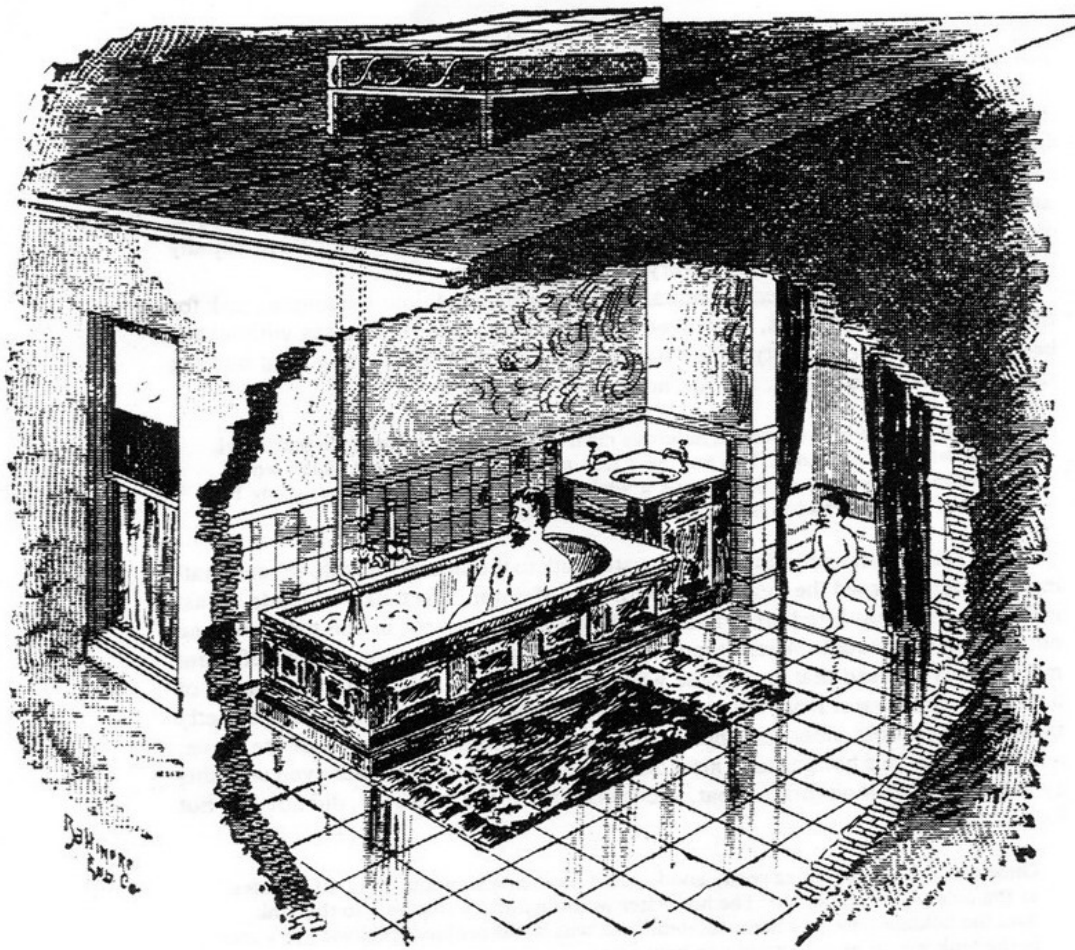


EARLY SOLAR WATER HEATERS PART-1

A History of the Climax Water Heater in California



A Maryland gentleman of the 1890's enjoys a steaming hot bath provided by his Climax solar water heater.

Although regular bathing had been commonplace in ancient Rome, the practice died out almost completely during the Middle Ages; not until the nineteenth century did it return to Europe and America. During the 1800's, the requirements of personal hygiene, advances in technology, and greater material well-being all combined to increase the demands for hot water. Pasteur's germ theory of disease underscored the need for frequent warm-water bathing. With the introduction of iron plumbing and cheap manufactured soap, such home hygiene became much easier than before. People also needed hot water for washing cotton clothes—which were rapidly replacing the woollens worn by everyone but the gentry.

Unfortunately, water heating remained a laborious and time-consuming task for the majority of Americans, who lived in small towns and rural areas without the benefits of gas or electricity. They had to rely on wood, gasoline or coal-burning stoves to heat their water. As one homesteader recalled,

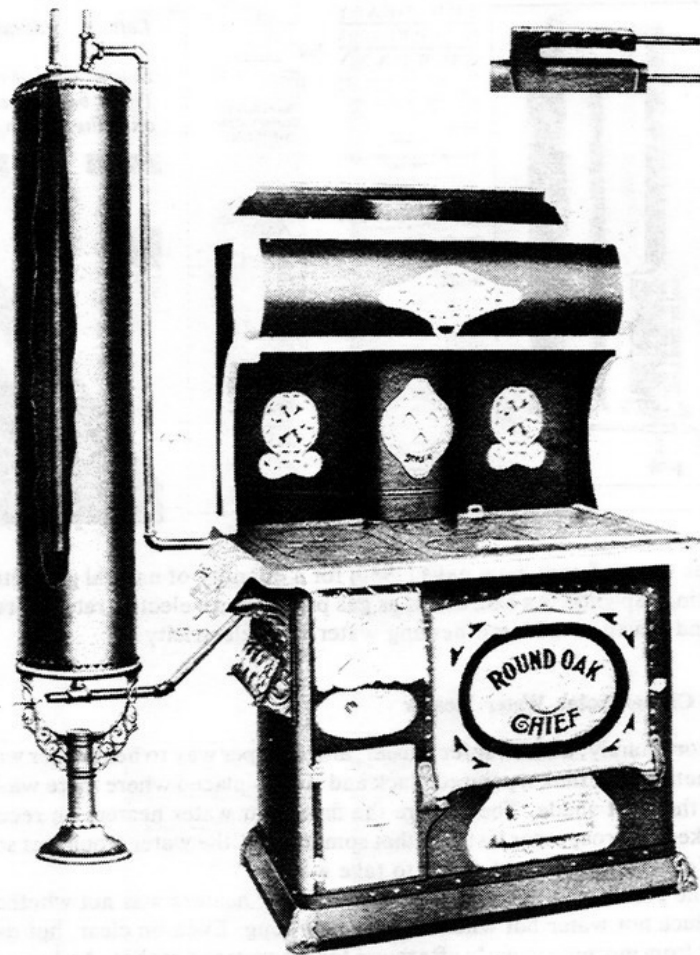
You took just one bath a week, a Saturday night deal, because it was such hard work to heat water on the stove. You put the water in pots, pails, anything which would hold water and you could lift. It took a while for those old stoves to get going because the heat first had to penetrate through the heavy metal.

Some people attached a four-gallon water tank to the side of their stove, eliminating the need to crowd the top burners with pots of water. The tank was made of cast iron, with a lid that lifted off to allow cold water to be poured in and then scooped out after being heated. Where there was enough water pressure, a more efficient method was devised that heated the water faster and did away with the burden of having to carry water from the pump or tap to the stove. Water circulated directly from the household pipes into metal coils looped through the firebox of the stove, and from there to a holding tank attached to the side of the stove. But even with this system the water took time to heat, and according to one old timer, did not stay hot for very long:

Once you got the fire going really good, you'd have to wait about 15 or 20 minutes as the cold water heated up. The hot water would naturally rise up into the tank. And the holding tank was not insulated. That was a real problem because the water in the tank would be cold within an hour or so.

Wherever water was heated—whether on top, next to, or inside the stove—the job of starting the fire and keeping it hot was a chore. After the wood was chopped and brought in or heavy hods of coal lifted, the fuel had to be kindled and the fire periodically stoked. There were also the unpleasant side-effects of smoke, ashes, dirt, and in the case of coal, foul odors. In the winter, families endured such nuisances anyway as part of the price of using the stove to cook hot meals and help keep the house warm. But in the summer, as one resident exclaimed, "It was torture just to be in the house with the stove on!"

In large cities the situation was a little better. There were gas heaters, which ran on "artificial" or "manufactured" gas made by baking coal in an airless environment. Artificial gas had only one half the heating capacity of natural gas, was not as clean-burning, and left oily residues. The most common type of gas heater was the "side-arm," so named because it was attached to the side of an uninsulated hot water tank. The side-arm was not automatic. It had to be lit with a match. The water

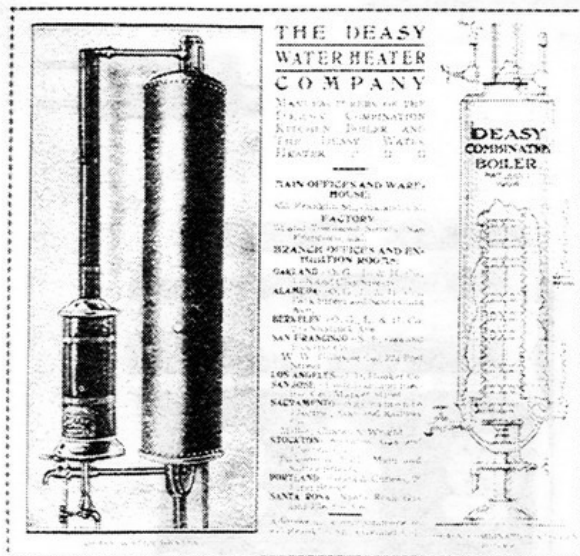


A typical turn-of-the-century water heater. Water was warmed in metal coils inside a cookstove and stored in the holding tank beside it.

took a while to travel through the heating coils inside the side-arm and into the adjacent tank. And when the water got hot enough, "the tank would start jumpin' and you knew it was time to shut it off," said one plumber who installed them. If you forgot,

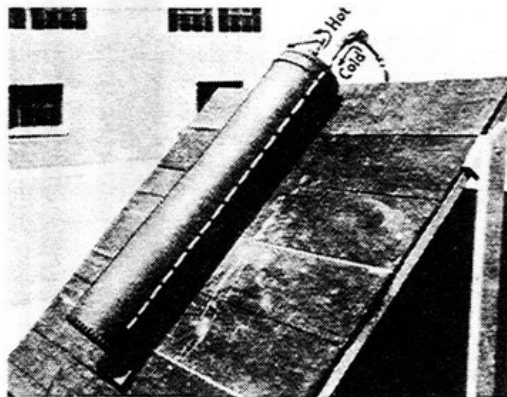
You might get your hand scalded or get a face-full of steam if you opened the hot water faucet. There were times when they would split a tank. We had this one house where this woman started [the] side-arm up and went uptown and when she came back the back of the building was blowed off!

Besides being dangerous, these early gas heaters were too expensive for many families to use. The price of artificial gas was about \$1.60 per thousand cubic feet around the turn of the century. Taking inflation into account, it cost more than ten



Left: A "side-arm" gas water heater, circa 1900.

Below: One of the first solar water heaters. These bare metal tanks were painted black and tilted facing the sun.



times what a family now pays (1980) for a quantity of natural gas with comparable heating capacity. As exorbitant as gas prices were, electric rates were even worse; nobody even considered heating water with electricity.

The Climax Solar Water Heater

Fortunately, a much safer, easier, and cheaper way to heat water was discovered — metal water tanks, painted black and simply placed where there was the most sun and the least shade. These were the first solar water heaters on record, and they worked. A prospector testified that sometimes "the water would get so damned hot you'd have to add cold water to take a bath."

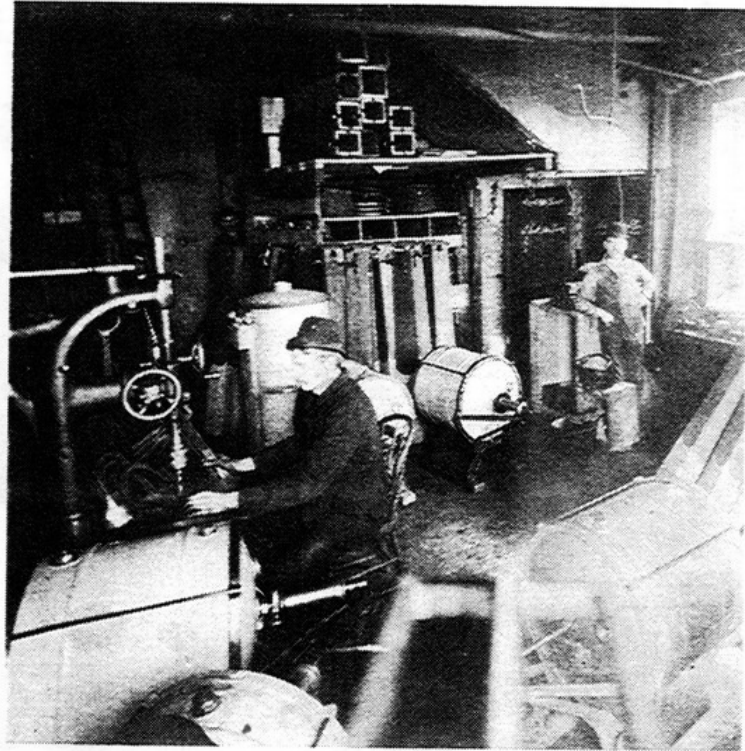
The problem with these rudimentary solar heaters was not whether they could produce hot water but when and for how long. Even on clear, hot days it usually took from morning to early afternoon for the water to get hot. And as soon as the sun went down, the tanks rapidly lost heat because they were bare and unprotected from the night air.

These shortcomings came to the attention of Clarence M. Kemp, a Baltimore, Maryland, inventor and manufacturer. Kemp sold the latest in home heating equipment, including devices that produced artificial gas from coal for those living on large estates, and gas and coal stoves for the average homeowner. But fossil-fuel-consuming appliances weren't his only concern. In 1891 he patented a way to combine the old practice of exposing bare metal tanks to the sun with the scientific principle of the hot box, thereby increasing the tank's ability to collect and retain solar heat. Kemp called his invention the Climax, and it became the nation's first commercial solar water heater.

Kemp sold the Climax in eight sizes. The most popular model was the smallest, a 32-gallon heater that sold for \$25 and measured 4½ feet long, 3 feet wide, and 1 foot

Right: Interior view of Kemp's factory in Baltimore, Maryland.

Below: Clarence M. Kemp, inventor of the Climax solar water heater, patented in 1891.



deep. The largest heater held 700 gallons of water and had a price tag of \$380. Every model contained four long, cylindrical water tanks made of heavy galvanized iron painted a dull black. They lay horizontally next to each other inside a pine box insulated with felt paper and covered by a sheet of glass. The box was usually installed on a sloped roof or on brackets at an angle to a wall, so that the tanks lined up one above the other. The tanks were completely filled with water, which was then heated by the sun.

To draw hot water from the tanks, a faucet in the bathroom or kitchen was opened. In a house with pressurized plumbing, cold water from the inlet pushed solar-heated water out of the tanks and down to the bathtub or sink. If the home had gravity-feed plumbing, opening the faucet drew hot water from the tanks. Cold water refilled the tanks from a small reservoir located above the heater. A float valve in this reservoir allowed it to refill. In either system, a drain allowed the tanks to be emptied before the onset of freezing weather so that the water would not turn to ice and split the tanks.

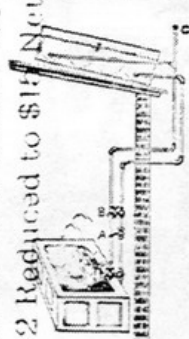
Kemp advertised the Climax as "the acme of simplicity" compared with conventional heaters. Just turn on the faucet and "instantly comes the hot water," boasted the sales literature. Housewives could avoid the terrible heat of lighting the stove in the summer, and "gentlemen who occupy their residences alone during summer months, while their families are absent, can have the convenience of hot water without delay or attention." Of course, one of the main selling points was that a solar heater did not cost anything to operate.

Climax Solar-Water Heater

UTILIZING 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 \$15.00



GIVES HOT WATER at all HOURS OF THE DAY AND NIGHT.

NO DELAY.

FLows INSTANTLY.

NO CARE. NO WORRY.

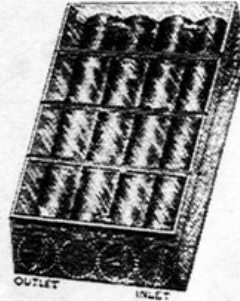
ALWAYS CHARGED. ALWAYS READY.

THE WATER AT TIMES ALMOST BOILS.

Price, No. 1, \$25.00

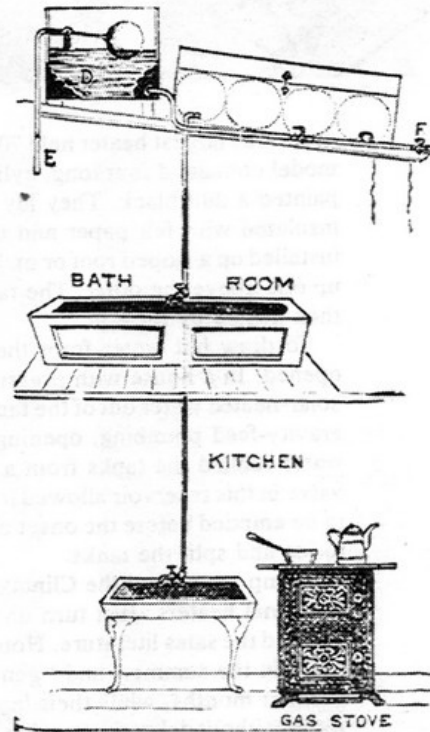
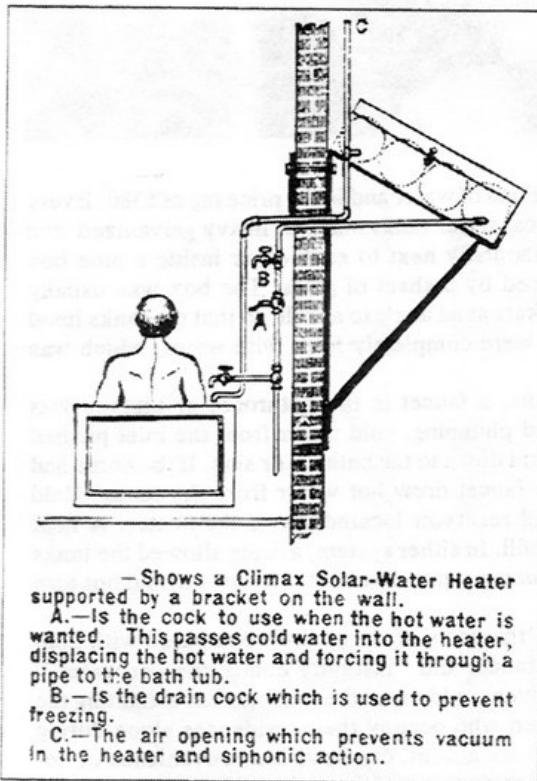
This Size will Supply sufficient for 3 to 8 Baths.

CLARENCE M. KEMP, BALTIMORE, MD.



Left: Advertisement for the Climax solar water heater, 1892. The price of this, Kemp's smallest unit, had just dropped from \$25 to \$15.

Below: Two ways to install the Climax, from a company brochure: pressurized system (left), and gravity-fed system (right).



Solar Water Heating in California

In the Maryland area, Kemp claimed, the Climax could be used from the beginning of April until the end of October—producing water hotter than 100°F on sunny days even during early spring and late fall when daytime temperatures sometimes approached freezing. In areas of the country like California, the climate and fuel situation made the Climax even more attractive. Sunshine almost year-round meant free hot water most of the year, and extra savings because energy costs were high on the West Coast. California had to import coal at a price over twice the national average, and artificial gas was also expensive. As one journalist wrote, it was essential for Californians to “take the asset of sunshine into full partnership. A builder cannot afford to waste his sun rays.”

Two Pasadena businessmen, E.F. Brooks and W.H. Congers, recognized the potential market for solar water heaters in southern California. In 1895 they paid Kemp \$250 for the exclusive rights to manufacture and sell the Climax in California. Sales took off so quickly that just three years later, in 1898, Mrs. Sarah Robbins was willing to pay Brooks and Congers ten times what they had paid Kemp for just the southern California rights to the Climax. That same year Richard Stuart purchased the northern California rights for \$10,000.

Climax installations spread from Pasadena to much of California and Arizona. By 1900 they topped the 1,600 mark in southern California alone. Economy was a



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342 S. Spring St.



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Homes in So. Cal. are using Solar Heaters. Ask your neighbors how they like it.
The Climax Solar Water Heater Co.,
125 S. BROADWAY.

OUR goods are always of the best quality. Cost no more than the unsatisfactory kind.

GOODENOW-SHELDON CO.,
135 S. Spring—211 W. Second



Take Out That Kitchen Boiler
It costs you money to run it. Utilize the sun's rays to heat water. The Climax Solar Water Heater Co.
125 S. Broadway.

Dr. PIERCE'S FAVORITE PRESCRIPTION FOR WEAK WOMEN.



MAKE MONEY
By utilizing the sun's rays to heat the water for the bath.
The Climax Solar Water Heater Co.,
125 S. Broadway.

Various advertisements for Climax solar heaters that appeared in the Los Angeles Times in 1900.