NEWSLETTER May 2022

Hello Gents,

The days are flying past, the sun is out and we are finally moving on from the Covid.

First, I would like to say thank you to all who helped to make John Arrowsmith's visit a fantastic success. John and his wife Ann were very impressed with what they saw, and we all enjoyed their company. John gathered enough content to probably do two articles in *Model Engineering Magazine*. It is likely to be published towards the end of this year, and as soon as we hear anything more we will let you know. The Hungate Centre proved just right for the occasion.

I visited *The Ryedale Society of Model Engineers* (*RSME*) Rally at Gilling East for the first time, and what a good idea it was. The sun shone, there was very impressive organisation and running, and all with lovely refreshments. If you have not been before, the next Rally is at the end of August. Recommended.

For those not jetting off on holiday, there is a relatively busy calendar in June. If you want a lift to Saltburn's miniature railway on the 22nd June, car sharing is available. If you don't have e-mail, please contact me so that you do not miss out. Car sharing worked out O.K. when we went to Ellenroad Museum. It was not at all like Peter Kay's Car Share!

On the 25th June, if you plan to attend Brian and May's kind invitation to their 'Armed Forces Day Garden Party.' please will you let them know in advance to help them plan the catering.

That's all for now folks, enjoy the Newsletter.

Jonathan.

☐ **Help Wanted:** Ted Fletcher would like to hear from anyone who can help with reprogramming an *Arduino Uno.*

☐ **Forthcoming Events.**

- **Wednesday 1st June**: **Club Meeting** at the Hungate Centre. Jon Selby will be talking about *"Ground Effect Vehicles"* and his experience with testing scale models locally.
- **Tuesday June 21st from 10.0am. Workshop Morning**.
- **Wednesday June 22nd A Visit To *Saltburn Miniature Railway.*** Visit arrangements to be confirmed nearer the time. https://www.saltburn-miniature-railway.org.uk/locomotives-rolling-stock
- **Saturday 25th June: Brian and May Stephenson** are hosting a **Garden Party** and have ordered *The Red Arrows* to fly past. Details to be confirmed.
- **Wednesday 6th July: Club Meeting. 'Bring and Brag'**

Frank Cooper N.A.M.E. Chairman (Northern Association of Model Engineers.)

PEEMS would like to extend their condolences to the family of Frank Cooper on his sad passing.

Frank visited PEEMS last July.

Club Meeting Wednesday 4th May.

This was the first PEEMS meeting back in the Hungate Centre since it was closed by the RVS. The centre is now run by **CaVCA** (**C**oast **a**nd **V**ale **C**ommunity **A**ction).

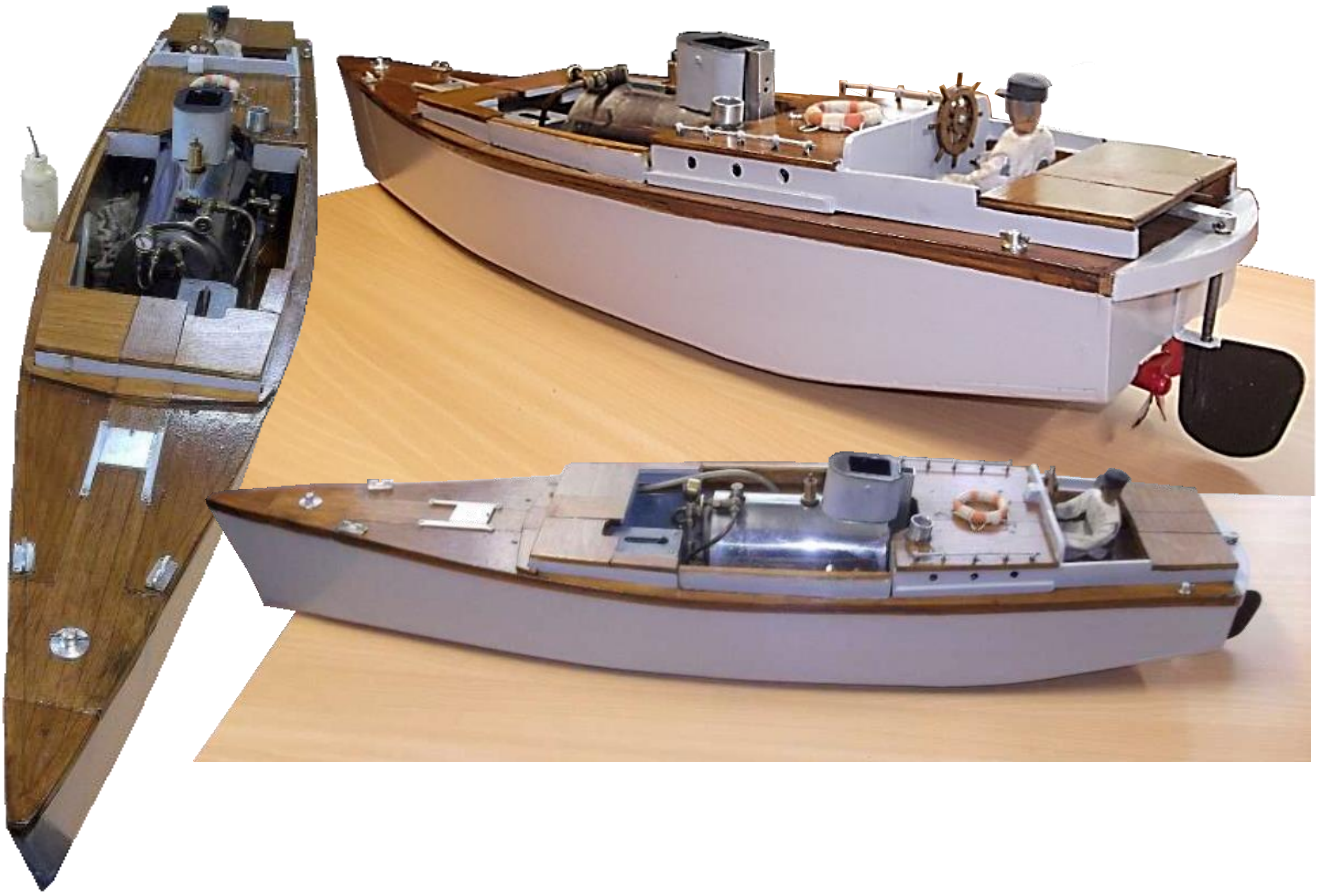
It was a good turnout for this meeting too, as about twenty four people came.

The evening was an "open forum" where members could chat about some of their engineering experiences.

John Heeley gave a talk at the April meeting about his steam launch and how he intended to widen the model in order to improve stability.

He brought along the modified launch and gave us an interesting talk about its progress.

- **John Heeley ~ Steam Launch Progress.**



At the last meeting in April, John explained that the launch was quite unstable in the water, and he had to resort to attaching a metal block under the keel to aid stability. The only way he could see to solve the problem was to band-saw the launch down the middle and make the launch wider (by inserting a spacer 'plank' in the keel and upper deck) and make the launch slightly longer.

In fact since that meeting, that is what he has done. The launch was split down the middle and a 1½" 'plank inserted along the keel, and others along the upper deck sections (see photo above). The bow, having been split, had to be brought back and bolted in. This consisted of a 3" long bow section which puts the 'pointed' shape back at the front. A small tail piece has also been attached to the stern. This has nothing to do with hydrodynamics, but is simply there as a handle to help lift the launch out of the water without fingers being damaged by a still rotating propeller.

John had brought along his air compressor, so we could hear the turbine running up. The run-up was at just under 20 psi and was loud. John did this in order that we could imagine how loud it sounded at 50 psi !

There is a small video where the turbine can be heard at this link:

https://youtu.be/QaoxzZKa4SI *Press on link. To return to newsletter press back arrow at top left of screen.*

Q: How much does it 'gear down'?

John: 4 to 1**.** I've tried going to 2 to 1**,** but it didn't work. I had a smaller turbine in another hull, and I tried 2 to 1 with a nylon gear. I'm a bit restricted with gear cutting as I don't have a proper dividing head.

I can only work with what I can do on a rotary table. The gear worked fine, but the 2 to 1 reduction wasn't sufficient. I would really like to go to a 6 to 1 reduction.

4 to 1, however is quite reasonable. The turbine is turning a 2¼" four bladed propeller. The speed of the propellor reduces about 20% when the launch is lowered into the water. I was asked if I could start the propeller in the water, and had to admit I've never tried that, but it will start in the water. It just requires a bit more time to get up to speed. When the fire goes out and there's 'nothing on the gauge', it will still travel about 100 yards, which is sufficient to bring it back to shore. There's a reluctance for the propeller to stop turning.

Future Development Ideas ~ The 'Manoeuvring' Engine'.

John was hoping that the next development might be to have several stages of turbine wheel, like a triple expansion arrangement but there doesn't seem to be any energy left once the steam has gone around the turbine. As can be seen in the photos there is even an auxiliary funnel because the steam doesn't like all the bends in the main funnel. All the energy has been expended once it's been around the *Stumpf* wheel.

John is hoping to mount a second, slightly smaller *Stumpf* wheel in the opposed direction to the main wheel. Being smaller, it would be out of direct line of the steam flow. A second jet would be put on it to provide reverse propeller rotation. There would be a little change-over lever which has neutral (stop) in the middle. This arrangement would provide forward motion with the lever in one position and reverse motion in the other position, and stop in the middle. This would all be operated by a servo.

Currently the boat is controlled by a two-channel radio, but only one channel is used, for the rudder. The other channel could be used for forward/reverse motion. John hopes that when he builds this manoeuvring engine, he doesn't lose too much forward efficiency.

At the moment he doesn't know whether to put each Stumpf wheel in its own 'can' or whether he should risk putting them into the same 'can'. He thinks he might try the latter first to see how it goes. A 'manoeuvring' engine which stops and starts will be an advance on the current setup which runs on full power until it runs out of fuel.

The launch has never failed to run. John runs the launch every Saturday at Huddersfield, usually for three sessions, which adds up to half an hour. This has been happening since before Christmas. This means that there has been five or six hours running time on it, during which the gears have been getting quieter. By making the launch wider means that all the stability problems have gone away. The launch weighs less than it did before, because there is no longer any need for the lump of metal underneath, and the buoyancy has increased.

The big worry in cutting the launch in half was that it would completely disassemble itself because of the release of the inherent tension in the hull. However, the launch did not distort at all when cut. From the time it was cut and widened, it actually took eight days to get it back in the water, because of the drying times for glue, paint and varnish. The actual widening operation only took one day.

Q: How did you manage to keep it in line when cutting the hull through the bandsaw?

John: Actually, the keel is formed by two planks which are tongue and grooved together, so there was a line down the middle to work to.

Correction: In the previous March/April newsletter it was stated that the launch ran on a mix of paraffin and a 5 -10% mix of motor oil. This was not correct. The lubrication is paraffin with a 5-10% motor oil mix, whilst the burner uses methylated spirits.

The previous online March/April newsletter has been corrected to reflect this.

- **A Talk About Some Of The Tools John Has Used in His Modelling Life And A Description Of His Workshop.**

John has previously given this talk in Huddersfield.

The very first lathe John got, was the only piece of second-hand machinery he's ever bought. It was an *"Otley Premier"* lathe. It is an enormous machine that originally was driven by overhead shafting onto a flat belt pulley on the headstock. The manufacturers were so proud of it that they stamped *"Otley Premier*" on the lathe bed under the headstock. This means that the lathe has to be dismantled to see what it is. It's so old, John suspects they turned shells on it for the first world war.

All the gearing had been taken out of it. There were no power feeds and it was hand fed. John managed to rig a motor and gearbox on the top of it to give it two speeds, but it mostly ran at 300 rpm, and it was handfed.

John started his 3½" gauge *"Evening Star"* locomotive on that. His "mill" at the time was a *Black and Decker* in a drill stand with a cross vice.

John only wanted to say this because, he could model engineer on this equipment rather than having to pay out thousands of pounds on machinery. Theoretically, if you can turn a piece of metal, you can make something.

It took John 7 years to build *"Evening Star"* because he was also assembling his workshop. Finally, he realised he needed something better with more precision, but unfortunately the "Premier" is so big and heavy, he hasn't been able to pass it on to anyone else. It's in John's cellar, and if anyone wants it, they're going to have to take it away.

The next lathe he bought was an East German *Hobbymat* lathe with a centre height of 2.6" and 12" between centres. It is a slightly strange machine. The bed is formed by a very solid round bar with a flat top. The great thing about this lathe is that it has a very substantial cast base, which is very rigid and stiff. John found that this lathe was a very successful machine. He still says to this day, that it's the best "parting off" machine he has ever owned. It could screw cut and it had a power feed.

John built a North Eastern (LNER) K1 on it with drawings in a book bought at the North Yorkshire Moors Railway in Pickering. The drawings were to 1:76 (OO) scale, and John built his 3½" gauge locomotive from that. The original *Hobbymats* disappeared with the Berlin Wall. The only problem John had with it, was switching it on and off. Not the switch gear itself, but the ceramic plate that was part of the starter switch cracked. The importer was able to provide spares "straight off". It was a known problem.

The *Hobbymat* was originally offered with a milling attachment which bolted to the back of the bed. The milling head was gear driven. John bought the mill attachment and it was O.K. as a milling machine. However, the time taken to set up the mill was excessive. If you had a 5 minute milling job, followed by a substantial turning operation, it was too much like hard work changing between the two. John would not advise anyone to buy a "combination" machine. Also the limitations of the 2.6" centre height with 5" swing was such that John was at the limits of the machine when building his K1 locomotive. The K1 conveniently had 5" wheels, and he was just able to machine them.
The machine was OK, but John was running out of centre height.

The *Hobbymat* was eventually traded in for a *WARCO* 9 x 18. John doesn't know if *WARCO* makes this machine anymore. Basically the *WARCO* is a Taiwanese copy of an *EMCO-8*. In many ways it is better than an EMCO lathe. The castings on the *EMCO-8* are nowhere as heavy as those on the *WARCO. The WARCO* also has a screw cutting gearbox. It only has two levers, but it gives all the threads you're most likely to want.

The *WARCO* also has a very convenient belt tensioning lever on top of the headstock, which if used with common sense, can be used as a clutch. This means that the job can be stopped to allow measurements to be made, without using a press button on-off switch, which John doesn't like to do with a machine of this type.

The *WARCO* has a 4½" centre height, a good set of speeds and could screw cut nicely, but it had one major fault which was the drive system. The drive system starts from a motor with a flat toothed belt that will never slip. The other belt is a Poly-V belt which is plastic with a nylon core inside. It's about a ⅛th wide. It also will not slip. The problem is when a lump of cast iron is being machined on the lathe, and a 'hard spot' is hit and the tool digs in, then the Poly-V belt will break. At the time, twenty five years ago, the belts cost £27. Poly-V owned the market on these belts and they all came from America. John did think about using ordinary belts, but he had increased his finances by selling some models, so thought about a 'trade in'.

At the same time, John was able to get a *WARCO Minor Mill/Drill*. He would have got a proper milling machine, but he has limited height in his workshop. There was trouble enough getting the Mill/Drill in. The difference between the *Minor* and *Major* Mill/Drills is the size of the castings. The outside of the machine only varies by a couple of inches, but this Mill/Drill was the biggest piece of milling equipment he could fit in. John then decided to buy a bigger lathe.

John bought a *WARCO BH*(Belt Head) *600* (which came from the Chinese mainland). *WARCO* no longer supply this lathe, but it can be bought from other suppliers. At the time paid £1750 for it (and £800 for the Mill/Drill). The BH 600 is a serious industrial machine, and he's never regretted buying it. He will never change it. The lathe has a 150mm centre height and is 24" between centres. It has a full *Norton* gearbox, it's 12-speed and it has the belt tensioning lever that can be used as a clutch. There is a modification that John has passed onto other people about this. Two metal rods can be put into the headstock, one immediately above the belt, and one immediately below. When moving the lever over to take off the belt tension, instead of the belt expanding into a loop, as the belt is held by the parallel rods, the pulley will move away from the belt when disengaged. John has used this modification over twenty years and the belts are still original.

It was difficult getting the Mill/Drill into John's workshop, as John only has 4" clearance between the top of his head and the ceiling. The stand for the machine was bought at the same time. The only way to install it was to assemble the stand first in the position required. The top section of the mill was removed from its column. The column was then taken and layed horizontally on its base and then raised vertically. This component was very heavy to reassemble. John ended up with a 2" clearance to the ceiling. This can be a problem because the draw-bar can't be brought out until the head has been brought right down.

John could use his garage as a workshop, but it is more convenient to use his cellar as it is just a few steps down from his kitchen. This is a room that does not vary too much in temperature annually. When the Mill/Drill was set up and running, on occasions the head would move around the column even when not a lot of feed was being applied.

Eventually when tightening the bolts attaching the head to the column, he found he had stripped the threads on one of the bolts and realised that there was not enough thread on the bolts to clamp the components together. As soon as he put new bolts in, the problem has gone away. This is the problem with buying machine tools from the Far East, because although the machines are fine, sub-contractors are used to assemble them.

The Mill/Drill is a fairly crude way of milling compared with a proper milling machine, but if that is all that can be afforded, and if there are workshop space limitations, it's a decent way of milling. John has had 2" drills in it and it will drill with reasonable accuracy. John doesn't like press button on-off switches on machines like this, but has installed a switch more to his liking, and it works perfectly.

The oldest imported machinery John has got, which is the very first thing he ever bought, is a *WARCO* D-I-Y drilling machine which he has had for over 35 years. This has a 'real' on-off switch (not press button). Of all his machine tools, this is the one John uses the most. It's 24" high and has a ½" clutch, and it sits at the corner of the bench. It is a bit under-powered. This machine is Taiwanese, and has lasted 35 years, with just one belt change. Everything is still nice and tight. When you deal with a reputable British importer, you get the 'pick of the crop'.

What everybody needs is a metal cutting bandsaw, preferably with a radial arm. They are also the most annoying machine because the blade will jump off the pulleys for no reason. Providing you can put up with this annoyance, the convenience of the machine is well worth it. The radial arm allows the blade to be 'mitred around'. Perfect 45° mitred corners are achieved with this machine. The important thing is to get the blade to run exactly upright. The blade runs on grease filled ball races. There are two on the sides and one on the top. Some time has to be spent setting the blade to run exactly upright.

John also bought a linisher with a ½ hp motor, a 6" wide sanding band and a 9" disk. It's not a surface grinder, and won't give a perfect surface. However, it's good for grinding a cosmetic surface using different grades of belts.

In John's 8' x 10' workshop, there's not much more room. If you go down the steps, you have to step over the band saw, then you can stand in the middle of the room and touch everything. Working around, there is the bandsaw and then the linisher, then the lathe taking up most of the space along the back wall. In the corner is the Mill/Drill, then the grinder, then there is the bench with the drill. At the other end of the bench there is a manual arbor press. It's supposed to give half a ton when the lever is pulled which is quite useful. That's it.

John is so stuck for space that when the models grow, they have to be moved to the "assembly area" which is his kitchen worktop. The bigger models John has built over the years, like the 7¼" gauge locomotive, only come out of the workshop once, and that one came out to have the boiler fitted. John makes sure his boilers can be fitted and removed quickly. It's all 'O' rings that slot into holes. Only six bolts need to be loosened and the boiler is off. Once fitted out, the 7¼" gauge locomotive never went back in the workshop.

The whole experience of the three imported lathes, plus one ancient British one John got at the beginning, is that they all represent a steady progression. Each machine has been the result of a problem with its predecessor. What John has now is what he requires. (Many thanks to John for proof reading all these articles).

John Arrowsmith's Visit To PEEMS on Tuesday 17th May.

John Arrowsmith, who is the 'roving reporter' for *Model Engineer Magazine* visited PEEMS so he could write a report about the Club. PEEMS decided that for the visit, the exhibition they would put on would be split between two sites; The PEEMS workshop and grounds for the larger exhibits, and the newly re-opened *Hungate Centre* for the rest of the members models. This would demonstrate the eclectic nature of the club where a large spread of interests are catered for, from motorbikes and cars to a full range of various model types which are shown on the following pages.

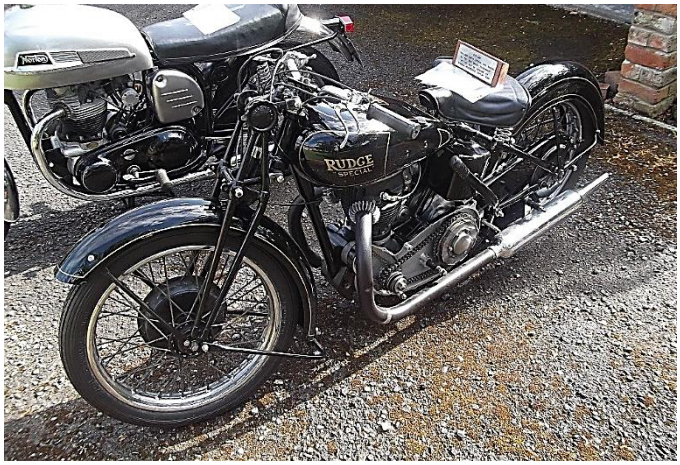
Exhibition At The PEEMS Workshop.

Exhibition At The Hungate Centre.

a) Some of the Exhibits at the PEEMS Workshop.

- **Motorbikes.**

1962 Norton 650cc SS Bought as a wreck ~ many horrors uncovered during rebuild. Restored by Jonathan Milner.



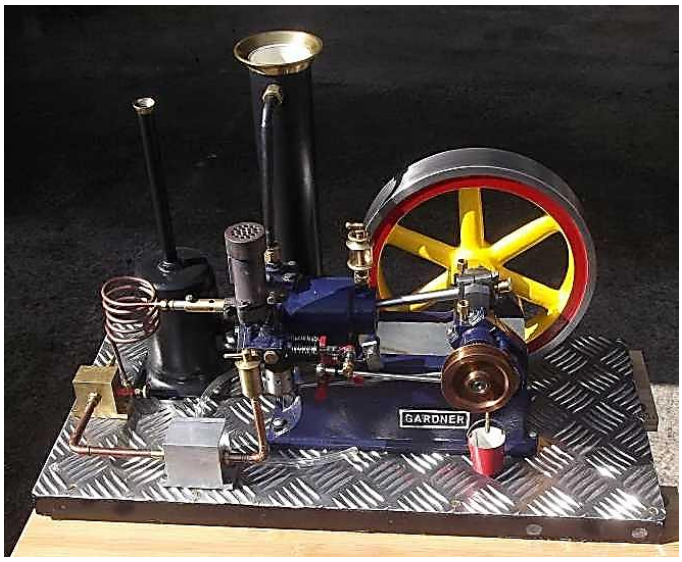
1937 Rudge 500** Bought at Auction. Found a well worn engine and a broken frame. Restored by Jonathan Milner.

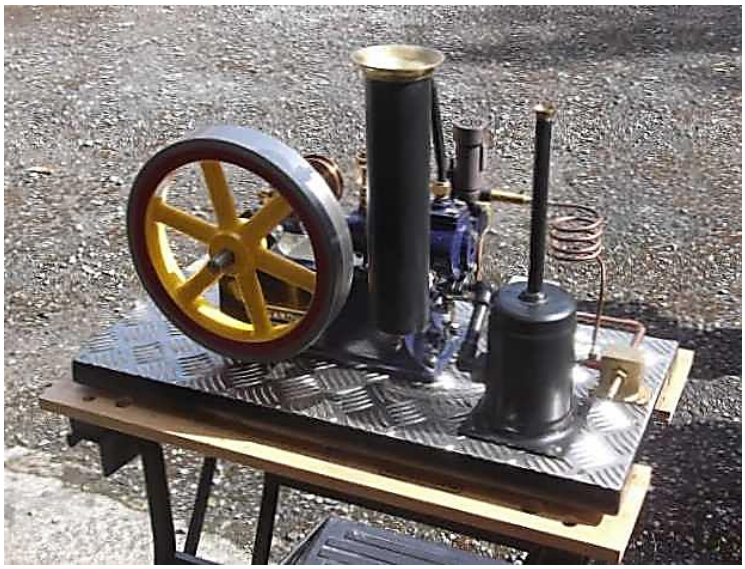
1967 Velocette Valiant LE 200cc. Various additions and modifications. Restored by Rob Davey.

1919 Indian Powerplus 1000cc V twin. Constructed from a pile of spares bought by Mike Sayers and his Dad.

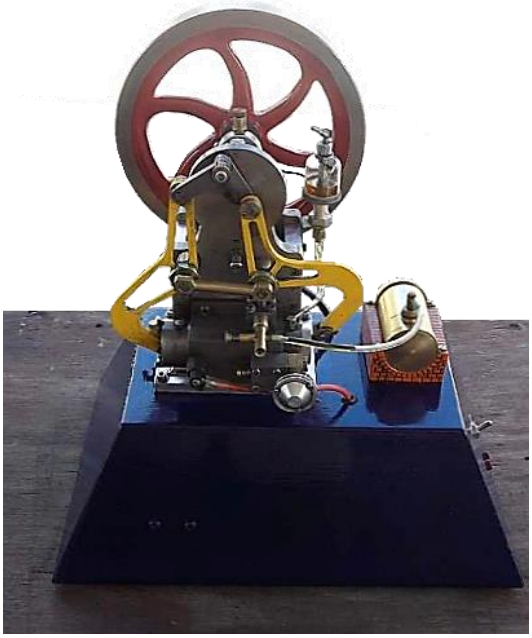
** **The Rudge 500:** This 1937 Rudge Special was ridden at the 1990 Royal Tournament by the 1937 56 (London) DIV Signals Motorcycle Display Team.

- **Scale Model Engines.**

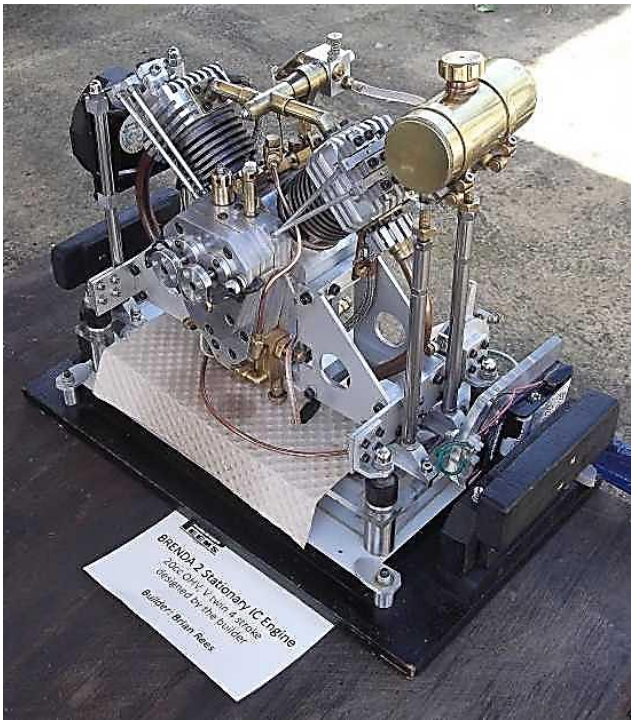




Gardener O Hot Tube Gas Engine ~ Half Size Replica.
Built from a casting set bought from *The Anson Engine Museum*.
Mel Doran.



Atkinson Differential Engine ~ Runs On Petrol. Built by Mel Doran.



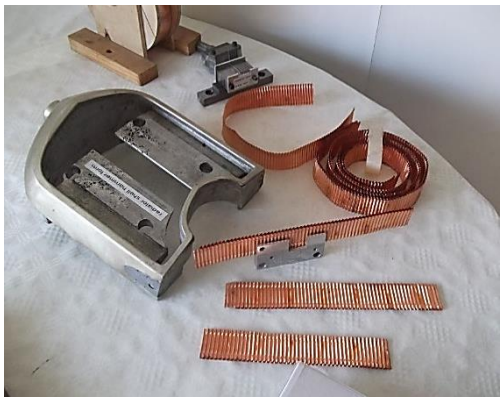
Above: **Atkinson Cycle Engine** ~ Runs On Petrol. Built by Mel Doran.

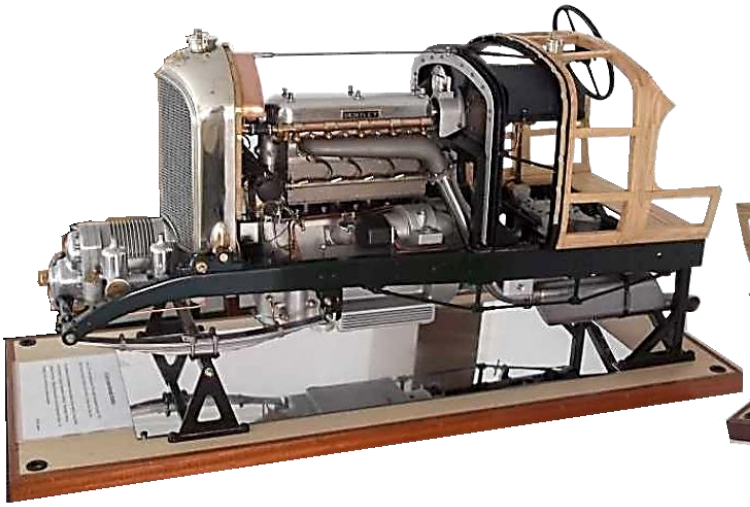
Right: BRENDA 2 Stationary Engine IC Engine. 20cc OHV V Twin 4 Stroke. Designed by the builder Brian Rees.

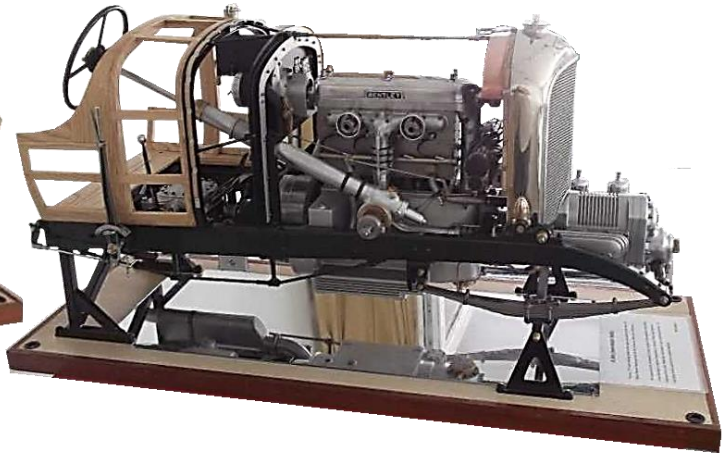
4½ Litre Supercharged Bentley Engine. A 1/3rd Scale Working Model by Mike Sayers.

This is a working model of the 1929 Birkin 4½ litre supercharged “Blower” engine from the car built to contest the Le Mans 24-hour race that year. It did not succeed in winning at Le Mans but has become the ultimate and iconic image of Bentley. (Editor’s note: This model won both the ‘The Barry Jordan "Best In Show" Cup‘ and ‘The Bradbury-Winter Memorial Challenge Cup’ at the 26th National Model Engineering and Modelling Exhibition at Doncaster in 2019.)

Various Tools, Moulds and Jigs.



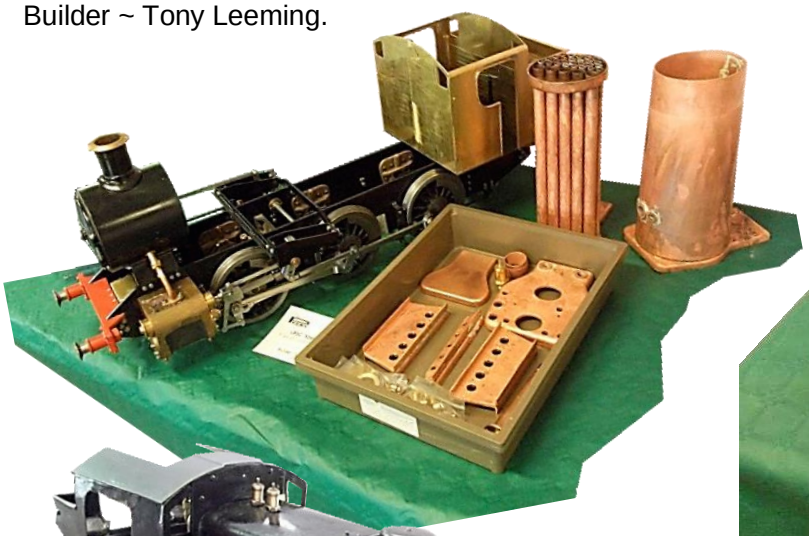




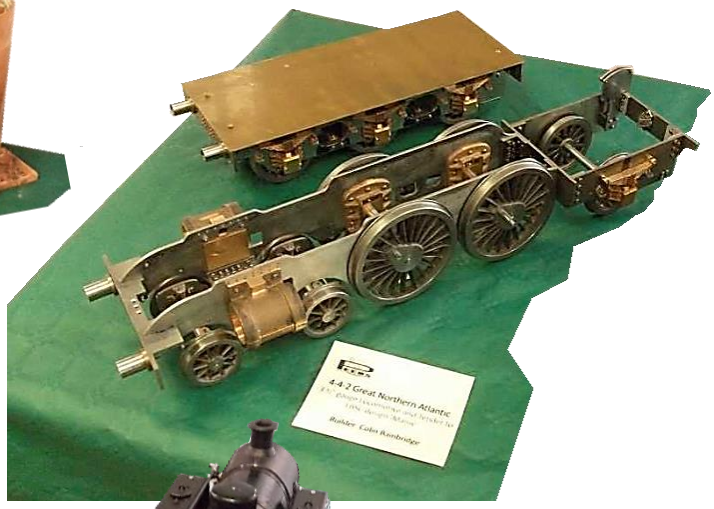
b) Some of the Exhibits at the Hungate Centre.

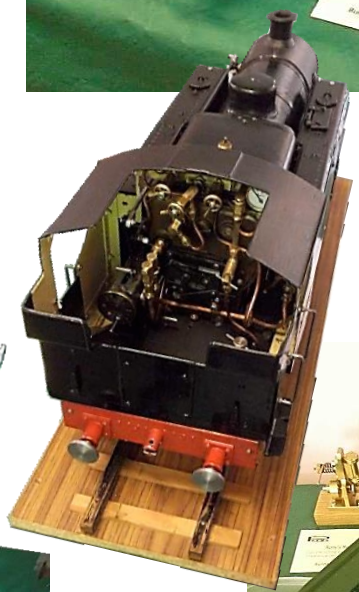
- **Model Locomotives both complete and 'Work In Progress'.**

LBSC 'Speedy'.
5" Gauge Steam 0-6-0 Locomotive.
Builder ~ Tony Leeming.



4-4-2 Great Northern Atlantic.
3½" Gauge Locomotive and Tender to LSBC design 'Maisie'.
Builder ~ Colin Bainbridge.





3½" Gauge Pannier Tank Locomotive.
Builder ~ John Heeley.

5" Gauge
Nigel Gresley.
Builder ~ William Burrell.

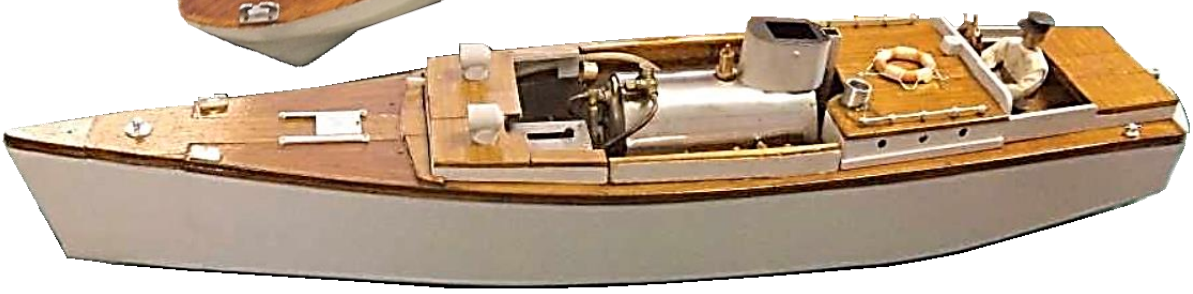
LCDR Europa Class Locomotive Tender.
Builder ~ Paul Gammon.

- **Model Steam Boats both complete and 'Work In Progress'.**

'Lady Jay' Steam Boat.
Builder ~ Ron Baier.

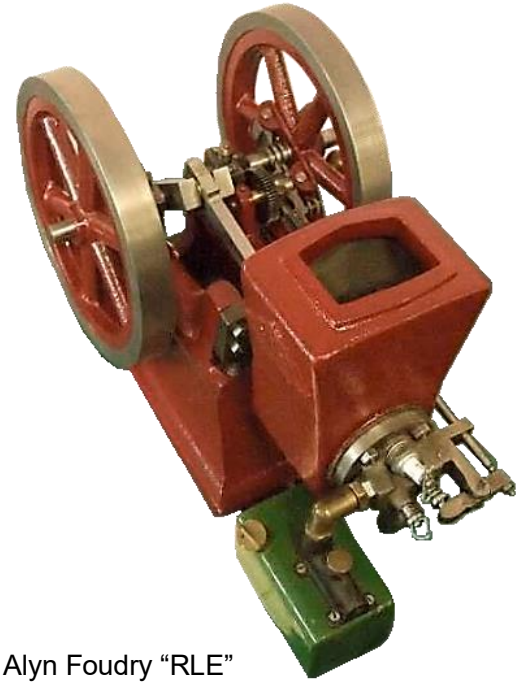
'Miss Mini Madam'.
Builder ~ Ron Baier.

Steam Boat.
Powered by a small oscillating engine.
Builder ~ John Heeley.

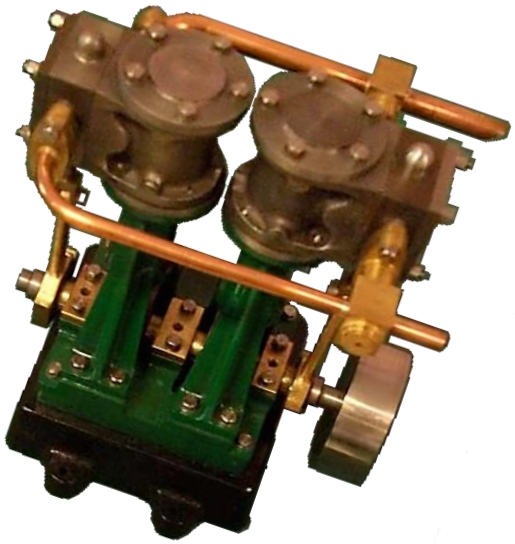


Steam Turbine Powered Boat.
Stumpf Wheel turbine with 4:1 reduction gearing.
Builder ~ John Heeley.

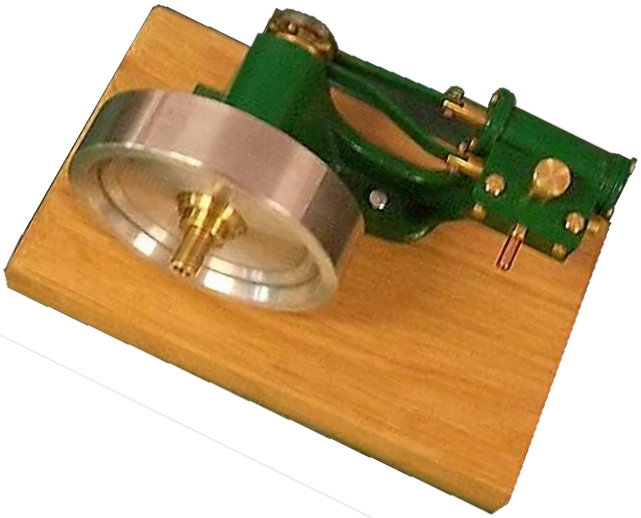
- **Model Stationary Engines, both complete and 'Work In Progress'.**



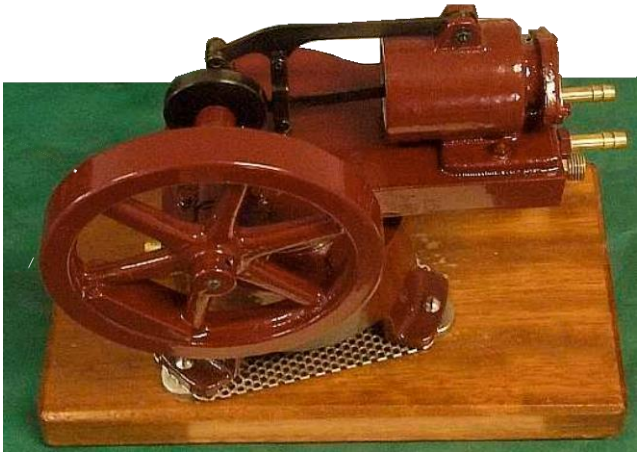
Alyn Foudry "RLE"
1¼" bore 'Hit and Miss' Stationary Engine.
Builder: Barker-renovated by Tony Leeming.



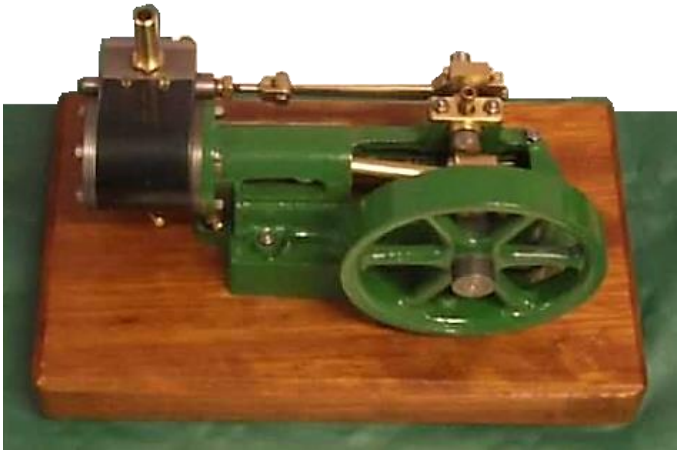
Stuart Turner D10
Twin Cylinder Stationary/Marine Engine
Builder: Tony Leeming.



Myfordboy Stationary Engine.
Double Acting Piston Valve Engine
Designed By David 'Myfordboy' Abbot.
Builder: David Proctor.

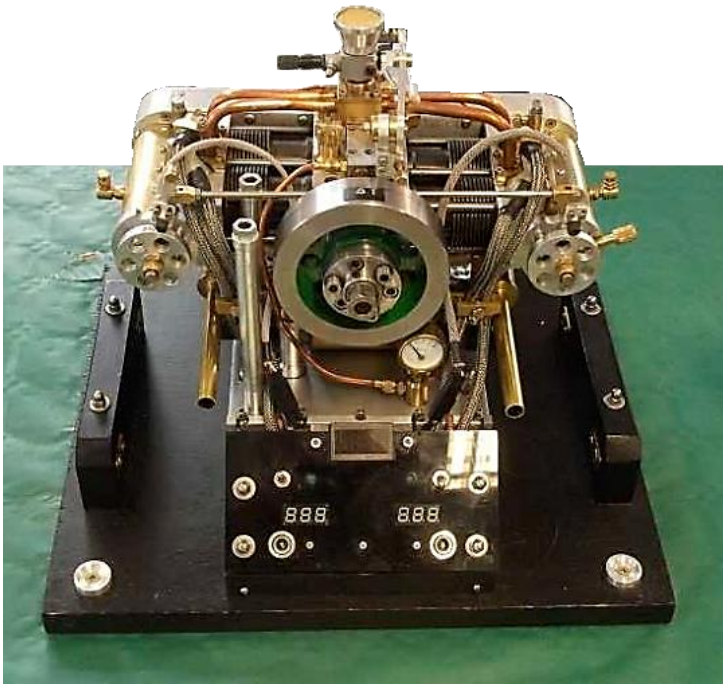


Robinson Hot Air Engine.
Builder: Paul Gammon.



Stuart No.10 Horizontal Steam Engine.
Builder: Paul Gammon

Oscillating Engine.
Built to 'Tubal Cain' Design
Builder: Dave Dobson.



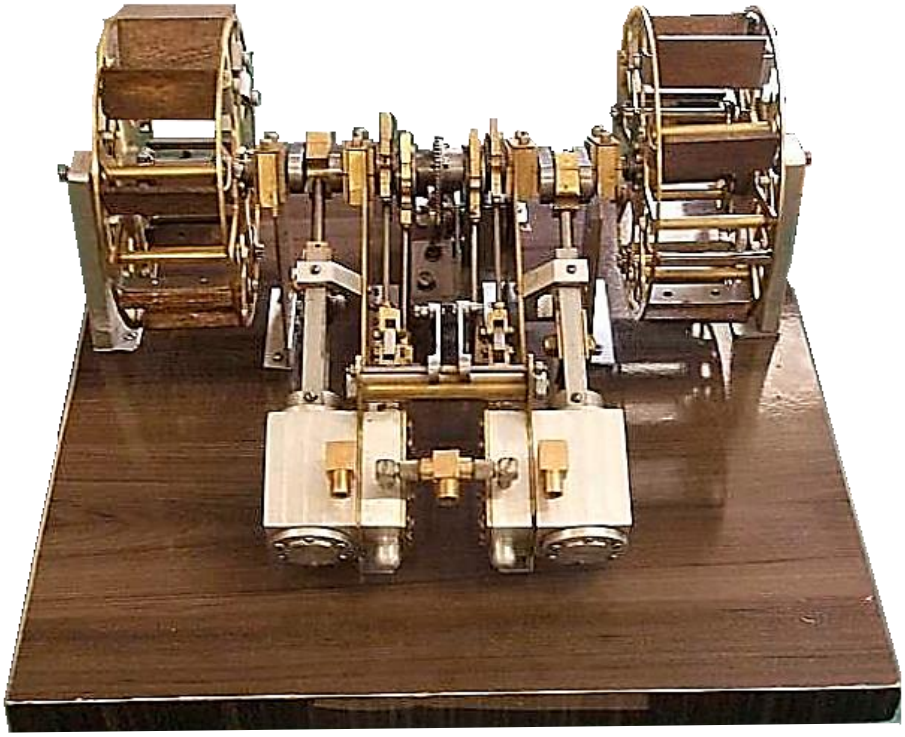
BRENDA 4 Stationary IC Engine.
28cc Overhead Cam, Flat 4 designed by the builder.
Builder: Brian Rees

Boiler Feed Pump and Boiler (Work In Progress).
To the Martin Gearing Design as published in
The Model Engineer 4576-4615
Builder: David Proctor

'Rory's Rocket' Double Oscillating Engine.
Freelance design by the builder.
Builder: David Proctor

Steam Engine.
Builder: Brian Stephenson.

Stationary Engine ~ 'Georgina'.
To 'Tubal Cain' Design.
Builder: Dave Dobson

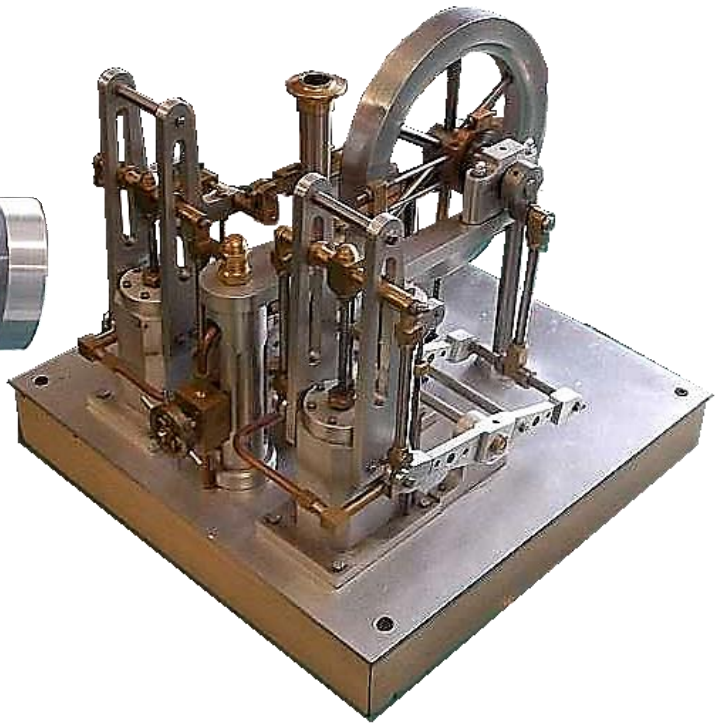


Twin Steam Paddle Engine.
Builder: Brian Stephenson.

Twin Cylinder Capstan Engine.
Builder: Brian Stephenson.

Twin Vertical Steam Engine.
Builder: Brian Stephenson.

Six Cylinder Experimental Steam Engine.
Builder: Brian Stephenson.



To watch these models running press on this link:

https://youtu.be/4qS0WQFmR_Q

To return to newsletter, please press back arrow at the top left hand side of the screen.

Please Note: There were so many models on display, that it has been decided to extend the photos of the two site displays not shown here, into the June Newsletter.

- **Dinner at the Forest and Vale Hotel.**

  Following the day presenting their models, members, wives and partners, (totalling fourteen), accompanied John and his wife Ann to the 'Forest and Vale' Hotel where they had an excellent evening meal.

PEEMS Visit To Ellenroad Steam Museum on Sunday 1st May.

- **Introduction**

Five PEEMS members travelled on the M62 over Saddleworth Moor to visit the Ellenroad Steam Museum in Milnrow, Newhey, Rochdale Lancashire. This was PEEMS first excursion since the Covid lockdowns in March 2020.

The last group excursion away from Pickering was to the Anson Museum in Poyton Cheshire in September 2019, and so this visit was an appropriate visit to a similar British industrial heritage site.

The museum is home to the World's largest working steam mill engine (*Victoria and Alexandra)* and as there is a 'steaming day' on the first Sunday in the month, PEEMS took this opportunity to visit the site. An extra attraction was the classic car and motorbike rally being held by the local enthusiasts.

The museum is contained within what was the original factory engine house, which along with the chimney, is the only part of the factory still there. In fact, the smoke from the chimney could be seen from the approach on the M62 (the museum being just adjacent to the motorway), so it was comforting to know that the museum was actually steaming as we arrived.

The museum is very interesting, as not only were *Victoria and Alexandra* running, but other industrial engines such as *Irene* and the *Whitelees Beam Engine* were working on each side of the large ground floor *Engine Room Café* and bookshop area.

At the back of this area was the boiler, and the coal bunker. There were two fire boxes and you could watch the stokers feeding the fires.

- **A Brief History** (with help from Wikipedia**).**

- During the boom of the late 1880s, a limited company, *the Ellenroad Spinning Co. Ltd*, was formed to build a new cotton mill. They chose the well-respected Oldham architects of *Stott and Sons* to manage the design and construction. The design was for a conservative five-storey 40-bay mule spinning mill, with detached engine and boiler houses, driving the line shafts by means of a rope drive. Built in 1892 on the banks of the River Beal, the Ellenroad cotton mill produced fine cotton yarn using mule spinning.
- Rochdale was a prime site for cotton spinning in 1890. It was conveniently located for the coal fields and the railways made the importation of cotton easy.
- For the steam engine they went to the local firm of *J & W McNaught* and chose a single triple-expansion horizontal engine, which in 1890 produced the greatest efficiency in terms of power per ton of coal. The steam was raised by five Lancashire boilers. These required a 220 ft chimney to provide the draught.
- Work commenced in February 1891, and the first cotton was passing through the card room in May 1892. The final mule was installed and in operation by December 1892. The mill would have had humidifiers and a sprinkler system.
- The mill was extended by *Stott and Sons* in 1899.
- The industry peaked in 1912 when it produced 8 billion yards of cloth; The First World War of 1914–18 halted the supply of raw cotton; and the British government encouraged its overseas colonies to build mills to spin and weave cotton. The war over, Lancashire would never regain its markets.
- At 2:30 pm on 19th January 1916 the headstock of one of the two mules, in Number 2 Spinning Room, caught fire. The sprinkler system and the operatives could not contain the fire. The fire brigades of both Rochdale and Oldham were summoned. Oldham were delayed until 4:00 pm. By 5:00 pm the fire was believed to have been extinguished, but it reignited, and with the help of strong wind burnt fiercely. At 8:00 pm the centre of the mill collapsed. Though it was of fire-proof construction, on the patent triple brick arch method, the iron girders had been subjected to great heat and dousing with water, and this caused them to fracture. By the following day the ruins of the mill had become a tourist attraction. The boiler and engine houses were untouched.
- The mill was rebuilt in 1919, but in a new form: as a ring spinning mill, thus replacing the slower mules with ring frames. Mules still produced the finest spin, but that was a more niche market, and money was now made with rings. More ring spindles could be operated in the same space. Many mills were converted to ring frames, but the most efficient ring frames required a greater floor height, and the positioning of the floor support pillars (and hence the bay size) needed to be changed in order to achieve the greatest spindle density. The new mill was called *The Ellenroad Ring Mill* to distinguish it from the former *Ellenroad Mule Mill*.

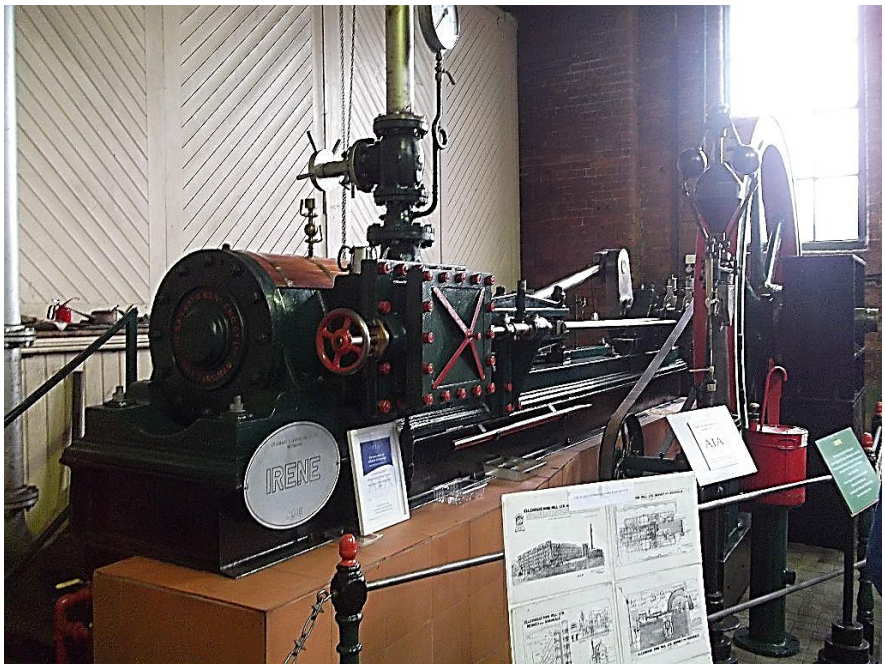
- The opportunity was also taken to reconfigure the engine. The four-cylinder triple-expansion horizontal engine by *J & W McNaught* was reconfigured into a 3000 indicated horse power *twin tandem* which would deliver the extra power required by the increased number of spindles. At 3000 h.p., the *twin tandem* compound steam engine *Victoria and Alexandra* is possibly the most powerful of the type in preservation. The engine has a *Craig* cut off gear attached to *Corliss* valves on the HP cylinders, and slide valves on the LP cylinders. It is regulated by a *Whitehead* governor, and drives an 80-ton, 28-foot flywheel grooved for 44 ropes. These driving ropes drove the line shafts on each floor of the mill, which in turn drove the ring spinning frames. In this form the engine was designed for 2600 h.p. but was run overloaded for many years producing more than 2800 h.p.

- The mill continued to spin cotton into the 1980s. The mill was electrified in 1975, and the engines fell silent but remained intact.
- After closure in 1982, the mill was largely demolished by 1985, although the boiler house, engine house, complete with steam engine, and the boiler house chimney were retained. These were taken over by the *Ellenroad Trust*, who have maintained the engine and acquired a beam engine and other smaller engines. The one remaining Lancashire boiler is fired-up once a month to demonstrate these engines in steam.

- **Irene (1860)**

On entering the museum, there was a steam engine on the right hand side named *Irene*. Originally this had been built by *The Railway and General Engineering Company* of Nottingham in around 1860. The engine powered the *Downing Brick and Tile Works* factory in Stoke on Trent, until the factory burned down in 1932.

The engine was then restored and spent some time outside the *Ellesmere Port Boat Museum,* before being brought to the Ellenroad Museum in 2010. It was returned to working in steam in 2019. 4,000 hours were spent by Ellenroad volunteers restoring the engine to steam. It weighs about 7 tonnes and won a restoration award.

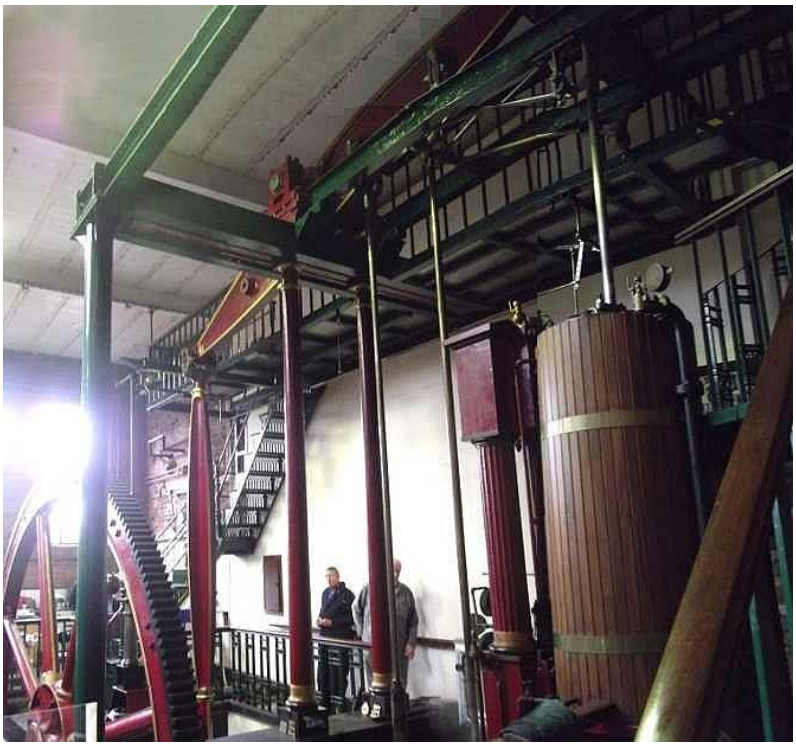


There is a video of Irene operating here: https://youtu.be/_O3Cyfnvdhc

Press link. To return to newsletter press the back arrow at the top left hand side of the screen.

- **The Whitelees Beam Engine (1841).**

Across the other side of the *Engine Room Café,* the Whitelees Beam Engine was also running.



The Watt-type beam engine was built in 1841 by *John Petrie and Co, Ltd.* a company in the middle of Rochdale, which was the manufacturer of steam driven engines for cotton mills.

The engine powered the W*hitelees* woollen mill in Littleborough (in the Metropolitan Borough of Rochdale, in Greater Manchester), until about 1946.

In the 1950s it was moved back to the works in Rochdale where it was built, and was installed in a glass case and run by an electric motor.

When the site was redeveloped, the engine was dismantled and was installed in the boiler house at Ellenroad. It was rebuilt to run on steam.

It is probably a unique example of an unaltered beam engine built to run a textile mill.

There is a video of the Whitlees Beam Engine operating here: https://youtu.be/JfX5SkUTuhI

Press link. To return to newsletter press the back arrow at the top left hand side of the screen.

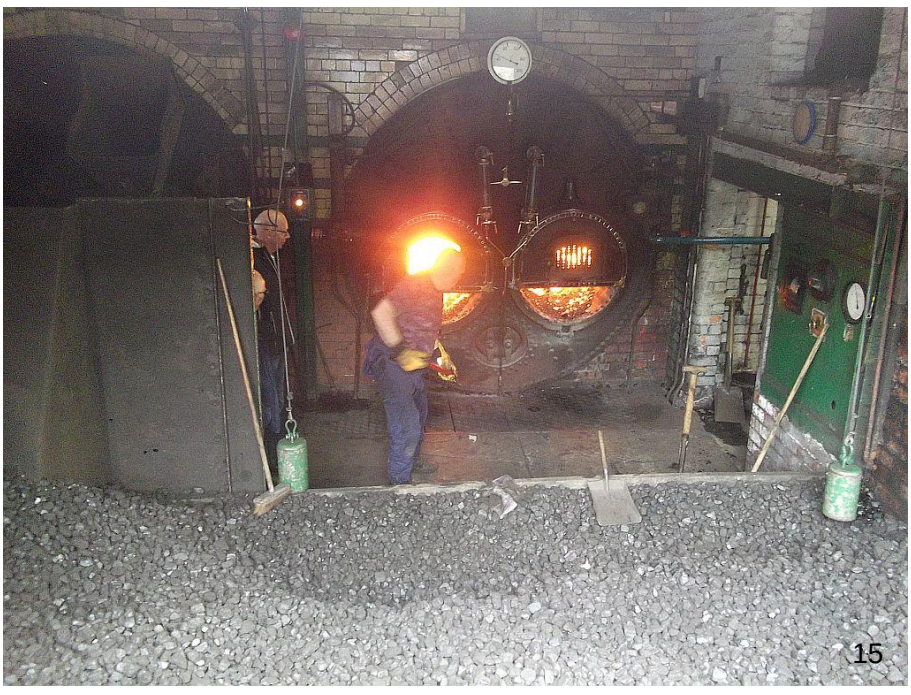
- **The Ellenroad Boiler (1921)**

The original 1892 boilers were replaced during the 1919 rebuild of the factory because more power was needed by the upgraded twin tandem engines (*Victoria and Alexandra*). *Tetlow Brothers* of Hollinwood Oldham built the boilers.

In about 1948, mechanical stokers were added so they could be operated by one man, When the museum was set up, these were replaced with electrical stokers.

One of the Lancashire boilers from the 1921 refit is still in place, and is used to drive the engines. It has twin furnaces, and coal is shovelled in by hand on steam days.

On the day of the visit, the coal being used had been imported from Colombia. At least 57psi – 60psi of steam had to be raised to drive *Victoria and Alexandra.*



- **Victoria and Alexandra.**

  Climbing the stairs brought us into the main room with the *Victoria and Alexandra* twin tandem compound steam engine with its 80-ton, 28-foot flywheel grooved for 44 ropes. The boiler was raising steam, so there was a wait until sufficient steam pressure had been raised.

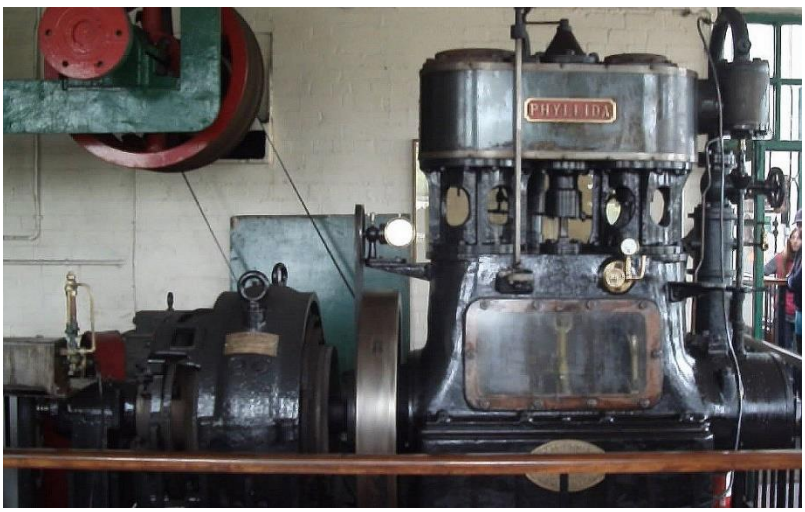
  The main pressure dial can be seen in the centre between the two engines, and quite a crowd had gathered around the periphery by the 12.30pm start up, when about 57 psi of steam pressure had been raised.

There is a video of *Victoria and Alexandra* operating here: https://youtu.be/ljXzC1p9nYw

Press link. To return to newsletter press the back arrow at the top left hand side of the screen.

- **Phyllida.**

While waiting for the big engine to start, *Phyllida* could be examined in an adjoining room. *Phyllida* is a generator set, consisting of a steam engine coupled with a D.C. generator.



The engine was built in1921 by *Browett, Lindley and Co.* an engineering company in Patricroft, Manchester. It is a high speed twin cylinder vertical engine. It can run at high speed to drive the dynamo, because the crankshaft is enclosed and there is a pumped lubrication system to the main bearings.

The dynamo was built by *Mather and Platt* in Manchester, and produces direct current electricity (70 kW).

The set was used to provide pilot lighting in the mill so the workers could enter and leave when it was dark. Maintenance work could also be carried out when the main engine was not running.

The electrical distribution boards could also be seen

There is a video of *Phyllida* running here: https://youtu.be/IiOVe8By0tA

- **The Mather and Platt Sprinkler.**

Going outside and re-entering the building through the left hand entrance into the workshop area, we passed the *Mather and Platt* sprinkler system

The sprinkler system was built by *Mather and Platt* of Manchester and installed in the mill to provide the water for the firefighting sprinkler system. This was required by the insurance company because mills were fire risks. This gave it its other name “The Underwriter’s Pump”.

It was recently refurbished, and pumps water from the river Beal via the underground supply.

It is a direct acting two cylinder steam pump. It is one of only two survivors of this type of pump, the other is in Belgium.

There is a video of the *Mather and Platt sprinkler* operating here:
https://youtu.be/FSBN6aPeobY

Press link. To return to newsletter press the back arrow at the top left hand side of the screen.

After passing the pump, we entered the blacksmith’s workshop called the Flock ‘Ole. Demonstrations of blacksmithing were carried out in this room.

- **The Flock ‘Ole.**

The Flock ‘Ole room originally contained four large air fans which sucked air and cotton fibres out of the spinning rooms. This was necessary because cotton fibres (flock) are very flammable. The fibres were filtered out and were used to stuff pillows and mattresses.

The fans were removed decades ago, and the room is now used to house the 1910 workshop. The workshop has a collection of historic machines which are powered by overhead line shafts driven by a single cylinder diesel engine.

The system is shown in this video:
https://youtu.be/8d8VQ3pcGiM

Press link. To return to newsletter press the back arrow at the top left hand side of the screen.

- **A Pair Of Sisson Engines.**

Although not related to the original Ellenroad factory, two Sissons engines were on display. These had been donated by the Ellesmere Port Boat Museum. These experimental steam engines were manfactured by W. Sisson and Co. in Gloucester, and were supplied to technical colleges in Britain and the Commonwealth for the training of engineers.

There were fittings and fixtures which allowed experiments to be carried out by the trainees.

The photo shows the left hand engine of the pair.

The two engines were of slightly different design. The first engine’s cylinder had an 8” bore, and was described as a low pressure engine.

The other engine's cylinder was about 6" bore and was described as a high pressure engine. This had a slide valve with Mayer expansion.

Both engines had forced lubrication from a pump in the base, similar to a car engine.

The engines could be run independently or linked together to form a compound engine.

- **Harry Butler Models.**

In the same room as *Phyllida*, there was a display of Harry Butler's models of mill engines and vehicles. There was even a model of *Victoria and Alexandra.*

There is a video of Harry Butler's models operating here:

https://youtu.be/JDqfJoD6h_Y

Press link. To return to newsletter press the back arrow at the top left hand side of the screen.

- **The Fern Mill Engine**

The Fern Mill Engine was outside the museum, awaiting restoration. This large *Buckley & Taylor* horizontal twin tandem compound engine was from Fern Cotton Mill, Shaw. It is the only *Buckley & Taylor* engine in the UK and very typical of the company's early large engine design. The engine was built in 1884 with all slide valve cylinders and gear drive from the flywheel rim. It was rated at 1200 hp. It was rebuilt by its makers in 1905 with new *Corliss* valve cylinders with *Buckley & Taylor's* trip gear.

As rebuilt, the cylinders were 22" and 48" x 72" and it developed c1500 hp on steam at 160 psi. Cotton spinning ceased in 1939, but the mill was subsequently used for government work. From about 1943 the engine ran non-condensing on the high pressure cylinders only, and then it was stopped by a major crack in the crankshaft in about 1954. (This description: © *Copyright Chris Allen and licensed for reuse under the Creative Commons Licence.)*

This photo © *Copyright Chris Allen and licensed for reuse under the Creative Commons Licence*

- **Classic Car And Motorcycle Rally.**

In addition to the visit to the museum, there was a classic car and motorcycle rally in the grounds. This included military vehicles, including American Jeeps and ambulances. Here are some examples of the vehicles on display:

- **In Conclusion**

This was an excellent ‘day out’. PEEMS would like to thank the Ellenroad Trustees for all the work they have carried out in the restoration of the steam engines, and the buildings. When a representative of the Trust was informed that the photos and videos taken on this visit by PEEMS were going to be published in this newsletter, he said that was acceptable so long as the Trust was acknowledged, which PEEMS is pleased to do.

Contact:
If you would like to contribute to the Newsletter,
the contact is: Nevile Foster Tel 01751 474137 or e-mail nevf123@outlook.com