NEWSLETTER March 2026

Hello Everyone. First of all, notwithstanding current world events, our PEEMS world seems to have started off with good attendances at our meetings and new members signing up. We had an excellent Spring '*Bring and Brag'* event this month, with a wide range of projects on display, all written up in this issue.

We are putting together a programme of events for the year, including visits, speakers and Summer and Autumn '*Bring and Brags'*. The programme up to the end of June, can be seen below. This also includes our Annual PEEMS lunch at the Kirkbymoorside Golf Club, which have given us good service over the last few years. Menus will be sent to members shortly, to select meal choices for themselves and their guests.

Our thanks to Mike for producing an eye catching PEEMS banner for outside the Hungate Centre, and to Paul and Doug for taking time out to put it up. We now have a presence, if not on the high street, but on a major thoroughfare.

At our next meeting, one of our new members John Schofield, will be giving a talk on 'The Trams of San Francisco', and in July another long-term member Paul Hayward, has been scheduled to speak about the historic Rosedale Hill climb. This gives me the opportunity to ask members if they would like to discuss an area of interest relating to any aspect of engineering, modelling or transport, at one of our monthly meetings. If you would like to do this, please see Colin our Vice-Chairman, who is currently standing in for Jonathan.

In addition, the Newsletter is open to articles or essays by members on anything that would be of interest to our readership. The only articles we have received over the last couple of years have been Colin's excellent Hi-Fi series, so please, if you are willing, we would welcome anything that would "inform, educate and entertain".

Nevile

□ **Forthcoming Events.**

- **Wednesday April 1st** ***The Trams Of San Francisco*. A Talk by John Schofield.**
- **Tuesday April 21st** **Workshop Morning.**
- **Wednesday May 6th** ***Aircraft Development*. A Talk by Ivan Shaw.**
- **Friday May 15th** **PEEMS Annual Club Dinner at Kirkbymoorside Golf Club.**
- **Tuesday May 19th** **Workshop Morning.**
- **Wednesday June 3rd** **Summer *Bring and Brag.***
- **Tuesday June 16th** **Workshop Morning.**

Club Evening Wednesday 4th March ~ Spring '*Bring and Brag'.*

Colin welcomed everyone to the meeting. There was a good turnout, with a number of guests.

Colin thanked everyone who had brought a great selection of projects for examination and discussion.

Before the show began, there were a few notices:

- **Jonathan:** The good news is that Jonathan is back home, and is convalescing.
- **Annual Dinner:** PEEMS tries to have an annual dinner for members. This is usually a weekday and lunchtime occasion. For the past few years, we have been to Kirkbymoorside Golf Club, which has been favourably reviewed by those who attended with their wives and partners.

  The suggestion has been made that we book there again this year, with the intention of it being held sometime in May. In the past, a menu has been sent to us, which is then distributed amongst the membership.

  In the next few weeks, members will receive a copy of the menu, along with a form to be filled in indicating both member and guest menu choices. This form will then be sent back to the PEEMS committee for ordering.
- **New Members Welcomed.** Paul Gatenby and Chris Cooper were welcomed as new members.
- **PEEMS Banner:** The new PEEMS banner (see February Newsletter) advertising our presence at the Hungate Centre, our website and meeting times, has now been installed outside the building (with CaVCA's permission.)

Photo Courtesy Of Chris Cooper

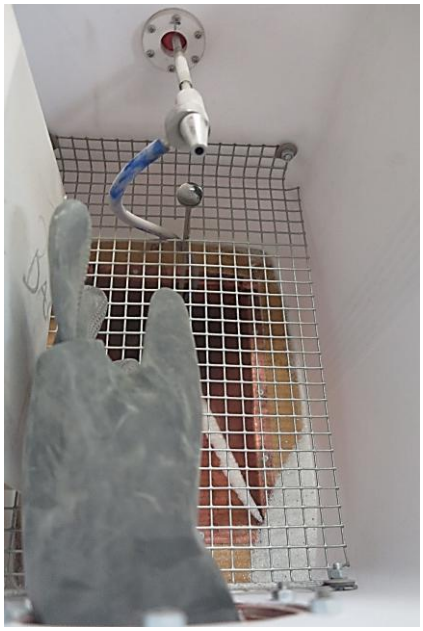
- **Spring Bring and Brag.**

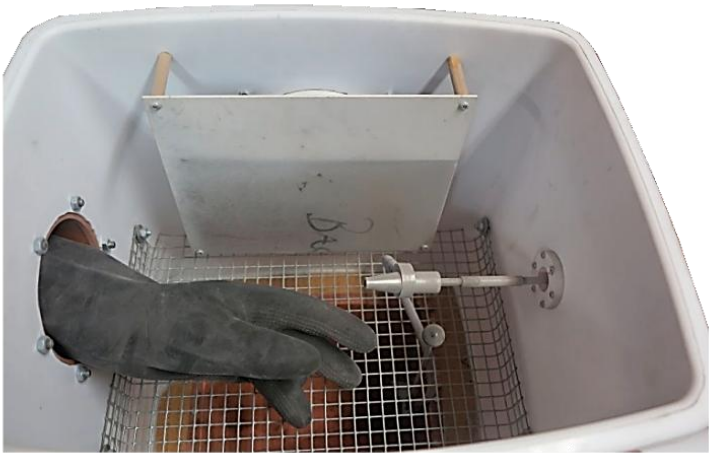
  - **Tony Leeming ~ A Homemade Glass Blasting Cabinet.**

Tony said that he didn't have a sand blasting cabinet, and when he got to the stage where he had a locomotive to paint, he decided to build one himself, using glass beads instead of sand as the abrasive material. He also wanted to clean up the brass work and any paint mishaps.

It's just a modified plastic waste bin with a removable top. He got the idea from *The Model Engineer's Workshop* magazine, and at the moment, it's very much a work in progress. Tony likes it because he doesn't have the space for a big cabinet. It sits on a table and is just at the right height for operations.

There is a hand glove for holding the component on one side of the cabinet, and an air-gun at the other through which the glass beads are projected. On the inside is a mesh to retain any scrap material, and a copper bottom which acts as the glass bead retainer. Tony used copper only because he didn't have any thin aluminium or steel sheet.





The suction system works remarkably well. The glass beads are sucked up from the bottom of the cabinet into the gun, via a tube, and then projected onto the target by the strong horizontal jet of air through the gun. Tony was initially dubious that there would be sufficient suction to lift the beads from the bottom. The 'gun' is just an ordinary workshop air-gun with the nozzle taken off. The 'gun' is also able to swivel.

Q: How do you get the glass beads into the airflow?

Tony: A tube comes up from the bottom of the container to the gun, and there's air moving across the top of the tube, and that creates a suction to bring the glass beads from the bottom.

Comment: That is called the *'Venturi Effect'* (or principle), and is commonly used in siphon-feed (or suction) sandblasting guns. As air is forced through a narrowly constricted nozzle, its speed will increase substantially. According to *Bernoulli's Principle*, this increase in velocity results in a decrease in static pressure. This low pressure (vacuum) created at the constriction, acts as a suction source.

Q: What's the outlet at the back for?

Tony: The air comes into the cabinet, but needs to get out too, and it does it through there. There's a filter in the outlet. The plastic grill comes out and you can replace the filter.

- **Paul Hayward: A Model Of An Imaginary Port Lewaigue** (Pron. 'Laig') **Railway Station On The Isle-Of-Man.**

Like Paul Gammon, Paul is interested in the Isle Of Man railway. Paul's wife comes from the I.o.M. and they go over there quite a lot. When he goes there, he usually takes a trip on the railway.

He thought he would take the plunge and buy a model locomotive from *Accucraft* and some other 'bits and pieces'. He wasn't intending to build a railway line, but eventually decided to build a garden railway in his back garden 'inspired' by his two grandchildren. The grandchildren (8 and 6) have been fascinated by the project.

The locomotive has an electric motor, and is battery operated with a hand controller, so it is simple, but there is no "live steam". On the other hand, it is easy to run and the grandchildren love it, but they told Paul that it needs a station, so he has made one.

He's used some kits and some 'bits and pieces' from a garden railway show. Paul has enjoyed making this station. To make it more realistic, he's based it on an imaginary station at Port Lewaigue.

Port Lewaigue is a little cove a mile and a half outside Ramsay on the North East coast of the I.o.M. You can walk there from Ramsay, along the beach when the tide is out. In 1898, there was a scheme to develop a hotel on the little headland. They did build quite a big promenade around the side of the headland, but they never built the hotel. So, if the hotel had been built, this is Paul's imagined station to service it.

Paul has tried to make the station as I.o.M representative as he can, so the bushes depict the extensive Fuchsia and Gorse hedges on the island. Paul used dobs of red and yellow paint to give that effect.

The grandchildren decided they would make some fruit which is seen in the baskets, to be delivered to the hotel. The fruit is a little 'out of scale'. Paul has found the project to be very therapeutic.

Paul is waiting to get some figures for the platform, a couple of passengers and a porter, who will stand by the milk churns. He's a bit nervous because they are 3D printed and he will have to paint them. You can buy pre-painted figures, but Paul is not very impressed with the ones on offer. Currently, there is a twelve-week waiting period for these figures.

Paul thanked Paul Gammon for creating the I.o.M themed sign boards depicting Velocette motor bikes and Esso and BP signs.

Paul made the cattle wagon from an *IP Engi*neering kit. It's quite a basic kit, but Paul has added some more details such as the plate that the couplings hit, and rivet details. The wagon roof is removable so the grandchildren can put a cow in it. Ryedale Model Engineers at Gilling, have a cattle wagon with a sound card that "moos". Paul has tried to source this chip but has failed.

- **Paul Gammon ~ Some Very Old Tools Found During A 'Clear-Out'.**

Paul had been digging out stuff from his three-draw cabinet, which had been filling up, when he found these threading dies. He doesn't know how old they are. This one is for threading thin brass tubes, such as light fittings. You can take a very fine cut with it.

With this tool, the die can be opened up. If you tried to thread a thin brass tube with an ordinary die, there is a tendency for it to "scrunch up".

The die cuts 26 threads to the inch, which is a standard brass thread.

The Marples Tool (A) can cut 3/16" to 5/16" Whitworth threads.

Q: Have you actually used those tools, because they look quite difficult to start.

Paul: No, I haven't. The Marples tool (A) has a *Hibernian* marking on it (referring to the Hibernian works) and that is a high carbon steel. I have a lino knife with that marking on it too.

At first, Paul couldn't make out what this was. Then he discovered it's for measuring tapers.

It has an adjustment on it.

It's a *Monodex* tool. *Monodex* are better known for making cutters, but they make precision tools as well, a fact Paul wasn't aware of.

You place this tool on a taper, and then take precise measurements across the rollers.

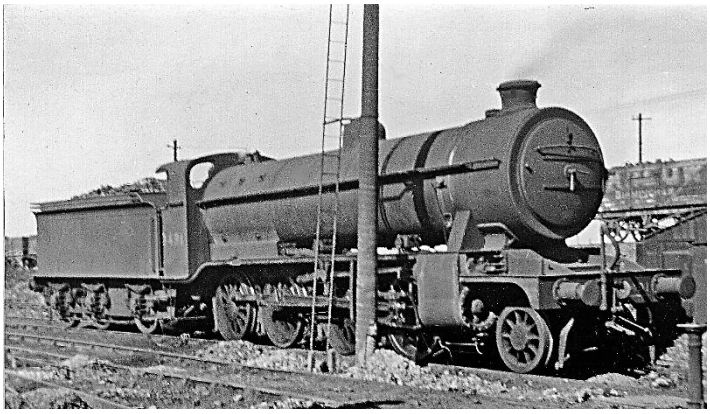
- **William Burrell. Continuing Progress With The 5” Gauge GNR Class O1** 2-8-0 Model Locomotive Designed By Sir Nigel Gresley.**

Introduction.

William has spoken about this model before in March 2023 and in October 2024 at the *Mike Sayers Trophy* evening.

In 1980, William decided to build a steam locomotive. He wrote off to *Model Engineer Magazine* (from Japan) saying he would like plans to build a 5” gauge locomotive, something like a “Sir Nigel Gresley*”* Class A4.

They wrote back to say they had plans for a “Nigel Gresley”. He got the plans, but they weren’t for an A4 4-6-2, they were for a GNR Class O1 2-8-0 freight loco and the model was designed by the original Martin Evans at *Model Engineer* magazine, based on the full-size version designed by Nigel Gresley.

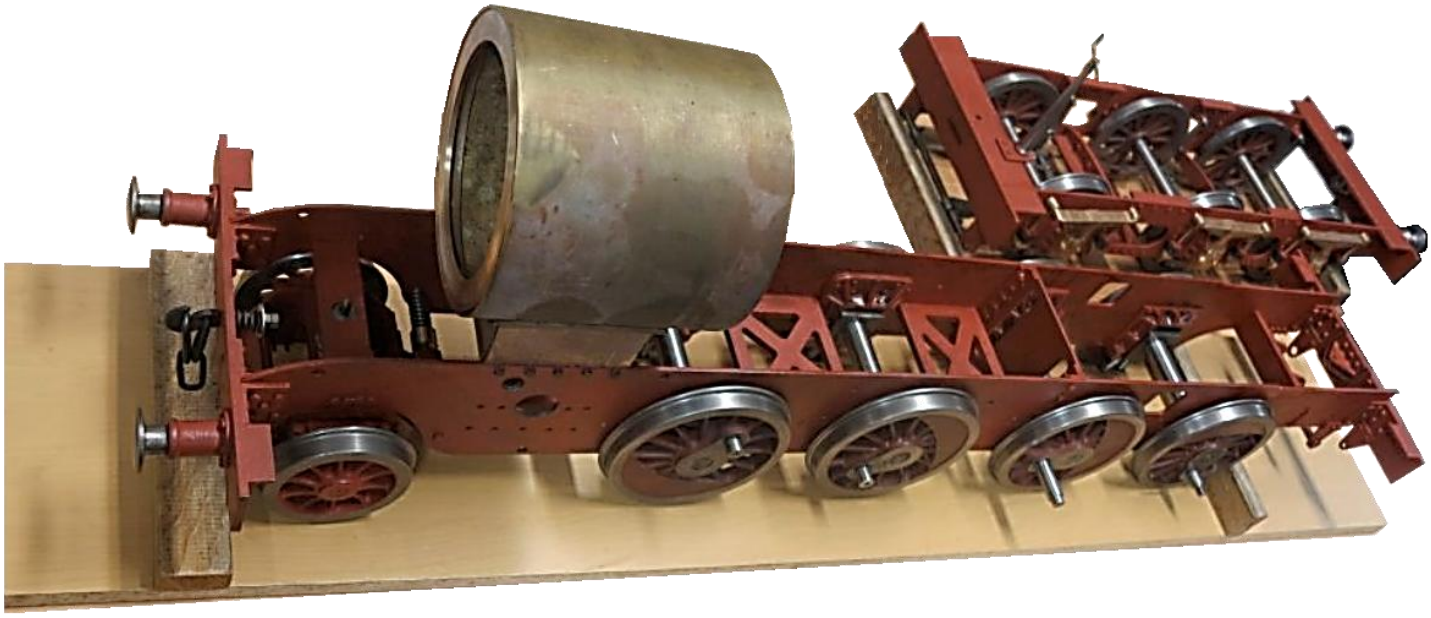


This is a Great Northern Railway (GNR) Class O1 2-8-0, a two-cylinder locomotive. When Nigel Gresley was Chief Engineer of the GNR, a freight locomotive was required. So, he designed and built the 01 for service between 1913 and 1919.

Gresley designed the O1 2-8-0 for the heavy coal trains on the mainline from Grantham to London.

Five examples were ordered in 1913, which were completed at Doncaster in 1914. A further fifteen were ordered in January 1916. They were later designated O3.

**** Please Note:** Previously this model has been described as an O2 Class, which was a later three-cylinder loco designed by Nigel Gresley, so thanks to William for correcting this.



William started the model in the 1980s, but work, family etc. got in the way. After Covid he got coerced into joining *Scarborough Mates* and discovered they had a workshop, so he could restart his loco project. He met Ted Fletcher and Brian Stephenson there and has now joined PEEMS.

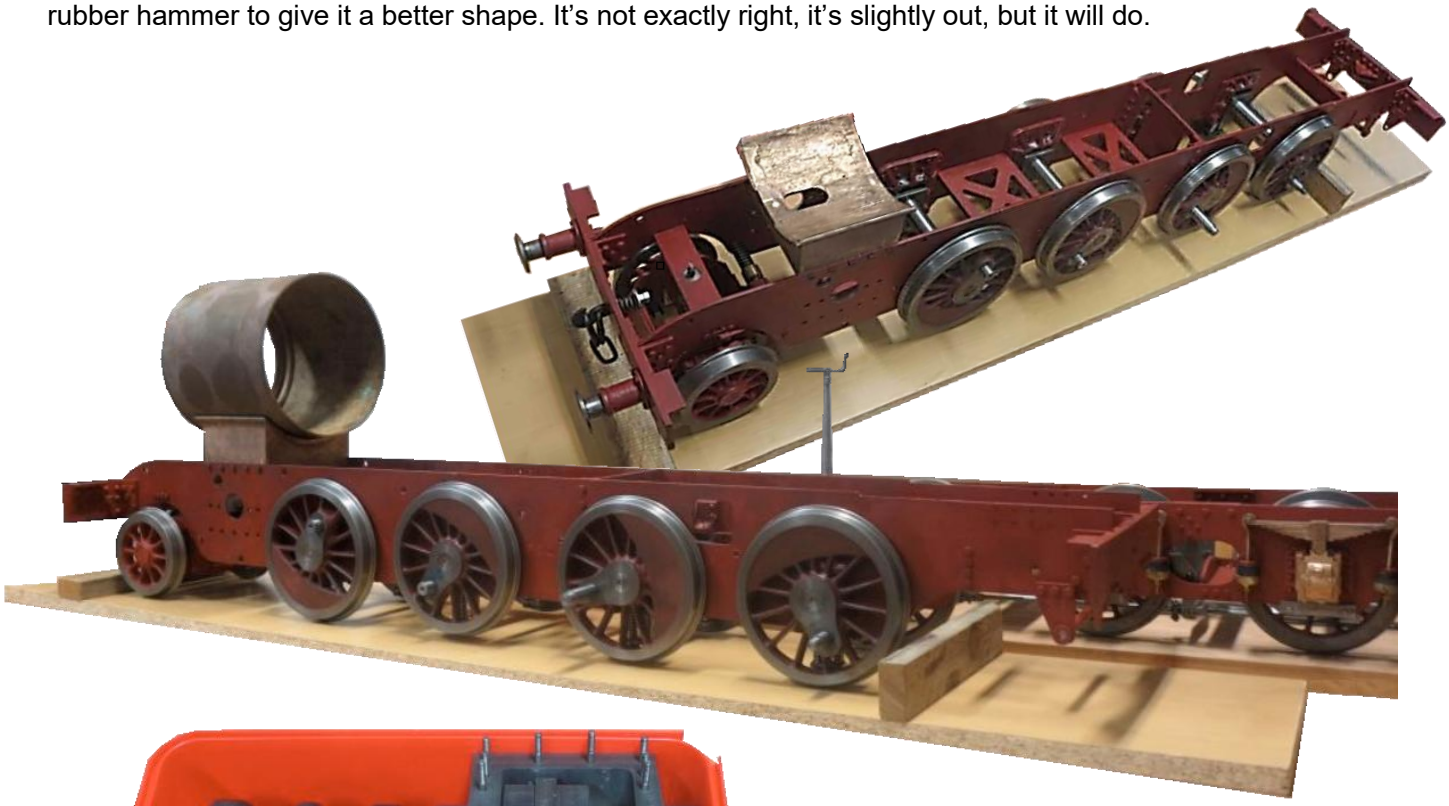
William has now been able to properly get on with the project, because he’s never had a substantial lathe or milling machine before. He has a small hobby lathe, but that was just not ‘beefy enough.

William remembers George Gibbs giving a talk and saying, don’t build a boiler, have it built professionally. So, he has now had a boiler professionally built and it’s TIG welded. William recently spoke to a PEEMS member who said that he had built five boilers, and they all had leaked, so he feels vindicated in buying a boiler.

William purchased his castings from *Blackgates,* and he has made some components himself, for example the buffer stops, which have been machined from the solid.

The smoke box ring has come from a failed sea water pipe on one of the ships William has worked on. The pipe was made from *Yorcalbro* (aluminium brass ~ see following) and he thought it would be good for the smoke box. The shipping company allowed him to have it for free.

So, William chopped up the pipe. He was just machining it in the lathe when it 'jumped' at the last minute, and a 'dint' was put in it. The ring was too big for William's Myford ML10 lathe, so Brian Stephenson machined it for him. There was also a big 'dint' on the other side where the boiler fits in. Fortunately, this is such a solid piece of casting, and with Brian's machining work cleaning up the majority of the surface, William was able to peen it back with a rubber hammer to give it a better shape. It's not exactly right, it's slightly out, but it will do.



William showed us the two cylinders, and they contain the slide valves. These are very much a work in progress.

As mentioned earlier the O1 Class is a two-cylinder locomotive. Later on, GNR built a three-cylinder locomotive, the O2 Class.

Q: Did you machine the cylinders on the ML10 lathe?

William: I've yet to bore out the cylinders. I've done nearly all my machining on the milling machine, but I will try and bore out the cylinders on the ML10 lathe. If I can't use that, then I may require Brian's help again.

This is the advantage of being a PEEMS member. The tender wheels are castings, sometimes cast iron. It's so hard. On one casting I couldn't break through it, so I took it to Brian's and there were lumps of material coming off. Talk about not normalising the castings after manufacturing them. Fortunately, it was just the one, most of the castings were OK.

Q: Have you thought about machining your castings in a milling machine?

William: I might do that. I have a boring bar for the lathe.

Q: Could you explain a bit more about the material for the smoke box?

William: It's *Yorcalbro*. [Ed. *Yorcalbro* is a high-performance aluminium brass CuZn20Al2, renowned for its superior corrosion resistance (more of that later), particularly in sea-water. It is used for condenser tubes, heat exchangers and marine piping. It was popular in the 1970s and 1980s for ships. It is trade-marked by *IMI Yorkshire Alloys Ltd*.]

It cost me nothing, and the firm didn't want it. It was used on the ship I was working on, where there was a centralised cooling system. The sea water came into the freshwater coolers, where optimal temperatures for engines, generators, and machinery were maintained by transferring heat from a closed-loop fresh water system to the surrounding seawater.

When I was at sea, sea water was going all over the place for cooling, that was one of the main mediums in fact; the *Doxford* marine engines had water cooled crossheads.

Q: So that pipe is completely saltwater corrosion proof?

William: It should be, but it wasn't in practice, so that's why they stopped using it.

Comment: It's very corrosion resistant if the sea water isn't moving; once the water is moving through the tube, the seawater erodes the pipe on the bends.

William: Yes, and estuarial water is picking up sand and that also erodes the pipes. I don't know if they are still using *Yorcalbro* anymore.

- **Chris Cooper ~ A Universal Pillar Tool Refurbishment.**

Chris said that those who knew him from the early days of PEEMS knew that he started out as a plastic modeller with *Airfix* etc.

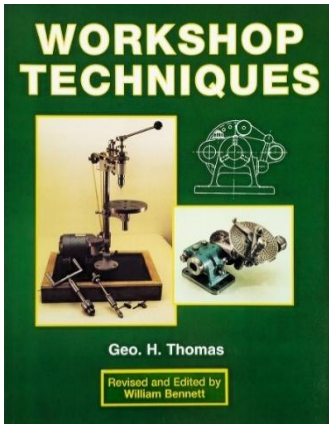
He still does that.

A model making colleague asked if Chris would like this little stand and charged him a tenner for it. It was a bit rusty, and jammed up, and it was put in the workshop and not looked at for a year and a half.

Chris eventually took all the components and put them in an anti-rust bath and then tidied everything up. It ended up as displayed at the meeting.

Chris didn't know, until quite recently, that it is a Universal Pillar Tool.

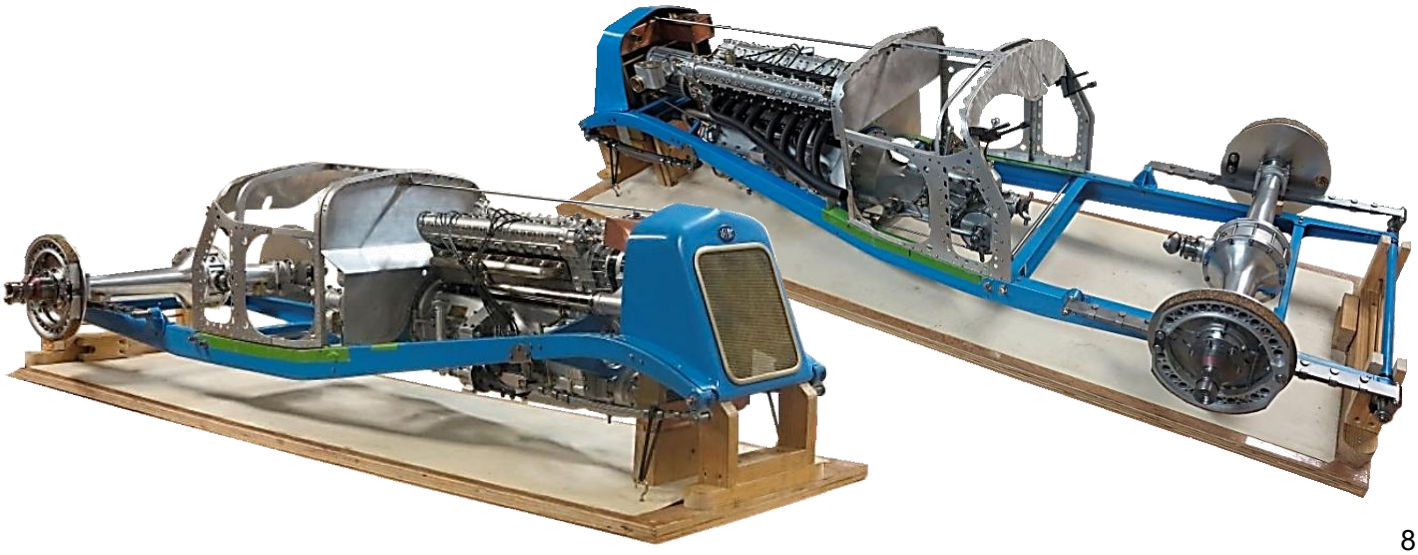
It can perform various tasks. The next plan is to make a bushing tool, and a staking tool for a clock repair, which is Chris's next project.



Q: Have you read George Thomas' book on the Universal Pillar Drill? It's an excellent source of information.

Chris: I bought it fairly recently when I discovered what this tool was.

- **Mike Sayers ~ Continuing Progress On The Delage Model.**



Mike said that we had seen the model many times before, so all he had to do was explain the work that's been done since the last presentation.

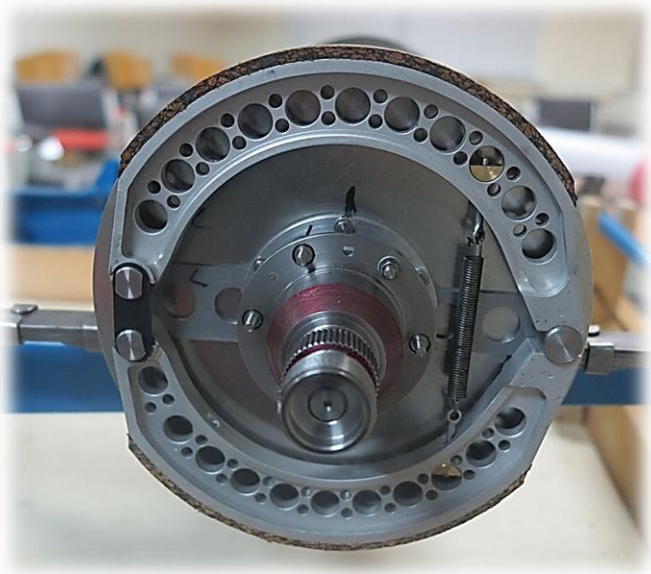
Mike has completed the body frame, and what you see is as far as it will go. The top and bottom tanks of the radiator are now installed, and the *Delage* badge is now fitted on the front. The radiator core is in progress.

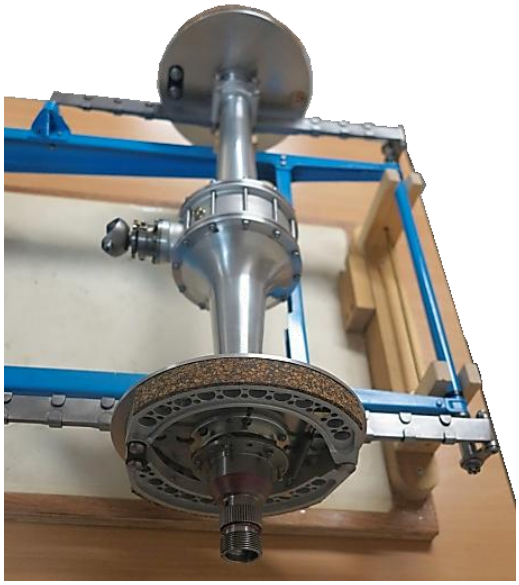
The rear axle is also complete, and all the gears are in. The brakes are now operating and are just waiting for the brake drums.

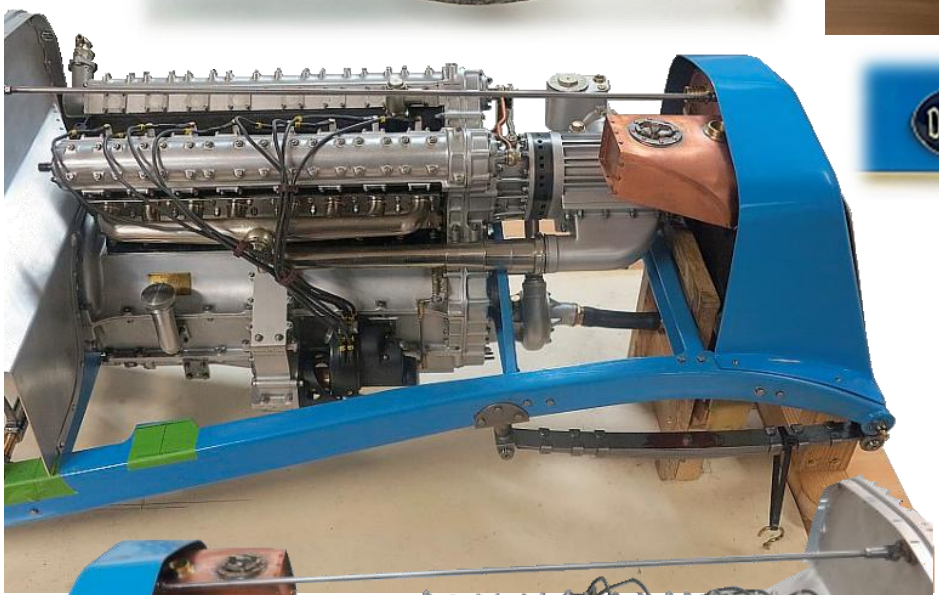
The next component Mike will be working on is the front axle, which consists of three parts bolted together.

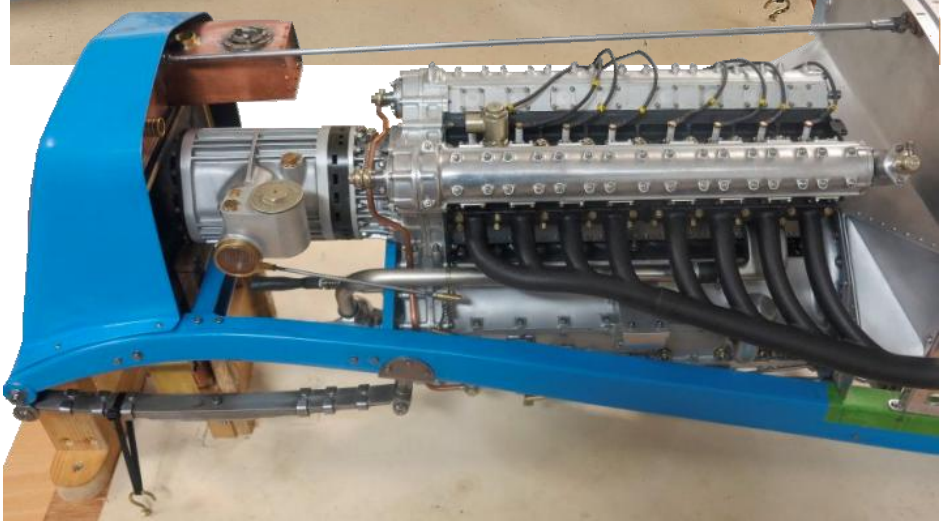
He hopes to get the front axle on in the middle of the year, because there's a big centenary celebration around September for the beginning of Grand Prix racing in the UK. [Ed. In August 1926 the first British Grand Prix was held at Brooklands].

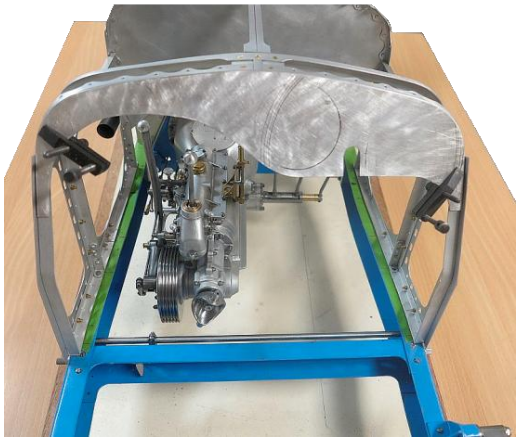
Mike is still figuring out how to make the wheels, hubs, rims, spokes and tyres. That is a parallel project which is quite challenging at the moment.











Questions and Answers.

Q: Have you made a prop-shaft ?

Mike: No, I haven't, not yet. The universal joint at the back of the gearbox is there. The joint on the rear axle differential started out as the other part of the universal joint.

After I made the rear axle, which was quite difficult to make, I decided to leave the prop-shaft until later, as I wanted to concentrate on the other important components. The prop-shaft will be quite a challenge, but I will get there. The other important components to make are:

- The steering wheel and steering box.
- The front axle and the hubs for both axles.
- The prop shaft.
- The working brakes, and wheels.

And that should be it.

Q: What did you make the brake linings out of?

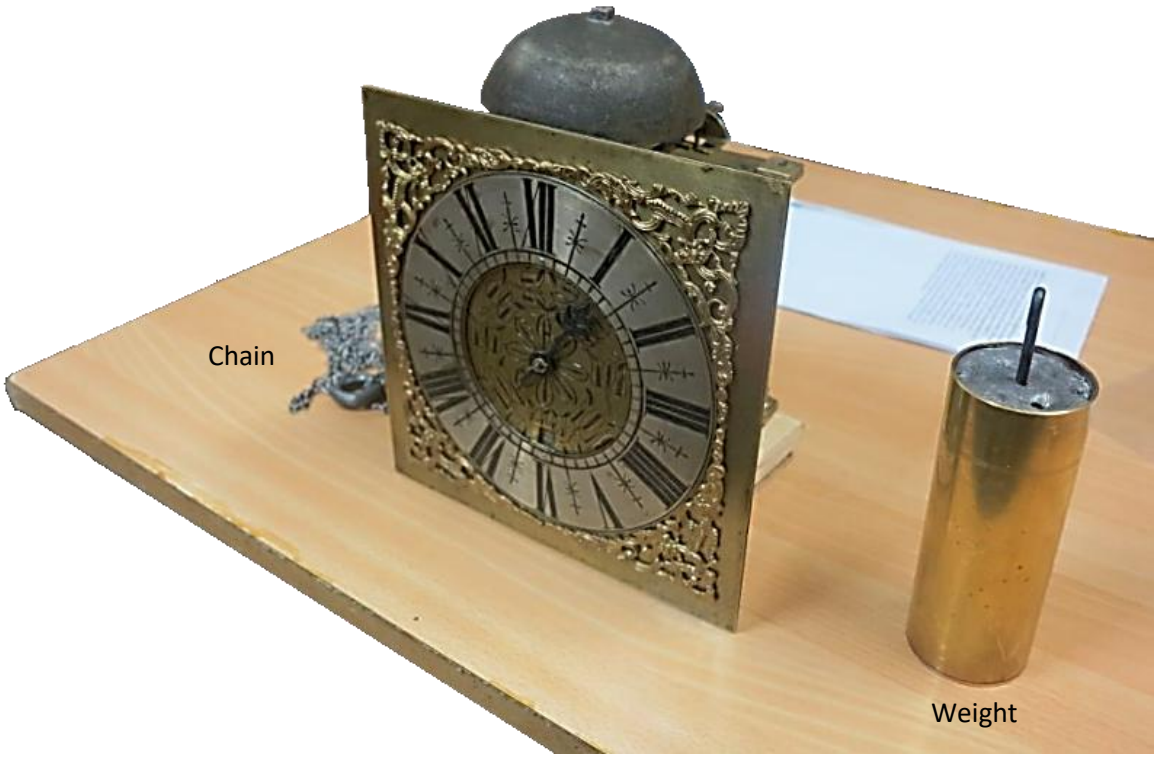
Mike: It's not really brake lining, it's actually vulcanised rubber and cork, a gasket material**.** I wanted a soft lining that would grip the brake drums when they're on, but not score them**.** This is just so you can prove the brakes work without putting undue force on the mechanism. This should grip quite well. You can get the gasket material in various thicknesses. This is 3mm thick. The linkages themselves are scaled so are not capable of supplying a large force.

We then took a break for tea/coffee, biscuits and a chat.

- **Mel Doran ~ A Lantern Clock Restoration.**

- **Introduction.**

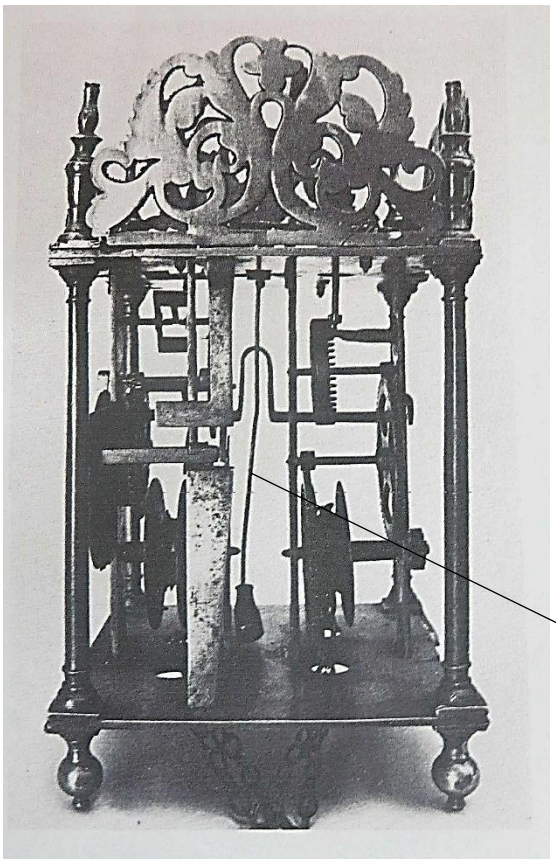
Mel started by saying that he found this clock in bits at a boot sale, ten to fifteen years ago. It was in a corroded state; the steel was pitted and rusting, and all the brass was covered in verdigris. However, he saw the potential in it, but he didn't know it was going to take nearly a year to get it right. It had stayed under his work bench until recently.



Mel had Doug Pickering helping him, and it was decided that Mel would do the work on it, and get it as good as possible. Doug would help, learning how do the necessary procedures during the restoration. Doug was an enormous help with the cleaning and polishing, and doing some of the smaller jobs. Between them, there is now a clock that works, keeps time and strikes the hour. The clock has gone through various stages during its history and it now has a square dial face on it.

- **A Brief History Of Lantern Clocks.**

- Verge Escapements.



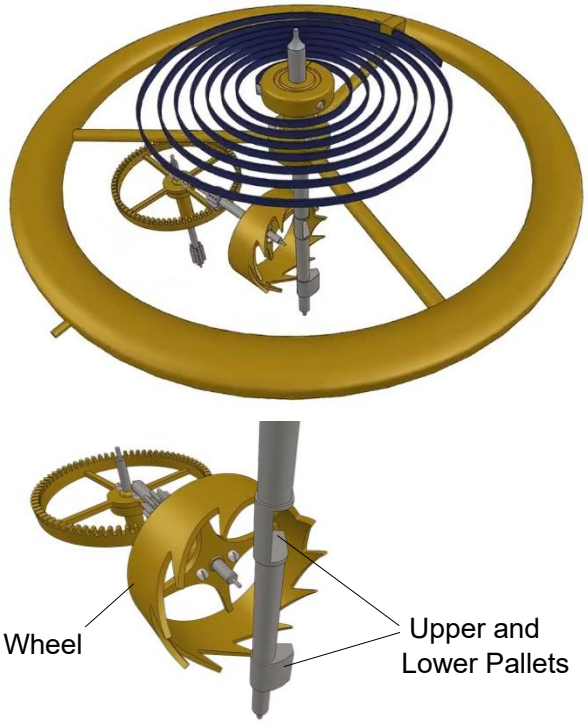
This is a photo of a typical lantern clock, similar to Mel's.

Lantern clocks were the only clocks around in the 1600s. These clocks were produced for about 200 years.

A lantern clock is a weight driven clock and, as can be seen on Mel's example, with a single hand. The reason for this is because people only wanted to know the hour, and that was near enough. The dial on Mel's clock displays the quarters of an hour, and that was the accuracy of the clocks at the time.

The clock originally had a verge escapement, which worked on two pallets at 90° to each other, being pushed by a 'crown' wheel, as shown below, which was operating under the weight.

At the time, the verge driven clocks were very poor time keepers, and in order to improve them, a simple balance spring was fitted to the verge to control the movement. The mass of the balance wheel has the spring acting against it to try and give it a regular movement. The way they were regulated was: if the clock was running a bit fast, more weight would be put on, and if it was running slow, some weight would be taken off.



https://www.youtube.com/watch?v=BoeP0adbDKg

(*Courtesy of Croix Rousse Watchmaker*)

- **Anchor Escapements and Pendulums.**

The system continued until around 1670-80. In 1656, Christiaan Huggens a Dutch clockmaker was experimenting with a pendulum to regulate a clock's time keeping. Eventually, when this system became more widely known, clocks started to change. The verge and crown wheel assemblies were removed, and a short pendulum was installed. These were usually around 5" to 6" long, and swung through a 90° to 120° arc very quickly. If you look at the photo of the lantern clock on the previous page, you will see a small pendulum in the middle.

Q: What did they calibrate clocks against in those days, a church clock?

Mel: A sundial. Sundials are very accurate if they are made correctly, and the sun is out.

Q: How did they calibrate the sundial?

Mel: The starting point was noon when the sun was directly overhead, and they could set up from there.

The short pendulum fitted within the plates of the movement. That went on for a few years until Robert Hooke invented the anchor escapement which, in conjunction with a long pendulum, made a big difference to time keeping. It was a major innovation, and it was one that was incorporated in longcase clocks, in fact in a lot of clocks. The anchor escapement and pendulum would be the method of time keeping up to the present day.

https://redfernanimation.com/the-anchor-escapement/

For animation press on link, to return to newsletter press back arrow at the top left of the screen.

Other escapements were invented to improve time keeping, but the anchor escapement would keep the longcase clocks accurate to one or two minutes a week which was far better than they had been before.

- **Mel's Clock.**

Mel started looking at what was on the clock and what wasn't. There was no pendulum, and the crutch at the back was missing. There was a tag about 10mm long, coming off the collet arbor, that Mel used for silver soldering a crutch (from a longcase clock) in place.

There was no bell stand, no bell, no chain, no pulley, no weights and the corner spandrels on the front face were missing.

The chapter ring (chapters = numerals) was intact, but there was no hand.

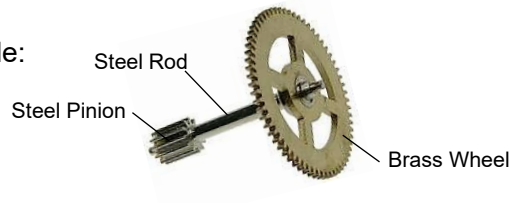
The clock has one chain (with an endless loop) laid over the "going" sprocket, and also over the "strike" sprocket, with one pulley and a weight hanging between, which powers both trains. It can run for 30 hours.

All the brass was oxidised, and the steelwork heavily rusted.

- The procedure to restore the clock was as follows:

The clock plates and mobiles** were immersed in an ultrasonic tank to remove grease and loose material, and to attack the corrosion. The brass plates were cleaned up to brightness, and the steel parts were brightened with emery cloth and wire wool. They were further treated with rust preventer. All brass wheels and steel pinions were checked over to see what condition they were in. Notes were made to what remedial work was needed.

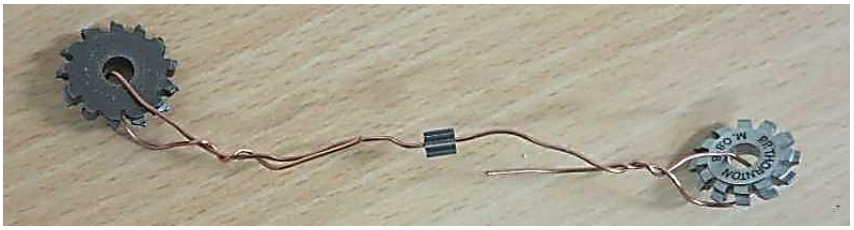
** A typical mobile:



Mel's clock has two chains, a "going" chain and a "strike" chain. On inspecting the mobiles, Mel found that the brass wheels, though worn, were serviceable. However, three of the pinions were deeply rutted and needed to be replaced. When checking the correct module cutter, Mel found it was "too long in the tooth" to cut the pinions.

Doug came to the rescue with a box of homemade cutters that he had picked up from somewhere, and one of them, when sharpened was used to make the three new pinions.

Here is the P.P Thornton's horological module cutter at the righthand side, another cutter at the lefthand side, and a new loose pinion in the middle.

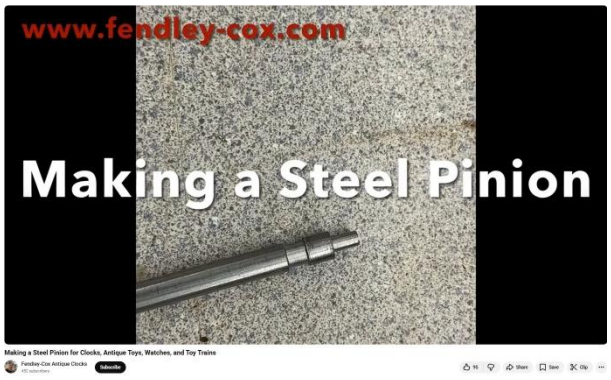


As the three of the pinions were unusable, Mel took the mobile, and carefully hand ground the leaves off the pinions so he was left with a bit of "a lump" on the shaft, but this was something that could be turned on the lathe. Mel put the mobile shaft on the lathe with supports and carefully turned the shaft back to "roundness" where the leaves had been.

He then made a 6-leaf pinion and drilled it through the centre with a number drill, so the new pinion could slide onto the mobile shaft with a close fit, at the position of the old pinion. The new pinion was fixed to the shaft with *JB-Weld* which provides a very strong attachment. After it was left for 24 hours, the mobile was usable again. He did this for each of the three unusable pinions. Those were the major repairs.

The pivots were resurfaced and polished.

There is a YouTube video here which almost follows the procedure Mel used to replace the pinions, and helps to visualise the procedure:



https://www.youtube.com/watch?v=7lNw8TB8HVc

For the video, press on link, to return to newsletter press back arrow at the top left of the screen.

Mel and Doug then reassembled the clock, and looked at where new bushes were required, where pivot holes were worn. There were quite a few of those, so they opened up the pivot holes and pressed in a suitable bush. The bushes were then broached out to suit the pivots, so they were in good running order at the end of the operation.

Mel was interested in what was happening inside the clock once it was reassembled, especially the mobiles and the great wheels. There are 92 teeth meshing into 6-leaf pinions, which is as small as you can go for this to work. You really need 8 leaves to get a good transmission of power. A clock acts in the opposite way to what we normally find in engineering. In engineering, you normally find a pinion spinning very fast around a brass wheel, in a clock you find a brass wheel driving a pinion, so in clock making, it has to be more accurate for any power transmission.

In Mel's clock there is a 92 teeth wheel driving into a 6-leaf pinion, which then turns a third wheel which has 72 teeth, which in turn drives a 6-leaf pinion with a scape-wheel on it. A scape wheel has 40 teeth, so it needs 61 swings per minute.

It takes two swings of the pendulum to release a tooth. Most longcase clocks have a 30-tooth wheel and it swings the pendulum through a pallet once a second. That is a "one-second" pendulum. In Mel's clock there is a "one-second" pendulum, but it works on 80 swings to get the escape wheel to go the whole way around. It's all to do with the gearing.

Originally, it was never intended for this clock to have a "one second" pendulum, it was intended to work with a balance wheel (see page 11). It was then modified to have a 6" short pendulum, which had a big swing driven by a verge escapement, and then it was modified to have an anchor escapement.

When you examine the clock, it has dozens of holes all over the brass plates, because it has been repeatedly modified. In essence, it is still an 18th century clock. Clocks like this were called *"sheep's head clocks"* (a lantern clock that has an extremely large chapter ring covering most of the entire frontage), and eventually it ended up as a longcase clock. As it evolved, it had to be lifted up about 6 feet on a wall bracket to allow the chains and long pendulum to perform correctly.

In the background is the wooden wall bracket that Mel has made to support the clock.

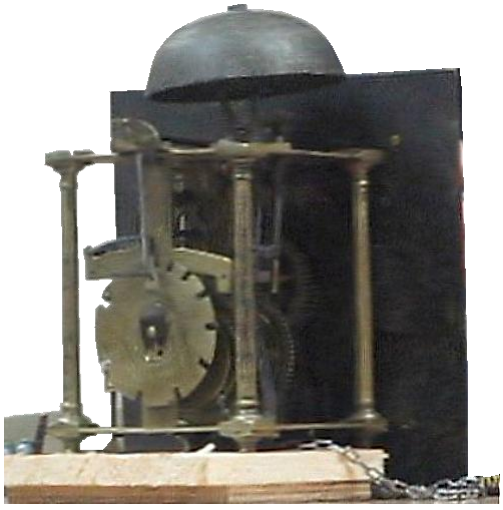
When a pendulum is knocked, the clock stops, and the chains can be interfered with accidently, so someone had the bright idea of putting a wooden casing around it resulting in the longcase clock.

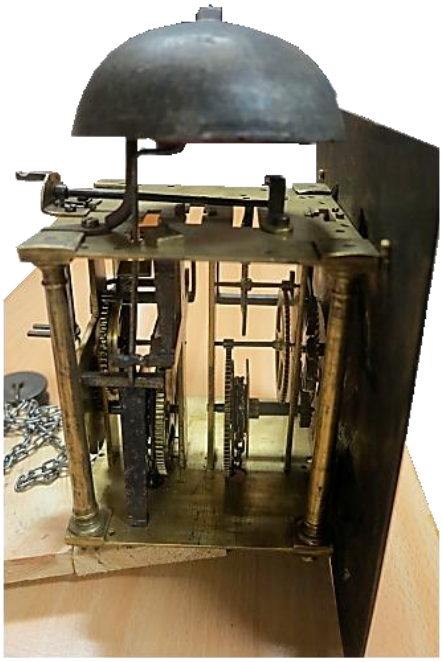
This clock hasn't got that far; it still only has a single hand. Mel made a new hand by copying an 18th century design.

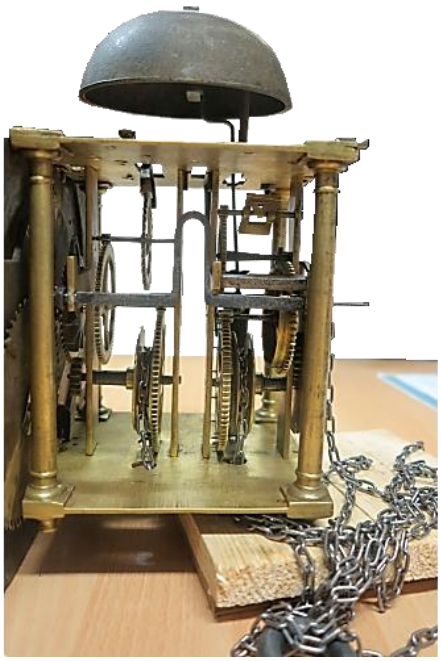
The chapter ring is original, with quarter of an hour divisions (no minutes). Mel doesn't know how old the dial is, maybe late 18th century early 19th century when it was converted.

The bell rings, one strike for one o'clock, twelve strikes for 12 o'clock.

The size of the weight was derived by trial and error. The pendulum would swing and have a slight overswing both ways. You don't need to apply too much weight for nothing. You only need sufficient weight and a slight overswing to release a tooth without any problem. The minute a tooth is not released the clock stops.







Questions And Answers.

Q: Did you consider restoring the clock back to its original state?

Mel: I picked it up in the state to which it had been modified. To go back to a single balance wheel and a verge, would have meant making lots of parts, a crown wheel, a verge shaft, and I'm sure gears as well. I probably would have had to make wheels as the gearing wouldn't have been correct. I just wanted a usable clock. It looks quite good and it keeps time.

Q: Don't clock renovators want to take a clock back to an original state like they do with other renovation projects?

Mel: We never decided to do that. The clock has been through so many changes, I'm unsure whether this clock ever had a balance wheel, but I do know it's been converted to have a small swinging pendulum, because one of the levers has been bent to incorporate one. It's certainly had a short pendulum at one time.

Unfortunately, there's no name on the clock, so I can't research the clockmaker to find out which year it was originally working.

Q: Would this be a city made clock, or would a blacksmith in a small town would have been able to produce something like this?

Mel: I think it would have been made by a clockmaker, because a lot of it is brass, and blacksmiths normally specialise in steel. There are steel parts in it, but by the way it's been made I'm sure it was built by a clockmaker.

Q: Would one person have made it or would have been manufactured by a team?

Mel: One man would sit down and make it. It's not factory made. Whoever made it would have cut all the wheels himself. There's nothing special about it. The wheels could have been cut very easily.

Q: So, this would have been a time before specialists worked on individual components?

Mel: Maybe a specialist engraver would have been involved in the process. When I got this clock the chapter ring was all green. I've polished that and re-silvered it. That part could have been made by an engraver. It could have been roughed out by the clockmaker with the hour track, and then marked out to place the chapters themselves. Then an engraver would finish it off.

Q: What did you use for the silvering?

Mel: A chemical powder containing silver nitrate, distilled water and a pad of cotton wool. Once the surface has been polished and cleaned, I used a 500-grade wet and dry. It's bright brass and that will take the silver nitrate. You go around a few times and see it changing colour. It looks a bit like steel when it's finished. When the re-silvering has been done, you rinse it off and use cream of tartar over the silvered area to "fix" it. After that, the surface can be lacquered.

Q: Presumably you had to repaint the chapters (numbers)?

Mel: No. All the chapters are engraver's "black wax".

Q: So, the re-silvering didn't damage the chapters?

Mel: The silver wouldn't attach to those. Sometimes you would find a missing chapter, and you would have to put it back in and clean it off. On this clock, fortunately, all the chapters were intact.

Q: What is engraver's wax?

Mel: The engraver creates a depression for each of the chapters, and that is filled with wax. You normally use a Bunsen burner or an alcohol burner to warm the depression, and then that is filled with the black wax. As it's setting, you start to wipe it off, with a piece of card.

Q: Is it like sealing wax?

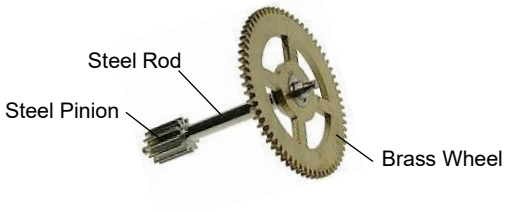
Mel: Yes. You can buy black wax, red wax etc. The wax is harder than wax crayons, but melts very readily. When it's in place, it's there for a long time, unless the clock suffers impact damage.

Q: Can you polish the wax after it's fixed?

Mel: You don't polish the chapters; they are self-polishing. Once the wax has run into the depression, it is wiped off with a piece of card so that each chapter is flush.

Q: When you talk about mobiles, I assume you mean the spindles.

Mel: A mobile is an arbor, with a brass wheel (an escape wheel or toothed wheel) and a pinion, so generally you would make an arbor, cut with a pinion. This is then turned down so it becomes a rod with a pinion. Where the wheel is required, you would solder a boss on the rod, and then turn that to suit the wheel. The wheel is then pressed onto the boss.



Q: You also mentioned when you were talking about operations on the steel components, that you used some rust preventative. What do you use?

Mel: I use *Jenolite.* It converts the rust into a stable water insoluble compound (a polymer primer layer), turning black in the process. You can see all the black steel areas on the clock that have been treated. It won't go rusty again.

Many thanks to Tony, William, Paul G, Paul H, Mike, Mel and Colin for proof reading the articles, and helping with corrections and further explanations where necessary.

Thanks to Chris Cooper for supplying the photo of the PEEMS banner installation.

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