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MODEL ENGINEER & WORKSHOP

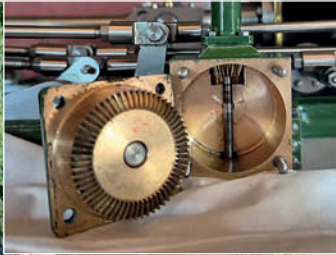
EST. 1898

THE LEADING MAGAZINE FOR HOBBY ENGINEERS AND MODEL MAKERS

www.model-engineer.co.uk

Volume: 235, Issue: 4777, June 2026

**CONNECTING A
HARTNELL GOVERNOR
FINAL TWEAK TO A CORLISS ENGINE**



FULL STEAM AHEAD!

DETAILS OF IMLEC 2026 INSIDE!



**MAKE AN
INDEXABLE
DIAL**

DESIGNED FOR THE EMCO COMPACT 5



INSIDE this packed issue:

- BUILD A TOOL & CUTTER GRINDER · VALVE GEAR FOR THE CLARKSON HORIZONTAL ENGINE
 - MODEL ENGINEERING IN NEW ZEALAND · MAKING AND FITTING TAPERS · CAD TIPS FOR ALIBRE ATOM 3D
 - EXPERIENCES USING ROSEBUD GRATES · REWORKING AN ML7 MANDREL EXTENSION · RESTORING A SET OF MONUMENT CLAMPS · SAMSON AN L&NWR 2-4-0 · MAKING A GARDEN HARROW · FOURRUNNER - AN UNUSUAL OSCILLATOR · ENTER THE 2026 STEVENSON TROPHY AND BRADFORD CUP · BUILDING A LOCOMOTIVE FROM A KIT
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Editor: Neil Wyatt
Designer: Druck Media
Illustrator: Grahame Chambers
Publisher: Tim Hartley

By post: Model Engineer & Workshop,
 Kelsey Media Ltd, Media Centre,
 Morton Way, Horncastle, Lincs LN9 6JR.
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ADVERTISING

Group Advertising Manager
Sue Keily
Email: sue.keily@kelsey.co.uk
Telephone: 01507 529361

Advertising Sales

Fiona Leak
Email: fiona.leak@kelsey.co.uk
Telephone: 01507 529573

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Just ask
 This issue was published on
22 May 2026
 The next issue will be on sale
19 June 2026



SMOKE RINGS

IMLEC 2026 7-9 AUGUST

The Sheppey Miniature Engineering and Model Society have kindly agreed to make sure the International Model Locomotive Efficiency Competition happens this year, see page 20 for full details. My thanks to the Society and especially Chairman Bob Dawson and volunteer Steve Eaton for all the work they have put in already. I'm sure it will be a great success. I'd also like to thank the other clubs who have looked into holding the event - we've also got a list of hosts for the following few years so the future of IMLEC looks secure.

LittleLEC, for smaller locos, will be happening on 20 -21 June at the South Cheshire Model Engineering Society's track in Nantwich, more details in *On the Wire*.

ON THE EDITOR'S BENCH

One of the pleasures of a workshop is being able to help out with fiddly little jobs for people. My brother presented me with the skeleton of an old multiplier fishing reel he was restoring, a replacement pillar was about 0.5mm over length, and the supplied countersunk screw for locating it was a tad too large for its hole. Turning the extra length into a short spigot and reducing the screw were the work of moments on the lathe and ensured a reliable repair. Coincidentally another friend had problems with a 'gritty' handle bearing on a fixed spool reel a few weeks earlier. It proved impossible to remove easily without damaging the plastic plate it was embedded in, but the use of various solvents managed to remove the gunk inside and the application of some mineral oil restored a smooth action. If it fails again it will have to be cut out with a rotary tool.



3D PRINTED PRESSTOOLING

Readers could be forgiven for being sceptical about the robustness of 3D printed workshop aids, such as those featured in Paul Zeusche's article on that subject in *ME&W* 4775. Hopefully some doubts can be dispelled by two photos Paul sent me recently, they show his jig for shaping auger, and the results - eight of these were produced from laser cut blanks with minimal wear to the press tool.



Neil Wyatt
 Editor

Neil



The Melbourne Society of Model & Experimental Engineers presents our

100TH YEAR CELEBRATION 2026



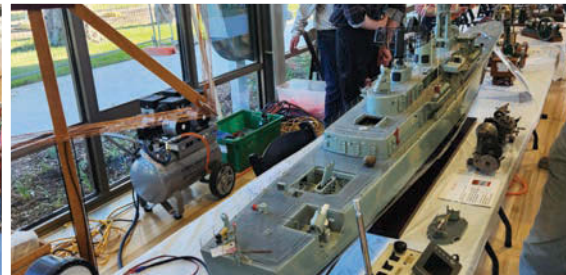
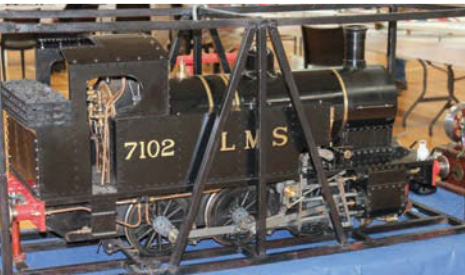
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This year we invite you all in celebrating Melbourne Society of Model & Experimental Engineers Centenary 100th Anniversary! To mark such a historic event, our exhibition will be hosted over two full days, back to back. We hope to see you there.

Use our website to get in touch if you'd like to exhibit models from past club or family members. As for our centenary, we hope to feature earlier work alongside today's latest creations.

To keep up to date with further information, visit our website or Model Engineer & Workshop's website.



At this time, we would also like to recognise and celebrate 51 years for the Australian Antiquarian Horological Society and 42 years for the Melbourne Meccano Club Inc.



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Extra Content!

There's lots of extra content to be found online to support past articles in **Model Engineer & Workshop.**

Visit the www.model-engineer.co.uk forum

You can also see a video of **Jason Ballamy's engine running using this QRcode.**

Hot topics on the forum include:

Broken 6BA Tap in steam cylinder started by John Ross 4. It happens to all of us... what are the best ways to solve this most awkward of problems?

Boiler Marking/serial number started by Speedy Builder5. What's the right way to mark a model boiler for testing and insurance purposes?

My adventures with a bench top CNC mill started by John Hinckley. This thread will give you an idea of what to expect if you get a CNC mill.

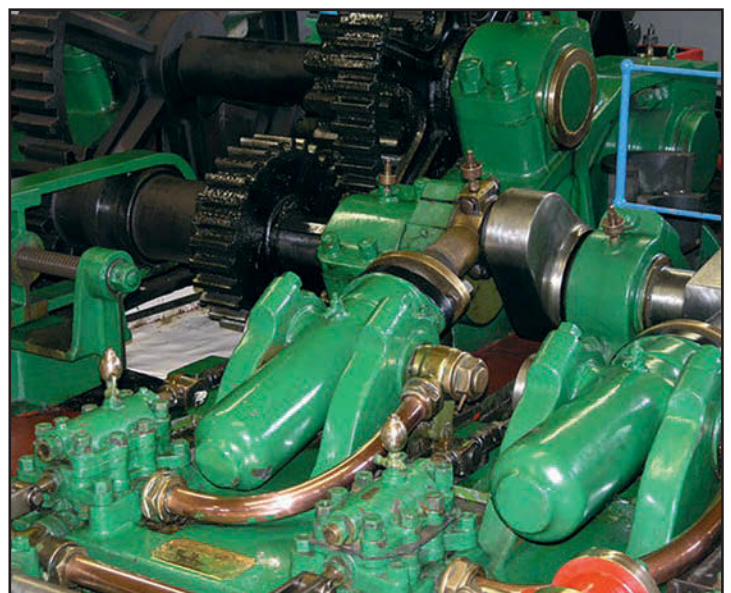
Come and have a Chat! As well as plenty of engineering and hobby related discussion, we are happy for forum members to use it to share advice and support. Come and join us - it's free to all readers!

On the Cover



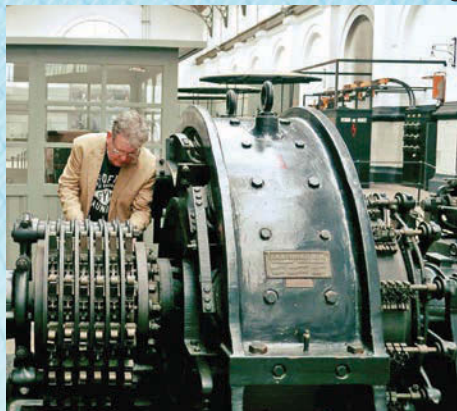
Our cover features Craig Weatherley running his LNER B1 Sprinkbok at IMLEC 2026. For news about IMLEC 2026 see page 30.

Next Issue



In our next issue, a fascinating look at hydraulics in engineering with Mike Tilby.

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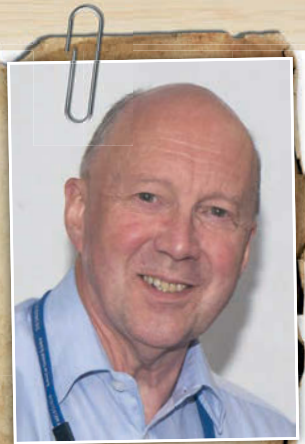




PART 25

A Tandem Compound Mill Engine

David Thomas add a post-script to his series on building Arnold Throp's Corliss Mill Engine design by getting the Hartnell Governor spinning round.



Before trying to adjust the valve gear on the mill engine, I detached the belt drive to the governor from the crankshaft and the link from the governor to the trip gear. Setting up the steam valves was complicated

enough without having the mechanical input from the governor interfering, so I left it for later. If it is made to drawing the governor will spin round and look good, **photo 1**. For a model that may be all that is needed, but to have it controlling the engine speed

in response to changes in load will be more difficult.

In Part 14 of this series (*ME&W* 4763, April 2025) I described the making of a pair of 4:1 bevel gears for the governor, something I decided to do as 0.5 module commercial gears at

Photo 1:
The finished governor.



Photo 2: Ropes driving the governor on the horizontal steam engine in the Energy Hall of the Science Museum in South Kensington.



that ratio were difficult, or impossible, to find at an affordable price (it's the small size that is the problem, 15:60 pairs are readily available in 1.5 module). Another option I mentioned was to redesign for the easily available 3:1 pairs and the Editor passed me a link to far eastern sources of such small bevels (thanks Neil!). This idea became more interesting when the first thing I noticed when I came to look critically at the governor was that the weights swung to the maximum position well before the engine was at its normal 90 to 100 RPM, so a possible reduction in the speed of the governor was certainly something to look into. The other variable that could be adjusted was the stiffness of the governor spring and I'll discuss these two possibilities in turn.

On the full-size engines of the vintage of the original the drive to the governor was by two or three cotton transmission ropes, similar to but smaller than those taking the power to the mill, **photo 2**. There may well be people (perhaps ship modelers?) who can make a long splice in 1/16th scale rope, **photo 3**, but I'm not among them so the drive was not going to be anywhere close to prototypical. On Arnold Throp's original model the drive is a flat belt that, as far as I could see through a museum case, was made from some sort of leathercloth (Rexine perhaps?) with a lapped and glued joint. A flat belt from a record player turntable drive persistently came off the pulleys so I moved on to try O-ring cord which worked well when used



Photo 4: Two millimetre O-ring stock being used as governor drive belts. With smaller pulley diameters these would slip without the grooves.

with a grooved small pulley, **photo 4** and looked just a little bit more like the original ropes. Without the grooves the cord wouldn't grip a pulley of 5/8" diameter and a larger pulley looked too much out of scale and might reduce the governor speed too much. Once I had a reliable drive to the governor, I went back to trying to work out how to fit in the 3:1 gears with the initial motivation of reducing cost but

later as a way to reduce the rotation speed of the governor.

A pair of module 0.5 bevel gears in brass with 20 and 60 teeth cost AUD14.75 in March 2025 and the quality was adequate for the purpose. The 20-tooth gear came with a 3mm bore which was opened out to 1/8" to match the existing governor shaft, the larger gear however had a 6mm bore which meant that a new pulley shaft had to be made. The space for the small gear in the gear housing had to be opened out to 7/16" and the boss on the bottom of the column increased to match, modified drawings are provided in **fig. 1** and the assembled governor with these gears is shown in section in **photos 5** and **6**. This combination of pulley and gear sizes has the governor turning at 900 RPM for a 100 RPM crankshaft speed. On my set of original drawings Arnold Throp specifies a spring for the governor with an OD of 9/32", a free length of 5/8" and having six turns of wire 0.024" diameter. I found a similar commercial spring with the only difference being an OD of 1/4". It is only recently that I've calculated the theoretical spring stiffnesses (Machinery's Handbook and Tubal Cain give exactly the same formulas) and found that Throp's specified spring has a stiffness of 88 g/mm and mine has 68 g/mm so my choice may be too soft. Also, measuring actual springs around this size showed spring rates 2/3 to 3/4 of theoretical so my choice

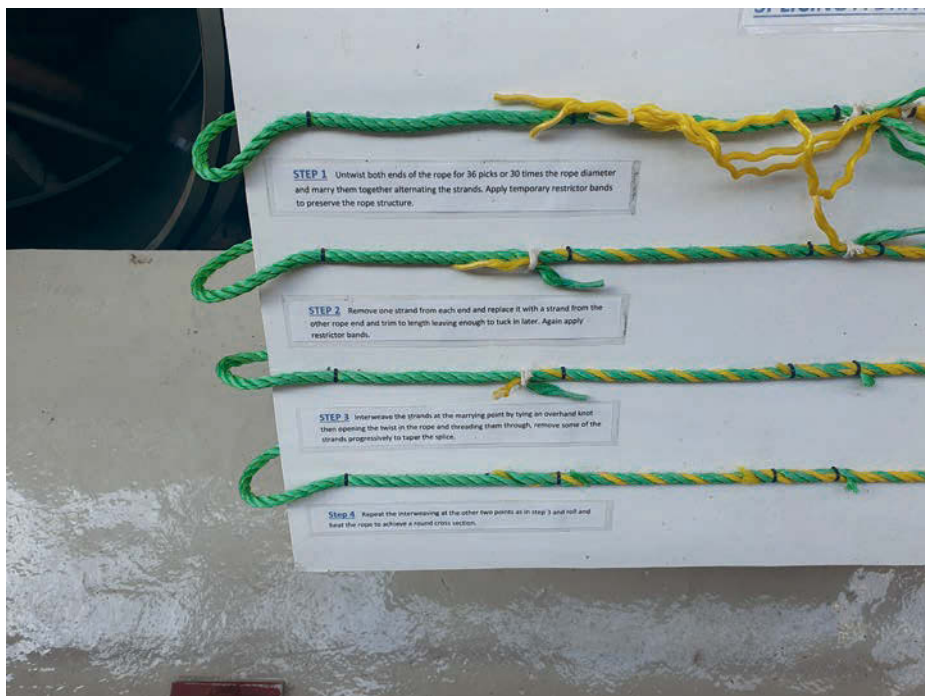


Photo 3: How to splice a driving rope. A display at the Bolton Steam Museum.

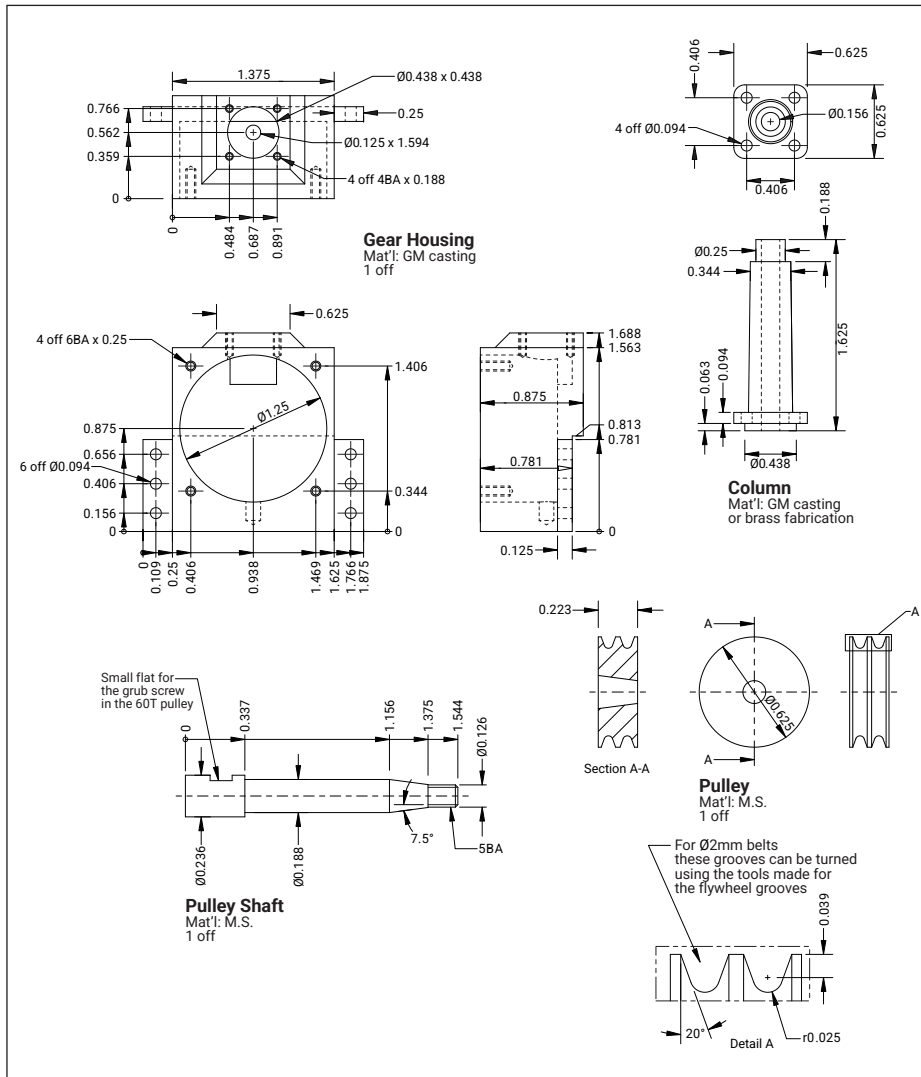


Fig 1: Detail drawings to replace those for some parts on Part 13, figure 33 and Part 14, figure 2.

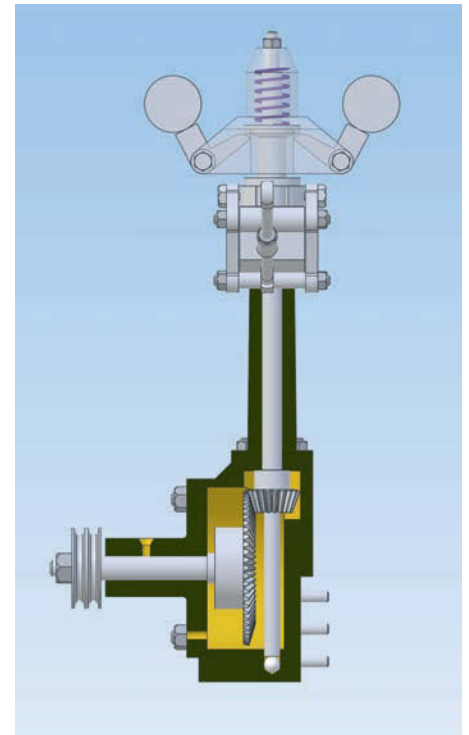


Photo 5: Cross section of the governor using 3:1 commercial bevels and a grooved driving pulley.

was possibly even less stiff than needed. The next step along this path will be to get together the kit needed for making springs and doing some more experimenting.

The original drawings have details for a damper that have been added after the engine speed was found to be 'hunting' which I interpret as the speed swinging either side of the desired setting without ever settling. With my model there was the possibility that small variations in valve timing and differences in friction through some misalignments were causing the obvious variations in speed. I'm going to ignore the damper, at least until everything else is working as well as possible. I had also noticed that the original model in the Powerhouse Museum didn't have a damper and didn't show any sign of one having ever been fitted. Additionally, the damper as originally drawn needs modification to allow for the sideways movement of the pivot point that occurs as the governor operates.

At this point we have a governor that appears to work but probably doesn't do anything to control the speed of the engine and, as I wrote at the start, this may be good enough. However, there is a good argument for doing more design work on the speed control of the engine (and on miniature governors in general) but right now I'm going to take a break! 🍷

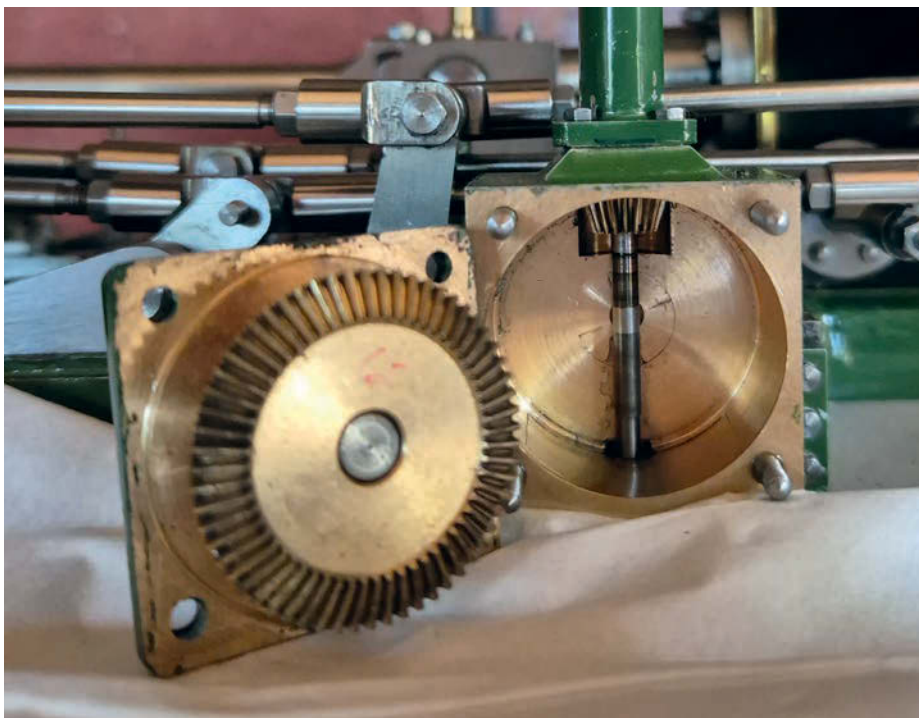


Photo 6: Bevels fitted in governor.

On the Wire

News from the world of engineering

The Midlands Model Engineering Exhibition 2026

The Midlands Model Engineering Exhibition returns to the Warwickshire Event Centre from Thursday 15th to Sunday 18th October, bringing together the very best of the hobby for four days of inspiration, expertise and engineering excellence.

Recognised as the UK's largest event of its kind, the exhibition will feature nearly forty leading specialist trade suppliers, offering everything model engineers need—from tools, machinery and materials to components and expert advice. At the heart of the show are the models themselves. Visitors can enjoy hundreds of exhibits across thirty-two competition and display classes, showcasing exceptional craftsmanship and a wide range of engineering disciplines.

More than thirty clubs and societies will also be in attendance, presenting their own displays and providing



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opportunities to connect with fellow enthusiasts. Outdoor attractions, including visiting steam engines, add to the experience. A programme of live demonstrations, workshops and talks will be announced in the coming months,

offering further opportunities to learn and develop new skills. Whether you're a seasoned model engineer or simply curious about the hobby, this is a key date in the calendar. For more information, visit www.midlandsmodelengineering.co.uk.

NAME Junior Engineer of the Year

A recent the award made by the Northern Association of Model Engineers demonstrates how we can be supportive of young people in our hobby. The award goes to the best nominated junior engineer for 2025. Connor Cheevers of Sale Model Engineering Society received a trophy, certificate and cheque from Bob Hayter, Boiler Registrar for NAME. The presentation took place in April at the Sale Club track in Walton Park. Photo attached. Bob found Connor under a member's locomotive on the steaming bay where he was helping to fix a problem that was preventing the use of the loco for public running. Nominations for the 2026 award for young and junior engineers are now open. Details can be found on the NAME website at www.nameuk.org.uk.



LittleLEC 2026, 20 - 21 June

Bryan Finch, Secretary of Guildford Model Engineering Society and LittleLEC Co-ordinator has asked me to remind readers that the LittleLEC cycle has come round again. This year's Competition will be taking place at the South Cheshire Model Engineering Society's track in Nantwich on 20th and 21st June.

Full details were published in our February issue, but to remind readers, LittleLEC is an annual locomotive efficiency competition for drivers of small locomotives weighing less than 50lb dry. These are much more challenging to drive than larger ones, and so this competition was devised by Peter Langridge in the 'noughties', enabling owners of small locomotives to take part in an IMLEC style efficiency competition. Full details can be found on the LittleLEC website, www.littlelec.co.uk/home/



Artist Rob Trent supported by REMAP

Rob, a talented artist was born with arthrogryposis, a condition affecting the joints and muscular development.

"My name's Rob Trent. I'm married to Kim, and although I am now retired from my full-time career, I'm still extremely busy! One of the things that takes a lot of time, but that I really enjoy, is painting. I'm a mouth painter for the Mouth and Foot Painting Artists (MFPA) UK. Recently I had some paintings hung in an exhibition at Lindly Hall, Royal Horticultural Society. I was also honoured to meet Her Royal Highness, the Duchess of Edinburgh."

One of REMAP's dedicated volunteers previously supported Rob by designing and building a bespoke easel just for him, making painting more accessible and opening up new creative possibilities.

Rob explains: "The easel can be moved up and down, left or right, simply by pressing buttons on a control box, or even using voice control! It has enabled me to paint much larger surfaces, as without it, I would have very limited range. So, thank you REMAP. You are wonderful!"

<https://remap.us4.list-manage.com/track/click?u=8cad620e2ac16c8db44f27b71&id=e8bf6abb4e&e=a1ddf9c41d>

You can explore Rob Trent's artworks here:

<https://mymfpashop.co.uk/collections/rob-trent>

To support or get help from REMAP, visit remap.org.uk.



Alibre Version 29 Announced

Alibre version 29 is now in beta testing for Professional and Expert customers. An Atom3D installer will be made available when the full 'production' release happens – at that point those on the extended 6-month trial will be able to update to v29 if they choose to. Every dialog product wide has been thoughtfully reconsidered and optimized with these guiding principles:

- Top to bottom flow
- Hide inputs until they are usable
- Declutter and simplify wherever possible
- When possible, remove extra clicks
- Consistency of design language
- Simple, direct language and inputs
- Be as visual as possible

Best of all... when you do something wrong and get a notification, it will no longer require you to click 'OK' before you can get on with your work.

They are about making the UI more efficient – no doubt some users will find the change difficult at first, but from what we have seen the end result will make Alibre easier and faster to use. More details on the changes for v29 can be found at www.alibre.com/version29/.



Errata: Fourrunner.

Our apologies to Steven Fulton for mis-spelling his and his father's surname in a few places in the last issue.

Beginning CAD With Alibre Atom 3D

Rob Footitt shares some more tips and tricks to help you progress faster with learning 3D CAD.

In the last issue, I looked at the general approach to using Alibre for 3D CAD. In this article, I will look at specific elements of Alibre Atom 3D including 'sketching' and 'assemblies'.

SKETCHING

Keep Sketches Simple

A common trap I've seen people fall into when they are new to CAD, is attempting to include too many features in a single sketch. A good example is including fillets in the sketch for an extruded part, I would suggest leaving the fillet out of the sketch and applying it as a 3D feature instead. This results in the sketch being easier to edit, and the 3D fillet tool gives you more control over the final feature (for example you can vary the radius along the edge using 3D fillet, which would not be possible if it is driven from the sketch), **figs 10, 11, 12** and **13**.

Reference Figures

When creating sketches, it is often useful to include elements that you do not want to be part of the 3D feature. Alibre provides 'reference figures' in the sketching environments to accomplish this. You can either directly draw reference figures or convert a standard figure to reference by right clicking and choosing 'Convert to Reference Figures'. The software also automatically creates reference figures when needed, for example if you create a dimension from the edge of the model a reference figure for the selected edge will be added to the sketch, **figs 14** and **15**.

Sketch Constraints

I highly recommend using sketch constraints when creating your sketches, as they can help to better define design intent and greatly reduce the number of dimensions required for a given sketch. Sketch constraints apply geometric or mathematical rules to the sketch, for example the 'Parallel' constraint allows you to make two or more lines parallel to each other. Alibre provides an explanation and

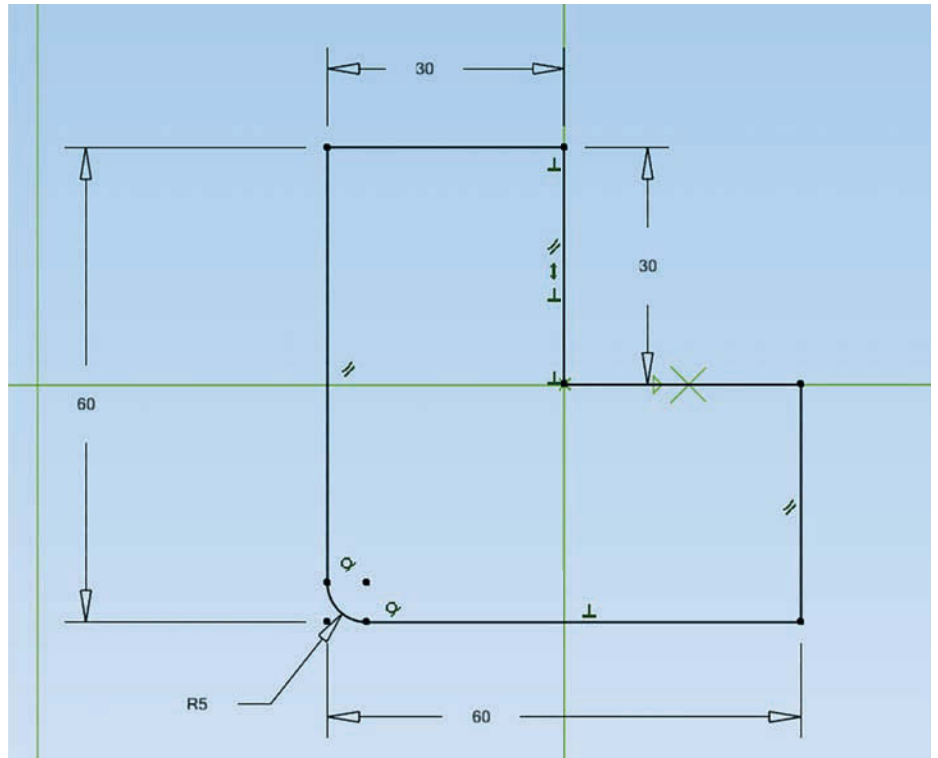


Figure 10 Complex sketch.

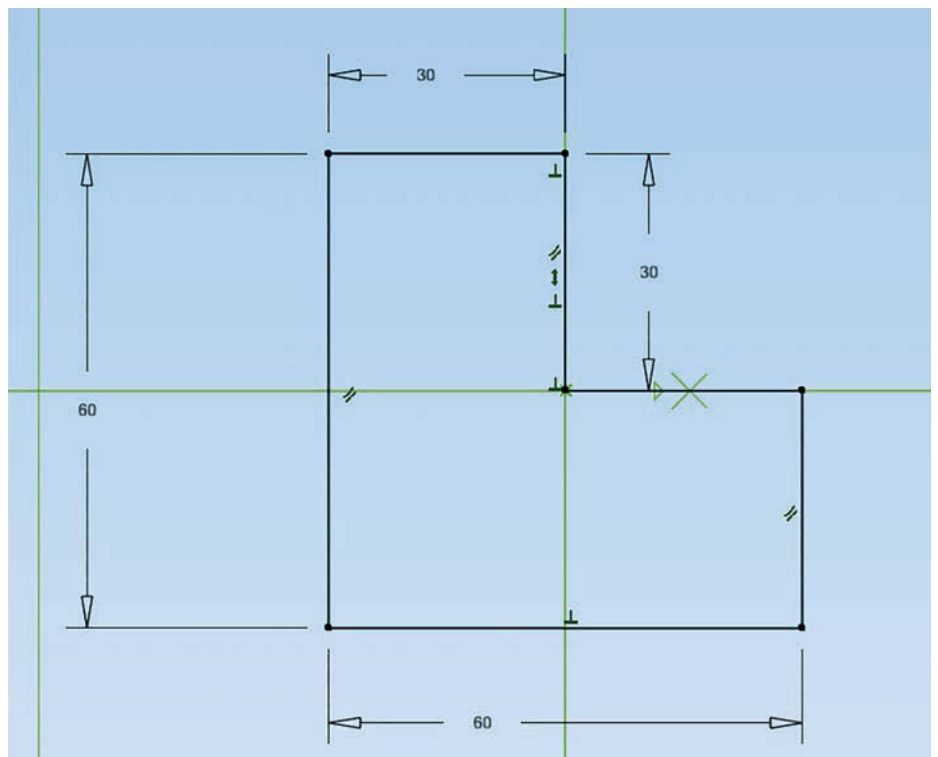


Figure 11 Simpler sketch.

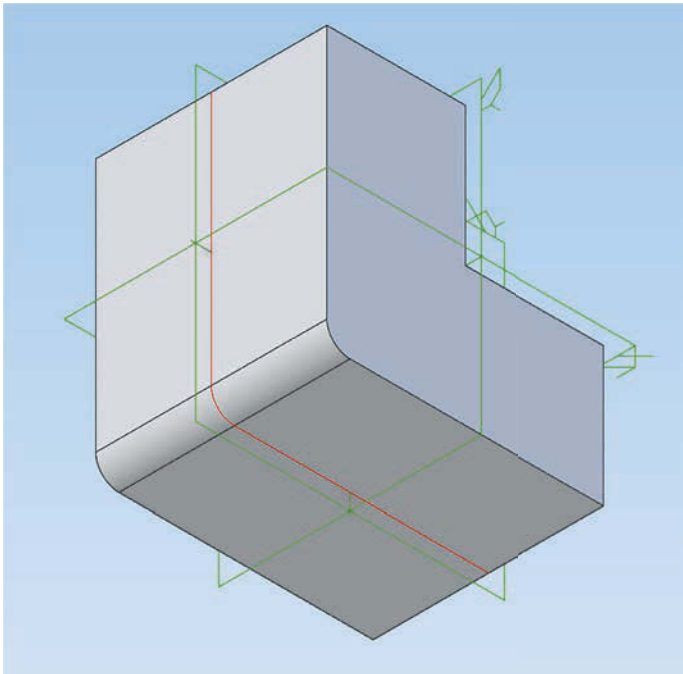


Figure 12 Fillet on extruded part driven by sketch.

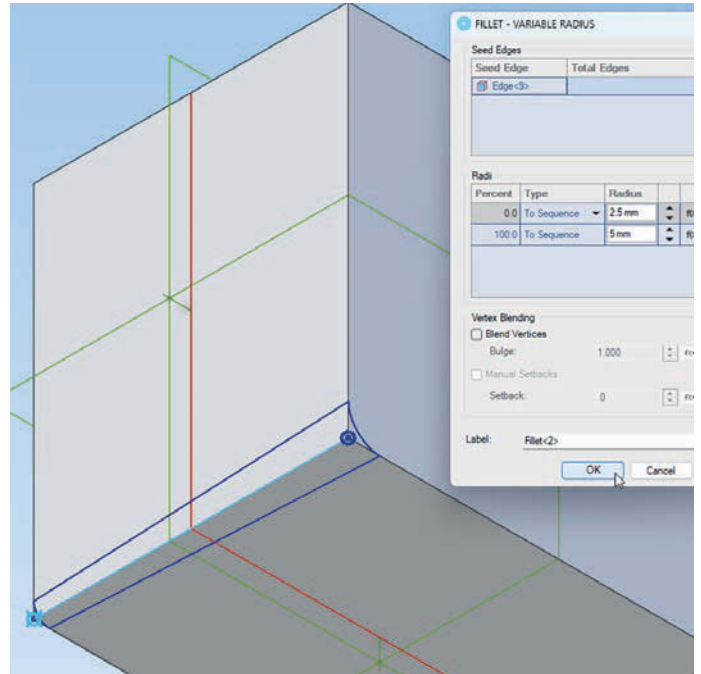


Figure 13 3d Fillet dialogue providing more options.

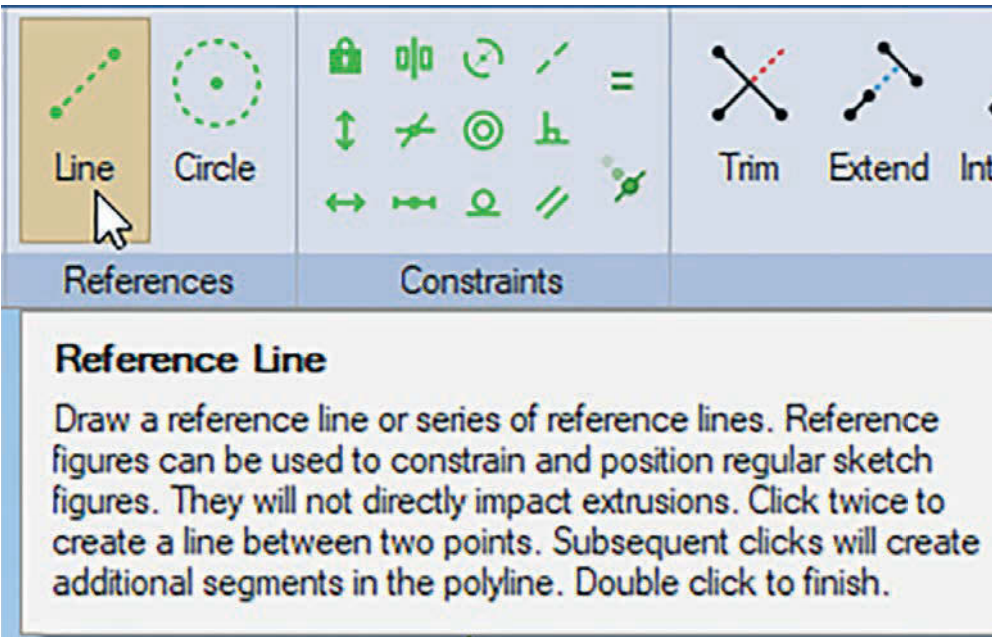


Figure 14 Reference line tool tip.

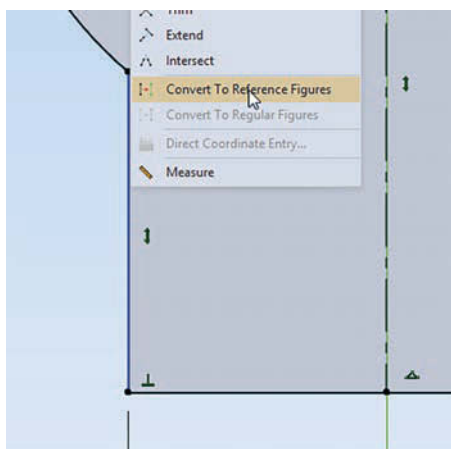


Figure 15 Parallel constraint tool tip.

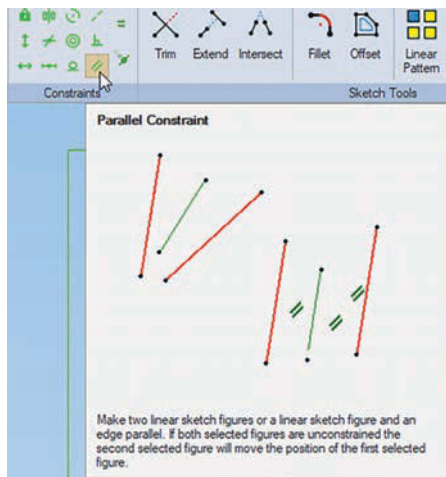


Figure 16 Parallel lines.

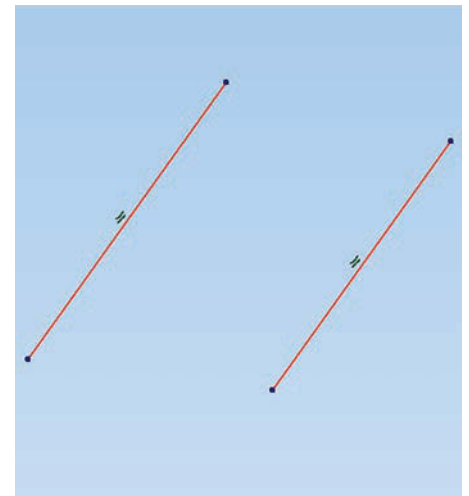


Figure 17 Show reference geometry.

instructions for how to use each type of constraint when you hover the mouse over a constraint for couple of seconds, figs 16 and 17.

ASSEMBLIES

The First Component Needs to be Positioned

When starting an assembly, it's important to remember that the first component needs to be located within the assembly workspace, before adding more components. An easy way to do this is to line up the construction planes used to create the part with the assembly reference planes. The part construction planes can be turned on by right clicking on the part and selecting 'Show Reference Geometry'. Then use the constraint tool to line the three part construction planes up with

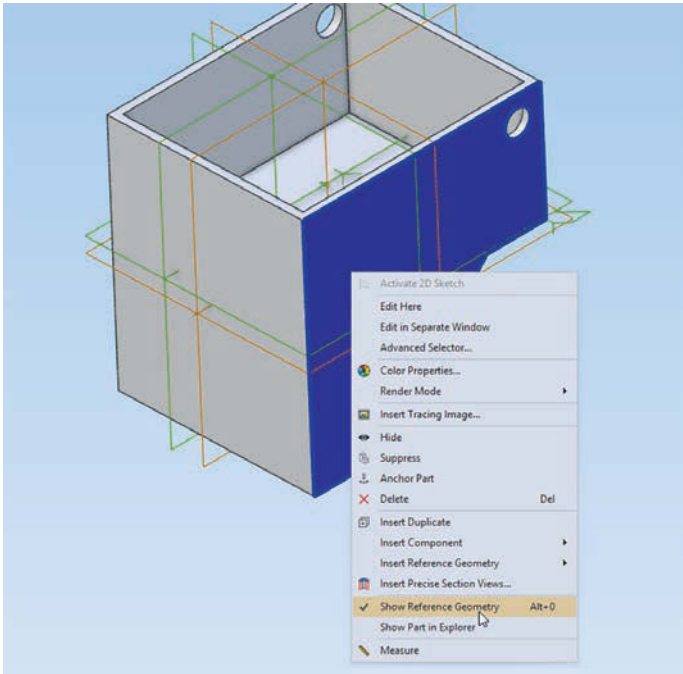


Figure 18 First part placed in assembly.

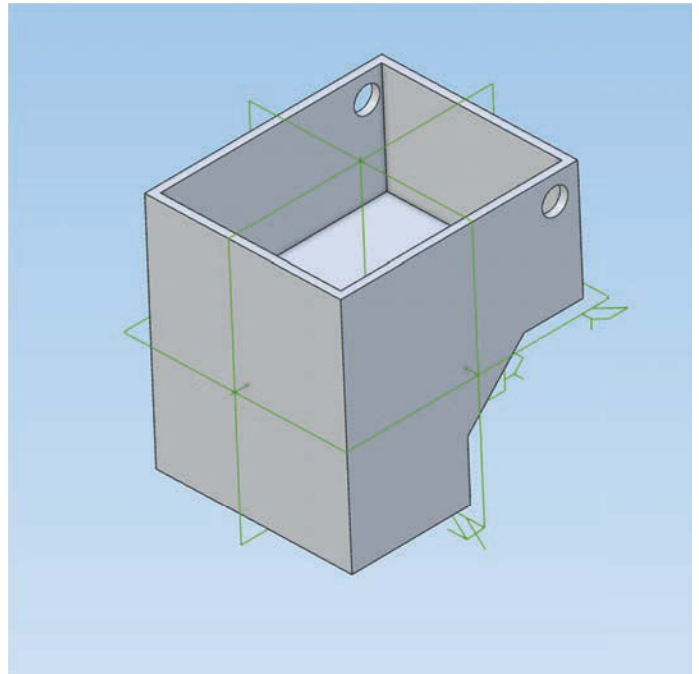


Figure 19 New part added to assembly.

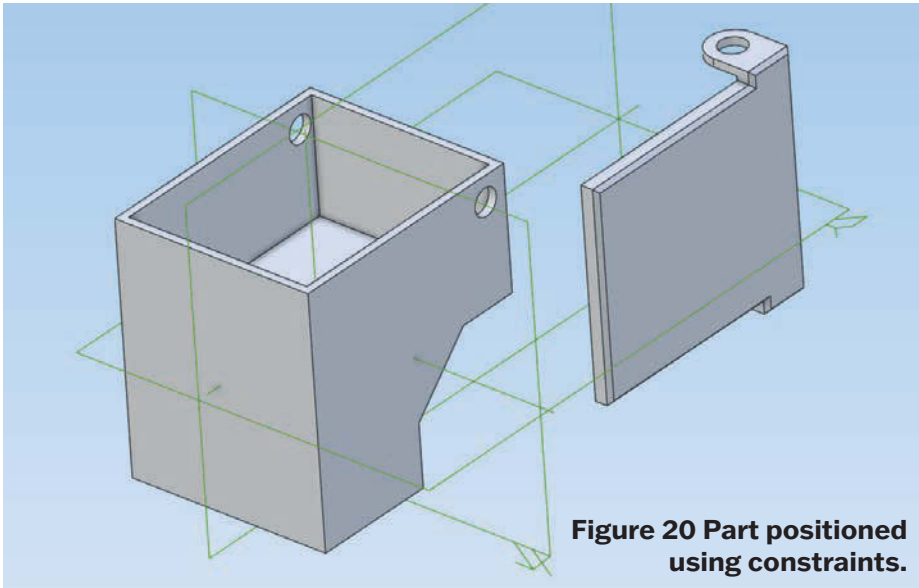


Figure 20 Part positioned using constraints.

the corresponding assembly reference planes, **figs 18 and 19**.

Applying The Correct Constraints Will Position The Part

When bringing new parts into an assembly, it's often the case they the part isn't oriented in the way needed to fit the model. I often see people new to 3D modelling use 'Component Placement' tools to manipulate the part into roughly the required position by dragging and rotating however this isn't necessary. Creating the required constraints between the new part and the rest of the assembly, will result in the part being in the correct position and orientation without needing to orient it first. This is something that becomes second nature with more experience, **figs 20 and 21**.

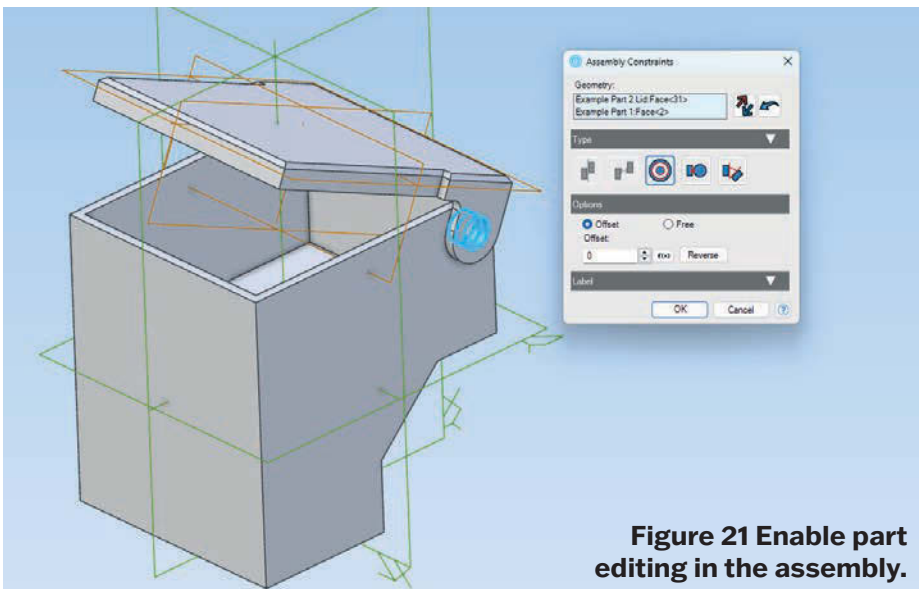


Figure 21 Enable part editing in the assembly.

Editing Parts Within The Assembly

When developing new designs with multiple parts, it's common for the features of one component to be dependent on features of another (for example holes that need to line up in two parts). This can be tricky when working on each component individually through the part modelling workspace. In this case the solution is to work on a part from within the assembly workspace so you can see and take references from the other components in the assembly. To do this right click on the part you wish to edit, then click on 'Edit Here' – this will enable the part modelling workspace within the assembly. All the other components within the assembly will turn translucent but will remain visible, **figs 22 and 23**.

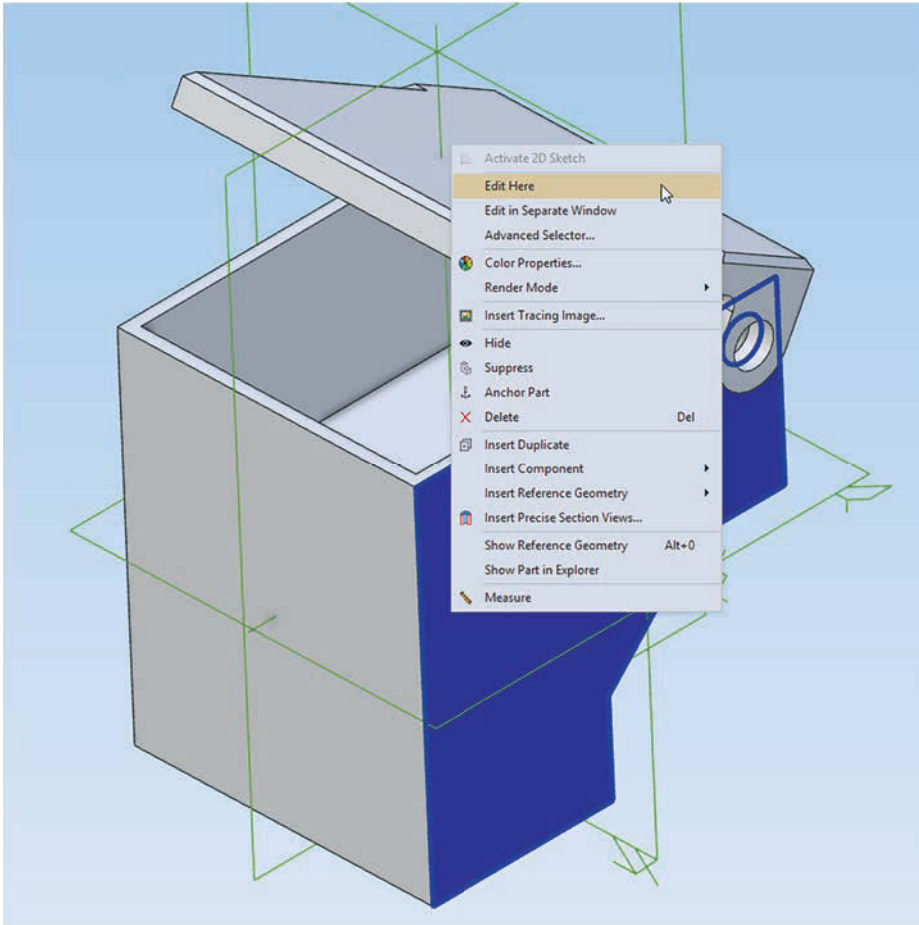


Figure 22 Part edit mode in the assembly.

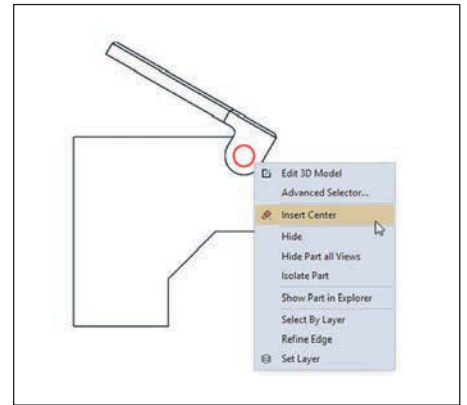


Figure 24 Single centre mark added.

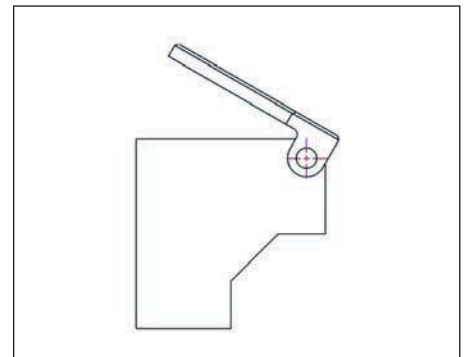


Figure 25 Activate sketch in view.

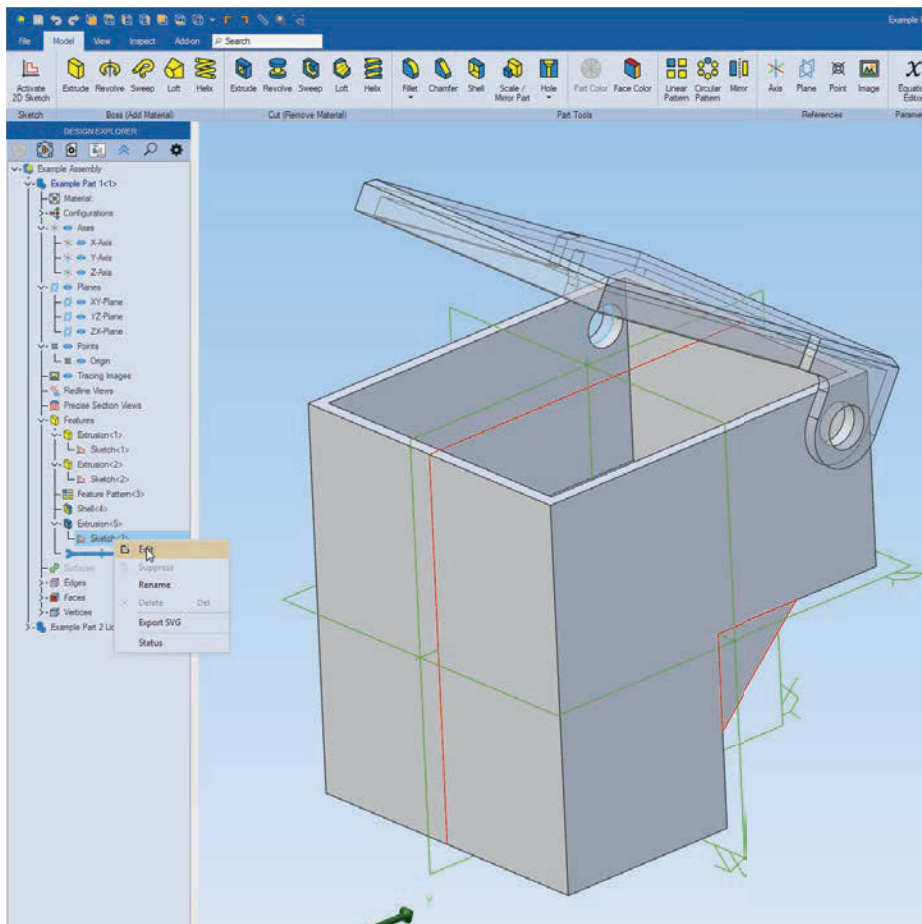


Figure 23 Insert centre option in drawings.

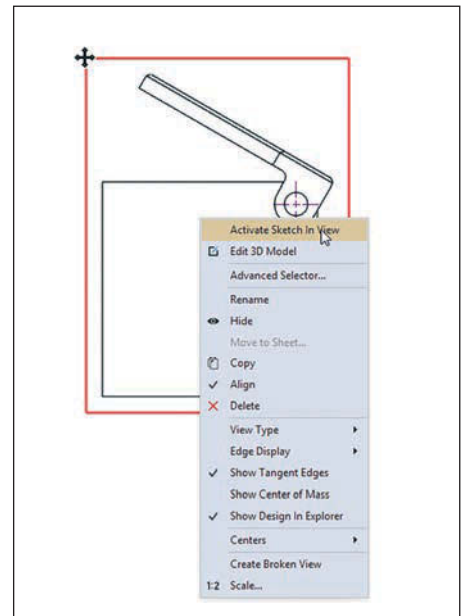


Figure 26 Example of sketch in view.

2D DRAWINGS

Showing Individual Centre Marks

The drawing creation tools allow centre marks to be added to all holes in a drawing, however this can make a drawing very busy if the model includes a lot of holes. To add a single hole centre (or to add a centre to a

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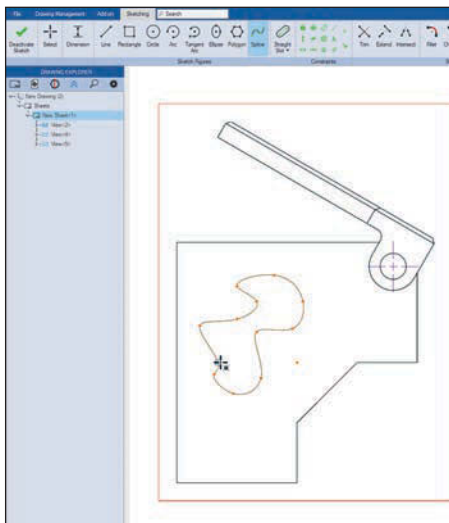
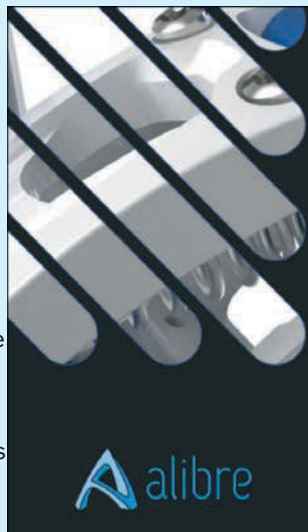
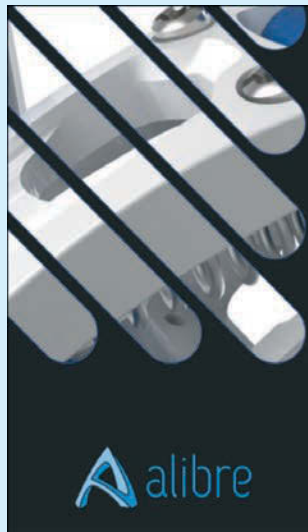
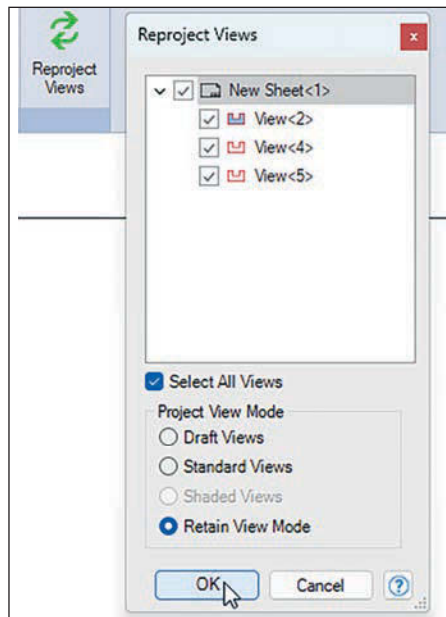


Figure 27 Reproject drawing views.

radius), right click on the circular edge you wish to add the centre mark to and click on 'Insert Center' option from the right click menu, **figs 24 and 25.**



Activate 2D Sketches

It's sometimes not practical to create every detail of a design in 3D – for example fine surface textures or

logos. It is possible to manually add details to the 2D drawing by right clicking on a view you wish to edit and selecting the 'Activate Sketch in View' option. This will enable the full sketching menu, and you can draw the required details directly onto the view, **figs 26 and 27.**

Reproject Views

2D drawings created in Alibre are linked to the 3D part and assembly data. When changes are made to a part or assembly that is in a drawing, the drawing will update to reflect the changes when it is opened. It does not automatically update whilst the drawing is open, however. It is sometimes handy to quickly make changes and see the result in the a drawing you have open – to prompt Alibre to update the drawing click on the 'Reproject Views' button then click 'OK' on the 'Reproject Views' dialogue and the drawing will update any parts or assemblies that have changed without the need to close and reopen the drawing, **fig. 28.**

Perforated Grates for Longer Life

Matt Jeffery looks at the advantages of perforated grates, often known as ‘rosebud’ grates in the UK, for model locomotives.

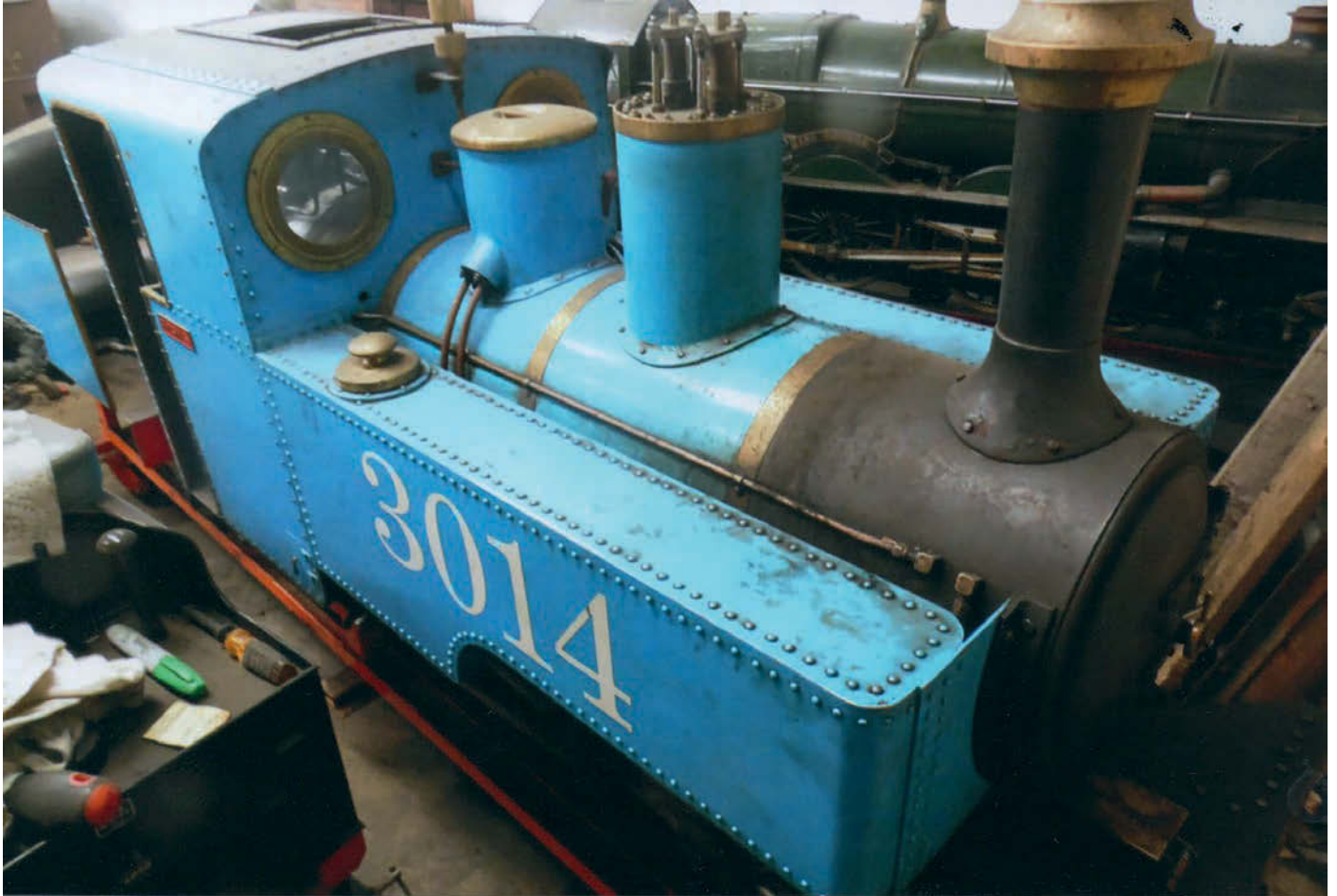


Photo 1: *Thomas*, my narrow-gauge engine in 7 ¼" gauge.

It was a number of years ago that I first started experimenting to find a solution to grates that would clog and burn out in just a season, even if they were made of stainless steel 300 series. My first attempt was on a large American engine that I bought from a man in Connecticut. I drilled ¼" diameter straight holes in two lines about 5/8" apart on a piece of ¼" thick mild steel with a strip of ¼ x ¼" welded as a t-piece to act as a reinforcing strip on the back. This was only partially successful as the ash still blocked the holes.

I then looked at my own ‘*Thomas*’ the tank engine, **photo 1**. That was a good steamer, but the grates would clog and burn out relatively

quickly. So, I used 1/2" thick plate as I thought these would also burn out quickly. I purchased a taper reamer/milling cutter from Manhattan Supply Co. and using the digital readout on my milling machine, spaced the initial ¼" holes at ¾" centres. I then staggered the holes for each consecutive row and then followed up with the taper reamer, using my readout on the quill for depth. I continued using the same centres all over the rest of the plate, **photo 2**. To my amazement they did not burn out, due to the fact that if the ash falls through the initial hole the taper does not allow it to stick and it must fall through, thus no ash can accumulate on the grate and the air underneath keeps the grate cool.



Photo 2: The grates of my *Thomas*, upside down and the taper that works so well.

These same grates have been in my *Thomas*, **photo 3**, for nine years and are not even discoloured. I have converted all of my eight locomotives



Photo 3: Another view of *Thomas* showing the brute of an engine it is. It was just brought in as a snow storm warning hit, so I was unable to clean it up.



Photo 4: The Wilson-design *King* in 7 1/4" gauge that I eventually rebuilt, now awaiting a valve rebuild having worked hard for many years.



Photo 5: The taper holes in the *King* grates (upside down) they are fully 16 1/2" long.



Photo 6: The *King* grates right way up. The *King* is a very powerful locomotive and since I fitted steel tyres to it the adhesion is very good on aluminium rail.

to this same design using much thinner material, that is all except one, my 7 1/4" gauge midland compound that is fitted with its own shaker grate. If this engine shows signs of clogging or burning the grates, then I will convert them, but still keep the shaker grates.

My latest set of grates, I am making for my newest acquisition, a 2-10-0 *Evening Star*, that arrived from England in June last year. They will be 1/4" thick mild steel, 2" wide and approximately 5" wide across the firebox.

My 7 1/4" *King*, **photo 4**, has been converted to 1/4" thick stainless steel only because I came across a piece of plate from a scrapyards. I purchase it from England and when I first ran it, it was a complete failure breaking down every time I brought it out. I persisted and after many mishaps such as steel tyres coming loose, all four crossheads cracking (one of them bursting the left hand inside cylinder cover off) and the crankshaft falling to pieces. I eventually put everything right and it now awaits a valve job after fifteen years of hard work.

The *King* has a narrow grate 16 1/2" inches long and in order to generate enough steam to feed those greedy cylinders, the tapered holes act as venturis, **photos 5 and 6**. They increase the steaming ability of most engines 10% and especially on my *King*, I have had thirty people behind me up that bank at Pennsylvania Live Steamers, 1 in 40 or 2 1/2% and at the top it has been blowing off with one injector on. This with a white-hot fire from the anthracite that I burn and absolutely no burning effect on the grates, so I have proven time and again that they work. I did have a man some years ago and said "they get clogged worse than my normal grates", so I said "it sounds like you may have them upside down". He said "Oh shoot" and quickly put the phone down without giving his name. 🙄

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POSTBAG

The Editor welcomes letters for these columns, but they must be brief. Photographs are invited which illustrate points of interest raised by the writer

PostBag is one of the most popular sections of the magazine - readers want to hear from you! Drop us a line sharing your advice, questions or opinions. Why not send us a picture of your latest workshop creation, or that strange tool you found in a boot sale? Email your contributions to neil.wyatt@kelsey.co.uk.

MEW BANDSAW DESIGN

Good Morning Neil, an article by Raymond Wood in *Model Engineers' Workshop* dated Autumn 1990 describes the design and build of a metalworking bandsaw. Mr. Wood built his saw from scratch because he was unable to find a commercial vertical blade saw which was small enough for his workshop but substantial enough to cut steel.

Thirty-five years later I've encountered the same situation; Woodworking saws too flimsy and commercial saws far too big for my shop. I've copied Mr. Wood's design at roughly twice the original size. Some parts are improved - or at least more complicated, others are blatantly simplified - but the design is obviously his. Long story short - I am extremely pleased with the result. The saw works well, expectations exceeded! If Mr. Wood is still in touch with the magazine - I'd like to pass on my thanks to him and offer an early sight of the many drawings and photographs of my saw.

If it is helpful - an article may be forthcoming in due course.

John Scott, by email.



This was actually featured in the second issue of MEW. What tools have other readers made from, or inspired by, designs in MEW and ME?

A TIP WINNER'S TALE

Neil, many thanks again for the Chester Tools voucher and of course to Chester for sponsoring it. I wonder if you ever wonder what people do with their vouchers? Well here is what I have done.

A 2 in square - I needed a tiny one when marking up small items - currently based around 20 mm square bar

Set of centre punches. - I am always looking for one so this might help also in different sizes

Three scribes - well why 3 - well they just disappear so hopefully I can keep one near where needed and put a 'spare' in the tool chest.

A set of diamond files - always useful and there are for very small work.

Angle block. They are just one of those things that you do not need until you come to set up a fiddly job in a mill and then you need such a thing desperately. Well now I have one to hand.

Total cost almost £80 but much reduced with the voucher.

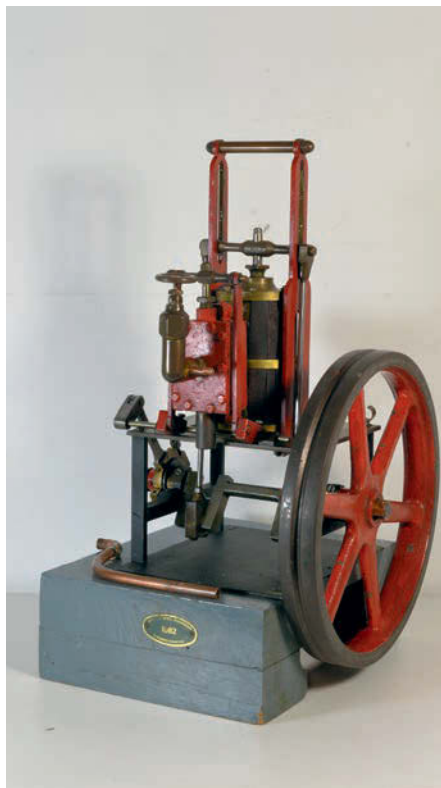
William Waddilove, by email

TABLE ENGINE

Dear Neil, In the past I have written a number of articles for Model Engineer relating to several clocks and two model steam plants that I made. I have recently bought a most interesting steam engine made in the 1980's and exhibited in the Midlands Model Engineering Exhibition in 1982. I have attached some images for you to see. I have no idea who made the engine, but it is certainly an impressive piece of work. At the moment the engine is not running and has lost a number of components as well as its original pipework. It is my intention to fully restore the Engine. I intend describing the engine and its background and wondered if initially you might have any information regarding the maker in any records you have relating to the 1982 exhibition.

Ian Beilby, by email.

Unfortunately I don't have details of the 1982 MMEEX exhibition exhibits, can any readers help Ian?



MECCANO BUILDINGS

Hello Neil, enclosed are some photos of a model train Station and Platform built with Meccano and Märklin Metal construction parts. It was inspired by the tin toys made by several toy companies in Europe in the period 1880-1930. Many people have always been wondering why Hornby didn't pursue further into designing buildings/houses for Meccano, therefore they came with Dinky Builder and Bayko!

Henk de Ruiter, the Netherlands

ALTERNATIVE COAL

Dear Neil, having just received my latest edition of ME&W, I have been reading the commentary about ecoal (I have not heard of it before) and am not too impressed. Here in Pennsylvania we have at least 400 years supply of some of the best anthracite in the world, as to its suitability for use in model locomotives, I have been using it for many years (at least 50 and counting). I sent quite a lot of it to my friend Tom Hubble of Crewe for him to try, whilst it is not as good as Welsh steam coal, it is certainly hotter or as hot when a blast is put to it, in fact with using my tapered hole grates the steam that can be generated from it is incredible, all my locomotives have copper boilers and so far have shown no signs of the silver solder corroding or any of my boilers failing their hydro tests. I have eleven 7 1/4" gauge locos that I steam periodically as my fancy takes me.

Here are some of the downsides of this coal, it is very hard and difficult to light, you need a good hot fire of sticks soaked in paraffin or similar before you add the coal but once it is burning you



must keep it bright with a brisk blower and it will give you plenty of steam. There is a delay of about two minutes after applying the coal to when you get any heat out of it. After about four hrs of continuous passenger hauling of at least 20 people per ride, some clinker does occur and requires breaking up with a fire iron, I then pick it out and make sure it is wetted to prevent curious children from picking it up! It is then good for at least another two hrs before the fire is too far gone and needs to be put on shed and drop the fire. I have used it in my 3 1/2" gauge Stanier tank engine and it works well, we have even used it in a gauge one engine but a much smaller size has to be used, rice coal compared to pea size for most engines. That's about the same size as beans in the UK. As to it being classed as a clean coal or smokeless, when it burns just a light

blue smoke at first then no smoke can be detected once it is hot.

I have tried other coals from various regions. I did try a mine some 45 miles away, but it was so hard to light and when it did the heat it gave off was no better than my own mine. I found out later it was only good for steel smelting because of it needing a forced draught far exceeding that of a miniature locomotive.

Pocahontas coal from Virginia is sought after by many of my fellow model engineers because it burns fiercely and gives off heat almost immediately, but its disadvantages are as follows: It gives off massive black smoke (and if this inhaled can lead to lung disease) and forms a cache over the fire and if this is not broken up will put the fire out. It causes large lumps of clinker and they have to be taken out of the firebox as it gathers, it's very dirty in your tubes and they need cleaning more frequently. Now some drivers only run for a couple of hours, and it suits them, but if you do any serious passenger hauling, as I do, then the anthracite I get from a particular mine is the best.

If anyone wishes to contact me, my email is vapour2@yahoo.com
Matt Jeffery, Pennsylvania, USA.

Wheel Standards

Dear Neil, MJP's comments about differing rail and track standards in the April issue of ME&W are well taken. However, he should congratulate himself on realizing that there is an issue. When stage 1 of the Ottawa light rail transport (LRT) system had been finished it was found that the car wheels had been profiled to European standards and the rails were profiled to North American standards. This mismatch has been suspected or demonstrated in derailments and bearing failures. At the moment most of the cars on Line 1 are out of service to have wheel bearings replaced.

Would it surprise anyone that the city parents and their acolytes decided on the lower cost and technically less compliant bid and avoided hiring an experienced project manager?

John Bauer, by email.

More on Peveril

Dear Neil, regarding the 5 inch gauge Peveril locomotives, the original designer was Mike Casey. His loco Peveril won a silver medal at the London ME show in the mid 1980's and shown in ME centre pages from that time. Mike did a short description in the Late Don Young's "Locomotives large and small" not long after. Boiler and frames were covered. castings supplied by Ashford models if my memory is correct. It is a superb design with a fairly big boiler supplying 1 1/2" cylinders and a 3" stroke 2-4-0 Beyer Peacock as I described in the ME&W last year.

The Mona design is of course the late great LBSC 0-6-2 in 3 1/2" gauge, also a fine locomotive. My own loco to Mike's design is

Mona after her original 1874 full-size sister.

These series of locos from Beyer Peacock were pretty much the same from numbers 1 "Sutherland" to number 9 "Douglas". Numbers 10-13 being longer wheelbase and larger boiler. 16 "Mannin" slightly bigger again.

I can supply pdf copies of Mike's Peveril with his Permission. Model Engineers Laser can supply laser cut frames. Usual disclaimer applies. Hope this helps.

Jim Woods, Otago, New Zealand

By an extraordinary coincidence (or the power of suggestion) this month's Club News features a photo of Mike's Peveril.

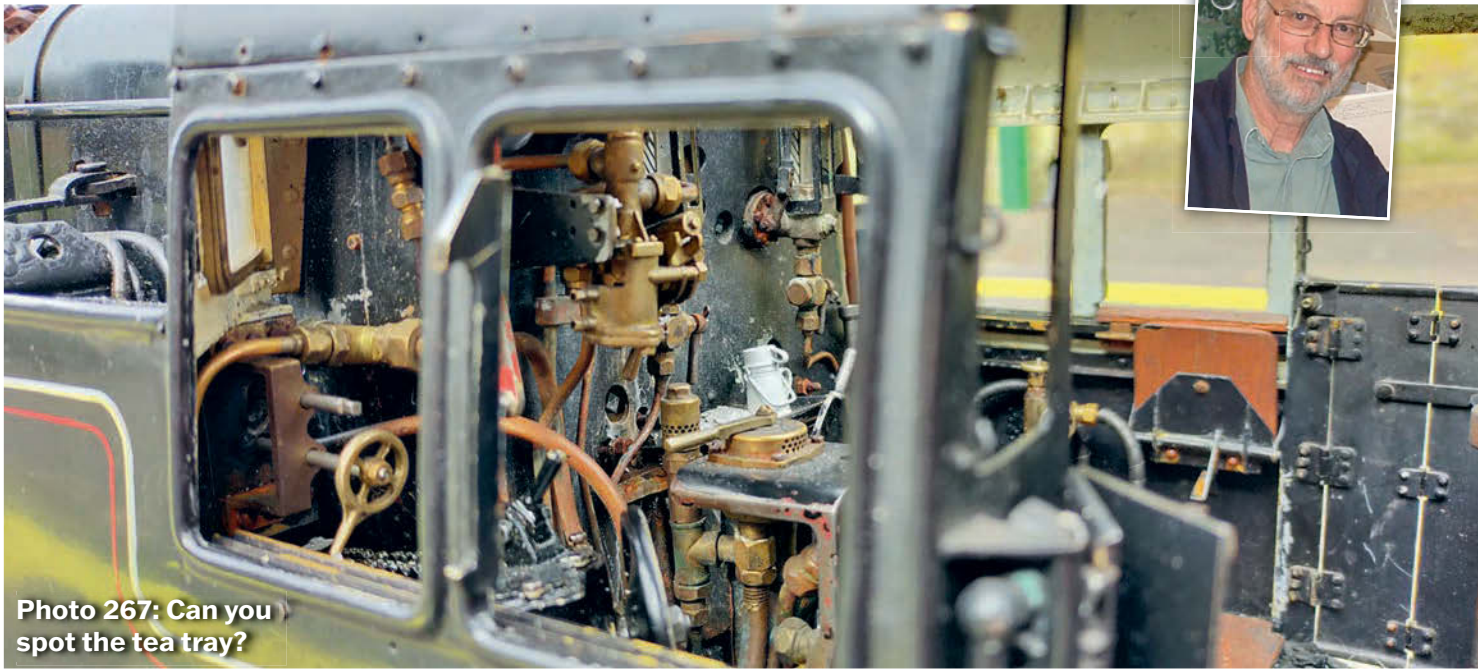
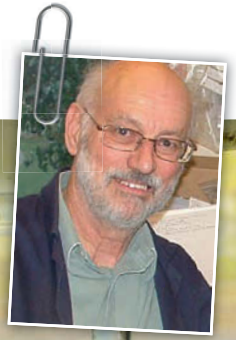


Photo 267: Can you spot the tea tray?

The BR Standard 2-6-0 Class 4 Tender Engine

Doug Hewson makes the fire hole doors and the all-important tea tray.

PART 28

We will now get on with the fire hole doors, and they are quite a tight squeeze so be warned. I have given the instructions of how to make them so if you follow those you should be fine. First of all, I made a template for flanging the backplate out of



Photo 268: Raising first steam.

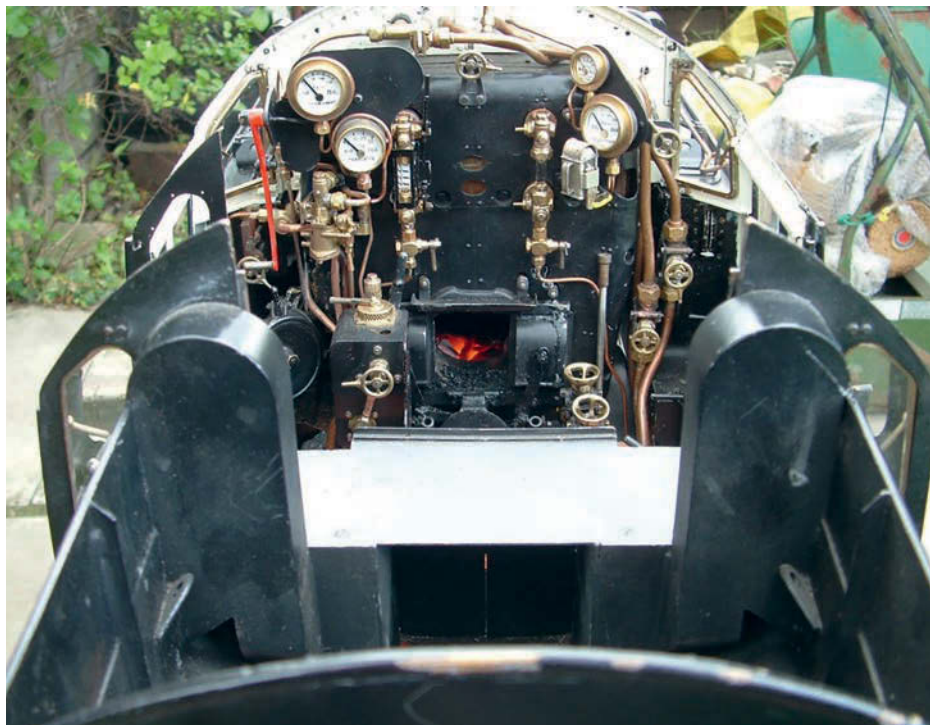
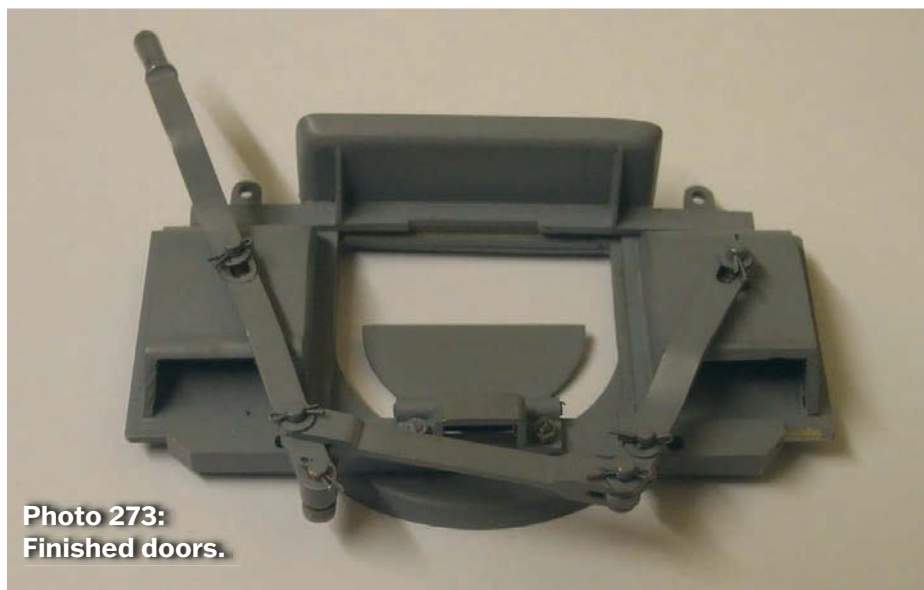


Photo 269: The fire is lit.



Photo 270: Flanging formers.



**Photo 273:
Finished doors.**



**Photo 274: Back
plates slit with a
piercing saw.**

¼ steel plate and also the tea can tray which is also a standard fitting. As I intimated, the fire hole doors are the same on all the BR Standards

so once you have seen one you have seen them all. **Photograph 267** is a peek in the window showing my tea can tray with tea can in place. It now



Photo 271: Components for door frame.



Photo 272: Door frame assembled and primed.

has that "Lived in look" about it. The other shots are just for the record, **photo 268** is me lighting the very first fire in my 4MT, very exciting and the fire now lit with about 25lbs on the clock, **photo 269**. I am old fashioned as I don't do Barrs and things like that, apart from propping one up very occasionally. **Photograph 270** shows the formers which I made for flanging the back plate and the tea tray shelf. I then turned my attention to making the frame for the doors and this **Photograph 271** shows the first stage of making those and the laminations with two pieces of 18swg strip and in the centre is a piece of 16swg strip so that the doors slide nicely. One this I made sure of was leaving a gap in the lower rail about ¼" wide to let any coal dust through. **Photograph 272** shows the frame and my tea tray mounted and its back plate now primed.

Following that I was determined to make a proper job of my fire hole doors and of course mine were the LMS type, **photo 273** shows my completed set of doors. I had seen a pair of doors somewhere en route, and they had louvres in the back plates, so I thought I had better copy them. First of all, I used a piercing saw with a fine blade to very carefully cut three sides of a rectangle in one of the plates, **photo 274** shows me cutting the 18swg stainless steel sheet down two sides and what

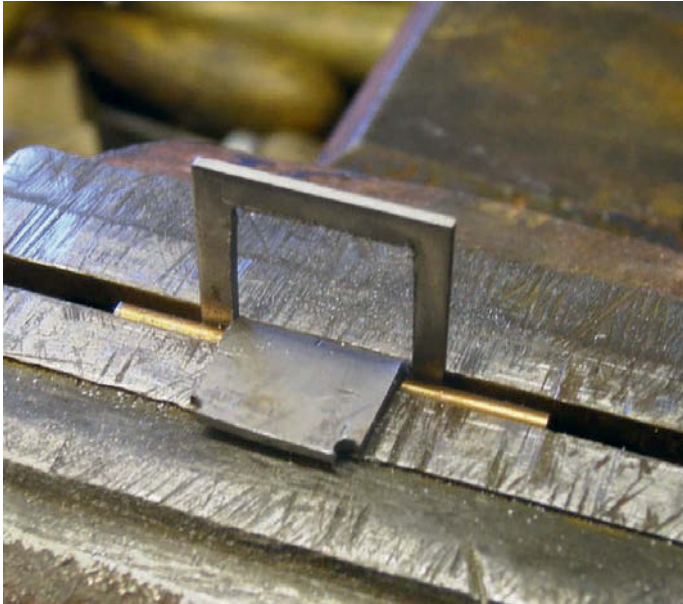


Photo 275: First fold.

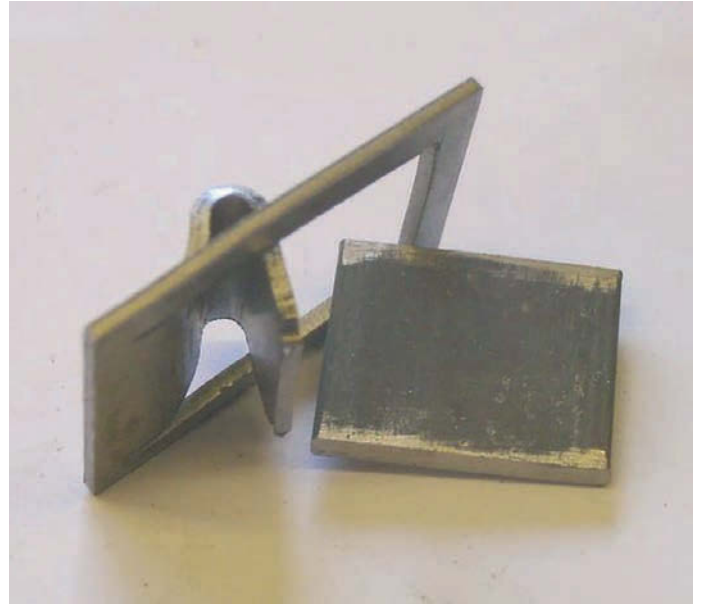


Photo 276: Shaping louvre.



Photo 277: More progress.



Photo 278: Inside view of finished (and track proven) louvres.

will become the bottom end of the door. I then bent it back 90° using a piece of 3/16 brass round, **photo 275**. I then needed to bend the plate back at 90 degrees to form the first louvre. Now, in case you hadn't noticed before there is a slight beading along the bottom of the doors, so I put on my forging hat and forged the beading on to the bottom edges of the bottom edges of the outer door plates before any of the silver soldering was carried out. For those in the know this is called 'upsetting' the edges of the plates, in blacksmithing terms. **Photographs 276** and **277** show the bending of the plate into the other three louvres. Anyway, as long as you can see a bit of beading it doesn't really matter how you form it. At this stage I also added the side walls of the doors which lean inwards by 5° or so, so I made a very simple jig for those as I wanted

them all the same of course. I then made the second louvres and bent those in the same way as I had done them before and made them match. To make the Western Region doors all you require is a couple of 18swg stainless plates and all you need is a couple of 3/16 holes drilling in the back plate for the air vents. **Photograph 278** shows my fire hole doors from the inside after the loco had a few years under its belt. I just took the opportunity to include another photo which Andrew sent me **photo 279**, (by Toddington Standard Loco Ltd). and that was the



Photo 279: Full size fire doors. Photo Toddington Standard Loco Ltd.

Western Region doors which will be fitted to our adopted loco 76077. Looks a bit like they haven't used the correct pattern the right-hand door! Oops.

To be continued

A Tailstock Handwheel Dial

Graham Meek describes his design for an adjustable tailstock handwheel dial for the EMCO Compact 5.

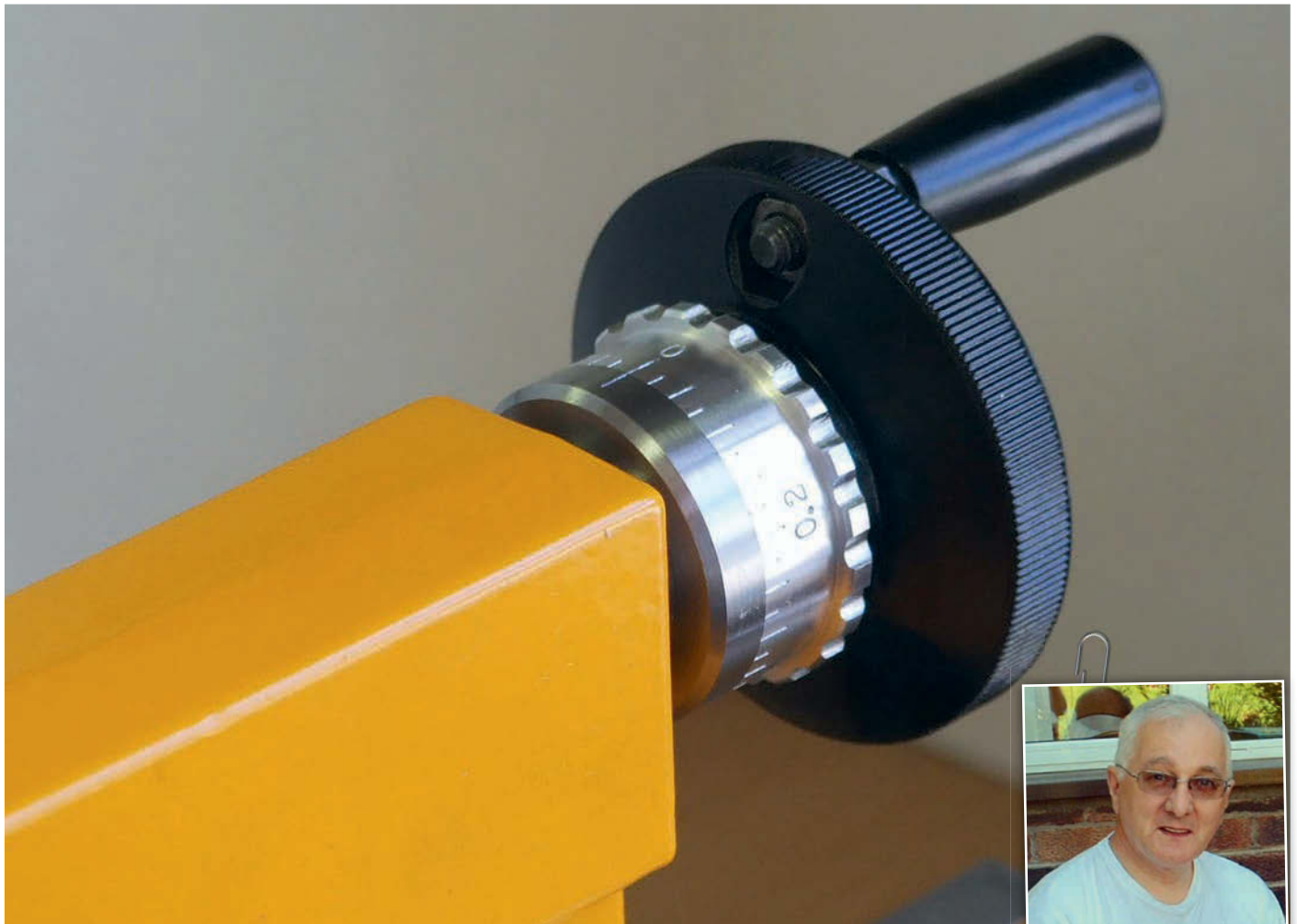
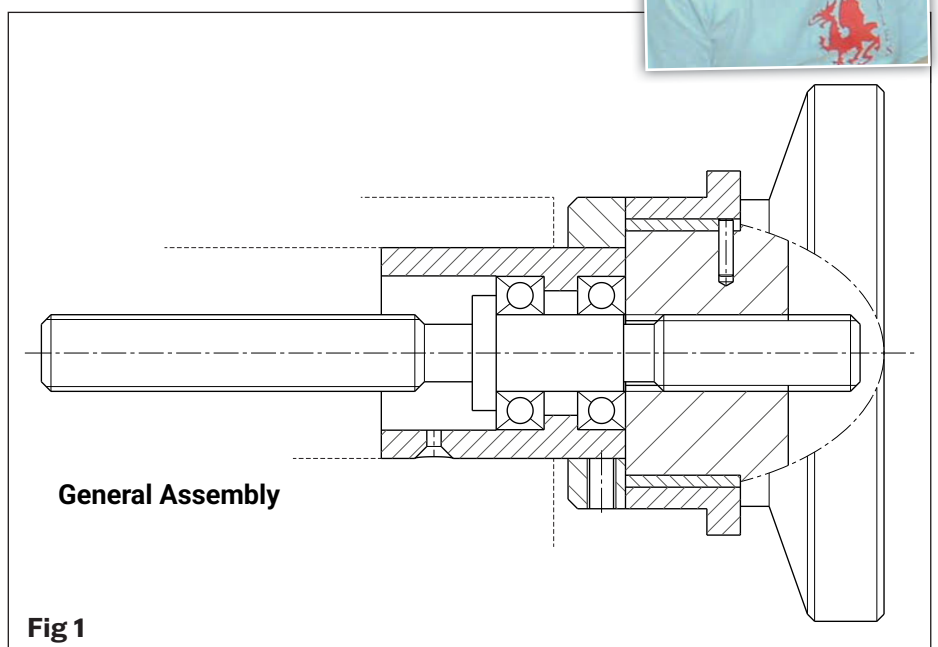
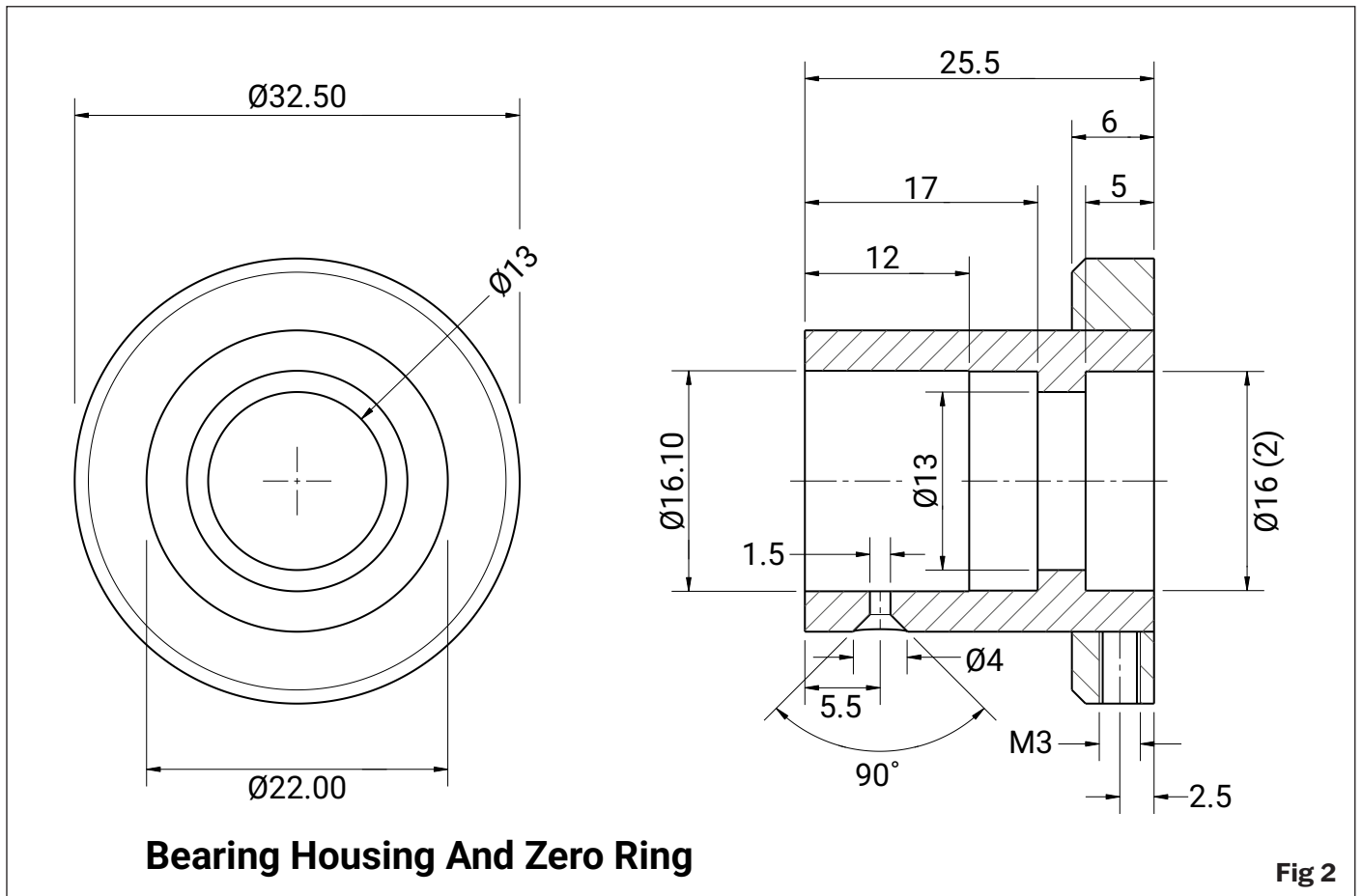


Photo 1: Finished C5 Tailstock Dial.

The decision by EMCO not to fit an adjustable dial to the tailstock of the Compact 5, (C5), was done, I presume, purely because of cost, as the style of dial used on the C5 would have required another plastic injection mould tool to be made. This does seem odd given that every other manual lathe in their line-up at the time all had a tailstock dial. Even the lowly Unimat SL, 3 and 4 had one.

Given I am used to having this feature on my lathes and using it quite a lot during my work, it was not going to be long before a dial would have to be added to the C5 tailstock handwheel, **photo 1, fig. 1**. To enhance the tailstock feed and feel, the decision was also taken to add two 6882RS radial ball races to the feedscrew bearing. This does entail a new feedscrew and bearing housing, **figs 2 and 3**. This





Bearing Housing And Zero Ring

Fig 2

can however be omitted if the reader desires. I must add the difference this modification makes to drilling larger holes and ejecting Morse tapers makes it well worth the extra work involved.

For those making the additional parts, do not be inclined to make the ball races a press fit in the housing, or onto the new feedscrew shaft. A good sliding fit with no shake or side play is all that is required. Remember, there might be a need to get these bearings out one day.

A steel sleeve is made to carry an aluminium dial, **figs 4 and 5**, on the plastic Emco handwheel, see John Slater's exploded diagram, **photo 2**. The plastic handwheel needs skimming



Photo 2: Compact 5 tailstock, Courtesy of John Slater.

on the existing dial diameter to take this sleeve. This diameter on the Emco handwheel is currently far from round, or parallel. To ensure the concentricity of the machined sleeve diameter with the thread, this is best machined on a screw cut mandrel. Trying to grip a very flexible plastic handwheel in the chuck

and hoping it will run true, is a tall order. The steel sleeve incorporates the friction element for the dial, and this is the same design as that used on the Myford Super 7 handwheel dial. The sleeve is bored to a nice slide fit on this new diameter and is stopped from rotating by a 1.5 mm diameter snug



Photo 3: Engraving the dial.



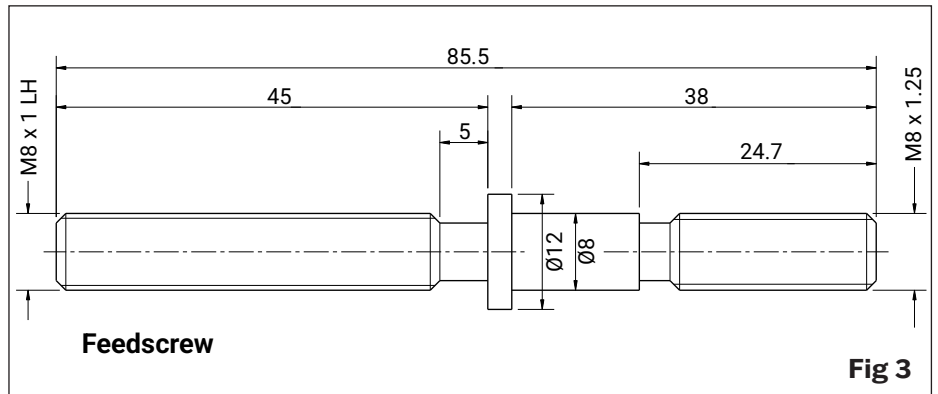
Photo 4: Super 7 Stamping Fixture.

that is pressed into the handwheel and a cut-out in the sleeve. Ensure all burrs and sharp edges are removed after the slitting operation, which is best carried out using a small fixture. Locate on the inner diameter and use a small snug to stop the sleeve rotating during slitting. A washer and stud inside the sleeve will hold the sleeve securely but be sure the stud position will miss the slitting saw.

I have found scallops work best for aluminium dials as knurling tends to fill up with debris which looks unsightly after a while. Don't be tempted to make this dial too good a fit on the steel sleeve. A 'classy fit' in the Summer can become a 'tight fit' during the winter months. A clearance of around 0.05 mm would be best. The dial diameter is best left oversize by about 0.1 to 0.15 mm, more later. Graduating the dial was carried out using the Emco C5 dividing attachment fitted with my 40:1 dividing attachment on the Proxxon Mill, **photo 3**. The engraved lines will need to be engraved slightly deeper due to the material left on the dial, (half the amount that is). The tool used has a 40-degree included angle and a small flat on the end approximately 0.15 mm wide. This means the engraved lines do not have to be too deep in order to get a decent width.

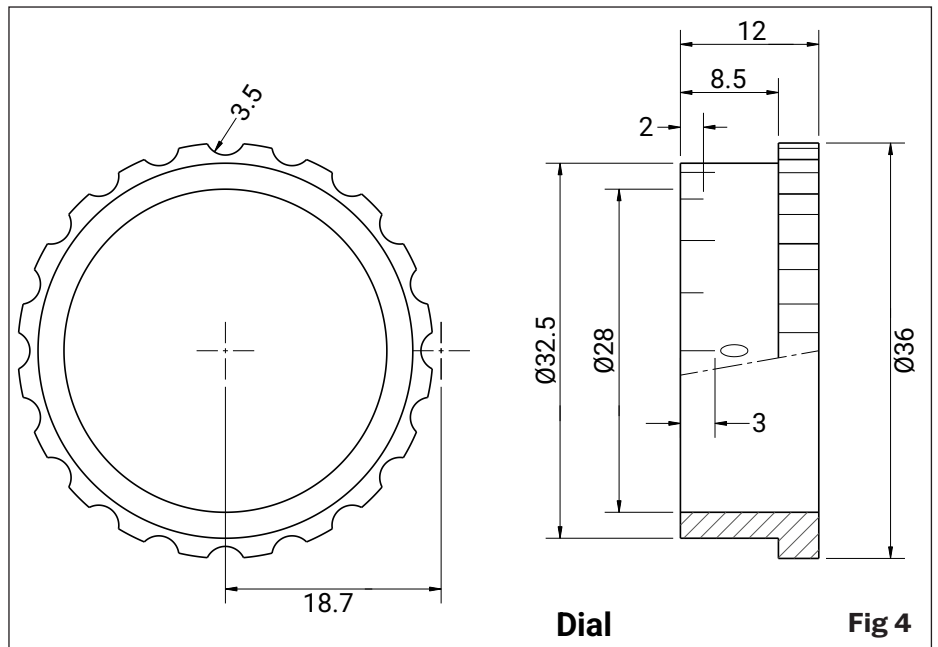
Stamping the numbers was done using my trusty Super 7 stamping fixture, which was suitably adapted to take the new dial and position the stamp in the correct position, **photo 4**. To take the burrs off from graduating and those thrown up from the stamping, the dial is mounted in the lathe on the mandrel used to graduate the dial. It goes without saying that this mandrel needs to be running true, or the reader may find the graduations are deeper on one side of the dial than the other. A honed HSS tool is best used for this task along with light cuts and some WD40.

Assembly is pretty straight forward. The friction lever is prised out little by little until the desired 'stiction' is reached. If this is overdone, slip the sleeve off and tap the lever gently



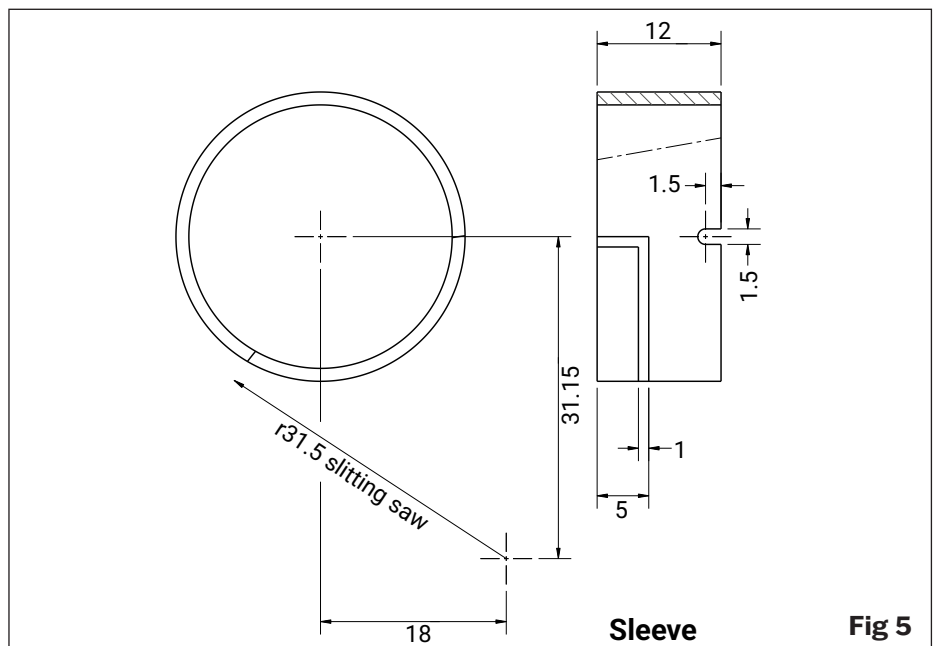
Feedscrew

Fig 3



Dial

Fig 4



Sleeve

Fig 5

with a plastic mallet. Refit the sleeve and set the adjustment again. Finally when the desired feel is reached lubricate the parts with some grease, like Castrol LM. I know this sounds all wrong but if anything the grease will

add some additional drag as well as stop any galling of the sliding surfaces. There will be no gain in pre-loading the ball races when fitting the handwheel. The adjustment only needs to take out any sideways play, nothing more. ●



One of the competition runs at IMLEC 2025

IMLEC 2026

The 56th International Model Locomotive Efficiency Competition will be hosted by the Sheppey Miniature Engineering and Model Society on the 7-9 of August.

MLEC is one of the highlights of the live steam model railway year. Although it's not normally a competitive hobby, as number of events take place where locomotive drivers compete to pull a train headed by a model steam locomotive as efficiently as possible. The small scale (and the fact that model engines are primarily designed for pulling power rather than efficiency) mean that the efficiency is typically very low – often under 1%. With careful preparation and skilled driving, it's possible to conserve fuel, make the best use of steam and achieve higher figures, sometimes 3% or more. IMLEC focuses on larger passenger hauling locomotives in 3 ½" and 5" gauge.

Last year's event in 2025 included a long incline, which proved challenging for many entrants. The first place for 5" Gauge Locomotives was won by Ben Paviour, of Southport Model Engineering Club, his third IMLEC win. He drove his LNER Q5 based on LBSC's *Netta*, pulling five adults, one of the largest loads in the competition while carefully keeping his coal use down to 1.175lbs achieve efficiency of 1.589%.



Photo 1: An aerial view of the Sheppey MEMS track at Barton's Point.

First Place in the 3 ½" Gauge Locomotive class went to Peter Wardropper, of the Society of Model and Experimental Engineers. His *River Darenth* to LBSC's *Betty* design was run light, with no passengers, but the second lowest coal use of any finisher meant he achieved an efficiency of 0.84%.

Regular readers will be aware that due to various constraints we have struggled to find a club with both the resources and ability to host IMLEC in 2026. I'm delighted to report that the Sheppey Miniature Engineering and Model Society (SMEMS) have stepped up to host IMLEC 2026 at their excellent track.

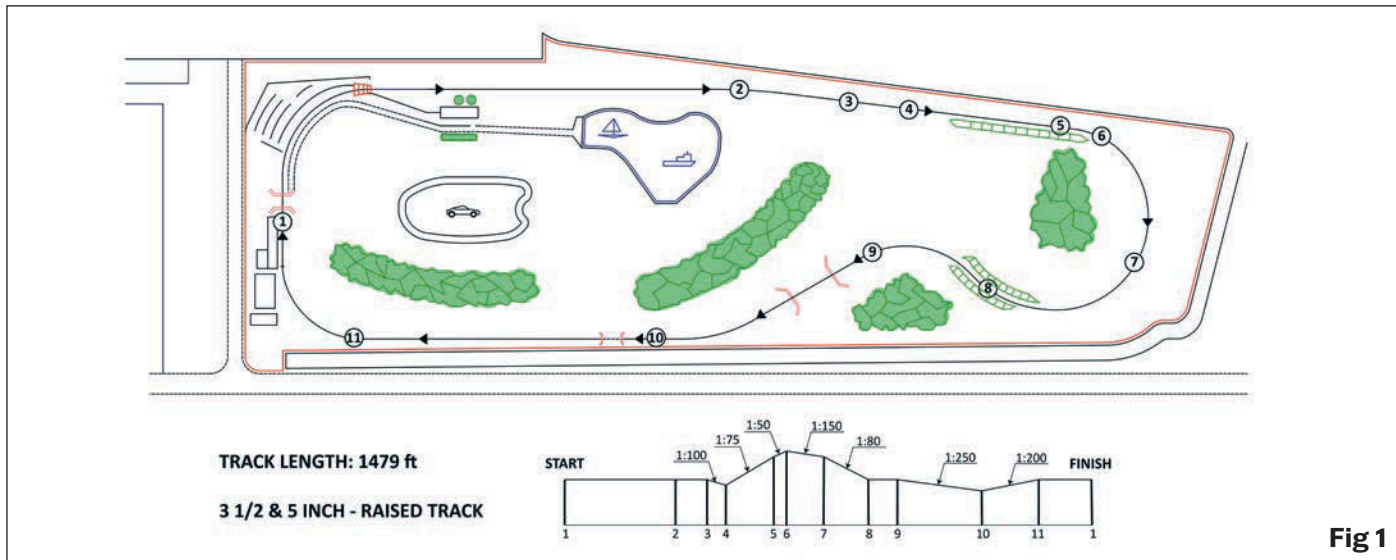


Fig 1



Photo 2: The club's preparation tracks.

**ROBERT DAWSON,
 CHAIRMAN OF SMEMS
 IS PLEASED TO INVITE
 ENTRIES FOR THIS
 YEAR'S COMPETITION:**

The Sheppey Miniature Engineering and Model Society will host IMLEC 2026 over the weekend of 7th 8th and 9th of August. With no other club holding the event this year we have been asked to step in at the last minute, and we are working hard to make it happen, there is lots to do so please bear with us.



This is rather later in the year than usual, in order to give the club adequate time to organise this most prestigious model locomotive driving competition.

The track is set in a large, rural park between Minster on Sea and Sheerness on the Isle of Sheppey in Kent, **photo 1**. Bartons Point Coastal Park has a large lake with the boat house café, a children's play area, free car park and public toilets are all close to the railway. The park is also home to Bartons Point Model Flying Club and Lazer Model Sailing Club. Next to the railway is a separate compound and building belonging to the Sea Cadets and Royal Marine Cadets.

SMEMS TRACK LAYOUT

Established at a Sheppey school in 1978 the track was constructed on our site during 1980/81 to a length of approximately 1,000ft and later extended to 1,479ft. We have a Station House, Club House, storage building and carriage tunnel store. The Steaming Bay has an unloading plate, a transporter to move locomotives from the entry track to the preparation tracks, **photo 2**, of which there are three, plus one shorter one. There are clip on 12v connections for steam raising blowers and two water hoses. the track is entered by the traverser, which also brings the carriages onto the running track. There are no major inclines, but drivers will find it an interesting drive. Please see the track plan, **fig. 1**.

**INFORMATION FOR
 ENTRANTS AND
 VISITORS**

Members of SMEMS welcome all IMLEC 2025 entrants as well as family and friend spectators.

All information for IMLEC will be posted on our website as it becomes available from the organizing group. We also aim to send out all the information as one package by email by

mid-June. Please email smemsmail@talktalk.net to register your interest.

For those wishing to stay on site we have two large areas inside the track for camper/caravans and tents. if you would like to stay, please let us know. We have added an IMLEC page to our website at www.sheppeymodelengineering.co.uk.



For those who may wish to book hotel or B&B we have listed several venues on the website page.

GETTING THERE.

The Island is served by two bridges, the main one being the Sheppey Crossing this is a high-level dual carriage way of the A249, which connects with the M2 near Sittingbourne and the M20 near Maidstone. Our postcode is ME12 2BX, the Boathouse Cafe being the nearest building given on sat nav. Full directions can be found on our website.

You can also find us on Facebook and there are several video clips on you tube. if you are entered into the competition, good steaming!

**SUBMITTING YOUR
 ENTRY**

If you want to receive the information pack, including entry forms, please send an email to smemsmail@talktalk.net.

If your hobby includes any aspects of engineering, the **ME&W** will have much to interest you in its pages. Bigger than either of its predecessors it has the space to cover all aspects of model engineering from traditional live steam models to gas turbines, from clocks to toolmaking. We look in depth at the skills you need to get the most out of your hobby: using maintaining and improving lathes, mills and other workshop machines such as 3D printers and CNC. We also cover the widest range of workshop activities – traditional ones like casting, brazing and welding to modern skills like using embedded electronics. Finally, we keep you up to date with what's happening in the world of hobby engineering with our event reports, news features and reviews.

Neil Wyatt

Editor

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The Silver Crest BR Class 1500

PART 3

Mark Thatcher builds a 5" Gauge Live Steam BR Class 1500 loco kit from Silver Crest Models. This month he covers the cylinders, slide bars, smokebox saddle and boiler test fit.

Welcome back. I hope you are enjoying this build series. So far, it has been very plain sailing even for me, but that was all about to change as I dealt with fitting the final connecting rods to the cylinders, slide bars and had a go at setting up the wheel quartering – badly!

Also, I hit my first and only snag when it came to attaching the smokebox saddle. I think I was partially to blame but the instructions could have been clearer regarding this step, as I suspect many of these kits will find their way into the hands of builders with limited skills, like me. In that respect I guess I am Silver Crest's target customer. In

the end the solution was simple but alluded to a common thread that runs throughout this kit. Anyway, read on and I'll tell you more.

Each kit came with some very detailed instructions, plus copious pictures to aid the assembly process. There were also very useful CAD diagrams, which I probably ended up referring to more than anything else. The CAD for kit three, **photo 1**, really gave me an incentive to crack on with the build and offered a positive aiming point for me to achieve by the end of this kit. However, note it clearly showed the two exhaust pipes from the cylinders in place. I thought this was too early in the build as if I fitted

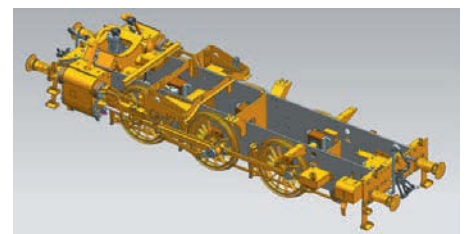


Photo 1: CAD view of the assembled chassis.

these now, I would not be able to fit the smokebox to the smokebox saddle in the next kit. The same applied to the two pipe cover plates that screwed down into place once these pipes have been fitted.

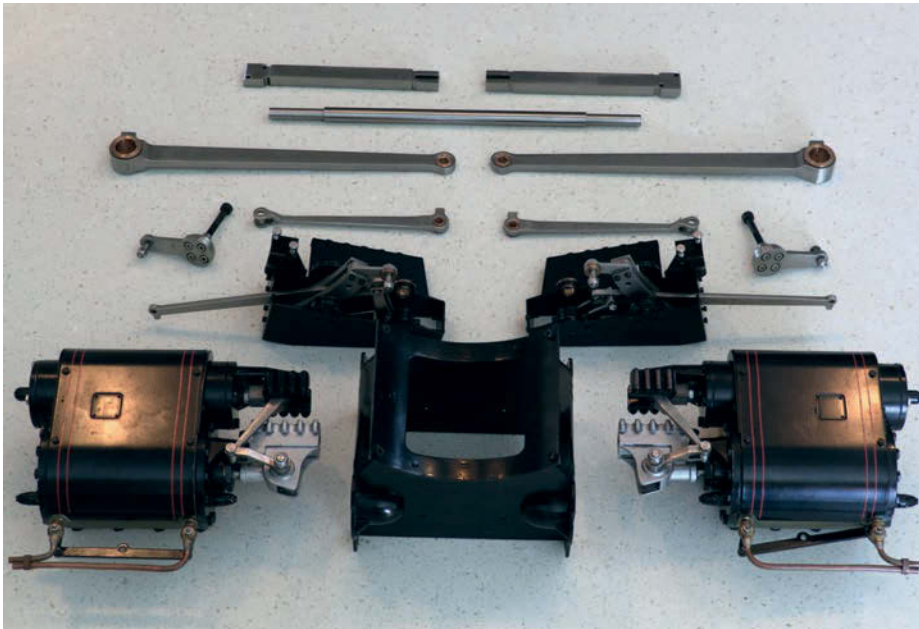


Photo 2: The contents of kit 3 seem fairly straightforward to fit.

The contents of this kit, **photo 2**, looked simple enough, but they did belie the involvement needed in order to fit them. Thankfully the reversing gear came partially assembled as did the two reverser pivot arms.

At the top of this picture are the two slide bars. These fit better one way round than the other. Below these is the weigh shaft which is

used to connect the two reverser pivot assemblies to keep the notched gearing in sync on either side of the loco.

You may find this CAD schematic interesting viewing, **photo 3**. There seemed to be an awful lot going on inside the cylinders. Silver Crest have taken the view that stripping these assemblies into their constituent parts

would be quite a job, and it would also be quite an ask for the inexperienced builder to put them back together again. I, for one, was very grateful that these cylinders arrived complete and as functioning sub-assemblies, **photo 4**, so all I needed to do was to bolt them into position on the outside of the frames.

Photograph 5 shows where the weigh shaft roughly located laterally through the frames and into the pair of reverser pivots and their brackets. Provided the connecting rods were positioned correctly and the pivot brackets were then connected to the connecting rod on the middle wheelset, the weigh shaft/pivot/bracket assembly seemed to work fine with both the pivots moving in tandem

Note that the reverser pivot assemblies were not handed but the connecting rods were, **photo 6**. The pictures in the instructions were not that clear for this stage, but the brass bushes on the connecting rods faced outwards with the oiling points being uppermost. I did manage to install these components the wrong way up at first, but after another careful look at the instructions I noticed I had installed the rods with the oiling points facing downwards - doh! The reverser pivots locate through the frames and are secured with a Nyloc nut and Allen

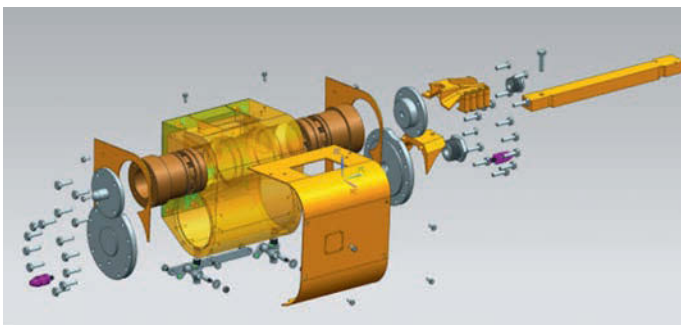


Photo 3: Exploded view of a cylinder.

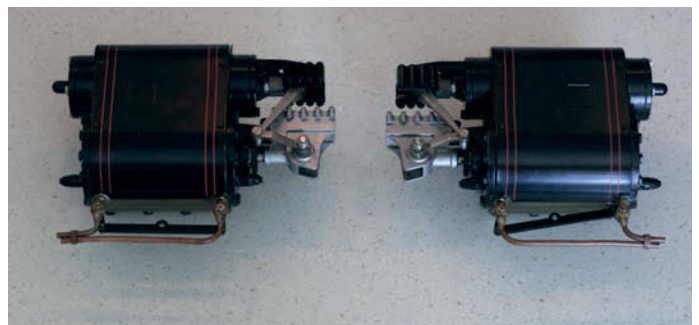


Photo 4: Cylinders supplied assembled.

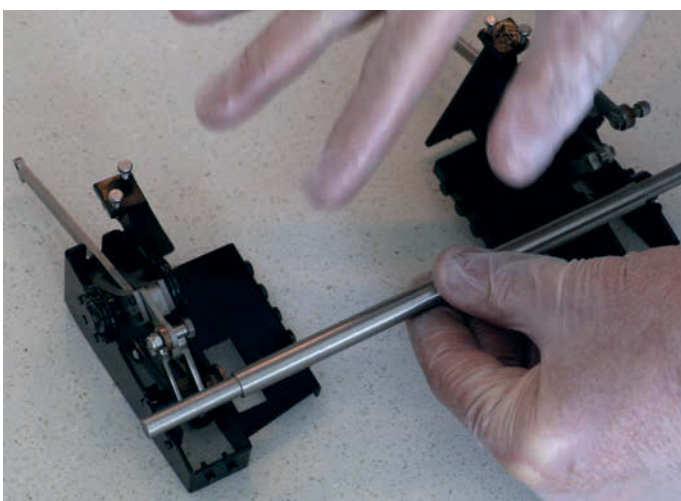


Photo 5: Offering up the weigh shaft.



Photo 6: Valve connecting rods, not oiling point at bottom right.

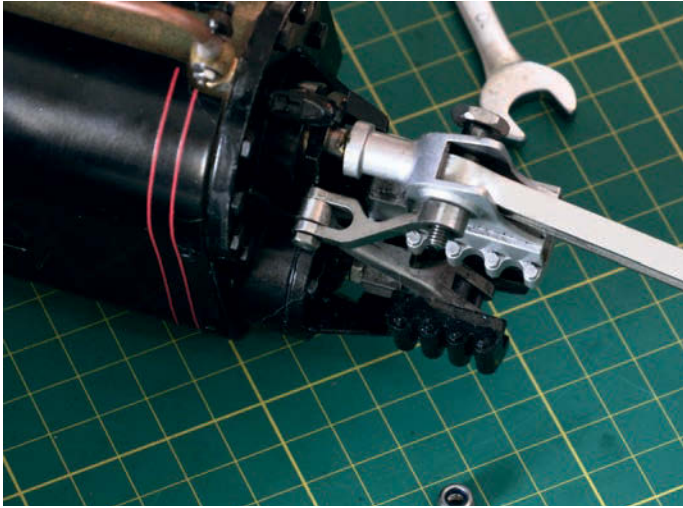


Photo 7: Fitting a rod.

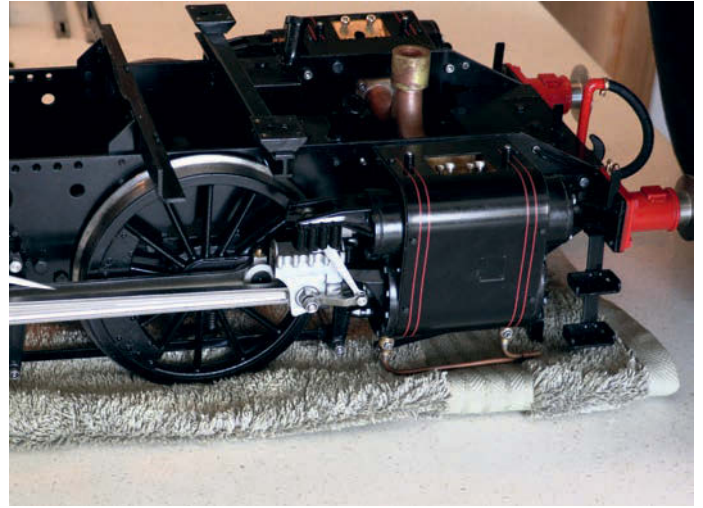


Photo 8: Ride hand motion fully forward.

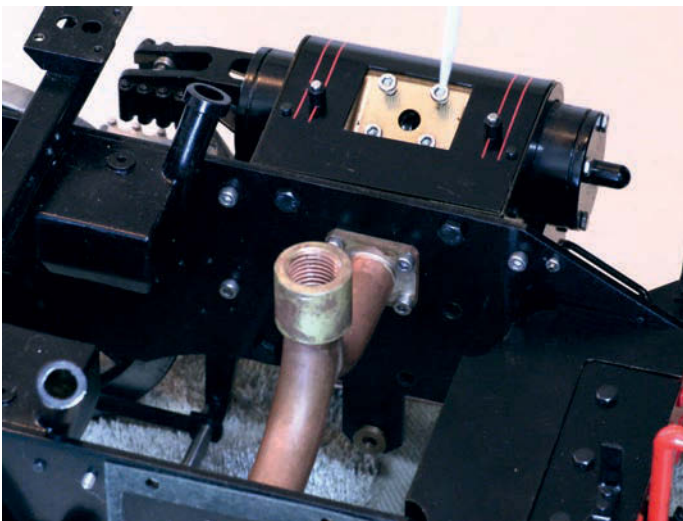


Photo 9: Pre-located bolts.

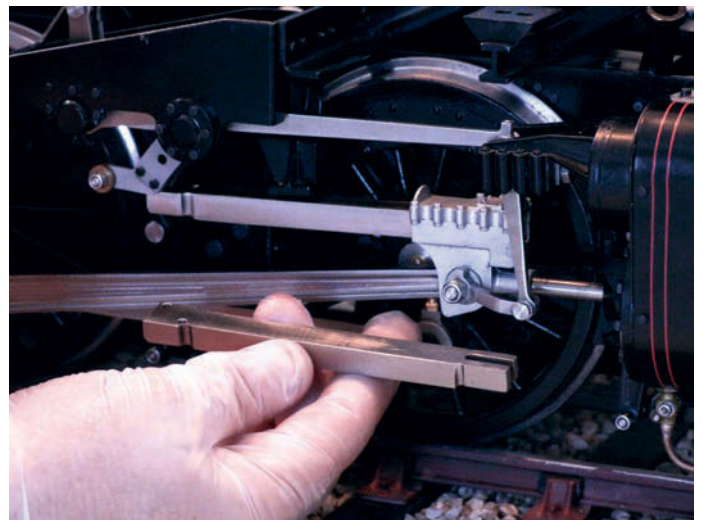


Photo 10: Orientation of slide bars.

bolt. These can be adjusted to set the timing, but as a novice I found some of the nomenclature in the instructions a little hard to comprehend

The instructions mentioned that it was easier to attach the connecting rods to the cylinders before mounting these to the chassis frame. As the wrist pins were already installed this was a simple nut and bolt affair, with the rods held in place with a bolt through to a Nyloc nut, **photo 7**. I recall the use of these nuts stimulated quite some conversation on YouTube in my series of build videos, not all of it positive, and many commentators did not like the appearance of these nuts on what essentially is a scale model kit. I suspect the assembly has been designed this way to keep things as simple as possible for the builder, although I agree a thinner nut and a spring washer would be more visually appealing

When fitting the cylinders to the frame, the motion gear needs to be rotated so the connecting rods are the furthest back they will go to the 9

o'clock position on the wheels when the chassis is viewed from the right. This made the fitting process easier and increased the available wiggle room to more easily allow me to bolt the cylinders into place. Once one cylinder was installed, the motion gear was rotated 180 degrees so the other cylinder could be attached. Here the right motion gear is at its fullest forward extension, with the wheels at the 3 o'clock position. Note the slide bars have not been fitted at this time, **photo 8**.

On the top of each cylinder were four Allen bolts, already loosely preinstalled into their threads, **photo 9**. This was a common theme in this kit, so as you pick up each sub-assembly, the bolts you require are already pre-located for you, so you are not sorting through a myriad of bags trying to find the right ones. As I said earlier, the CAD shows the steam pipes from the cylinders being fitted in this stage, but I thought it was too early in the build for these components to be added, so I left these off.

The orientation of the slide bars is shown in **photo 10**. This step nearly caught me out as whilst they were not handed, the front end has a slot, and the rear is screwed into position with the flange to the outside. However, in this orientation either slide bar could be installed on either side of the model. But when I tried to fit one, I felt a slight binding. So, I tried the other and it was a perfect fit. Remember, these are well engineered kits but not made to quite the fine tolerances you might get if you machined each part yourself. But, as this once was a built-up RTR model, only to be taken apart at the factory for me to reassemble, it had to go back together one way or another!

The slide bars are secured at the rear onto a bracket by two bolts inserted into pre-threaded holes in them, **photo 11**. Whilst I knew they would not be going anywhere; I added a nut to the top of these for extra security. I would have preferred these slide bars to be bolted in from the top, not the bottom. An old engineering friend once said, it is far better for a bolt to go in from the



Photo 11: Rear fixing of slide bar.



Photo 12: Reversing brackets and weighshaft.

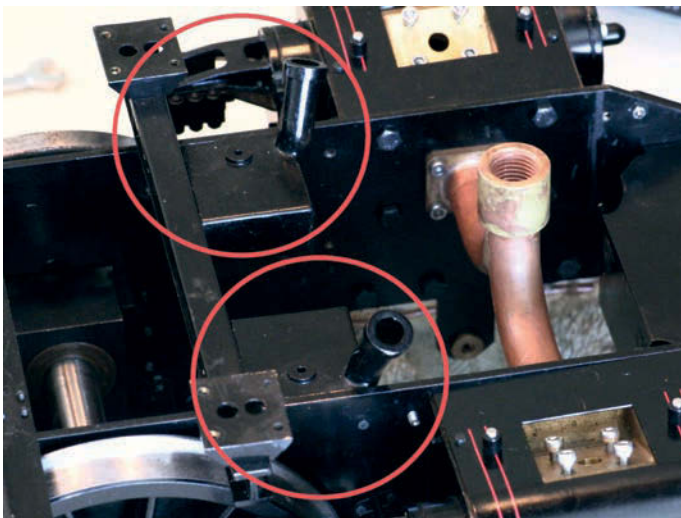


Photo 13: These sand boxes would have to come back out.

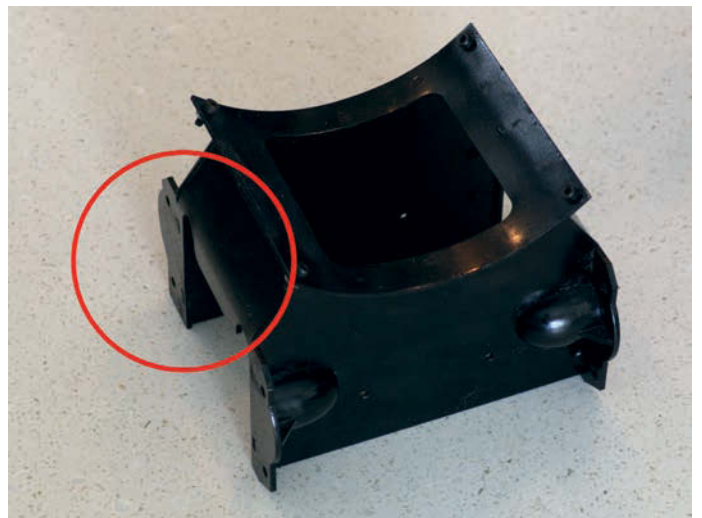


Photo 14: Rear lug has square bottom, the front one has a bevel.

top, as if the nut on the bottom works loose, the component is still held in place by the bolt, albeit loosely. I never forgot that piece of advice.

Photograph 12 would soon become the last close look at the arrangement of the reversing brackets and weigh shaft as soon these would all be hidden by the boiler. In order to support the boiler, I added the two front boiler supports next. They just simply bolted onto the frames. It was worth paying careful attention to the orientation of these parts and to note the profiles of them as they are slightly different.

Now, here is where things got a little eggy, although after I figured out what was going on, the solution was incredibly simple! Whether this was my error or not, it was clear that the two sand boxes that I had already fitted to the inside of the frames, **photo 13**, would have to be removed if I had any hope of locating the smokebox saddle. However, after I did this, the saddle still refused to slide into place and I could not figure out why, plus the instructions offered

me no guidance. So, like any other 'model-engineer-in-training', I walked away, put my thinking cap on and attended to other matters!

It is pretty hard to see, but if you take a close look at the bottom profile of the lugs on the smokebox, **photo 14**, the eagle-eyed amongst you will notice they vary slightly at the bottom. Here we are looking at the left-hand side with the part orientated so the lug that is circled with the square bottom fits to the front of the loco. You may notice that the other lug has the slightest 45-degree angle to it at the bottom. This cut-out must go to the front. You may have thought after I had spotted this, that would resolve the issue, but there was another thing that compounded matters.

Whichever way round I tried to drop the saddle into place, it simply would not fit. It was at this point I noticed two grab rails to the outside front of the frames! Yes, they were the culprits and here is what I think happened. These grab rails were removed at the factory in order to release the smokebox when

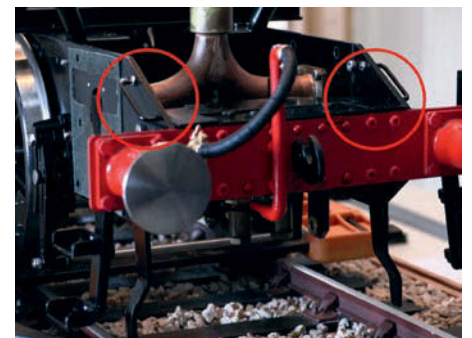


Photo 15: These grab rails had to be removed too.

taking the loco apart. Then someone rather helpfully reinstalled the rails for safekeeping, **photo 15**, but without telling anyone they had done this. I guess when the pre-production control model was built by Silver Crest back in the UK, that this was not picked up on and that is why any instructions on how to fit the saddle never made it to print

Despite these few frustrations, I was once again, pleased with the outcome of this stage of the build. It also gave me a chance to do a test-fit of the



Photo 16: Offering the boiler up to the chassis.

boiler to see where everything else would go later on, **photo 16**. During this process I realised I was building a behemoth of a kit – well for me at least. Yes, it is ‘only’ 5” and not 7 1/4” gauge, and yes, it is ‘only’ an 0-6-0 tank loco and not an A3 Pacific tender loco, but it still weighs in at 51kg, which is far more weight than I can comfortably manage. I once asked a model engineer with a much larger loco how he moved it around. He replied “With great care!”

HAVE I LEARNED ANYTHING?

I believe I have. Firstly, I took my time, and I did not force anything into place. The designer, Mike Pavie’s mantra has always been that as this loco was taken apart at the factory, then it must go back together again.

Also, both sides of the model are not necessarily equal. Whilst having neither the skills nor the tools to build various individual components, I am just happy to have them in my hand, but also, I can now appreciate there are very slight tolerance differences in the final fit-out. These may only be micro-millimetric variations, but they can make a difference between a good fit

and a tight or sloppy fit. So, it may be stating the obvious, but if one part will fit either way around, try both ways as one direction could be a better fit than the other.

Finally, I am beginning to realise who this kit is really aimed at – me! If I can build this, even with a little head-scratching along the way, then I am sure even the most inexperienced of model engineers could too. The whole kit is being assembled on the 1.2 metre square central island unit in my kitchen with only the most basic of hand tools. Yes, I could not resist buying a few tools like ball-ended Allen keys (that I admit I had never heard of prior to undertaking this build), plus a set of Allen bolt drivers to make the assembly process a little quicker and a bit less fiddly, but that was about it, as the other basic tools I already had to hand.

I will round off with what may be a contentious statement. The average age of experienced model engineers is increasing. Their own projects often remain unfinished due to general time constraints, the length of the build and the life expectancy of the builder. Is this hobby a dying art – literally? Younger generations seem to be more focussed on digital technology & digital media and will readily indulge

in passive activities of playing games on-line, rather than actively choosing to understand how to make stuff.

So surely, whilst kits like these may not be perfect, or indeed up to the standard of an ME-built model, they do provide a toe-dipping exercise into this great hobby for people who may otherwise choose to avoid it. And surely this can only be a good thing. Will perhaps the kit builders of today choose to hone their skills over time and become the model engineers of tomorrow?

NEXT TIME...

I will be adding some of the pipework to the underside of the frames, plus adding the footplate. I will put my own spin on the fit and finish of this part, so please join me then. Also, I will attempt to wrap the boiler, and if time allows within these pages, add the smokebox too.

If you would like to contact me personally, I can be reached on the **Unofficial Mamod & Other Steam** forum. You will need to join then you can PM me, but it is free to join and a great forum to be a part of in any case. So, until next time, happy steaming!

To be continued.



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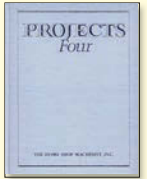
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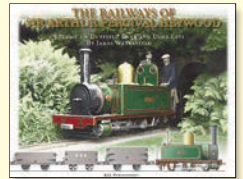
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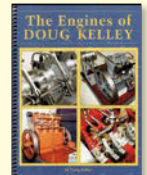
Step by Step Metalwork 3 • £18.90

If you are taking your first steps in model engineering this is a very good place to start. Why? Well when it was originally published in 1972, author Kenneth Wells was the Master in Charge of Metalwork at a school in Portsmouth, and this was actually the third, and last in a series which came from the designs and instructions he produced for pupils in his classes. Some use of workshop machinery is needed to complete these models, although a mini-lathe will cope with the machining. Alternatively, join a model engineering society with workshop facilities, or evening classes and have supervision to hand. This book can certainly start you on a wonderful hobby! 94 landscape A4 format pages, with considerable number of drawings, and B&W photographs which clarify the instruction. Spiral bound with acetate outer covers. The first two volumes, and this third volume, are available as 'Digital Editions'; full details on our Website in the 'Digital Editions' section.



The Engines of Doug Kelley • £28.78

From the pages of 'The Home Shop Machinist' come full drawings and building instructions for four IC engine models from Doug Kelley. All four are scale models and are: The Snow, a Tandem, Double-Acting Engine, the Two Cylinder Nash, the Bruce Macbeth 4-cylinder upright, and the horizontal two cylinder Titan 50 HP engine. All these engines feature a cylinder bore of around 1" and with the exception of the flywheels are designed to be fabricated. The presentation of all four designs and the drawings is impeccable, and the dimensions are in decimal inches. They certainly are not designs for beginners to model engineering - as it says in the Introduction, building any of them 'will challenge your machining prowess', but you will end up with a very attractive model. 116 pages, full drawings and numerous colour photographs of parts, machining set-ups, and prototypes. Spiral Bound.



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WOE TO RONTAGO

Gerard Dean took a trip from Oz to Ontago, New Zealand to find out more about model engineering in the antipodes.

Funny thing life isn't it – a chance encounter and now I'm driving a truck south out of Auckland headed to a place I never heard of until a so-called mate of mine, Ron Savage, convinced me it was worth the 1600km drive.

I met Ron at the Melbourne Society of Model & Experimental Engineering Society meetings and we got on OK ... just OK. I say that because every year he rabbitied on (Aussie term for talked a lot) about this model engineering club nobody had heard of, in a city nobody heard of, in a thin long island somewhere east of Australia. It has to be said – he kept telling us about the Otago Model Engineering Society located in Dunedin on the South Island of Kiwiland (New Zealand for our American readers).

Ron's passion is Tether Car Racing where crazy modellers fling cars around a pole at over 100 mph which explains a lot about Ron. It turns out that Ron designed the tether car timing system for the Otago club, hence his regular annual visits across the Tasman Sea. That's OK as far as it goes, but Ron then went on to tell us that the club had a sailing lake and a railway track for 3 ½", 5" and 7 ¼" gauge trains.

Yeah, sure they do Ron. But he kept on spruiking the Kiwi club adding that they have a library, a model display hall, model train layouts and then the final detail which we knew was impossible – a carpeted meeting room with a fridge!

A carpeted meeting room with a fridge was the final straw – Ron had gone too far. After all our society, the MSM&EE turns 100 years this year

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1



3

and we have a celebrity visiting our 100 year Let's Make It Exhibition – Mr Neil Wyatt, editor of this fine publication. How could the Otago Model Engineering Society have all this stuff when all we own is a book case!!!

So when Ron bailed me up, (Ned Kelly said that – with a Colt revolver in his hand!) and floated the idea of my V12 powered Tiger 141 invading Kiwiland, I jumped at the idea and begged Celeste at my company to get the Tiger sea freighted to Kiwiland! What Ron didn't know is that I told our other mates at the club that, on my return, I would reveal the truth about this so-called 'wonder club' at the bottom of the world.

After two days of hard driving I arrived in Dunedin. Usually a 1600 km drive is nothing to us Aussies, however, the roads in Kiwiland are bendy and winding and truth be told, a lot more interesting than driving across the



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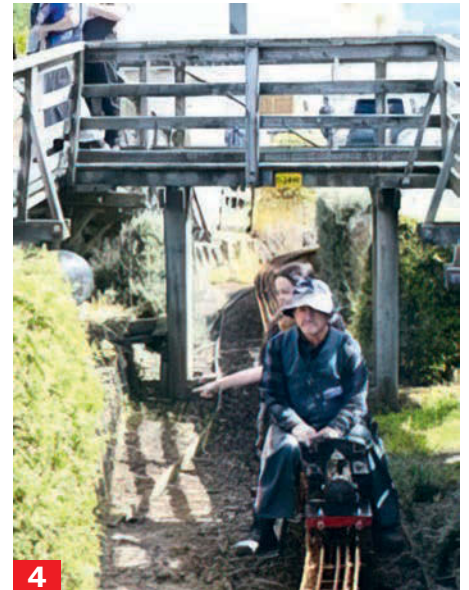
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Nullarbor Plain in WA or for that matter, from LA to NYC back in 2012.

On arrival, I dropped into the Otago Model Engineering Society club rooms to check them out. The door was open and a bloke said, "G'day Gerard – we've been expecting you". Looks like Ron had warned them about my mission. I was given a tour and that evening met Ron who had just arrived from Oz (Australia for American readers). I then excitedly told him about my tour of the Otago club – it started like this, "Hey Ron, you are not going to believe this – the club has a sailing boat lake, a railway with 3 1/2", 5" and 7 1/4" gauge tracks, a tether car track..."

Ron smiled at me and shook his head. The next day the fun began so I will let the photos tell the story but before I do, check out the official poster, **photo 1**, then check out the real poster, **photo 2**.

On the drive south I hung a few posters on the front door of the New Zealand Army Museum and in the main streets of Wellington, Blenheim, Christchurch and finally Dunedin, scene of the great battle to come. I am pretty sure that the poster prompted



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many Kiwis to attend the Otago Model Engineering Exhibition – well, maybe a few - OK, one or two – you get the picture.

Maybe Ron was right! Check out the amazing Otago Model Engineering Society Exhibition! **photo 3**.

First up, the railway lines wind around the grounds giving views of the distant hills and valleys and the boating lake, **photo 4**.

Live steam from American, British and New Zealand made diesel electric locomotives, **photo 5**. The Australian K class steam locos must have been in for maintenance!

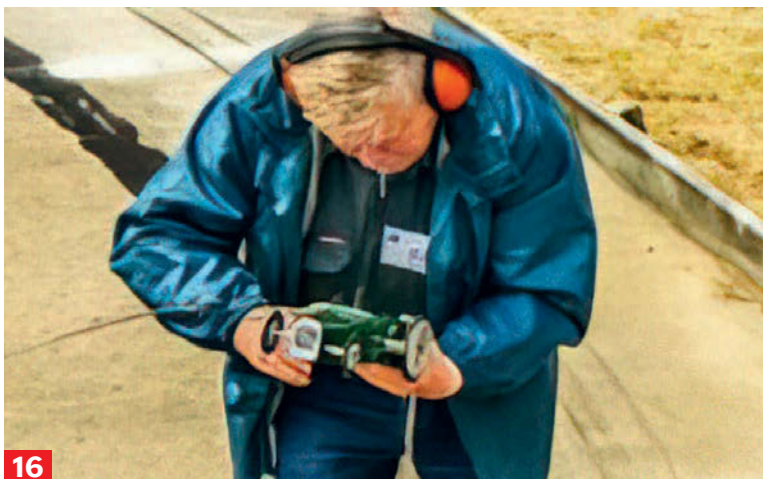
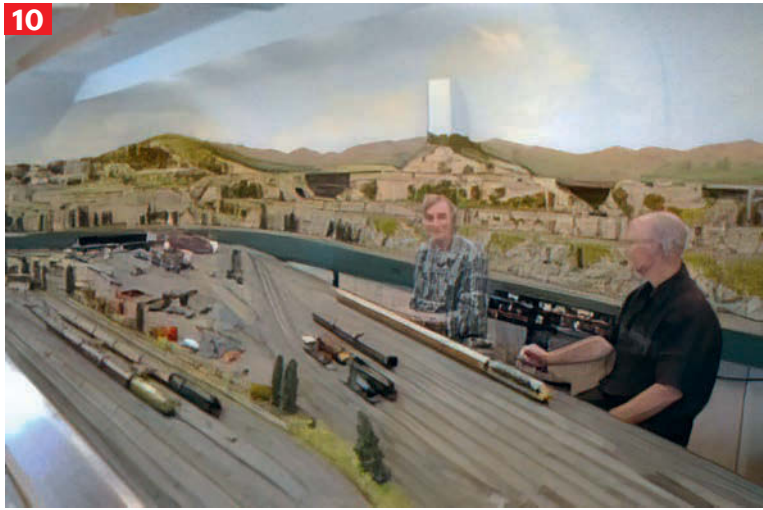
Here is Chris driving his Evening Star loco with two dodgy Aussies - Ron and his so-called mate, **photo 6**.

Speed was king in the lake – a hydroplane skips across the water, **photo 7**. Also on show were models of Jet Boats, a New Zealand invention, famous for scaring the living daylights out of innocent tourists in the wild rivers around Queenstown.

A steam loco with a load of passengers chuffs past two yachts racing on the lake, **photo 8**.



7





DSS Kraken looks like it has a merry crew! **photo 9.**

leaving the lake one is drawn into the dark to be blown away by two model train layouts featuring New Zealand and American trains, **photo 10.**

Now it is time to go upstairs and what do we see – a wall of 3D printers hard at making parts for model cars, trucks, trains, boats and planes. No corner of the globe can hide from the high technology future, **photo 11.**

But don't worry, there are treasures from the past – traction engines, locomotives complete and in construction, planes, boats and machine tools, **photo 12.** A collection of superb models of boats, warships and the mighty U-Boat, **photo 13.** But, we can hear an angry buzzing sound so out we go to see – Tether Car Racing! **photo 14.**



It was hard to see and sounded like an angry mosquito so out came the video camera to capture the moment. We have a human on a pole watching a model car whiz around a track at over 180Kmh or 120 mph in the old money. A cage is necessary should the steel tether cable break and spin off into the never-never (Aussie term for a long way away) , **photo 15.**

Ready to race in Otago! My so-called mate Ron adjusting his car at an earlier meeting, **photo 16.**

Then another sound broke over the scene – the sound of a V12 powered vehicle bent on invading Otago in one last final push – death or glory! Unfortunately, the much feared 141 Tiger tank met its match in the hard Otago mud and broke a track drive, dooming it to spend it's time circling the enemy. But

never underestimate Kiwi newspaper reporters and photographers who managed to get the author to join his Tiger in the mud for a photo in the Otago Daily Times newspaper, **photo 17.** I can't let you read the article because, in a moment of weakness, I was very complimentary about the show and Kiwis – the truth is I won't live it down at our club in Melbourne!

The shame! Club long termers Murray Wright and Marie and my so-called mate helped pack the humbled Tiger 141 for its voyage home across the Tasman Sea, **photo 18.** As well as driving steam and electric loco's, Marie is building a PZKW to run on rails?

In closing, even a diehard Aussie like me has to admit that my so-called mate Ron Savage was right all along – the Otago Model Engineer Society is awesome. So, if you get ever get tired of hauling hard down the M6 to Birmingham (UK, not Alabama) or past Melbourne on the 195 (Florida, not Victoria) make it a mission to swing down State Highway 1 from Christchurch In Zid (Kiwi pronunciation of En Zed - NZ) to hit Dunedin. Then drop in to meet the legends who make up the Otago Model Engineering Society and go for a tour to see their carpeted meeting room with a fridge! 🍷

Look out for your next issue of Model Engineer & Workshop

Number 4778
July 2026

On sale
June 19
2026



Mike Tilby looks into the use of hydraulics in engineering.



Edward Draper undertakes the challenging repair of a variable speed wood lathe.



Graeme Monk describes his 5" gauge steam tram.



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THE BRADFORD CUP AND STEVENSON TROPHY 2026

Once again, we are pleased invite entries for the two model engineering competitions that are decided by a poll of readers of *Model Engineer & Workshop* and members of our forum, www.model-engineer.co.uk

THE BRADFORD CUP

The Bradford Cup is awarded to the author of the best article or series in *Model Engineer & Workshop* during the previous year. Articles that appeared in Issue 4762, March 2025 to 4773, February 2026, are eligible for this year's competition.

The Bradford Cup was established by Bradford Model Engineering Society in an attempt to encourage people to write articles for their *Monthly Bulletin*. Member Graham Astbury suggested widening the scope to create an award each year for the best article appearing in 'Model Engineer'. Hence the name of the trophy and why it is in *Model Engineer & Workshop*. The cup was donated by Bradford MES to the Society for Model and Experimental Engineers, SMEE, and latterly has been presented at the Midlands Model Engineering Exhibition.

The competition first ran in 2022 and was previously won by Mike Tilby, Steve Goodbody, Ron Fitzgerald and last year's winner Gerald Martyn for his series on a GWR Pannier Tank in 3 1/2" Gauge **photo 1**.

Entry to the Bradford Cup is by nomination by a third party only, you cannot nominate yourself. To make a nomination, please send the name of the author and the article in question to neil.wyatt@kelsey.co.uk by **26 July 2026**.

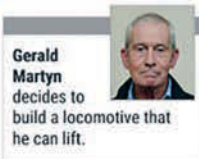
THE STEVENSON TROPHY

As well as being a contributor to MEW, John Stevenson, was known for his larger-than life presence on the Model Engineer forum and his willingness to advise on practical issues and often offer practical help. Funded by many donations in his memory, the Stevenson Cup was first awarded in 2018. The cup is engraved 'John Stevenson, 1948 - 2017. Remembered by his many friends' with 'Awarded for Excellence in Practical and Useful Workshop Equipment' on the plinth.

The John Stevenson Trophy is presented for just that, a

A GWR Pannier Tank in 3 1/2 Inch Gauge

PART 4 - STRETCHERS AND BUFFER BEAMS



Continued from p.562
M.E.4754 October 18

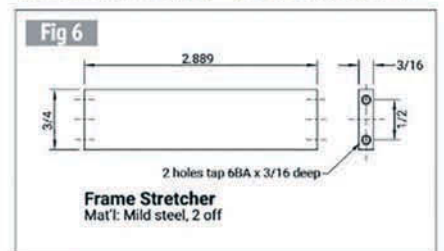


The two stretchers are in their near correct position but are much simplified, being just bits of 3/4 x 3/16 inch bar (**fig 6**). Note the 2.889 inch dimension, being the width between the frame plates. This slightly odd dimension is to account for using 3mm steel for the frame plates rather than 1/8 inch as in the old days and puts the outer faces the customary width apart for a 3 1/2 inch gauge model. It's odd but not as frightening as it looks. If it can be measured then we can generally make it.

First square up the ends of a length of bar. This is easy with a milling machine or if the vertical slide is set-up on the lathe. Just pop the bar in

the milling vice and skim the ends flat. Mark out the 2.889 inch dimension from each squared end, or otherwise use the nearest next longer mark on a rule. Hacksaw off and pop

each piece into the milling vice in turn to simply skim down to length, using a (digital?) caliper to check progress. It's no great problem to get accurate to a 'thou' or so this way, though



Stretchers.

www.model-engineer.co.uk

653

Photo 1: Gerald Martyn's series.

well-made and usable piece of tooling, a modification to a machine or an accessory for a tool where the fact it works well is more important than making it look good.

The last competition was won by Dave Sanderson, for his CNC mill, by far the largest and most complex item to win the competition, **photo 2**. The trophy is also awarded at the Midlands

Model Engineering Exhibition.

The competition is open to all Model Engineers Workshop readers and Model Engineer forum members, who may enter their own work. We encourage entries of items published in MEW, but unpublished items can be entered. To enter, send no more than four good photographs of your entry with up to 500 words of description by email to neil.wyatt@kelsey.co.uk no later than **26 July 2026**.

Bradford Cup Entry Rules and Conditions

1. Nominations from readers shall be invited in Model Engineer & Workshop magazine in the July issue.
2. Nominations shall close on the 26 July 2026.
3. Nominations should be sent to the editor of ME&W stating: That it is a nomination for the 'Bradford Cup'; The author's name; The title of the article; The issue number in which it starts; The name, postal address and email address (if applicable) of the person nominating the article.
4. All nominations must not have been entered into the competition before.
5. Any reader of ME&W may submit only one nomination which must not be their own work.
6. The article must have appeared in issues 4762 to 4773 and may be a single article in a single issue; a single article published over more than one issue; or a series running in several parts which may run into or from another year.
7. All entries must have been nominated by at least two people to be eligible. When nominations close, the editor of ME&W will list all the articles in order of numbers of nominations.
8. The six articles with the greatest number of nominations will be deemed to be the entries to be selected for the judging. If there are fewer than six eligible entries for the Trophy, then the editor may select, at his or her sole discretion, additional articles to make the nominations up to six.
9. If the editor of ME&W suspects that any unfair or undue influence has been brought in to attempt to influence the selection of entries, then that entry may be disqualified. The editor's decision will be final on this matter.
10. The editor may reject any entry if it fails to meet adequately any of the criteria for inclusion on the shortlist. These will be that: the article is well written; it demonstrates some original thinking or design; it reports experimental work undertaken by the author; it is well-researched; or describes something of interest to model engineers not published in the model engineering press before.
11. Articles which are a simple narrative of building someone else's design will not be eligible, unless the building involves a novel approach, technique or process.
12. Prior to publication of the list of entries available for voting, each author will be contacted to confirm that they are willing for their article to be entered into the competition. They may withdraw their consent at this time should they wish to do so. If this occurs, the editor of the Model Engineer shall select the next article in the list or may substitute another article of his or her own choice.
13. The entries for the competition will be listed in no particular order in ME&W in sufficient time for readers to vote, and the date for the latest submission of votes will be published also. Votes cast after this date will not be counted.
14. Voting shall be by an on-line vote by readers and forum members of the Model Engineer website (www.model-engineer.co.uk). Readers who join the forum specifically in order to vote will be allowed to do so. Voting will be strictly one vote per person. Any reader of Model Engineer who does not have on-line access will be allowed to vote by writing to the editor of the Model Engineer clearly stating that it is a vote for the Bradford Cup and shall name the selected entry and the author.
15. In the event that the editor considers that invalid votes have been cast, or that an attempt has been made to unduly influence the result of the vote, any questionable votes will be disregarded, and those entries may be disqualified.
16. The winner from the six shortlisted authors will be announced at the Midlands Model Engineering Exhibition, or other time or venue as decided. The trophy will normally be presented by a member of the Society of Model and Experimental Engineers.
17. The trophy will remain the property of the Society of Model and Experimental Engineers. The winner will take responsibility for ensuring safekeeping of the trophy until the next exhibition. The trophy must be returned in good condition, in the supplied packaging, in good time



Photo 2: Dave Sanderson's CNC mill.

for awarding to the winner of the subsequent competition. However, an A4 certificate of the award will be presented to the winning author for their retention.

17. The winner may arrange for their name and the year of the award to be professionally engraved on the base of the Trophy at their own cost.
18. No alternative prizes, cash payments or awards will be made. In all matters relating to the competition, decisions made by the editor are final.

Stevenson Trophy Entry Rules and Conditions

All entries must be a piece of practical workshop equipment i.e. a tool, jig, fixture or a modification to or accessory for an existing piece of equipment. One entry per person.

All entries to the competition must be materially your own work (commercial parts etc. are allowable but please be clear about what these are) and not have been entered to the competition before.

A short list of entries will be selected by the competition organisers, a group of people who knew John and are familiar with his views on workshop equipment.

Criteria for inclusion on the shortlist will be that the tooling is practical and capable of being used for accurate work in a home workshop setting. It should

demonstrate ingenuity, good design, economical use of materials and be appropriately finished for its function.

By entering you confirm your permission to feature the entry in the magazines or on the forum.

If practical, you may be invited to display your entry at a model engineering exhibition in the future.

The winner will be selected by a popular online vote by forum members. Readers who join the forum in order to vote will be allowed to do so. Voting will be strictly one vote per person.

In the event that the judges consider invalid votes have been cast or that an attempt has been made to unduly influence the result of the vote any questionable votes will be disregarded, or entries may be disqualified.

The trophy will remain the property of the competition organisers. The winner will take responsibility for ensuring safekeeping of the trophy until the next exhibition. The trophy must be returned in good condition, in the supplied packaging, in good time for award to the winner of the subsequent competition.

The winner may arrange for their name and the year of the award to be professionally engraved on the base of the trophy at their own cost.

No alternative prizes, cash payments or awards will be made. In all matters relating to the competition, decisions made by the organisers are final.

Monument Clamps

Richard Lofting struck lucky when buying a 'lucky dip' box at auction.



Photo 1: A lucky dip auction box purchase.



Photo 2: Part of the Monument clamp set, the rest is in the bottom of the box.

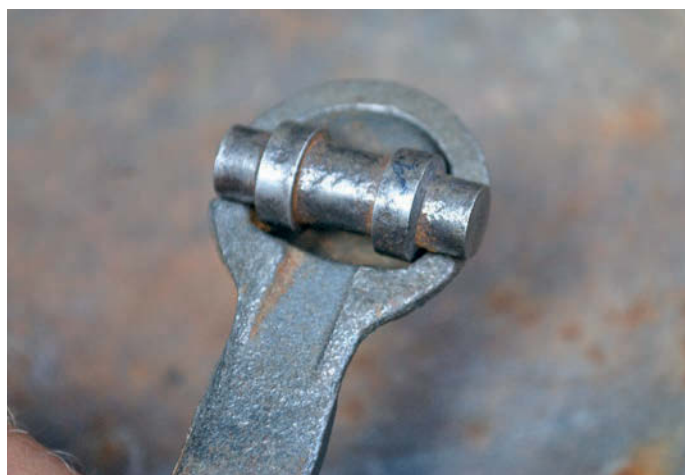


Photo 3: I only had one hinge pin but it gave me something to copy.

I bought a cheap lot at a local auction, I can't now remember what was in the box that caught my eye to make me raise up my hand and be the sole bidder; it was mine for the princely sum of £5.

As usual with these lucky dip boxes there is a load of stuff usually destined for the bin, **photo 1**, but sticking out was what looked like one of those test tube holders from the school science days, a closer look revealed a Monument clamping set with only one clamp, **photo 2**. Rummaging around in the bottom of the cardboard box I discovered the other clamp in pieces.

After sorting out what I had, I discovered that the only thing missing for the second clamp was the pivot pin. As I had the other clamp intact I took it apart to measure up the pivot pin on



Photo 4: The original was cast iron but I soon turned up a bit of mild steel to suit.



Photo 5: The complete clamp set after a good wire wheeling.

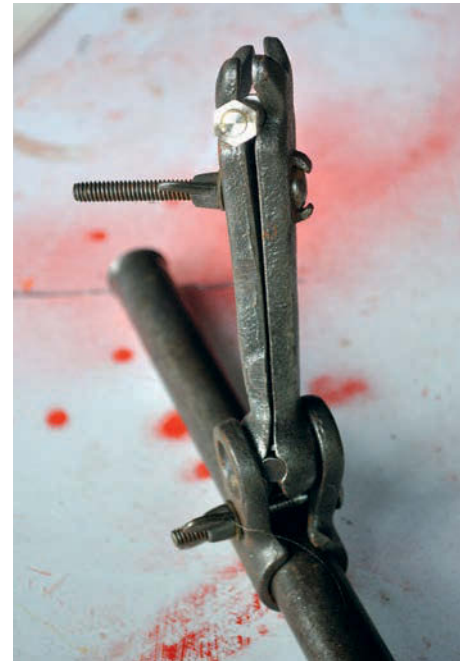


Photo 6: One half of the clamp holding a component ready to solder.



Photo 7: The gas torch can be used without fear of burning your hand!

that one, **photo 3**. The pin was actually a cast iron item, but I soon had a piece of steel rod in the lathe and copied the relevant dimensions. The original cast pin had the centre section hollowed out but I didn't see much point in removing metal needlessly as it didn't interfere with the clamp's operation, **photo 4**. After a session on the wire wheel the clamps become presentable and ready for use, **photo 5**.

USES

You may well ask what is a monument clamp set for? They were originally

intended for the plumbing trade where various items required clamping together while they were soldered; items such as pipe fittings and the like. Trying to hold things together while wielding a gas torch around in one hand and a stick of solder in the other is near on an impossibility, so in effect the clamp is like a third hand, **photo 6**.

Of course modern plumbing is all a bit different today, with all the plastic and slip on fittings. In certain quarters these are known as 'shark bites' due to the stainless-steel teeth that grip the pipe within the fitting - I digress.

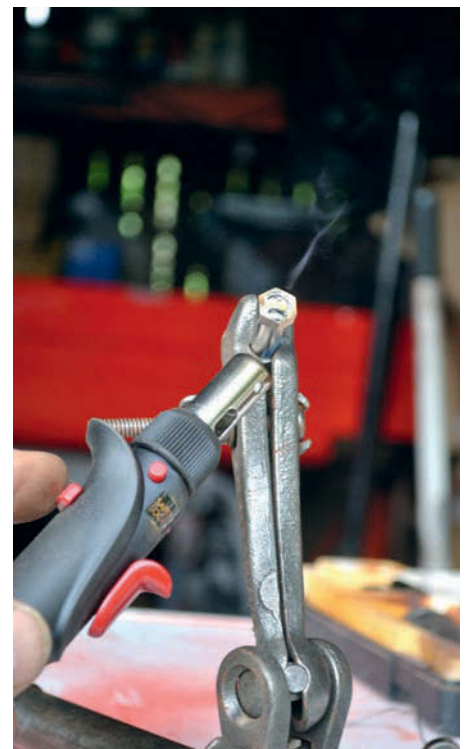


Photo 8: One half of the clamp in action.

In the world of Model engineering, and others, the ability to hold work while it is silver soldered or soft soldered can be a problem as I expect many here will know, **photo 7**, As I have stated in articles before I mess about with vintage tractors and often times when component parts that have been made require a touch of silver solder these clamps will be a real asset, **photo 8**. ●

Readers' Tips

We have £30 in gift vouchers courtesy of engineering suppliers Chester Machine Tools for each month's 'Top Tip'. Email your workshop tips to neil.wyatt@kelsey.co.uk marking them 'Readers Tips', and you could be a winner. Try to keep your tip to no more than 400 words and a picture or drawing. Don't forget to include your address! Every month we'll choose a winner for the *Tip of the Month* will win **£30 in gift vouchers from Chester Machine Tools**. Visit www.chesterhobbystore.com to plan how to spend yours!

ORGANISING SMALL TOOLS

Our tip winner this month is John Arrowsmith, with a neat tip for organising small tools.

I have found that by collecting all my small tools etc. altogether on small wooden blocks, it means I have them all to hand when assembling any sort of model. With the inconsistency of modern hexagons for example a range of small box spanners together saves lots of time when perhaps you need a slightly larger spanner without having to fumble through a box of assorted tools. I have centre punches, Pin punches, Spanners and Rotary tools, plus small end Mills down to 1/16 diameter keeps them sharp as well.

(Your Editor uses a similar approach for endmills, specialist drill bits and even collets in his own workshop, so can vouch for this tip!)



Please note that the first prize of Chester Vouchers is **only available to UK readers**. You can make multiple entries, but we reserve the right not to award repeat prizes to the same person in order to encourage new entrants. All prizes are at the discretion of the Editor.

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Tuesday 12th – Tuesday 19th May

South West

Friday 22nd – Monday 25th May, Thur 3rd Sept

Bristol Channel & South West Wales

Tuesday 26th May – Wednesday 17th June

North Wales & the Mersey

Friday 19th – Monday 22nd June

Northern Ireland

Tuesday 23rd & Wednesday 24th June

Glasgow & Clyde Coast Summer

Friday 26th June – Sunday 30th August

South Coast and Isle of Wight

Thursday 3rd – Tuesday 22nd September

London and Thames Estuary

Thursday 24th September – Sunday 11th October

Glasgow & Clyde Coast Autumn

Saturday 17th & Sunday 18th October

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Club Diary

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2026

EVERY SUNDAY

Urmston & District MES

Public Running every Sunday Contact: secretary@udmes.co.uk

Warrington MES

Running day. Contact : contact@wdmes.org.uk

Wakefield SMEE.

Public running day. Contact Denis Halstead 01924 457690

MAY

17 Bradford Model Engineering Society

Public running day. Members from 11:30 am, public from 1:30 pm to 16:00, whatever the weather, Northcliff. Contact: Russ Coppin, 07815 048999.

17 Stafford Model Engineering Society

Running day at County Showground, Stafford. 10:00-14:00. Further information via www.sdmes.co.uk.

17, 28 Guildford Model Engineering Society

Public running days at Stoke Park Railway. Info and times see www.gmes.org.uk.

17, 31 Saint Albans Model Engineering Society

Running sessions at Puffing Field. 1pm start, weather dependent.

23-24 Bradford Model Engineering Society

Event at Bradford Industrial Museum

24 Worthing & District SME

Public running day, Field Place. 1:30-4:30. www.worthingmodelengineers.co.uk.

25 Brighton & Hove SM&LE

Hove Park Railway public open day. www.hovepark.com

JUNE

5-7 Cardiff Model Engineering Society

34th Welsh Locomotive Rally Heath Park, rally@cardiffmes.com.

6, 20 Brighton & Hove SM&LE

Hove Park Railway public open day. www.hovepark.com

6, 28 Stafford Model Engineering Society

Running day at County Showground, Stafford. 10:00-14:00. Further information via www.sdmes.co.uk.

7, 14, 28 Bristol SMEE

Public Running day, Ashton.

10 Saint Albans and District MES.

Puffing Field, depending on weather. Alternate July

13-14 Rugby Model Engineering Society.

Sweet Pea Rally, To be held at Rainsbrook Valley Railway.

14 Chichester Model Engineers

Public running at Blackberry Lane, Chichester PO19 7FS. 13:00.

14 Saint Albans Model Engineering Society

Running sessions at Puffing Field. 1pm start, weather dependent.

14 Guildford Model Engineering Society

Public running days at Stoke Park Railway. Info and times see www.gmes.org.uk.

14, 28 Worthing & District SME

Public running day, Field Place. 1:30-4:30. www.worthingmodelengineers.co.uk.

20-21 South Cheshire Model Engineering Society

LittleLEC annual locomotive efficiency competition, Willaston, near Nantwich. littleLEC@gmes.org.uk.

21 Bradford Model Engineering Society

Public running day. Members from 11:30 am, public from 1:30 pm to 16:00, whatever the weather, Northcliff. Contact: Russ Coppin, 07815 048999.

JULY

4 Bromsgrove SME

Bromsgrove SME will be hosting a Moden Traction Open Day. All gauges

welcome 5", 3.5", 2.5", Gauge 1 and 16mm. Contact Doug Collins 07585 524836.

4-5 Guildford Model Engineering Society

Stoke Park Railway Gala 2026. Info and times see www.gmes.org.uk.

4, 18 Brighton & Hove SM&LE

Hove Park Railway public open day. www.hovepark.com

5, 26 Bristol SMEE

Public Running day, Ashton.

8 Saint Albans and District MES.

Puffing Field, depending on weather. Alternate July.

11 Gauge 1 North

Live steam on the Ridings track, traders and society stands North, Agriculture and Business Centre, Bakewell. Contact: secretary@gauge1north.org.uk

12 Chichester Model Engineers

Public running at Blackberry Lane, Chichester PO19 7FS. 13:00.

12, 26 Worthing & District SME

Public running day, Field Place. 1:30-4:30. www.worthingmodelengineers.co.uk.

12, 26 Saint Albans Model Engineering Society

Running sessions at Puffing Field. 1pm start, weather dependent.

16 Stafford Model Engineering Society

Running day at County Showground, Stafford. 10:00-14:00. Further information via www.sdmes.co.uk.

18 Nottingham SMEE

Miniature Diesel Locomotive Gala. For enthusiasts of both battery and petrol-powered diesel locomotive models in 7/4, 5-inch and 3 1/2-inch gauge. You must book in advance with Rob Buxton - buxton845@gmail.com or 07837 272650.

19 Bradford Model Engineering Society

Public running day. Members from 11:30 am, public from 1:30 pm to 16:00, whatever the weather, Northcliff. Contact: Russ Coppin, 07815 048999.

19 Guildford Model Engineering Society

Public running days at Stoke Park Railway. Info and times see www.gmes.org.uk.

24-26 City of Oxford SMEE

Dreaming Spires Rally at Cutteslowe Park Miniature Railway. Open for visiting engines throughout the weekend. Contact 07850 062932 or denis.mulford@btinternet.com to book or for further information.

AUGUST

1, 15, 31 Brighton & Hove SM&LE

Hove Park Railway public open day. www.hovepark.com

2, 30, 31 Bristol SMEE

Public Running day, Ashton.

6, 16, 27 Guildford Model Engineering Society

Public running days at Stoke Park Railway. Info and times see www.gmes.org.uk.

9 Chichester Model Engineers

Public running at Blackberry Lane, Chichester PO19 7FS. 13:00.

16 Bradford Model Engineering Society

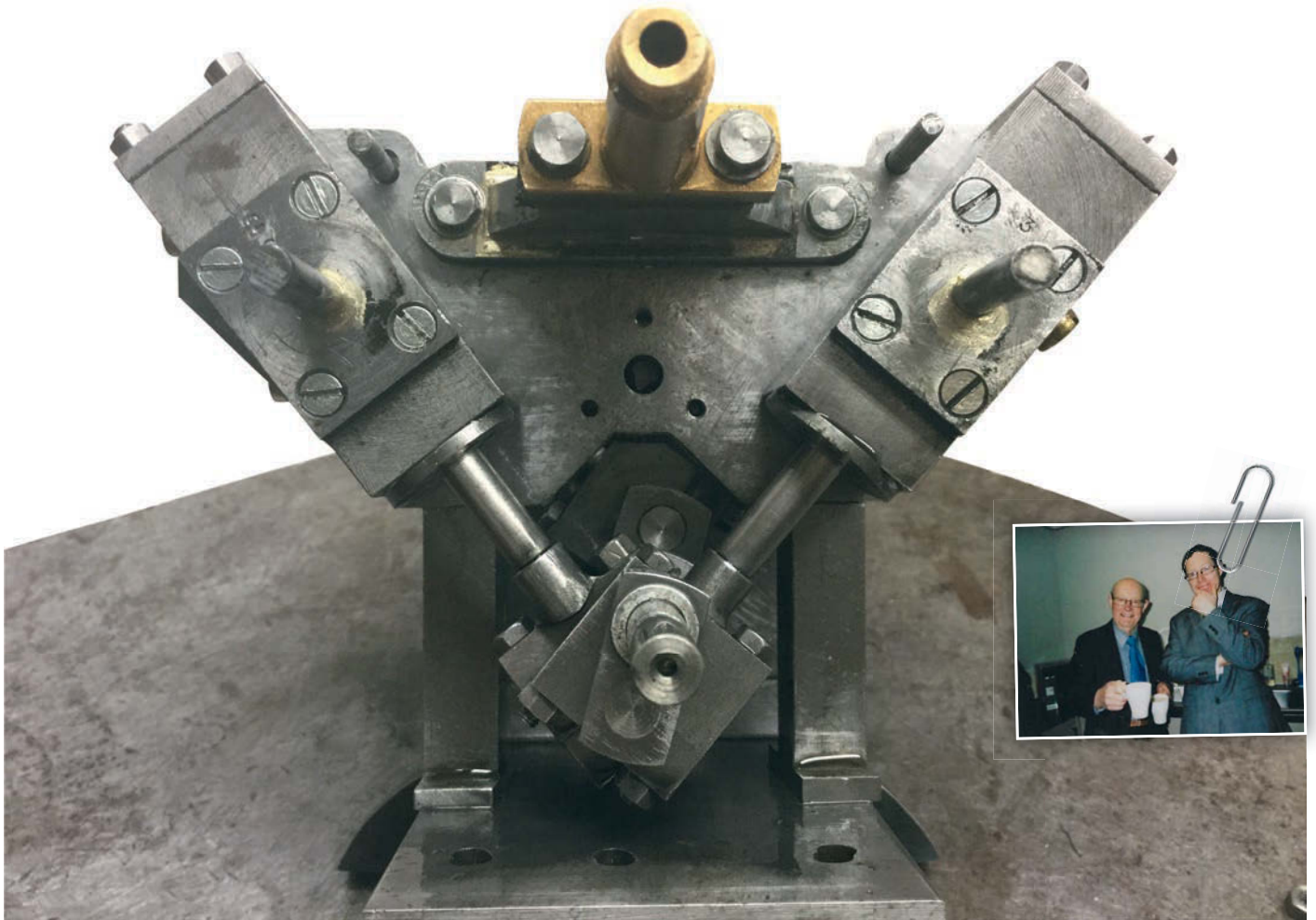
Public running day. Members from 11:30 am, public from 1:30 pm to 16:00, whatever the weather, Northcliff. Contact: Russ Coppin, 07815 048999.

16, 30 Saint Albans Model Engineering Society

Running sessions at Puffing Field. 1pm start, weather dependent.

23 Stafford Model Engineering Society

Running day at County Showground, Stafford. 10:00-14:00. Further information via www.sdmes.co.uk.



Fourrunner

PART 2

Steven Fulton concludes his description of his father, David Fulton's, experimental engine, starting by looking at the pistons and cylinders.

Fourrunner has an 18mm stroke. The cylinder has a bore of 12mm, a width of $\frac{3}{4}$ " (port side) by $\frac{7}{8}$ " depth and length of $1\frac{3}{4}$ ". The pivot pin, or trunnion centreline is positioned at $\frac{15}{16}$ " from the top of the cylinder body. The inboard pivot pins are $\frac{3}{4}$ " long by $\frac{3}{16}$ " diameter. They are not fixed and run through the port block supporting a cylinder on each side. **Photograph 7** shows a cylinder, inboard pivot pin, piston and piston rod guide.

Friction between the moving faces is reduced by relieving much of the area of a cylinder below the pivot. The bottom edge is left unrelieved, though, to ensure that the cylinder remains parallel with the port block.

Everyone will have their own methods, but David's steps for making cylinders and pistons can be found in a pdf in the Fourrunner Documents folder.

Photograph 8 shows the cylinder at the bottom of its stroke with the uniflow auxiliary exhaust slot just



Photo 7: Cylinder, piston, rod guide and pivot pin.

visible. This slot should be fractionally narrower than the piston ring to prevent it from springing into the gap and jamming the piston. Otherwise, leaving a bridge or post in the middle of the slot will guard against this. The inset picture shows a groove in the

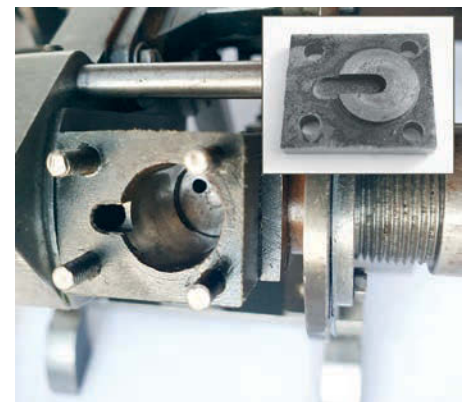


Photo 8: The cylinder in situ with inset of cylinder head.

cylinder cap, taking steam directly above the piston. This is needed because, at the top of its stroke, the opening in the cylinder wall is blocked.

Due to the fact that it was impossible to force a piston ring over the crown without snapping or distorting it, David made a two-piece piston in which the ring sits on a landing between



Photo 9: A disassembled piston and its keys.

the halves. Note that the crown is tightened by means of two 0.080" diameter holes 1/8" deep, 0.240" apart, fitting two pins in a purpose-made key.

In **photo 9** the two holes are visible in the crown, and the key is shown in the background. Meanwhile, a specially made spanner (also seen here) grips the lower half of the piston, avoiding vice jaw damage to the walls. Work on the piston and crown to give a 0.003" clearance for the piston ring when the crown is tightened. The taper on the rod fits in a 60° countersink underneath the piston.

The piston rods are 5.5mm in diameter and the rod guides in each cylinder have three or four 5mm vents.

Figure 2 is a sketch of the drilling angle for the 1/8" passage in the cylinder wall. This passage allows ports to be positioned near the pivot, close together, thereby lessening friction because the width of the cylinder face required to keep them covered can be smaller.

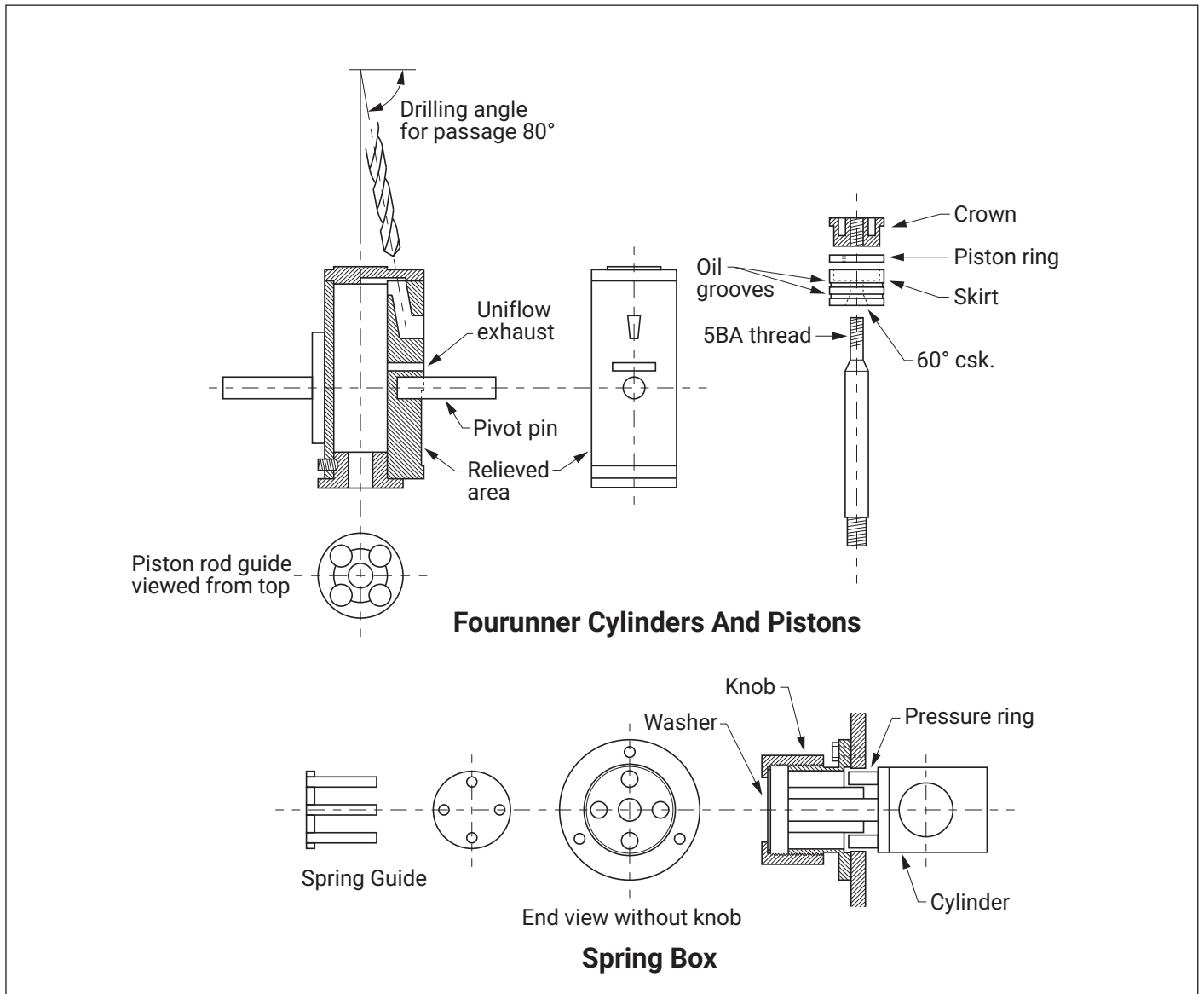


Fig. 2 Fourrunner's cylinders and pistons.

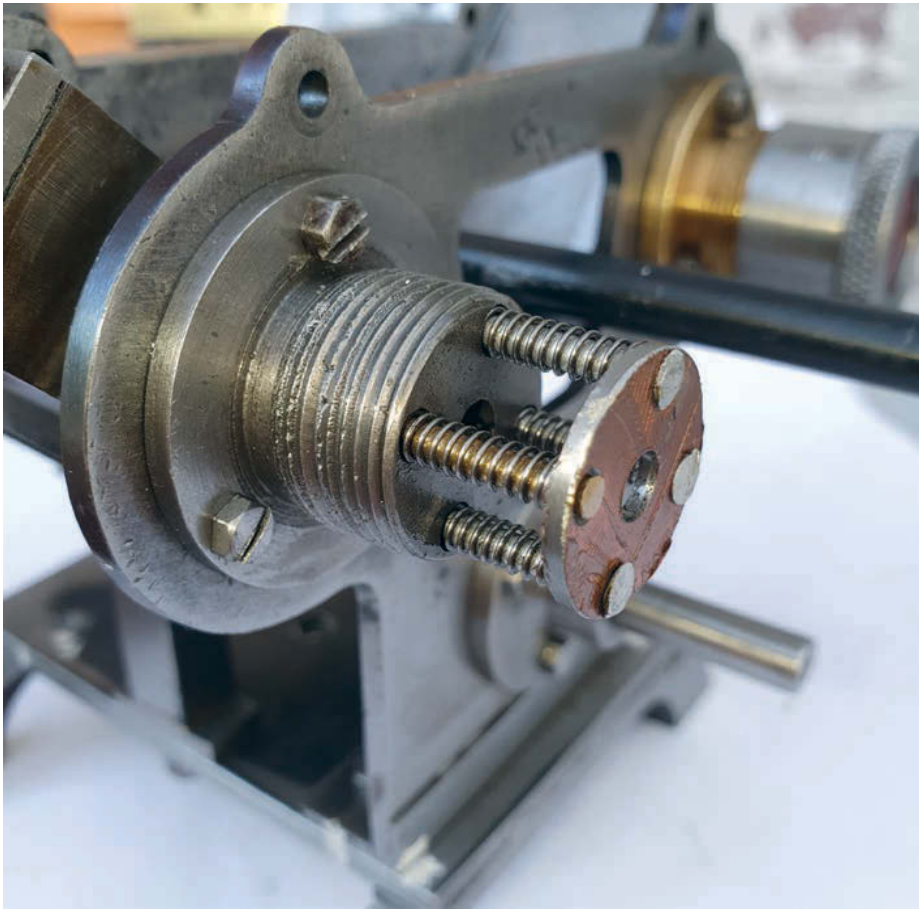


Photo 10: Spring box.

Figure 2 also shows the spring box design. Each box has four 3.5mm wide springs, with a rate of 0.55 N/mm. The guide pins for the springs are riveted to a penny, **photos 10** and **11**. Each knob is threaded, allowing gradual control of the pressure. There is a washer between the knob and spring guide.

ASSEMBLY ADVICE

Based on a couple of assembly and test notes, David advises: "Letter stamp or otherwise mark each major component right from the start of construction. In theory the cylinders and spring boxes, etc. should be interchangeable. However the small adjustments necessary to get a part to fit nicely will require that it always goes in the same place. In the course of construction and testing a number of dismantlings will be required, so it's wise to identify what goes where." Incidentally, the columns under the port block are for appearance only and are not fixed to the block.

Photograph 12 shows David's method to ensure that the bearings are parallel.

LEAKAGE TROUBLESHOOTING

Mr. Fulton wrote: "In setting up this unit it is most important that all four

cylinder faces are flat against the port face plates on the centre section. Cup a hand around the cylinders on each side of the engine when running on air. There should be very little detectable



Photo 11: End plate with knob and pressure rings removed. The knobs on the end plates take four springs to apply even contact pressure to the port interface.

leakage at the interfaces. When setting up, it should not be possible to insert a 1 ½ or 2 thou feeler gauge between the port faces. Any gap can be closed by moving the spring boxes bodily (bolt holes having clearance to permit this), or by inserting shims under the spring boxes. Manipulate until the feeler gauge shows there is contact across the face of each cylinder. This is fiddly but essential for proper running".

To obtain perfectly flat faces on the port block David placed it on a surface plate coated with engineer's blue. The raised parts shown up by the blue are hand scraped until the faces are level. The same was done for the port side of the cylinders.

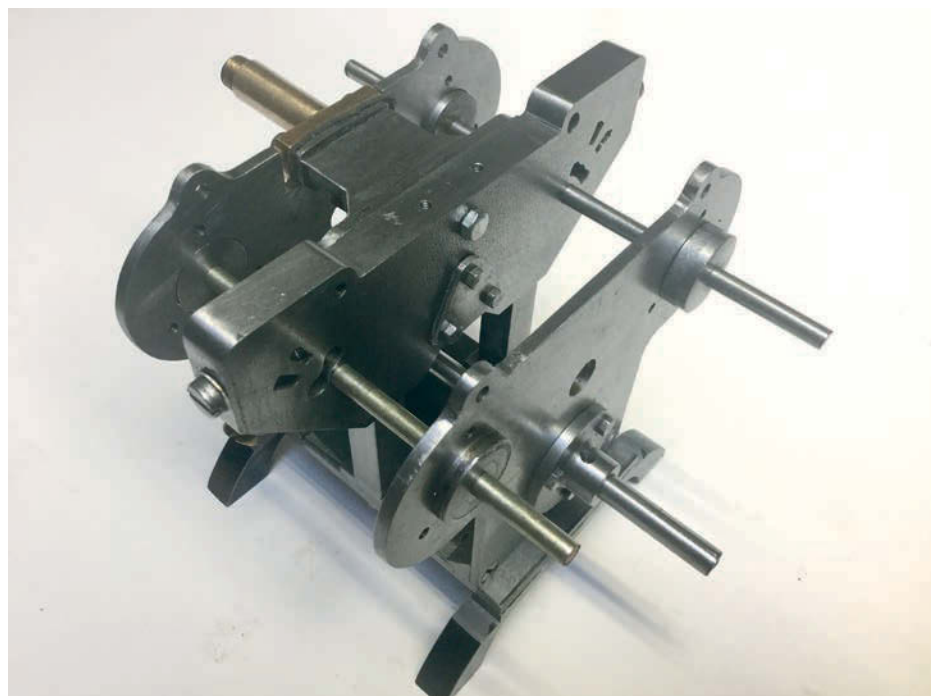


Photo 12: Bearing alignment using a dummy shaft. The two rods in the central port block align the cylinder trunnion bearings. When the end plate bolts are tightened into the base the shaft should rotate freely.



Photo 13: Side view showing cylinders and crankshaft. The right-hand cylinder is pulled back slightly revealing the inboard pivot pin and offset big end on the crank pin.

RUST PREVENTION

"After a couple of runs on steam it was found the following day that the crankshaft was stiff to turn. Dismantling showed that all the cylinders had rusted. Spraying with WD40 and then applying oil to the cylinders recovered easy movement. A displacement lubricator as well as built-in oiler had been used with steam oil but was found insufficient or ineffective. Water is

also present when running on air. It is sufficient to dose with steam oil in the unit's lubricator and run it on air for a moment, especially after a steam run. Much water is blown out by the air".

For a thorough dry out, David put the engine on a baking tray in the oven for half-an-hour on a low gas mark. Not quite what mother used to make.

SPEED RANGE

His final test note on 4 June 2022 says: "The engine runs up to 2,200 rpm from a small compressor set to 30 psi" (Later, it seems, he clocked it up to 3,000 rpm). "At higher speeds (not recommended unless run-in) the unit fairly howls, indicating the adequacy of narrow inlet ports. The compressor does not lag behind except at large throttle openings. Unfortunately Fourrunner does not self-start. Given a flick to overcome static friction, it will throttle down to a leisurely tick-over of about 200 rpm no-load speed."

Perhaps, one day, someone in the engineering world may be able to advance David's design, **photo 13**.

Well, to my surprise, someone did. An Australian engineer with experience in machine design, Peter Stuart, has developed the principles of Fourrunner and built his own MK2 version! This

is a sleek looking engine and his construction methods, along with CAD drawings, will appear in few months, (following the completion of Jason Ballamy's Clarkson engine - Ed.)

If you would like to watch some videos of Fourrunner operating on steam and air, please scan the QR code shown which provides a link to a folder, 'Experimental Model Steam'. They should play in good quality, if not, please adjust the video settings (usually a gearwheel symbol).

David Fulton had an interest in all sorts of steam powered engines. The next model could hardly be further removed from Fourrunner. David's eye-catching hypocycloid engine explored the way in which reciprocating motion can be transformed into rotary movement using gears. I will be writing about his other engines in the future. 🍷



Book Review



Bassett-Lowke Shops and Factories by Christine Sanderson. No 4 in the Making of An Identity series.

Publisher: Christine Sanderson. Paperback 2025. 68pages. £10. ISBN 978-1-036913-66-3.(Obtainable from 78 Derngate, Northampton NN1 1UH)

other models to a largely middle class and discerning clientele. His many activities included setting up seaside and country house miniature railways and rebuilding the Ravenglass and Eskdale Railway.

Probably best known for high quality gauge 0 and gauge 1 railway models he also developed a ship models business, even supplying such models to the Royal Navy to improve ship identification skills. These businesses were based in various Northampton premises notably in Kingswell Street, which I visited as a small boy finding it less exciting than the Bassett-Lowke catalogue suggested! Other shops opened in Edinburgh and Manchester. Best known was 112 High Holborn, London, where visitors from around the world browsed and purchased.

Bassett-Lowke's firm also made high-quality one-off railway and other models for clients. The National Rail Museum has several examples. Elsewhere see the model of the giant

Cowan's crane built for Canada's Cartier Railway in Carlisle's Tully House Museum.

W. J. Bassett-Lowke cared about design standards. He was a member of the Design and Industries Association and practised what he preached, employing good designers for his publicity which featured in the previous three books in this series. This book explains the development of factory buildings in Northampton, starting with his father's engineering works and then explains the history of the shops, showing commitment to a corporate identity.

Maybe a book targeting model railway specialists but it makes an interesting read for all lovers of Bassett-Lowke's works of whom there are many! The author deserves our thanks for thorough research into the life and achievements of a remarkable businessman.

Roger Backhouse

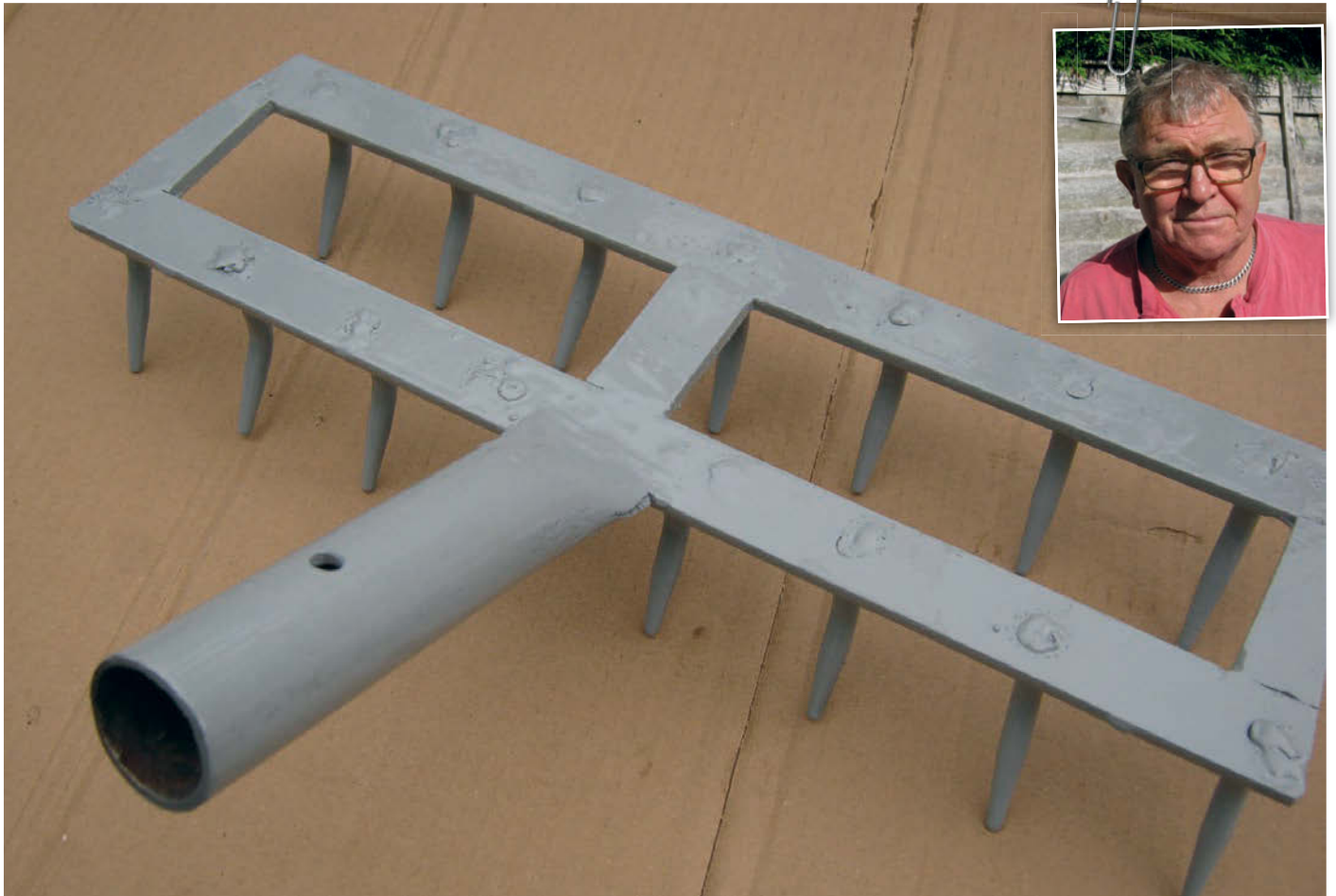


Photo 1: The finished harrow.

A Garden Harrow

Will Doggett has many other hobbies, he turned his engineering skills to making a special tool to help with gardening.

One of my several hobbies is gardening and after watching gardeners' world with Monty Don I liked the rake that he was using. This rake, as I thought it was, will get a good fine seed bed, so I looked on the internet but could not find one. After a lot of searching I found one that was a steel hand harrow the only problem was the company would not sell to the UK after we left the European Union. On top of this it was very pricey anyway, but I did find a picture of the harrow and from this the layout of the frame and the prongs.

The picture from the internet gave me an idea of the way to make the frame and the layout of the pins that works the soil but for copyright reasons I cannot show the photo here. The harrow looked to be about the

same width as a normal rake, this being about 16 inches or 400mm so. From scaling the width it looks like the depth will be 70-75mm and the tines to be 80mm overall in length. As with most of my work, I look at something I want to make and do the measuring and scaling by eye.

The next thing to work out was the size of the flat steel to be used to make the support frame and the size of the tines. The frame I will make from 20 x 4mm flat steel and the tines from 6mm diameter, also steel.

STARTING THE CONSTRUCTION

The first thing I did was set the 20 x 4mm flat out on the bench ready to mark the cutting lines it was at this point I thought the flat looked a bit small and flimsy

for a frame that has to support fifteen angled tines, that had the potential to pull the frame into the soil. So I looked for something a little bigger that came in the form of some second hand 25 x 6mm, also mild steel. This looks a lot better in proportion with the original part as shown in **photo 2** as you can see in the photo there is not much difference between the two pieces, but to me it is enough to make the change worth doing.

RESTARTING THE CONSTRUCTION

I cut two pieces of the steel flat to a length of 400mm, I then positioned these on the workbench at what looked like the right distance apart, then proceeded to measure the gap between the parts at 50mm, so I then cut three more pieces to this length.



Photo 2: Comparing the two steel flats.



Photo 3: Parts as cut.



Photo 4: Laid out as they will be welded.



Photo 5: Welded up and marked out for tines.

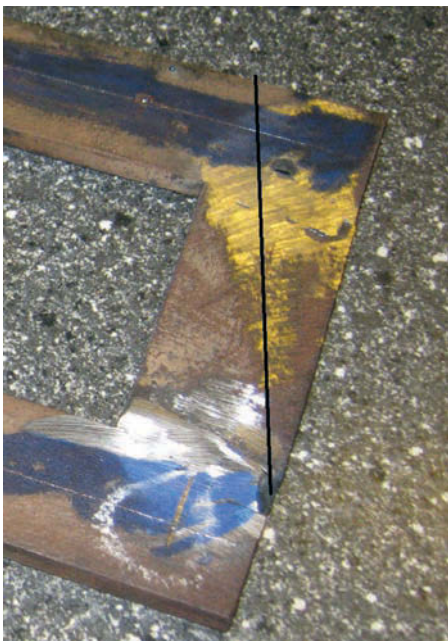


Photo 6: Section to be removed.

Photograph 3 shows the parts as cut and **photo 4** shows the general layout and position before they are welded together. Note the lower part has a hole in it as can be seen in the photo, the steel I am using is second hand (and rusty) so this hole will be filled when

the welding is done and cleaned up. To start the welding, the parts required to be clamped to something. I used pieces of short angle iron one at each end of the frame. But before that the parts were cleaned with a wire brush and scraper to get rid of most of the rust and rubbish, as this will make the welding easier and stop rubbish inclusion in weld. After the frame was welded together, I ground the welds flat. The frame was then blued with a large felt tip pen, and the position of the holes were marked out and centre popped ready for drilling, as can be seen in **photo 5**. There are eight tines on the front and seven on the back, all equally spaced.

The holes are offset front row to back row, which means the ends of the frame look to heavy on the back row. The line on the end of **Photo 6** shows a section that is going to be removed to the right of the line. The exact amount will be decided after the holes are drilled. The holes that I had marked out and centre popped were then centre drilled. This then gave the position of the line for the removal of the ends of the frame, I marked it out on one end leaving enough metal on the end so that the end is still secure and will

not break. cutting away the waste was done in the metal cutting band saw and is shown in **photo 7**.

THE TINES FOR THE HARROW

The next thing to be done is to decide the size of the tines the original idea was to use 6mm rod but that was with the smaller frame but lined up with the holes on the new steel and they looked small in relation to the frame. I then found some short bits of 8mm rod and held them in position with magnets so that I could get a good look at them in position. The 8mm looked a lot better, so the decision was made. The rod was brought as two lengths of 8mm x 1m from the local DIY shop. After the rod was purchased, I checked the actual diameter of them so that I could drill the base for the tines, as it may say 8mm but this not always the case as I have found out. **Photograph 8** shows the size not to be 8mm as the label shows. I planned to drill under the size of the rod, as if they are too small, I could open them up or reduce the tines to be a push fit; this will make the welding easier as they should stay in place when the base is inverted. To test the drill size I drilled a



Photo 7: Trimming the end of the frame.



Photo 8: The steel rod was undersize.



Photo 9: Frame drilled.

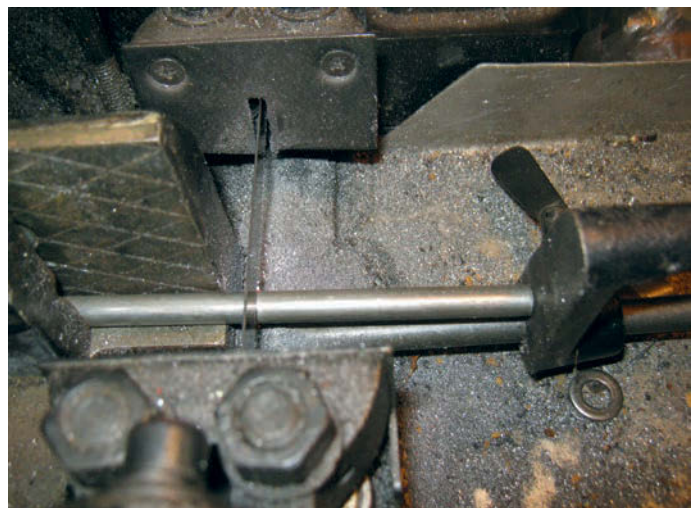


Photo 10: Cutting tine to length.



Photo 11: Setting taper angle on the lathe.



Photo 12: Cutting the taper.

piece of the same material as the frame, and found the hole was a bit on the small side. It was going to be an interference fit if I used a 7.5mm drill. I did try some imperial drills, but this was not going to work so the only option is to use 7.5mm then remove a small amount off the ends of the tines to fit in the bases holes without falling out. **Photograph 9** shows some of the holes as drilled.

To get some sort of idea for the length of the tines I measured one of my normal rakes these were 65mm in length, including the thickness of the base material. I cut the bar 65mm, and the material will pass through the frame so that they can be welded on top of it. Cutting to length was done on the band saw, with a stop set to give a uniform length to the tines.

Photograph 10 shows the first tine being cut to length, the stop is the big black thing on the right of the photo with a washer under it. Next, I put them one at a time in the lathe and turned a taper of 5 degrees, **photo 11** shows the angle set and **photo 12** shows the taper being started from the bottom.

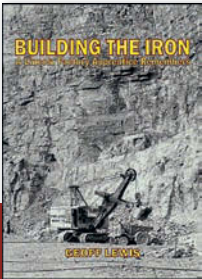
To be continued

A 1950'S SCHOOLBOY REMEMBERS

When digger mechanics roamed the land!

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Things were getting advanced in the 1950's when you could build Meccano models of diggers seen on town building sites by excited schoolboys invited by Priestman of Hull to build a working model of their Wolf excavator. So let me take you around some of those sites for a chat with hero digger drivers and then to the Lincoln RUSTON BUCYRUS factory and erecting shops to put 38-RB, 54-RB & 22-RB kit together: -



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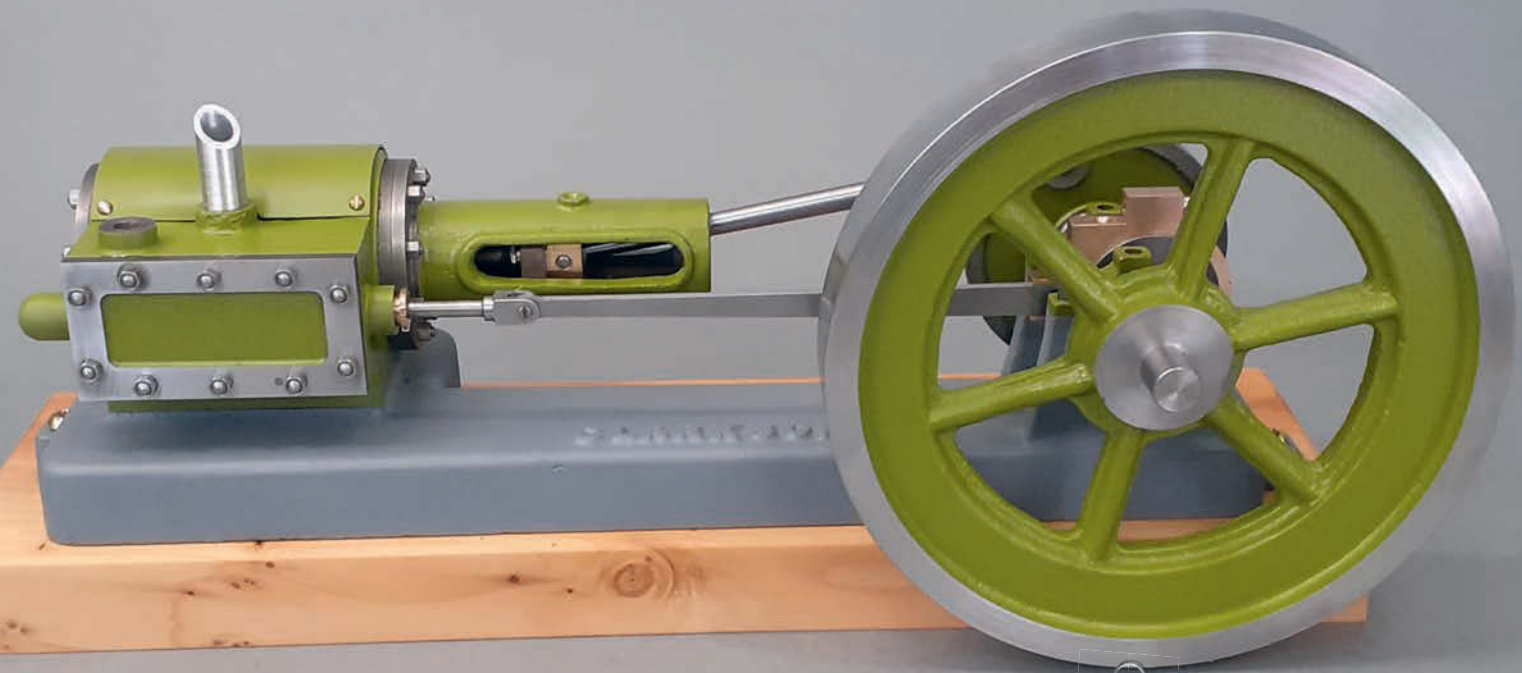
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The Clarkson 24x38 Horizontal

PART 4

In his series aimed at beginners, **Jason Ballamy** details the valve and connecting rods for this stationary steam engine.

VALVE ROD

Face a piece of 2.5mm stainless steel to length thread one end M3. The other end can have the

2.5mm diameter guide pin turned followed by cutting the longer M3 thread. A small flat should be filed on the guide pin which will allow any trapped condensate to escape from the guide hole in the valve chest.

VALVE NUT

Another straightforward part, mill a piece of brass to size and tap the central M3 hole. I found it easier to do the drilling and tapping before separating the nut from the piece of stock that I made it from as the tapped hole needs to be perpendicular to the face if the valve is to sit flat on the port face, **photo 42**

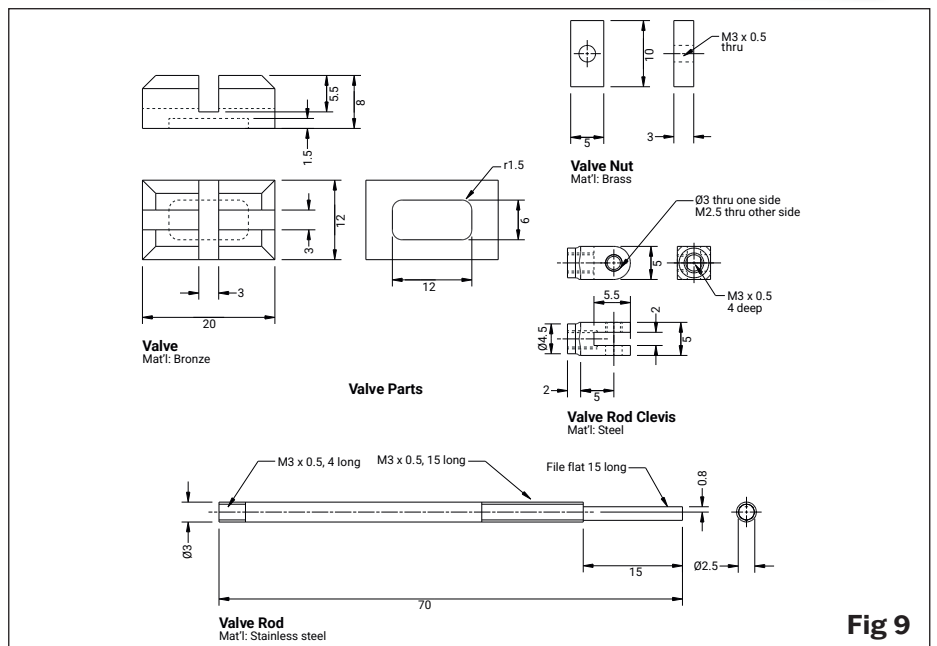


Fig 9



Photo 42: Valve nut machined from larger stock

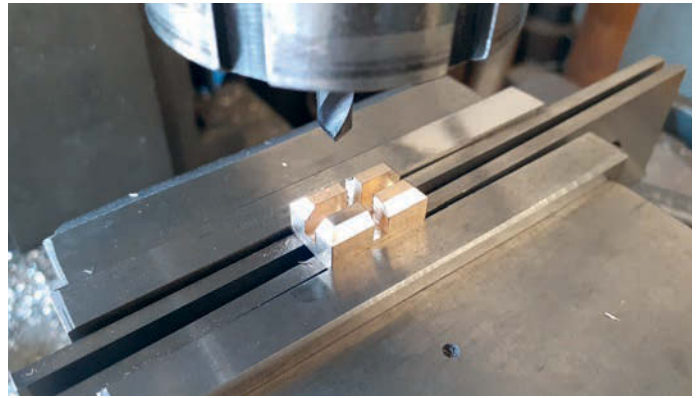


Photo 43: Valve slotted and chamfered

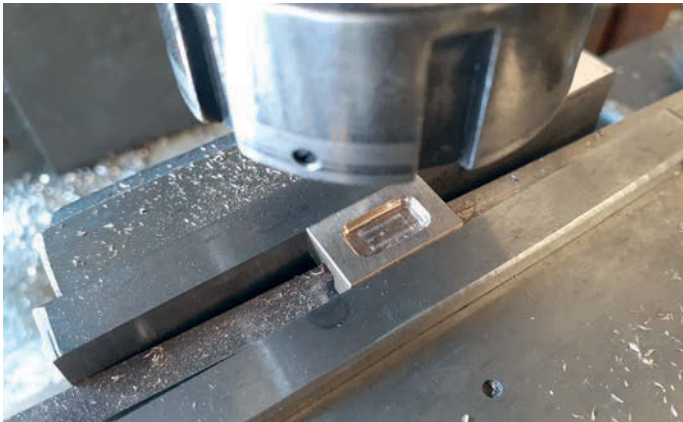


Photo 44: Milling valve recess



Photo 45: Valve rod clevis milled and drilled



Photo 46: Conrod flats milled, drilled & reamed



Photo 47: Taper turning conrod with rounded tool

VALVE

Start by machining a piece of bronze to the overall sizes then set up on parallels in the vice to mill the slots. The nut needs to be a free fit in its slot but should not wobble about. This is best achieved by using a 2.5mm cutter to first cut down the centre of the slot and then take equal amounts off either side until the right fit is obtained, **photo 43**. The chamfered edges can either be filed or machined in which case a spotting drill will do the job if you don't have a chamfer mill or simply tilt the valve to 45 degrees and use a plain cutter.

Turn the valve over, locate centre and then with a good sharp 3mm cutter so it does not throw up an excessive burr form the 1.5mm deep recess, **photo 44**.

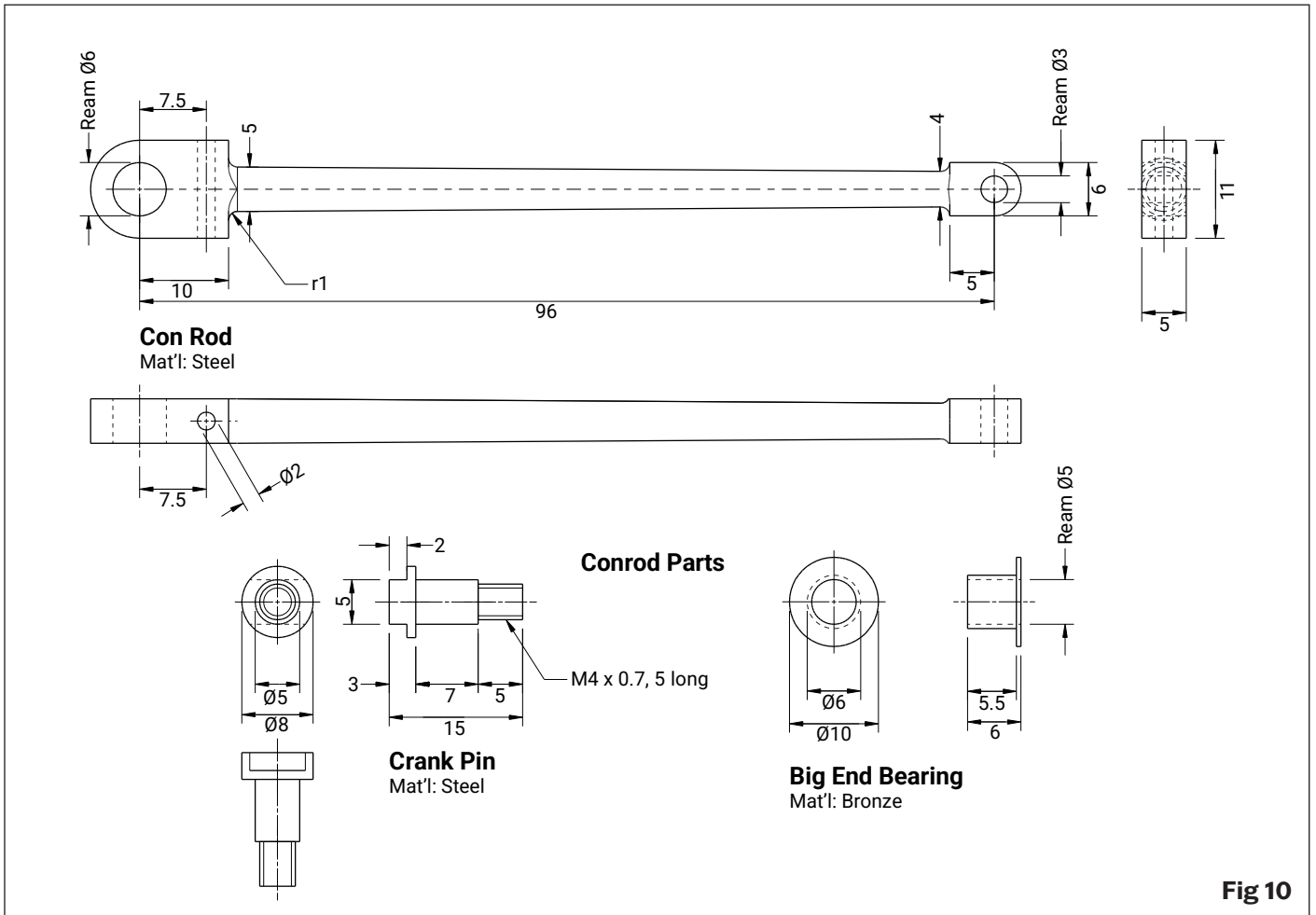
VALVE ROD CLEVIS

For small square and hexagonal parts I like to start with round stock and do the lathe work then move the work over to the mill to machine to the required shape. The clevis is a good candidate for this approach. Mill to form the square profile, the clearance and tapped cross hole can also be done at the same setting, **photo 45**. In the lathe face, turn the 4.5mm diameter and then tap M2.5. All that remains is to cut the part off from the parent bar mill the slot and round over the end either with the aid of filing buttons or on a rotary table if you have one.

CONNECTING ROD

Start by facing and centre drilling both ends of a large enough diameter piece of bar approximately 20mm longer than the rod. Hold this in the vice and mill flats towards the ends but leaving some round material, drill and ream the two holes, **photo 46**.

With one of the still round ends held in a collet or 3-jaw chuck and other supported by a tailstock centre remove the majority of the waste with parallel cuts using the lathe's power feed. The taper can then be added by either setting the topslide to an angle (0.4degrees), offsetting the tailstock or as I tend to do by putting my boring head into the tailstock and offsetting



that which saves disturbing the main tailstock position. Use a tool with a rounded end so that the taper blends nicely at each end, **photo 47**.

The round ends can then be sawn off, the two ends milled to 6mm and 11mm wide and the small 2mm hole for the dummy strap bolt added. Lastly radius the two ends with filing buttons or rotary table.

CONROD BEARING

A fairly straight forward turning job from a piece of bronze bar, drill and ream the hole and then turn the spigot using the conrod as a gauge and finally part off. The bearing can be Loctited into the big end.

CRANK PIN

Face the 8mm rod and turn a spigot down to 4mm and then thread that using a die preferably in a tailstock die holder, if not use the end of the tailstock barrel to apply light pressure to the back of a handheld diestock as you cut the thread which should help to hold it square to the work. A small undercut may be needed at the end of the thread to make sure it screws ring in to the crank disc.

ECCENTRIC STRAP

Hold this in the 4-jaw with the more rounded face outwards, some parallels between it and the chuck face will minimise any wobble, it does not need to run true at this stage, **photo 48**. Take a couple of cuts to clean up this face then mount it the other way round and face down to the finished 5mm thickness.

Mark the middle of each lug where the bolts go and scribe a line between the two. Set this line parallel to the top of the vice jaws and high enough to be able to use a slitting saw to later cut along the line. Take equal amounts off the side of each of the lugs until the overall width is 38mm. Set the milling cutter 6mm above the scribed line and flatten the surface ready for drilling, a cut 4.9mm in from the outer edge will



Photo 48: Setting strap to run wobble free with parallels

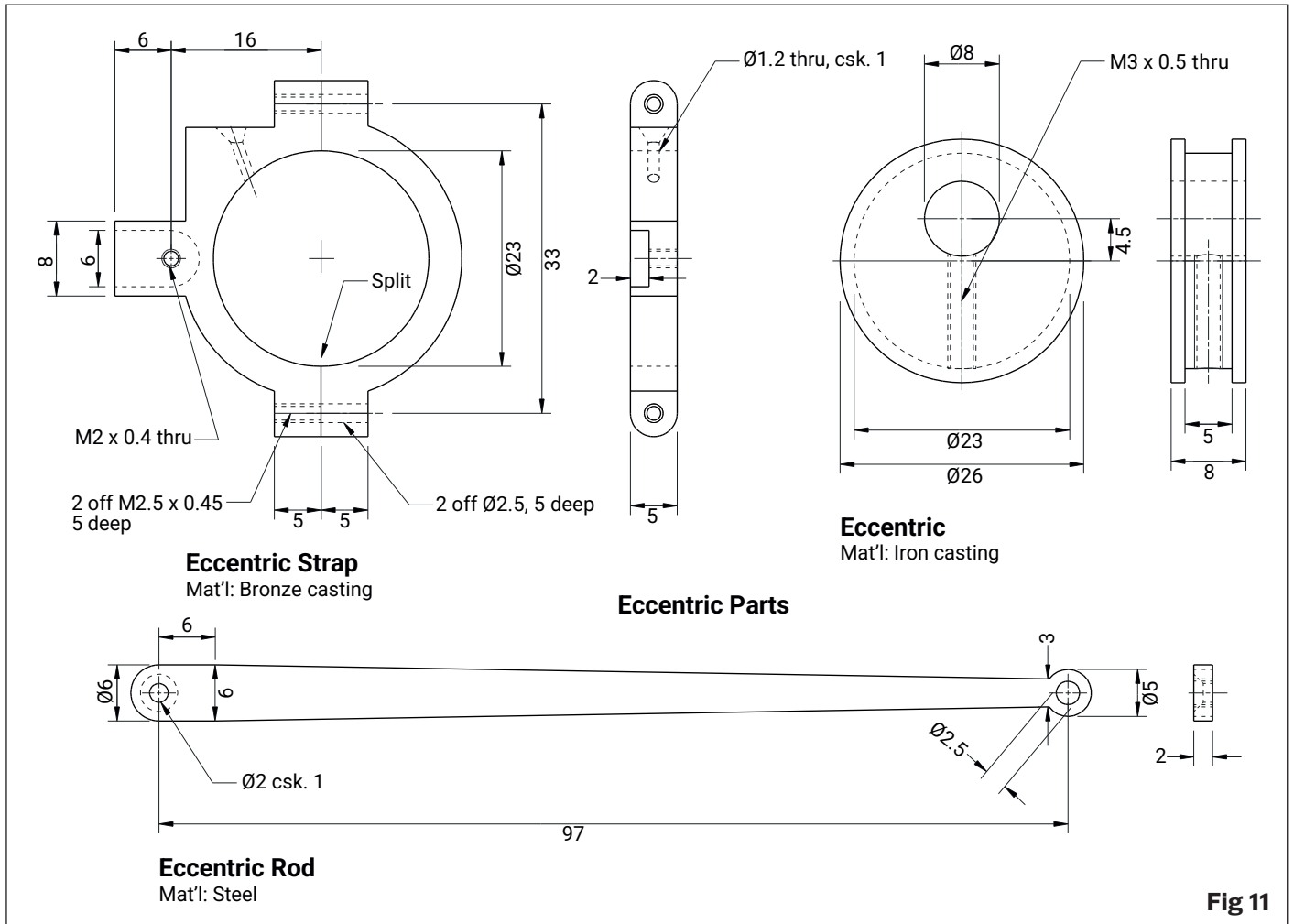


Fig 11

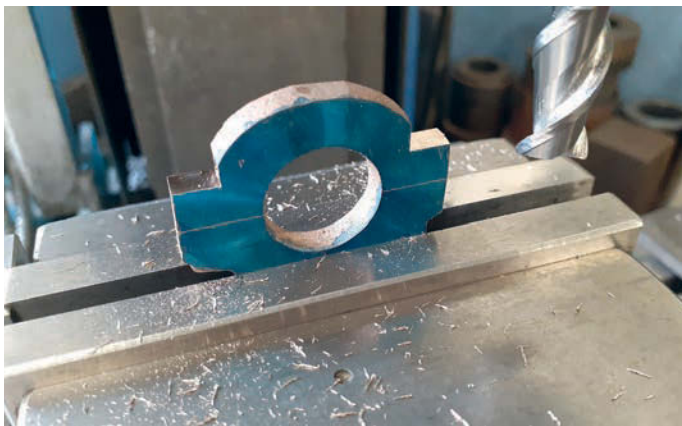


Photo 49: Milling strap to width and lugs to height

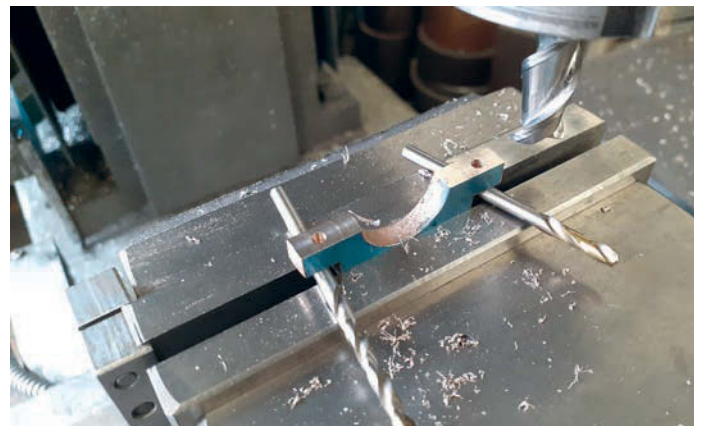


Photo 50: Cleaning up saw edges

be ideal, **photo 49**. Drill right through 2.1mm then open up to just below the line 2.5mm and tap M2.5.

If you have a slitting saw, then set that to cut along the line (if not a hacksaw can be used). Use a milling cutter to just clean up the surface of the half that is still in the vice. Then use a couple of drill bits to set the other half horizontal and mill its sawn face down to leave the lug 5mm thick, **photo 50**.

Screw the two halves together and ensure the faces are flush then tack a

piece of thin scrap sheet to the face of the eccentric with hot melt or super glue and mark a line through the joint on that and another mid-way between the two lug edges and punch where they meet to indicate the centre of the hole that needs to be bored, **photo 51**. Set the strap back in the 4-jaw and get the punch mark running true, don't apply too much pressure to the jaws as it could distort the soft gun metal. Remove the making out plate and then bore the casting to 23mm diameter **Photo 52**.

The remaining milling can now be done, start with the boss for the rod bringing it to length and at the same setting the sides around the oil hole can be squared up, then set up to drill the oil hole using either a small centre drill or spot drill to form the chamfered oil pocket, **photo 53**. Lastly the recess for the eccentric rod can be milled with a 6mm cutter and the screw hole drilled and tapped M2.

Finish off by filing the remaining curved outer edges to shape.



Photo 51: Centre of hole marked on scrap piece



Photo 52: Boring the strap halves screwed together

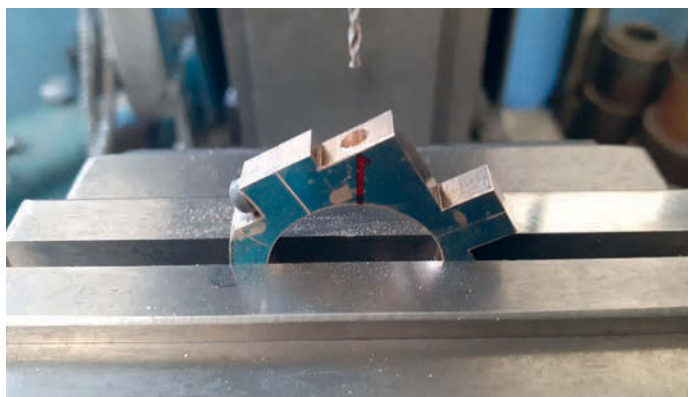


Photo 53: Drilling oil hole



Photo 54: Using strap to gauge size of eccentric



Photo 55: Offset hole reamed & marking high point



Photo 56: Completing eccentric mounted on arbor

ECENTRIC ROD

I sawed this from a piece of 2mm sheet, then milled to a parallel 6mm width so it could be held to drill the ends before holding on edge at an angle to create the tapers and lastly filed the ends round.

Make sure that you leave the first 6mm parallel where it fits into the slot in the strap.

ECENTRIC.

Set the chucking spigot to run fairly true in the 4-jaw and take off enough to just clean up its diameter and the remaining face of the eccentric. Then holding by the spigot set the main diameter to run true, face and turn to the 25mm overall diameter. Using a small parting tool form the 1mm deep

x 5mm wide recess, the strap can be held around the eccentric and the lugs pinched together to gauge the fit of the recess within the strap, **photo 54**.

Transfer the 4-jaw chuck to the mill with the eccentric still in position, locate the centre of the 25mm diameter and then move over 4.5mm and drill and ream 8mm. With something pointed in the mill scribe a small mark opposite the 8mm hole to indicate where the high point is and to locate the grub screw as this can be used to help set the timing later, **photo 55**. The M3 grub screw hole can then be drilled.

Hold a piece of the crankshaft material in the lathe and fix the eccentric to it using a short grub screw. This will enable the eccentric to be faced to its final width and the spigot finished for diameter and length, make

sure you don't turn away the grub screw's socket! **Photo 56**.

Just to remind readers, the castings for this engine are available from Blackgates Engineering. Next month we will finish off the engine. You can see a video of my engine running using the QRcode.

To be continued



Original anti-rotation peg.



It Needs a Rework

Laurie Leonard made a gear carrier for dividing on his Myford ML7 and it wore out; he does the job properly on a second attempt.



Many moons ago I made an extension for the mandrel on my ML7 so that I could use gears as dividers for work held in the chuck. As is often the case the need arose in the middle of a job and although a drawing, **figure 1**, was made of the components, the design was focused on minimising time to make it. From the drawing it can be seen that the extension has a portion that enters the lathe mandrel and is held in place by expanding the outer diameter utilising an inner conical wedge. As its function is to index the rotation of the mandrel utilising a gear the latter has to fit such that it is firmly located preventing independent rotary movement between mandrel and gear. Now, after a good number of years (the date on the drawing is 18/2/94) the design decision for a quickly made locator has come home to bite me.

Photograph 1 shows one of the Myford gears being fitted to the mandrel extension. As it was easy to drill a hole and solder a peg into it, a peg was used to prevent rotation of the gear on the mandrel. Over time the peg has worn, a bad original idea when you think of the minimal contact area between the peg and the gear. The gear now partially rotates independent of the mandrel. An attempt to get myself out of hole by squashing the peg in the vice to fatten or expand it failed. It needs a rework.

THE REWORK

The component parts of the mandrel extension are shown in **photo 2**. The offending peg can clearly be seen on the mount for the gear. Obviously a more robust method of location was required; either a woodruff key



Photo 2: Components of the mandrel extension.

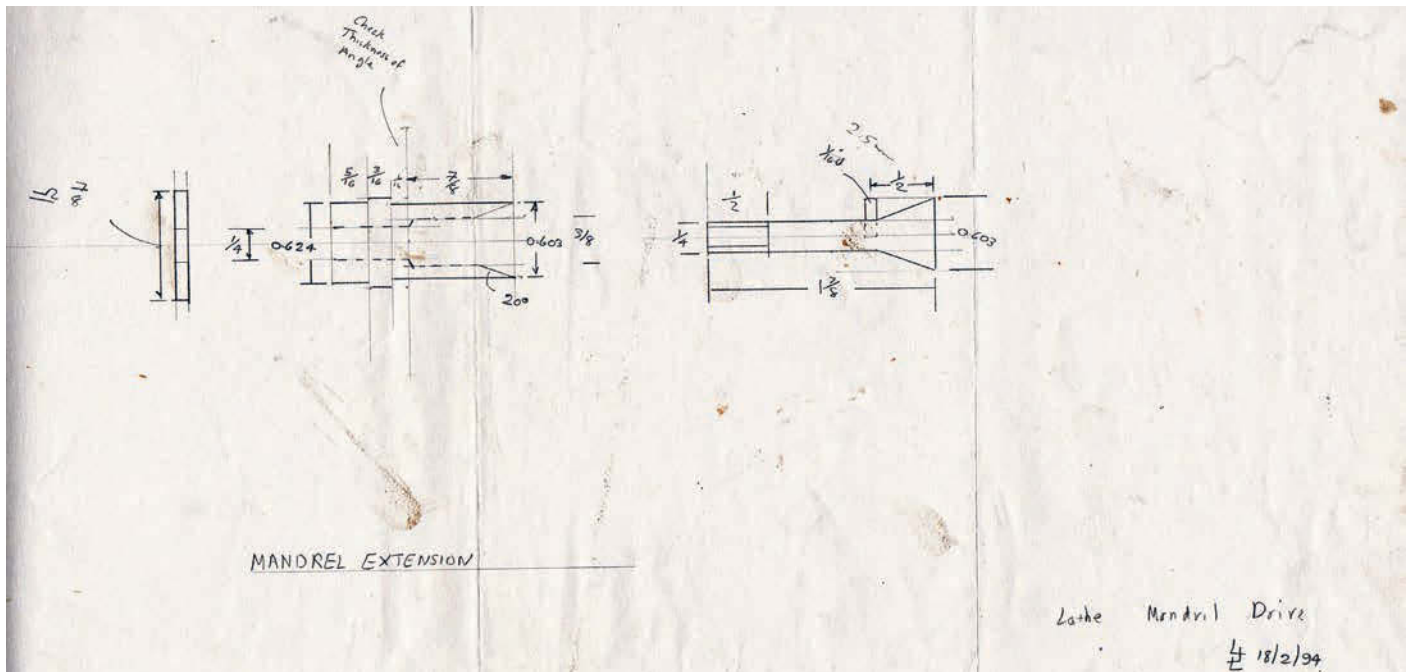


Figure 1: Laurie's 1994 drawing for the mandrel extension.



Photo 3: Milling with the work held in a three-jaw chuck.



Photo 4: Key and machined mandrel extension ready for soldering.



Photo 5: Completed rework.



Photo 6: End view of gear mounted with its nice snug key.



Photo 7: A final view of a gear on the extension.

or an integral key would satisfy this requirement. The latter solution was chosen as the key would be fixed so it could not get lost when changing gears or packing away ready for use next time.

The old peg was filed off cleanly and a fresh area of the gear location portion of the mandrel chosen for the new key's position. A key was fabricated from a piece of 1/8" plate and a slot was milled with a 1/8" slot drill. Thought was given to putting a 1/8" key in a 1/8" slot. The key was a reasonable fit in the gear and it was felt that the 1/8 milled slot would probably be over

size making it easy to slide the key in and providing the necessary gap for capillary action to cause the flow of the silver solder, **ref. 1**. The work was held in a three jaw chuck mounted on a rotary table, **photo 3**. This arrangement was chosen as it would be secure and the rotary table would assist aligning the work for the cut. It was also thought

that it would provide good access for the cutter but in practice, as the latter only had a short shank, the position of the jaws on the chuck was critical to prevent the mill chuck fouling them.

The key and the machined mandrel are shown in **photo 4**. All that remained was to silver solder the key in place and clean it up. Not taking sufficient heed of the article on silver soldering in issue 262 of MEW, specifically the amount of filler rod and employing the belts and braces approach, there was a bit to the clean up stage. I ended up resorting to a mini milling cutter on a hand-held mini drill as there was little room for a needle file. The completed but far from beautiful part is shown in **photo 5**.

Photographs 6 and 7 show a gear mounted on the reworked extension.

CONCLUSION

Rework is not a nice word in my book and there is also the adage 'right first time'. There were reasons for the original design, but the reworked part should now go on for many more years.

REFERENCES

- 1 Hale, Keith. *Introducing Silver Soldering*. MEW 262

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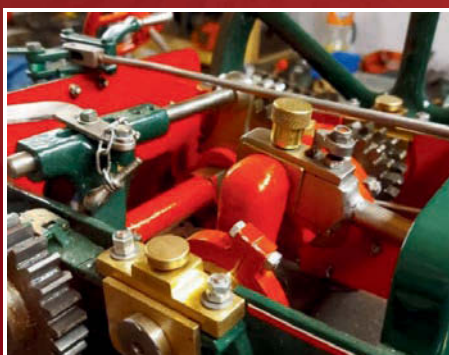
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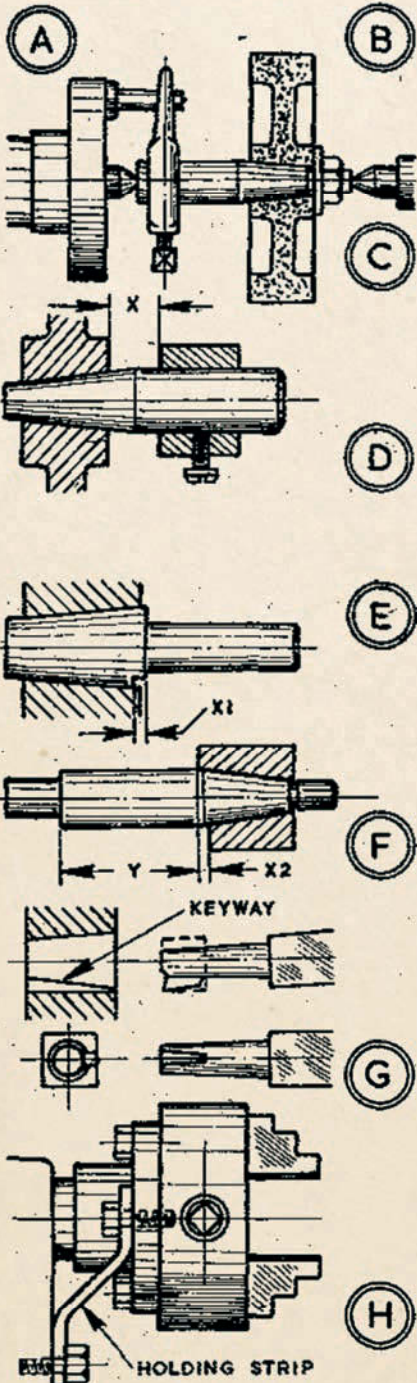
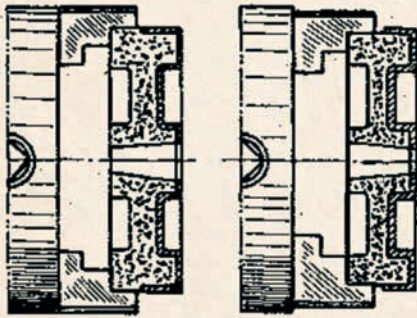


These articles by Geometer (Ian Bradley) were written about seventy years ago. While they contain much good advice, they also contain references to things that may be out of date or describe practices or materials that we would not use today either because much better ways are available or for safety reasons. These articles are offered for their historic interest and because they may inspire more modern approaches as well as reminding us how our hobby was practiced in the past.

Beginner's Workshop

TAPERS

GEOMETER gives a few hints on machining and checking



THE DESIRABLE true running of a pulley or flywheel tapered on a shaft is generally best ensured by finishing faces and outside diameter with the component mounted on a mandrel running between centres in the lathe. All important surfaces are thus finished at one setting and the wheel is both parallel and concentric—a condition difficult to achieve by chucking and re-chucking no matter how carefully this may be done.

The preliminary roughing out is advisedly done in a chuck (which can be a four-jaw independent type with the jaws reversed if necessary, since heavier cuts can be taken in a chuck than on a mandrel), leaving about 1/64in. surplus for finishing. In this way, scale or any hard spots in the casting can be successfully dealt with in the rough machining, using a slow rotational speed and taking cuts deep enough to be everywhere well below the surface.

Diagrams A and B illustrate typical chuck set-ups for rough machining a small flywheel, the material removed at each being shown by the shaded areas. At each set-up the wheel is pushed back to the jaws for facial alignment and the jaws are regulated for peripheral or general spinning truth.

Although it is not vital to do so it is generally best to machine the taper bore on the first set-up, and also to turn along the outside diameter, as far as possible. On the second set-up it is then practicable to fit a taper mandrel in the bore and employ its end for checking and truing—if it should happen that it is difficult to apply the pointer, of a surface gauge to a portion of the outside diameter.

Moreover, should a small error result from the setting, cleaning cuts can easily be taken on the mandrel set-up C since the particular faces will be towards the tailstock.

TAPER UNIFORMITY

When the shaft is available on which the wheel is to fit, it can be

tried in the taper as this is machined (or reamed) in order to locate the wheel endwise correctly—in which respect, should the taper bore be made slightly too large a reducing cut can always be taken over the face.

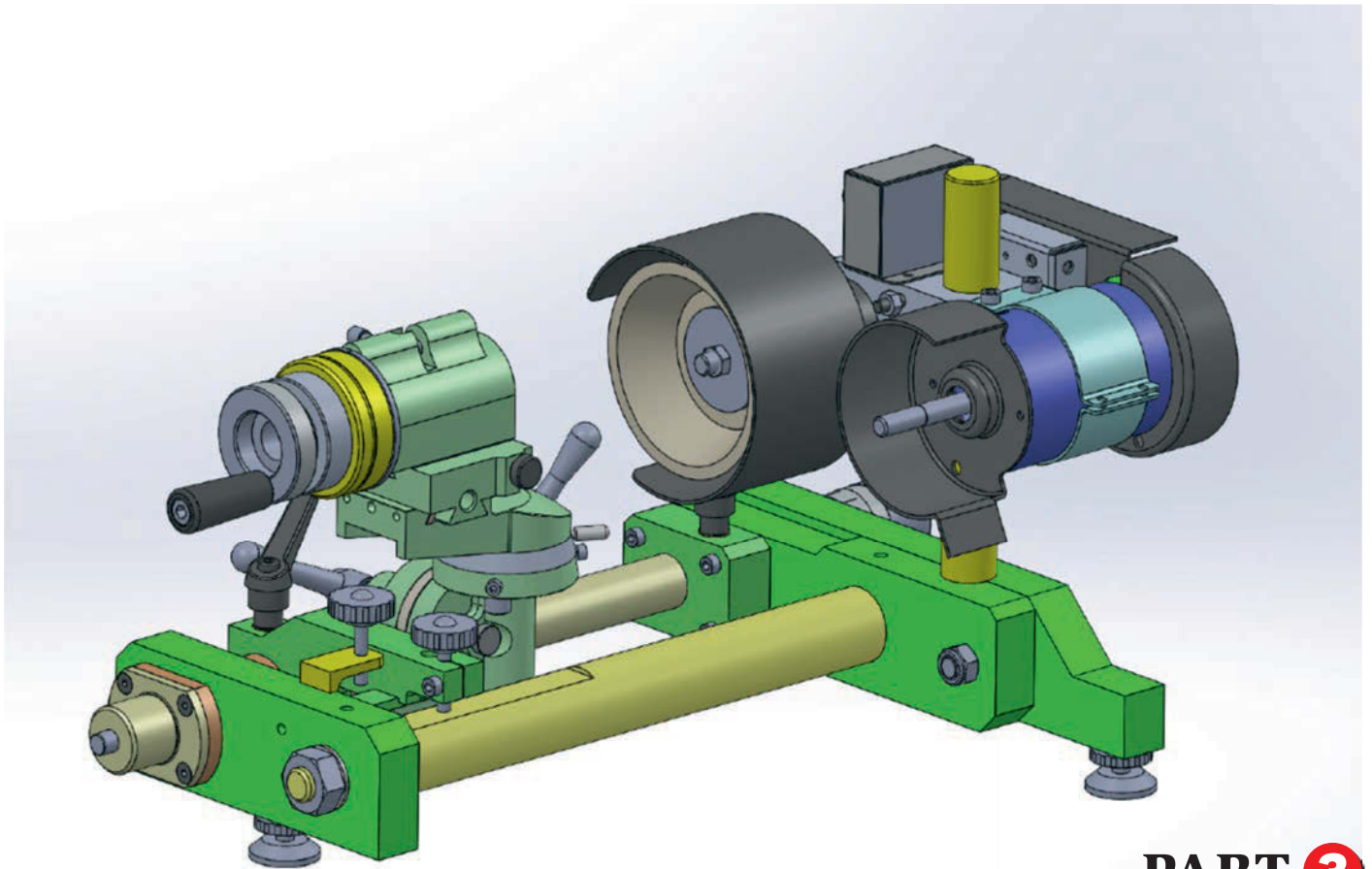
Alternatively, the bore can be sized from a reamer or mandrel, as at D, which may be necessary if the component is a replacement, or one is requiring to standardise tapers for wheels to be fitted on different shafts. In the case of a mandrel, a shoulder can be left in machining or a sleeve can be fitted for a distance X to obtain when the taper is at correct size; in the case of a reamer, a sleeve is essential when the distance can be measured with a rule, or a small gauge made just to push into the space.

A common type of gauge for this method of sizing tapers is as E, where the taper portion ends in a step on one side XI. On the tool being pushed tightly into the bore to be tested, the step should go just below the surface while the full diameter just stands proud—showing the bore to be within its particular tolerance.

Should the gauge enter too far a light correcting cut can always be taken across the face—assuming there remains sufficient material on other faces to machine them into relationship—which is as good a reason as any for finishing the taper early in the proceedings.

The principle also applies to a shaft F where a ring gauge (corresponding to the component) is used. This may have a step X2 to locate the position where the taper finishes at the full diameter, or at the opposite end on the small diameter, though a better way is to take the distance Y from the face to a shoulder or the end of the shaft.

If a keyway is required in a wheel its cutting should be the final operation. From square silver steel a tool is made as G, turning the shank, filing the surplus to tool shape, then hardening and tempering. Planing cuts are taken from the saddle with the chuck secured against rotation, as at H, by a holding strip from backplate to headstock.



PART 3

A Tool and Cutter Grinder

Paul Lousick has designed this tool and cutter grinder around a readily available cutter holder. It offers a great deal of flexibility while being relatively straight forward to construct.

The motor and grinder assembly was previewed in fig. 7 in the previous issue. The motor and speed control was taken from a 150 watt, 240v mini bench grinder with 75mm grinding wheels and a no-load speed of 1000-9900 rpm, **photo 17**. I purchase mine at a hardware store but they are also available on the internet. A bigger motor would be better for making heavy grinding cuts but it is adequate for sharpening existing cutters.

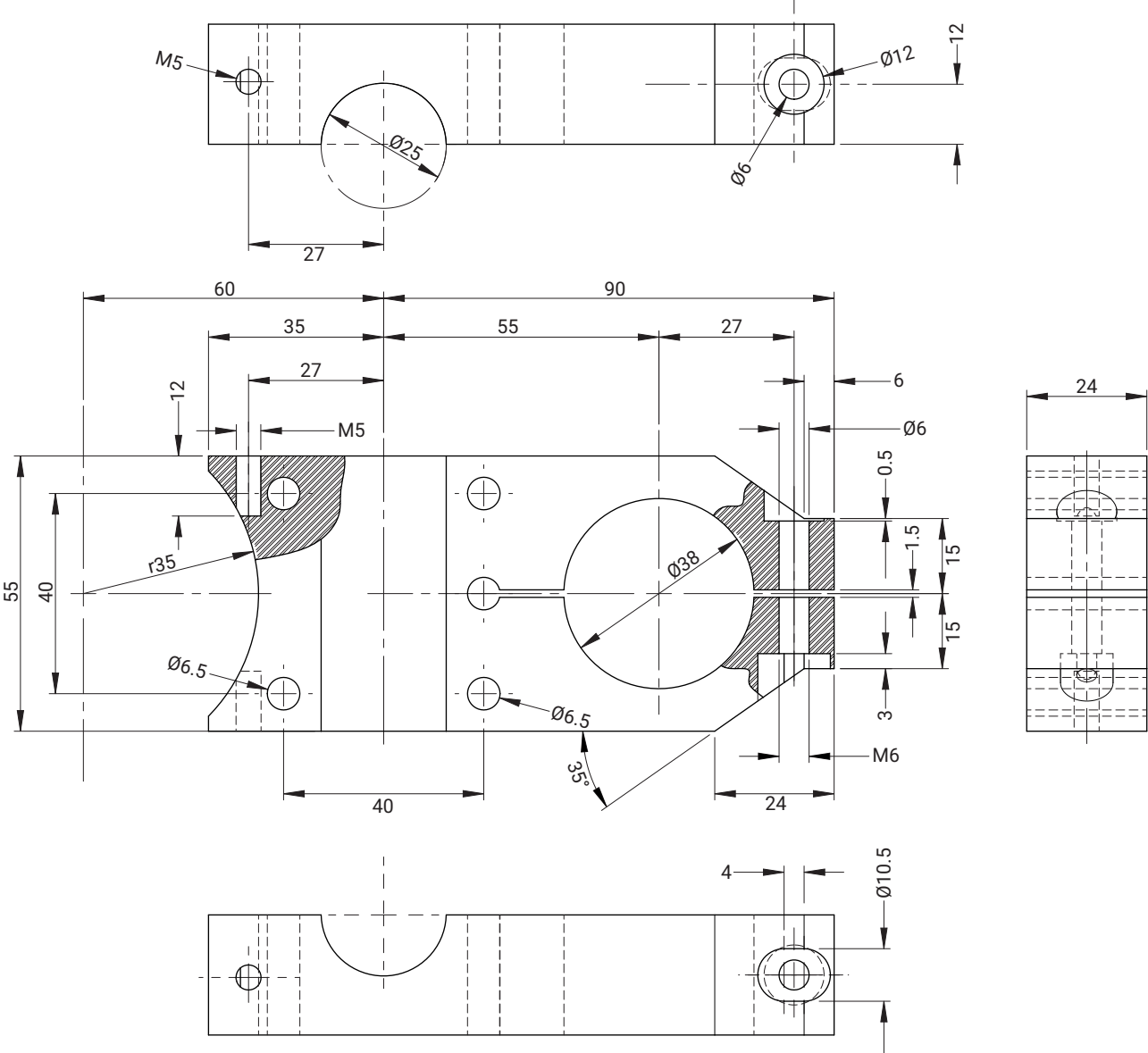
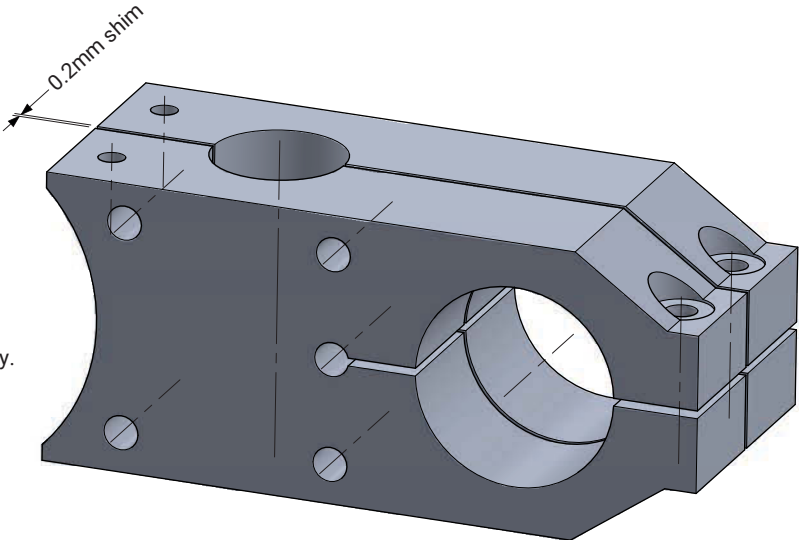
Material for the support frame was cut from re-cycled aluminium plate and all sides machined flat with a flycutter, **photo 18**.

Place the two plates on top of each other in a vice and drill 4 holes for the clamping bolts. I also added a hole for a spring/hammer dowel pin for additional alignment while machining. Then bore a hole for a slide fit with the grinder housing, **photo 19**.

Remove plates and clamp together with shim plate between them and machine a slide fit hole for the support column. I used a piece cut from the side of an aluminium can.



Note: Clamp plates together with a spacer when boring hole for a clamp fit with the mating part at assembly.



One as drawn, one opposite hand

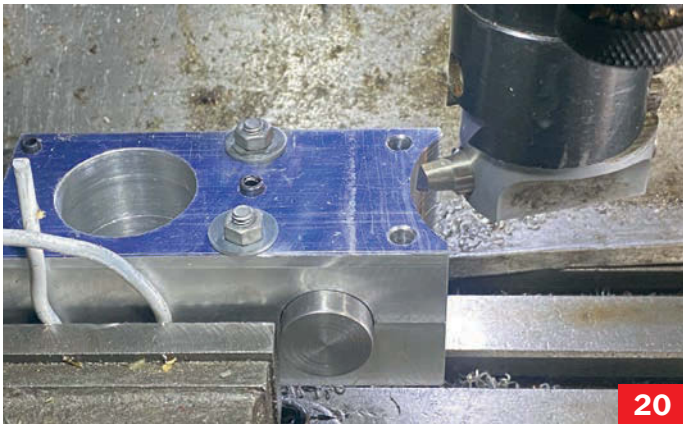
Fig 8



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23

Remove the shim and clamp the plates together around a piece of round bar (same diameter as column). Bore the curved shape on the end to mate with the side of the drive motor, **photo 10**.

Both end covers for the spindle were turned as one piece from hollow bar and the thread cut manually with a single point tool. As the thread was into a blind corner and not very long, I manually turned the chuck with a spanner held on one of the chuck jaws.

Thread gauge wires and a micrometer were used to determine the correct depth for the thread profile. Slots were milled for tightening the nuts with a C-spanner and the cover was split into two pieces, **photo 21**.

The spindle housing was turned from hollow bar and the internal threads at both ends bar cut with a single point

lathe tool using the retainer nuts as a gauge for a close fit.

My first attempt with a carbide tipped cutter was not successful and they broke easily. Changing to a HSS cutter was much better. The end of the nuts were faced and a groove cut into the end for a labyrinth seal, **photo 22**.

The diameter of the collet spindle when measured was a light press fit with the bearing which is OK for the head end, but the tail end bearing has to be a sliding fit for the springs to remove any slop between them, **photo 23**. The shaft was fixed by holding the head in the lathe chuck and supporting the tail in a centre and reducing the diameter with emery paper.

The grinder spindle is made from a standard ER11 collet chuck with a 12mm diameter straight shank extension.



24

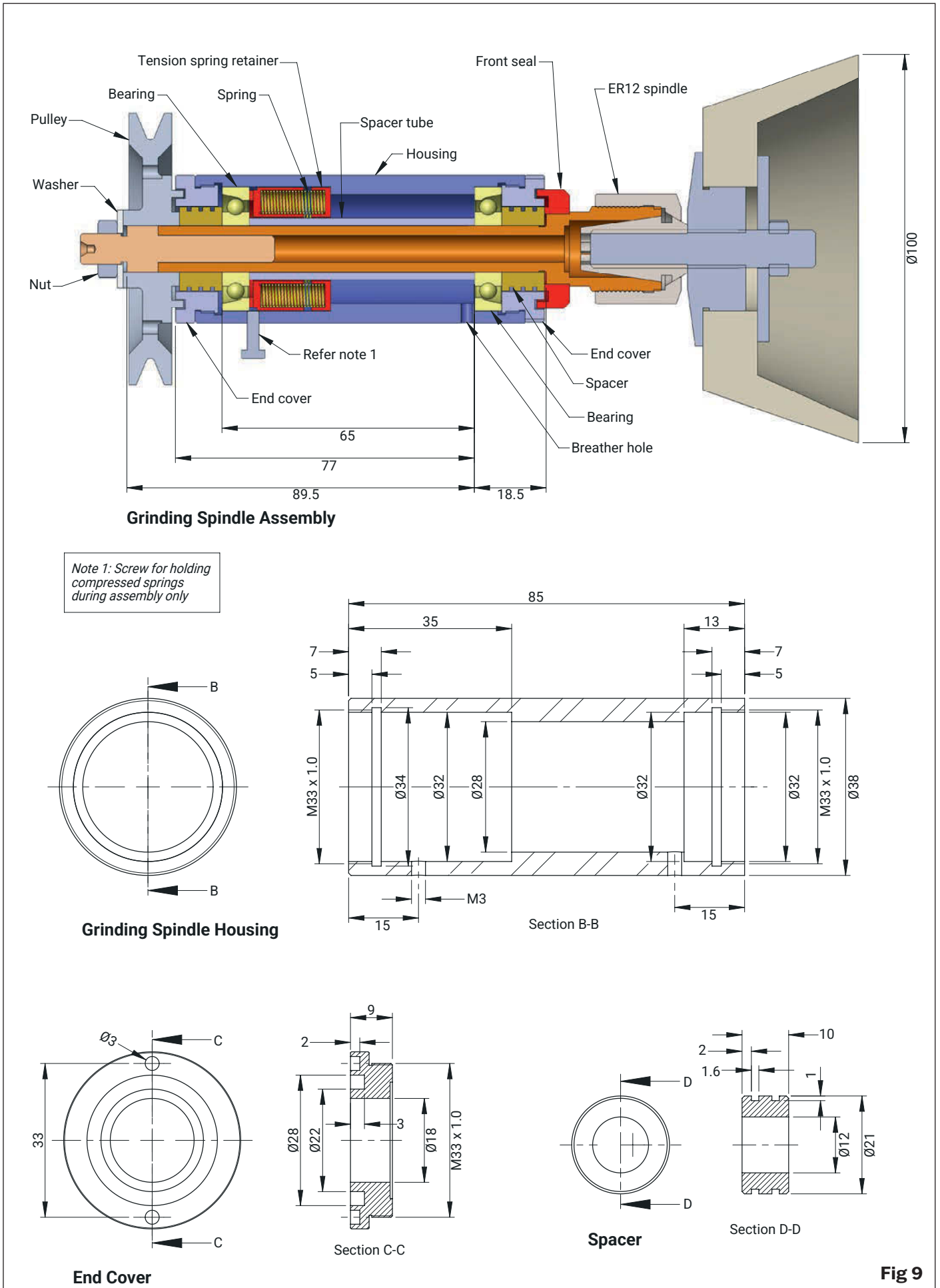


Fig 9



25

The shaft is hardened and a thread for retaining the chuck is required. Instead of attempting to soften the shaft and cut a thread, I added an extension out of mild steel which was pressed into the hollow end of the spindle, **photo 24**.

The extension was made oversize and after pressing into place was turned down to match the OD of shank and to ensure it was straight and parallel. A thread for a retaining nut was then cut onto the soft end of the shank using a thread die, **photo 25**.

The tension spring retainer was turned to the finished diameter, then mounted in a chuck on a rotary table for drilling the holes for the springs, **photo 26**. The excess material then cut off and the sawn end faced to be flat and square.

GRINDING WHEEL SAFETY GUARD

The clamp for the wheel guard mount is made from 12mm round bar. Half of the bar is drilled 6.5mm diameter and the remainder tapped for an M6 screw. (The 2 halves will be separated later in construction). Shape the side of the bar for a matching fit with the mating part, **photo 27**.

The support tube for the guard is made from 42mm OD pipe with one end turned to fit the hole in the side plate. The surface of the tube where it is attached to the clamp was ground to remove rust and cleaned with paint thinners. Then coated with flux and wired together for silver soldering, **photo 28**.

to be continued



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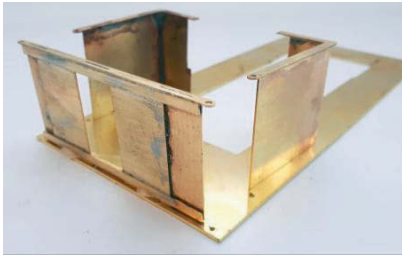
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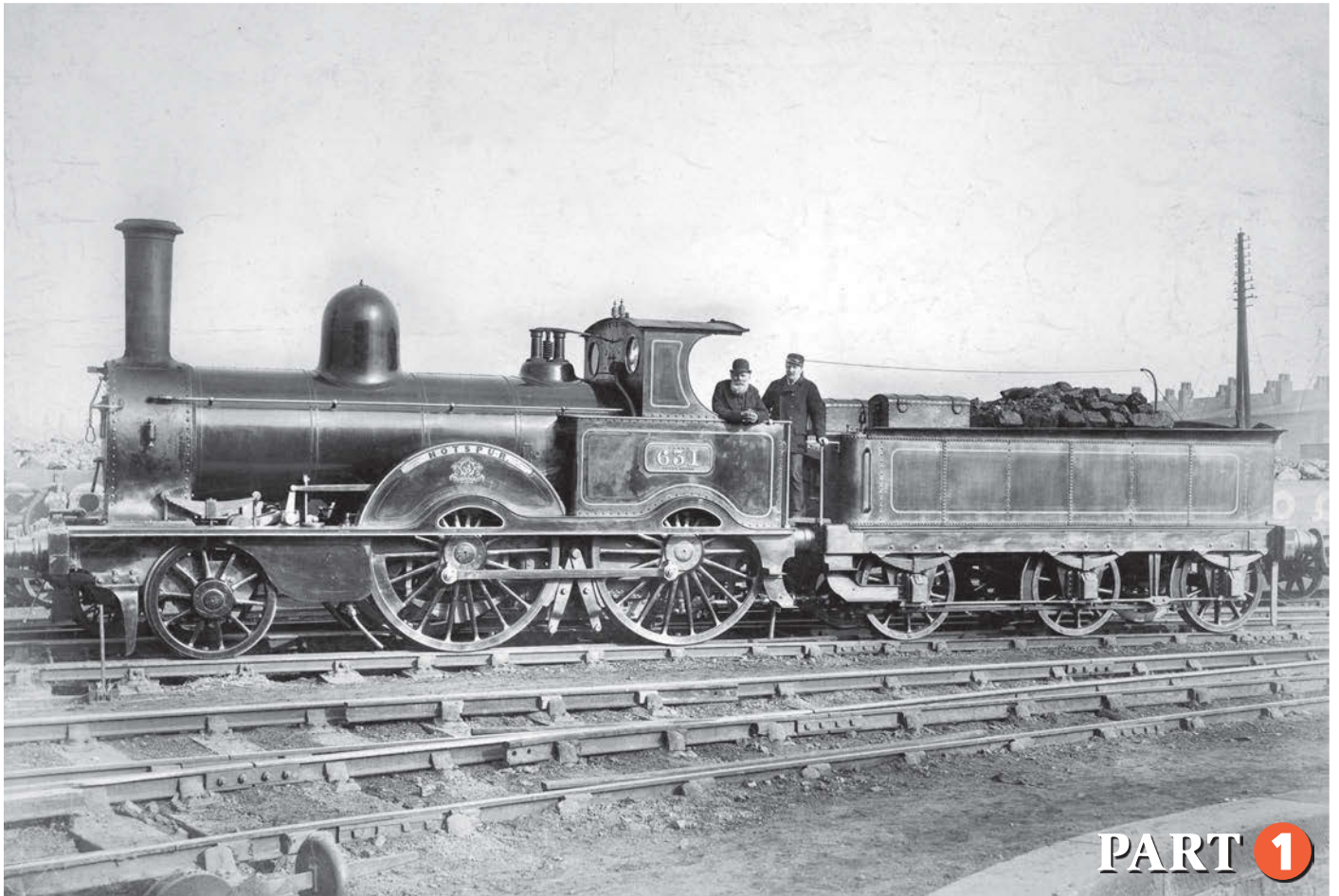


Photo 1: The prototype being used the Author's model.

Samson

Chris Rayward describes modelling an early L&NWR **Samson** Class 2-4-0 passenger locomotive in the first part of an occasional series focusing on the more unusual challenges posed by modelling a mid-19th century locomotive.

THE PROTOTYPE:

Those readers who have been kind enough to read my book on my model engineering history, will be aware that way back in 1969, I began to build a 5" Gauge model of an L&NWR 2-4-0 'small Jumbo' locomotive of the *Whitworth* Class. It was my first model, but unfortunately the design proposed by LBSC and followed up by the late Martin Evans was not a huge success. The valve gear was subsequently re-designed by two experts (Simon Bowditch and the late Don Ashton) and was published in the *Engineering in Miniature* in August and September 2011. As an illustration to learn from, I had obtained a picture of one of the class No. 631 called *Hotspur* and this is why it became my pen name for articles submitted to the *Engineering in*



Photo 2: A view showing the current progress with the model development which is ready for the driving wheels and leaf springs to be fitted plus the coupled wheels.

Miniature and later on, formed the title of my small business trading name. The misfortune of putting so much effort into building the model came very hard and I have always vowed to build a model of the locomotive class that preceded the *Whitworth*, which was called the *Samson*. An illustration of my prototype is shown in **photo 1** so you can see the connection with the model I made.

John Ramsbottom designed the *Samson* class, and they were introduced in several batches totalling ninety engines between 1863 and 1879. They had 16" by 20" cylinders, nominally 6-foot driving wheels with Stephenson's valve gear and were called curved link engines. All gave good service right across the North Western system until they were scrapped between 1889 and 1894. From my notes the wheels were used to produce the new engines of the *Whitworth* class between 1889 and 1896 and the same names and numbers were carried over. These later engines were really a smaller *Precedent* class with the Allan valve gear and 'V' shaped valve chests and so this is where the original model I made came from.

Everything about the *Samson* class locomotive was small; being just over 25 feet long and with an overall weight of about 26 tons. It had a small low-slung boiler, a tall chimney and a large dome casing. The tender was not much smaller and was the forerunner of the standard 1800-gallon type that was used with so many early L&NWR engines. It had a wooden under frame with a horse-shoe style water tank and a coal space in the centre. It ran on 6 wheels of 3' 9" diameter, with the rearmost pair very close to the rear buffer beam and originally had a water capacity of only 1500 gallons. The leading wheels on the engine are the same size. The preserved *Hardwick* has the larger tender.

THE MODEL

Fortunately, I have been able to obtain copies of some old drawings for the locomotive design from the L&NWR Society from which to scale the chassis and determine the layout of the structures using the wheel diameter as a reference for scaling. These show the basic layout of the design. The driving wheels were given a leaf spring suspension which Ramsbottom first used for the springing arrangement fitted to the early versions of his *Lady of the Lake 2-2-2* design built from 1859. Anyone keen on building a model of this locomotive is advised to find some

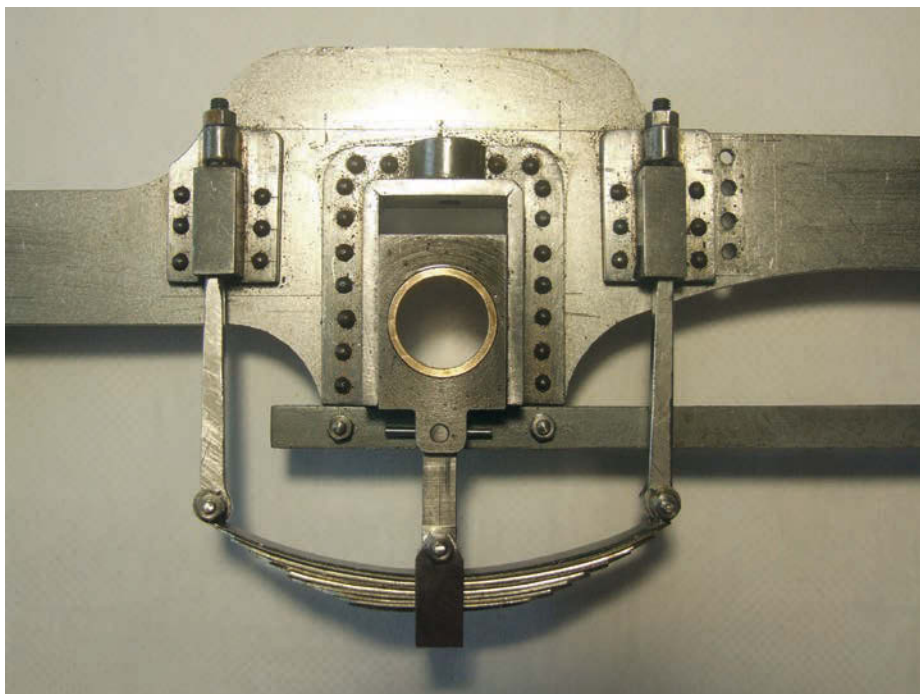


Photo 3: The driving wheel suspension arrangement.

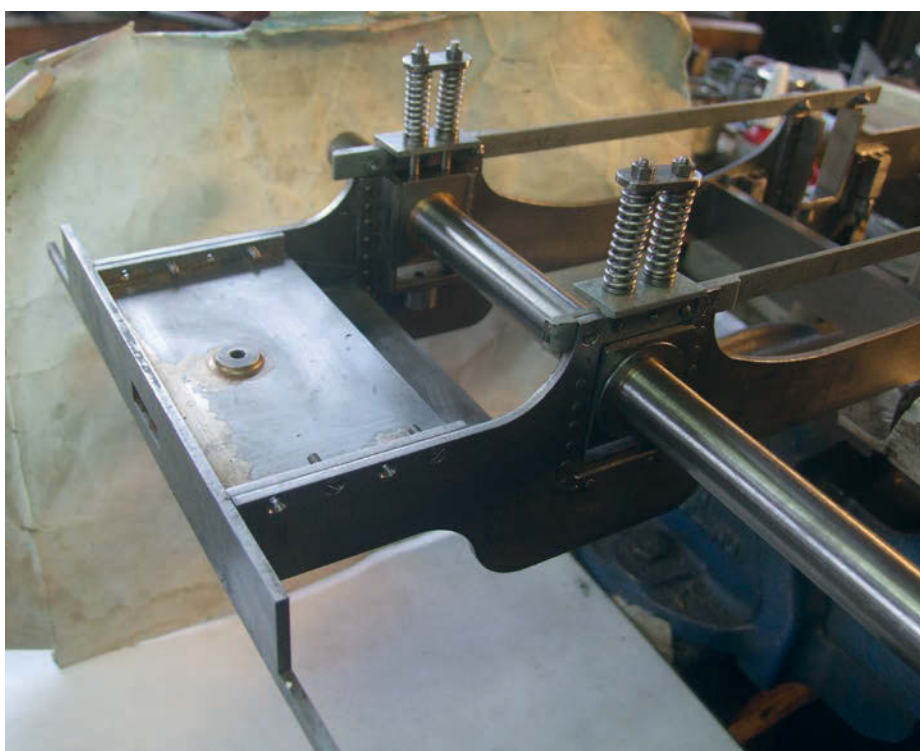


Photo 4: A view of the drag box assembly fitted to the frames with the rear axleboxes and their springing.

photographs from which to choose a prototype to follow and I suggest finding a copy of Edward Talbot's fine book *A History of LNWR Engines*. The very early engines had no cabs and no brakes. The front hook was a simple attachment dangling from a short chain. Later the L&NWR standard hook was used but neither was sprung loaded at that time; they were secured with a substantial taper key against a channel section plate behind the front beam.

The model locomotive will be very small and probably weigh about 70lbs, so it is easy to work on and transport to club meetings. I have begun work on the design, and the chassis frames are just over 24" long with the usual narrow profile and only a nominal number of stiffening stretchers. My **photo 2** shows the development to date.

The cylinders too are short but similar to those adopted for my Coal Tank design with the valves in

between. I am aware that bronze castings do not help the weight distribution for a model of this wheel arrangement, and I am proposing a special lightweight assembly by adopting a minimum size for the cylinders and valve chest material in a steel cage at the base of the smoke box that is bolted to the frames. To keep the cost down my usual scale boiler diameter of 4¼" (which now seems to be a non-standard size) is to be reduced to a more obtainable 4" which avoids the need to wrap the barrel. My prototype drawings show the engine has a steam brake and the usual Webb cab and side sheets that are such a feature of the Company's early designs, but builders can adopt the older spectacle plate version if they prefer.

One of the advantages of the L&NWR era is that the evolution of these small engines was quite slow and many features became a 'house style' which was carried over from one design to the next, so this cut down on production costs and stock inventory. It also means the casting material for the chimney, dome and safety valve casing are common.

The leading wheels and those for the tender are already available as a standard part for other models in my L&NWR model range and the pattern for the coupled wheel castings is to hand. All these are with Blackgates Engineering, and they also have the first six of my construction drawings plus the list of laser cut chassis parts.

The tender is going to be the early smaller version of that proposed alongside my *Lady of the Lake* design. The chief differences are the height and construction of the tank, as in the early days the L&NWR could not make wrought iron plates over a certain length and so there was an extra caulking seam of rivets in the centre of each side where the shorter plates were joined. A technique for simulating the caulking seam rivets was published in *ME&W* issue 4773 earlier this year. In agreement with our worthy Editor, I have agreed that this will not be a blow-by-blow series on how to make the model and although all the components will be featured on my drawings, the articles will concentrate on the more unusual or involved aspects of the construction with captioned illustrations for clarity.

FURTHER VIEWS OF THE CHASSIS.

Some additional views of the chassis are now shown with some explanatory



Photo 5: Checking of the spring loading at the axle running position. The collars fitted to the springs can just be seen.

notes included. For those that may not have seen my article on the leaf springs in *Model Engineer* No. 4737 in March 2024, a general view of the driving axle suspension arrangement is shown in **photo 3**. It will be seen that the axle boxes are extended below the stay bar to take a link that connects to the leaf spring pack.

A hefty drag box, made by assembling a laser cut kit of plates and silver soldering it together, is fitted to the rear of the chassis and this should be the first assembly that is attached to the frames as it contributes to a square and parallel start. **Photograph 4**. shows the fabrication in place and note that the two straight ends of the rear plate will be heated and formed to represent curved corner of the cab platform once the overall width of the plate work is

determined. Also in this view are the rear coupled axle bearings with the usual coil springs suspension. The spring load was made identical to the driving axle leaf springs with the same checks using weights. **Photograph 5** is an inverted view and shows the spring loads being checked.

Note that the springs fit against an angle bracket riveted to the stay bar but as the internal diameter of the springs is larger than the pins, small, shouldered collars keep them centralised.

The holes in the bracket are also larger, so the collars ensure that the springs do not become wedged in these holes, whilst still allowing for clearance in operation.

Next time I will describe how to make the crankshaft.

To be continued



Club News

Geoff Theasby reports on the latest news from Model Engineering Clubs.



Photo 1 Charlie's coach exterior.

Writing this column over the years, I have tried to keep the content topical, albeit dealing with club newsletters the contents of which are probably a month old by the time I can incorporate them into my piece. So, the term 'topical' is qualified. This does not of course refer to the jokes. An asterisked footnote was unaccountably omitted from the end of Club News 4776, in that my friend's decision to raise his chair by a few centimetres, led to my informing readers that '*My plinth will come'. (I hope readers will feel it was worth the wait - Ed.)

In this issue: a 5-star excursion, a superb coach, duplicates, endurance an impossible goods depot., drones, funiculars, multiple Decauvilles, and NZ clocks. 7 1/4 inch Gauge News, Spring, from the **7 1/4 Inch Gauge Society**, has been delivered, in which Daniel Mason reports that the Miniature Railway Workshop was asked to provide a 7 1/4 inch layout to run on the carpet of an upmarket hotel for a birthday party for one of the staff. The biggest available space, the loading bay, was three feet off the floor level, so the usual transport, a box trailer, was not

usable. Everyone worked so hard to make it happen, and the results were fed back for analysis. The railway ran for three hours without any hiccups, the locomotive ran faultlessly and the train only stopped to unload and load passengers. Rolf Thomas was asked to bring his locomotive, *Mixer*, to be shown at the MMEX 2025, while Robert McLuckie produced a long article about his J36 *Maud* with 27 photos. His reason for building it - his driver father fired and drove many J36's when based at Bathgate shed. John Ward, also writes at length on his 2MT, this type is also the favourite model of Editor, Tim Coles who made one some years ago. The Proficiency Award scheme proceeds. A number of Bronze and Silver awards have been, not 'given out' or 'awarded', but 'earned'. As predicted, The LOWMEX, or Lowestoft Model Engineering And Model Making Exhibition was an excellent event. "An impressive range of models", said Tim. Charlie Lovett made an LNER Gresley teak bodied coach, half dining, half first class. The detail, both interior and exterior, is wonderful, **photos 1** and **2**. Editor Tim says that Charlie is a prolific and able model engineer. We may see more of his models in due course. As an aside,

John Ward, says, the 1990s were the days when older members would sit and pontificate and pass comments on various matters. He called them 'rivet counters', so he purposefully left out a rivet from a row on the tender of his 2MT. This has not been spotted so far... Dr David Hatherill writes on early AGMs and the prehistory of the Society. www.sevenandaquarter.org. *Raising Steam*, Winter 2026, from the **Steam Apprentice Club** of the National Traction Engine Trust another bumper issue. This is partly because a few pages have been duplicated! Accidentally, I'm sure. Chairman Paul Stingmore advises us of two new Facebook sites, Next Generation Heritage Engineer Community, and Traction Engines Then and Now. Apprentice of the Year is Harley Plumb. New award Volunteer of the year is Elliot Jones and the Doc Romanes Trophy was won by John Rex Models. Victoria's 'Torton Tales' details what happened to their machine in 2025. Harry Talbot Has been restoring his Wilesco traction engine, and a grateful letter has been received from an owner, Jonathan Wheeler, about SAC member Freddy, who has been helping with his E. Young's portable. The Steam Boat Association have suggested that a steam boating day be added to the usual driving days. Trevor Barraclough has written about



Photo 2 Interior of Charlie's coach

'messaging around in boats'. Luke Canham wrote on his experience at a Driving Day at Astwood Bank. The organisers of Appleford 70 encouraged exhibitors and visitors to wear period costume. Apprentice member, Charlotte Langley, was pictured with her dog, Ted, in front of her family's *Endurance*. The back cover is a line drawing of a Pickering governor, blueprint style. www.ntet.co.uk

The Newsletter & Journal of the **Gauge 1 Model Railway Association** for

March arrives, with a fine picture of Accucraft 2-4-0 IoM *Peveril* No 6 on David Fletcher's track in Melbourne, **photo 3**. Readers are reminded of Gauge 1 North on 11 July, in Bakewell, as before. David Viewing describes the G1MRA's starter engine, a GN-style locomotive named *Greenly* which is a 3-D printed, electrically powered model. Didcot Railway Centre sent them an extract from a book by Transportation Press costing 1/- (1 shilling) the centre spread is a large puzzle drawing by R Bernard Way, of an impossible goods station, with many deliberate errors to spot. There are many! Andrew Bishop builds a Peckett, *Harrogate* by Roundhouse. John Boyson visited Japan's Hara Museum in Yokohama, whilst Rod Clarke, builds a Glasgow & South Western, Manson, '381' class and Andrew Giffen muses on a G1 kit. There is an extract from Model Railway and Electrician about the making of an electric locomotive from 1902. Peter Micenko in 'Sharps, flats and Goosenecks, discusses running a SAR 15F around a garden railway. Ken Toone has died, a member of Birmingham SME. His *Garsington Manor* is still in use, 47 years later. His overall service in Birmingham SME lasted 57 years, Notably, he built a Cowans Sheldon 75 tonne crane in 10mm scale. John Boyson describes gangways and glazing for the Mk 1 carriages he is building. www.g1mra.com The current issue of *The Engineer* features an item on long range drones, which are becoming useful for scientific research, logistics, wildlife monitoring and crime prevention. What it does not say is the phenomenal success of Ukraine in adapting them for the purposes of warfare. So much so that Ukraine is now a world leader in this activity. (Apart from the usual caveats regarding the moral purposes of war).

York City and District Society of Model Engineers, January newsletter, bears a picture of Ken Shipley's LNER V3 7684. Ken was visiting from the Bradford society, and Editor, Graham, says it not only looked ready



Photo 3 Accucraft *Peveril* in Melbourne (Picture courtesy of David Fletcher).

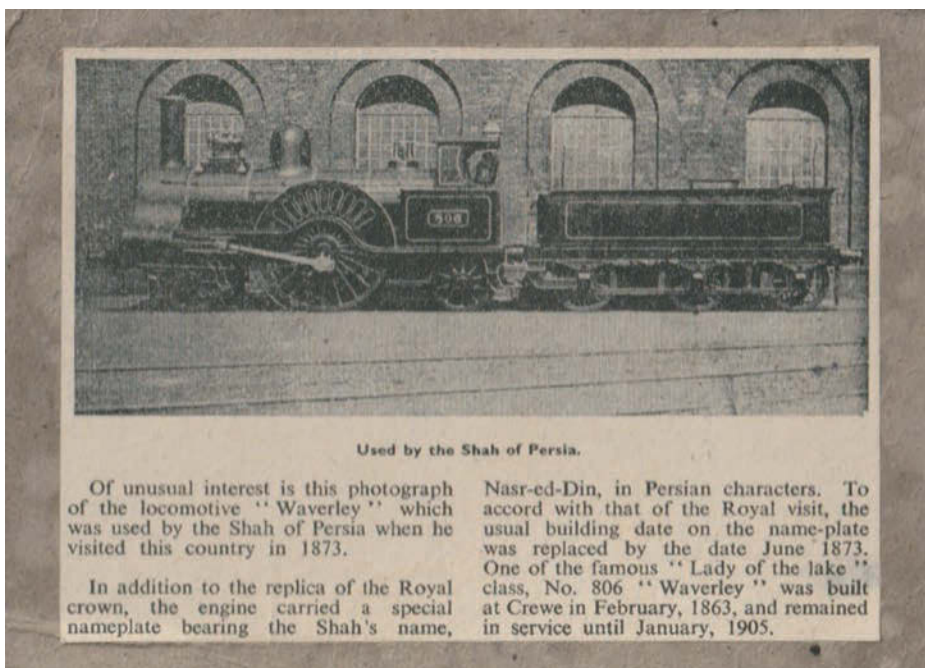


Photo 4 Waverley on a visit by the Shah of Persia's visit in 1873

for an exhibition, but it sounded good too. Dave Foster's wife has a medical condition which inhibits her ability to speak, and the York Speakeasy Club, a support group, held a benefit march, at which over £1500 was raised to help the club. Mike Pinder asks "What's in a name?" and discusses 'Hudson' locomotives, more popular in the USA than the UK. In the March issue newsletter, Nigel Bennett describes the first steaming of the *Super Simplex*. Roger Backhouse writes on Scarborough's funicular railway, at one time it had nine locos in service. The passion for sea bathing was first adopted in Scarborough, the first in Britain, (not Brighton, as is often claimed) there are several other subjects that make the town a forerunner in the history of the UK. The Rotunda museum was founded by William Smith, the 'father' of geology. The railway arrived in 1845, and the station still boasts the longest station seat in Britain. At one time it also had the longest platform, which took excursion traffic out of the station proper and avoided congestion. Phil Tattersfield tells a tale of two coaches, having already built one a few years ago. Mike Pinder asks "where is this old tunnel?" It turns out to be in central London, built to take tram traffic away from the Holborn/Embankment area. Originally accommodating only single deck trams, it was deepened in 1930 to allow double deckers, although it remained a tight fit, and included a central slot to avoid the use of overhead wires. www.yorkmodelengineers.co.uk In *Gowrie*, the newsletter of the **Gowrie Locomotive Trust**, Editor Alan Freebury updates us on the progress to date. A list of items which could be adopted or 'supported; by buying or making them in advance so to be available to be fitted when possible. This is where we learn that even on a small locomotive, there are components and fittings which are rarely seen but the work they do is still necessary. Alan Freebury and David Pumfrey briefly describe another project, 1916-built Decauville type 2-6-0. Five other similar locomotives were repatriated at the same time. A number of items intended for Christmas cards or gifts, show a narrow gauge locomotive at work in the Dales, possibly at the Threlkeld quarry, one of the cards shows the locomotive accompanied by a Series 1 Land Rover. Further details from Marion Allen. Marion also has several sponsorships available for such as die blocks, oil boxes etc. The boiler fund has reached

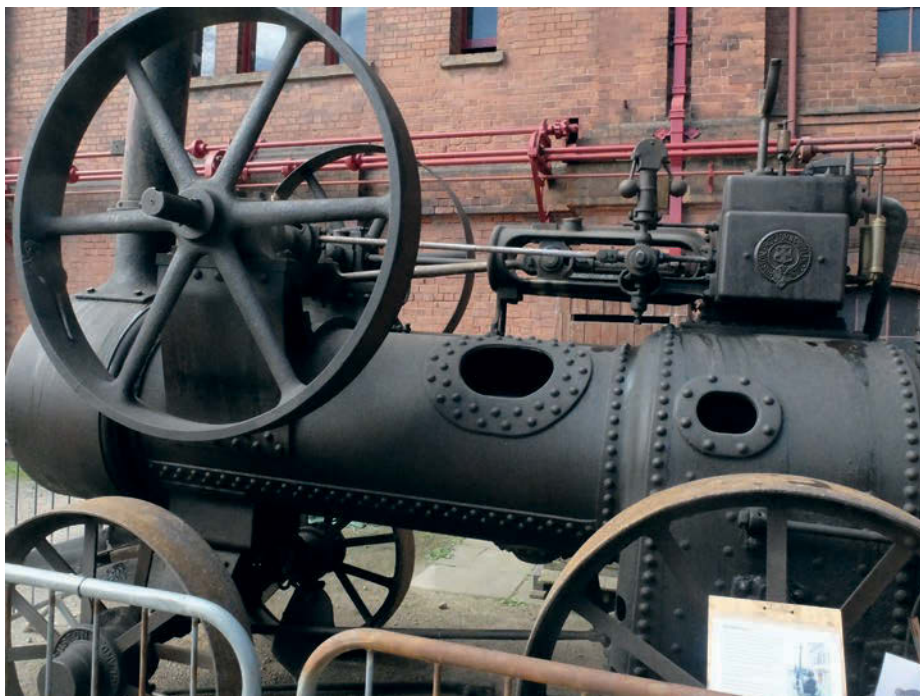


Photo 5 Portable Ruston Proctor at Claymills, in a state of 'decollete' 9316

the halfway point, so an order to make it should have gone in by the time this issue hits the press. The new building for museum, cafe and workshop is structurally complete and weatherproof but still needs fitting out. www.gowrieloocomotivetrust.com/ One of cousin David's photos, on the occasion of the Shah of Persia's visit, Locomotive *Waverley*, Lady of the Lake, Class No 806, was decorated. Note the crown' on the forward boiler ring (**Photo 4**) **Welling & District MES Newsletter**, April/May, introduces the new Editor, Tim Ellis, and advises that the Club Competition would be on July 16, 'You gotta be in it, to win it!' They found a report in 1866 of a test given to a Merryweather steam fire pump. All agreed that the performance was very satisfactory. Next, apparently submitted by Ron Head of Oxford MES, an article on setting Stephenson valve gears. We are treated to Train Mountain, which is a huge model rail system in Oregon. The site covers 2200 acres in size, with 32 miles of track, so you can get lost with a vengeance. www.trainmountain.org/ **Conrod**, from **Otago MES**, March, The engineering group reports that when we are all getting older, the first discussion is usually about our aches and pains. The latest steamfest was held in conjunction with the steampunk enthusiasts. It was thought that the subject needs better marketing. Terry Sutcliffe writes on the reunion of two Beverly clocks. Mr Beverly was a prolific inventor, one of his clocks is the 'perpetual motion clock', in

the physics dept of the University of Otago. Terry has a Beverly pocket watch, so a meeting was arranged in Dunedin. The Otago clock uses the changes in temperature within the Physics lab to keep itself wound. The improvements in the condition of the building over the years means that the ambient temperature changes are less than they were heretofore, so a little discrete manual assistance is sometimes necessary. The pocket watch is an important part of NZ's horology collection, being an English fusee lever escapement, and was one of the finest to have been made in NZ in about 1860. www.omes.org.nz We visited Claypits Pumping Station near Burton on Trent again recently, and saw this portable by Ruston and Proctor, (not operational) **photo 5**. Debs painting of a TE at Claypits, **photo 6**. And finally, "I'm writing my life history, my *Vade Mecum*, and it's getting quite large." "Is it a tome?" "No, I have it here..." ●

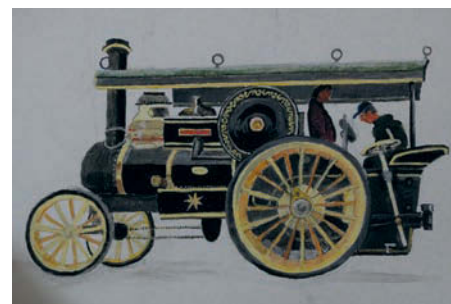


Photo 6 Deborah's painting of a TE at Claymills in 2025 (Picture Deborah Theasby)

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Taylor Hobson K2 engraving machine for sale with tool bits, rotary table grinder, good working order, 110 volt with transformer, only used lately for routing guitar bodies for B Bending installing for everything, £450 ono, buyer collection only. **Tel: 01516 534279. Birkenhead.**

Clarke Strongarm electric winch No CH4000 240 volt with pendant and fixing brackets, 400 KG capacity. Only used a couple of times. £70. **Tel: 01242 580548 or 07870900332. E: grahamgardner103@gmail.com. Cheltenham.**

120mm Diameter 3 Jaw Chuck. 120mm 3 jaw chuck with key and internal and external jaws, the chuck has a 95mm recess to the rear. In good used condition. Can post at cost to buyer. £40. **Tel: 07961928535. Email: stevew49@live.co.uk. Rainham.**



Chester Cobra variable speed lathe 3 1/2 ctr with 3 jaw chuck with tools reversible jaws only light use, pick up only, would be useful model or clock making, £250 ono. Also tailstock chuck keyless, good condition. **Tel: 01516 534279. Birkenhead.**

Myford items. 9" faceplate, collets and taps/die. All to suit small bore lathes. All in very good condition. £75. **Email: gewrogers@gmail.com. Pontefract.**

Quorn tool and cutter grinder. The machine has the correct parvalux motor fitted and is in running order (fwd/rev operational). The machine requires a workhead to complete the machine. I do not have a workhead casting, but this could easily be fabricated to include the MKIII improvements. £400. North Yorkshire. **Email: carlfstorey@gmail.com.**

MODELS

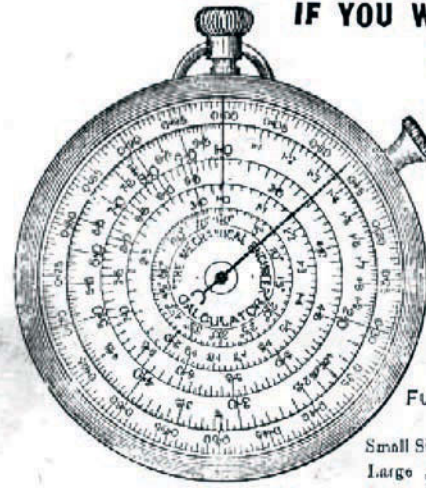
Part built Edward Thomas 5" ng loco. chassis, wheels, axles complete, silver soldered boiler complete with recent hydraulic cert. It's too heavy for me to complete £0. **Tel: 07526473230. Email: duncanwebster26@gmail.com. Warrington Cheshire.**

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Minimag Magneto kit. An untouched Minimag Magneto kit suitable for slow revving 18-50cc engines, typically Redwing or similar. Requires builder to source a couple of bearings and a Dural block to complete. This is a self-contained unit and does not require an external battery supply. £60. **Tel: 07443598406. Email: jandjhaines@gmail.com. Frome, Somerset.**

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MISCELLANEOUS

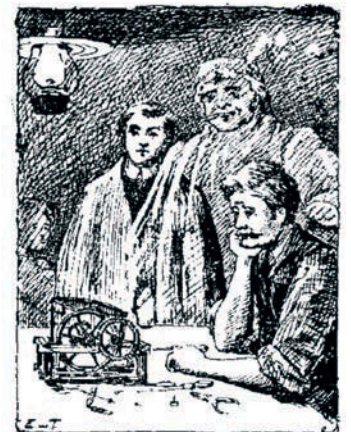
Hilger & Watts Autocollimator + Mirror. Very good condition optically, adjustment dial extremely smooth – top condition. 0.2 arc seconds. Feet covered in wax (not rusted). Includes original mirror (extremely rare) and the mirror itself is in great condition without any marks. Both with original box. £450. **Email: ryan.carter848@gmail.com. Beaconsfield (SL2).**

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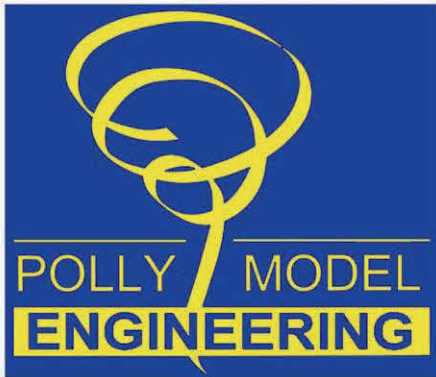
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