HEMSBY'S RAILWAY – END OF THE LINE

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MODEL ENGINEER

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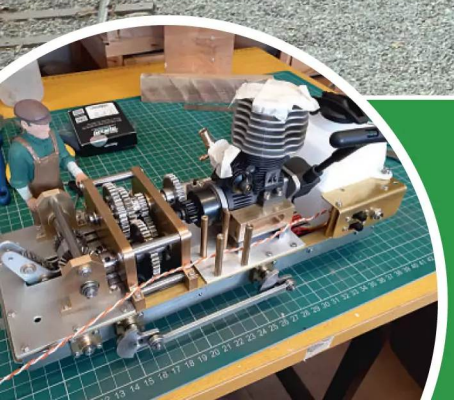
We Say Goodbye to Parklands



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IN THIS ISSUE

Vol. 233 No. 4751 6 – 19 September 2024

ON THE COVER...

Jack Potter from the Norfolk Railway Society bids a farewell to Parklands behind his M.J. Engineering Bagnall (photo Brian Baker).

This issue was published on September 6, 2024.
The next will be on sale on September 20, 2024.

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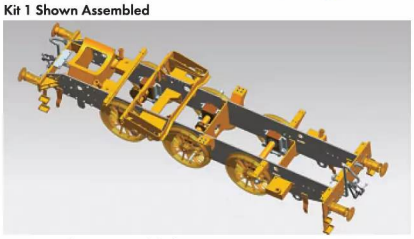
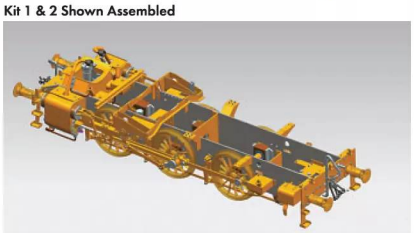
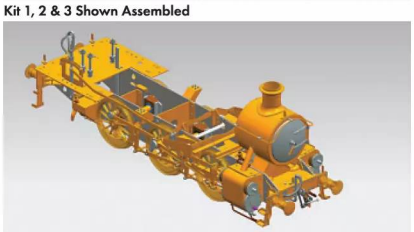


Kit 1 & 2 Shown Assembled

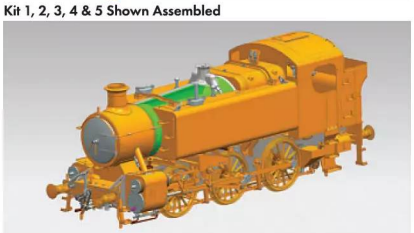


Kit 1, 2 & 3 Shown Assembled



Kit 1, 2, 3 & 4 Shown Assembled

Kit 1, 2, 3, 4 & 5 Shown Assembled



Kit 1, 2, 3, 4, 5, & 6 Shown Assembled

The GWR 15xx Class

All ten locomotives of the class were constructed in 1949 at Swindon and entered service on the Western Region of British Railways. They were employed on heavy shunting duties at London Paddington. Numbers 1501/2/9 were later sold to the National Coal Board for use in collieries. The 15xx was turned out in different liveries including lined black and NCB maroon.

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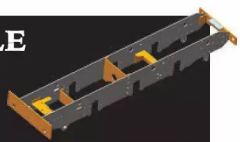

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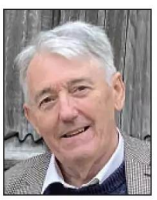

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Maidstone's 95th

On Saturday 17th August I spent a pleasant day at the Maidstone club track in Mote Park at an Open Day to celebrate the club's 95th anniversary. Many other clubs visited and the track was declared out of bounds to Maidstone club members' locomotives so only guests could run. The Open Day was very well attended and the clubhouse was full to overflowing for the cutting of the club's 95th birthday cake.

The club started as a Meccano and model railway club and then developed into a model engineering society. The current track in Mote Park has a long steady climb up to the top curve, around which the climb continues before running back down to the station.

This can present a bit of a challenge at first. The track can accommodate 3½ and 5 inch gauge locomotives.

Congratulations to the Maidstone club on reaching this milestone! I shall look forward to the 100th anniversary 'if we're spared' as a very elderly friend of mine used to say. However, I shall of course hope to have the opportunity to visit Mote Park again before that important event comes around.

Maidstone's 95th birthday cake.

Your editor is allowed the privilege of cutting the cake (photo Richard Linkins).

Races to the North

Patrick Hendra is looking for material on the famous 'Races to the North' and is particularly interested in photographs of models of some of the locomotives involved. Of special interest are:

GNR:
Stirling Single
Caledonian:
Lambie or Drummond 4-4-0
NER:
4-4-0 Class J and 4-2-2 Class F
LNWR:
Lady of the Lake 2-2-2 and Jumbo (Precedent) 2-4-0 – preferably *Hardwicke*.

Pre-grouping liveries would, of course, be preferred!

If anyone has models of late 19th century bogie and six-wheeler coaches they would also be of interest.

I shall be pleased to pass on any offers to Patrick.

Calling Harlington

Noel Shelley has been trying to contact the Harlington Locomotive Society but so far without success. Could someone from the club please drop him a line? His email address is noelshelley@hotmail.co.uk

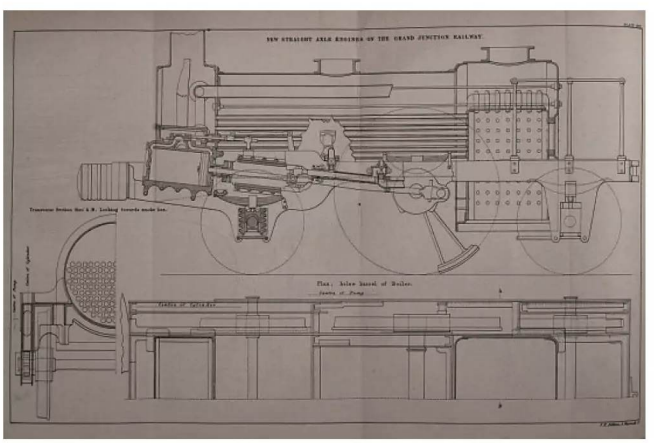
Cock-up Corner

Welcome to our regular feature! In Ron Fitzgerald's article on George Forrester in M.E.4749 (August 23rd) the illustration on page 344 shows the wrong locomotive. The correct illustration is given here. If you had already spotted that then full marks – very impressive!

Nostalgia

During the summer I enjoyed a very pleasant day out on the North Yorks Moors Railway. We took a trip from Pickering to Goathland and back again, with a visit to the excellent tea shop at Goathland as well as a ride behind a Black Five. All very nostalgic – like taking a day trip in the TARDIS, steam driven of course. Even more than the train, or the tea shop, what really took me back was a little sign on the village green, redolent of a gentler age. It reminded me of L.P. Hartley's line: 'The past is a foreign country: they do things differently there'. I wondered if I could perhaps do with more foreign holidays in future...

Maidstone MES



The Artizan's plate showing one of the two GJR locomotives built at the company's Edge Hill workshops.

Parklands Railway Hemsby – End of the Line

All good things must come to an end

Brian Baker marks the end of an era for a railway on the Norfolk coast

7¼ Society

It seems a long time ago when I first ventured into a Parklands Railway Week, some time in the mid 80's, and I still have the video I made that day, pulled round this attractive 7¼ inch gauge track in the village of Hemsby in Norfolk. That day I was pulled by a 'Jessie', an 0-4-0 tank locomotive designed by Ken Swann and driven by Norman Atkins. Sadly he no longer has the locomotive but he is still a regular visitor, lately with his fine Warship. I first wrote about the railway in *Model Engineer* with an article in January 2000 (vol. 184, issue 4112) entitled 'The Secret Railway'.

The railway was built in stages by the late Don Witheridge as a hobby, on the edge of land he purchased to develop into his 'Blue Riband Holiday' business, in the early 70's. I have heard it suggested that the field was where the shunting horse for Hemsby Station was grazed, when it was part of the Midland & Great Northern Railway from Great Yarmouth Beach station to Stalham, then many other stations in Norfolk, ultimately connecting with the Peterborough and Leicester. What is in no doubt is that the M&GN ran through the field and that Hemsby station was about 200 yards south of it. Few photographs of the station exist but this one (**photo 1**) shows the station in the early stages of demolition.

Don's business venture prospered and so he began his railway, culminating in the system we have today. Fast forward a few years and the railway was now a double track continuous circuit about 4/5th of a mile in length. Various improvements were added, including a tunnel, two bridges and a long viaduct, extensive sidings and storage and a three road steaming bay. The last big improvement was in early 2012 to 2016 when all

John Ward found this photograph of Hemsby station, which was located where the cemetery and new bypass 'Kingsway' now are. Photographs of the station are rare.

Not often seen in red livery, this Holmside Bess enjoyed the week with owner D. Smith.

Eric Upchurch's Pet class Crewe works shunting locomotive first ran at Parklands a few years ago and is still a regular visitor.

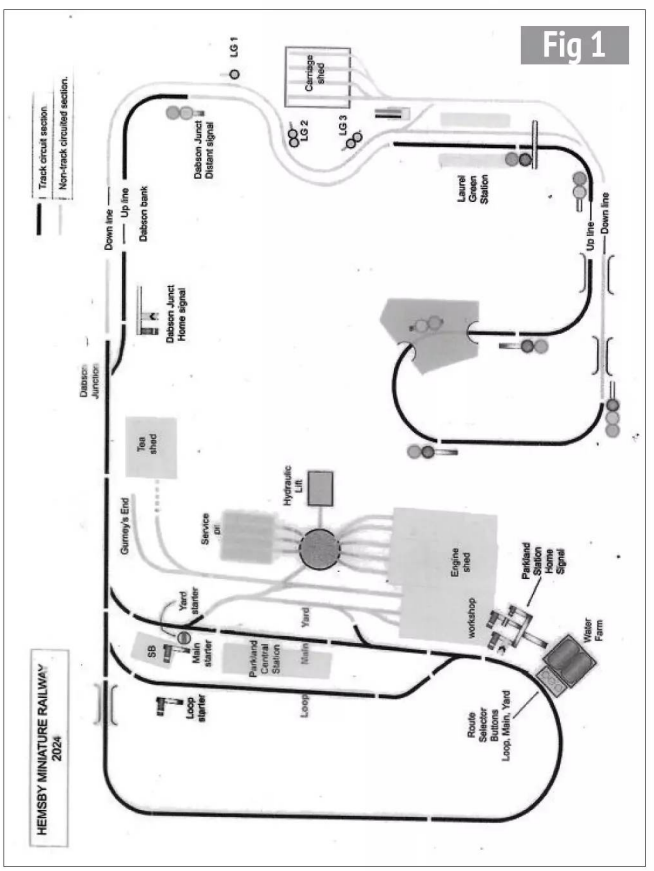
When not managing the yard "in your own time, driver" or giving rides in his Model 'T' Ford, Nigel Surman runs his Hunslet.

David Mawdsley tries out for size a Deans 0-6-0 Goods 2562. The Week is a good opportunity to sample other locomotives.

Mick Jones enjoying a tour of passenger duty with his GWR 0-6-0 Collett Goods. He also brought his Schools class loco No. 901 Winchester.

the wooden sleepers were replaced with plastic ones (see Model Engineer, 2014, issues 4496 and 4498 *Plastic Magic*). Signalling upgrades and improvements have continued up to the start of this year's Week and the attached diagram (**fig 1**) shows the latest system.

He started 'Hemsby Week' in the late 70's and began inviting his friends in the 7¼ Gauge Society to join him for a week, which has continued, interrupted only by covid, to the current day. Indeed for a time there were two 'Weeks', one in early May when the Brighouse Club attended. Often during



Parklands circuit.

Karl Oliver is one of our home grown younger members who proudly displayed the Lister D engine he had just finished restoring, complete with new trolley.

We tried hard to get a 'group photo' but some were always missing. Tough enough job getting them all to smile!

Since last year George Witheridge has acquired this fine Holmside and being a bit quiet because of the rain, is sneaking out onto the track for a quick run. Normally during the week he, like all Parklands members, is involved with running the railway and assisting visitors.

Another day, some rain and the pit is full again.

John Dalton is a regular visitor to Parklands and for the past few years he has brought his steam roller, but this year his Britannia 70025 Western Star.

Charlie Riches from Norwich Club, driving Pete King's (standing on the left) 0-6-0 Romulus Sophie B, *a regular visitor to the railway.*

the week there were working afternoons when everyone would work together to improve Don's railway.

Sadly in 2012 Don passed away and the railway, now owned by the Witheridge Family, was left to the support group Parklands Railway Society to operate, on the same basis as Don had - no charge for rides, Blue Riband visitors and personal visitors welcome, particularly 7¼ Society members. Indeed the railway was host for two society AGMs over the years but now sadly it is to close at the end of this year as the family have regretfully decided to close the business.

Every year, a Railway Week is held on the week including the late May bank holiday, and I can remember visitors attending packed Tuesday evening dinner dances, 'booted and suited', in the Highwayman Hotel with over 170 diners - splendid times these were. This year is the 44th such event. It was memorable because it rained regularly and was very cold but more importantly by how much visitors enjoyed this last ever week, everywhere was smiling animated people clearly having a great time. We had 44 visiting locomotives of various types and I will do my best to show as many as possible in the photographs.

So, they think it's all over?

So this 44th Week was the last event at Parklands - well not quite, because in order to celebrate Parklands Railway we were asked by the 7¼ Gauge Society to put on a

Rick Upchurch brings his Pearl *regularly to the railway and despite the damp conditions will tackle the banks with a coach full of visitors.*

A rare sight, John Painter driving his own GWR 42XX class 2-8-2 class 4203, since he usually generously enjoys watching other people on the regulator. On freight duty today.

Andy Potter brought this fine 6 inch scale 'Little Samson' Showmans engine which ran quietly all day, just ticking over sweetly.

John Painter (in the orange jacket) has happy memories of working with cranes like this in his early days with British Railways.

At the mini-gathering, Bruce Harvey ran his BR Standard class 4 80008 and here is shown on freight duty.

Back for a second visit this year, Lisa Chiver from Maidstone is passenger so that Sue Parham can have a few laps on Class 08 833 'Liverpool Street Pilot'.

Tim Coles from Cambridge, newly appointed 7¼ Magazine editor took time to join us with his LMS 'Jinty' 47406 and is that an S&D wagon he is riding on?

Jack Potter with a load of Norfolk Railway Society members on his M.J. Engineering Bagnall. Note the headboard.

Daniel Mason brought his LNER Mogul 4698 from Nottingham to run passenger service.

Invitation Day is a chance for us to show off what the railway can do and it is very busy. Here in the calm before the storm Pete King waits with Sophie B *and Brian Aldridge with* County of Norfolk *for the fun to start.*

'mini-gathering' for three days at the end of June, an event organised by the Society for members to visit the railway for the last time. These events, in different parts of the country allow members to meet and run their locomotives at times when the Society's AGM event might be a little too far away or occurring at an inconvenient date. You can find more information about 'mini gatherings' and the Society generally from its website www.sevenandaquarter.org. We organised it just like a mini 'Week' with bacon rolls and cake from the *Café de Parklands* very much in evidence. Some 25 locomotives attended, some for just the day, and the event was declared by the Society as the best attended yet.

Again, the photographs show smiling people enjoying themselves in, it must be said, much better weather than the week.

It is now!

So that was the last event organised at Parklands - well not quite. It has been our custom for a while now to invite members of other model engineering clubs, model railway clubs, the Norfolk Railway Society and our friends and family to our 'Invitation Day', where it is the intention that we run as many of our trains as we can, together with a few guest locomotives, so that the guests can enjoy rides, chatting, loads of cake from the *Café de Parklands*, and enjoy the happy atmosphere of Parklands. Quite different from ≫

Malcolm Wade, a Norwich member, brought his scamp to help out and spent the afternoon on demonstration freight haulage.

A number of visitors came regularly from overseas and here Luc Tennstedt is double heading with a GWR locomotive behind, I think driven by a very youthful John Hancock and I think that is Ben Fraser immediately behind him. This long train is climbing the bank into Laurel Green station.

Ron Manning from Chingford posses in Robert, *his Hunslet.*

This is the man whose 'hobby' built Parklands Railway. Don Witheridge had a fine stock of locomotives, nearly all standard gauge, but many think James, *a 0-4-0 Romulus, was his favourite, although some would argue that his B1* Bushbuck *is top of the list. Brian Reading, a keen supporter of the railway, and current president of the 7¼ Gauge Society, is acting as guard.*

If I had to sum up in one picture what Parklands Railway is all about I think this does it - Friendship, Relaxation and Contentment.

the Week - we do the running, the visitors watch and ride. As usual the weather was fine, with just the hint of a possible shower to aid closing on time and usher the invitees home, and the place was crowded.

This event normally takes place in the first week of Norfolk school summer holidays and thus gives harassed Mums and Grandmas somewhere to 'amuse' their charges, and well as enjoying themselves.

Well that is the end of our organised events, although I believe we have an adult party and a birthday party looming as well as a couple of school class visits in September. These events apart, we will always consider a private visit by an organisation or club who wish to visit us as we continue running the railway until the end of October on Sunday and Thursday mornings, and then Parklands Railway will finally close and the track will be lifted.

ME

The Stationary Steam Engine

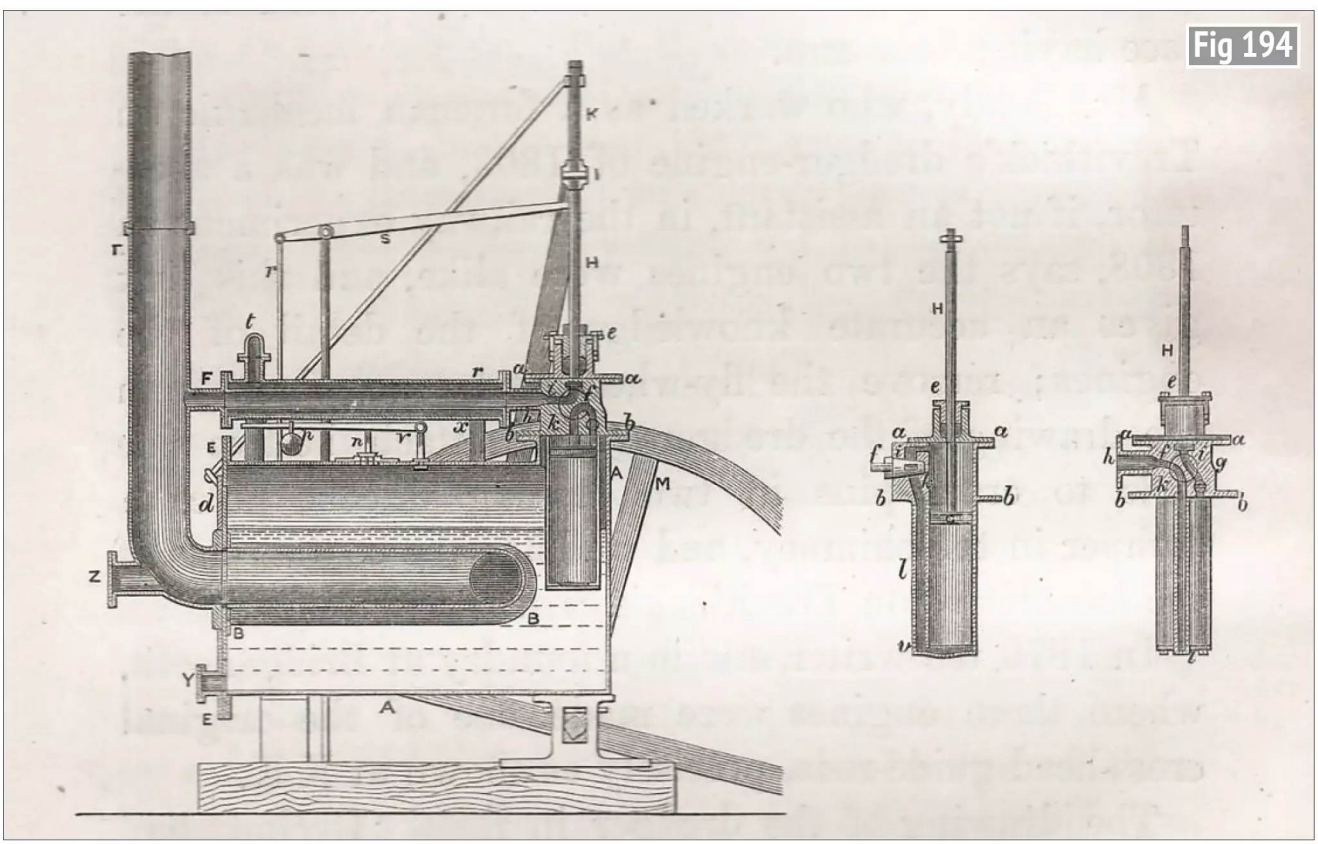
PART 61 – LOCUS CLASSICUS

Ron Fitzgerald takes a look at the history and development of the stationary steam engine.

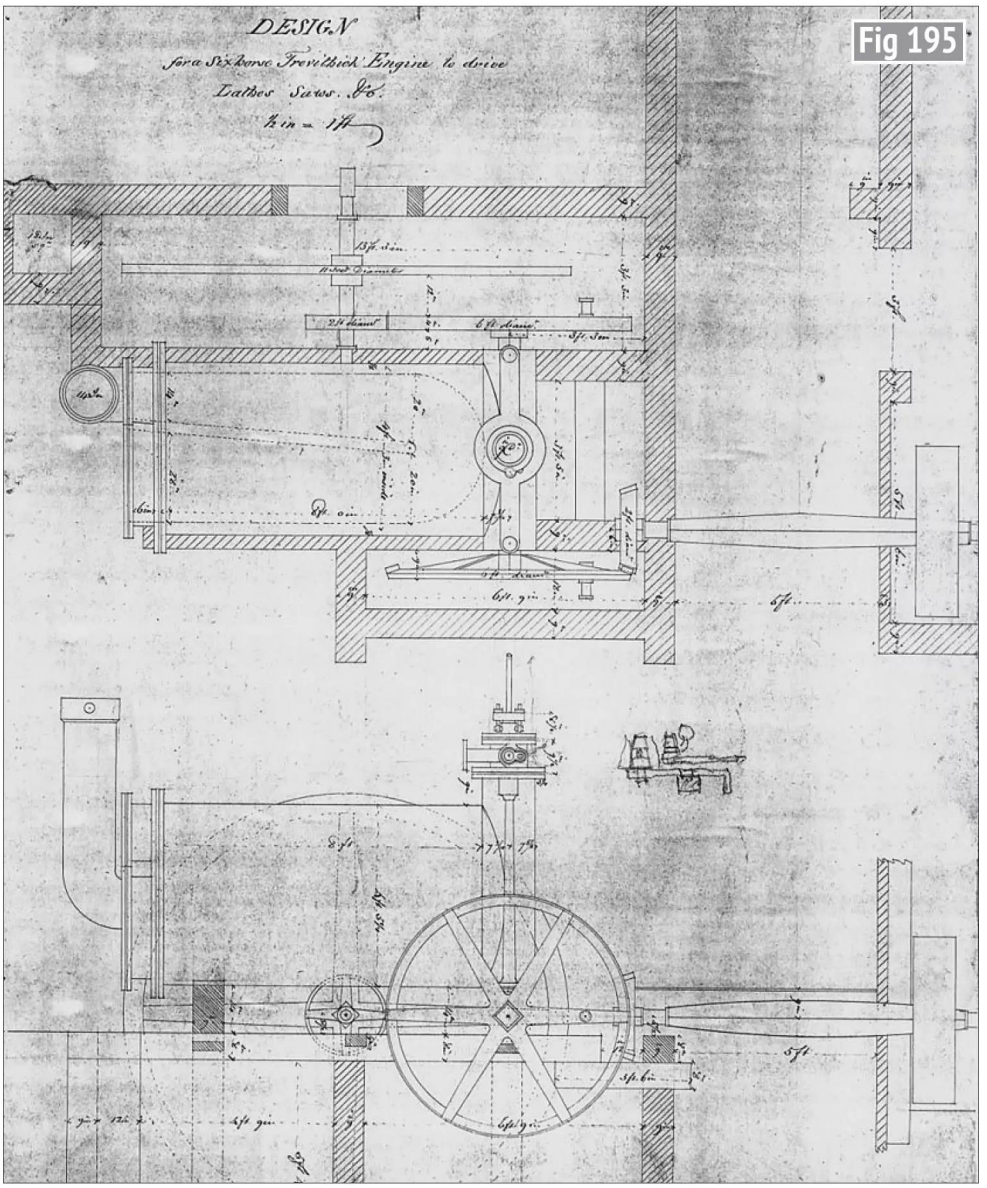
Continued from p.263, M.E. 4749, August 9

The Greenwich explosion was widely publicised and it undoubtedly had a temporarily depressing effect on public confidence in high-pressure steam. As noted earlier, Bentham's decision not to use the Trevithick engine that he had purchased for the second of his dredgers was a reaction to the explosion and Farey said that demand for Trevithick's engines never attained the level of popularity that they would have had, had it not occurred. Even so, there is evidence that the puffer engine was too attractive as a small power unit to ignore and it may be that the introduction of the new type of boiler assuaged some of the concern. Certainly, Farey's example of the tun type boiler seems to be unique in the literature on the Trevithick engine and all of the examples known today with the exception of Farey's, have the cylindrical cast-iron boiler with an internal breeches flue.

The dredger engine (**fig 194**) may not have been the earliest example of the full development of Trevithick's combined engine and boiler engine but the features that it embodies were to become the hallmarks of such machines. The boiler for the dredger



Section of the dredger engine with details of the valve chest. The left hand section of the cylinder in situ *in the boiler is slightly misleading as the inverted U-shaped port appears to have both ends communicating with the interior of the cylinder. It is correctly shown as leading from the boiler steam space exterior to the cylinder in the right hand drawing.*



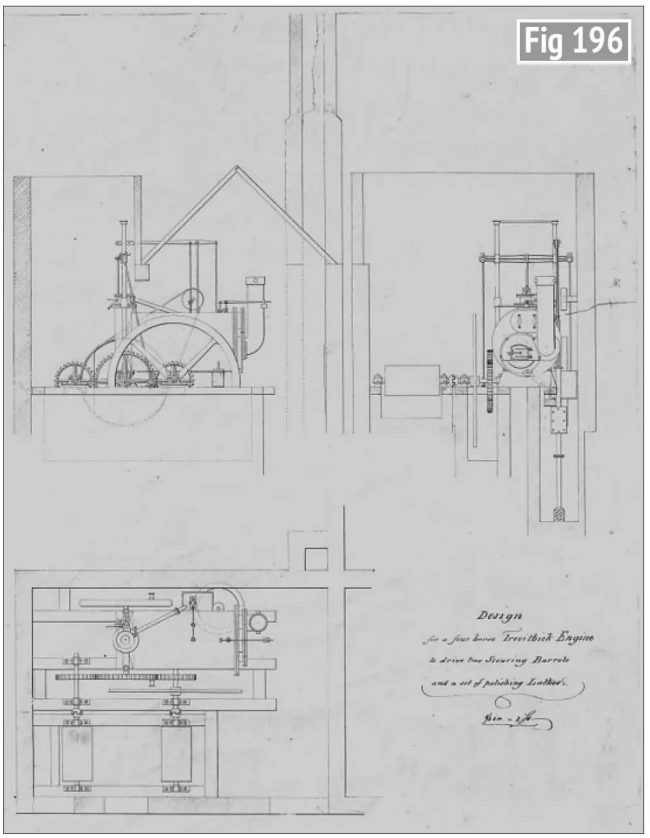
A six horse power engine bought by the Navy Dockyard to drive lathes and saws. (Goodrich Collection, Science Museum, London.)

engine is a horizontal cast-iron cylinder, in this case, 4 feet 10 inches in diameter and 8 feet long. One end plate is cast integrally with the shell whilst the other is a disc, bolted to a flange which is part of the shell. The cylinder is inserted vertically into one end of the boiler, bolted through flanges to a tubular mouthpiece. Seen in plan, a D-shaped projection against the flat surface of the cast-in end plate houses half of the diameter of the cylinder so that the cylinder proper is totally jacketed by boiler water and steam. The detachable end plate at the opposite end of the boiler is used to secure a U-shaped or breeches fire-tube cantilevered out horizontally into the boiler water space. One leg of the breeches tube contains the furnace and the other joins an external iron chimney that rises from the front plate. Correspondingly, the fire-door which opens into the furnace is adjacent to the chimney. The furnace side of the tube is 2 feet in diameter contracting to 1 foot 2 inches at the chimney end. The tube was almost certainly wrought iron. A dead weight safety valve is fitted to the boiler although missing is the second safety valve in a tamper-proof box and the fusible plug in the platework exposed to the fire, both of which Farey maintains, Trevithick commonly fitted after the explosion.

Farey shows the cylinder in a separate detail and whilst it follows the dyeworks engine in its general arrangement the valve chest is cast integrally with the cylinder body and the steam path has been simplified. Exhaust steam from the valve chest passes through an annular feedwater heater before entering the chimney.

The shape of the flue that Farey depicts in the dredger engine may be generalised for the purpose of illustration but a more detailed section is available in a drawing of a 6 hp engine prepared by Simon Goodrich which was to be used in the Deptford Naval Dockyard (**fig 195**). The boiler in this case is 4 feet 3 inches in internal diameter and 6 feet long over externals. The plan of the flue follows a U-shape, at the furnace end it is 2 feet 4 inches in diameter contracting to 20 inches at the U-bend and narrowing further to 14 inches at the chimney. In describing a nearly identical boiler Farey states (**ref 327**) that the wrought iron plates that made up the flue were half an inch thick and the grate was 4 feet long, which if identically long in the Deptford Dockyard boiler would give just over 9 square feet of grate area. The Deptford engine had a cylinder diameter of 9 inches and a stroke of 48 inches.

There is no surviving comprehensive list of high-pressure engines built in accordance with Trevithick's patent and it is now impossible to assess the total number built; estimates vary between one hundred and five hundred. Nevertheless it is clear that the engine quickly gained a firm hold upon the London market. In September 1804, Trevithick informed Giddy that the engineer from Coalbrookdale had just returned from London and had reported that twelve engines were at work there, possibly all built by Coalbrookdale. Amongst these was one supplied to a gun factory at the end of April 1803 (**fig 196** and **ref 328**). The cylinder had a diameter of 11 inches with a 3½ feet stroke making 26 strokes per minute at a pressure of between 40 and 45 psi. When it was first commissioned it was in use boring four brass cannons simultaneously and also working a clay mill at which duty it consumed 6½ tons of coal in 21 days working a fourteen hour day. The engine had replaced a Boulton and Watt machine and the proprietor of the factory was



A four horse power engine bought by the Navy Dockyard to scour barrels and a set of polishing lathes. (Goodrich Collection, Science Museum, London.)

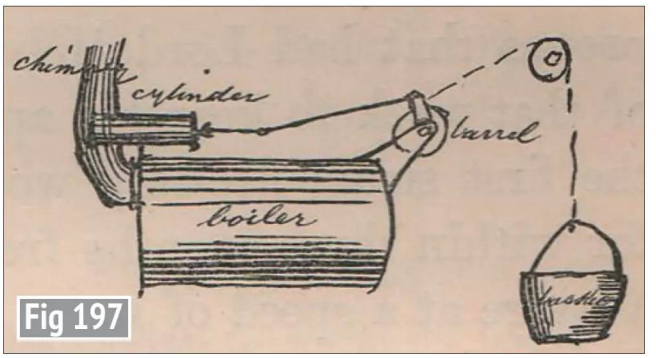
about to order a further engine from Trevithick.

The gun factory engine was visited by an Admiralty representative who apparently expressed interest. This may have led to Trevithick being invited to the Admiralty Office where he gave fuller details of the machine. He left convinced that:

...they are about to erect several for their purposes and that no other will be used for government purposes...

This was in May 1803, before the explosion.

At about the same time the Board of the West India Docks ordered a floating crane powered by one of his engines that was to pass from ship-to-ship for the purpose of discharging cargoes into the warehouses. It was also fitted up for firefighting; a pump capable of lifting 500 gallons of water a minute, one hundred feet high was attached to the rear of the boiler. It was built by Coalbrookdale and delivered in September 1804. Ironically, in view of its role as a fire engine, the dock authorities refused permission for it to operate within their premises as the Dock Act was supposed to prohibit a fire risk of the type which the engine was deemed to represent. The engine unit



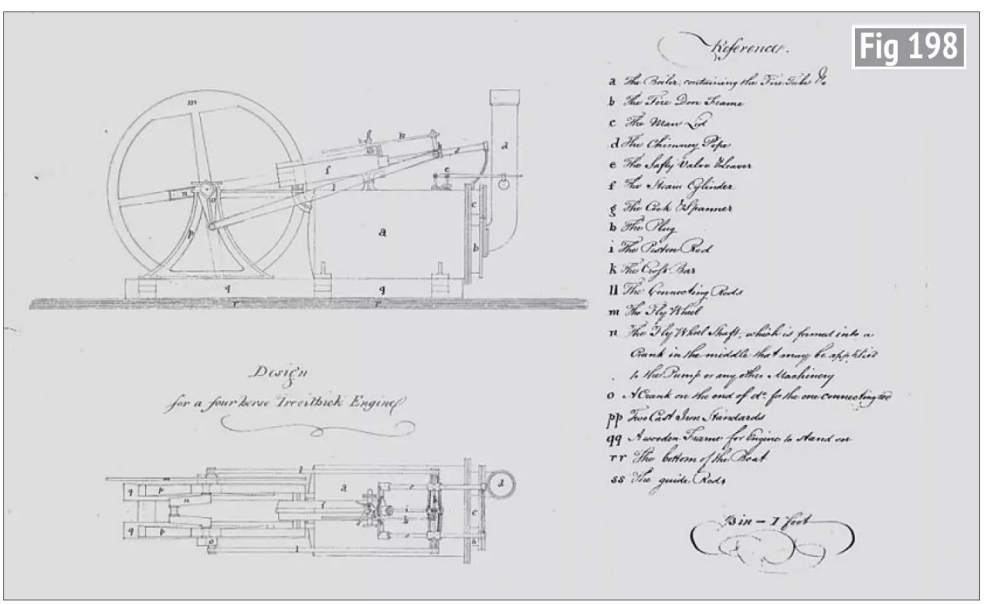
The coal whipping crane.

was eventually sold to power a factory.

The idea of a floating crane was not abandoned but appeared in another role as a coal whipping crane for discharging cargoes from coal ships which arrived in vast numbers on the Thames in the summer months (**fig 197**). The engine was said to be built in Staffordshire although this could be a mistake for Coalbrookdale in Shropshire. Its boiler was 2 feet 6 inches in diameter and five feet long with a cylinder 4 inches in diameter and 18 inches stroke, horizontally placed but outside of, and above, the boiler. It was not reversible, the weight of the basket descending serving to unwind the winch barrel (**ref 329**). Again this floating crane's career was blocked but this time by vested interests, the coal whippers, who manually discharged the coal cargoes. Ever ready to cause trouble, they demonstrated against its use and it disappeared.

A third version of the floating crane arose through Trevithick's ill-fated association with the West India Merchant, Robert Dickinson. In this case a patent was taken out, No. 3148 of July 1808, with Dickinson as co-patentee. The vessel was to be capable of self-propulsion with sweep anchors so that it could winch itself into heavy currents when towing other boats. As it was also equipped for unloading cargo it was called *The Nautical Labourer* (possibly a Trevithick snub directed towards the coal whippers).

There were other boating ventures. In the Goodrich collection there is a drawing of a four horse-power engine (**fig 198**) which the attached



The Goodrich drawing of a boat engine.

reference table indicates was to be mounted on the bottom timbers of a boat (marked *rr.* on the drawing).

Again the cylinder is external to the boiler, mounted on brackets attached to the boiler top and sloping downward at about 15 degrees to the horizontal. The piston rod drives a crosshead to which is pivoted a pair of connecting rods that pass back on either side of the cylinder where they meet overhung cranks. These cranks are at either end of a crankshaft which itself has a central double-web crank. Labelled *n.* the inscription reads:

The Flywheel shaft which is formed into a crank in the middle that it may be applied to the pump or any other machinery.

The crankshaft is carried on a cast-iron pedestal which is independent of the boiler and there is a single flywheel at one end of the crankshaft.

Two other boating applications are recorded by Francis Trevithick. One was a canal barge which a letter from Homfray to Giddy written on the 2nd January 1805 describes as having a 10 inch cylinder with a flywheel on each side of the barge and a crankshaft across the deck. The (fly?) wheels had flat boards 2 feet 2 inches long and 14 inches deep, six on each wheel like an undershot waterwheel. The peripheral velocity of the wheels was about ninety feet per minute which propelled the boat at 7 miles per hour. The barge was intended to carry cotton to a mill in Macclesfield and had about 60 to 70 tons burthen. It was assembled from parts that were already available but whether it ever arrived at Macclesfield is uncertain.

The other boat is shown in a schematic sketch in Trevithick's notebook (**fig 199**). The engine was housed below the deck. It was to use a 12½ inch cylinder apparently inserted into the boiler and worked horizontally to drive a crank axle. A single, fourteen feet diameter paddle wheel was enclosed in an air-tight, iron, compartment which an air pump pressurised to keep out the water. The cranks and the ends of the crankshaft were external to the box and sealed by stuffing boxes. The engine was rated at 400,000 ft. lb. per minute or 12 horse power.

Outside London the Trevithick high-pressure engine was also enjoying some success. In Cornwall, beyond the Camborne district, Seal Hole and Binner Downs had engines before the patent was sealed. Twelve months later Harris had a 12 inch cylinder machine made by Hayle Foundry for Crenver mine and this was followed by a 14 inch engine for Daniels' Perran Sands mine.

Possibly the first Trevithick engine to work in the Bristol area was ordered in early 1802 by a Mr. Clayfield, a pumping and winding engine for his colliery. In South Wales, Samuel Homfray was the dominant influence in the iron industry but in copper refining his peer was John Morris. Morris was buying Trevithick winding engines for his coal mines in 1803 (**ref 330**) and Andrew Vivian records a premium paid for a whimsy by Mr. Morris under date June 6th 1803 which was to cost him £262. 10. 00., suggesting a large machine. Morris's erstwhile partner Thomas Lockwood, who had parted from Morris in 1803, was also a customer.

Further north, in England, the Staffordshire coalfield could show several large engines by May 1803, one for Josias Spoils with a 12 inch cylinder (£150 premium), another for Thompson Turton, Esq., with a 20 inch cylinder (£315 premium) and one for Lord Dudley and Ward's collieries of unknown cylinder size but attracting the massive premium of £420. Much more common were engines of the 3 to 10 horsepower classification, at least seven of which were ordered between April and June. At the same time, Coalbrookdale had six engines building and two more of 10 inch, completed in 1804.

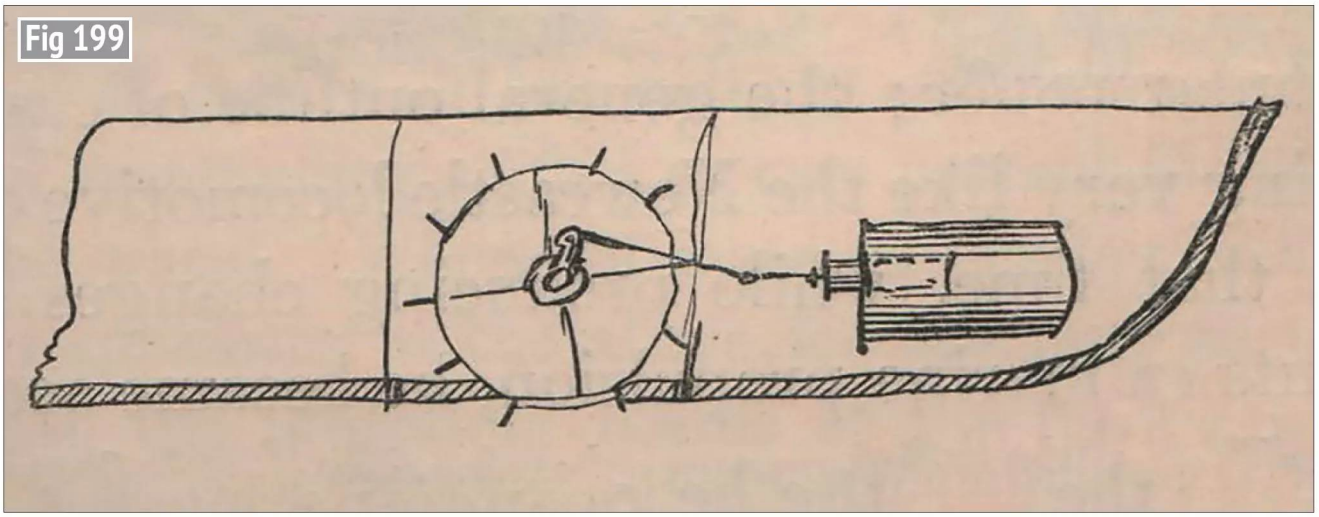
The table shows a summary of the sizes and prices of Trevithick high-pressure engines based partially on Farey's *Treatise* (**ref 331**). Farey qualifies these figures saying:

The table in this state may be considered as a favourable representation of the high-pressure engines which were brought into use by Mr. Trevithick, being rather what they were intended to be, than what they really were. The boilers were commonly so deficient that they could not at the utmost supply more steam than would impel the pistons in the manner designated in the table and many would fall short

Sizes and Prices of Trevithick High-pressure Steam Engines

Horsepower.	Cyl. Dia ins.	Cyl. Stroke ins.	s. p. m.	Piston speed ft.	Price Guineas
1	4	20	42	140	120
2	5½	24	36	144	210
3	6½	30	30	150	270
4	7	36	28	168	330
5					380
6	8	42	27½	192½	420
7					450
8	9¼	42	27½	192½	470
9					490
10	10¼	48	24½	196	510
11					530
12	11¼	48	24½	196	550
13					570
14	12	54	22	198	590
15					610
16	12¾	54	22	198	610
17					
18	13½	60	20	200	630
19					
20	14 ¼	60	20	200	650

Includes Patent Rights & Fixing so as to work but no brickwork.
Source: Cols 1-5. *A Treatise on the Steam Engine,* John Farey, Vol II. p.38.
Col. 6. Simon Goodrich. Notebooks. 16 August 1804.



Engine driving a single paddle wheel.

of that; whereas Mr. Watt's engines are commonly capable, at their utmost, of exerting half as much power as they are rated at in horsepower: hence to have placed the high pressure engines in fair competition with Mr. Watt's engines they must have boilers of much greater power than they were usually provided with.

Farey's views are usually measured and objective but Homfray, an acute man of business, was unequivocal in his support of the high pressure engine:

Trevithick's engine have been at work many months and is by far the best we have... Any person now wanting engines must be next kin to an idiot to erect one of Boulton and Watt's in preference to Trevithick's.

These diverging opinions with regard to the relative advantages of the Trevithick engine and the Boulton and Watt engine were put to the test somewhere around 1804 to 1805 when the Valley engine at Camborne was subject to a trial measured against the ex-Wheal Maid Boulton and Watt steam whim which, having spent several years in South Wales, returned to Dolcoath in an improved state. Trevithick was in Manchester when he first heard of the impending contest and whilst doubtless keen to see his ideas vindicated, this engine was not his first choice as an exemplar of his design. Whilst he had prepared the drawings and sent them to Cornwall, building the engine, in his absence, had been left to Andrew Vivian. He expressed his reservations to Giddy:

I fear that the engine at Dolcoath will be a bad one. I never knew anything about it being built until you wrote to me about the Penberthy Crofts engine when you mentioned it. I then requested A. Vivian to inform me the particulars ... and I find that it will not be a good job. I wish it were never begun.

Clark however gives a different version of the story saying that Trevithick was party to the contest:

The adventurers grumbled because Trevithick was so often away ... Glanville the mine carpenter, the head man over engines made a trial between Trevithick's high pressure puffer and Watt's low pressure condenser. When Trevithick heard of it he bet Glanville £50 ... Then he came down from London and found that the piston of his engine was half an inch smaller in diameter than the cylinder. When the new piston was put in she beat the Boulton and Watt all to nothing. ... when the trial was over a little pit was found with coal buried in it that Glanville meant to use in the Watt engines...

In a second letter to Giddy, written from Camborne on February 18th 1806, Trevithick says:

...on my return from town I altered the pressure of the steam engine at the bottom of the hill, Dolcoath... the B. & W. engine had beaten mine by 120 to 55. Since it was altered there have been three other trials the result was 147 to 35 in favour of the pressure of steam engine...

...The steam whim now idle at Valley (presumably the Boulton and Watt whim) *turned the whim one revolution to one stroke and lifted the kibble to same height as mine did. Their steam was not above 4 lbs, mine was nearer 40 but used a third of the coals... This is what I cannot account for... there is no smoke ... from my fire to clog the fire sides of the boiler while the common boilers get soot half an inch thick and the mud falls to the bottom of the boiler where the fire ought to act but in these new boilers the mud falls to the bottom where there is no fire.*

Trevithick was ultimately vindicated. He informed Giddy on the 21st of March:

Trial ended last Monday... The adventurers ordered that the new castings that were made for another Boulton and Watt engine to be set aside and a new engine of mine to be built immediately... I have received orders for nine engines in the past four weeks all for Cornwall Two 12 inch, two 16 inch three 9 inch one 8 inch and one 7 inch. I expect one will be put to work next week at Wheal Abraham for lifting water.

This Wheal Abraham engine was to demonstrate an unanticipated advantage that came with unit construction. When Trevithick demanded payment for the machine the Adventurers prevaricated. In response he descended upon the mine at night with some men and a cart; in the morning the engine had gone.

●To be continued.

NEXT TIME

The first railway locomotive.

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Ref 328 *Life...* Vol I p.158 Letter from Trevithick to Giddy 30th May 1803.

Ref 329 *Life...* Vol I p.325.

Ref 330 *Copperopolis, Landscapes of the Early Industrial Period in Swansea,* Stephen Hughes. Pub. R.C.A & H. Monuments in Wales, 2000, p.144.

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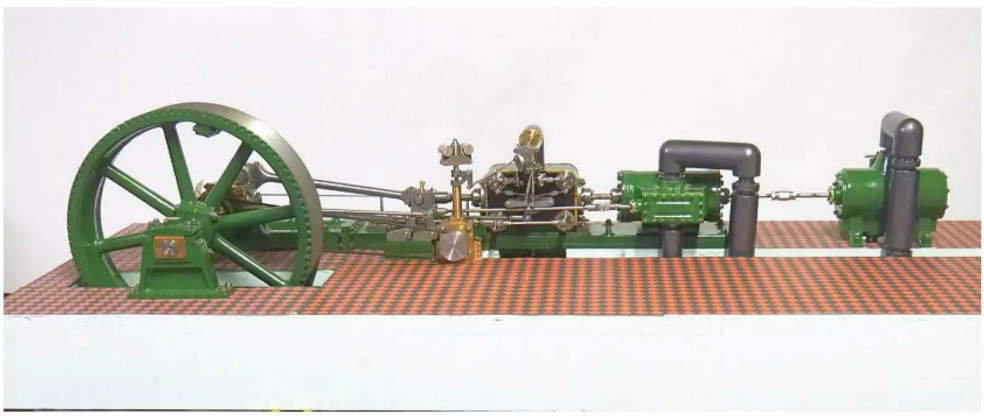
A Tandem Compound Mill Engine

PART 2



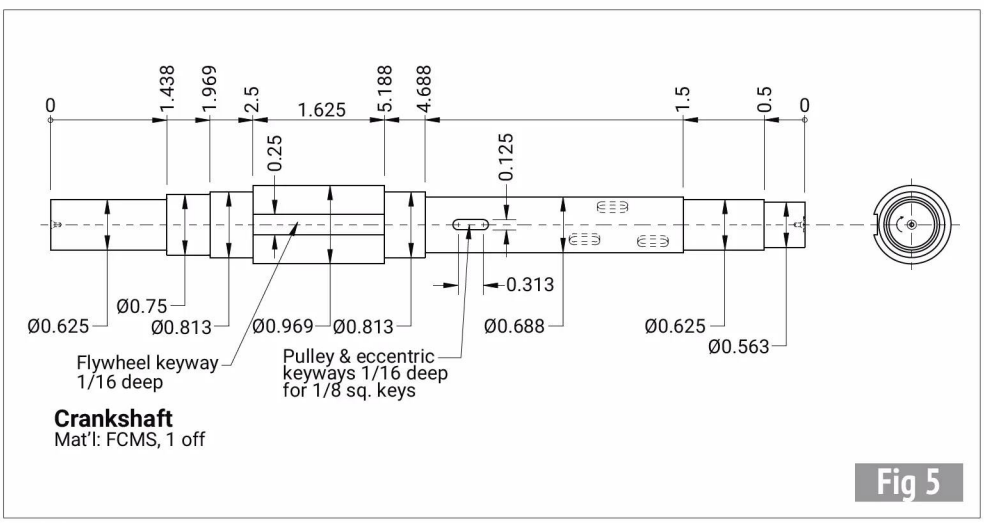
David Thomas builds Arnold Throp's model of a Corliss mill engine.

Continued from p.312
M.E.4750 August 23

The crankshaft and flywheel are a logical place to make a start on the engine, making these bits go round is what the rest of the engine is there to do. With my 260 mm swing lathe the flywheel was always going to be the main challenge for size and there just isn't room in the workshop for a bigger machine. Also, as this model was a major challenge to my skill and experience, I was anticipating that there would be times when things weren't going too well; having some successfully finished large bits to look at and handle would be a very useful confidence boost.

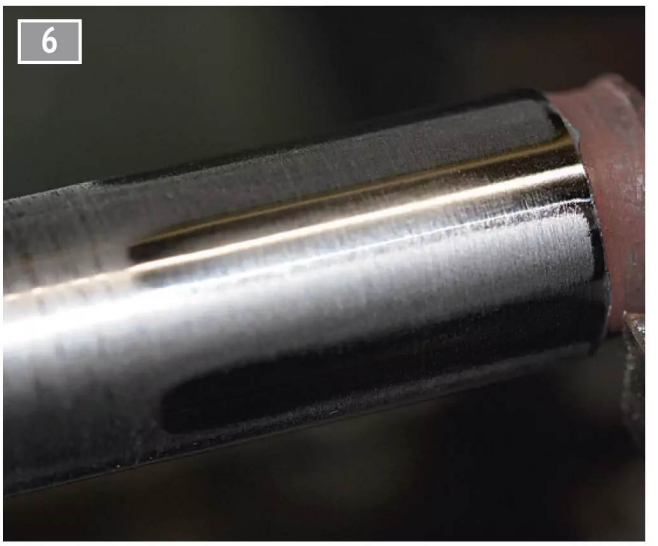
The crankshaft (**fig 5**) comes out of the largest piece of steel stock needed anywhere in the engine and here you need to do as I say and not as I did and buy in 10 inches of 1 inch round FCMS. In my case there was a shaft from a largish gearbox (**photo 5**) that had been in the storage heap for decades and was 'just the right size'. After getting it up to red heat in the wood heater and leaving it overnight to cool in the ashes it was just as hard as ever (perhaps this wasn't hot enough?), so carbide tips were necessary for making any progress. In the process I found some interesting patterns (**photo 6**) in the metal where the splines had been and made some very attractive blue chips (**photo 7**). The case hardening (nitriding?) must have been close on a millimetre deep. After all the effort the shaft took a really nice finish from either carbide (**photo 8**) or HSS (**photo 9**).

To bring the shaft to length and set out the axial locations for changes in diameter you need to know the total length of the shaft. This needs to be more accurate than a ruler dimension and, in my case, the 9 5/16 inches is longer than my biggest callipers so, after a bit of thought, I used the DRO on the mill table (**photo 10**). The

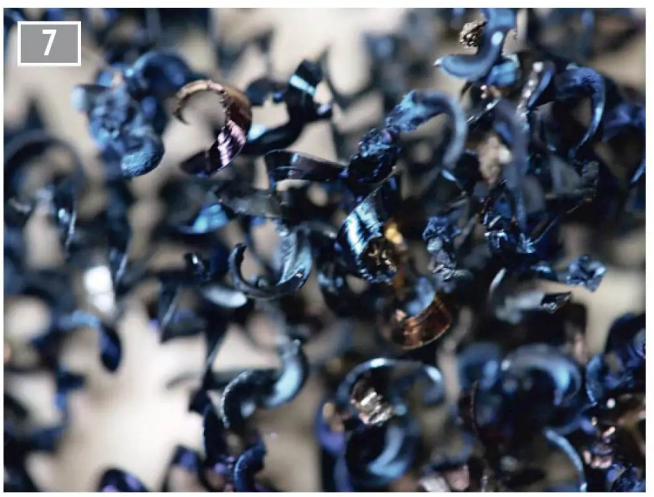


Crankshaft.

Ancient gearbox shafts are not necessarily a good source of material.

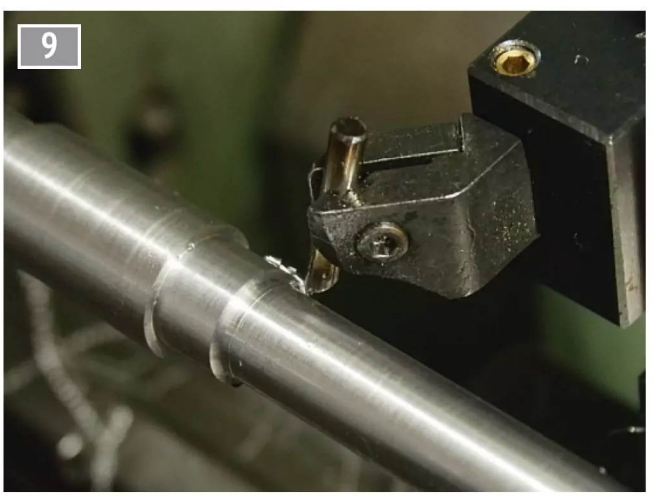


Interesting patterns were hidden inside the shaft.



Turning tough steel at around the correct rate for carbide tips makes for very pretty blue chips and occasional 'blue' language when one lands on your skin!

Despite being tough, the old shaft steel yielded a nice finish with a sharp carbide tip.

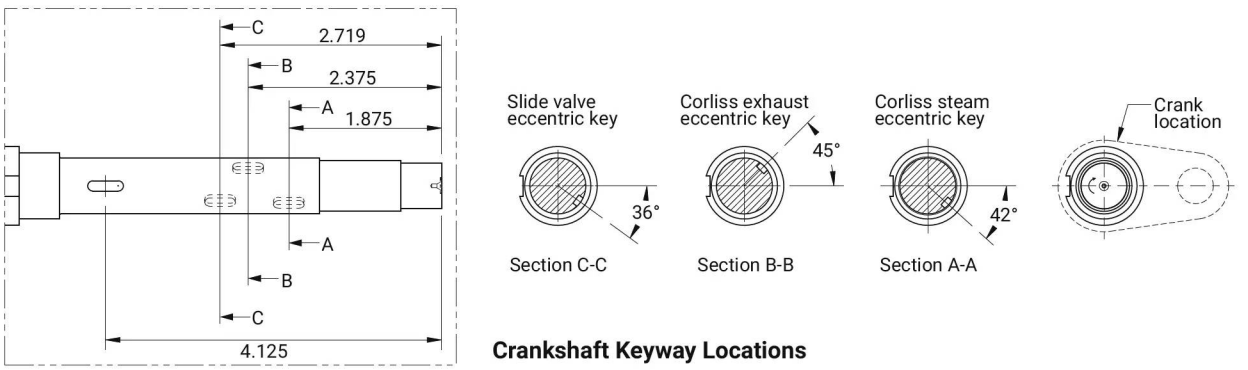


Even when putting in radii with an HSS form tool the finish was good, so I got away with using this bit out of the hoard. It's still better just to buy in some FCMS.

Measuring using the DRO.

edge finder was used twice, once on the clamp block and the DRO zeroed then on the end of the shaft to display the length. The axial details (fig 5) are dimensioned from each end of the shaft with the intention that, when the shaft is between centres, it will be turned end-for-end and a saddle stop used to determine the positions of the various steps.

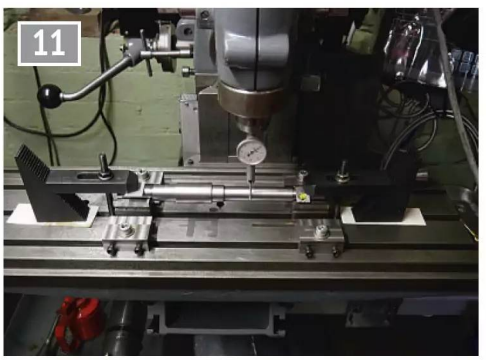
The important dimensions are the diameters of the flywheel mounting, bearing journals and the locations of



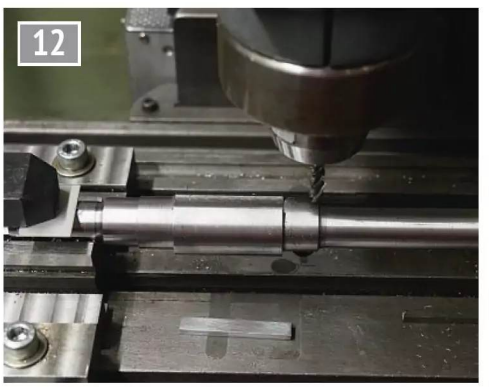
Crankshaft Keyway Locations

Fig 6

Crankshaft keyway locations.

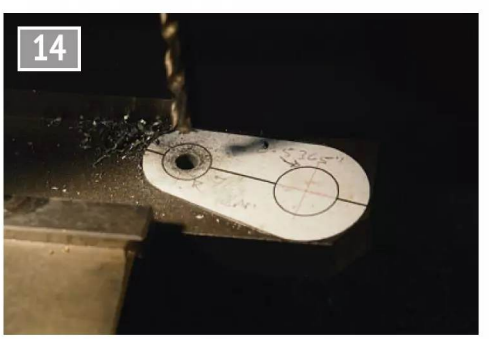


Aligning the shaft for cutting the keyways for the flywheel and the governor drive pulley.



Cutting the flywheel keyway.

Cutting the governor pulley keyway. You need to approach the correct width a little at a time using a piece of key material as a gauge.



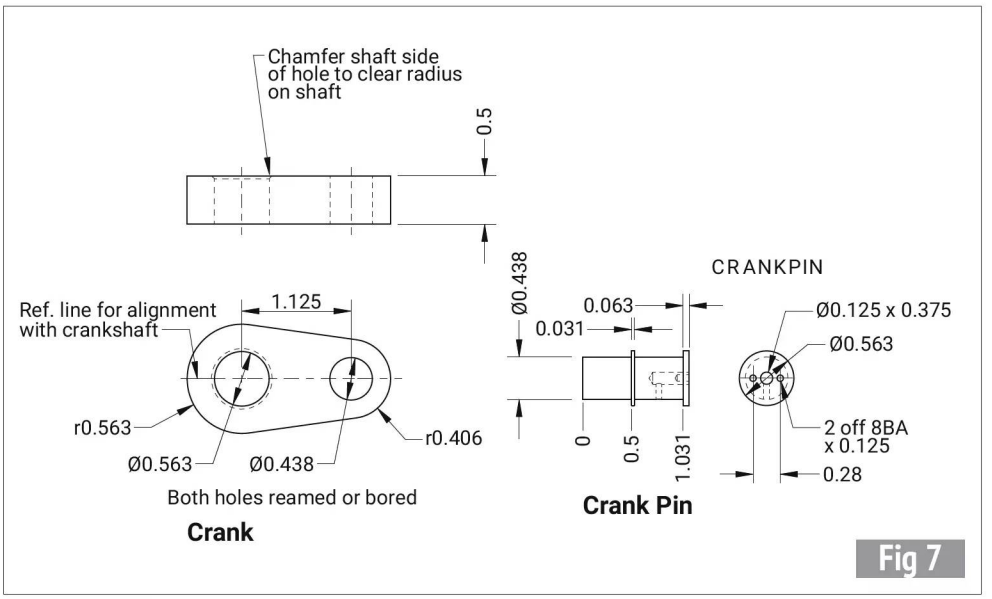
Crank material set up for drilling and reaming.

Bandsawing the crank from the stock.

Sub-table for the rotary table.

the keyways for the eccentrics (**fig 6**). The diameter of the flywheel mounting needs to give a slight interference fit and the two bearing journals are a close running fit for the bearings. To help achieve these fits it's a good idea to make two plug gauges now so they are ready for when the matching holes are bored to size. The key slots are best milled in two passes with an undersized cutter to achieve a firm fit on the key material. The keyways for the flywheel and governor drive pulley are straightforward and the angular positions are irrelevant so they may as well be in line and machined at one set-up. The shaft can be located on V-blocks and aligned with the mill X-axis (**photo 11**) then the two keyways cut (**photos 12** and **13**).

Before starting to set out the angles for the keyways for the eccentrics, scribe a clear line across the diameter of the crank end; this will make it possible to align the eccentrics with the crank centreline later. A long time ago I made myself a stepper motor drive and Arduino controller for the dividing head and rotary table and one of those makes setting out the angles very easy. Without such, then the eccentric positions can be marked out with a protractor or set out using a manual dividing head. Alternatively, it's possible to omit the keys and do what some of the original makers of full-size engines



Crank and crankpin.

Crank located on the sub-table for rounding over the larger end with a central pin and cap screw through the hole for the crankpin.

Finishing the sides of the crank.

Turning the crankpin.

Crank and crankpin assembled.

did and use a setscrew to fix the eccentrics in place after adjusting the valve timing. Throp describes and illustrates the method in his book (**ref 6**) where the eccentrics were secured using a setscrew bearing on a serrated block, after setting the eccentric the screw was tightened down and the block dug its teeth into the shaft to prevent rotation. The model version would be a small dimple drilled into the shaft.

The shaft is drawn with centres about scale size (for a BS 1 centre drill which has a 1/8 inch diameter body), but I blundered here and drilled the centres to a normal practical size which looked too large for 1/16 scale. I turned the shaft between centres then drilled out the practical size ones and glued in dummies of about scale size.

The crank (**fig 7**) comes from 1/2 inch FCMS. The holes for the shaft and crankpin need to be parallel and perpendicular to the surface, the other dimensions and alignments are less critical. The holes are best drilled and reamed while the piece is still attached to the stock (**photo 14**) then the part can be separated with the bandsaw or hacksaw (**photo 15**). A sub-table for the rotary table will come in handy now and will be essential for the flywheel a bit later and this needs an accurate centre hole for locating pins (**photo 16**). The first task for this is rounding over the ends of the crank (**photo 17**) and cleaning up the two sides (**photo 18**). Any slight ridges left where curves meet straight bits can be blended with a fine file and the surfaces tidied up with abrasive papers. I think that 240 was the coarsest grit I needed anywhere on the model, more usually starting with 400 then giving the metal a final finish with 600 grit did the job. In full size use, surfaces like these became polished over time but also acquired a lot of dings and dents so final finish is really a matter of choice.

The crankpin (fig 7) is turned from bar stock FCMS (**photo 19**), important dimensions being the diameters of the big end journal and of the spigot that secures the pin in the crank. This latter could be heat shrunk which would be prototypical or, more simply, use Loctite 638. Loctite needs a small gap of around 0.001 inch and this allows the pin to move around a bit although the collar should prevent any angular misalignment. To guarantee alignment leave a (say) 0.04 inch land at each end of the spigot at a light push fit and turn down the middle bit to give the Loctite somewhere to live. **Photograph 20** shows the two parts after assembly and indicates the alignment of the oil holes.

●To be continued.

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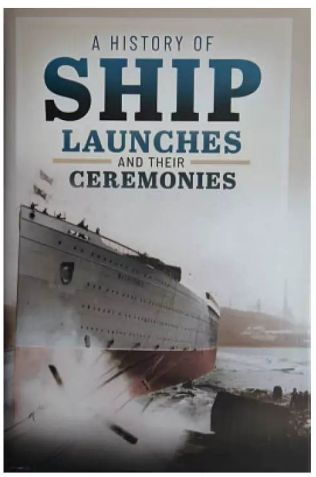
Book Review

A History of Ship Launches

George Hodgkinson



Published by Pen and Sword Transport, 2023
ISBN 978-1-399048-45-0
343pp, hardback, £25

Ship launches go back thousands of years. The epic of Gilgamesh (circa 2100 BCE), mentions using a runway of rollers to take a boat into water. However, the Bible suggests Noah used a float up method building his ark on dry land and waiting for the waters to rise.

Both methods are still employed today. Using a cradle to support the hull under construction before launching goes back to Hellenistic times. Whilst many ships are launched by sliding down a slipway the *Queen Elizabeth* and *Prince of Wales* aircraft carriers were built in dry dock at Rosyth. Historically, the float up method was much used in England where master shipwright Phineas Pett used it for his great warships built at Deptford or Woolwich.

Much of the book concerns launching ceremonies. Different countries have different launch customs. Ancient Greeks used libations or offerings of wine to the Gods, perhaps originating the breaking of a wine bottle at a launch. Later chapters feature 'Ladies who launch' and discussion about ship's sponsors and gifts they received at launches. New UK lifeboats have a standard dedication service, dating back to the 1860's.

Most launches were hull or stern end down the slipway into the water but some were launched sideways, notably the *Great Eastern*. An American shipbuilder, G.W. Bull of Buffalo, told Brunel of his success with sideways launches, though Brunel wrote back to say 'the most useful ... experience is ... derived from failure and not from success' - an interesting insight into Brunel's thinking. The author describes the *Great Eastern* launch in some detail but though he mentions the hydraulic rams used he doesn't quote Tangye's boast, (they were the previously little known makers) that 'We launched the *Great Eastern* and the *Great Eastern* launched us'.

As with the *Great Eastern* launches can go wrong. The *Daphne* capsize on the Upper Clyde in 1883 led to the loss of 124 men and boys. Although the shipbuilders were experienced they built the ship according to plans supplied by the owners as was usual but did not examine the design or stability of the hull. Following an inquiry, future plans were then checked thoroughly and only a minimum number of men allowed on board at launching.

Launching in a narrow waterway can give problems. Accounts of the *RMS Mauretania* launch on the Tyne in 1906 and that of the *Queen Mary*, the largest liner ever built, in 1934 show these could be overcome. John Brown and Co. tested a model of the *Queen Mary* in their shipyard tank to see how far the hull would travel on launching. Their prediction was out by just two feet!

Models had another place at launches. As vessels would go to fitting out berths after the launch a model showed assembled guests what it would look like when finished. Such models were made professionally and were included in the technical specification between ship owner and builder. They could also help guide construction.

Shipyard launch trigger seen in Riverside Museum Glasgow.

Shipbuilding and launches could be carried out quickly. During the First World War 'Hog Island' near Philadelphia built 122 ships using extensive prefabrication. That system was perfected in the USA during the Second World War with over 2,700 Liberty ships built to a largely British design by Robert Cyril Thompson. The construction genius was Henry Kaiser, a prefabrication and assembly expert. All were launched, as dry dock construction for so many would have been impossible.

Ship launch developments have continued. Chinese shipyards successfully use inflatable rollers for small and medium size ships and a slipway launch remains an impressive sight. Although this book lacks technical detail it is a readable account by an author with the good fortune to have attended many launches. How will they change in another hundred years ?

Roger Backhouse

The Melbourne Society of Model & Experimental Engineers presents the

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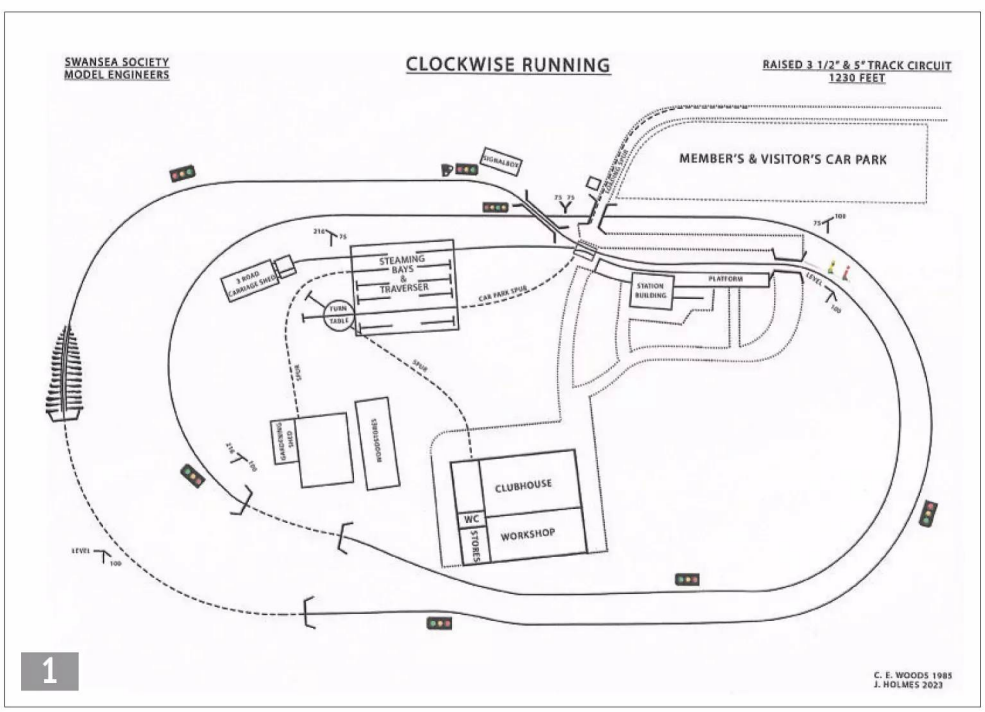
We Visit the Swansea Society of Model Engineers

John Arrowsmith visits a long established club in the Mumbles.

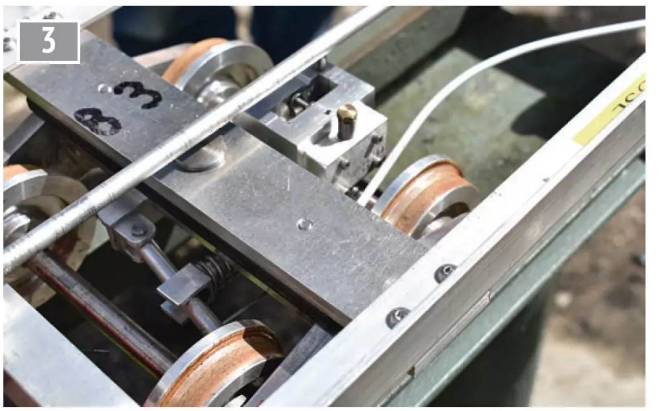
I visited this long established club - and by long established, I mean some 87 years long - tucked away along the road towards the Mumbles in South Wales. It was founded in 1937 following an advertisement in the South Wales Evening Post. In the years before WWII, the fledgling Society held their meetings in a room above a garage situated behind the Cross Keys Pub. Unfortunately, this building was destroyed during the Blitz in 1941 which resulted in meetings moving to be held in the local YMCA. This too was destroyed, only a short time after their first meeting room, so relocation took place again, this time with a move to the Kardomah Café on Castle Street. During the remaining years of the war, this weekend meeting place enabled those members who were on leave to continue to be kept in touch with the club.

Moving on now to the post war years, when one of the founding members of the society, Cecil James managed, in 1947, to obtain a 21 year lease on the piece of ground on which the present club now operates. However, as this was a large piece of land and the cost was just too much for them at that time, half of it was given back to the local authority. This was then used for housing around the perimeter. The building of their first track then commenced with a 2½, 3½ and 5 inch multi-gauge system as the basis. As it was in the immediate post-war years new materials were not easily available so it was built using what available scrap wood and steel were available. The acquisition of the clubhouse was also a story in itself because on the adjacent land, which was part of the University playing fields, there were a number of anti-aircraft guns and associated buildings. Because of the housing shortage following the war, these buildings were being occupied by squatters so in order to secure a building when it became vacant, both Cecil James and the late H. L. Franklin lived in one, day and night, to prevent anyone else gaining access. Another member, Martin Mossman arranged for transport to move the building onto the club site once it was disassembled. I wonder how many other club buildings have been acquired by such a process! Fancy having to squat in a building in order to get a clubhouse



The track plan for the clockwise running direction.

A view across the site from the station approach track with the clubhouse in the background.



Part of the brake gear on the new driving truck.

The truck itself almost complete.

A view from the station with lots of activity in the steaming bays.

for a model engineering club? I suspect that it is probably unique in that respect!

During the 1950s and 60s, membership held at around 35 - 40 with meetings being held in the YMCA, as access to their field was difficult at that time. Into the 1970s and the club's fortunes began to improve, particularly with the construction of two portable tracks which were used, like many clubs have done, at local fetes and rallies which started to raise some much needed funds. At this time they were also operating a ground level track in a local park to give rides to the public. Like many others in similar circumstances, the track was vandalised so the club decided to use the site they already had to build a suitable track for public running, albeit on Public Holidays only.

Development continued and the decision was taken to dispense with the 2½ inch gauge track and concentrate on the 3½ and 5 inch gauge system that exists today. My visit coincided with one of the club's work days and I have to say there was an impressive number of members attending, both to work on the site and enjoy some personal track time with their locomotives. It was a lovely spring morning and the location of the site is such that whilst standing on the station platform passengers have a good view out over Swansea Bay which is well worth seeing.

Chairman, Colin Morgan told me about the continued development here which has resulted in the very interesting layout which is shown on the diagram (**photo 1**). This shows the layout and position of signals for clockwise running; there is another diagram configured to show the anti-clockwise running positions. From this you can see that members do have a variety of operations available to them which makes this track a rare layout - not many clubs can easily switch running directions.

A nicely located clubhouse and workshop (**photo 2**) provide members with very well laid out meeting and working spaces or the opportunity to just sit outside and enjoy the view over the site and out into Swansea Bay. Plans are in place to re-build the station to further improve the overall railway facilities.

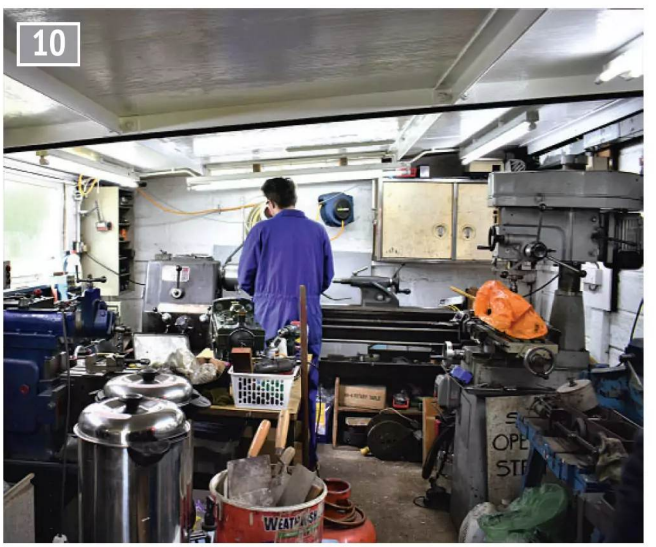
The chairman showed me his own driving truck, built in aluminium for ease of carrying, which has a well designed and built hydraulic braking system using easily obtained cycle fittings (**photos 3** and **4**). In front of the clubhouse there is a low level carriage storage shed which blends in nicely with the surroundings. The steaming bays, traverser and main line access bridge are all included in this space which makes for easy operations (**photo 5**). There was lots of activity going on during my visit with engines being prepared and steamed (**photos 6**, **7** and **8**), carriage maintenance and signal work.

Member William with his 3½ inch gauge Rob Roy.

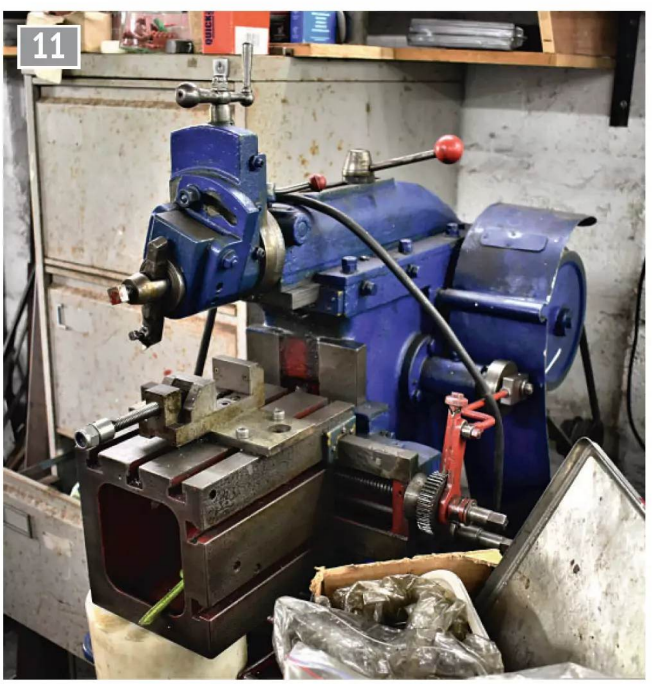
A very nice example of Somerset & Dorset 7F owned by Josh Holmes.

The club's saddle tank has been joined by a 5 inch gauge B1 on the steaming bays.

Don Burrow working in the signal box which controls all the working signals on the track.



A view inside the workshop with William on the Cardiff lathe.



A rare machine these days is this fine little shaper.

The attractive setting for the garden railway layout.

The signaling system here is built, as mentioned, to allow running in both directions. This is achieved by having a number of small location pillars arranged around the site in suitable locations to enable signals to be moved around to suit the direction of running.

The system was designed and built by Don Burrow and Geoff Bate and is a work of art in itself (**photo 9**). All the signals are automatic and work through a selection of track circuits and relays which can be simply adjusted to suit whichever direction they

A very nice 3D printed Single Fairlie locomotive and coach on the garden railway.

The entry portal for the inner tunnel.

Member Sandra with the club's saddle tank locomotive being cleaned up for the day's running.

are operating on the day. Don has also built a track cleaning wagon to be used before operations to ensure all the track circuits are clean and working. With all this work the club do have a good practical workshop adjacent to their club room which is furnished with a good range of tools and equipment to enable them to maintain their locomotives and rolling stock along with all the necessary ground maintenance (**photos 10** and **11**).

In addition to the larger gauges the club has an excellent garden railway track that is well laid out and provides an interesting journey for the smaller 16mm locomotives and stock (**photo 12**). Keith Evans, who is part of the group of members who organise this part of the club's facilities, told me that the inside 32mm gauge track is electrified while the outer ring is for self powered engines and stock. The locomotives and stock on the railway, when I visited, were all 3D printed kits and look very authentic (**photo 13**). One of the club's lady members, Sandra, is very keen on the garden railway and owns her own engine for that section. On the day of my visit she had been coerced into preparing the club's 5 inch gauge saddle tank for the day's operations (**photo 14**). She told me that she is very keen to build her own 3½ inch gauge narrow gauge steam engine, which will be a Sweet Violet' and she is hoping that the knowledgeable members in the club will help her with that.

A typical journey around the track, which is 1230 feet long, starts from the station and has a slight down gradient towards the straight behind the clubhouse where is passes through the short inner tunnel (**photo 15**) and then swings right back towards the station, still on a falling gradient. Two overhead bridges are the next track structures that the railway passes under and with a rising gradient of 1 in 75, takes the track on another right hand curve where passengers can view operations on the garden railway, towards the long, curved outer tunnel

Approaching the longer outer tunnel.

Yours truly trying out the motorised scooter!

(**photo 16**) after which the train emerges into a cutting and then returns to the station over one of the bridges. It is an interesting trip with lots of variety provided by the change in gradients and views over the site along the way. Both tunnels were the result of a great deal of excavating and moving soil from one side of the site to the other which has resulted in the track layout currently in use. There is one other length of track at the club and that is a short 7¼ inch gauge demonstration line that starts behind the clubhouse, runs parallel to the main line and then around the garden railway, finishing almost at the rear of the station.

I can testify that the main line provides an excellent drive and is a credit to the builders. They have a little electric vehicle made up from a child's scooter which provides a fun ride for unwary visitors and - yes, you've guessed it - I was given the pleasure of trying it out for myself; quite an experience (**photo 17**)!

I will conclude my notes by saying that for a club with just over 40 members they have achieved an amazing miniature railway here. Known as the Derwen Fawr Miniature Railway (in English, 'Large Oak' MR) operated by the Swansea Society of Model engineers it is a real asset to the area. They enjoy public running on Bank Holidays which is what the members can organise easily, but the club itself is very active and seemed to me to be a happy place where everyone is included. Unlike too many other Societies, they have a very good mix of all age groups involved in all aspects of the club (**photo 18**). There are a number of club locomotives available and some good quality rolling stock.

My thanks to Arthur Green, the secretary, for the invitation and to Colin, Chris, Don and Josh, Sandra and Martin together with all the other members I spoke to, for their hospitality and welcome along with plenty of information about the club and its origins. It was a pleasure to be with you all and I hope your excellent club and its members continue to prosper and to enjoy a long and happy future.

ME

The happy group of members attending on a fine Sunday morning complete with the club mascot, Charlie.

POSTBAG

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Responses to published letters are forwarded as appropriate.

Butterside Down

Dear Martin,

Having built many trailers over the last 50 years ranging from small 4' X 4's to 20' X 8' and towed them many thousands of miles, usually grossly overloaded, I have been reading Butterside Down with great interest.

Steve Goodbody is correct about the need to load a trailer with about 20kg of nose weight, depending on the towing vehicle. Much more may do the suspension no good, never mind about the braking and steering, BUT if there is little or NO nose weight (or, worse, it's tail heavy) then the trailer will be all but IMPOSSIBLE to tow AT ALL!

But what really interested me was his choice of aluminium for the chassis, having decided against steel due to salted roads - WHY? Steel is cheaper and can be easily be welded or repaired if need be. I will accept that steel is heavier but also stronger so lighter sections could be used, nor is it so likely to crack due to stress. Aluminium is only much good due to its almost instantly formed oxide coating which is insoluble in water BUT introduce any other chemical into the equation e.g. sodium chloride (common salt) and it will soon fizz away to a whitish powder or slush. Even marine grade ali is not entirly free from electrolytic corrosion and the wood body will hold moisture!

Part 4 shows no means of releasing the cable drum to spool out cable or any way to unload the engine from the rather smart chocks e.g. a snatch block or pulley at the rear to haul backwards or is that for part 5? Just in passing for UK readers, it is the DESIGN or GROSS weight that counts - even an empty trailer may well be above the legal load your car can tow. My four wheel box trailer has a GVW of 1.25 tonnes. My hatchback can tow it but the estate version can't, yet the estate tows it better. Ah Well.

Noel Shelley

Thunderbirds

Dear Martin,

I would like to thank Mr. David Greenaway for his kind reaction to my article Thunderbirds (Postbag M.E.4744, May 31st).
As an add-on I would like to mention also that, although Gerry and Sylvia Anderson used scale models in their Thunderbirds series, it was by no means a small scale business. At times it did involve around 100 people full-time.
With best regards,

Henk-Jan de Ruiter

Small Diameters

Dear Martin,

Reading the account by Dave Woolven about turning small diameters (M.E.4747, July 12th) reminds me of when I started in engineering as a way of earning a living way back in the early 60s. At the small company where I started we had a total of seven capstan latnes.

One job we did was to make platen cores for a firm named Tickopress. They were based at Dovercourt in Harwich on the Essex coast. They made, among other things, labelling machines. The platen cores were turned on a Herbert no.4 capstan lathe and the material used was 2 inch round EN1 free cutting mild steel. The diameter was to the best of my knowledge turned in one pass from the 2 inch diameter to about 1½ inch diameter in 1 go. To do this the operator or setter operator would turn about an inch or so to the diameter and then set a roller box fitted in one face of the turret to this diameter. This had a carbide tip cutter and two rollers which steadied the metal. Unlike a centre lathe where you can use a travelling steady bolted to the carriage you could not do this on the capstan lathe. These machines had quite a bit of power (at least a 4 hp motor I think) so they could certainly shift the metal and the way the swarf came off was impressive.

After we had machined them they then went off to have gear teeth cut at one end and then they were sent to another firm who bonded rubber tubing to it and ground the rubber so that it formed the rubber squeeze surface, and presumably then were assembled into a printing machine at Tickopress.

So - yes – Dave's idea was used on a larger scale in industry, in the roller boxes used on capstan and turret lathes. This idea of course was in use well before the CNC machines we now know today. In large factories there were both single and multi spindle automatic lathes but they took a lot of setting up so would only be used if you had a particularly long run of a component.

It was quite interesting to see the device that Dave made to overcome the problem he had in making the regulator spindles. As he says, quite rightly, just trying to use normal turning methods just doesn't work and it demonstrates the ingenuity that our fellow model engineers employ to solve a problem.

Yours sincerely

J.E. Kirby (London)

Deionised Water

Dear Martin,

Scale is a problem for steam boilers. A few days ago I had a short chat to a local window cleaner about water for use in our steam engines. He recommended a company called RO-MAN for equipment to provide de-ionised water such as that used by himself. Window cleaners use de-ionised water because it does not leave smears.

The difference between 'pure' water and de-ionised water is that the former requires distillation whereas de-ionised water is filtered. There seem to be devices that do both. I had been under the impression that if distillation is involved then HMRC would start to get interested but maybe only for spirits. RO-MAN claim water of 97 to 99% purity with devices like:

www.industrialwater equipment.co.uk/products/

pure-water-exchange-systems Does anyone have experience of these systems and the potential pitfalls?
Regards,

Mike Joseph (Chipperfield)

Scraping

Dear Martin.

I would like to comment on Neil Raine's excellent article on flatness (M.E.4744, May 31st *et seq*.). He says hand scraping is arguably the best method to achieve precise surface flatness. Not so - scraping is for the retention of lubricant between two flat surfaces which slide across each other. A cheap and quick way to achieve the same effect is to grind the flattened surfaces to a slightly rough finish. I was trained to hand scrape during my apprenticeship in the 1950's. I was able to achieve the beautiful crescent shapes which Neil mentions. I later visited the Cincinnati machine tools company and met their scraping man who finished the saddles etc of their milling machines. He use a scraper with a right angled tip, unlike my scraper which was like a wood chisel. Perhaps Neil would care to comment.

Martin Whillock

Neil responds:

Thank you for writing to *Model Engineer* and for complimenting my article on Engineering Surface Flatness. It is always valuable for readers to hear about the experiences of professional engineers. I certainly envy your opportunity to visit Cincinnati Machine Tools Company.

You have disputed that scraping is arguably the best method to achieve precise surface flatness and this is valid. As mentioned in the article, Joseph Whitworth clearly advocated that hand-scraping produced a superior flat surface on metal compared to surface-grinding. What is not clear is the method of surface grinding Whitworth referred to. Also, this was admittedly written a long time ago and since then there have been enormous improvements and developments in surface preparation.

The primary intention of hand-scraping metal is to improve surface flatness. High-spots on the surface are identified using an indicator pigment applied to a surface plate. The high-spots are then hand-scraped to make the surface more regular. After repeated effort, the number of bearing points on the surface greatly increases and these are more evenly dispersed. The retention of lubricant you mention, found between the mating surfaces as a consequence of scraping, is important but it is not the primary intention of the action of scraping itself.

From measurements of surface undulation on metal following various treatments, the following results were obtained. The values reported (micro-inch, µinch) represent the range of surface imperfection: Turned = 50 to 500 µinch, Ground = 35 to 200 µinch, Burnish = 10 to 50 µinch, Honed = 5 to 50 µinch, Lapped = 3 to 10 µinch. You mention that grinding surfaces may be a cheap and quick way to achieve the same effect, presumably as hand-scraping. Depending on the method of grinding and the level of skill of the metalworker, in some circumstances this might be the case but I suspect not in all. From the results shown above, surface grinding alone does not produce the truest surface. In many home workshops that are unlikely to be equipped with specialist surface-grinding equipment, hand-scraping remains a viable alternative.

Neil Raine

A further comment from Martin Willock:

Thanks for all this. Its a fascinating topic.
But - how could a horizontal spindle surface grinder not produce a flat surface, or one which needs flattening? Whitworth probably did not have one of these, nor will home workshops. I used one of these a lot and got really good results - 60/70 years ago! Has the mystery of wringing been solved? Is it really air pressure?

Martin

(That last question is slightly tangential but interesting. Does anyone know the answer? – *Ed*.)

National Railway Museum

Dear Martin,

Further to my letter about the NRM Store (M.E.4749, August 9th) the store is currently closed to the public so please don't rush to York in the hope of seeing it. The National Railway Museum website states that a new 'Open Store' will be 'quirky, atmospheric and intriguing' but doesn't indicate when that will open.

Artists' impressions on the website suggest something rather less than atmospheric but no doubt all will be revealed one day. Whilst many objects need better display I fear this new store will be antiseptic if not outright sterile. But I live in hope.

I found the article about the '0' gauge Hudson of great interest (M.E.4749). I wonder if any *Model Engineer* reader has successfully built LBSC's '0' gauge Hudson design as I cannot recall seeing any references to completed locomotives. It sounds like one to add to my long list of uncompleted projects so I'd appreciate information from any readers who have been successful with one. Thank you.

Yours sincerely,

Roger Backhouse (York)

George Forrester

Dear Martin,

I am greatly enjoying the series of articles by Ron Fitzgerald giving the history of George Forrester's locomotives. The subject matter is fascinating and the scholarship fully up to the high standards we have come to expect in 'ours'. Most of the precursors to the 'Stephenson' link have been described elsewhere but I was unaware of the connection to Forrester and Carmichael. In particular, Carmichael's gab motion for the steamboat machinery is interesting, as it seems to have been reused almost intact on his locomotives, with the space saving modification to the gabs themselves.

Can I request though, that Ron could give us more details of the valves, as opposed to the valve motion, that Carmichael used? They are neither the Trevithick semi-rotary plug valves, nor the familiar 'Dee' slide valves, but the drawing (Fig 10 in M.E.4748, July 26th) is too small to make out the details even under bright light and high magnification. Incidentally, I don't recall Dante mentioning a specific region of Hell for vandals who break up historic steam engines but I'm sure that many present enthusiasts would contribute to the construction costs!
Best wishes,

Alan Cox (Carnforth)

Moving Workshop

Dear Martin,

I am hoping the readership of *Model Engineer* will be able to help! We are planning a house move which also means a workshop move. It is something I have been dreading (and I do mean dreading) for a long time but if the planets align, the moving of my kit has to be dealt with. We live in Berkshire and I wonder if anyone can point me in the direction of someone that can undertake moving (and perhaps very short term storage) of my machinery and tooling? The principal items are a Bridgeport, Boxford lathe, pillar drill, T&C grinder and two large benches. In addition to that I will need to find out about wooden packing crates for all the small stuff. Any leads very much appreciated.

On the off-chance a reader wishes to get in touch please forward details as appropriate (I am happy to forward any replies – *Ed*.).

Regards,

Andrew Cliff

A BR Standard Class 4 Tender Engine

PART 2

Doug Hewson describes a 5 inch gauge version of the BR Standard 2-6-0 tender engine.

Continued from p.332
M.E.4750 Agust 23

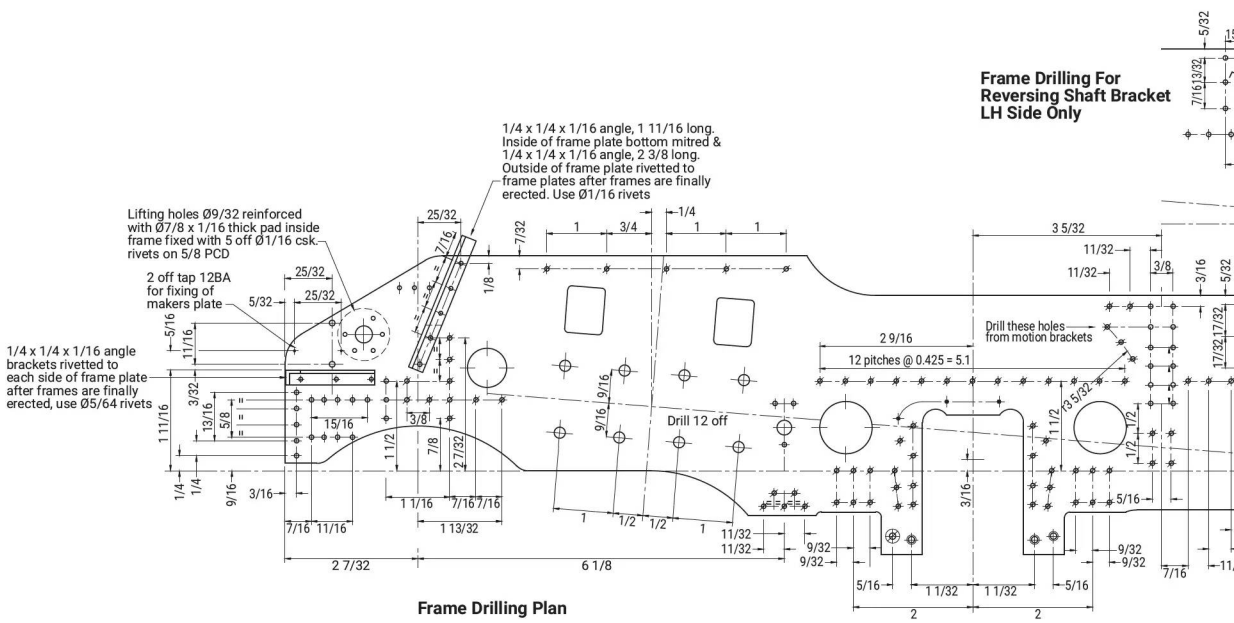
The main drawing here (**fig 2**) is the frame drilling drawing and I have added the general arrangement drawing of the frames (**fig 3**) as I thought it might be helpful - well that is if the editor can fit that lot in. As usual, I have included some photographs and these are now all of 76077 as Andrew Meredith sent me lots of them from the Gloucester and Warwickshire railway where the engine is being rebuilt. (However, see the notes in part 1 – M.E.4750.)

Photograph 5 shows the frames all painted up. **Photograph 6** shows the frame

Frames of 76077 painted.

Frame stretcher on 76077, also freshly painted.

>>


Frame Drilling For
Reversing Shaft Bracket
LH Side Only
1/4 x 1/4 x 1/16 angle, 1 11/16 long.
Inside of frame plate bottom mitred &
1/4 x 1/4 x 1/16 angle, 2 3/8 long.
Outside of frame plate rivetted to
frame plates after frames are finally
erected. Use Ø1/16 rivets
Lifting holes Ø9/32 reinforced
with Ø7/8 x 1/16 thick pad inside
frame fixed with 5 off Ø1/16 csk.
rivets on 5/8 PCD
2 off tap 12BA
for fixing of
makers plate
1/4 x 1/4 x 1/16 angle
brackets rivetted to
each side of frame plate
after frames are finally
erected, use Ø5/64 rivets
Drill these holes
from motion brackets
12 pitches @ 0.425 = 5.1
Drill 12 off
Frame Drilling Plan
Frame
All holes t
RH frame

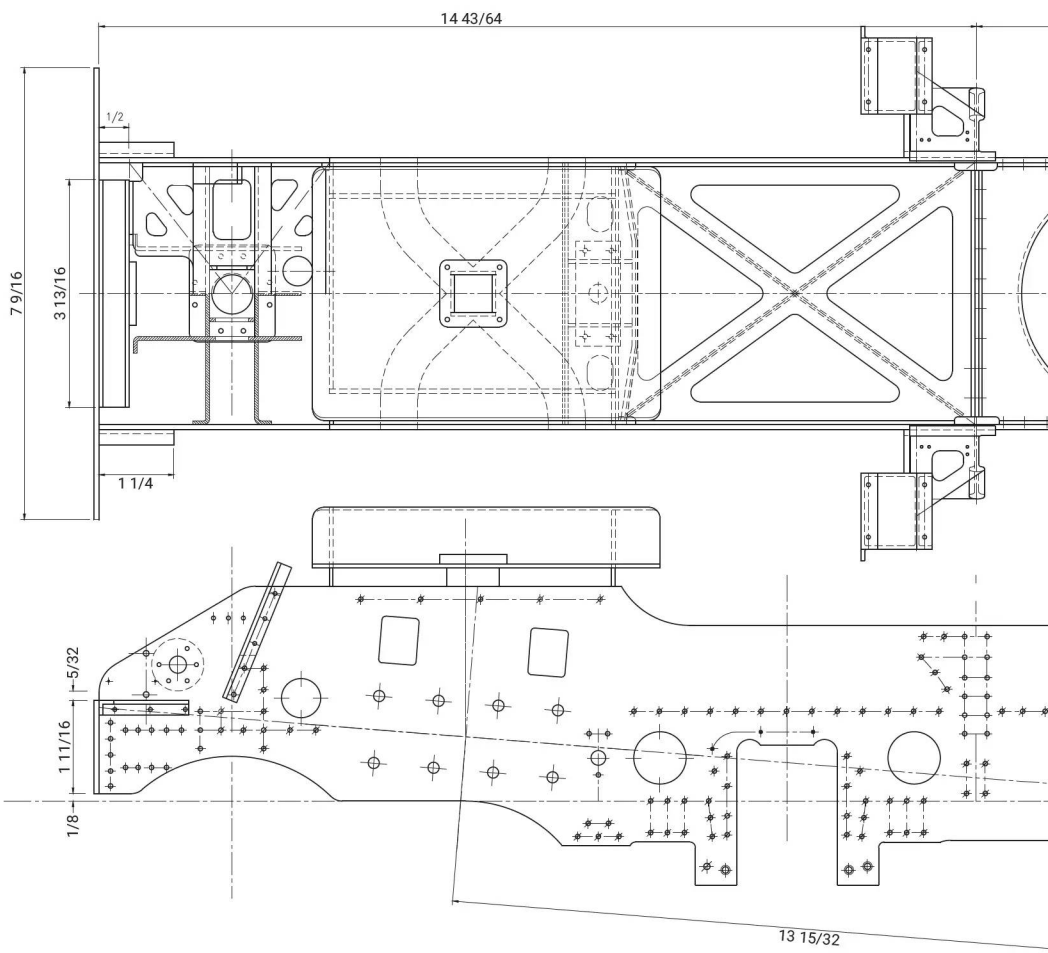
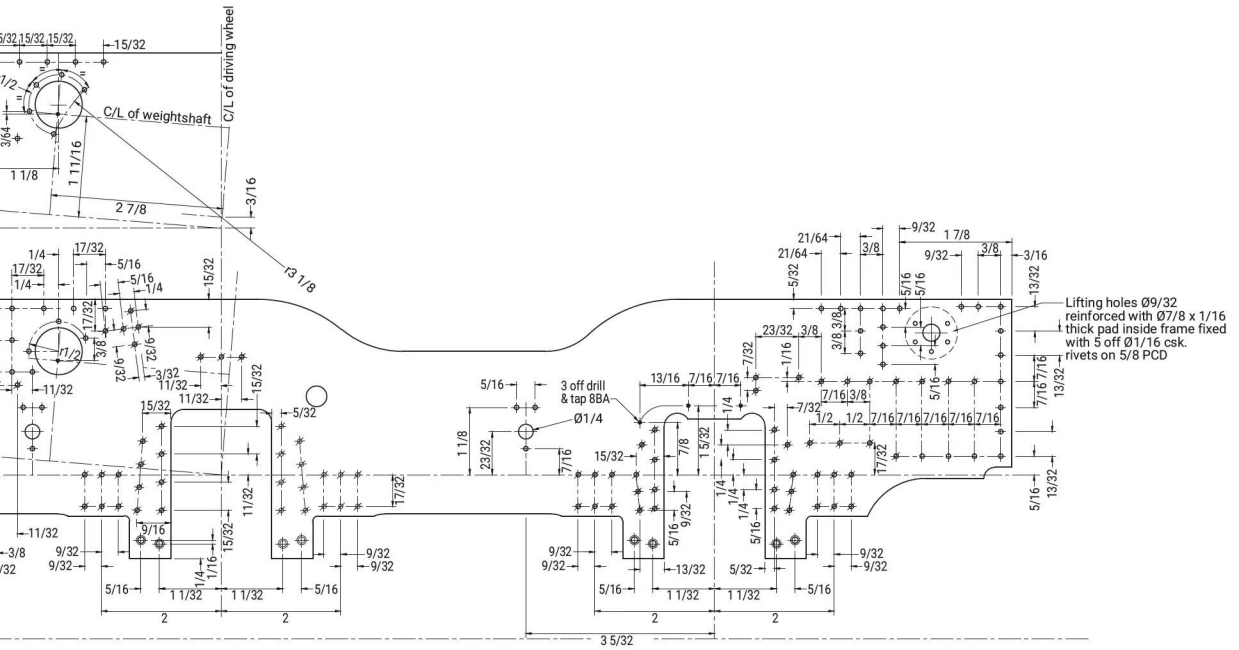

14 43/64
7 9/16
3 13/16
1 1/4
1 11/16
13 15/32

Fig 2



Drilling Plan
o suit Ø5/64 rivets (Uno)
drawn, LH frame as noted

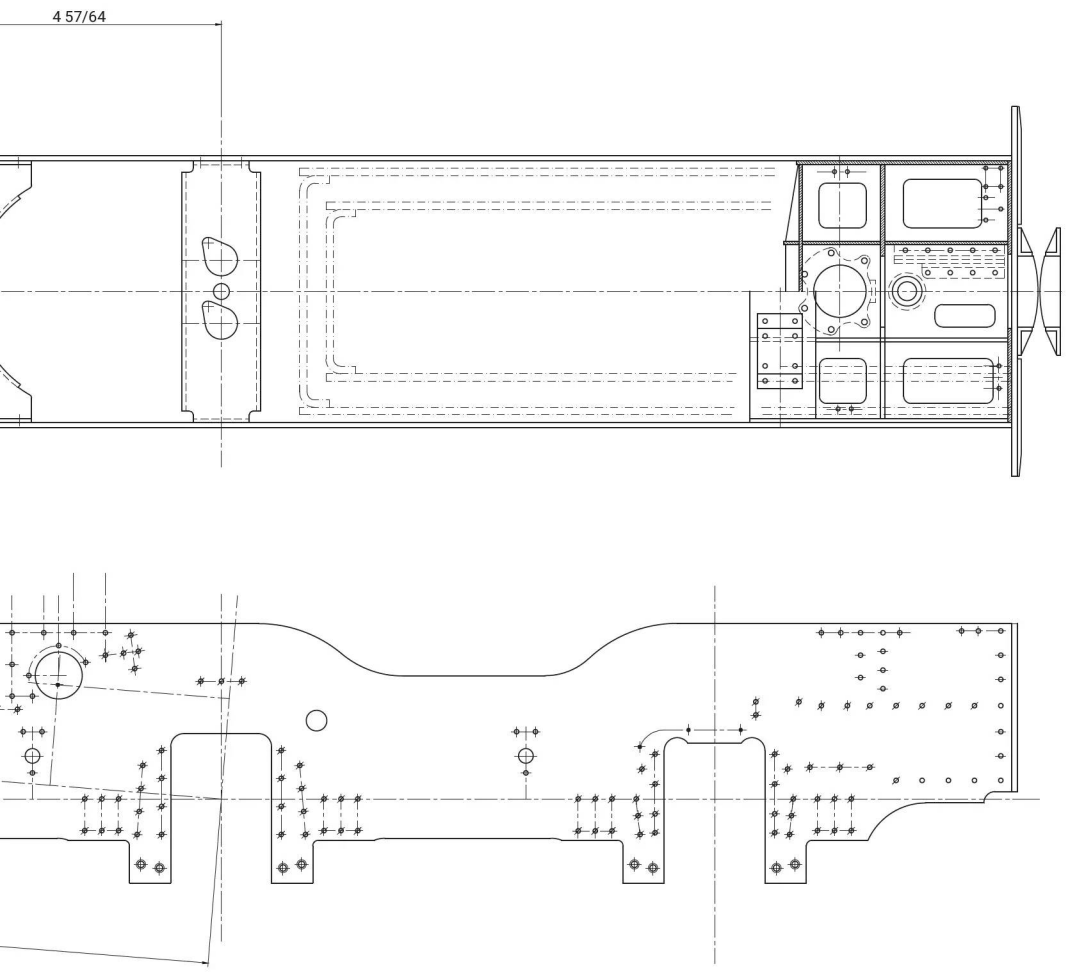
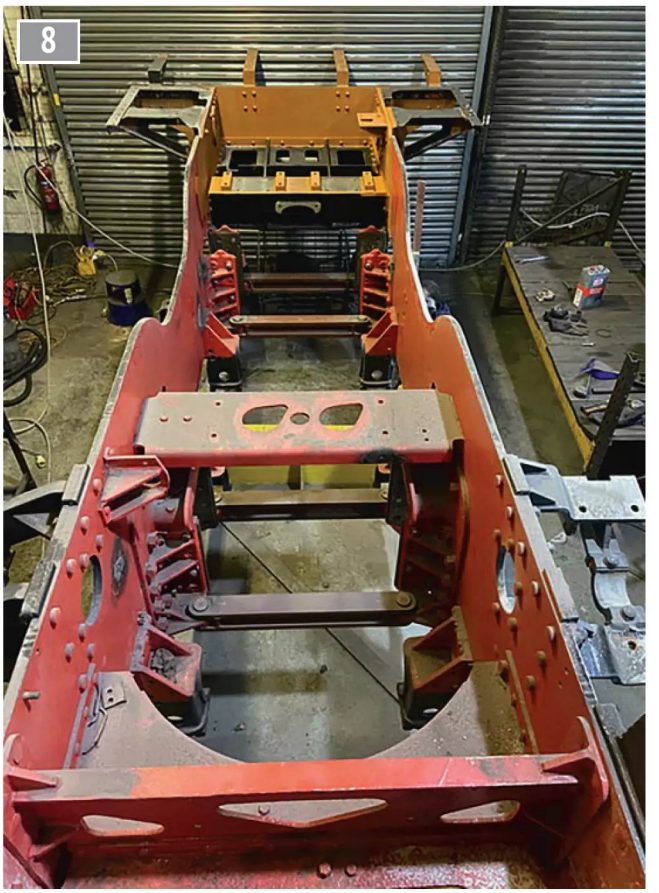


Fig 3

Frames of 76077, looking forward.



Frames of 76077, looking aft.

stretcher behind the smokebox saddle. Now, where these two meet up, I have used 8BA bolts to join the two plates together so that I could drop the saddle into the frames separately and I think you will realise why when you get that far. This is of course on my 4MT which is very similar. You need to remember to put some Boss White in there to seal around the exhaust ports. Anyway, that will be for later. **Photograph 7** shows progress on the engine but the smoke box doesn't show up very well with it being painted black but I will insert some better photographs in one of the next couple of articles. **Photograph 8** shows the engine looking towards the rear of the frames with a complete new drag box riveted in place. In this photograph it can also be seen why there are two separate horn cheeks as the fire box sits almost on top of them. I have also run an oil pipe into the axlebox keep on both sides, although this is for much later.

I thought that I would try to keep up my tradition of trying to fit at least one photograph of one of the full size engine into my article. With that in mind, **photo 9** is one from Rail Online which shows our engine, 76077 coming in to some company sidings in St. Helens on the 14th of April 1967 with a pick up goods train. In fact it looks as though it is in the middle of a shunt, as there is no brake van on the train.

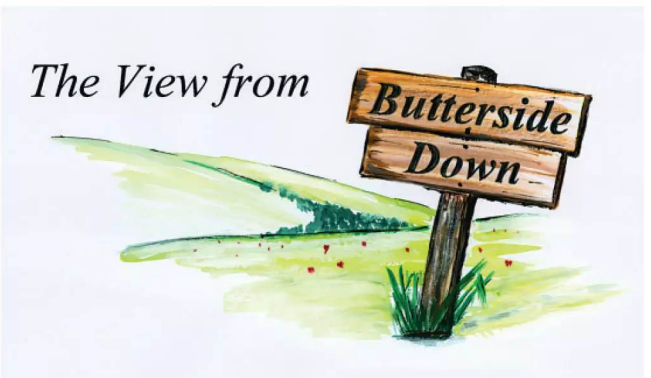
●To be continued.

76077 busy shunting a goods train. (Photo: Rail Online.)

Part 19: Pastures New - Part 3
The Comforts of Home

Steve Goodbody takes a random walk through model engineering.

Continued from p.318
M.E.4750 August 23



With the author's shed-com-office-com-library-com-workshop finally standing two stories tall, we re-join him as he prepares to make the inside both habitable and energy efficient if he can.

The thwack of neither leather nor willow

"See you in a couple of weeks and please don't forget to water the plants. Oh, and by the way, there's a cave cricket somewhere in the shed. Love you!"

Jenny's parting words to me this morning, the 26 September 2023, hurriedly spoken in the drop-off area of Newark Airport as I removed the last of her bags from the car and she waded headlong into the throng to begin another trip to England, reverberated in my mind as I returned to the driver's seat and began threading my way through the already congested six-in-the-morning commuter traffic. *Cave cricket.* I thought, gloomily. *Oh good.*

Now it is possible, fortunate Reader, that you have never shared your workspace with a member of the Rhaphidophoridae family, of which, I am reliably informed (correction – semi-reliably informed – it's Wikipedia after all) there are over five hundred species worldwide and which, according to the same source, may be known in your neck of the woods as cave wētā, jumping wētā, camel crickets, camelback crickets, Hogan bugs, spider crickets, criders, sprickets, sand treaders, or even land shrimp, but in New Jersey these unpleasantly chunky, long legged, wavy antennae'd devils are called *cave crickets* or, in my house, *bloody annoying little beggars* although, in truth, I do use a slightly different word to beggars. To substitute an acronym to avoid tedious repetition and possible censorship, let me state for the record that your average BALB is a relentless – absolutely-bloomin'-relentless - chirruper.

Except, of course, when you're hunting it down.

How on earth does the BALB know I'm coming? It can't see me – I'm upstairs in the office and it is skulking downstairs somewhere in the workshop – but the moment I lose patience and rise to seek it for humane eviction (under a jam jar) or inhumane termination (under a mallet) the chirruping ceases and all becomes silent. And so, while I nearly used the word *incessant* to describe its high-pitched, high-volumed warble, it occurs to me that this would be wholly and completely wrong: BALB-song is *cannily cessant*, which isn't really a word but conveys the point rather nicely.

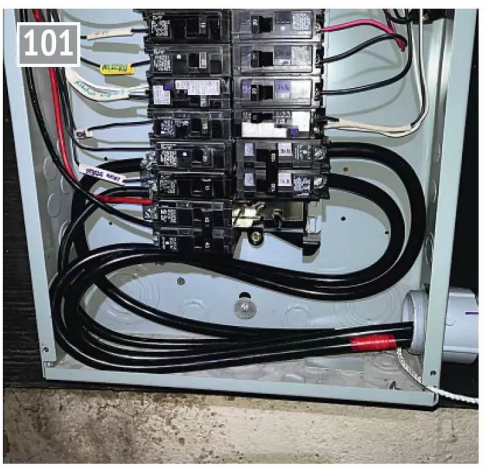
So please pity me today, kindly Reader, and forgive any errors or confusion in the narrative, for I am writing under duress. But rest assured that I will find the BALB sooner or later, and it will depart one way or another, and then everything will return to normality and you will have my undivided attention once more. At least, you will until I inadvertently leave the door ajar again and another of the little blighters gets in.

First light

In the USA, unlike (I believe) the UK, you can still undertake your own electrical work, provided it is formally checked and approved by a local inspector at certain critical stages along the way, and for the month following the shed's arrival in late November, with the temperature generally below freezing, my breath always visible and my hands permanently frozen in their fingerless gloves, I acted as my own electrician, busily installing, wiring and connecting a seemingly endless quantity of sockets, lights and other fixtures in accordance with my plans and intentions. ≫

A hefty drum of wire rests on two sawhorses, the free end inserted into the grey conduit beyond, all ready for the first pull.

Number one son Sam, ready to guide the first of four wires into the below-ground conduit section for its final pull from house to shed.



The four sizeable wires installed and connected to the house's main distribution panel.

The outdoor portion of the Mini Split heat pump system, sitting on its pad on the north side of the shed. The roof above prevents wintertime snow from burying the heat exchanger and hampering its operation.

With the innards of the shed wired, the day eventually arrived when, with the assistance of son Sam and wife Jenny, a weighty drum of large, stiff and unwieldy wire was mounted atop two sawhorses (**photo 99**), the wire's free end taped to a pull-string and inserted into the conduit and, with much heaving and sweating and several intermediate pulls along the way (**photo 100**), it emerged in the shed, none the worse for its experience, ready for its companions to follow. Repeating the exercise three more times, by the end of a long and tiring day, four sizeable conductors poked out of both ends of the convoluted conduit run, all ready to be connected to the 100-Amp circuit breakers patiently awaiting their arrival in house and shed alike (**photo 101**).

With that done, a few days later, following the electrical inspector's final visit and his on-the-spot issuance of the much-prized approval sticker, with bated breath I turned on the appropriate circuit breaker in the house, entered the shed and did the same there and warily flicked the nearest wall switch. And lo and behold, the lights came on and, mercifully, no smoke emerged!

Relieved, and following this initial success, I steadily worked my way around each circuit, first checking all the lights, then the workshop's two ceiling-mounted extraction fans (an absolute necessity, in my view), then confirming that every socket worked and was correctly polarised, finally ensuring that the ground-fault protectors all operated as they should. With this all done and with no small amount of trepidation, I turned my attention to perhaps the most important system to be checked - the one which would dictate whether the building was indeed to be habitable and the contents rust-free all year round – and the most complicated of them all. Yes, the time had arrived to test the climate control system.

Warming the cockles

Truth to tell, I did spend a lot of time researching and deciding how best to heat and cool the shed, render it year-round habitable and maintain the contents above the dew-point to avoid condensation and its corrosive results. In the winter it is normal for New Jersey to have long periods – certainly weeks and sometimes whole months - where the thermometer remains continuously well below freezing, and our summers are always hot and often humid in addition. While I planned for the building to be well insulated, the fact remained that an efficient and effective heating and cooling system was absolutely essential to achieve these goals.

Now to briefly digress, if you will permit, it is nearly thirty years since we departed England for foreign climes, yet Jenny and I retain strong ties to home (as we notably still call it) and visit the UK fairly regularly - increasingly so in recent years – in Jenny's case this very day, as you know. Furthermore, with the joyous advent of internet-streaming radio, I have reacquired my forcibly-lapsed addiction to BBC Radio 4 and, were you to visit me in the workshop, you would undoubtedly hear the strains of Radio 4 playing in the background (except of course during *The Archers* because, while I will happily listen to the familiar *dumty-dumty-dumty-dum* of its signature theme tune, I am most definitely not an *Archers* fan. Sorry about that).

Anyway, something that increasingly puzzled me while listening to the numerous Radio 4 programmes broadcast this past year and devoted to the upwards-spiralling cost of living, the catapulting price of natural gas and the UK's increasingly warm summers, was: *why aren't air-sourced heat pumps more prevalent in Britain for newly built houses?* Surely (I reasoned) a blown-air heat-pump system, providing both instant heating and immediate cooling in one package, would be no more expensive to install, yet almost certainly cheaper to run, than the radiator-based heating-only systems which are seemingly still the norm in the UK? In short, knowing that these 'mini-split' heat pump systems (as they are known hereabouts) are both common and well regarded in the USA

and other countries, I simply did not understand what I was I missing which made my native land fight shy of their adoption when new homes are designed and built.

With that doubt gnawing at the back of my mind, therefore, it was with some trepidation that, a month prior to the shed's arrival, I clicked the 'Complete Your Purchase' button on the manufacturer's website and ordered the components for a two-zone Mitsubishi Mini-Split system for our two-storey shed, with one exterior heat exchanger to gather energy from the outdoors in winter and disperse it back there in summer (**photo 102**) and two interior wall-mounted heat exchangers – one for each storey – to blow the resulting heated or cooled air around the indoor space and maintain a pleasant and stable temperature where it mattered most (**photo 103**).

Eight weeks later, the pallet of goodies having arrived, a few days' effort saw the various components mounted, the piping installed and the wiring connected. Then, with the assistance of a professional plumber who possessed all the specialist tools and equipment for the job, the piping was pressure-tested, evacuated and filled with the costly refrigerant lurking inside the purchased items. Thus, with the system installed, wired and primed, all that remained was to flick the appropriate circuit breaker, close a couple of wall-mounted switches and see whether the whole shebang worked.

The downstairs indoor heat exchanger, silently blowing nicely warmed air around the newly insulated and vapour-barriered workshop in February.

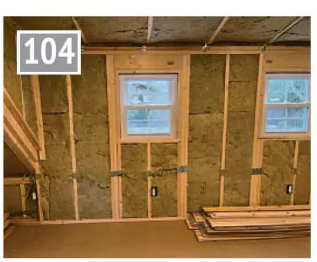
Watching nervously as the system completed its start-up checks and circulated the refrigerant for successful operation, before long each indoor unit's air-directing vanes opened, their fans began quietly turning within and warm air began to gently blow across my face and temper the otherwise below-freezing shed interior. Success!

Filling the cavities

There is, however, little point in heating or cooling an uninsulated building - one might just as well throw money into the bin - and so, after playing with all the settings to check that everything did indeed work as intended, I reluctantly turned the climate control system off once again and prepared to begin that uniquely uncomfortable job: insulation.

As anyone who has done the job will know, there are few materials as unwieldy as a roll of mineral-wool insulation and few that are as uncomfortable to work with. Yes, you may well have covered every square inch of your skin with protective clothing and be wearing goggles and a facemask as you should, but if you are like me then before long you will still find yourself rubbing the inevitable itches, eyes watering and throat tickling all the while, as those little fibres work their insidious way past every precautionary barrier you have donned.

But that's the nature of the job, and if you're still like me then, once every void is filled with that pesky material and you have installed thick plastic sheeting to encapsulate it and prevent moisture from creeping into the walls during winter, then you will stand back, listen to the blissful silence where once there was outdoor noise, notice that the air temperature is already beginning to rise from the small amount of heat emitted by your body and the high-efficiency LEDs illuminating the scene, and congratulate yourself on a truly worthwhile exercise (**photo 104**). For although decidedly unglamorous, of all the places we can expend our time, money and effort on projects like this, chances are it is the properly installed insulation that will provide most benefit to our long-term comfort and finances.



Insulation: an undoubtedly uncomfortable but truly worthwhile investment.

So, if you too have recently insulated your workshop, then please accept my congratulations and have a really good scratch to celebrate; you truly deserve it!

Postscript to Part 19

While the introductory paragraph of today's submission contains Jenny's parting words to me, give or take, my parting words in return occurred roughly fifteen minutes later, following a panicked call from my fine wife on a kindly policeman's borrowed 'phone, a not-quite-legal U-turn around a dual-carriageway's central barrier and yet another journey around Newark Airport's overly complicated road network. My *au revoir* to Jenny therefore, as I handed over her mobile phone which had evidently remained in the car as I drove away earlier, may well have included the word 'muppet'. Please rest assured that it was spoken with love, however.

On the subject of BBC Radio 4, for those of you in the know and for the remainder who have yet to make the discovery, let me unequivocally state, dear Reader, that it is without doubt the finest broadcast station of any kind - radio or television - in the world. Like the humble Public Footpaths lauded in Episode 10 of *Butterside Down*, BBC Radio 4 is a national treasure, so please tune in and see for yourself if you have yet to discover its multivarious delights.

Furthermore, having taken this overtly opinionated plunge, let me double-down by adding that: (a) Radio 4's *I'm Sorry I Haven't a Clue* (*ISIHAC* to its afficionados) is undoubtedly the supreme show of all time and (b) the late Humphrey Lyttelton – jazz trumpeter, band leader and improbably well-chosen host from the programme's 1972 inception and for fifty years thereafter – was (in my view) the greatest dead-pan comedian there has ever been. And for me, these two uncontroversial facts were firmly and forevermore cemented during a Grimsby-bound journey in 1994, my new fiancée sitting in the passenger seat beside me, ISIHAC emanating from the car's loudspeakers.

'And so…' our peerless compère began, stony-voiced as always, 'as the vanquished charwoman of time begins to Shake n' Vac the shag-pile of eternity, I've noticed we've just run out of time….'

And that's when we began to veer off the road.

Jenny, quick-thinking, grabbed the steering wheel and skilfully guided the car back onto the carriageway, then directed it towards an approaching and fortunately empty lay-by, grabbing the handbrake as she did and narrowly preventing our involuntary appearance on the local evening news as another road accident statistic. Turning ashen faced to her husband-to-be, she beheld him crying uncontrollably with laughter, shoulders and chest heaving mercilessly, unable to regain composure or operate the now stationary car for the next fifteen minutes.

Looking back, I still wonder whether 'Humphrey Lyttelton' would have been a valid explanation in the *Cause of Accident* section on the attending policeman's report were the worst to have happened. Fortunately, we will never know.

●To be continued.

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Driving Trolley for a Battery Locomotive PART 2

Mike Joseph builds a trolley for his locomotive *Zahia*, previously featured in *Model Engineer*.

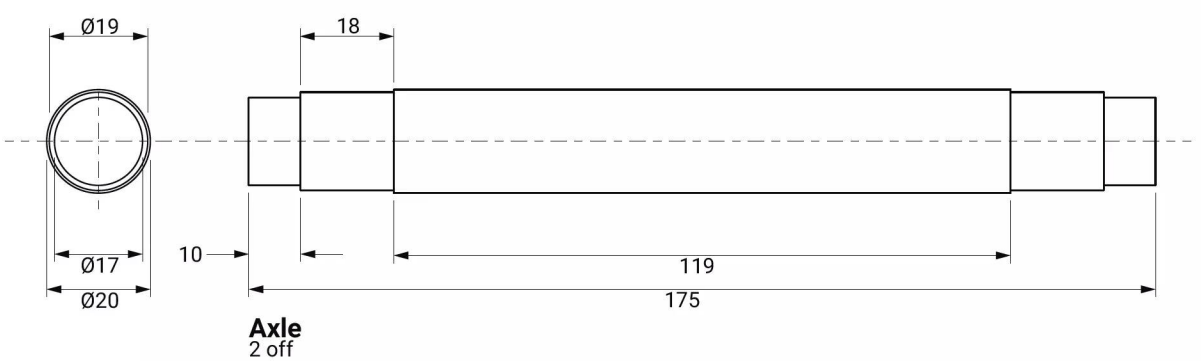
Continued from p.328
M.E.4750 August 23

Once I had the wheels I could turn the axles, disk brakes and bore the wheels. The wheels – as informed by SMR – need to have a back-to-back of 4 11/16 inches (4.6875 inches) or 119.0625mm. Take your pick. 119mm has been drawn – a difference of 2 thou in real units. I can't remember quite what I did - probably fudged it on one side with the relevant 2 thou rather than turn an extra thou on both sides. The internal bearing diameter is 17mm so I went for a 19mm hole diameter in the wheels and as the round stock was 20mm this then left a slight shoulder. I still went wrong on a wheel and had to turn a very fine bush, Loctiting it all together. (Is it permissible to turn Loctite into a verb?) The disk brakes were from a lump of steel turned down and the four grub screws on each lock on to recesses on the axle.

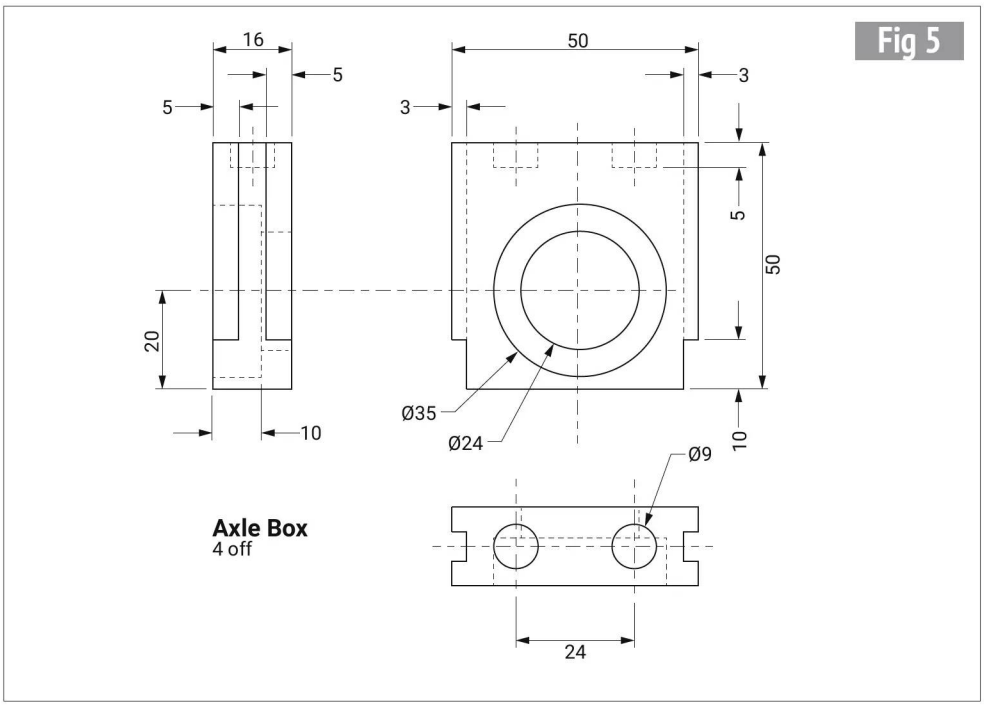
The axleboxes were cut from some square bar and faced with the recess for the bearing bored on the lathe to my level of precision – i.e. more or less to size. The ball races were a little sloppier than I had intended but they won't be going far. The two recesses on top are for the spring guides.

Now we come to the axle box covers. These were 3D printed for me by Matthew, a young and keen member of our club, in exchange for me wiring up his lathe with a no-volt-release switch – after he had done his

Fig 4

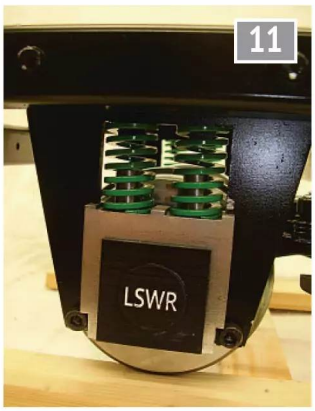


Axles.

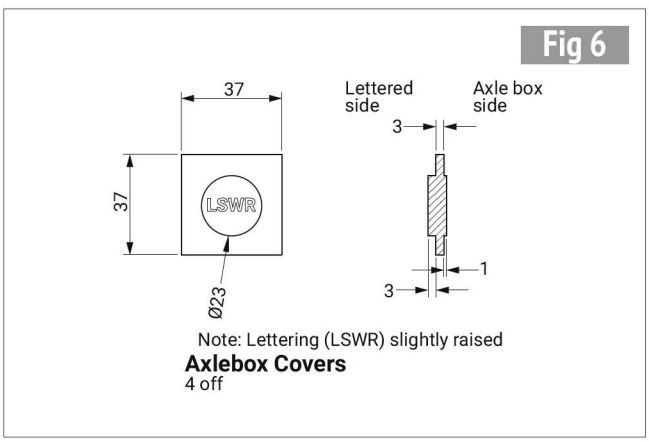


Axleboxes.

Axlebox.



W-iron, axlebox and Matthew's cover.



Axlebox covers.

Leg guard bracket.

Completed vehicle with leg guards.

homework! I was not prepared to accept them otherwise. And they look superb. Matthew printed the covers with 1mm high lettering and I first sprayed them and then, with a piece of perspex off cut sprayed white, 'printed' the lettering by pressing them onto the paint, gently.

The bodywork was nothing complicated and is held together, screwed and glued, by very small slotted round headed screws, and yes, they are all pointing in the same direction. There are corner plates to make it look 'wagonish' and they also hide the joint in the side panels. I meant to letter the bodywork LSWR with wagon number etc. but although I was able to print the transfers, I failed dismally at their application so it remains unlettered. The corner plates are black and the body is brown.

The leg guards are simple varnished panels and a frame. Again, the pieces were bolted together with 4mm bolts and taken to my welder. A crude template of 103 degrees was made to ensure that they were all at the same angle before welding. The angle iron is set to face inwards, so there are therefore two pairs of brackets. The panels were carefully fitted to the brackets, the edges having to be planed because there is a slight fillet on the inside of the angle. Similarly, the foot boards had to have a corner taken off to fit snugly. A small bracket was also fitted to the middle of the panels to support the tread. The metal used for this was a trifle thin but it was what I could get at the time. Should it give, then changing it will be no problem. The guards are locked in place by a simple M6 bolt through a boss welded on to the chassis. And I have just discovered that it is possible to buy butterfly bolts - one less spanner to cart about.

This project was started last summer and has taken about 9 months elapsed time. And there was me thinking it would be a quicky! On the other hand I am very happy with the end result.

Finally, usual disclaimers from a very happy bunny. Thanks guys!

Suppliers:

Bearings	bearingboys.co.uk
Wheels	smrengineering.co.uk
Springs	flexosprings.com
Upholstery	hukeupholstery.com
Brass screws	thevintagescrew-company.com
Welding	Mystery Man – he preferred not to be mentioned

ME

Enhanced By Vehicles PART 4

How introducing road vehicles improved a model tramway

Ashley Best realises that a typical street scene is not all trams.

Continued from p.315
M.E.4750 August 23

Windscreens and windows

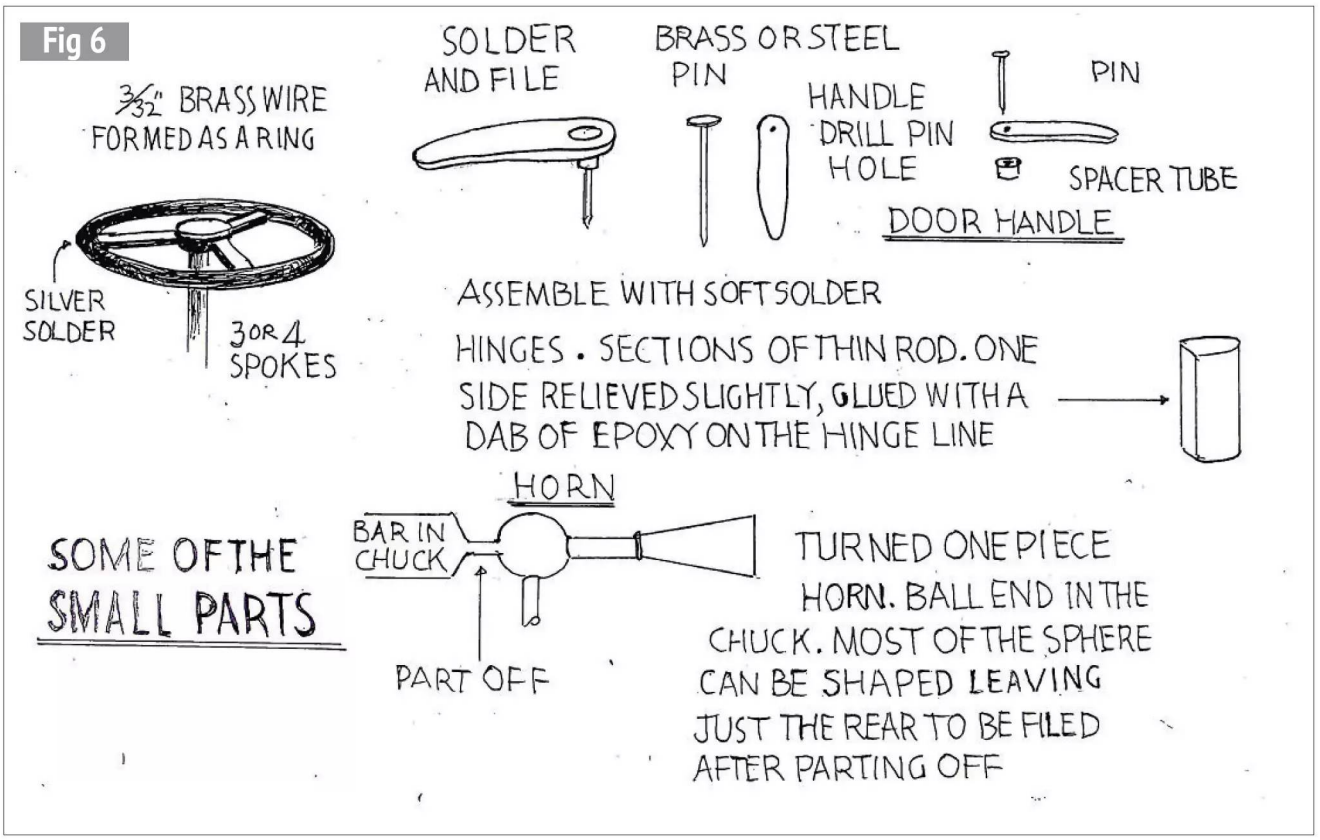
The windscreen on many early lorries and vans often split horizontally with a top section that could be opened (**photo 34**). Even so, wipers were fitted. The visible frames were chrome-plated and on the models I used polished aluminium cut from sheet with a very fine-cut piercing saw. I won't pretend this was easy. It was, in fact, difficult and there were some rejects. Many trucks and lorries offered little weather protection and open-sided vans were common – a boon to model makers as there was no need for windows.

Main bodies need a few added essentials. These include a wing mirror, head and side lights, door hinges, door handles and, in some models, an exterior hand-operated horn. Number plates and stop lights are added as well (**photo 35**) and, for the high floor lorry, a visible exhaust and silencer (**photo 36**). Most of these items are easily made from scraps (**fig 6**).

Headlights

These were made from robust brass shim and the use of a doming block. In the absence of a doming block, a ball point hammer and a planishing hammer can be used. The block on its own is not sufficient as the result of doming is a form probably a bit too shallow and needing to be deeper. A narrow brass strip, made into a ring, is silver-soldered to the rim bringing the body of the light up to correct size. It is then drilled for a fixing wire, painted white inside and the outside cleaned up ready for painting. Clear plastic discs are then cut to fit as lamp glass, which are then glued just inside the rim. This requires a touch of suitable epoxy and great care. The clear discs cannot easily be held to be inserted. I overcame the

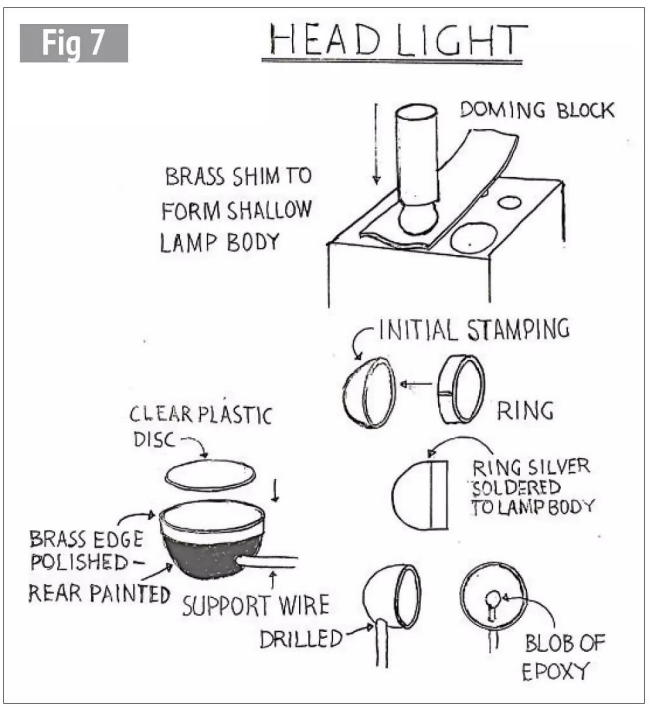
Van with split windscreen.



Assorted small parts.

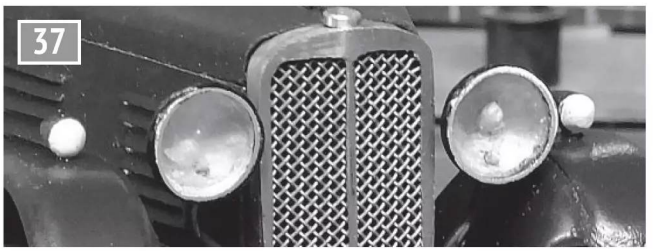
Number plate and stop lights.

Exhaust and silencer for a lorry.



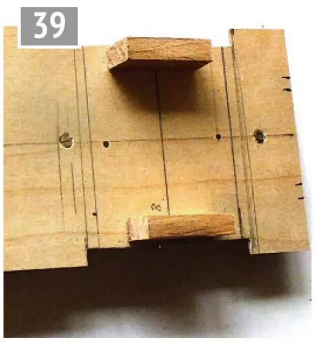
Headlight.

problem by using a thin rod with a tiny blob of grease just sufficient to hold the disc, in order for it to be positioned. A tiny amount of quick setting epoxy has to be applied to the edges of the disc, enough to fix it. When the glue has set completely, the grease can be wiped away (**fig 7**).



Headlights and side lights.

Rear axle and mudguard.

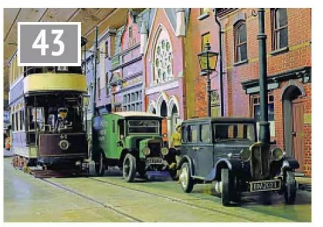


Mounting blocks carefully positioned for the mudguards.

Rear wheels and stub axles.

Rear wheel fixed in position.

Complete rear axle.



Cars and vans can now obstruct the trams.

Versatile garage services.

Receiving a visit from the gentry.

Perhaps a doctor or a solicitor?

Oiling the wheels of industry.

Side lights

Side lights, which are small, can be turned from rod and fitted with a fixing bracket or rod. Being small and solid makes a lens glass unnecessary so a small dab of white paint is enough for appearance (**photo 37**). The horn is simply a turning job and can be one piece or built up. The layout on which these vehicles have to be seen is just short of twenty feet long and so there has to be a limit to what can be accommodated on it. So far there are four road vehicles and definitely there will be need for a few more!

Assembling the models was straightforward and much the same for each, whether car or lorry. The front axle, as a unit, was fitted simply by placing under the front springs through which protruded two 12BA fixing screws. The rear mudguards (**photo 38**), which protrude into the rear end of the body, were screwed in place, fixed to shallow wooden blocks previously glued to the floor of the vehicle (**photo 39**), positioned carefully and accurately.

The body side panels would be attached later. Rear wheels are running fits on stub axles (**photos 40** and **41**). The inner ends of these, behind the wooden discs (brake drums) - could then be fitted under the chassis ready to receive them and at last fixed permanently with epoxy glue (**photo 42**).

The finished cars, now placed on the layout with room for the tramcars to pass, do a lot to impart a degree of realism to the scene. I am glad to have decided to embark on this addition to the tram fleet which has also had the added virtue of opening up a new line of research and model making techniques. The layout does, however now represent what is, in effect, a display diorama with the only difference being that the tramcars, at least, can move. The scene as a whole is not quite fixed as cars, vans and even people can be repositioned for a change. Mostly though, things can be left alone (**photo 43**).

Conclusion

Making these vehicles and the research it involved has in many ways been revelatory and inspiring. The four vehicles so far made can be seen in **photographs 44, 45, 46** and **47.** I have to say that I find the vehicle products of the twenties and thirties to be most appealing. There is an architectural quality, now long gone, which allowed cars of that era to fit and blend so well into the street environment. I was also surprised by so much innovation and thinking ahead of time which became evident. Back in the twenties there were already some attempts at streamlining, independent front suspension was being tried and some of the cars were astonishingly robust and capable of great speed. Many designs were masterpieces of aesthetic proportion and balance, which I have to confess to finding preferable to most of the present designs. Perhaps the most astonishing thing is that there were large numbers of car manufacturers with now the merest fraction still in business. Times indeed are a-changing.

ME

REFERENCES

Books, probably now out of print:

British Cars of the Early Thirties, Olyslager Auto Library

Classic Trucks by Nicholas Faith ISBN 1-85283-948-1

A-Z of Cars of the 1930s by Michael Sedgwick and Mark Gillies

A-Z of Cars of the Twenties by Nick Baldwin

The Austin Seven by R.J.Wyatt

British Lorries 1900 – 1992. S. W. Stevens-Stratten

LittleLEC 2024


Les Brimson and **Owen Chapman** report from the North London Society of Model Engineers..

LittleLEC

LittleLEC is the locomotive efficiency driving competition for small locomotives weighing 50lbs or under, devised by the late Peter Langridge, who was a member of the Guildford Model Engineering Society, as a companion to the larger IMLEC competitions. LittleLEC spotlights those small designs that were once the introduction to the hobby for many but now eclipsed by larger models capable of greater distances and speed.

Locomotives are run around a track completing as many laps as possible within 20 minutes, the amount of coal used is recorded and efficiency calculated from this coupled with the weight of the engine, trailing load, track gradients and distance. The locomotive driven the most efficiently is declared the winner.

The North London SME's track at Colney Heath was the venue for 2024, the club having hosted the event previously in 2011 and prior to extending their track to 2,941 feet (0.54 miles), plus adding an additional gradient. To avoid starting on the ruling up gradient at their steaming bays, the club set up a temporary steaming bay at the station allowing the runs to commence on a down gradient.

Saturday 8th June was a colder, more overcast day than expected for June and saw a cohort of members ready to officiate as the competitors arrived for a 10 o'clock call. Coal was sieved and weighed into 250 gram amounts and stored in containers for competitors' use. Charcoal, water and temporary steam raising facilities were arranged at the raised track station with the run timer prominently set up beside a full sized semaphore starting signal. A laptop and all the necessary paperwork were setup under the station canopy.

Mike Foreman and Rob Roy on the first run of the 2024 LittleLEC.

Sean Pritchard on his first run with Mona.

All competitors this year were 3½ inch gauge locomotives, the longer main line being chosen in preference to the club's much shorter 'Cuckoo Line', thus precluding 2½ inch gauge entries.

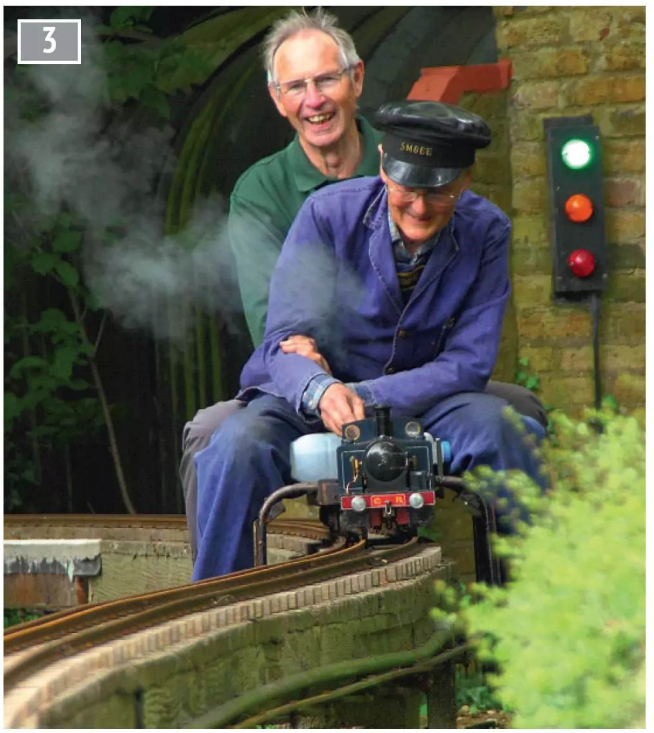
Run 1

The dubious pleasure of having the first run fell to the host club's honorary treasurer, Mike Foreman, with his well-travelled Rob Roy with no additional passengers or weight, commencing at 10.38am.

The engine was not so happy with the early start suffering lubricator problems and eventually needing a blow up on the extension embankment during the second lap after which Mike called time, after 21 minutes. Mike covered two laps and used 352gms of coal. He achieved an efficiency of 0.091%.

Run 2

Next to run was Sean Pritchard with his grandfather Les's smart SECR green Mona. ≫



Peter Wardropper passing the tunnel entrance on the return leg.

Stephen Harrison's first run.

Jumbo going well before the crank pin came out.

After a bit of head scratching over a leaking gauge glass blowdown valve, the run was begun with grandfather Les as passenger offering constant encouragement.

A cautious first lap was made, with the climb to the bridge taken slowly but a faster second lap was made after taking an additional pot of coal as insurance. The run was ended after 19 minutes. Sean completed two laps and used 290gms of coal. He achieved an efficiency of 0.218%.

Run 3

The third competitor of the day was Peter Wardropper of SMEE with his very smart Royal Caledonian blue Rob Roy. With host club member Bryan Luxford as passenger, Peter picked up the pace with a bold and confident run at a much faster pace.

Completing four laps in 21 minutes and doubling the average speed whilst demonstrating the art of deftly refilling the side tanks on the move without the aid of a funnel or tube and raising the collective excitement. Peter used 375gms of coal during his four laps, and achieved an efficiency of 0.305%.

Run 4

Next on the track were John and Jack Shawe from the host club with their old LNWR Jumbo 2-4-0, similar to LBSC's Mabel or Sister Dora designs though with slip eccentric valve gear. With its tender it weighed in just under the competition weight limit. The day's run began well with John driving and Jack as passenger. A blisteringly fast run began for the old engine, running for the first time in a great many years. Sadly, the right side leading crank pin came loose, the connecting rod dropping onto and colliding with the sleepers until the engine came to a stop ending the run.

The engine was recovered to the main steaming bays for attention where under close inspection a hairline crack in the wheel boss revealed the root cause of the problem. (The crank pin was later found by the track repair team the following day.)

Run 5

Saturday's fifth competitor was Stephen Harrison from Birmingham SME with his teal green Rob Roy.

Opting to take 35.4kg of ballast weight instead of a passenger this engine set off on a fast run, going fast for three laps. However, when attempting a fourth the grate worked free of its supports, partially dropping into the ash pan and naturally making the fire difficult to maintain. The engine slowed and stopped opposite the station. Stephen attempted to rescue the fire but

Sean on his second run.

Peter and Rob Roy going well.

Jumbo running as a 2-2-2.

Stephen and his Rob Roy on their second run.

retired after a short while, as all did for lunch provided by the host club.

Run 6

Mike Foreman, being the only competitor available for both days, elected to have his second run on Sunday so Sean Pritchard and Mona were the first run of Saturday afternoon with companionship provided by his grandfather Les as before. With the pace now set and experience gained from the earlier run this was one was very confident; four laps of the track were managed in 20 minutes without fuss with extra supplies taken during the run.

Sean used 336gms of coal for his four laps and achieved an efficiency of 0.376%.

Run No.7

Peter Wardropper, having raised the pace with Rob Roy earlier in the day, raised high hopes for a record number of laps of the track.

Even with the sun coming out from between the clouds, and despite the engine appearing to run faultlessly, the speed dropped significantly during the fourth lap with the engine crossing the timing point just the wrong side of 25 minutes and so, under the competition rules, being retired.

Run 8

Mood was good however as John Shawe resolved to run Jumbo again, but this time as a 2-2-2 with the left-hand side coupling rod removed, to balance the one missing from the right-hand side.

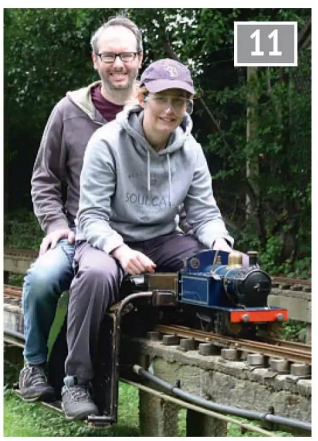
With Jack again as passenger the engine struggled for adhesion during the first part of the run. So it was that Jack dismounted alongside the station leaving John to carry on alone but at a better pace. Now back in the running and without further incident, three laps were completed in 19 minutes. John used 304gms of coal with a resulting efficiency of 0.173%.

Run 9

The final run of the first day was by Stephen Harrison and his Rob Roy, once again choosing to carry ballast weights instead of a passenger. Three more laps were completed at an almost identical pace to the morning effort but without the earlier problems.

As with all runs the unused coal was gathered and weighed to calculate the amount used and the results recorded into the calculation spreadsheet to await comparison with the following days results. Stephen used 288gms of coal giving him an efficiency of 0.259%. ≫

William Powell's first run with Jessica.



Anne Brimson with Juliet on her first run.

William Powell with his Mona's first run.

Anne's second run with Juliet, confidently going solo this time.

William's second run with Jessica.

Run 10

The first run on the second day, Sunday, was by William Powell from Bournemouth SME who brought two locomotives to the competition - a freelance 0-6-0 *Jessica* (the Purple One) and a Mona. Opting to run *Jessica* first and after careful preparation William elected to carry an additional weight (a 17.9kg concrete block) and set off at a steady pace which he maintained achieving two 10-minute laps.

William used 174gms of coal for his two laps, achieving an efficiency of 0.283%.

Run 11

Sunday's second run was guest driver Anne Brimson, wife of host club member James, with a 49-year-old Juliet 2. Anne had never previously driven the Juliet and only on one occasion previously had driven any steam locomotive, a Marie E, on the club's short and nearly flat 'Cuckoo Line'. A one lap training session with Juliet on the Saturday evening was the extent of the prior experience she brought to the event, which was however unmatched by her willingness to have a go.

Electing to take husband as ballast Anne managed to complete one lap within the allotted time including stops for a blow up prior to tackling two of the three inclines on the track. Anne used 218gms of coal and achieved an efficiency of 0.129%.

Run 12

Next and third run of the day was William Powell with Mona. William has a careful preparation routine maximizing the use of charcoal until the last minute and ensuring the cylinders are warmed before commencing a run.

Electing to pull a second truck with host club member Bryan Luxford on board, William completed the first two laps within 13 minutes continuing for a third lap which he easily completed in another 5 minutes. 354gms of coal had been used, giving William an efficiency of 0.323%.

Run 13

Following the lunch break, Anne Brimson took to the track again. James prepared Juliet for the run but this time Anne felt confident enough to go solo and left James behind.

Setting off with the lighter load she sped up the first bank, completed a circuit non-stop and passed back through the start point at decent speed to encouraging cheers from those watching. The second lap was a bit slower but, overall, her run was within the time allowed and although the gauge glass was quarter full and with a decent fire she decided against a third lap. The competition results show that her run was the least efficient but her achievement, as a novice driver, was arguably the greater. Anne used 334gms of coal resulting in an efficiency of 0.089%.

Run 14

This was William Powell with his second run with *Jessica*.

As before William took an additional weight and completed three laps, this time in 18 minutes, but resisted the temptation to go for a fourth. Nonetheless he had done enough, as can be seen from the table, to finish second. 126gms of coal were consumed, resulting in an efficiency of 0.391%.

Run 15

Mike Foreman took to the track with his Rob Roy which normally flies round the NLSME track with passengers on board. In recent weeks the locomotive has been struggling with timing as also reflected in the first run on Saturday. His second run proved equally uncharacteristic by its slow pace. After one lap with further poor steaming Mike decided to retire.

Run 16

The last run of the event was William Powell with his second run with Mona, again taking a second truck with Bryan Luxford as passenger.

William put in a great run completing four laps in 20 minutes. The run involved some slick handling by the pit crew passing coal and water as he sped through the station. He used 383gms of coal on his four laps with an efficiency of 0.398%.

The results

The final run placed William Powell triumphantly at the top of the leader board, taking first place with his Mona, with 0.398% efficiency, and second place with *Jessica*, at 0.391% efficiency. Very closely behind was Sean Pritchard also with a Mona, who was awarded third place for his 0.376% efficiency. A first and third place for a Mona is surely a testament to the soundness of this compact design from Curly Lawrence (LBSC).

The leader board table gives all the results.

Run	Driver	Locomotive	Run No.	Laps	Work Done (ft lb)	Coal Used (lb)	Energy Released (ft lb)	Average Speed (mph)	Efficiency (%)	Status	Position
1	Mike Foreman	Rob Roy	1	2	8,003	0.776	8,749,851	3.2	0.091	Finished	
2	Sean Pritchard	Mona	1	2	15,698	0.639	7,208,684	3.5	0.218	Finished	
3	Peter Wardropper	Rob Roy	1	4	28,446	0.827	9,321,574	5.8	0.305	Finished	
4	John Shawe	Jumbo	1	0	0	1.103	12,428,766	0.0	0.000	Retired - less than 15 mins	
5	Stephen Harrison	Rob Roy	1	3	18,522	0.617	6,960,109	6.3	0.266	Finished	
6	Sean Pritchard	Mona	2	4	31,395	0.741	8,352,131	6.7	0.376	Finished	3
7	Peter Wardropper	Rob Roy	2	4	28,446	0.631	7,109,254	5.3	0.400	Ran Out of Time	
8	John Shawe	Jumbo	2	3	13,042	0.670	7,556,690	5.6	0.173	Finished	
9	Stephen Harrison	Rob Roy	2	3	18,522	0.635	7,158,969	6.3	0.259	Finished	
10	William Powell	Jessica	1	2	12,257	0.384	4,325,210	3.3	0.283	Finished	
11	Anne Brimson	Juliet	1	1	7,007	0.481	5,418,942	1.5	0.129	Finished	
12	William Powell	Mona	1	3	28,408	0.781	8,799,566	5.6	0.323	Finished	
13	Anne Brimson	Juliet	2	2	7,416	0.736	8,302,415	4.2	0.089	Finished	
14	William Powell	Jessica	2	2	12,257	0.278	3,132,049	3.7	0.391	Finished	2
15	Mike Foreman	Rob Roy	2	1	4,737	0.538	6,065,238	2.6	0.078	Retired - less than 15 mins	
16	William Powell	Mona	2	4	37,878	0.845	9,520,435	6.7	0.398	Finished	1

LittleLEC Results

Mike Foreman struggling with his Rob Roy.

William Powell and Mona on the final run of the event.

The running of this event this year is to be savoured bringing out the essence of model engineering where a group of like-minded people were able to pleasurably gather together and share their common interest, though not without incident, away from the drama of the ever-adding concerns of modern life.

Photos by Owen Chapman, Les Brimson, and Jonathon Avery who are members of the of North London Society of Model Engineers.

Postscript from Bryan Finch, LittleLEC Co-ordinator

The coordinators of the LittleLEC (now under the stewardship of Guildford MES) wish to express their thanks to Martin Cooper, Owen Chapman, Les Brimson and the team at North London SME for hosting this year's LittleLEC, and also to all the competitors without whom there would be no competition. Thanks is also expressed to *Model Engineer* magazine for its continuing support to LittleLEC.

The host for next year's LittleLEC is subject to confirmation and details will be advised as soon as possible. Full details will be published early in the new year.

For more details about the LittleLEC competitions, its concept, guidelines, efficiency calculations, and past runners and results, please take a look at the LittleLEC website www.littlelec.co.uk

ME

The Leufortin Project

PART 5

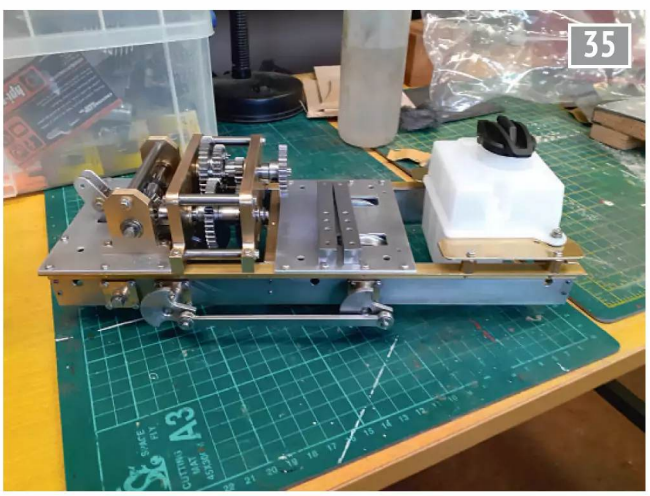
Ian Bayliss presents an internal combustion G-scale locomotive.

Continued from p.322
M.E.4750 August 23

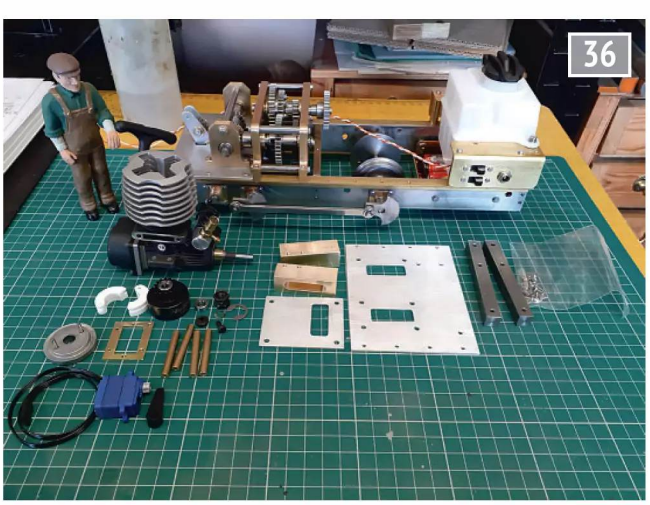
Trial engine installation

The quite simple engine bearers had been made so the Kyosho GS11 engine was offered up. With it all bolted down, I stood back and admired what had gone without a hitch. The clutch bell gear seemed to mesh with the gearbox input gear. Without further ado the commercial fuel tank was installed on its plates and pillars at the front end of the chassis (**photo 35**). The engine had been out again to ease the tank installation when the photograph was taken.

All the main components had now been fitted into the tight(-ish) constraints of the chassis. Then without any thought of starting the engine, as it needed re-conditioning, all was turned over with the pull starter. The realisation that all was not well sunk in. The bell housing gear was wobbling and at least one spot in a revolution the meshing became precarious. It was so bad that I felt it was unsatisfactory at the R.P.M. expected during running. The engine was stripped out and dismantled. Something less than obvious was out of line. The crankshaft was checked and seemed to be straight and all the components making up the output, i.e. flywheel, bell housing, output gear and miniature roller nose bearing all individually came up showing no accountable errors or out of true. The whole lot seemed to be reliant on an M6 thread tapped into the forward end of the crank shaft and I had to assume something had been damaged in the thread form making what is actually an M6 socket grubscrew of 16mm length run out of true. A replacement from workshop stock still showed, to me, an unacceptable error in the meshing of a full revolution.



Major assemblies installed.

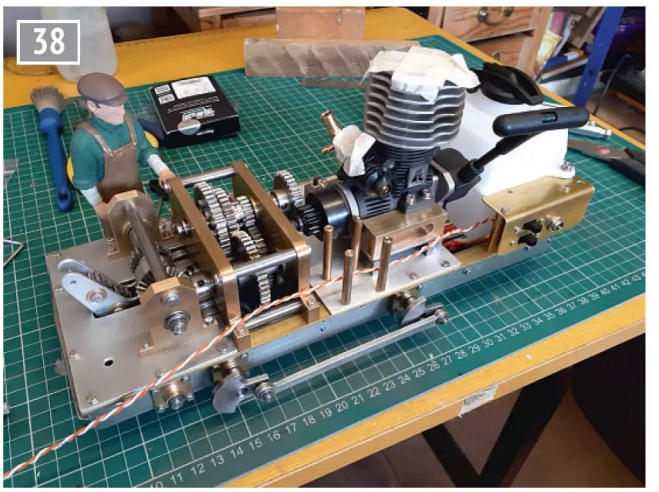


Replacement engine and installation components. See text.

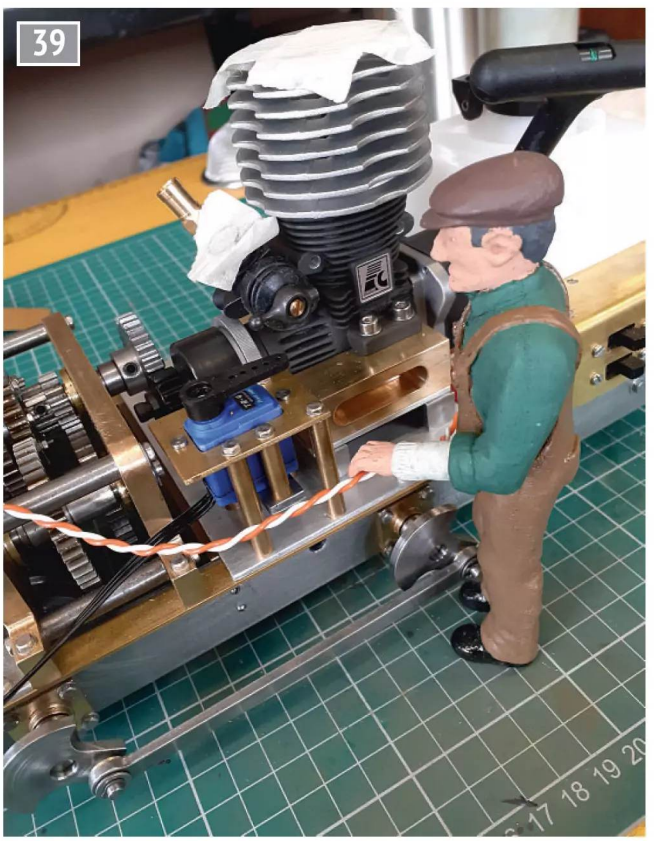
Consequences

There were a number of options. Gnashing my teeth and growling over lunch I was told by my wife to get in the car, go down to the model shop and get a new engine - stop the messing about and move the job along. Hence enter stage left the Force-18 3cc engine. I would have liked a little smaller displacement unit but we were still suffering

Ready for engine with wiring started.



Engine installed and gear meshing being checked.



Control servo installed and whole installation under inspection by a workshop fitter.

in 2023 with some shortages during the catch-up from the COVID-19 restrictions. The choices available with the specifications I wanted were less than I had hoped and the catalogues had listed. I also bought a new bell housing with bearings, new flywheel, new clutch shoes and springs to match with the new engine.

It was not so bad. The mountings were on crank centreline and not underneath the crank case as with the Kyosho GS11 so a quick re-design of the mounting plate, engine bearers and additional risers was drawn up and made. Meshing was now really good - after blaming myself for screwing up the main gearbox.

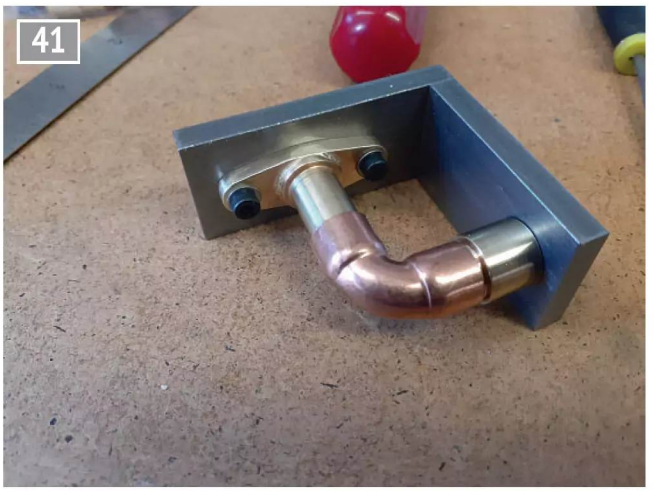
Unfortunately, whilst the engine is rated well there are differences which are even more of a problem than a few bits of metal to mount it. Firstly I did not realise it but the throttle built into the carburettor is linear, not rotary as with the Kyosho GS11. Hence the simple expedient of a standard servo in the cab area with a straight link going forward is no longer an option. The servo has to be forward of the cab and the connection at the carburettor is basically a 3mm diameter sphere requiring a commercial female connection as used in R.C. model cars. I managed to accommodate that with just two additional holes in the motor plate and a number of fiddly bits to be made (**photo 36**).

The carburettor centreline sits higher than on the GS11 so a rebuild of the fuel tank mountings also had to be undertaken. The fuel level should never be above the carburettor centreline as it will flood and these engines do not like to be hydraulically locked but it still had be raised. I took the opportunity to drill the holes in the chassis for the battery box mountings that I had forgotten. The new mounting plates for the fuel tank were no longer simply flat and drilled, they were to have sides bent upon them due to the height. Perhaps this was fortuitous because I like to have rechargeable batteries easily switched into a plug-in 'smart charger' using a 2.5mm/5mm jack plug and socket. To be doubly safe this entails two switches as well. All the cut outs and holes were completed and wired in the right hand side plate vertical (**photos 37**, **38** and **39**).

Whilst the fuel tank level is not over critical there is no fuel pump as such. The engine relies on the venturi effect of the carburettor but, to help, a connection between the sealed tank filler cap and the exhaust resonator is made which puts just a little pressure on the top surface of the fuel. This acts as the fuel pump for want of a better description. Hence it needs to be neither

>>

Exhaust manifold components, tooling and template.



Exhaust manifold 'dry-run' in silver soldering fixture.

Two finished assemblies.

Four completed side handrails.

too far away nor too far out of alignment.

The exhaust entailed the manufacture of a bespoke manifold and pipe, plus the resonator itself. Standard practice is to connect the two on final assembly with a high temperature silicone rubber connection about 25mm long with each end secured by cable ties in the moulded grooves.

Two exhaust resonators pickled, cleaned and ready for final silver soldering operation.

All brass and copper parts were silver soldered, actually requiring two temperature grades of solder to complete each part. The manifold is a two piece silver soldered fabrication to give the effect of a solid casting. The manifold then has to be machined to bring the porting and outer shape close to that on the engine block. The commercial manifold items are pretty coarse as standard but give an idea of porting requirements (**photos 40, 41** and **42**).

Photograph 40 shows all the parts for two manifolds ready for silver soldering. There are very expensive offerings of tuned pipes for the performance car people to extract every last fragment of power and revolutions from their engines. These are definitely not needed for a narrow gauge locomotive. It was finally all plumbed up with 'TYGON' tubing. The bright yellow colour is standard and not by choice. It is specially formulated to handle hot hydrocarbons. It tends to be expensive from model outlets but finding a Saint Gobain agent is better financially. I bought a box each of two sizes from a medical supplies outlet for similar prices to a couple of metres from model outlets.

Photograph 41 has the parts set up on a 'dry-run' in a little jig before fluxing and silver soldering.

Photograph 42 shows the finished component, pickled and cleaned up.

Photo 43 shows the two resonators/silencers. The connections for the tank pressure pipe have yet to be silver soldered in. They are small and, having had a problem melting the part by overheating to get the temperature range with the silver solder stick in use, I cleaned up and to complete it I used the lowest temperature stick I had which was 610oC to 640oC. Carefully. These two incorporate an M2 drain as oil will separate into the base of an upright exhaust system.

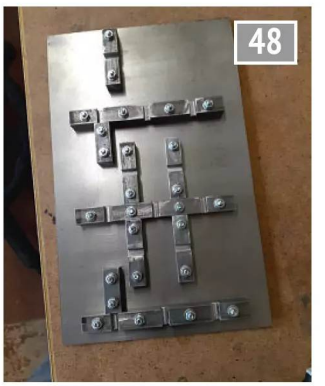
The handrails/side guards

With the appearance of a close to running chassis, now came the moment of dread - how to turn a whole heap of engine, gears, tank and all associated

Notching fixture in use.

Over engineered handrail bending fixture.

The bits for handrail assembly fixture.



Fixture ready for first handrail components.

First handrail dry run at assembly.

junk into something resembling (at a distance) a locomotive. There was no spare space - most of the chassis was full with something.

Here is where the ATCO ethos came into its own - minimum tin work. I had for a while been toying with another project. This is a delightful little two foot narrow gauge Bagnall 0-6-0 tender locomotive, originally oil fired, three of which were built for Weetman Pearson's exploits in Mexico in 1910 and the world's most prolific oil well at Potrero del Llano. I had the good fortune to examine the works drawings in the archives, or what is left of them. I came to understand the way they built cabs. Bagnall-Price valve gear is another matter. I had started a layout of a gas fired version in 7/8ths scale. ATCO and Bagnall combined led the design consisting of a cab with an exposed engine and workings to the front (needs servicing and running access anyway) protected by a pair of heavy duty handrails each side.

Job done!

Well not really, it was still a lot of work both in drawing and workshop work. In essence the Bagnall cab is a spectacle sheet with two eyes straddling a marine type boiler with cylindrical firebox, two simply shaped side sheets attached with angles, riveted, and a back sheet with two eyes attached top and bottom. Then there is a rolled sheet roof double skinned with wood exterior for hot climes. Principles set – well, sort of.

I am going to start with the handrails (**photo 44**). These were to be made from 4mm diameter mild steel rod. This equates to 2 inch nominal bore steel pipe in the 12 inch to the foot world. They were to be from the cab spectacle plate running forward and the top rail bending down to the fuel tank mounting plate. A second intermediate horizontal rail and verticals would also form part of the assembly. So the bar had to be notched for the verticals of quite accurate length to maintain spacings.

The first thing to make was a notching fixture/tool (**photo 45**). This is an offcut of square mild steel bar, faced both ends and reamed 4mm diameter through. Two holes were reamed vertically through, centred on one face of the bar. Two tapped holes were tapped on the same centre line between the first two holes down to the bore for screws to lock the stock into place. One 4mm hole was 5mm from the end and the other centred on the horizontal centres. The long intermediate rail is just notched one end, the cutting tool being a 4mm diameter cobalt spotting drill, the other end threaded M4. For the verticals, the first end is notched then the bar is turned around and a piece of 4mm bar is then located in the far hole positioning the stock in both directions to give the correct length and orientation of the notches. The bar is then cut off by notching through the first hole. This provides also as a by product the first notch for the next vertical to be finished as described above. Enough were made to make handrail assemblies for two locomotives.

The top rail had to have a right angle of fairly wide radius bend put into it, in the right place. I tried a number of methods (cheating foolishly trying to 'knife and fork it'). None were satisfactory and so - yes - a fixture had to be made (**photo 46**). It is a little easier than before as both ends are threaded so length adjustments are possible if over length.

Now we come to the assembly and silver soldering the whole gamut together. A set of blocks was milled up from 10mm square steel and slotted to locate the various bits in the right places. Now there is a choice of direction - use a hefty base plate to bolt them to or have a sacrificial base for each rail. The first is a problem as the heating to temperature becomes more difficult and there is still a chance of distortion. The second is a problem by having to throw away a much lighter piece of steel sheet that is definitely going to distort as the thing cools. That means drilling a piece of sheet for each handrail and transferring the location blocks for each rail. As I had some guillotined pieces of 16 gauge left over from a project some years previously the latter was chosen. They really did distort but the end handrail product was satisfactory for my purposes, as can be seen (**photos 47,48** and **49**).

Photograph 49 is a dry run again before fluxing and silver soldering. It all does get a bit untidy and there is an amount of cleaning up after pickling.

●To be continued.

CLUB NEWS

Geoff Theasby reports on the latest news from the clubs.

I've been so busy over the last couple of weeks that I haven't had the chance, or impulse, to write a preamble. So, here goes another Club News, naked and unashamed. (Genesis 2:25) Hang on, I've just written a preamble. Well, that's alright then...

In this issue, buckets of diamonds, nursery rock, "is it finished yet?", odd sounds in Donetsk, buses and a Professor.

Tom Winterburn sends the **Northern Districts SME** *Steam Lines,* July-August and apologises for the late delivery of this missive but he was busy on another project and shunted it into a siding - and then forgot it. (Remaining true to life, yeah? (Ho ho) - Geoff.) The Society's insurers allow visitors and members of the public to drive trains on open days, subject to certain conditions, and a sub-committee has been formed to clarify the requirements in detail. The AGM was insufficiently attended and a count revealed that there was not a quorum so the date has been rescheduled. A discussion on whether a troupe of dancing girls would improve attendance, was NOT appreciated. Ron Collins ran his 1/3rd scale Climax, which is very similar to the B Class locomotive at the Puffing Billy railway in Victoria. Ron's locomotive (**photo 1**) shows off its unusual wheel arrangement. At the Midland Railways Open Day, the Machinery Preservation Group showed a Clayton & Shuttleworth Traction Engine which, with its low loader, was very popular and suitable for riding on during a trip around the works. Lyall Austin describes the Yarloop collection, before the area was swept by a devastating fire. He spotted through a fence a steam winch which turned out to be by Clarke Chapman and decided to model it, even to the extent that he made all his nuts, bolts and studs in metric dimensions. One of his fellow club members had been in the Merchant Navy and had operated such machinery on many occasions. The meeting on June 9 was supported by a show of stationary engines which gained much attention. This is another Society which was offered a load of coal for their locomotives and they filled a trailer with 24 large buckets of the 'black diamonds'. https://www.youtube.com/watch?v=h4nL8n-RbWA

W. www.ndmes.org.au

The Sheffield Auctions had a few interesting items under the hammer on 11 July. A number of Mamod and Wilesco steam plants and vehicles, various O-Gauge and Gauge 1 models; guide prices mostly sub-£100. Some kit built, some scratch and Hornby, all live steam, and a scratch built vertical steam boiler and engine. A 2 inch scale live steam Fowler A7 traction engine, estimated to sell for £1500/2000, and a three-truck G-gauge Shay locomotive, est. £200 plus.

North London SME *Newssheet* for July reports that Bryan, who moved his business to the West Country, was contacted by one Malcolm, who had picked up some black pebbles on the beach. These turned out to be Welsh steam coal, from the torpedoed S. S. Rosehill, which was carrying several hundred tons of it to the Devonport Naval Dockyard. Over the years, this has been picked up by the waves and dropped on the beach. As he now has central heating, he does not need the several bags he still has, and seeing the railway in action, asked if they would like it? Would they? I'll say they would! A problem for the signaller in summer, is that the triangle of grass in front of the signal box where members are wont to gather, disturbs his sight lines. (Surely the grass doesn't get THAT high?) A photo shows such a group, one doing the work (hi-viz jacket) and five supervisors, which seems about right. Roy, in Part 18 on his series of model boat collection articles, wrote a story about *Dolphin.* This was a project from 10 years back, but it really started more than 50 years ago. The builder had recently died and Roy was asked to finish the boat, with full radio control, for the builder's grandchildren to admire. This would include the magnificently named, Marx

Ron Collins' third scale Climax. (Picture courtesy of Ron Collins.)

Dolphin, *North London SME. (Picture courtesy of Roy Verden.)*

'Coffee pot' locomotive at Sheffield SSMEE.

Hectoperm electric motor, which are as rare as hens' teeth now, and subject to much adverse comment in the fraternity (**photo 2**).
W. www.nlsme.co.uk

The Link, July, from **Ottawa Valley Live Steamers and Model Engineers**, describes the Show & Tell evening, in which Stuart Gentle had made a combined flashlight and metal detector, all the better to find small items dropped in the grass. Len Winn has finished his electric Steeple-cab locomotive. Graham Copley asked when a locomotive could be considered 'finished', and the answer is 'when you decide to abandon it....' The Society were expecting two visits in the near future, from the British Railway Modellers of North America and the Frontenac club. John Bryant makes a plea for helpers on both days. There will be a number of untried locomotives, so fingers crossed that they all work okay, in their baptism by fire. Subsequently, Philippe Leblanc gives feedback. Thank you all, says John, who made it such a super day, naming 24 people.
W. www.ovlsme.com

Stamford Model Engineering Society, June N*ewsletter* reports, sadly, that the response to a request for help manning a show stand was almost 10% underwhelming. Of the five who did offer, two were guests. Dave showed a video at a recent meeting, about a walking dragline that could not be saved. It was a fine example of mechanical engineering. He also showed a miniature suit of armour, correct in every detail. The Bure Valley Railway is trialling ovoids as fuel, since the only mine of steam coal had now closed. The railway tested ovoids about three years ago and their thoroughly detailed investigation won them an award. It is claimed that the latest ovoids burn longer and are quicker to ignite.

Working on an old (almost as old as me) transmitter, I encountered a small difficulty in that I needed a high frequency milliammeter. Not having one I made up a suitable probe from an old ball pen, which would plug in to my mobile test meter, or 'Voltswagen'. So called, because it can be used anywhere in the house. Success! I can now transmit on a band nobody uses, in a mode not currently fashionable, using obsolete technology (valves). It suits me down to the ground...

The **Sheffield SMEE** Open Day had a varied collection of motive power, including this 'coffee pot' locomotive as seen from the car park (**photo 3**) and this Wren from PS Models (**photo 4**).
W. www.sheffieldmodelengineers.com

Goodwin Park News, summer, from **Plymouth Miniature Steam** begins with some notes about later events, one of which is a visit from the superbly named 'Rock-a-Tots' nursery. Ian Jefferson then writes about boilers and certificates. This is followed by a piece by Ted Lawrence, on *Sir George Newnes*, a Bagnall 4-4-0 locomotive, built in 1946 for South Africa. Ted then writes on his work refurbishing the Walschaerts valve gear working model from the L&B. It was delivered to him in a rusty and seized state and returned to the Lynton & Barnstaple in working order.
W. www.plymouthminiaturesteam.co.uk

Leeds Lines, July, from **Leeds SMEE** has an interesting project by Nigel; a blackout cover for his bicycle rear light. In the last unpleasantness, only minimal illumination was allowed, from whatever source. The next item explains how new crossheads for *Invicta* were made. He says that due to its age, the machining of parts would be quite easy. He was unprepared for the difficulties which lay ahead. However, he is thoroughly enjoying the process.
W. www.leedsmodelengineers.org.uk

Norwich & District MES, summer, sends their *e-Bulletin*, telling us that the Society had acquired another locomotive, a Feldbahn, that will be used for

PS Models, 'Wren' at Sheffield SSMEE.

'Mobylette' at SYTM.

members training to be drivers. Several have already qualified. Only 12 locomotives were built, six for the UK, three of which remain. The Middlesborough bridge is currently closed being thought to be seriously at risk of imminent collapse, despite being a listed building. Brian Parker was dissatisfied with the performance of his locomotive drain cocks. Thinking 'outside the box', he realised he could make cocks operated by an electrically-powered linear actuator. He refers to this R&D process, as a 'bunbit', which sounds like something from *The Importance of Being Earnest*. A video refers to the Advanced Passenger Train and claims that it failed on account of finance and government interference. Firstly, it was rushed into service far too soon and not enough was spent on pre-production work, with only one train available, and it was filled with celebrities without being thoroughly tested. Thus the inevitable happened and the driving unit resides now in York Railway Museum. Conversely, Italy dealt with it properly and we now have the Pendolino. https://www.youtube.com/watch?v=YF3hEienSEw Pete King took his Elidir to the Parklands Railway in Hemsby and it wouldn't 'perform'. Investigation found that there was a serious build up of calcium in the boiler, due to his living in a hard water area. Adoption of a water-treatment regime would ensure this phenomenon is not repeated. Norwich SME has therefore installed a rainwater (i.e. soft water) collector which will help members everywhere who have this problem to put up with. ('Up with this, we will not put'... says Deborah.)

W. www.ndsme.org

Prospectus, July, from **Reading Society of Model Engineers**, has an item by Alex Bray on the unusual dual fuel combined steam-diesel system locomotive. L. M. Mayzell, a student at the Moscow Institute of Railway Engineers, had the idea that a combined steam and diesel locomotive would be feasible, using the same cylinders for both fuels. This gave rise to an odd chimney noise; *'bang, bang, chuff chuff'* you may say, had you been there at the end of Donetsk station platform in 1939. (To be continued.)

W. www.rsme.uk

I visited **South Yorkshire Transport Museum** in Rotherham because they were holding an autojumble. Every 30 minutes, a shuttle bus from their preserved fleet ran into Rotherham interchange and back for the ease of visitors. As I was disembarking I said to the conductor that I didn't realise that these vehicles were so primitive and difficult for the less abled to use. There was an open rear platform, then a high step up into the central aisle on the lower deck. The driver sometimes had difficulty in selecting a gear in the crash gearbox. ('I know they're here somewhere!'.) There were no hand holds, except for a rudimentary hollow on the corner of each seat. These were not 'utility' buses, without internal panelling, wooden slat seats etc., they were modern vehicles, brand new at the time. This reminds me of a joke I first heard in the 1950s. There is between Lancashire and Yorkshire a bus which travelled over a hill (we've got lots of those) and at the bottom, the conductor would call out, "First Class passengers keep your seats, Second Class get out and walk and Third Class get out and help to push us up this 'ere 'ill". Another vehicle that may have needed the occasional assistance on hills was the Mobylette. Made by Motobecane, a French bike maker now owned by Yamaha, they were a major manufacture of bicycles and small motorbikes (**photo 5**).

Ian Fletcher, chairman of **Derby SMEE** writes to say that they held a chair casting session using grade LM6 aluminium and making 220 chairs. (Held a chair? So, like Punch and Judy Men, they should now be referred to as 'Professor'.)

W. www.derbysmee.co.uk

Urmston & District MES have been encouraged by our editor, Martin Evans, to send some details of their Society. Brian Lamb advises that a defibrillator has been fitted in the clubhouse, but it is NOT to be used for charging electric locomotives! A welcome addition to the membership is extended to both Junior and Adult new members and two memorial benches have been installed, dedicated to past members, Alan Green and David Roberts.

W. www.udmes.co.uk

And finally, a man went into a pub and ordered "a pie, a pint and a kind word". When the pie and pint arrived, he asked, "what about the kind word?"

"Don't eat the pie."

ME

CONTACT

geoffttheasby@gmail.com

Club Diary 4 September 2024 – 7 November 2024

September

4 Bradford MES
Meeting: 'Talgo - Rolling Stock Manufacturer' by Colin Smith, 19:30, St James' Church, Baildon, BD17 6HH. Contact: Russ Coppin, 07815 048999.

5 Sutton MEC
Bits and Pieces evening 20:00. Contact: Paul Harding, 0208 254 9749

5 Westland and Yeovil MES
Thursday running afternoon and evening followed by fish and chips. Contact : Michael Callaghan, 01935 473003

8 Cardiff MES
Steam up and family day at Heath Park, Cardiff. Contact : secretary@cardiffmes.co.uk

8 Sutton MEC
Track Day from 13:00. Contact: Paul Harding, 0208 254 9749

14 Bromsgrove SME
Rob Roy Rally and 3½ inch gauge friends. See www.bromsgrovesme.co.uk

15 Bradford MES
Public Running Day. Members from 11:30, public from 13:30, whatever the weather, Northcliff. Contact: Russ Coppin, 07815 048999.

15 Westland and Yeovil MES
Running the track at Yeovil Junction – Steam Train Day and Comic Corn. Contact : Michael Callaghan, 01935 473003

20 Rochdale SMEE
Auction Night. Castleton Community Centre, 19:00. See www.facebook.com/RochdaleModelEngineers

22 Cardiff MES
Open Day at Heath Park, Cardiff. Contact : secretary@cardiffmes.co.uk

22 Guildford MES
Open day – charity day, 14:00-17:00. See www.gmes.org.uk

26 Sutton MEC
Afternoon run from 13:00. Contact: Paul Harding, 0208 254 9749

28 Bromsgrove SME
Open Day – all gauges are welcomed – 5, 3½, 2½, Gauge 1 and 16mm. Contact: Doug Collins, 01527 874666. See www.bromsgrovesme.co.uk

28 Westland and Yeovil MES
Track running day 11 :00. Contact : Michael Callaghan, 01935 473003

28-29 St Albans MES
Club exhibition, Townsend School, St Albans. See stalbansmes.com

29 Sutton MEC
Diamond Riding Centre Fete. Contact: Paul Harding, 0208 254 9749

October

2 Bradford MES
Meeting: 'Bits and Pieces', 19:30, St James' Church, Baildon, BD17 6HH. Contact: Russ Coppin, 07815 048999.

3 Cardiff MES
An evening with Tony Bird. Contact : secretary@cardiffmes.co.uk

3 Sutton MEC
Bits and Pieces evening 20:00. Contact: Paul Harding, 0208 254 9749

4 Rochdale SMEE
Models Competition Night. Castleton Community Centre, 19:00. See www.facebook.com/RochdaleModelEngineers

6 Bradford MES
Public Running Day. Members from 11:30, public from 13:30, whatever the weather, Northcliff. Contact: Russ Coppin, 07815 048999.

6 Guildford MES
Small Model Steam Engine Group, 14:00-17:00. See www.gmes.org.uk

10 Cardiff MES
Bring and buy. Contact : secretary@cardiffmes.co.uk

13 Cardiff MES
Open Day at Heath Park, Cardiff. Contact : secretary@cardiffmes.co.uk

13 Sutton MEC
Track Day from 13:00. Contact: Paul Harding, 0208 254 9749

17-20 Midlands Model Engineering Exhibition
Warwickshire Events Centre, See www.meridienneexhibitions.co.uk

18 Rochdale SMEE
Annual General Meeting. Castleton Community Centre, 19:00. See www.facebook.com/RochdaleModelEngineers

20 Guildford MES
Open day, 14:00-17:00. See www.gmes.org.uk

24 Sutton MEC
Afternoon run from 13:00. Contact: Paul Harding, 0208 254 9749

26 Cardiff MES
Steam up and family day at Heath Park, Cardiff. Contact : secretary@cardiffmes.co.uk

27 Westland and Yeovil MES
Track running day 11 :00. Contact : Michael Callaghan, 01935 473003

31 Guildford MES
Open day, 10:00-13:00. See www.gmes.org.uk

November

1 Rochdale SMEE
Talk – 'Re-building the Ellenroad Beam Engine'. Castleton Community Centre, 19:00. See www.facebook.com/RochdaleModelEngineers

2/3 Halesworth and District MES
LOWMEX 2024, East Coast College, Lowestoft. See www.lowmex.co.uk

6 Bradford MES
Meeting: Autumn Auction 19:30, St James' Church, Baildon, BD17 6HH. Contact: Russ Coppin, 07815 048999. Note: Only Members may bid on lots.

7 Cardiff MES
Talk : 'Temperance Town', Richard Britton. Contact : secretary@cardiffmes.co.uk

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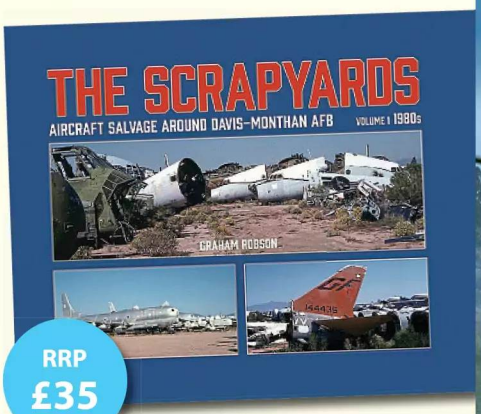

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Tools and Machinery

■ Myford Vertical/Swivelling Slide lathe milling attachment, part number MA 68/2, including Myford Vertical Slide vice £120. 'Eclipse' Magnetic chuck with threaded backplate attached 11/4" X8 TPI, suite Viceroy/ Boxford/Denford £400. Both items brand new. **T. 07905783031. Bromsgrove.**

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Miscellaneous

■ Post Office type 46 master clock,4.5 volt drive. Working and in good order. £280.00 ono. **T. 01553 630429. King's Lynn.**

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Wanted

■ Wanted model steam, petrol or gas engines, cash paid. **T. 07891 864131. Ipswich.**

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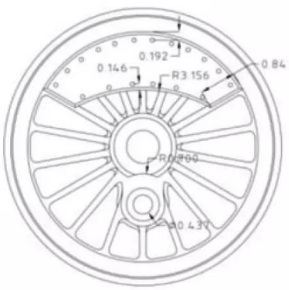

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