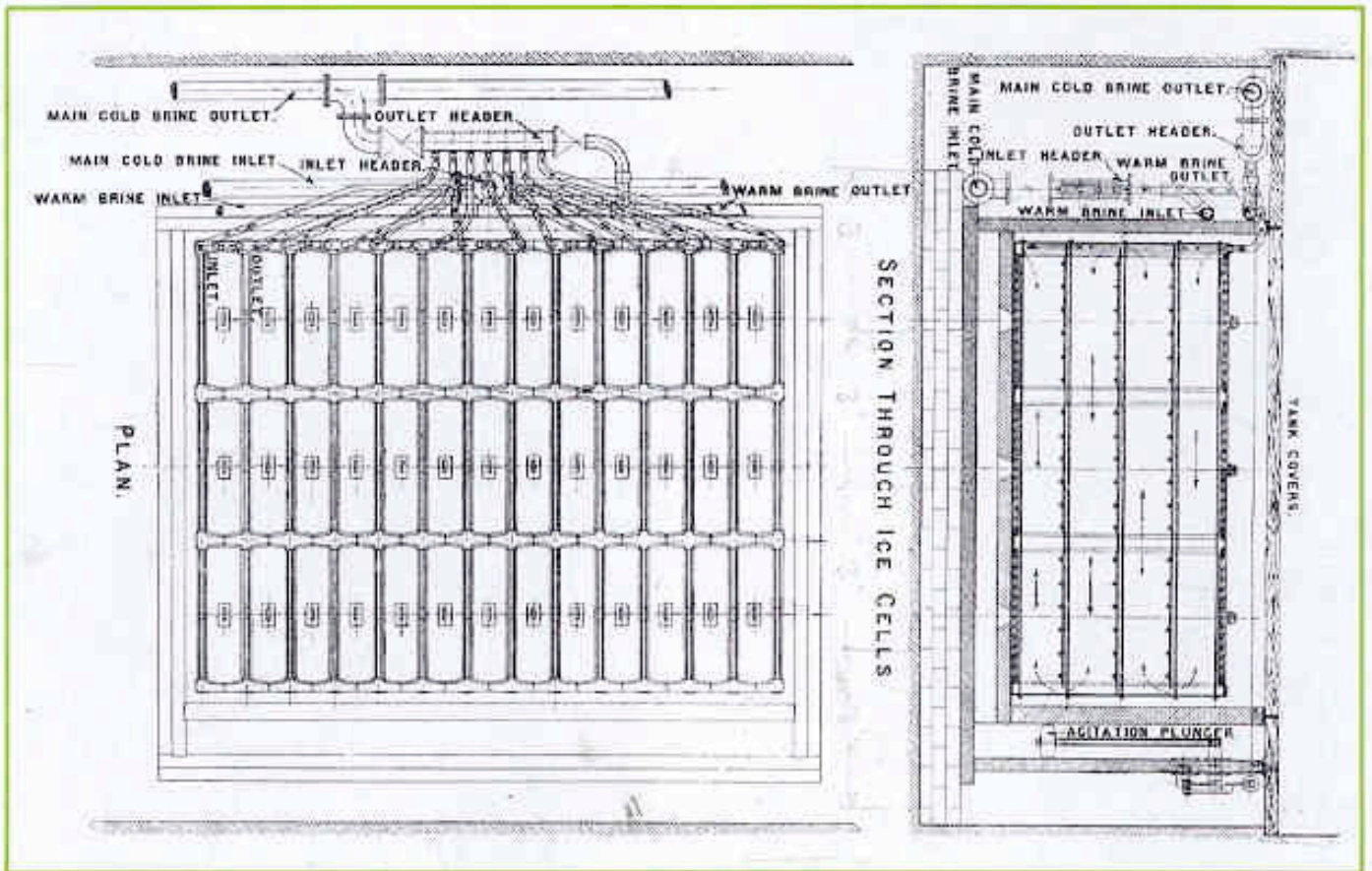
*Ice can system at the Liverpool Cold Storage and Ice Company.
Fitted by The Linde British Refrigeration Company
[Refrigeration, 1908, p.143]*



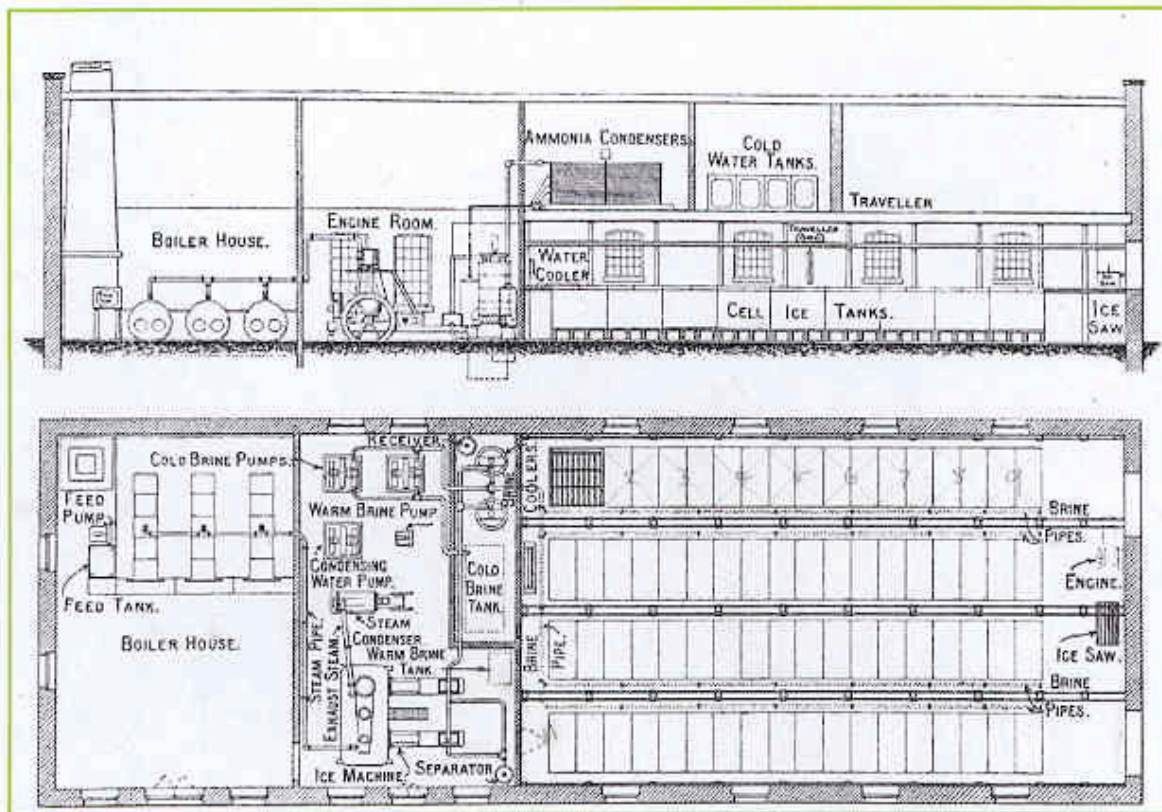
*Ice can system at the Liverpool Cold Storage and Ice Company.
Fitted by The Linde British Refrigeration Company
[Refrigeration, 1908, p.145]*



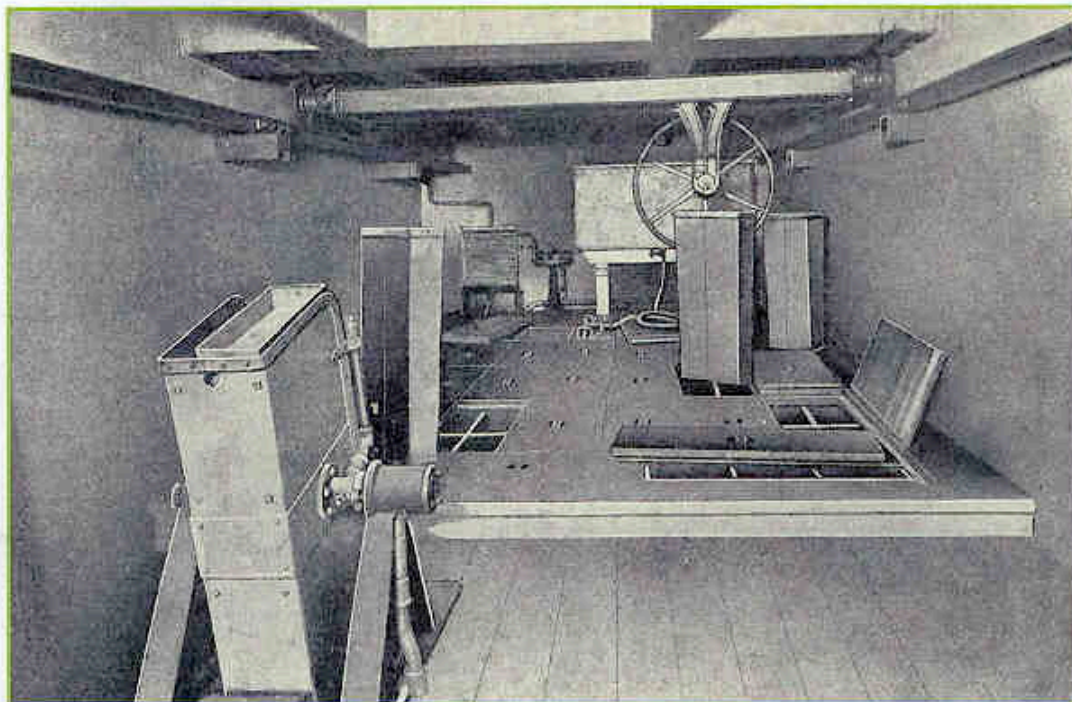
*Ice cell system at the Liverpool Cold Storage and Ice Company.
Fitted by the Liverpool Refrigeration Company
[Refrigeration, 1908, p.148]*



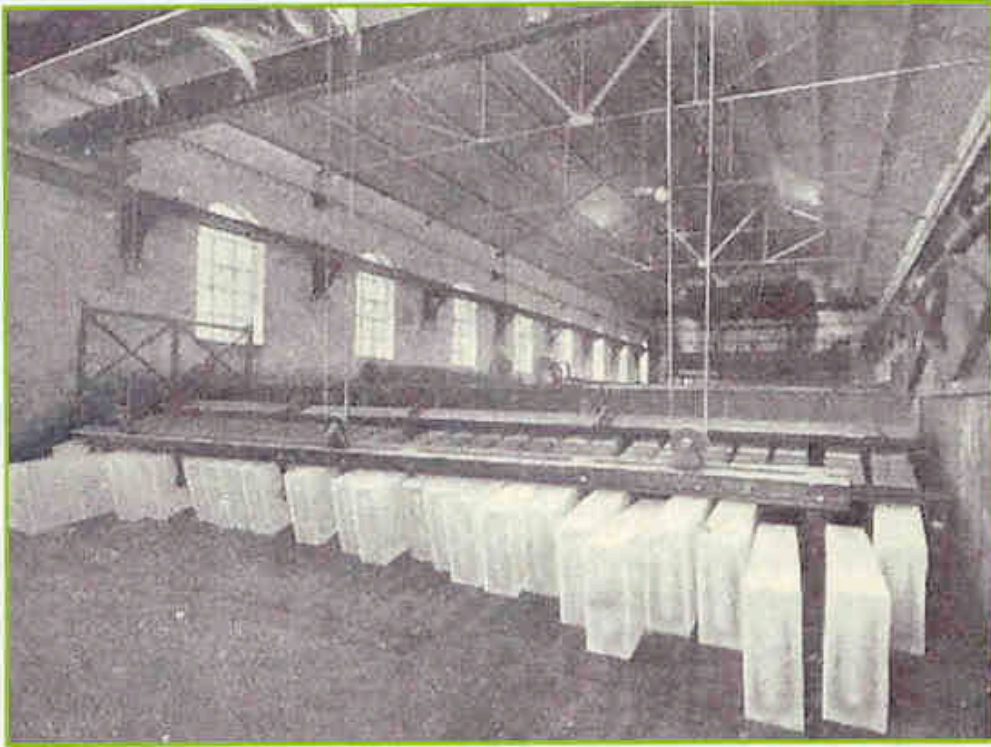
*Ice cell system by the Liverpool Refrigeration Company
[Refrigeration, 1908, p.149]*



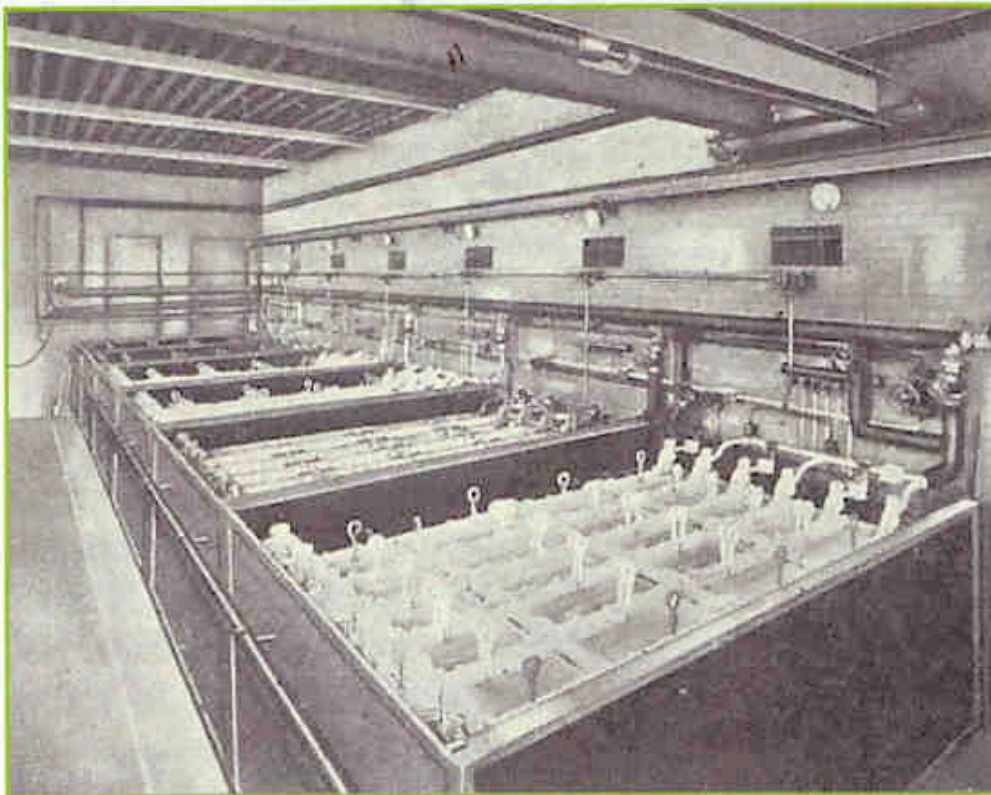
Typical ammonia compression ice-making plant, 1908 [Refrigeration, p.196]



Ice-making plant at The Ritz hotel, London, 1908 [Refrigeration, p.199]



*Lightfoot Refrigeration ice-making plant, possibly c.1910
[Cold Storage and Ice Making, p.75]*



*Empire Direct Expansion Ice Plant Co, Liverpool, c.1910 (?)
[Cold Storage and Ice Making, p.81]*