

STATIONARY *Engine* MAGAZINE

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FOR ALL STATIONARY ENGINE ENTHUSIASTS



**Coolspring
USA**

Stirling engines

Another Lister H

Rogue engines

Flame Licker Visit to Thursford



Waterworks Museum - Hereford Stirling Engine Rally

After the main rally season is over, the Waterworks Museum in Hereford hosts an annual gathering of Stirling engines from all over the country. The event is organised by the Stirling Engine Society of Great Britain and attracts exhibitors from a wide area.

Julian Wood, of Caldicot in Monmouthshire, is the Secretary of the Society and arranges to bring in members with their Stirling engines from far and wide. Julian has built and supplied a wide variety of small Stirling engines for enthusiasts over many years and likes to demonstrate possible uses for them. These include radio-controlled model cars, motor tricycles and boats. He has also done considerable work on harnessing solar power as the heat source.

These are all examples of hot-air engines, also known as Stirling engines after their inventor, the Rev Robert Stirling in 1816. Although a Scottish clergyman he inherited his father's interest in engineering. In 1818 he went on to build and demonstrate a practical version of his engine, used to pump water from a quarry. Stirling engines require no fuel such as petrol, or steam. They work purely from the expansion and contraction of air as it is successively heated and cooled.

Malcolm Rowney from Norwich has always had a love of mechanical engineering and began tinkering as a young lad in his father's shed at the bottom of the family garden. This year he brought along a rhombic-drive hot-



Julian Wood, secretary of the Stirling Society, has supplied a wide variety of small Stirling engines for enthusiasts over many years and likes to demonstrate possible uses for them.



Here we see a small selection of the Stirling engines on display.

air engine used to propel small boats, typically 12 to 16 feet in length. It runs normally on Propane but also works well on a wood-burning stove. The idea is to fit the engine and stove in a boat thus producing a step towards the ultimate environmental river motor-boat, quiet running, efficient, carbon-neutral, quick starting and no boiler.

Trevor Jenkins, of Ashford in Middlesex, specialises in older and vintage Stirling engines and, where possible, uses them to drive equally vintage mechanisms and machinery. He brought to the rally this year a hot-air engine driving a Victorian praxinoscope which shows animation from a strip of pictures. The engine is of a type known as a Heinrici.

Walking round the exhibition it is always pleasing to see the numerous hot-air engines fulfilling the tasks that the



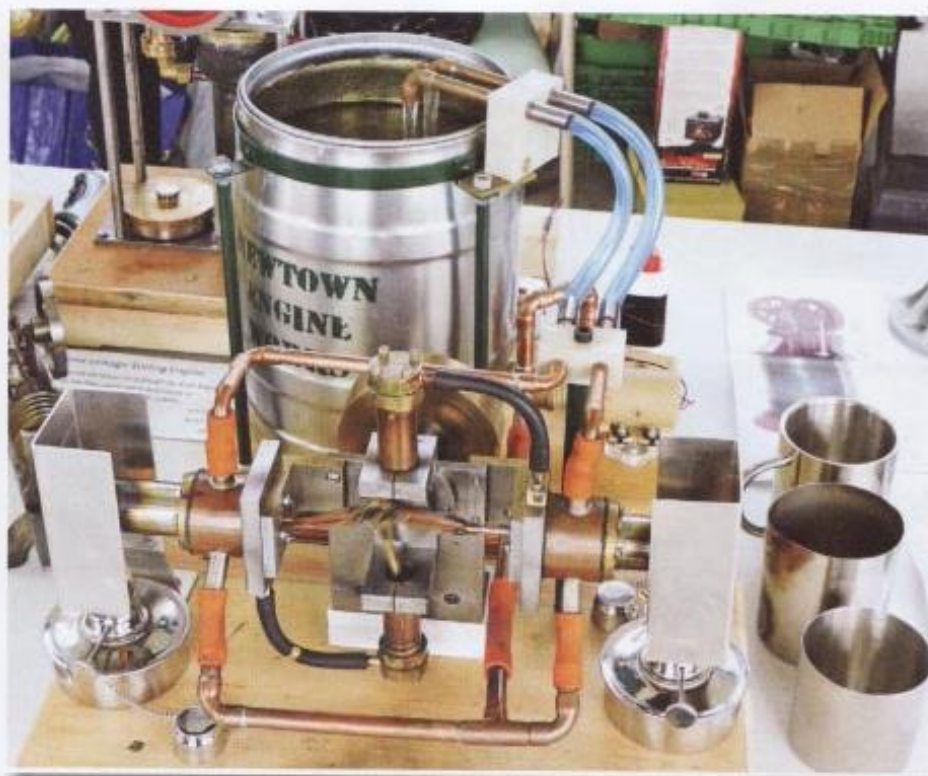
Malcolm Rowney brought along a rhombic-drive hot-air engine used to propel small boats, typically 12 to 16 feet in length.



Trevor Jenkins, of Ashford in Middlesex, had a Heinrici engine driving a Victorian praxinoscope which shows animation from a strip of pictures.

Victorians would have expected. The praxinoscope was an animation device, invented in France in 1877 by Charles-Émile Reynaud. It used a strip of pictures placed around the inner surface of a spinning cylinder.

Bob Cannon from Newtown in mid-Wales is a most creative developer of various types of Stirling engine and each year he brings along a good selection of his latest developments. This year his key exhibit was a horizontally-opposed twin gamma engine, which Bob built from scratch to a Gingery design. It has provision for altering the phase angle



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between the pistons and the displacers.

Colin Davies from Gloucester exhibited outside, in the Museum courtyard, and showed a variety of Stirling engines including a large Kyko fan. Kyko hot-air engines were British made in the 1920s. He also demonstrated an old Heinrici engine and a twin-flywheel horizontal hot-air engine.

Hot-air engines are really quite remarkable devices and work simply on the temperature difference between two parts of the system. Small-scale models can be made sufficiently sensitive that the heat from the palm of your hand, compared with ambient temperature, is enough to make them work, often to the amazement of visitors.

Applications for Stirling engines are showing a resurgence. They are not simply a relic of the past but new horizons are opening for the Stirling principle. If the



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Stirling engine action is reversed and the engine is turned by an external power source, then the system will produce very low, cryogenic, temperatures. Such devices have applications in cooling medical equipment such as MRI scanners. Stirling engines are now found generating power in desert areas, propelling submarines, and have potential for applications in space travel.

The National Stirling Engine Rally took place at the Waterworks Museum - Hereford on Sunday 8th October 2017. The next Rally will take place at the Waterworks Museum, Hereford on Sunday 14th October 2018. Don't miss it!

Dr Noel Meeke for the Hereford Waterworks Museum. ●