Times Past

BOILER EXPLOSIONS, c1890

TODAY, it may be difficult to appreciate the danger posed, both to property and to life, by the ever present threat of a boiler explosion around 100 years ago. The risk was present in both steam and hot water boilers. Causes ranged from inferior materials, bad workmanship and overheating to defective safety valves and feed-water equipment. The number of boiler explosions in the USA from 1884 to 1894 was about 255 per year. The number of people reported as being killed by such accidents totalled 2,562, with a similar number being injured. For roughly the same period, the total number of boiler explosions in Great Britain was 660, resulting in 313 deaths. A scientists of the time computed that the total stored energy in a Cornish boiler working at a pressure of 30 pounds per sq. inch gauge amounted to something like 58 million foot-pounds and was capable of hurling such a 'projectile' a distance of over 3,000 feet!

FIG. 170.
THE BOILER BEFORE EXPLOSION.

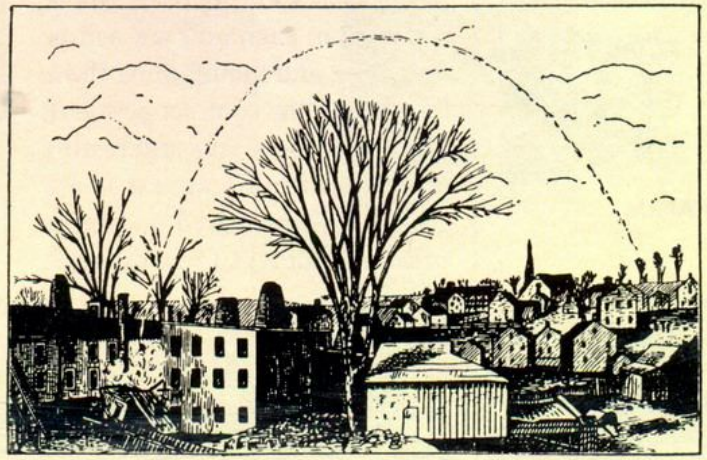


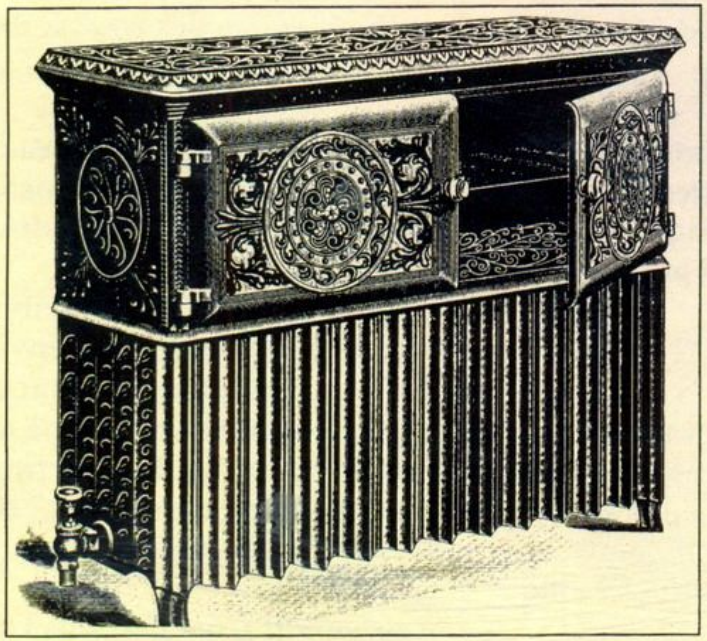
FIG. 171.—PATH TAKEN BY THE BOILER.

Part-2 of a series from the HAC magazine
From June 1996 to July 1998

Times Past

ORNAMENTAL RADIATOR, 1896

EARLY ROOM central heating apparatus was made up from coils of pipe in a variety of configurations. Stephen Gold of Connecticut patented a Mattress-type radiator in 1854. This comprised of two embossed iron sheets, fastened together by rivets, and bearing a distinct resemblance to James Watt's experimental steam radiator of 1784. Cast-iron radiators (typically single castings or halves bolted together) date from around 1850. Tasker of Philadelphia patented a primitive sectional radiator in 1858, while Joseph Nason and Robert Briggs received a US patent in 1863 for a steam radiator made up of vertical tubes screwed into a horizontal cast-iron base. Nathaniel Bundy of New York designed a similar radiator in his 1874 patent for the A A Griffin Iron Co, who later manufactured the sectional radiator patented by Gillespie in 1877. In the 1880's, a number of UK radiator patents were taken out by James Keith, W G Cannon, A Waters and T E Heap. By the 1890's a wide variety of radiators, mostly of American origin, were available, including that illustrated which features an integral food-warming compartment.

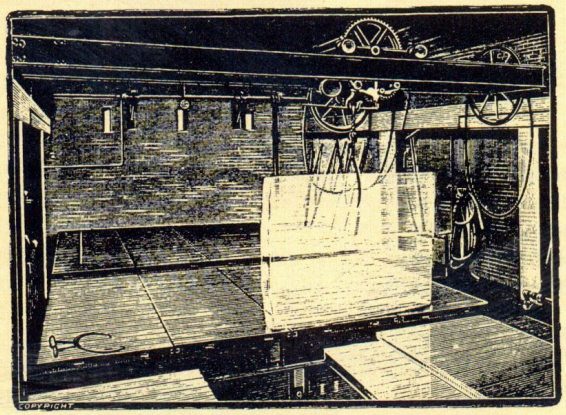


Times Past

ICE-MAKING, 1902

THE REFRIGERATION INDUSTRY developed equipment for the manufacture of artificial ice from the mid-1850s. Pioneers included Harrison in Australia and Twining in the USA. In Germany, Carl Linde introduced significant improvements in 1885. In Britain, ice-making plant was developed by companies such as Pontifex & Woods and by the Pulsometer Engineering Co. By the turn of the century, a typical plant could produce blocks of ice 8 feet x 6 feet and either 8 inches or 16 inches thick, and used a special lifting mechanism to raise the slabs from the freezing tanks.

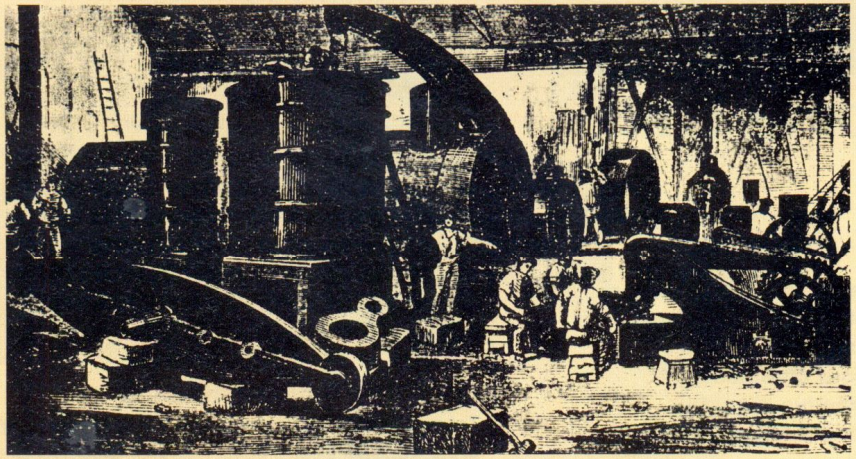
Prepared by Brian Roberts



Times Past

BOILER MAKING, 1861

THE CORNISH, and later the Lancashire boiler, were developed to meet the needs of the Lancashire and Yorkshire textile industries for high steam pressures and capacity and for economy in fuel consumption. The Lancashire boiler, patented by Fairbairn and Hetherington in 1844 employed a design with two internal flues, each with its own furnace. The engraving is of the works of Wm. Fairbairn in Manchester, and shows a steam-engine beam and cylinders, Lancashire boilers (with cranes for moving them) and steam-powered machines (right) for punching holes in boiler plate.



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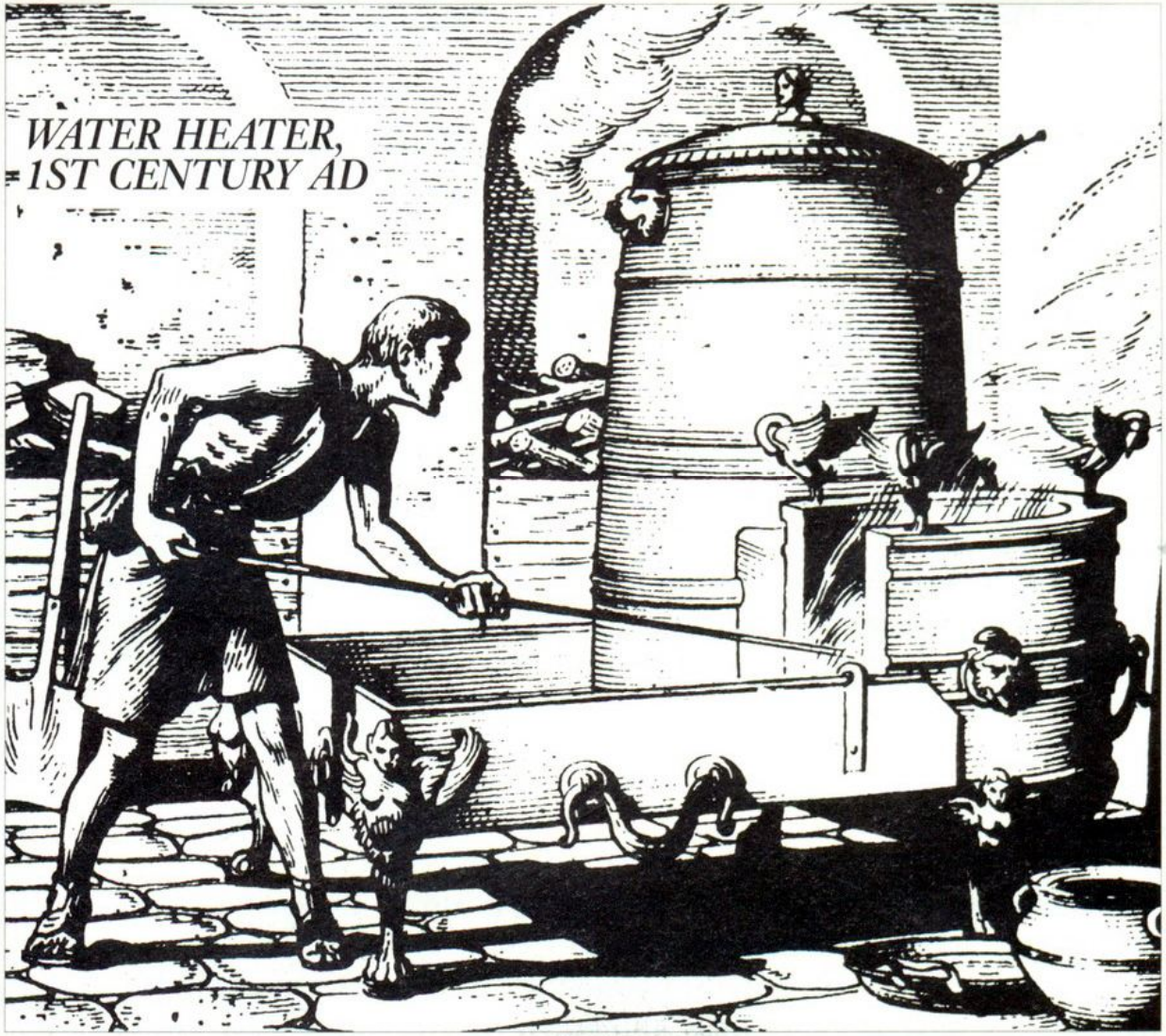
TIMES PAST . . .

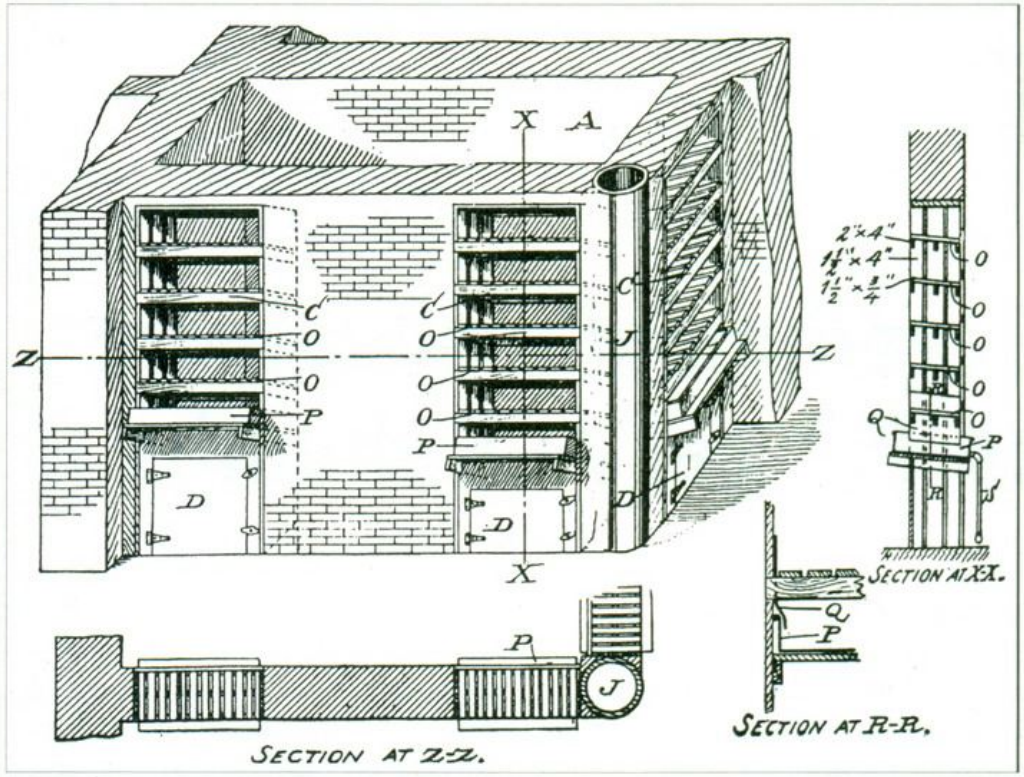
Public bathing was a well established social habit in ancient Rome and throughout their Empire they set up the "thermae" or bathing establishments. The most famous of these are the Baths or Caracalla in Rome which could accommodate 1600 bathers. Roman villas also had their own baths and some used heaters like the one pictured to provide domestic hot water. Another, described by Seneca, was a "once-through" heater, made from a spiral copper pipe through which the water flowed, being heated by the flames of a fire.



WATER HEATER, 1ST CENTURY AD

TIMES PAST . . .

ICE-BLOCK COOLING SYSTEM, 1891



Early cooling systems relied upon ice or well-water as the source of cold. In 1833, Dr John Gorrie of Charleston, South Carolina, sought to cool hospital rooms by blowing air over buckets of ice suspended from the ceiling. The illustration shows part of the ice cooling system design by Alfred R Wolff for New York's Carnegie Hall in 1891. A is the fresh air shaft; O are the ice-racks and P the iron drain pans.

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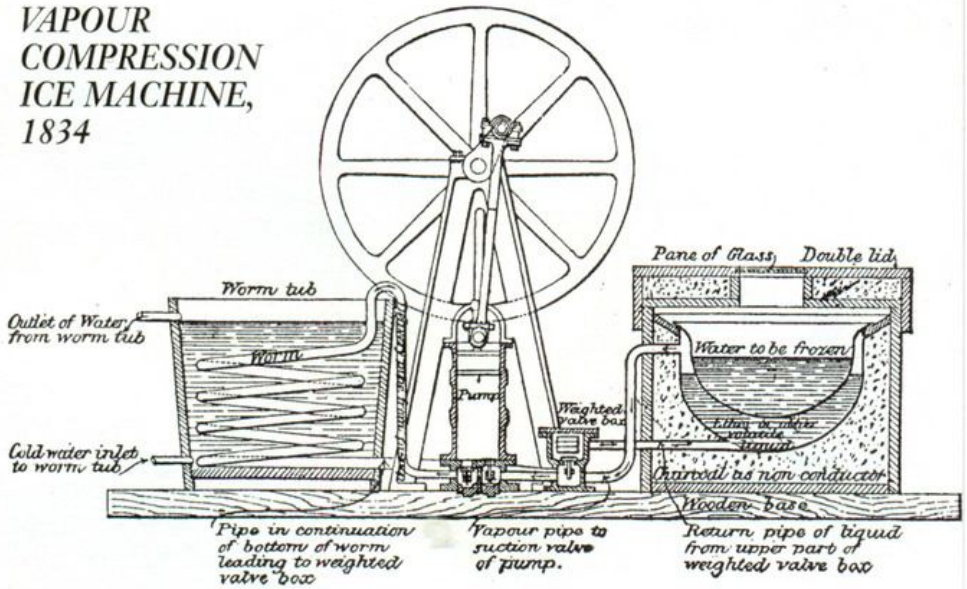
TIMES PAST . . .

VAPOUR COMPRESSION ICE MACHINE, 1834



In 1805, the American Oliver Evans proposed a mechanical refrigeration cycle which was perfected by his friend Jacob Perkins while working in London. Perkins was granted British Patent 6662 of 1834 for the machine illustrated. While a working machine for making ice was constructed, it never progressed beyond the experimental stage.

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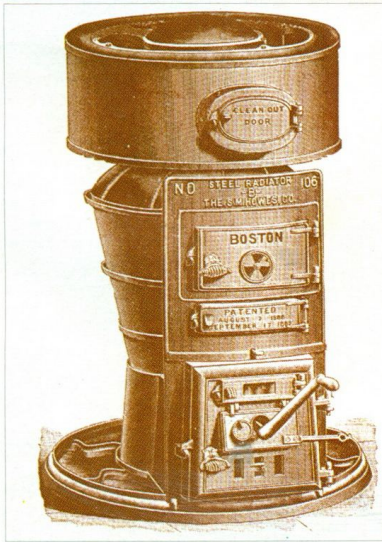
times past . . .

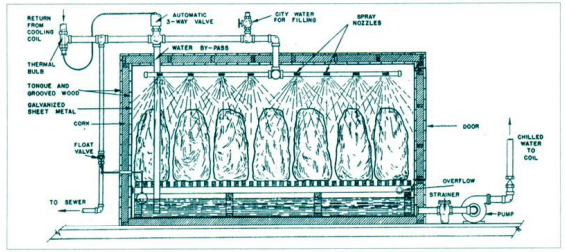


steel radiator furnace, 1897

This is the Steel Radiator Furnace produced by the S M Howes Company of Boston, Mass. manufactured in six sizes (with 12, 18, 20, 22, 24 & 26 inch firepots), first patented 7th August 1888, and complete with "Fully convertible flue in top radiator and steel plate drive into cup joints". Advertised in The Metal Workermagazine of 3rd July 1897, it was described as "In Every Way Just What the Trade Wants".

times past . . .

ice tank, 1934



"In the spray-type tank, chilled water is carried in the bottom to a depth sufficient to keep the circulating pump primed. Just above the water line, a heavily built rack of wood carries the 300lb blocks of ice. A system of piping and nozzles ..... (ensures) warm water returning from the air cooling units will be sprayed over the ice blocks. The pump takes the chilled water from the reservoir at the bottom of the ice tank and circulates it through the air cooling unit".
(From a Trane Air Conditioning Manual, 1934).

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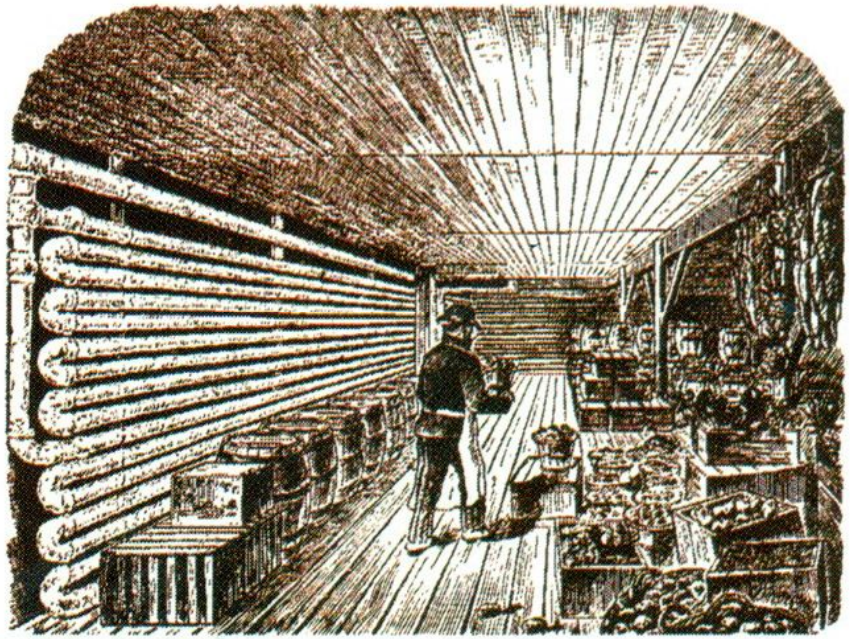
times past . . .

Cold store refrigeration, 1890



In 1863, an anonymous author in the "London Practical Mechanics Journal" wrote: "One hundred years ago the notion of making ice by a machine would have seemed as preposterous as an attempt to call down fire from Heaven." Some thirty years later, the use of refrigerating machines for the preservation of food was well established. The illustration of an early cold-storage refrigeration application is taken from an 1890 catalogue of the American Frick Company.