WARMTH WITHOUT WASTE

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Electric Heaters in a Variety of Styles and Sizes

Electric Heaters require no attention, give off no fumes or smoke, and are instantly available at any time of the day or night

EL 121. PORTABLE MAGNET HEATER
A Pedestal Bowl Fire by means of which warmth can be radiated in any desired direction. This heater can be used as a lighting circuit. Current consumption 300 watts £1/-
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Harrods Heaters are each supplied with two yards of heating flex

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Maximum consumption 1 units per hour. Controlled by 3-way switch

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Bright realism finish. A realistic effect of flames and smoke give a delightfully cheerful atmosphere. Maximum consumption 1 units per hour with 3-way control
Size 16 ins. wide x 26 ins. high x 11 ins. deep .. £10 0 0
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EL 125 MAGNET REFLECTOR FIRE
Handsome design constructed in ornamental sheet metal and finished in Real Bronze or Oxidised Silver
Real Bronze finish
2,000 watts .. £8 5 0 3,000 watts .. £10 5 0
Oxidised Silver
2,000 watts .. £10 10 0 3,000 watts .. £11 15 0

EL 450 HARRODS "MAGICOAL FIRE"
Just like a real blazing coal fire, but the heat of the "Magicoal Fire" can be regulated by a turn of the switch
Brass and Bright Realism Finish
£8 15 0
(Max. consumption 1 units per hour)
Special Heaters to order
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LONDON S.W.1

The story of electric heating

Electricity was at first regarded as a reliable source of good light, simple to use, and with no smells and no need of regular maintenance. Yet, as miraculous as it seemed in the 1880s, and a big improvement on all other forms of lighting, it was admitted that the electric filament lamp was inefficient; far more of the energy used was converted into heat than produced light.

If, of course, you wanted a portable heater that needed no fuelling, and gave off no smoke, then the filament lamp seemed to be ideal! Mr H.J. Dowsing in 1896 designed just such a "heating lamp" with a frosted glass envelope. It had a 250 Watt carbon filament that gave off no light except the warm red glow. The Cannon bulb fire in 1904 had four of the "Dowsing Sausages" set against a polished reflector and controlled by brass switches.

The Dowsing lamp heaters were the first practical electric radiant heaters. The Crompton "electric fires" that were being sold in 1889 for £3 each were made up of resistance wires embedded into squares of cast iron, but they proved slow to heat up and cool down and they also went rusty rather quickly.

Previous page: Electric heaters in Harrods 1929 catalogue.

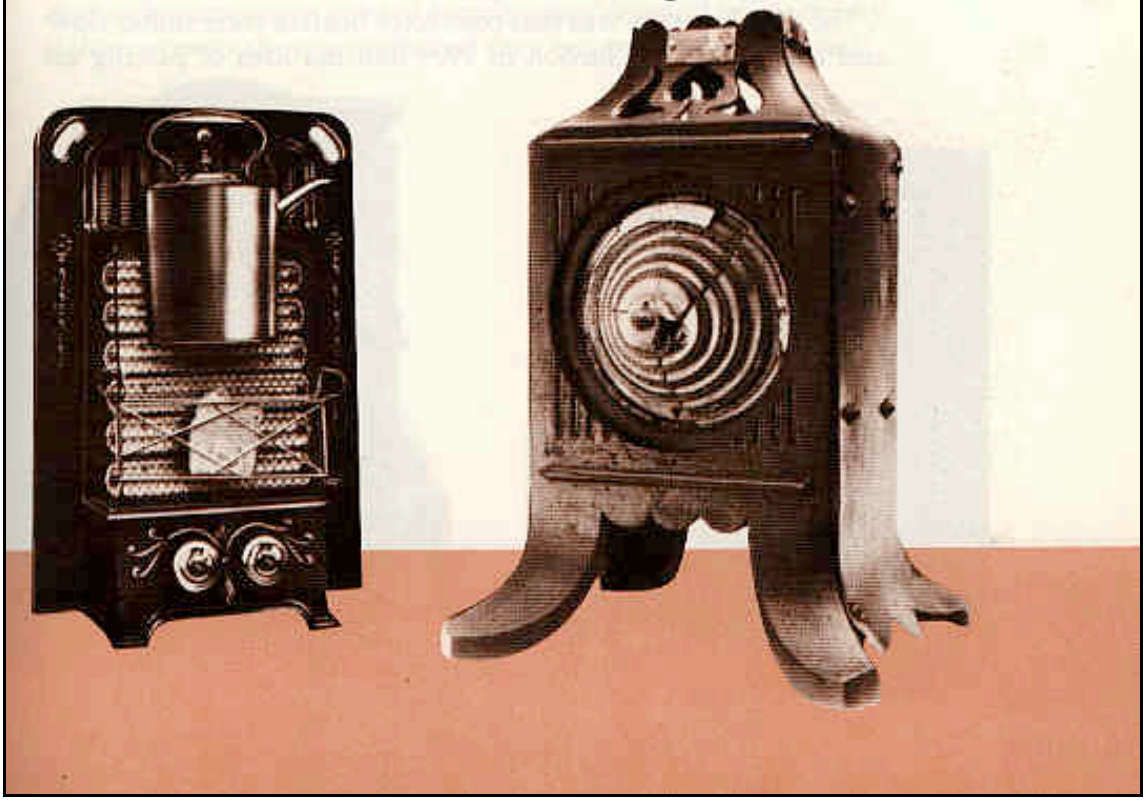
Left to right: Electric fires of 1912: a Dowsing lamp heater; the first Belling electric fire that could be adapted to boil a kettle and make toast, and a Ferranti radiant/convector heater (1919).

It was an apprentice at Crompton's firm who saw the disadvantages – and also the possibilities – and he started his own business in 1912 with the intention of making improved electric heaters. His name was Charles Richard Belling and the company he founded exists today where he started it in Enfield, Middlesex.

Belling had the idea of winding resistance wire on the front face of a strip of fireclay "which meant the wire was working at a red temperature in free air and heat from it was thrown forward". Belling used a new metal "Nichrome" which did not rust when heated. His heater was an improvement not only on Crompton's ideas, but on another invention called a Bastian heater. This had a resistance wire wound inside a quartz tube. It gave off a good heat but was not only expensive to manufacture but rather fragile.

Belling's first heater appeared in 1912 and was fitted with a trivet for boiling a kettle and with a warning "this fire is warmed by electricity so do not use a poker".

Simple electric fires with fireclay elements were developed by Belling and other firms until, by 1920, there were many kinds of "reflector fires" on sale. One mail order catalogue in 1929 listed



sixty-one different models.

The "fuel effect" fire was the invention of an Englishman, Mr H.H. Berry, who, in 1920 – lying in bed recovering from flu – became irritated by the housemaid constantly coming into the sickroom to make up the coal fire. He designed imitation coal and used the heat rising from a red lamp to revolve a slotted aluminium wheel to give a flickering effect.

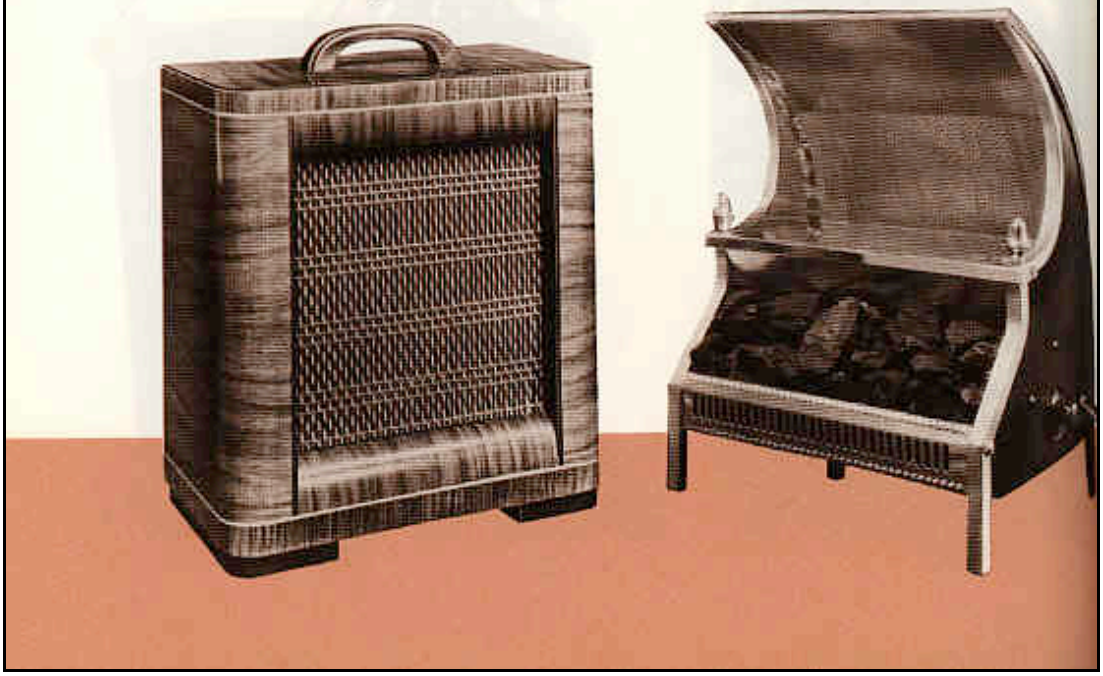
A later development, in the 30s, returned to the idea of the Bastian heater. Instead of sitting inside a fireclay frame, the resistance wire was now protected inside a silica glass rod. This is now the most popular and most efficient type of heating element in use in electric fires.

Convector heaters with concealed heating elements warming air that passes over them were a parallel development.

The first appeared in 1910 but, as there was no reassuring red glow, they were not popular. Then, in the winter of 1914, the War Office ordered thousands to provide heating for the recruits "to fight the Kaiser". Radiant heaters and stoves were found to be too dangerous for the hurriedly built wooden barracks but the small convectors were safe and easy to instal.

The disadvantage was that convector heaters were rather slow and bulky. Robert Gordon in 1929 had the idea of placing an

Left to right:
Belling fan heater in veneered wood case (1937).
Popular fuel effect fires by English Electric (1924) and Belling (1921).
A small portable electric fire in a ceramic surround (1930).



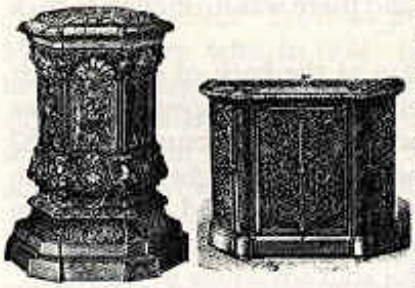
electric fan at the base to speed air flow and reduce the size but nobody else saw the possibilities and there was no money to back his invention.

Then in 1937 Belling fitted a fan at the back of one of their convectors and, although it was effective, it was noisy. What was needed was a small, quiet fan and this was not found until 1953 when Bruno Eck of Cologne made a lightweight tubular fan powered by a small motor and placed behind the heating element. Within five years the compact little heater became the most popular type of electric heater sold anywhere in the world.

Electricity is very versatile: other forms of heating extend from tiny tubular heaters for heating an airing cupboard and dating from 1900 to the very slim panel heaters and the oil filled radiators. Another form – dating from 1959 – is ceiling heating where the elements are hidden out of sight behind the ceiling surface.

Storage heating

Because electricity had at first been used solely for lighting, the generating plant was idle for the greater part of each day. The electricity companies needed a continuous demand for electricity if they were to show a profit and they began a quest for "load".



Crompton's heaters from his first catalogue.

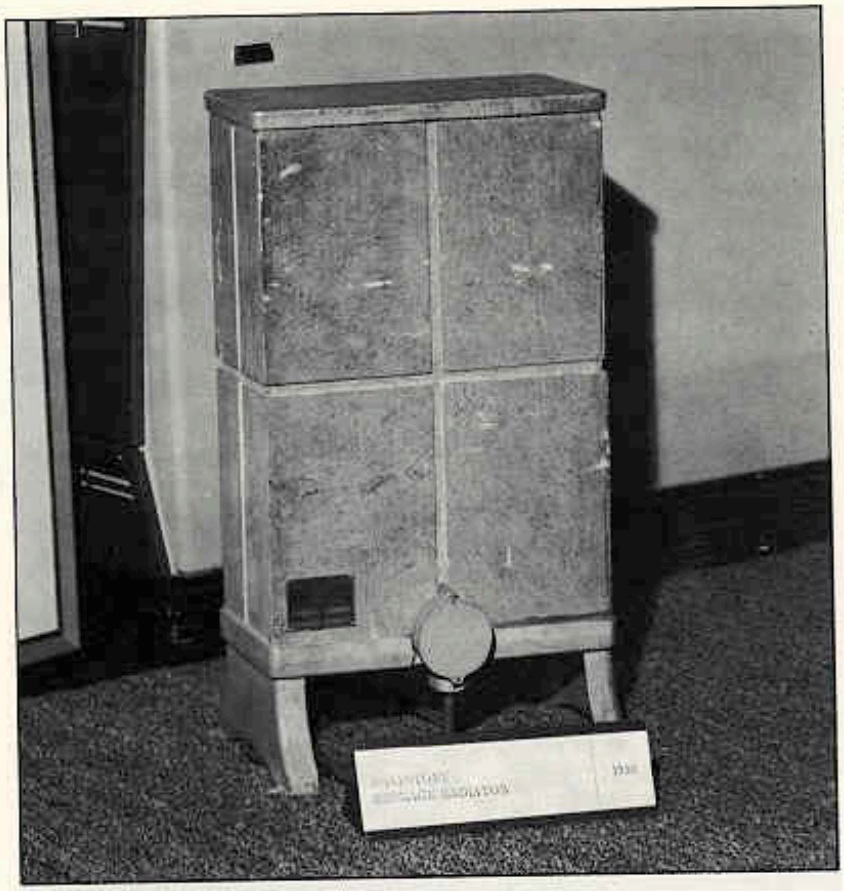
Heating more than cooking seemed the most promising as except for open fires, no public building had any form of heating. Electric radiators in ornate cast iron cases were designed with the heating elements embedded between layers of enamel on a cast iron base and they were advertised at prices from £6.

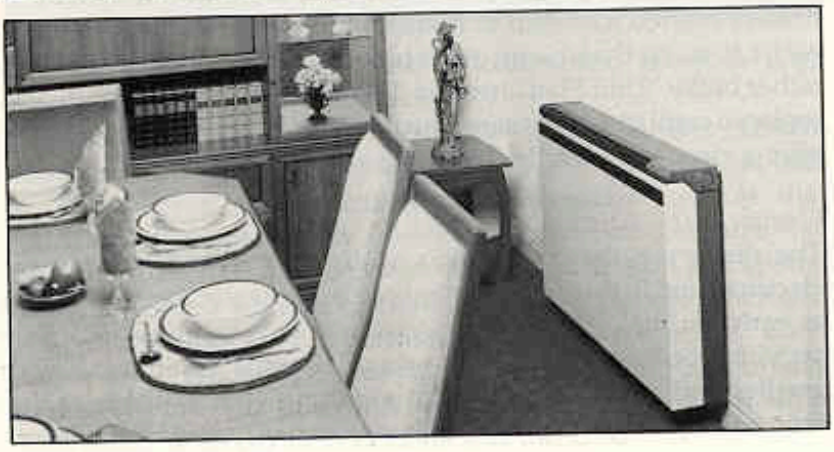
One such installation, carried out by Crompton and Co in 1895, was the Vaudeville Theatre in London. The winter that year was exceptionally cold (the Thames was blocked by ice-floes in February) and the theatre needed a system that could be installed quickly. Crompton and Co received the order at 11.00 am one morning and by 6.00 pm the same day the theatre was being warmed electrically!

As well as establishing Crompton's reputation for speed and efficiency, this success stimulated sales. Electric radiators were easy to install and no chimney was needed. It was also found that some materials retained heat better than others and this heat continued to be given out long after the electricity had been switched off.

One of the most successful heat storage materials was soapstone (magnesium silicate or stearite). It was incredibly heavy but soapstone did not split when elements were inserted and it was comparatively cheap. In 1904 the description of "electric storage heater" was used for the first time and small soapstone heaters, without elaborate cases, began to be sold for home heating.

Electricity has to be used when it is generated. Except in batteries it cannot be conveniently stored and, as industry turned to electricity, the need for continuous "load" for the generators moved gradually from the day to the night time. After 1947 and nationalisation, new electric power stations were being built, including the first nuclear stations, and electric storage heating was seen as an ideal means of providing this load. The term "off peak" was used to refer to hours in the early afternoon and at





Soapstone storage radiator (1930) with its modern slimline counterpart (Storad).

night when demand for electricity fell off and a reduced charge (tariff) was introduced to encourage the greater use of electricity just between those hours.

Not only soapstone but concrete, brick, sand, some chemicals and even water, were all found to be capable of retaining heat – especially when contained within an insulated case. By 1960 there were over forty different designs of storage heater, including one that combined an electric radiant fire.

Floorwarming systems with heating elements buried in concrete utilised the same thermal principle and were found to be a very effective form of central heating. It was first used to heat air-raid shelters in World War II but came into wide use when the supply industry offered "off peak" electricity at substantially lower prices. Unfortunately, some of the earliest systems dating from 1951 lacked a proper knowledge of insulation and an excellent system of heating had a shaky start.

The lack of thought in design showed up in some applications like the high rise blocks of local authority housing and these failures overshadowed its more numerous successes. Among many invaluable applications were heated roadways, such as The Mound in Edinburgh, to prevent winter accidents due to the frost, and under the stones of Salisbury Cathedral so there were no unsightly heating pipes and radiators to detract from the historic fabric which electric underfloor warming protects from damp and condensation.

In the post-war period, off-peak heating through storage heaters offered a system of home heating that was cheaper and easier to instal than many other home heating systems. The first rather bulky "Unit Plan" heaters dating from 1957 were gradually replaced until today the slim, insulated and controllable versions offer a clean, efficient method of home heating.

Electric water heating

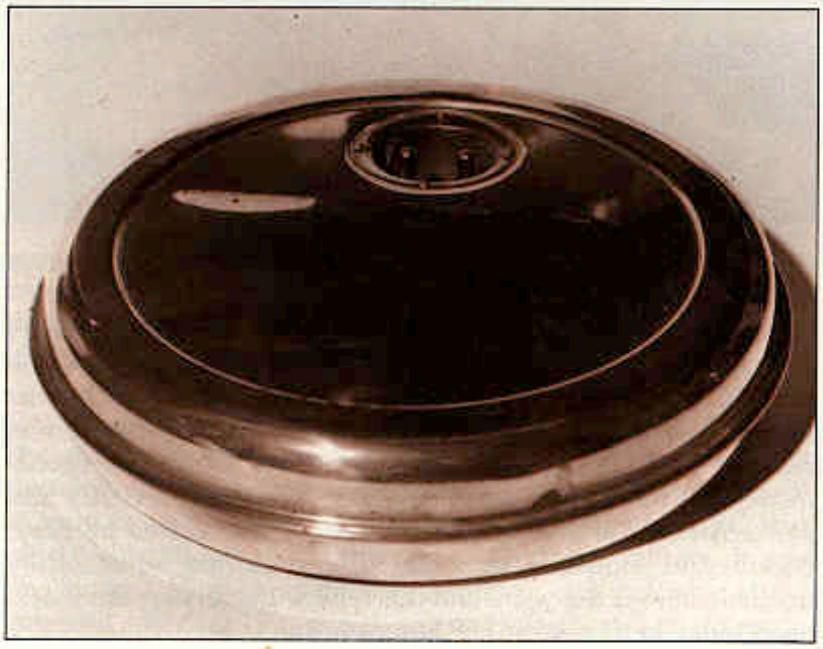
The discovery that water was easily and quickly heated by electricity led to the development of electric water heaters – some as early as 1890. An electric geyser was developed in 1912 that provided boiling water at the rate of 12 pints a minute. It was smaller and more compact than anything else available at the time and cost £14. "There was just one snag", said its inventor,

Electric water heating at the sink (1930).

Charles Belling, "it took a 10kW load which in those days dimmed the lights for miles around".

It was not long before practical electrical water heaters appeared – the simple immersion heater that fitted into a hot tank in 1920. These were fitted with thermostatic controls that switched off automatically when the correct temperature was reached. Although dual immersions for sink or bath and special models for hard water areas have improved the efficiency and performance, the very successful designs introduced by Bray, Backer and Hotpoint in 1932 have remained substantially unchanged over the years and this type of immersion element is used today in 63 per cent of homes in the U.K.

Electric kettles were first designed with the heating element beneath the base. ***Right:*** 1914 kettle from Simplex. ***Left:*** 1922 model by Bulpitts who were the first to immerse the element in the water.



Electric bedwarmer (1920) designed to take the place of the hot water bottle.

Electric kettle

Electric kettle (c1919).

Simplest of all the water heaters is the electric kettle. This first appeared in Chicago in 1894, and in Britain in 1902, and is now to be found in more than three-quarters of the homes in Britain.

The kettle that switches itself off on boiling dates from 1955 although whistles, buzzers and flashing lights had all been tried prior to this to show when the water had boiled. A protection device to prevent the kettle being switched on if no water was present was another improvement of the 50s but the design has altered little except that the 1902 model took twelve minutes to boil one pint of water and the 1981 model will do it in 96 seconds – easily the fastest and most economical method of making a hot "cuppa".

Curiously, although it no longer needs to stand on a circular ring or flame since the heating element is immersed in the water, the electric kettle has still kept the traditional, circular kettle shape. "Kettles" that can be mounted on the wall so the teapot or pan goes to the heater rather than the other way around date from 1917 but only now are they coming into wider use.

Electric blankets

The passage of electricity through a resistor creates heat. This is the principle of all electric heating and an American, Sidney Russell, discovered in 1912 that a gentle heat could be obtained from an insulated length of metal tape laid inside two layers of blanket. He designed his heating pad so patients at his clinic who were suffering from chest ailments could sleep outdoors! Neither he nor his patients presumably realised the risk of electrocution. In 1937 one of his patients designed a blanket version which was advertised as "a night warmer for invalids".

In 1926 in Britain the Ex-Services Mental Welfare Society started making electric heating pads as they were a simple sewing job for the patient members. They used a German design whose

inventors may not have been pleased to learn, after war broke out, that RAF maintenance staff adopted their idea for an electric blanket to keep night fighter aircraft engines from freezing up in winter.

The Society used the name "Thermega" for their pads and also a "multi-pad" version which they sold as a small electric underblanket in 1930. Thermega are also credited with the first use of an insulated resistance wire which they placed in flying suits, designed to provide warmth for air crew at high altitudes, and at a safe low voltage – 24 volts.

The first of the post war blankets were made with asbestos insulated resistors but they were only safe if they were kept dry. If the asbestos became wet there was risk of a shock and there were a number of fatalities.

All kinds of "extra safe" electric bedwarmers were then tried, including one introduced in 1970 by Thermega, which had an electric heater that circulated hot water through flexible plastic piping forming a grid sewn into the blanket. There was also the electrically heated mattress and a bed heater made by Belling from left-over parts of a wartime incendiary bomb "snuffer".

Another post war "adaptation" was the Yarworth Jones Bed Heater. In this, electric heating wires were fitted between a lightweight, plastic sheeting. This sheeting had been originally designed for the Mosquito fighter-bomber to provide protection against flak and the bed heater was believed to be bullet-proof!

A monitoring system to detect overheating in blankets was introduced by Dreamland in 1967 and, today, all electric underblankets and all-night overblankets contain safety devices and are manufactured to stringent safety standards laid down by the British Electrotechnical Approvals Board (BEAB) and carry the British Standards Number 3456 A4. They are perfectly safe when used in accordance with the manufacturer's instructions and have become one of electricity's most valuable and inexpensive contributions to modern living.