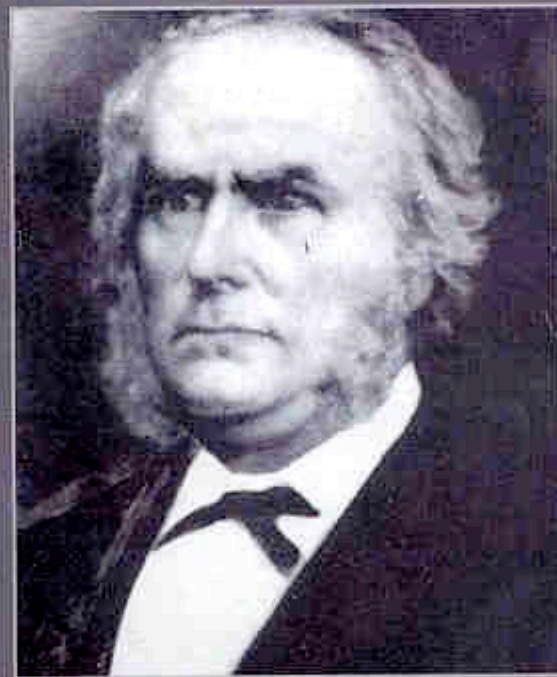


*Industrial Refrigeration  
and  
Air Conditioning*



*Part 1.7 Pioneers*

## *Part 1.7 Pioneers*

*Mini-biographies in the following order*

**Jacob Perkins**

**Alexander Catlin Twining**

**Dr John Gorrie**

**James Harrison**

**Ferdinand Carré**

**Louis Charles Abel Tellier**

**Daniel Livingstone Holden**

**David Boyle**

**Professor Carl von Linde**

**Dr Willis Haviland Carrier**

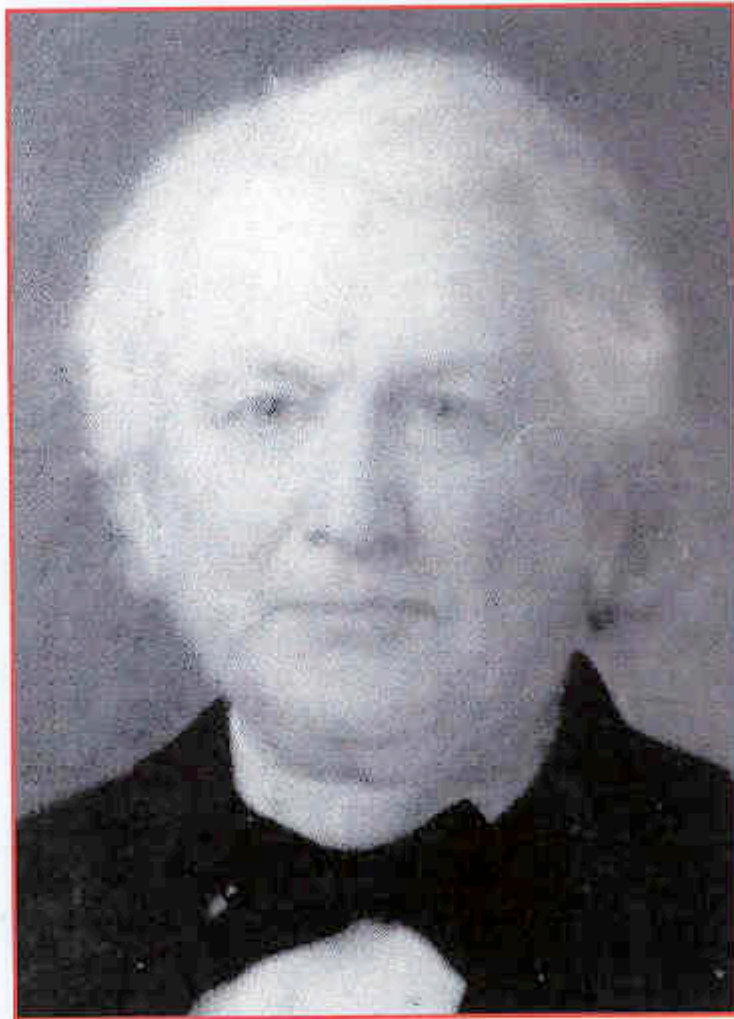


## *Jacob Perkins 1766-1849*

*American born, moved to England in 1819. Became interested in refrigeration; corresponded with Trevithick. Patented a closed-cycle vapour-compression machine (BP 6662: 1834) which was constructed by John Hague in London, being notable for the use of a weighted expansion valve.*

*[The Comfort Makers, entry 77]*

*[Portrait from A Dictionary of Arts, 1856]*

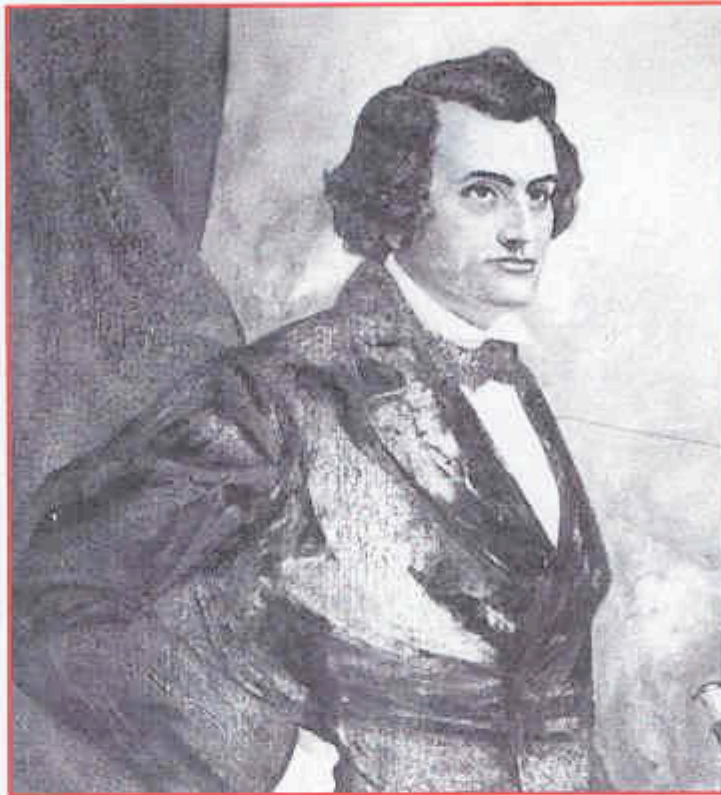


*Alexander Catlin Twining*  
**1801-1884**

*American scientist and engineer. Wrote papers and designed and patented a number of “freezing” machines. Developed ice-making plant but commercial manufacture was stopped by the Civil War.*

*[The Comfort Makers, entry 79]*

*[Portrait from Heat & Cold, p.124, Twining family]*

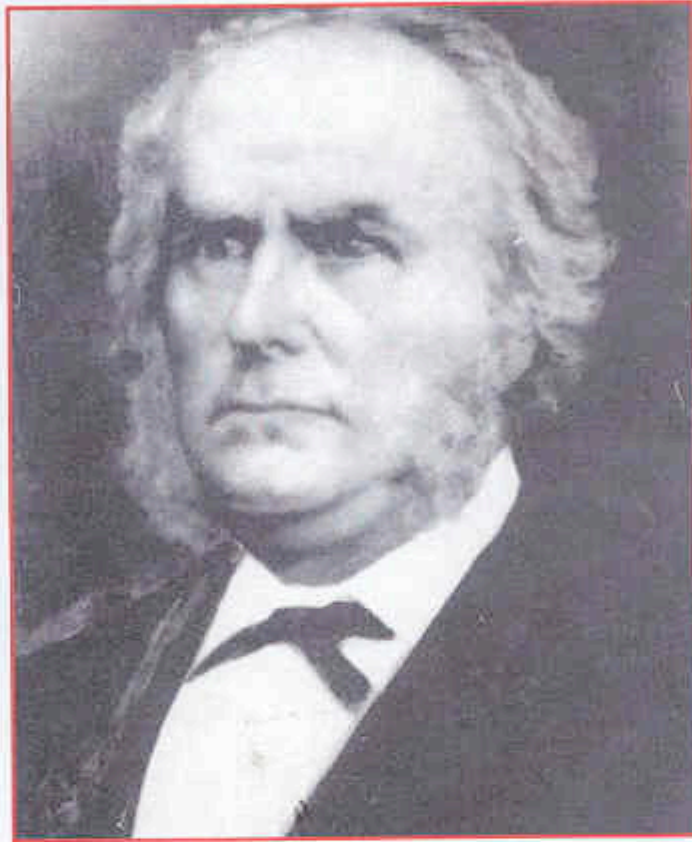


## *Dr John Gorrie 1802-1855*

*American physician, worked in Florida, became interested in air cooling for fever patients. Constructed a working air-cycle refrigeration machine. Obtained patents (USP 8080: 1851 & BP 13,324: 1850). Commercially unsuccessful, but important modifications suggested by William Siemens were used by later air-cycle refrigeration pioneers.*

*[The Comfort Makers, entry 96]*

*[Portrait from Heat & Cold, p.122, Florida State Archives]*

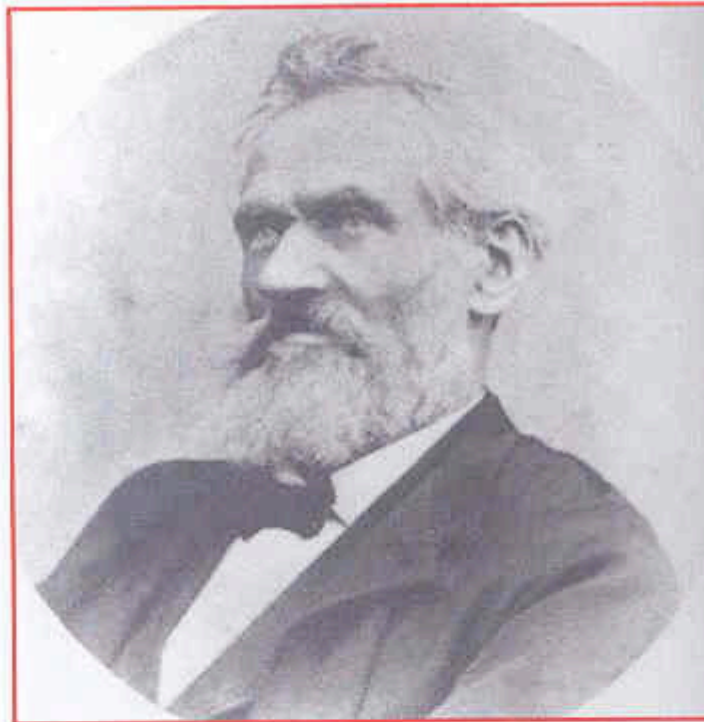


## *James Harrison 1816-1893*

*Born Scotland, emigrated to Australia where he took a strong interest in mechanical refrigeration for the meat trade. Developed an ethyl ether compressor which was successfully manufactured by Siebe Bros in London. Obtained various patents (BP 747: 1856 & BP 2362: 1857). First machine sold to Truman, Hanbury & Buxton Brewery of London in 1857. More machines sold by Siebe and by P N Russell & Co in Sydney, making Harrison the first pioneer to see commercial production of his invention.*

*[The Comfort Makers, entry 80]*

*[Portrait from Heat & Cold, p.125]*



## *Ferdinand Carré 1824-1900*

*French engineer, studied thermodynamics, obtained series of patents (1857-62). Famous for building an intermittent aqua-ammonia absorption refrigerating machine in 1859. Later developed a continuous machine for commercial use. Left no written records apart from his patents.*

*[The Comfort Makers, entry 81]*

*[Portrait from The International Institute of Refrigeration]*



## *Louis Charles Abel Tellier 1828-1913*

*Known in France as “The Father of Cold” he had a life-long interest in refrigeration and its application to brewing and food storage. He made a methyl ethyl compressor (1868). The same year he failed in his attempt to ship refrigerated meat but was later successful (1876). Built what was possibly the first mechanically refrigerated cold store. Died in poverty.*

*[The Comfort Makers, entry 82]*

*[Portrait from International Institute of Refrigeration]*





*Daniel Livingstone Holden*  
**1837-1924**

*Born in Kentucky, he significantly improved the performance of a Carré absorption machine that had been smuggled into the Confederate South during the Union blockade. He went on to improve the compressor of Van der Weyde (1867) and later produced his "Regealed" ice machine (1869).*

*[The Comfort Makers, entry 89]  
[Portrait from Heat & Cold, p.133]*



## *David Boyle 1837-1891*

*Born in Scotland, emigrated to California where he designed an ammonia refrigerating compressor (USP 128,448: 1872) Established Boyle Ice Machine Company in Chicago, c.1877. Jointly credited (with Carl Linde) as inventor of the ammonia compressor and regarded as the "Father of Ammonia Compression Refrigeration in America."*

*[The Comfort Makers, entry 87]*

*[Portrait from Ice and Refrigeration, July 1891, p.24]*



## *Carl von Linde 1842-1934*

*German Professor, wrote his classic paper on the mechanical extraction of heat in 1870; applied a rigorous thermodynamic approach to refrigeration design. He built an ammonia compressor in 1876 and established commercial production in Weisbaden in 1879. Fred W Wolf secured the manufacturing rights for the USA (1881). The Linde ammonia compressor and system was widely used throughout the world.*

*[The Comfort Makers, entry 90]*

*[Portrait from Ice and Refrigeration, Vol.35, 1908, p.123]*



*Dr Willis Haviland Carrier*  
**1876-1950**

*American engineer and inventor. Instrumental in founding Carrier Engineering Corporation. Although best known for his air conditioning achievements and called “The Father of Air Conditioning” one other major success was the production of the first centrifugal refrigerating machine. It found many industrial applications and revolutionised the commercial air conditioning industry. Carrier was ASRE President in 1927.*

*[The Comfort Makers, entry 101]*

*[Portrait from ASHRAE Journal, October 1994, p.51]*