NEWSLETTER July 2019

FORTHCOMING EVENTS

August

Club Meeting: Wednesday 7th August - ***'Bring and Buy'* Auction**

Workshop Morning: Tuesday 20th August 10-12 noon.

September

Club Meeting: Wednesday 4th September – **The Art Of Silver Soldering, a talk by Keith of "CuP Alloys (Metal Joining) Ltd ".**

Workshop Morning: Tuesday 17th September 10-12 noon.

CLUB MEETING: Wednesday 5th July

Chairman Colin Bainbridge welcomed everyone to the meeting, which was the 'Mike Sayers Trophy Night'.

- **Factory Visits**

  Since we last met, we have visited two factories in Scarborough: *North Sea Winches*, and the *Unison* Pipe Bending Company. Colin said that speaking on behalf of everyone who attended, they were both excellent visits of great interest. It was very heartening to see that engineering is 'alive and well' in this part of the World. Many thanks to all those who helped the visits run smoothly. Colin wanted to thank Richard Gretton and his family at *North Sea Winches*, and Ted, Brian and Tony for arranging everything, including the lunch and the afternoon visit to *Unison*.

- **Future Visits.**

  Since the last meeting, Colin has sent out an e-mail to members regarding the late summer outing, asking them to vote for their preferred destination. Unfortunately, Colin has only received six replies. This is under the required number to hire a coach, which is very disappointing. He had hoped that by requesting outing preferences from each member, he would be able to announce the favourite choice at the July meeting. He asked for a show of hands at the meeting to gauge how much interest there was in each destination.

  The three choices are:

  - The Bolton Steam Museum
  - The Anson Engine Museum (Poynton Cheshire)
  - The Manchester Science Museum.

  The show of hands was inconclusive, but everyone who voted would support any destination that was the final choice of the club. At least twenty members voted in favour of the excursions, and if some brought wives, partners or guests, that would be sufficient to order a coach.

- **Welburn Hall School.**

  The Welburn Hall School event was postponed at the end of last month, due to wet weather. At the moment it is provisionally rebooked for the third or fourth week in September. The dates suggested so far are:

  - Tuesday 17th or Wednesday 18th September
  - Tuesday 24th or Wednesday 25th September.

  Currently, Charles Hill and Mark Angus are doubtful they can attend with their traction engines on any of the above dates. Members pointed out that it was good if at least one traction engine was available for the children as an alternative to the railway. Colin said he would go back to the school to see if we could extend into early October.

- **Brian and May Stephenson's Garden Party on Sunday July 21st ~ 2.00 to 5.00pm**

  There will be a garden party, with refreshments at 86 Holbeck Hill Scarborough. All Welcome. £5.00 per person with all proceeds going to Cancer Research. Please let Brian know if you are going to attend (with numbers) as this will help with catering.
  RSVP with numbers to: Maygs80@gmail.com or tel. 01723 354415 or 86 Holbeck Hill Scarborough YO11 3BW

- **Ryedale Show Tuesday 30th July**

  The railway and locomotive were given their annual inspection at the last workshop morning, and are now ready to be used for the Ryedale Show on Tuesday 30th July. The setup will be on Monday 29th July. Volunteers are required for both the setup on the Monday, and also for the running and the dismantling of the railway on Tuesday.
  Colin requested a show of hands for those who could attend the setup on Monday and those who could attend the running and dismantling the railway on Tuesday. He was happy with the result. Passes will be required for anyone entering the showground on the Tuesday show day. Tony Leeming said that the club will receive a number of passes which include vehicle passes. Vehicles towing trailers have a pass each. Tony will have the passes on the Monday afternoon to hand out during the setup. The intention is to start the setup on the Kirkbymoorside showground at 4.00 pm.

- ***'Bring and Buy'* Auction.**

  The next club meeting on August 7th is the annual '*Bring and Buy'* auction. Colin handed out auction slips for those without a PC or unable to print them off. One auction slip is required per item or per lot if several items are to be sold as one lot.

- **The Club Annual General Meeting (AGM) in November.**

  Colin suggested that members considered putting themselves forward for election to officers of the club or committee members.
  This year we need a new club secretary. Tony Leeming has filled this role successfully for a number of years but will not be standing for re-election.
  There is also the eventual requirement of a Vice-Chairman to succeed Jonathan Milner in 2021.
  The club can only run as smoothly as it does if people step forward and volunteer. Even though it may appear that not much is happening on a month to month basis, all the things that do happen throughout the year, for example arranging speakers, planning and attending exhibitions and the club's involvement with the schools, all require organising and coordination. Please give this your consideration and if you're interested, put your name forward at the AGM. If you would like to know about it please see Colin or any of the committee members.

- **Workshop Sale**

  Ian Pickering is selling up his workshop. The workshop comprises a Myford 254 lathe, with an inverter and digital display. He also has for disposal, an Axminster milling machine, drill and Axminster bandsaws for cutting steel. All are in good condition. Contact is through Ted Fletcher.

- **A Request For Help Regarding A 'Titch' Locomotive.**

  Dear Sir,

  I have a 3 ½" gauge large boilered 'Tich' locomotive.
  Unfortunately the blower port on the whistle turret has split.
  Do you have any spare 3 port turrets or know anybody that could manufacture one?

  Yours sincerely,
  Tim Parker.

  If you can help, please contact Tim via Tony Leeming.

- **Twin Fluorescent Tubes.**

  There are over nine 6-foot twin fluorescent tubes/bulbs available from Alistair McLeod.
  Telephone: 07729064318.

THE MIKE SAYERS TROPHY

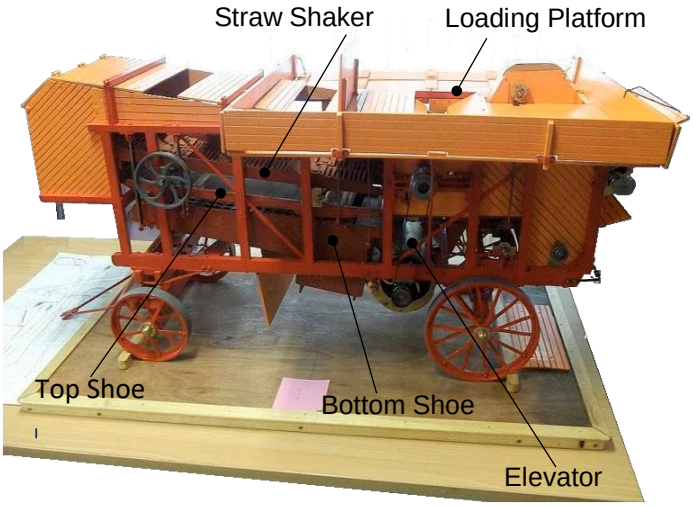
This year there were seven competitors for the 'Mike Sayers Trophy' :

i) Chris Bramley: 2" Scale *Ransomes* 'Threshing Machine"

Introduction: Chris said some people call these "Threshing" machines and some call them "Thrashing" machines. In the dictionary, the definition of "thrashing" is a "severe beating" whereas a "Threshing" machine separates the grain from the straw and the other definition is "to move about wildly". It depends on where you come from as to what you call it.
Chris said that in his early youth on the farm, they used to thresh every autumn which was very exciting for a young person. It wasn't a very clean job and it was hard work, but he enjoyed it and earned a "couple of bob" for helping out. Chris is therefore very interested in old agricultural machinery, and that's the reason he built this model. It took a lot of work. He wasn't a woodworker when he began, but with some help from Dave Hick cutting all the wood to the right size at the beginning, this started him off. Since then he is a 100% better woodworker.

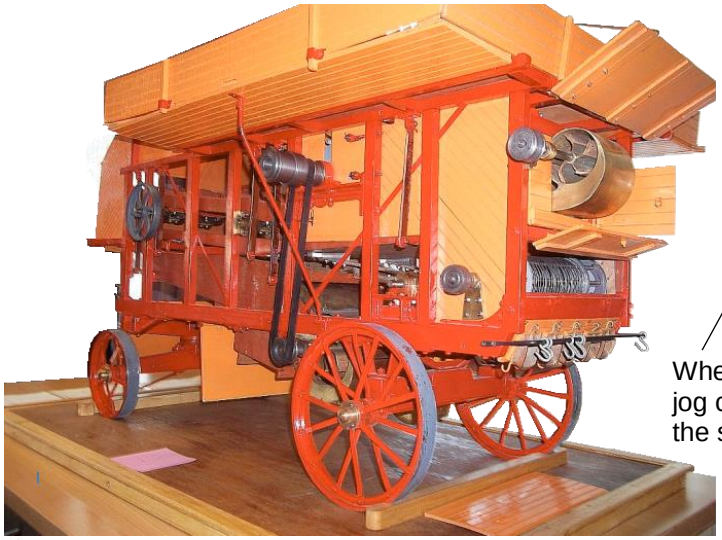
A bit of history: Threshing was originally done with a flail. It was hard work and there had be some wind to carry the "caff" (chaff) away. This "Threshing" machine can do in ten minutes what would take a whole day with a flail. The first mechanical "Threshing" machine was made by Scotsmen Andrew Meikle and his brother. They made this in 1790, and it was hand powered with a hand wheel. After that the machines became more mechanised, and eventually there were four threshing machine builders in Scotland, and twenty-three in England.
Ransomes last "Threshing" machine was built in 1954, and *Fosters* last "Threshing" machine was made in 1961, with many thousands having been produced. Great Britain had the biggest production run of these machines. Most of them were powered by portable engines, usually 6 hp. running at 160 rpm and 100psi.

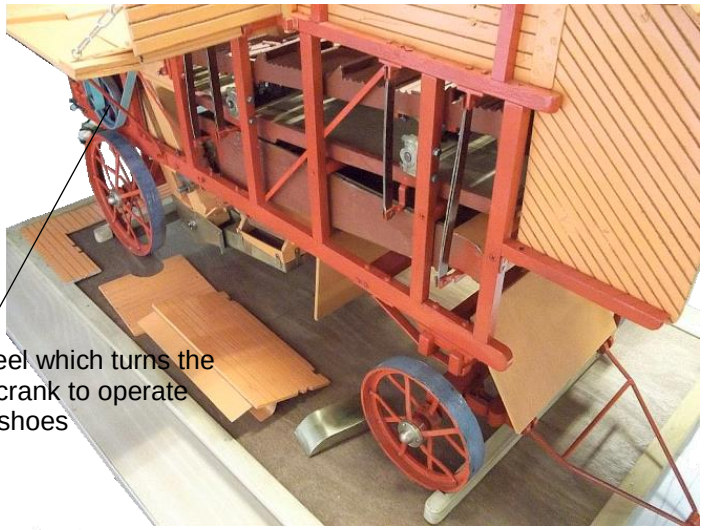
The Model: The model has taken Chris five years on and off to build. It is a 2-inch scale running (when the belts stay on) model. Chris has built it with the sides left open so people can see how it works. The boardings on the sides and top are made from plywood which were "jigged up" in the milling machine and a special tool was used to cut the grooves.



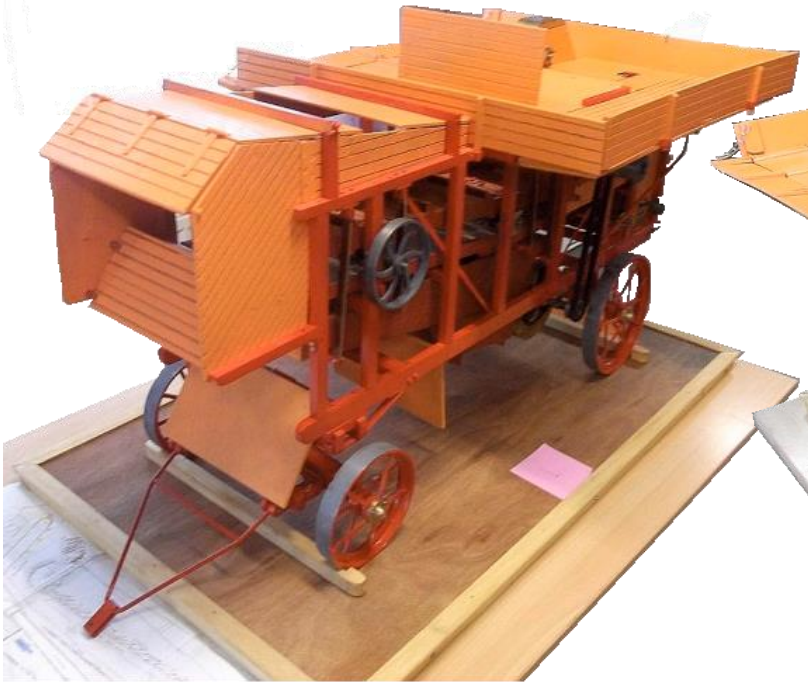
The straw shaker and crankshaft are shown above.
The four straw shaker longitudinal sections oscillate and bring the straw out of the front end. The jog crank on the right-hand side of the machine moves the bottom and top shoes backwards and forwards. The crankshaft for that is made from solid metal. It took several attempts before one was right.
The top and bottom shoes are shown above. The bottom shoe has filters in it gradually taking out the dust and "caff". Along the shoe, these filters get smaller towards the elevator at the back.
In 1858 *Garretts* made the first "Threshing" machine with a fan to blow the dust and "caff" out. After the 1860s two fans were put in. There are two fans on Chris' machine. The threshed grain drops through the sieves and eventually goes into the elevator buckets, and from there it drops down into an *"Awner".* In the "*Awner"* there are diagonal heads which knock the husks (awns) off. The corn then goes down into some more sieves where there are slides to drop the corn (or beans or whatever is being threshed) into the correct bags.
The hangers on the shoes are made out of *Tufnol*, because it is very flexible and does not break. Originally they were made from ash wood. Chris found that ash wood to the scaled thickness didn't last.

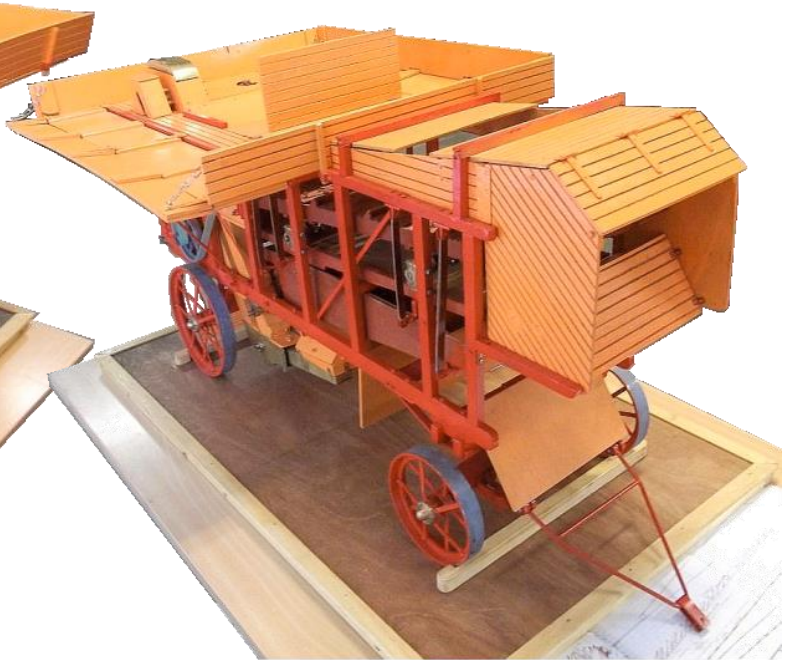
The model has been running.



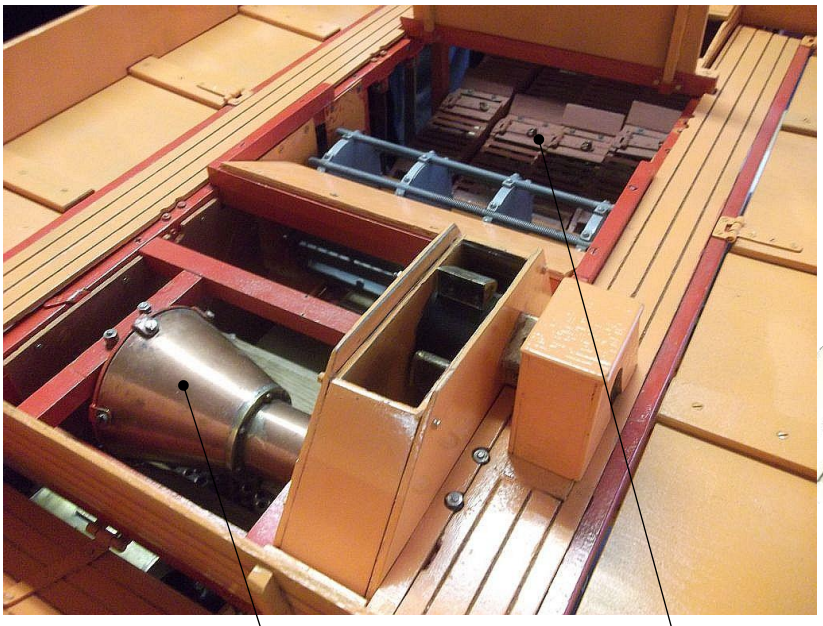


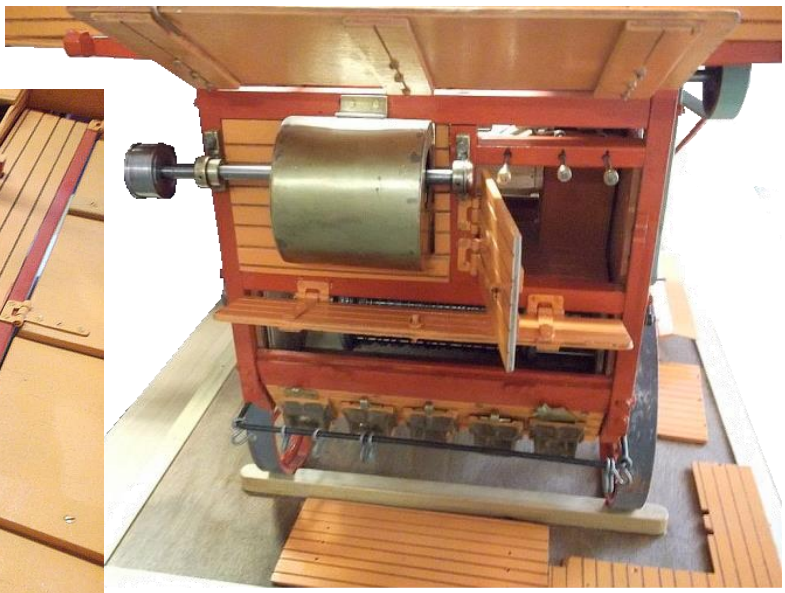
Wheel which turns the jog crank to operate the shoes





View On Top Looking Forward From The Back





View On The Back Of The Thresher

Awner

Four Longitudinal Straw Shaker Sections

Questions and Answers:

Q Did you work from drawings?

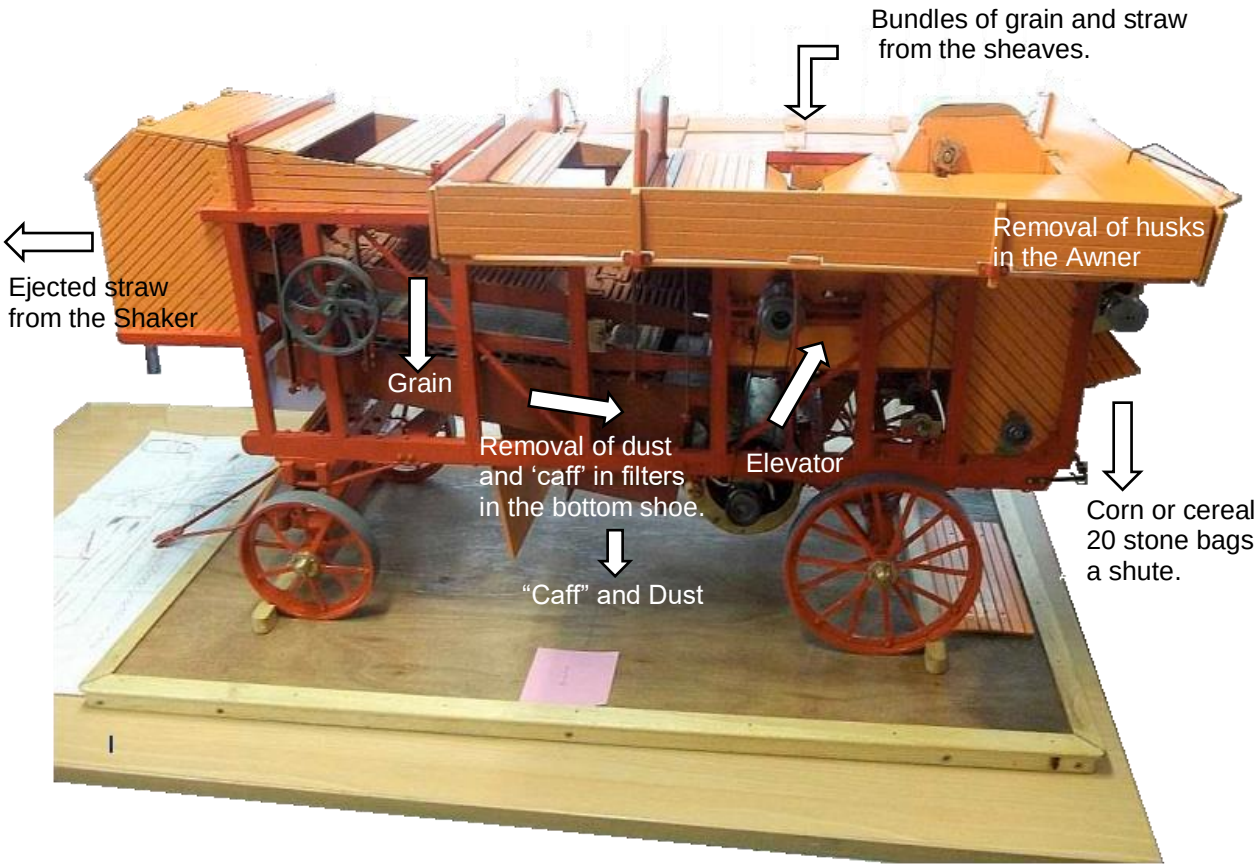
Chris Yes, I did work from drawings. They were produced in the 1960s. I couldn't get any castings, but luckily someone had started a similar model but didn't continue it, so I bought those castings off him. There's not that many castings in it. I've had to fabricate quite a lot. When you're putting it together you have to start from the bottom and work up.

Q Where is the corn loaded?

Chris The straw and grain from the sheaves are loaded on the platform at the top, and the corn comes out of the shute at the back into 20 stone bags.

Q Chris, could you describe the process of getting corn from the sheaves?

Chris The bundles of grain and straw from the sheaves go in the top as shown below. The straw shaker then takes the straw away from the grain. The straw is thrown out the front by means of the straw shaker. The grain falls onto the top shoe and then into the bottom shoe which contains the sieve filters. These filters get gradually smaller towards the back, taking out the dust and "caff". The grain then goes into the elevator buckets and the husks are removed in the *Awner* as explained before.



Q How are the straw and grain bundles lifted onto the top platform?

Chris With pitch forks. Someone has built a model, half the size of mine which is powered with a scale model Marshall tractor. It runs OK, but a type of grass has to be put in to represent the sheaves.

Q The 1960s seems very late for these machines to be still working. This will be after the war when the Americans had combine harvesters.

Chris There were combine harvesters in the early 1950s. The threshing machines were probably still being exported.

Q You said you were having problems with the belt that keeps coming off.

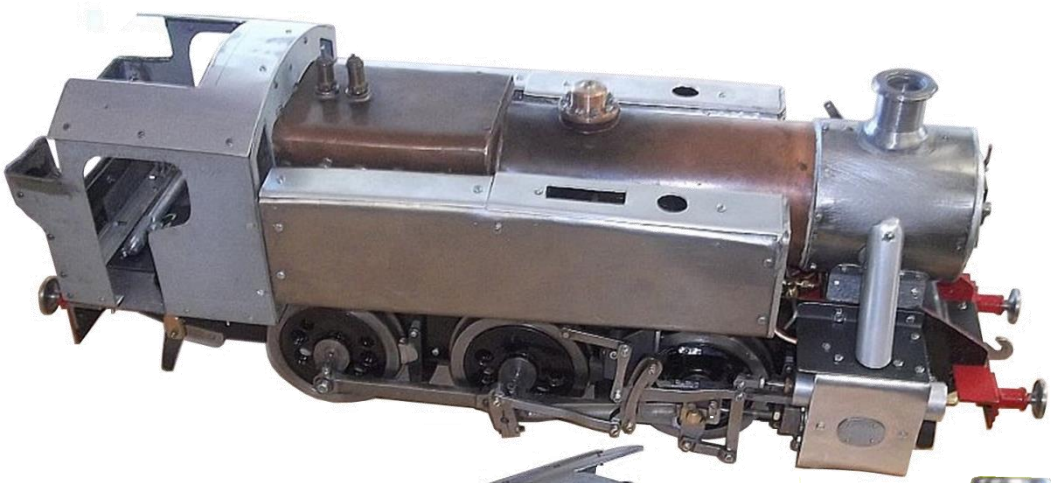
Chris. Yes. The belts are too thick and are on a wooden frame which twists a little so they don't keep in line.

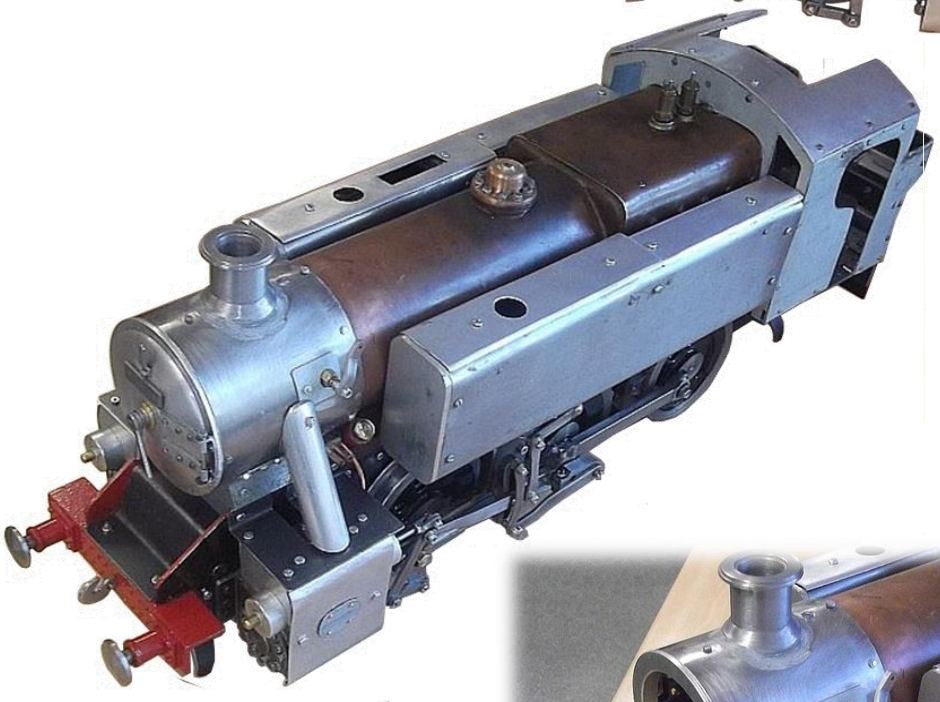
ii) John Heeley's 3½" Gauge Locomotive, Based On A Great Western Railway '1500' Pannier Tank Engine.

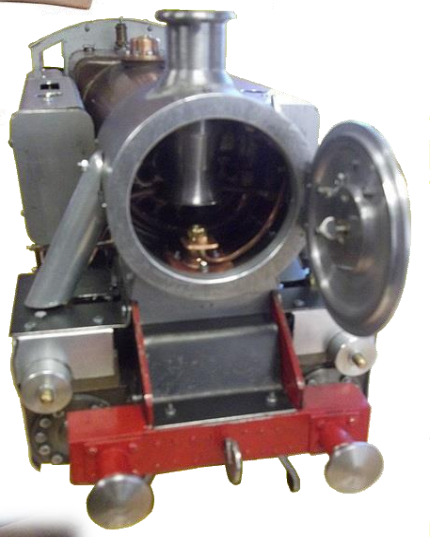
This is a 'work in progress', and John showed the undercarriage and boiler at last March's mini 'Bring and Brag'. John said that the model as shown, is the shape he wants but not the design, as either the cab or side tanks, or both will need refining.

The idea is that he is putting two hours a day, every day, into it, (including Saturdays and Sundays). He started at Christmas last and it's due to finish on next Boxing Day. He is exactly on schedule. At this moment it is 65% complete, and cost £509 to date, which includes the £220 he paid for the boiler. The boiler has never been used but was built in 1985. It's going very well. Every week there is a project to complete. Last week it was a displacement lubricator which started on Monday, and was completed on Friday. In the next week, the sliding doors will be fitted on the back end.

It has been running beautifully on compressed air and the valve gear is pretty much sorted, although the rods need to be tidied up. The front end is done, and the door has been left open to show the *Condine* nozzle for the extractor. It's all been worked out based on what has been done on previous engines (for example the 17° cone angle). The side tanks and the cab are not right yet. They were made in a hurry for the Doncaster Show. Either the cab is too narrow or the tanks too wide, or both, but something will need to change.

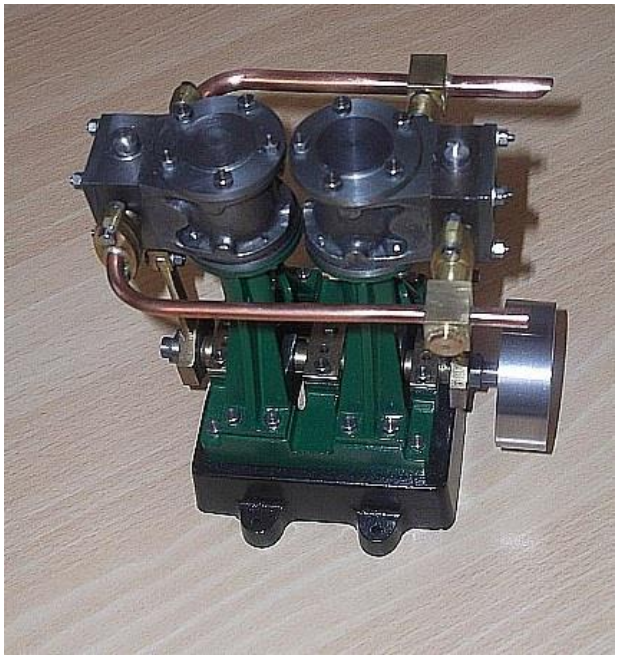






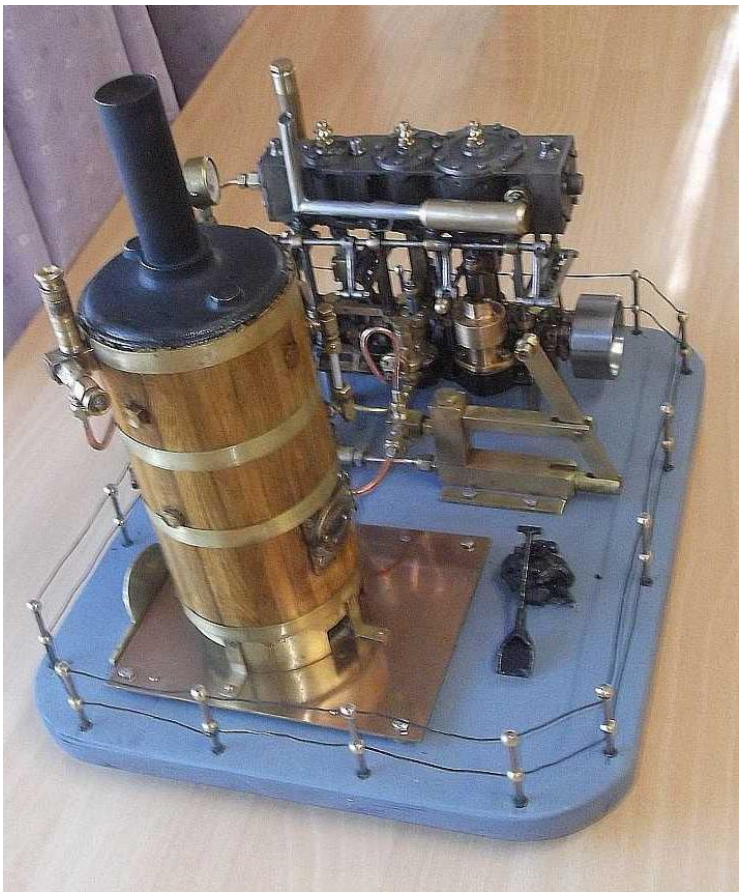
iii) Tony Leeming: Stuart Turner Double Ten Engine.

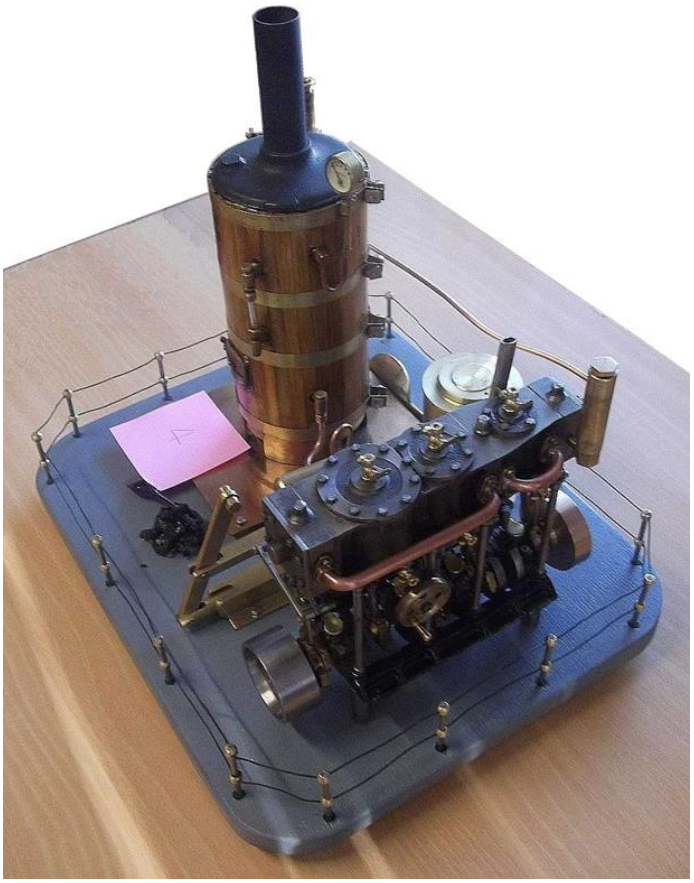
Tony said that this engine had been displayed before. He had started this in Gibraltar in 1982 at evening class. He didn't have a lathe, so when the evening class finished, it went in a box. He got a lathe in 2008 and it didn't take long to finish it.



iv) Dave Dobson: Triple Expansion Engine.

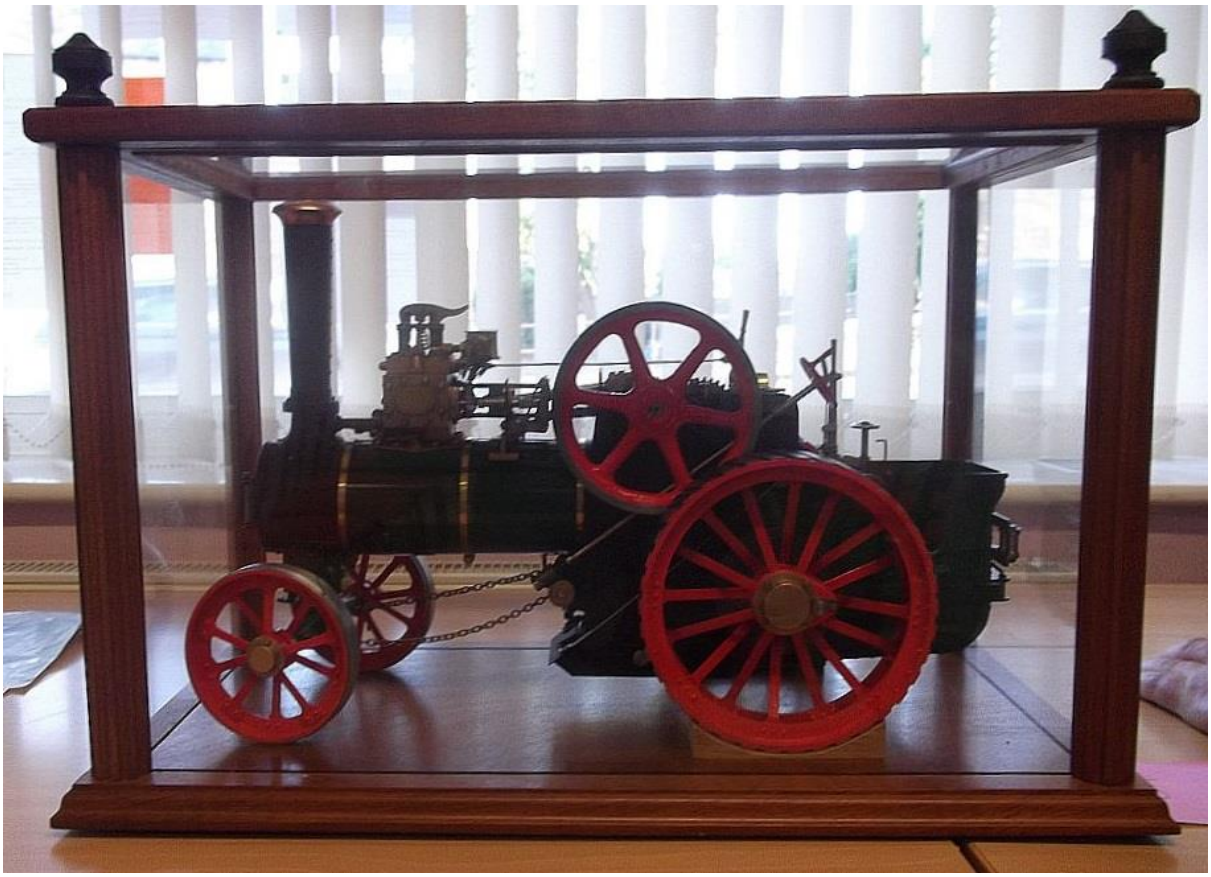
Dave bought this as a kit and the cylinder and crank shafts had already been made. Dave made a lot of bits at the technical college. Making some of the smaller bits has been hard work, being on and off over the years. The outer cylinder lagging is in oak, and the engine easily runs on compressed air. It also starts on its own. The boiler construction took two to three years, on and off, but when it was pressurised it held the pressure. It's now up and running.





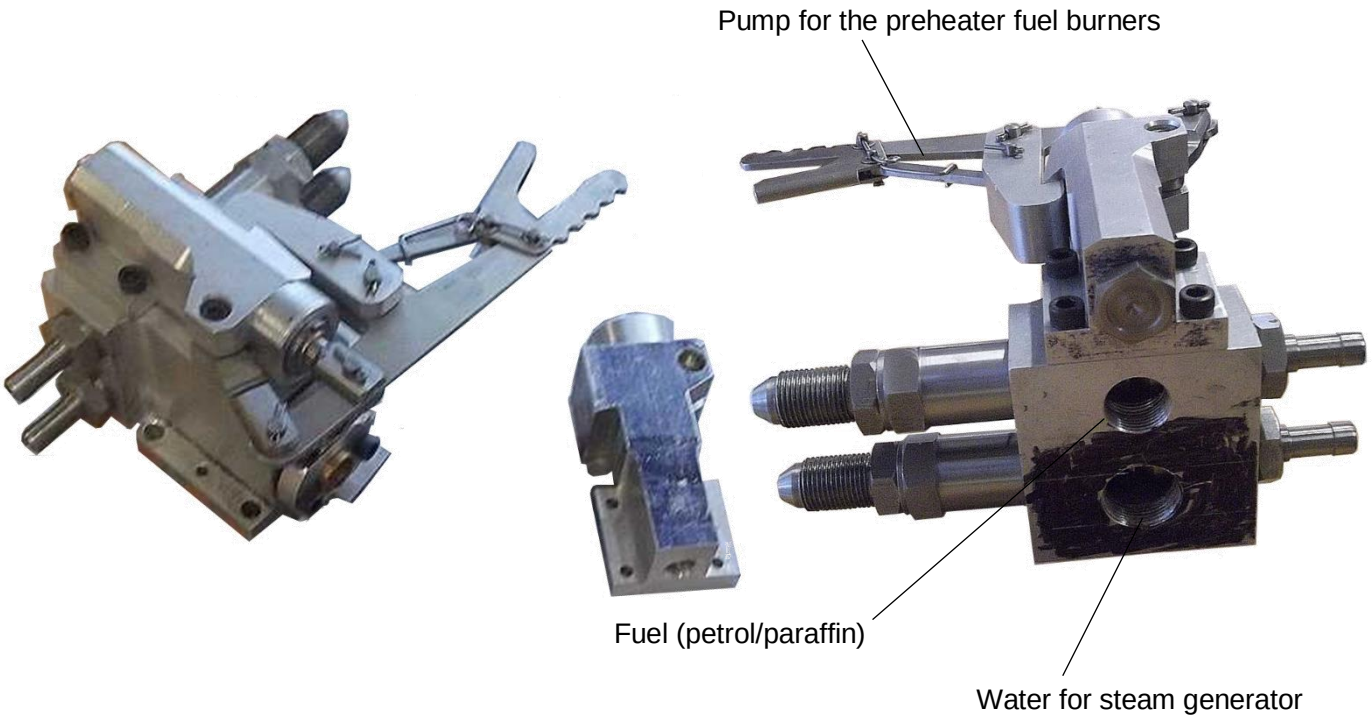
v) Dave Hick: One Inch Scale Model 'Minnie' Traction Engine.

Dave and his son Adrian started on this project thirty years ago. It is an L.C. Mason design. Dave bought the book and they made it from that. It then got put in a box and lay there for fifteen years. In the meantime he built a 4½" scale Foden wagon. He was instructed that he couldn't start another project until he finished this one, so he decided to finish it before starting his clock. It runs on compressed air. The cabinet is made from second hand reclaimed wood.

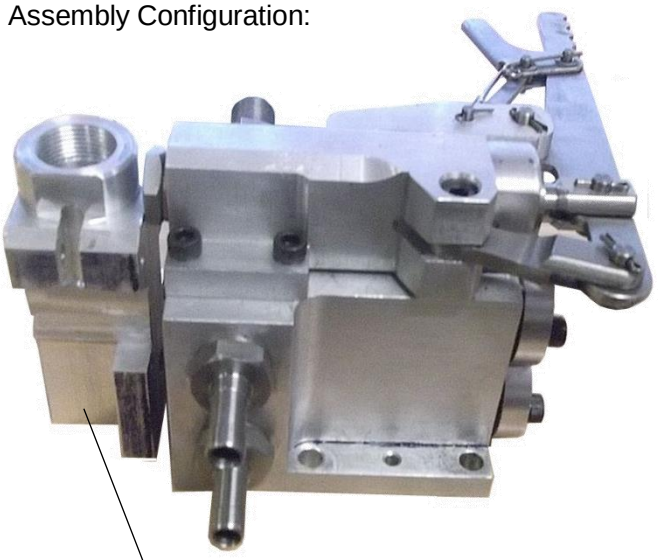


vi) Paul Windross: Steam Engine For A Motor Bike Or Three-Wheeler ~ Fuel and Water Pumps.

Last October at the “Bring and Brag”, Paul displayed the work he was doing on a steam engine for a three-wheeler or motorbike. This time he was displaying the fuel and water pumps that he was manufacturing for the engine.



Assembly Configuration:



This will eventually be the pump for the steam generator and will be a similar arrangement to that for the fuel

Just a few more bits and pieces (for the steam engine). There is still a bit more to do, but the main parts are now finished. Eventually some metal will be removed in order to save weight.

What is shown here is the pump arrangement. The unit is dual purpose containing two pumps, one to pressurise the burners for starting, and the other for pressurising the steam generator. Both are driven by a “Scotch Yoke” (which converts rotary motion into linear motion).

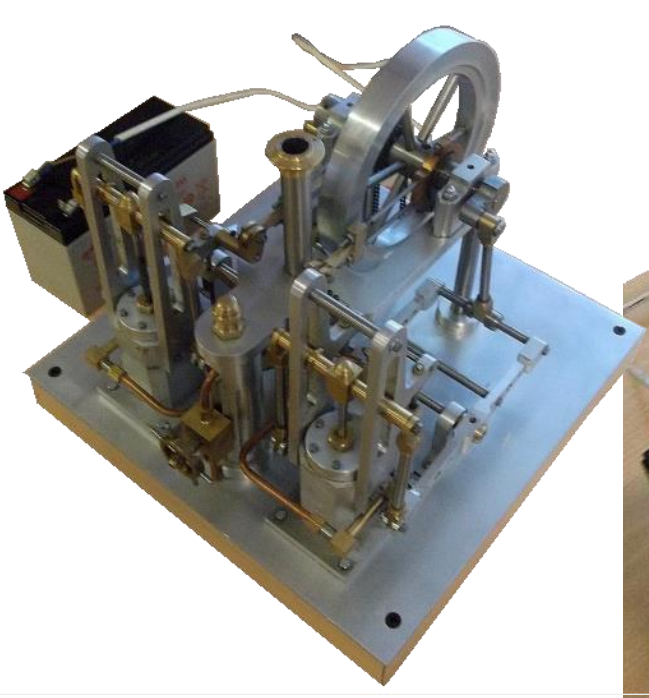
There isn’t much in the way of electronics in it and it is mostly mechanical.

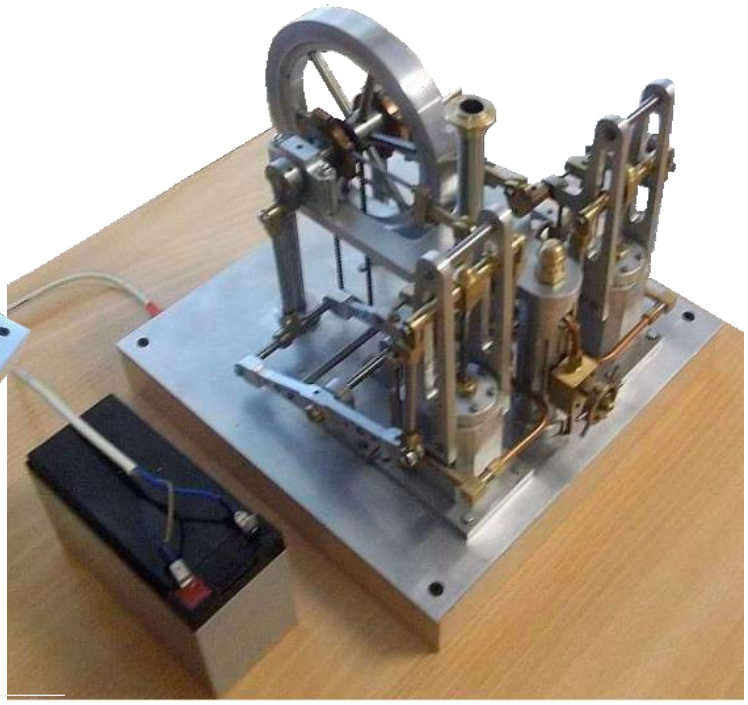
Paul will see how it runs before weight saving

vii) Brian Stephenson: Model Engine

Brian said that this was one of the twenty-four models that he has built in the last fourteen years. It is built to the design of a friend of his in Scarborough who is a self-taught engineer/draughtsman. The idea of this model is that it is not representative of any model that has been made in the past, but is something specially for himself, with plenty of moving parts. Brian thinks there are about thirty-six parts and they are all ‘scratch made’.

The engineer who designed it used to be a ship’s captain. They had a library on the ship which was stocked every few years, and that’s what got him thinking about model engineering and steam. Brian started building his models for him, and made about ten. They were displayed at the Doncaster and Harrogate shows. ‘*The Captain*’ now has internet contact with enthusiasts in about twenty countries. There is a lot of interest in the different engines that have been displayed at shows.





To see the engine in motion, please click the following link:

https://www.youtube.com/watch?v=hoseMGOexzw

Please press back arrow at the top to return to newsletter

Judging.

Each member voted for one entry only, and the votes were added up.

There were two winners, Chris Bramley and Dave Dobson, with only one vote between them. However, each had less than 50% of the total vote, so this required members to re-vote between the two.

Also unusually, there were three entries which tied for third place.

After the re-vote was taken the results were:

- Mike Sayers Trophy* Chris Bramley
- Second Prize (£15) Dave Dobson
- Third Prize (£10 shared) John Heeley, David Hick and Brian Stephenson.

***** In addition there is also a £25 award

Mike said that with regards to the quality of the models this had to be one of the best 'Trophy' nights there had been. It was very encouraging and he urged everyone to try for next year. Well done to everyone who entered.

PEEMS Visit To Alne School (York) For Their 'Science Fun Day' On The 10th July

Alne School – Report by a 'nervous attendee'.

…..10th July is the answer to the question that Tony Leeming posed at the end of his account of the Club's involvement with the Amotherby School Science Day last year. For the 10th of July 2019 was the next occasion when the Club presented its ''Science Fun Day'' this time at Alne School.

The format for the day was in line with previous years, that being four demonstration groups in four classrooms each lead by a pair of our knowledgeable members with the school children moving from one demonstration to the next following a pre-arranged timetable.

Following a rather early start (speaking as one not used to seeing the sun at that point in the sky when I got up), we all arrived at the School at 08.15 am thus being ahead of the dreaded 'School Run'. The group having assembled and been assigned according to their various areas of specialization for the day ahead, moved off to the classrooms leaving your reporter the last, but in my opinion, important position of seeing that the children coloured the rockets with the marker pens provided and affixed stickers as per spec.

The demonstrations themselves ranged from can-crushing to horse driven wagons, from *Harmonographs* to *Wimshurst* machines and steam/hot air engines to lathe work and the building of rockets ….and how to decorate the rockets in the manner prescribed.

In total, around 70 to 80 children were thus provided with entertainment and knowledge designed to stimulate thought and hopefully a wish in them to learn more and to experiment further some of the things shown to them – avoiding nipped fingers and static shocks!

The highlight of the day was the launching of the rockets made and decorated under the supervision of our *'Head of Rocket Group'* (my assumed title), in the school field. After careful selection of a suitable location for the rocket launcher, this time under the supervision of *'Head of Ballistics'*, the launcher was set up and range-finding trials undertaken.

With the gauge on the air compressor now showing all was ready, the by now excited children once assembled were encouraged to aid their rockets skyward by a countdown cheer lead by our *'Master of Ceremonies'* Tony Leeming. Judging by the distance covered by the rockets he did a magnificent job.

So with the rockets launched our 'Science Day' at Alne School came to an end.

Post Script: By the end of the day your previously nervous reporter came away with happy memories of a successful day and with only one thought in mind: when will the next one be?

Colin.

Some Further News From Elvington ~ Paul Windross

It's Elvington on Tuesday 16th July ~ '*Top Speed*.'

The previous *'Top Speed'* Guy Martin was the fastest at 257 mph.

The results for that meeting are shown below. My friend Andy did his fastest yet at 214 mph.

STRAIGHTLINERS

Standing Start 1 Mile at Elvington 18 June 2019

Weather Sunny

No.	Name	Machine	Best	s1	s2	s3	s4	s5	s6
Top Speed Riders									
18	Guy Martin	Hayabusa 1300cc	257.727	257.727					
8	Guy Martin	Hayabusa 1300cc	256.491	149.533	137.529	247.013	249.715	255.973	256.491
1	Becci Ellis	Hayabusa Turbo 1300cc	253.534	253.534	245.081	215.773			
122	Jack Frost	Kawasaki ZX10R Turbo	226.724	226.724	222.589	224.392			
250	Andy Lincoln-Smith	Hayabusa Turbo 1300cc	214.728	200.034	214.728	211.416	210.917	207.334	202.387
113	Tom Swales	Kawasaki ZX10R	213.259	199.807	213.259				
91	Dennis Pettman	Hayabusa s/c 1340cc	207.420	183.056	204.988	207.420			
H2	Bob Clegg	Kawasaki H2	206.283	202.124	197.628	200.615	206.283		
258	Mick Varey	Hayabusa Turbo 1300cc	204.780	199.150	197.800	196.822	204.780	85.971	
222	Darren Stephenson	Hayabusa 1300cc	199.209	188.555	191.179	191.771	193.987	192.890	199.209
1222	Darren Stephenson	Hayabusa 1300cc	198.426	193.595	198.426	190.505			
269	Mark Weir	Hayabusa 1340cc	189.815	164.730	188.048	183.105	181.743	189.815	186.327
290	Tony Colston	Kawasaki ZX10R	187.396	179.090	182.462	182.261	187.396	185.806	182.346
271	Daniel Weir	Hayabusa 1340cc	182.946	177.285	176.653	180.160	179.243	182.946	
1269	Mark Weir	Hayabusa 1340cc	182.103	182.103					
273	Daniel weir	BMW 1000cc	182.054	163.265	170.300	173.418	177.406	182.054	
270	Mark Weir	BMW 1000cc	181.135	156.933	179.001	181.135			
246	Simon James	Hayabusa 1300c	177.672	168.855	172.502	175.392	177.672	170.284	169.717
274	William Formosa	Hayabusa 1300cc	152.051	141.492	144.928	152.051			
147	Mike Grainger	Hayabusa Turbo 1300cc	151.628	151.628					
117	Mike Grainger	Hayabusa Turbo 1300cc	136.152	136.152					
267	Chris Davies	Triumph Terrier 1955	90.117	87.124	60.005	90.117			
11	Neil Gilfillan	Mission 100 90cc	62.532	48.432	60.659	62.532			

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

NEWCOMEN
The International Society for the History of Engineering and Technology

Newcomen Society, South Yorkshire

Meetings Programme 2019 - 2020

Meetings are held at Kelham Island Museum, Alma Street, Sheffield S3 8RY, between 6.30 – 8.15pm unless otherwise indicated. Meetings are free and visitors are always welcome.

Monday 23rd September 2019, 6.30 pm

Professor Graeme Gooday: ***The Role of Women in Engineering***

Monday 28th October 2019, 6.30 pm

David Boursnell: ***Pioneers of Armour Plate. The manufacture of iron plate in the 1860s***

Monday 25th November 2019, 6.30 pm

Bob Bowden: ***It's not just about the robot!, the development of automated welding***

Monday 27th January 2020, 6.30 pm
This is a joint meeting with the South Yorkshire Industrial History Society

Julia Elton: ***Who Designed the Clifton Suspension Bridge - Fact and Fiction***

The meeting will be followed by the Branch Annual General Meeting

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Monday 24th February 2020, 6:30pm

Professor Julian Allwood: ***Forging Identity: how people and metal shape each other***

This is a joint meeting with the Institution of Mechanical Engineers

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Ken Barraclough Memorial Lecture, Holiday Inn Royal Victoria, Sheffield

Date and speaker to be confirmed

This is a joint meeting with the Sheffield Metallurgical and Engineering Association and the South Yorkshire Industrial History Society. This talk is open to all and there is on site car parking providing you register your car at reception.

Monday 27th April 2019

Jonathan Aylen: ***Presidential Lecture***

Travel to Kelham Island
For directions to Kelham Island Museum please visit:- http://www.simt.co.uk/find-us
For further information please contact John Suter on:- meetings.syorks@newcomen.com

Newcomen Society Sponsors Major Bramah Exhibition and Conference at The Hawley Collection - Kelham Island Museum

As part of the **Newcomen Society's Centenary Celebrations** the society is sponsoring a major exhibition at **The Hawley Collection** - Kelham Island Museum**, Locks, Water Power and Precision** - **A Celebration of Joseph Bramah 1749-1814.**

Born in Stainborough on the 13th April 1749, **Joseph Bramah** moved to London where in 1778 he took out his first patent for an improved water closet. More important patents were to follow including locks, fire engines and hydraulic presses. The exhibition brings together important artefacts that illustrate his work including the Wentworth Castle Fire Engine and a small hydraulic press from the Royal Institution, that was used by Michael Faraday in his investigations of benzene. This is complemented by a display of modern locks manufactured by the Bramah Company. In part, Bramah owed his success to his assistant **Henry Maudslay** (1771-1831), who is rightly seen as the father of precision engineering, and the differing contributions made by these two gifted engineers are outlined in the exhibition. We hope that you are able to visit this important exhibition which will be on from the Summer of 2019 until the Spring of 2020.

Bramah Conference - 5th November 2019 - Precision: Bramah and Maudslay to Advanced Manufacture -

We would also be pleased if you were able to join us at **Kelham Island Museum** on the **5th November 2019** for an important one day conference on the lives and work of Joseph Bramah and Henry Maudslay and the central role they played in the development of precision engineering. The important work undertaken by Bramah and Maudslay has received little attention from historians in the recent past. The last biographical work, Henry Maudslay & the Pioneers of the Machine Age, was published in 2002 and is now out of print. The full conference proceedings are given on the attached notice. This conference is open to both Newcomen Society Members and Visitors and tickets can be booked through Eventbrite using the following link
- https://www.eventbrite.co.uk/e/precision-bramah-and-maudslay-to-advanced-manufacture-tickets-59949878701

Meeting Programme 2019-20

Enclosed is the meeting programme for 2019-20. Our first talk is on Monday the 23rd September when Graeme Gooday, who is the Professor of History of Science and Technology at Leeds University, will speak on **The Role of Women in Engineering.** The full programme of talks for the coming year is attached.

As in previous years, meetings will be held at Kelham Island Industrial Museum starting at 6:30 pm. Tea and coffee will be available from 6:00 pm and we look forward to welcoming you to what we hope will be an interesting series of talks and discussions.

Meetings are free and open to all and there is no need to book seats in advance, however, if you are attending as a group and wish to sit together please let me know and I will reserve a block of seats for you.

I look forward to seeing you at the above events but if you have any queries please drop me a note

John Suter Meeting Secretary, Newcomen Society South Yorkshire.

meetings.syorks@newcomen.com

A Symposium

Precision: Bramah and Maudslay to Advanced Manufacture

Tuesday 5th November 2019 10:00 – 4:00

Kelham Island Industrial Museum

Ticket £25 including buffet lunch and coffee. Tickets must be pre-booked

Entry to the Bramah Exhibition is included in the price

Programme

10:00	Registration and Coffee	
10:30	Introduction	Keith Crawshaw
10:45	Joseph Bramah	Jeremy Bramah
11:45	Henry Maudslay	Richard Maudsley
12:45	Buffet Lunch and Conducted Tour of Bramah Exhibition	
13:45	A History of Interchangeable Manufacture and Precision Engineering	David Eaton
14:45	Coffee Break	
15:00	Modern High Value Added Manufacture	AESSEAL
16:00	Closing Remarks	Jonathan Aylen

Further Information www.newcomen.com
Email: meetings meetings.syorks@newcomen.com
Tickets
https://www.eventbrite.co.uk/e/precision-bramah-and-maudslay-to-advanced-manufacture-tickets-59949878701
Booking Close 14th October 2019

The Symposium is organised by the South Yorkshire Branch of the Newcomen Society, in association with Kelham Island Industrial Museum and The Ken Hawley Collection Trust