

due to its low cost (\$25) and utter simplicity. Four small, black cast iron tanks were arranged side by side in a glazed, wooden box and gravity fed with low pressure water from a header tank

Climax Solar-Water Heater

UTILISING ONE OF NATURE'S GENEROUS FORCES

THE SUN'S HEAT { Stored up in Hot Water for Baths, Domestic and other Purposes.

Price Of No. 1 Heater for 1892 Reduced to \$15 Net.



GIVES HOT WATER at all HOURS OF THE DAY AND NIGHT.
NO DELAY.
FLOWS INSTANTLY.
NO CARE NO WORRY.
ALWAYS CHARGED. ALWAYS READY.
THE WATER AT TIMES ALMOST BOILS.

Price, No. 1, \$25.00
This Size will Supply sufficient for 3 to 6 Baths.

CLARENCE M. KEMP, BALTIMORE, MD.



Fig 1.10 Climax water heater

Original advertisement for the heater that started a revolution. Available in eight sizes from 32 to 700 gals.

Other factors contributing to Kemps success were the dangerous and unreliable nature of early gas heaters and the prohibitively high cost of electricity at the time .

During the next twenty years, dozens of inventors attempted to improve on the Climax but few were a commercial success. One that did make inroads was patented by Frank walker in 1898. The Walker heater consisted of one or two 30 gallon tanks in a wooden hot box like the Climax but were recessed into the roof for aesthetics and better insulation. It's big advantage however was that it could be coupled into a fuel stove for increased utility.

In 1905 the "Improved Climax" came onto the market. It featured a single shallow, rectangular collector tank for faster heating in the morning and could also be connected to an auxiliary heater like the Walker unit.

These early solar water heaters provided users with large amounts of hot water for two thirds of the year in the sunnier states of the U.S but their one defect was their thermal efficiency. They lost heat rather quickly, as the only insulation was a wooden box and a glass pane. This meant they were not as effective late at night and useless very early in the morning.

In 1909 William Baily, an engineer, invented a new system that was to revolutionise the industry. He introduced the first flat plate collector consisting of a parallel grid of copper pipes welded onto an absorber plate. Hot water thermo-syphoned up into an insulated storage tank which unlike its predecessors, kept the water piping hot overnight. He called his system the "Day and Night" and it was an instant success, newspapers heralded it as the ultimate solar water heater.

They were not far wrong. By separating the functions of collection and storage and using a flat plate absorber , the modern solar appliance was born. Baily refined his system in 1913 by isolating the collector circuit from the mains and filling it with anti-freeze. A heat exchanger coil in the storage tank transferred thermal energy from the solar circuit to the water within. These improvements prevented damage to the collector pipes from freezing and blockages due to calcium deposits in hard water areas. It could also be connected to a fuel heater or stove as backup. Baily hit the jackpot and his brilliant design is basically unchanged to this day, despite the hype of modern manufacturers.

Business was booming ! by 1920 over 6000 units had been installed, with 1000 that year alone. However, this was a peak year because the 1920's saw the discovery of vast natural gas deposits in the Los Angeles basin and fuel prices plummeted to unsustainable levels.

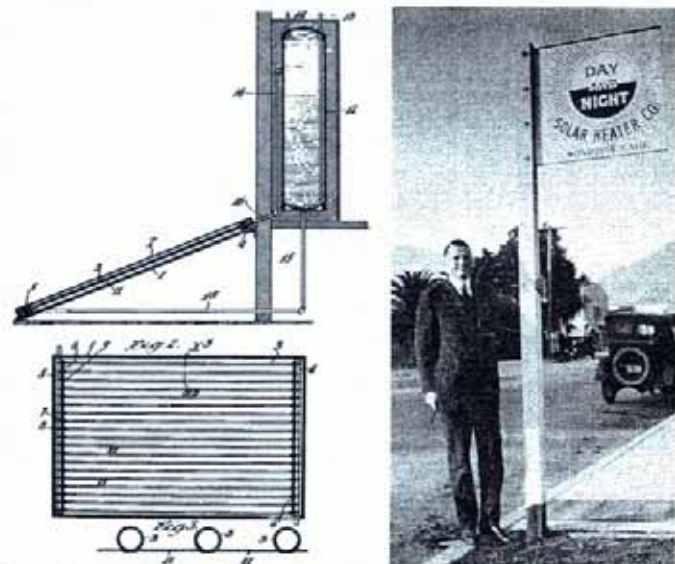


Fig 1.11 "Day and Night" heater

The 1909 patent drawing of Bailey's original unit. The precursor of todays modern solar hot water systems.