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IN THIS ISSUE

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ON THE COVER...

Ramon Wilson's new series describes the building of this delightful steam launch, Wide-A-Wake. *He introduces the article with a look back at his inspiration.*
Photo: Ramon Wilson.

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(Note: The production model cab is welded and does not have bolts showing on roof or sides).

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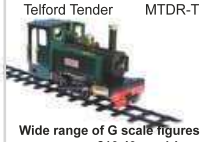

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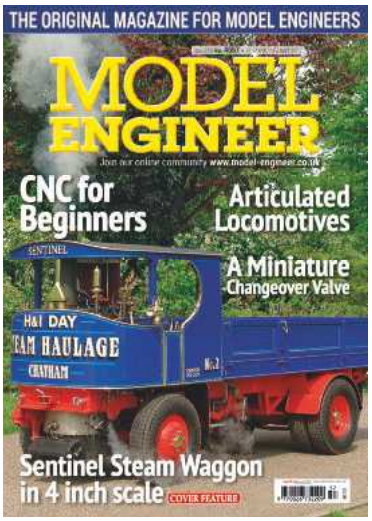
DIANE CARNEY
Editor

West Huntspill's 50th Anniversary

This South West Model Engineering Society is celebrating its 50th Anniversary this year and to mark the occasion the members will be holding a Gala Weekend on 16/17 September to which all are invited. Historically, the club had a close connection with the old Somerset & Dorset Railway, many of its founder members being employees of that company. The original 520 foot oval track was officially known as the Somerset and Dorset Memorial Railway and much of it owes its existence to the old S&D works at Highbridge. The first station building at the track came from Evercreech New down platform. The club expanded in the 1980s and the track was extended in 1987 and again in 2010/11, now running to just over 1000 feet. Set in an idyllic location within the Memorial Playing Fields, the club offers a 3½ and 5 inch gauge raised track and space for the running of road steam engines. If you would like to go along to the Gala weekend please contact Mike Herrin on 01935 420086.
http://westhuntspillmes.co.uk

Sentinel stolen

The beautiful 4 inch Sentinel waggon built by Ian Day, featured on the cover of *M.E.* issue 4557 (31 March) was stolen from the maker's home in the early hours of Monday 7 August. Ian had attended the Weald of Kent steam rally over the weekend and the Sentinel was locked in a box trailer, hemmed in by two other vehicles on his drive. The model was removed and wheeled into a waiting trailer and driven away. Naturally, this is a tragedy for Ian who is said to be heartbroken. At the time of writing I don't believe there has been any progress in its recovery but if any reader hears of this unique and distinctive lorry being offered for sale, please report it immediately. If you live in the vicinity of Chatham and have knowledge of any private CCTV in the area, please do all you can to persuade the owner to check the footage for this date. You never know where some valuable information might be found!



Chernobyl Children visit Lancaster

The Chernobyl Children's Lifeline (CCL) is a charity dedicated to supporting Belarusian and Ukranian children and families that will forever be affected by the fallout (in every sense of the word) of the April 1986 nuclear disaster. Leukaemia and particularly thyroid cancers affect new born and young children on an unspeakable scale and one of the charity's functions is to bring children to the UK for four week recuperative breaks. Their time here is spent enjoying trips out in the local area and the Lancaster & Morecambe MES recently hosted the Lune Valley CCL Group for a special afternoon of fun and lots of train rides! Could your club become involved in this worthwhile cause?
www.ccll.org.uk

Forncett Steam Museum's Model Engineer's Day

It's that time of year already! Readers are invited to the 25th annual Model Engineers' Day at Forncett Steam Museum on Sunday 1st October. Why not go along either as an exhibitor or a visitor? There is always an excellent and varied display of models inside the museum and the M.E. day now also features a road run for miniature traction engines. Full details and entry forms are available from Bill Starling: **billstarlingbs@gmail.com**

The museum itself features a comprehensive collection of large, working, industrial steam engines, from beam engines to the last triple expansion pumping engine to be installed. See: www.forncettsteammuseum.co.uk Engines will be in steam from 10am to 5pm. The museum can be found approximately 12 miles south of Norwich (Satnav postcode: NR15 2BT).

Ashley Best's illustrated description of an award winning, scratch built model in 1:16 scale.

Continued from p.229
M.E. 4566, 4 August 2017

When Number 46 was withdrawn for scrapping in 1937, it was just another typical British four wheel, double deck balcony tram. There was nothing to indicate that it was, in fact, a significant tramcar. This article explains the significance and describes the making of the model.

PART 5

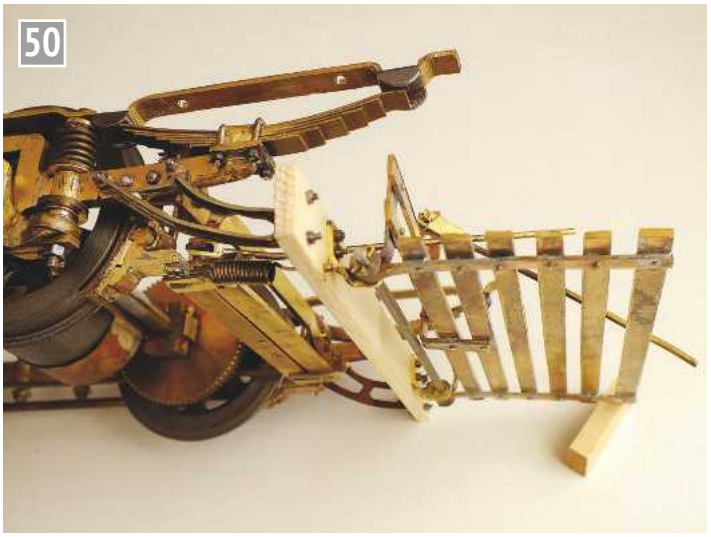
Bolton Corporation No. 46

Editor's note: at the end of the previous part (*M.E.* issue 4566) Ashely covered the motors and gears. Omitted from that section of the article was a photograph of the complete motor carriage showing all the main features thereof (**photo 49**).

Pilot board

Every truck has a large baulk of timber at each end, measuring approximately 7 feet long, 9 inches deep and 2 inches thick and supported by brackets attached to the side frames. This pilot board supports the lifeguard which prevents objects from passing under the tram. It is an important feature. **Photograph 50** makes the details clear. The brackets supporting the board were made from thin brass cut out by piercing saw and with strengthening ribs formed from wire and silver soldered in

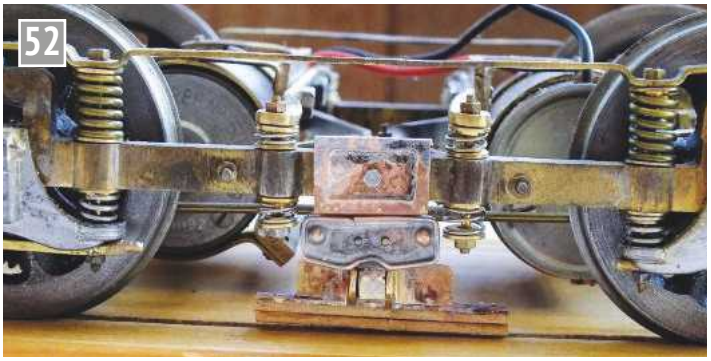
Motor in position.



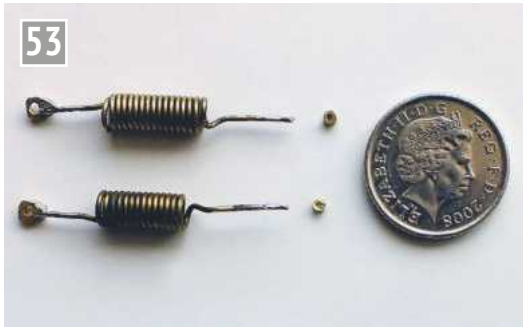
Pilot board.

≫

Brackets.



Track brakes.



Pull-off springs.

Lifeguard brackets.

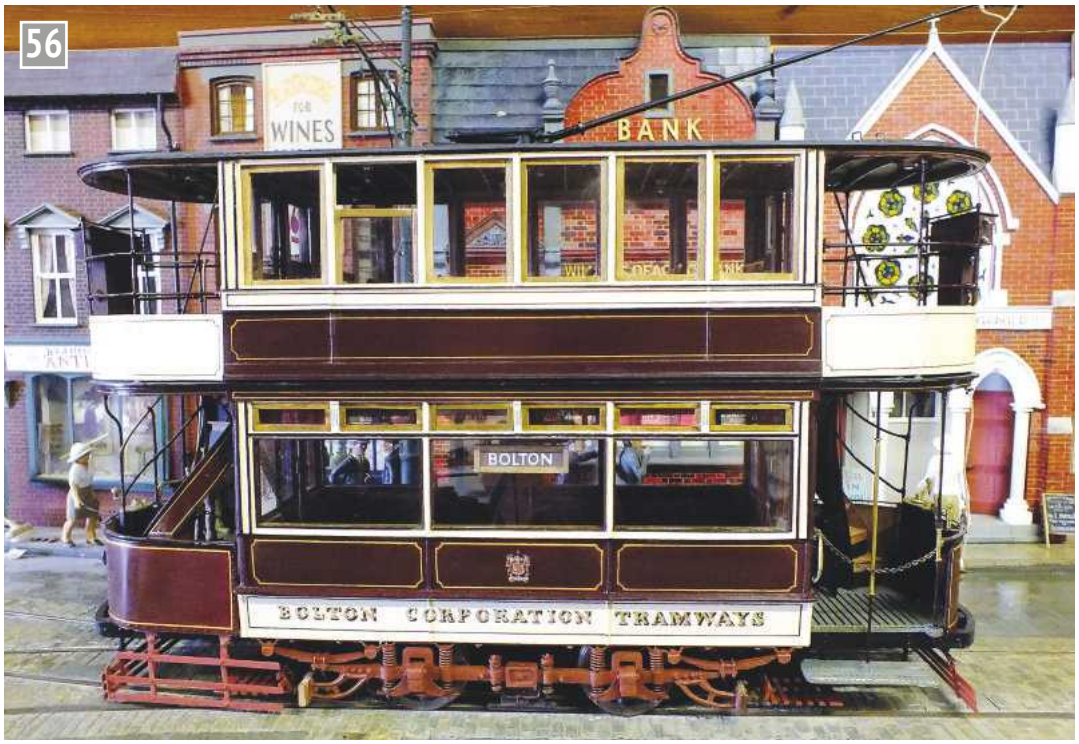
Lifeguard.

place (**photo 51**). I was careful to fabricate the brackets as matching pairs as, once in the past, I mistakenly ended up with a set of four identical brackets – easily done.

When completed, I gave the truck a thorough running-in to make sure it worked without over-heating and that the brakes worked. It is important to do that and I gave the truck a long session jacked up and under power in forward and reverse modes. Track brakes were made as dummies because on the real tram they were electro-magnetic so in the model there was no need for mechanical connection (**photo 52**). Bolton's fleet of four wheel trams had a variety of track brake designs to supplement the usual hand/wheel brakes. Those cars with mechanical track brakes could be distinguished by a large horizontal brass wheel mounted concentrically with the usual hand brake. No. 46 did not have this feature as its track brakes were electro-magnetic.

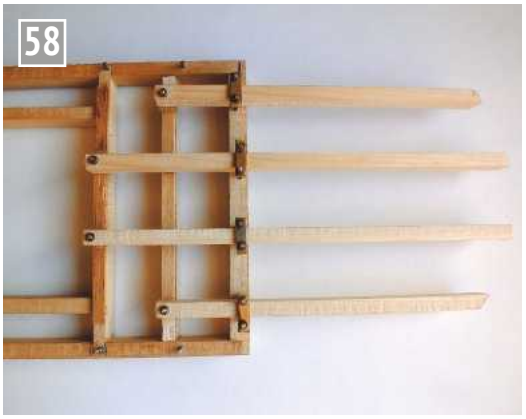
Some other parts of the trucks not so far mentioned include the brake pull-off springs (**photo 53**) and, of course, the pilot board lifeguard tray brackets (**photo 54**) and the tray itself (**photo 55**) which is shown fitted to a pilot board.

At this point it is perhaps appropriate to consider the typical first generation tramcar as a vehicle and, of course, Bolton 46 provides a perfect example. **Photograph 56** is a side view of the car, which for all its historical charm demonstrates its inherent absurdity. It was 27 feet long, perched on a tiny six foot wheelbase truck. Even though mitigated to some extent by the slow speeds, such a vehicle tended to give a lively ride which was particularly apparent to passengers seated upstairs and especially on the draughty balcony seats. Bogie cars were very much better in all respects and Bolton gradually eliminated all the four-wheeled trams and ended up with a fleet entirely of bogie cars. I remember these as being smooth riding but noisy. Not all four wheel cars were perched on such short wheelbases and later designs used much improved trucks with long wheelbases, sometimes as long as

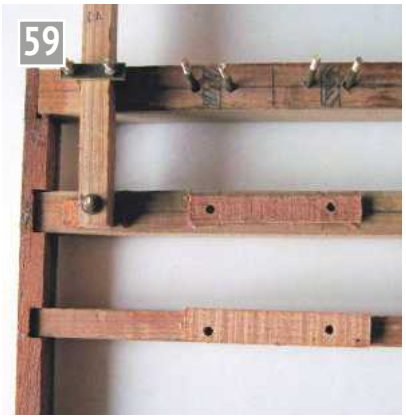


Short wheelbase.

U- and L-bolts.

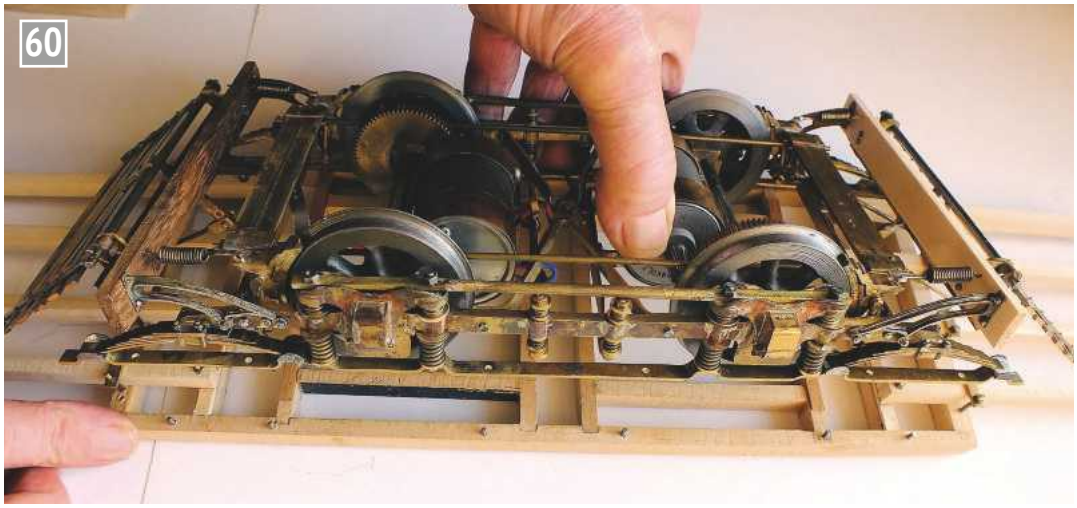


Platform bearers.



Bearing fixing.

Those cars with mechanical track brakes could be distinguished by a large horizontal brass wheel mounted concentrically with the usual hand brake. No. 46 did not have this feature as its track brakes were electro-magnetic.

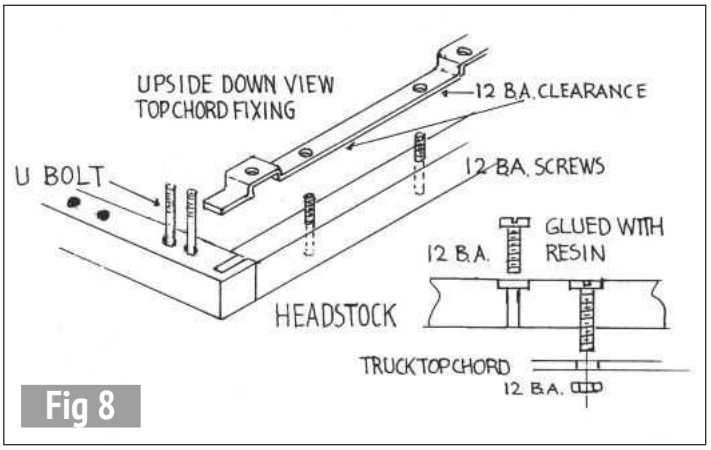


Fixing points.

nine feet, and these gave a perfectly satisfactory ride. Sheffield, for example, never had bogie trams yet its cars rode well - mainly because vehicles and track were maintained to a high standard.

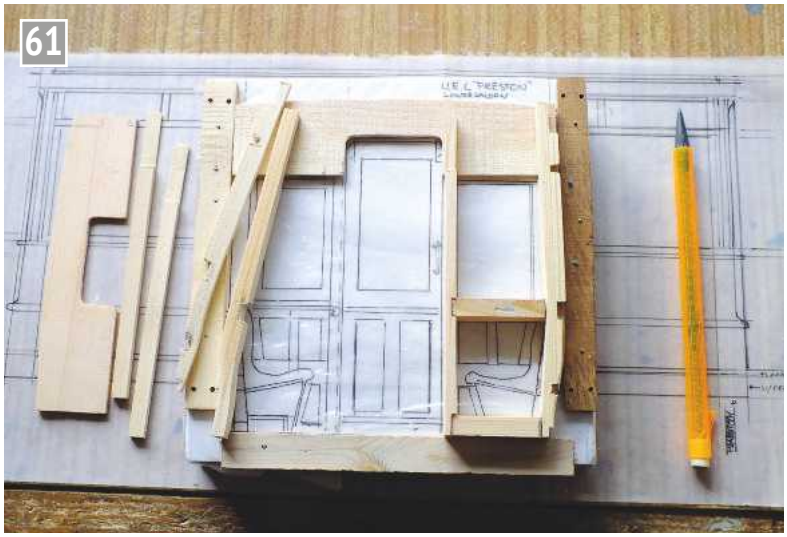
Bodywork

The tram body rests on an underframe which is bolted to the truck. The underframe is of critical importance as everything above the truck depends on it. It is a straightforward piece of woodwork and the basic structure should be assembled with great care to ensure accuracy. Fixed to the underframe are platform bearers which support the front of the tram, the controllers, the stairs, the brake mechanism and the front dash. These bearers are very slightly tilted up by about 2 degrees and on a real tram have to be adjusted to prevent platform sag. This feature can and should be applied to the model. The platform bearers are fixed by U-bolts and captive L-bolts (**photo 57**). The U-bolts are run down through the headstock which is provided with the requisite holes and recesses (**photo 58**). The U-bolts have ends threaded 8BA to facilitate the fixing of the keeper plates that hold the platform bearers in place. It is essential to tap the threads before forming the bolts. The rear of each bearer is attached by a captive L-bolt, also threaded 8BA. Packing pieces can be placed at this point making for easy adjustment of the inclination of the platform bearers, just as on a full sized vehicle. Platform sag was a problem often seen on tramcars particularly when maintenance became neglected as closure became imminent. **Photograph 59** shows the underside view



of the fixings with U-bolts, a platform bearer, a captive L-bolt and already drilled packing pieces. Before the saloon floor is applied, slots should be cut into the cross timbers to accommodate wires that might be needed for power or lighting circuits.

The first thing to be done with the underframe and completed truck is to establish the fixing points. I did this on the model by turning truck and frame upside down, so that the precise position of the 12BA clearance holes could be established and then holes drilled in the underframe to receive 12BA bolts for eventual joining the truck to the body. These bolts were glued in place with long-setting Araldite (**fig 8**). **Photograph 60** shows the eventual position of the bolts. The saloon floor, with the slots above the wheels for later fitting of small wheel arches, was glued down with PVA glue.



Bulkhead set-up.

Bulkhead.

Notice panel.

Panel parts.

Bulkheads

The lower saloon bulkheads have to be carefully constructed to ensure that the saloon does not twist out of alignment. The structure has to include a double skin on one side to accept the sliding saloon door. This problem can, of course, be avoided by having a fixed door. I always confront this challenge by making the sliding door work. The doors were made first so that the bulkhead door pockets could be made to the right dimensions for the door to slide easily. The bulkheads were made on a traced drawing covered with plastic sheet. This allows all the glued joints to be set up without them sticking to the drawing. **Photograph 61** shows the set-up and **photo 62** shows a bulkhead viewed from inside with missing panels where the longitudinal seats will be placed.

The door pocket side of the bulkhead, which has to be made from thin timber, has an added difficulty in that the inside window was used in Bolton as in most tramways to display notices such as a fare table or a timetable. This was usually a hinged glass panel. In the model, it was made as a glazed panel of very thin plastic containing an appropriate notice. **Photograph 63** shows a completed panel with its notice and **photo 64** is of the parts showing the narrow slotted wooden panel with its dummy hinges and a notice between two very thin plastic sheets which slides into the narrow slot in the frame. One final, very important thing I had to do before the bulkheads could be finished was to run a power feed down inside the edge of the door pocket. This was done with a strip of copper glued in place with Araldite. I put one in each bulkhead to make power and lighting circuits easier to connect.

●To be continued.

Funiculì, Funiculà in Scarborough

Roger Backhouse saves his legs ...!

View of Scarborough from the south cliff.

Eat your heart out, Brightonians! It was Scarborough that started the fashion for sea bathing in the 18th Century, well before Brighton. Sea and spa waters attracted growing numbers of visitors with fast developing hotels and boarding houses around the South Cliff (**photo 1**).

Engineering helped Scarborough's growth and it boasts some distinctive engineering heritage attractions. An impressive cast iron footbridge to the South Cliff was erected in 1827, contributing to hotel development there. Down below, the Rotunda Museum was the world's first purpose built geological museum erected in 1829, inspired by William Smith, father of English geology (**photo 2**). The railway's arrival in 1845 brought many more visitors. Scarborough still boasts the longest station seat in Britain.

Spa Cliff Railway

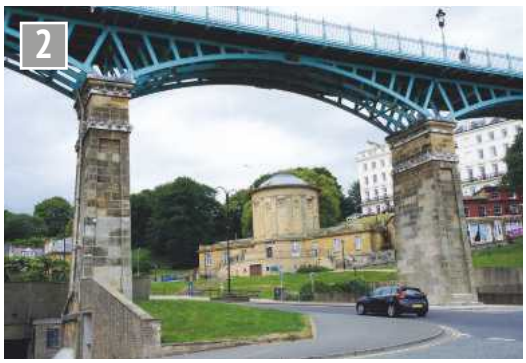
With new hotels on cliff tops, visitors needed facilities to go down to the sea front and back up. Scarborough had the first true passenger cliff lift - or funicular railway - in Britain with two cars linked by a rope carrying passengers to the spa and shore.

Railway rope haulage was well established; it was used on the Stockton and Darlington Railway and the remains of Brusselton Incline can be seen near Shildon, now followed by a public footpath. Several colliery lines used rope haulage until the 1960s, notably in County Durham where the Bowes Railway preserves a rope worked incline, though the future of this heritage line is uncertain.

Rope haulage wasn't generally used for passenger trains although the London and Birmingham used cable haulage on Camden Bank until 1844 and cables assisted trains on Glasgow's Cowlairs Incline until 1909.

At first, inclines used hemp ropes but wire ropes made operation safer. This invention was reputedly due to George Wright Binks, the foreman ropemaker at Woolwich Dockyard, though his claim has been disputed. His gravestone stands in the City of London Cemetery. He successfully convinced the Royal Navy to try wire ropes in 1830 and by 1853 was manufacturing in partnership with James Stephenson.

Scarborough's South Cliff Lift Tramway (or Spa Lift) opened in 1875 and was, like many early lines, a water balance line. It ≫



As Scarborough developed, new facilities were built like this 1827 cast iron footbridge and the Rotunda geological museum of 1829.

Spa lift looking down - the oldest funicular or cliff lift railway in the British Isles dating from 1875.

had two standard gauge tracks of about 285 feet long with a gradient of 1 in 1.75 (**photo 3**). Each car was fitted with a water tank that was filled for the descent. Two Crossley town gas engines pumped sea water up to fill the tanks. These engines were replaced in 1879 by coke fuelled steam pumps (**photo 4**).

The line was part owned by the proprietor of the Prince of Wales Hotel at the top, who helped promote the scheme. With a one penny fare it was a success from the start and ran with little change until a major modernisation was undertaken in the 1934/35 winter season. Hudswell Clarke then supplied new 12 seater cars, improved safety devices and installed a 90 HP electric winding motor (**photo 5**).

The changes dispensed with water tanks, as did most other cliff lifts, but at Saltburn and Folkestone water power is still used, retaining the practice of pumping water back up to fill car tanks. Water drawn from the River Lyn powers the Lynton lift in Devon. The Centre for Alternative Technology near Machynlleth has an eco-friendly, modern, water powered funicular designed by Roger White.

The Spa Cliff Lift was privately owned until 1993 when Scarborough Borough Council took over, running it from Easter to October each year. The line has since suffered accidents though, thankfully, not serious and improved safety systems are in place, hopefully ensuring the future of the oldest funicular in Britain (**photo 6**).

Spa Lift bottom station.

Spa Lift top station with sensors by the track side to control stopping.

Plaque commemorates the oldest cliff lift in Britain.

Cars pass on the Central Tramway, opened in 1881 and still owned by the same company.

Central Tramway cars were rebuilt in 1975 following a fire next door. They're decorated in a Victorian style.

Central Tramway

Next to the Grand Hotel the Central Tramway was once operated by means of steam winding with winch drums - clearly deriving from colliery practice. This was unique in Britain. The Victorians could work fast! Opened in 1881, just six months after the formation of the company, the standard gauge track was mostly built on a girder frame climbing 80 feet from the seafront to the top station. This was converted to electric operation in 1920 taking 500V DC power from the town's tramways, then reduced to 400V DC when lines closed in 1931 (**photo 7**). It is the oldest tramway still operated by the same company.

This lift has been renovated with Victorian 'style' redecoration (**photo 8**). Here the owners show how the system works with an excellent poster by Richard Palmer available as an A3 print. Cars are linked by a cable - in fact, four cables together - but at the upper end of each track cables pass over a sheave diverter pulley with grooves for the cables, and then down and round a 7 foot diameter winding (or sheave) pulley to link up to the other sheave diverter pulley and passenger car (**photo 9**).

Each 'Dyform' cable has a breaking strength of 32 tonnes but the weight of a loaded carriage is 7.5 tonnes, giving an ample safety margin (**photo 10**).

Diagram of the sheave and winding wheels displayed on a poster at the Tramway (Courtesy of Richard Gregory: www.richardpalmergraphics.com)

The winding pulley is driven by a 60 HP electric motor through a David Brown Radicon 17 inch gearbox. It's claimed little power is

needed because cars are similar in weight (**photo 11**). (Interestingly, some cliff lifts offer reduced prices for downward passengers in an attempt to equalise loadings.)

There are several braking systems. The primary control is the electric motor. A system installed in 2009, similar to a conventional lift control system, has switches on the track to send signals to the motor control: for stop; slow moving; proximity to station...

At the station a disc brake installed in 2016 automatically operates via the control system. This also acts as a dynamic brake should the cars have to stop part way. A 'dead man's button' in the driving booth is pressed down to allow cars to move; if the operator removes his hand, cars stop.

A foot brake remains from earlier operation and can still be used. It presses against the sheave wheel. Should other cables break there is a fifth cable that runs between cars via a separate pulley system and not the main sheave wheel. Increased tension on the cable operates a caliper brake around the central girder. This brake will be overhauled and reassembled when the line closes for maintenance this Autumn.

ABOVE: Four winding cables link cars for safety, a fifth cable to the left is a back-up. RIGHT: David Brown Radicon gearbox and motor, disc brake in front and lever operated foot brake just visible behind the sheave or winding wheel. (Courtesy of Central Tramway Ltd.)

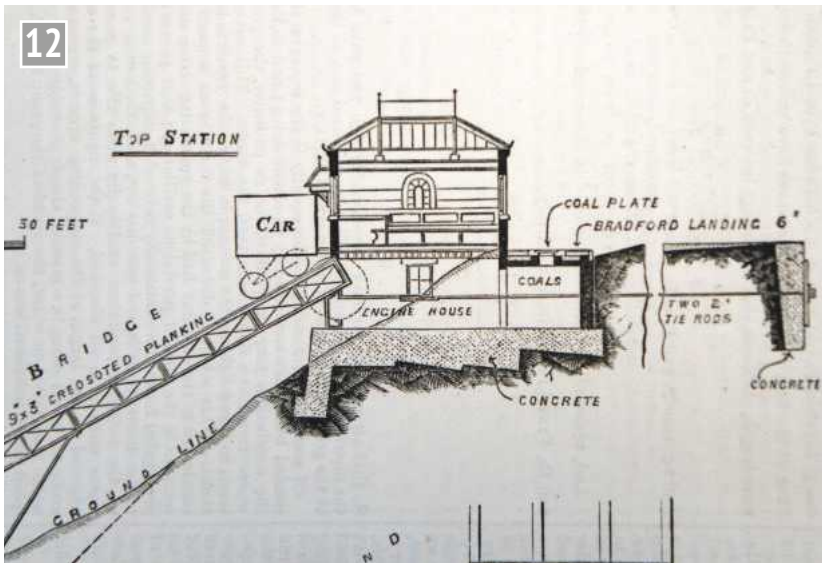
Lost lifts

Three Scarborough lines have closed. The Queen's Parade Tramway overlooking North Beach was opened in 1881 but had closed by 1887 following mechanical problems and landslips (**photo 12**). This coast is geologically unstable as was shown by the destruction of Holbeck Hall Hotel in June 1993.

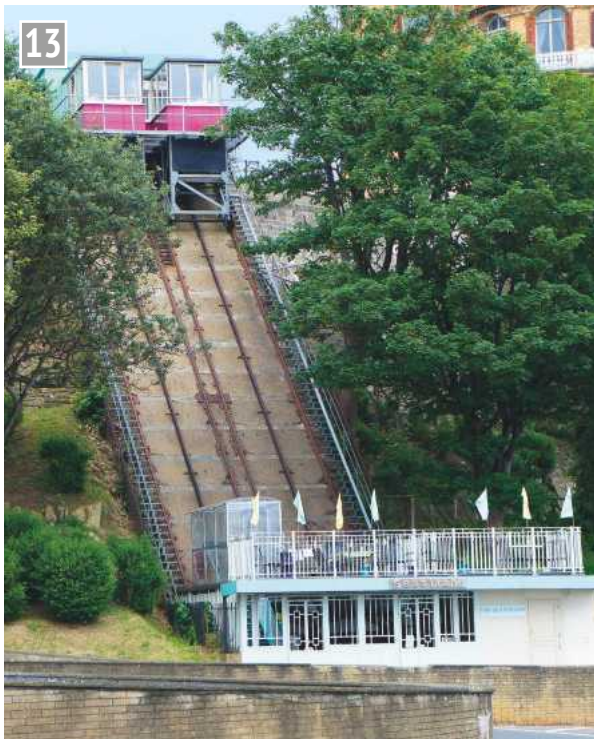
The line used a water balance system with a John Fowler engine pumping water up to the top - not quite as shown in the original plan. Fowlers also built engines for the Vesuvius funicular railway opened in 1880. The song, *Funiculì, Funiculà* was written by Luigi Denza to celebrate the opening of that railway though the composer, Richard Strauss mistook it for a Neapolitan folk song and unintentionally (it's believed) plagiarised it.

The North Cliff line was built by Scarborough Corporation in 1930 as part of major works including constructing Peasholm Park and the North Bay Railway. It closed in 1997 due to rising costs of maintenance. No trace remains.

Perhaps the saddest loss is the St. Nicholas Cliff Lift just south of the Grand Hotel. Owned by Scarborough Council, it has been out of use since 2006 due to high maintenance costs. This was Britain's widest gauge funicular at 7 foot 6 inches with a length of 103 feet and a gradient of 1 in 1.33 (**photo 13**); it was electrically worked from opening in 1929. The upper station is now a café with cars linked at the top of the incline. The tracks and lower station remain as a frustrating reminder of a unique railway.



ABOVE: Design for Queen's Parade Tramway station but it was probably not built quite like this. The line did not last long due to landslips. (Illustration from The Engineer *16 November 1877.)*



RIGHT: St. Nicholas Cliff lift opened in 1929 but was closed by 2006. It was Britain's widest cliff lift at 7 foot 6 inch gauge. Upper station and cars are now a café.

Funicular designed by Roger White at the Centre for Alternative Technology, mid Wales. It is ecologically sound using a water balance principle. (Courtesy of Centre for Alternative Technology: www.cat.org.uk)

North Bay Miniature Railway has steam outline diesel locomotives built by Hudswell-Clarke in 1931. Here is Triton, a Flying Scotsman *lookalike on 20 inch gauge.*

North Bay Railway recently built Georgina, *its first steam locomotive. Behind is* Robin Hood, *another Hudswell Clarke steam outline diesel from Blackpool but now at North Bay.*

Other British lifts

Several lifts remain including Saltburn's delightful Victorian line, lifts at Aberystwyth, Bournemouth, Hastings, Babbacombe, Lynton and Bridgnorth. The aforementioned Centre for Alternative Technology near Machynlleth has installed a spectacular water balance railway taking visitors to the upper reaches of the their former quarry site (**photo 14**). (The Centre will be subject of a future article.)

Other attractions in Scarborough:

North Bay Railway is a unique 20 inch gauge line with the original steam outline diesel engines made by Hudswell Clarke of Leeds and later additions (**photo 15**). The line now has its first steam locomotive, *Georgina* made in the Company's own workshops (**photo 16**). The line was laid out by the Borough Engineer, Harry W. Smith as part of large scale parks development and opened in 1931. (To feature in a future article.)

Readers of *Model Engineer* with non-engineering interests may enjoy the Rotunda Museum and the delightfully surreal Peasholm Park with its Japanese temple, waterfall and the ever popular 'naval battle' show. Band concerts take place in a floating bandstand with musicians ferried out in a swan boat. Scarborough may not have great architecture (though it boasts a very grand Grand Hotel) but it makes up for this with the Pre-Raphaelite church of St. Martin's South Cliff near the Spa Lift, designed by G. F. Bodley with works by William Morris.

Attractions further afield:

- Home of aviation pioneer, Sir George Cayley at Brompton;
- North York Moors Railway at Pickering, Grosmont and Whitby;
- Remains of the iron industry and Tom Leonard Mining Museum, Skinningrove and North York Moors;
- Saltburn Inclined Tramway and nearby Saltburn miniature railway (15 inch gauge steam outline diesels);
- Streetscene Transport Museum and Maritime Museum, Hull (to feature in a future article);
- York has the Yorkshire Museum of Farming at Murton Park, Yorkshire Air Museum at Elvington, the National Railway Museum and Holgate Windmill;
- The steam hauled *Scarborough Spa Express* runs on summer Thursdays from York (**photo 17**).

Website

www.centraltramway.co.uk

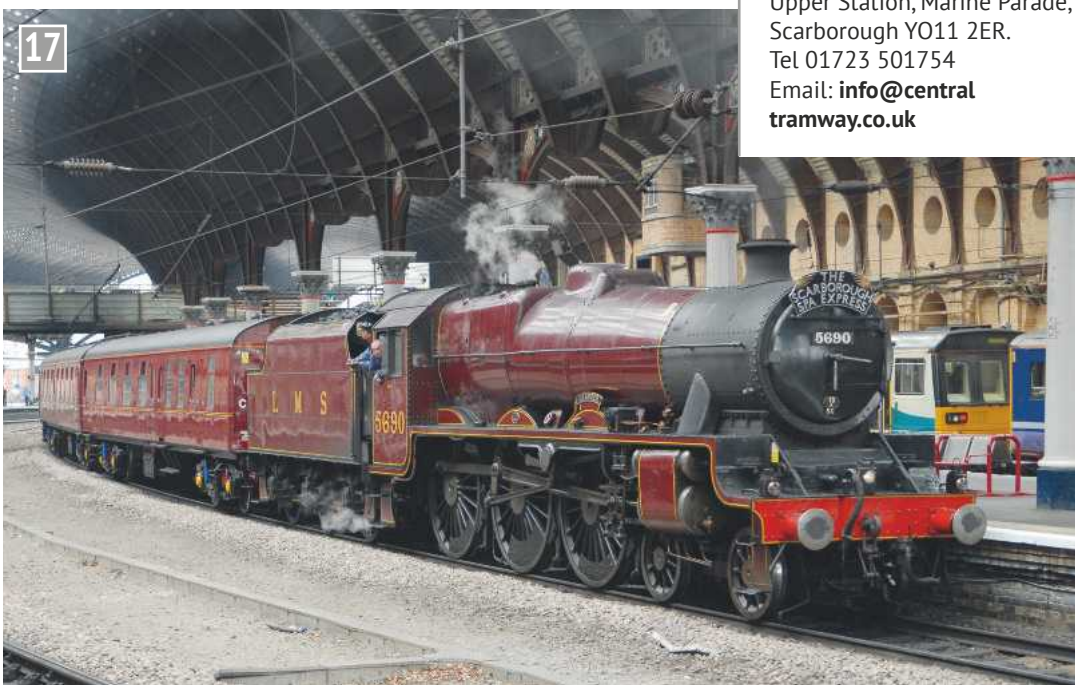
Further reading

Keith Turner. *Cliff Railways of the British Isles.* Oakwood Press. 2002.

Thanks to:
Neil Purshouse for information about Central Tramway; Frances Hill and Catriona Toms for information about CAT. Also thanks to staff at Search Engine, National Railway Museum.

Stop Press: The Central Tramway cliff lift control room and winding motor is on show during the Heritage Weekend, Friday 8th and Saturday 9th September 2017 with tours at 10 and 11am providing a rare chance to see the workings of a cliff railway. Each tour limited to 12 people.

Bookings to Central Tramway, Upper Station, Marine Parade, Scarborough YO11 2ER.
Tel 01723 501754
Email: **info@centraltramway.co.uk**

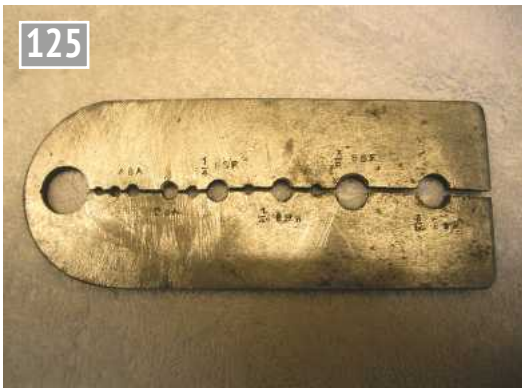


The Scarborough Spa Express at York.

Locomotives Built for Display PART 8

Some construction ideas from **Robert Hobbs** who completed a non-steaming Hielan Lassie.

Continued from p.175
M.E. 4565, 21 July 2017



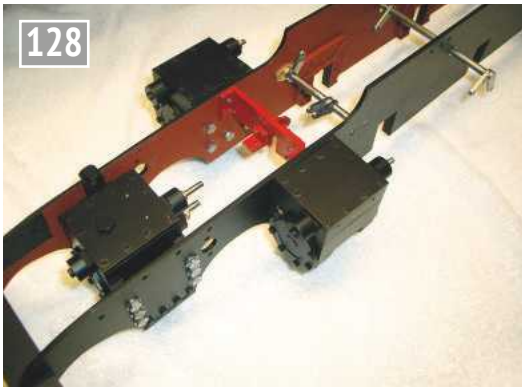
Thread plate.

Sawing the bolt to length.

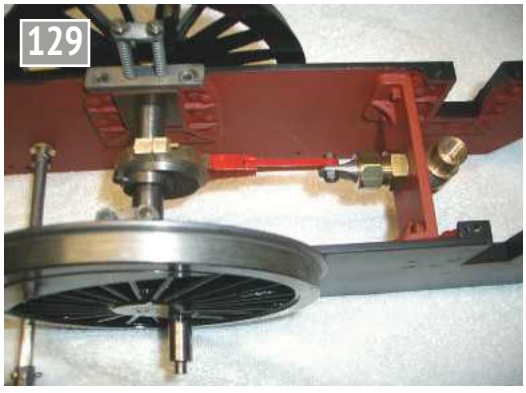
Eighteen months ago, I thought the end of my Lassie build was in sight; well here we are with the tender ready for fitting out, the locomotive being sprayed and brush painted and assembly well under way. Fitting the components together requires careful handling of the painted items and sensible selection of the fixing bolts. Even with a good selection of bolts you never seem to have ones of the correct lengths and this is where another old friendship from my apprenticeship days, some 58 years ago, comes into its own. Using my thread plate (**photo 125**) it is easy to cut bolts to length with the hacksaw (**photo 126**) and finish off with the file or just file if the bolt is only a little over length (**photo 127**). If you do not have a thread plate it is very easy to knock one out in an hour or so and it will be a friend for life. When un-screwing the bolt after reducing its length the act of removal from the thread plate cleans up the thread for easy use.

The first items fitted to the main frames were the inner and outer cylinder blocks and the lifting arms; **photo 128** shows the start of the build. **Photograph 129** shows the axle driven water feed pump and its eccentric in place. The central connecting rod, valve gear and slide bars (**photo 130**) were fitted between the frames together with the exhaust system. The exhaust transfer path from the outer cylinders to inside the frames is clearly seen in **photos 131** and **132**.

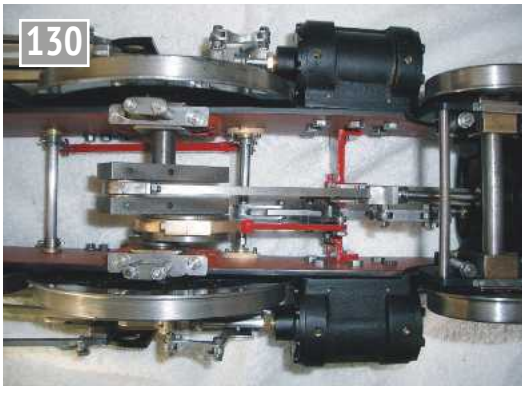
Finishing the bolt with a file.



Cylinders on the frames.



Feed pump in position.



Centre crank, connecting rod and valve gear.

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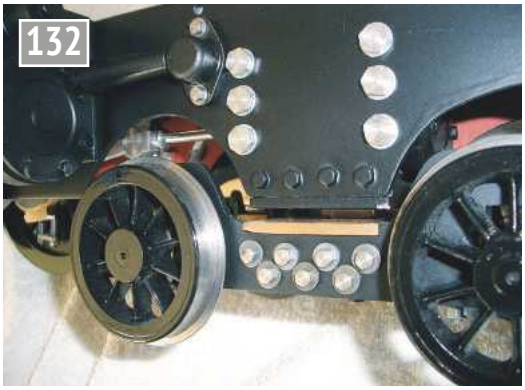
Photograph 132 also shows a good view of the front bogie in position on its pivot. The rear trailing bogie with its axle block, dummy spring and keeper *in situ* is shown in **photo 133**.

Motion and final assembly

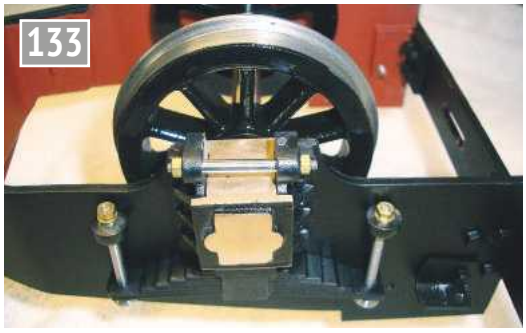
The next large job was fitting the coupling rods, connecting rods and the outside valve gear, slide bars and motion brackets. These items were quite fiddly to get in place without damaging the paintwork but care persevered over expediency and the completed installation is shown in **photo 134.** With all in place the final task was to drill and fit the roll pin in the crosshead and piston rod (**photo 135**); the photo shows the drilling taking place and **photo 136** shows the roll pin installed on the outside cylinder.

Photograph 137 shows the saddle, smokebox and door assembled and fitted to the frames together with the running board support brackets. Note the smoke deflector mounting spacers on the smokebox. The boards were a little difficult to fit and secure because the pre-painted rivet head bolts on the front buffer beam went through the running board, the lamp bracket and the front steps making it quite a fiddly operation. The smoke deflectors were next to go on and once again the fixing bolts served three masters by passing through lower angle on the smoke deflector, the running board and the mounting bracket. Fortunately, the handrail stanchions lined up with the spacers that were already in place on the smokebox which also acted as the top fixing for the smoke deflectors. **Photograph 138** shows the almost complete front end assembly.

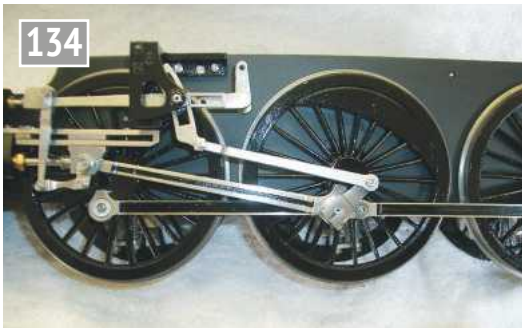
Exhaust connections.



Exhaust and front bogie.

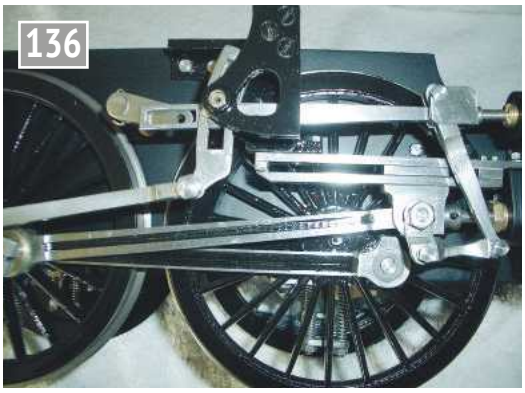


Trailing axel box.



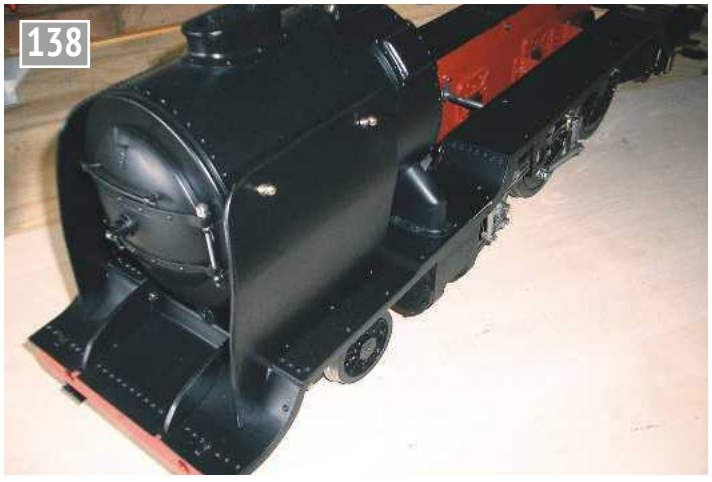
Outside motion, coupling rods and connecting rod.

Drilling roll pin in cross head / piston rod.



Roll pin in position.

Smokebox assembly.



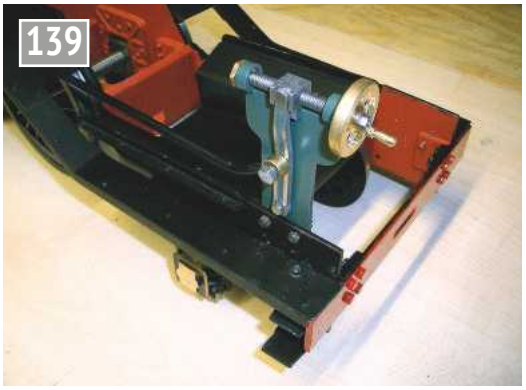
Smoke deflectors and running boards in position.

In part 6 of this series problems were encountered with the position of the rear running boards and the height of the cab. I recently purchased a copy of F. J. Roche's excellent *Historic Locomotive Drawings* and - lo and behold - Roche explains that when Mr. Thompson rebuilt Sir Nigel Gresley's *Great Northern*, originally built in 1922, it was rebuilt with the cab raised well above the drawbar during its 1945 update. When Thompson undertook a further rebuild of the cab/ rear end years later, the running boards and the cab were positioned at the lower level, which is how the Lassie now stands - and which, in my opinion, looks a neater solution.

The screw reverser and the reach rod have been completed and fitted to the main frames; these are shown in **photo 139** and will be removed to provide access for the boiler installation. The rivets fixing the backhead in place and the dummy row of rivets at the throat plate have been inserted. The throttle control and the boiler tube assembly have been installed in the main barrel and the boiler painted in primer awaiting its top coats. **Photograph 140** shows the rivets in position at the backhead. The boiler shell was spray painted with several coats and left to harden before the backhead fittings, safety valves, banding, handrails and dome were fitted. **Photograph 141** shows the boiler assembly on the chassis. The handrails and stanchions were fitted to the tender body (**photo 142**) and also to the cab sides (**photo143**). The cab roof has been fitted with rain gutters and two sliding sections installed on the centreline. The cab roof has been fitted with two location pins to keep it in position on the cab sides and the inside sprayed cream with matt black on the outer surface. We have decided to name the Lassie *Great Northern* and obtained a pair of relief engraved name plates from our local trophy and engraving store. These were finished off by flooding the cavity with red paint, allowing it to dry and then carefully rubbing on a flat plate of wet and dry to leave the brass letters and surround, these are shown in **photo 144**.

The completed locomotive with her nameplates, transfers, couplings and lamps is shown in my final seven photos (**photos 145** to **151**). In case you are wondering where the adopted number came from; 1478 is my old works apprentice number of nearly 60 years ago and has been applied to all my locomotives except the 2-6-4 Jubilee Tank.

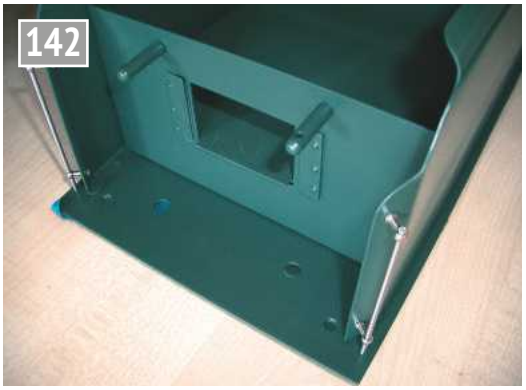
The Great Northern/ Hielan Lassie has provided me with an excellent project over the last 18 months; sourcing the parts, marking out, doing the



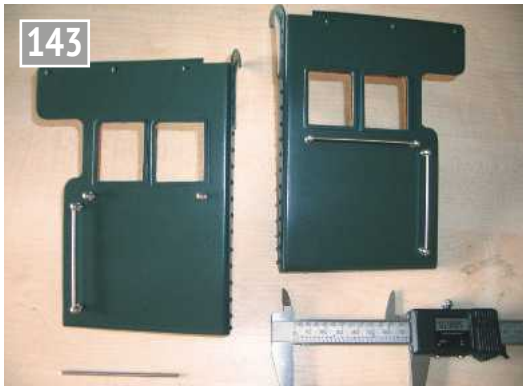
Screw reverser and reach rod temporally in position.

Back head riveted in position.

Boiler with brass bands assembled on the frames.



Hand rails on the tender front.



Hand rails fitted to cab sides.

Relief engraved name plates.

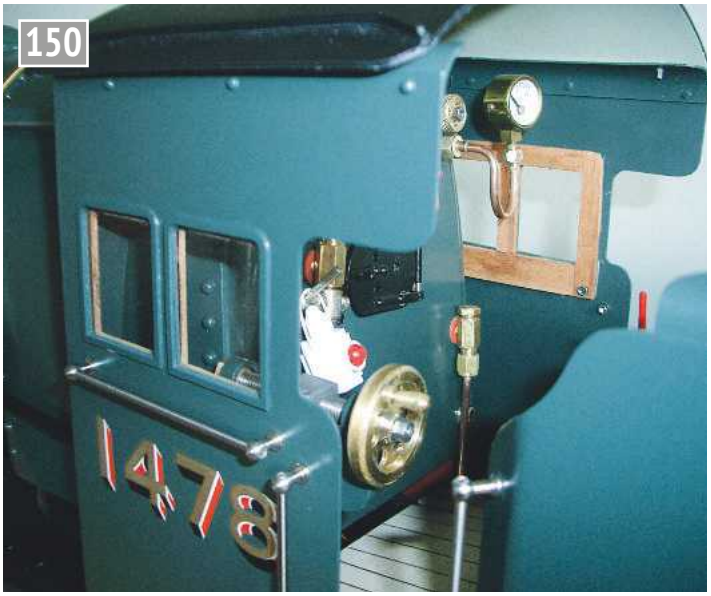
Cab and backhead.

Front end assembled.

The Lassie in the study.

The Lassie's tender in the study.

The smokebox and nameplate.



Close up view of the cab.

sums, using the mill and lathe, hand finishing and painting, which, coupled with the writing of these articles, has given me a vast amount of pleasure and I sincerely hope that you, the reader, have found some of the text interesting and the photos informative. I am now looking for a further project and if you would like to purchase *Great Northern* for your own display please let me know. I would like to thank Diane for giving me the opportunity to show that locomotives do not have to be fully accurate or under steam to provide enjoyment and I for one will keep building display models just for the sheer pleasure of producing a locomotive that looks splendid and graces my study - well at least until the next project is completed or the Lassie finds a new home. ME

Three quarter front view of the Lassie in the study.

An Index Mill Upgrade

Alan Hopwood widens the scope of a sound machine, guaranteeing it a new lease of life.

Following my article on *The Banana Milling Table* (*M.E.* vol 218, No. 4559) Phil Tattersfied, the machine's owner, phoned me. My first thoughts were that he had found a problem with the table but - and much to my relief - having had the mill table brought back into usable condition, my friend was finding that the usefulness of the miller was now being limited by the lack of more modern tooling.

The Index miller (**photo 1**) was claimed to have been shipped over the pond during the 'lend lease' period in the very early 1940s. It is a very well spec'd machine for its' time and has many good features, one of which is the way that it was built - akin to a brick outhouse. The limiting factor recently discovered was that the spindle had been supplied with a Brown & Sharpe No. 9 taper. Now, if the machine was located in the US tooling may have been readily available but as it resides in the spa town of Harrogate, it is thought that a more common UK system would be advantageous. As an aside, on checking www.lathes site for information, it turns out that an R8 version of the miller had been produced but our friend, Sod's Law came into play again and this machine had the B&S version.

Index Miller (P. Tattersfield).

Brown & Sharpe arbor.

Identifying the taper

He told me that the machine quill had a peculiar taper which was a bit bigger than a 3 Morse taper, and wondered if it would be possible to amend the drive socket to something a bit more user friendly. He had only a drill chuck on the correct taper and one other arbor but this was in turn taper bored with an unknown taper and no tooling to fit (**photo 2**). I asked him to bring the spare arbour over to my workshop so that I could try to identify the taper and then hopefully come up with some scheme to widen the options available to him. I immediately discounted any changes to the actual quill as I knew it would be made of some very good steel and probably heat treated, which would preclude any chance of me being able to modify it with the tooling I have access to, so some kind of adapter was going to be the order of the day.

When Phil came over he told me that the taper was probably a Brown & Sharpe but he did not know which one. Now I am lucky enough to have a Greenwood and Batley Ltd., catalog (sic) No. 139 which Msrs. Brown & Sharpe Mfg. Co., Providence, R.I., USA. had printed in 1929. Why oh why have these wonderful books disappeared from

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Open ended 3 to 4 MT.

general circulation? Please don't answer that - but this catalogue is filled not only with details of the most extensive range of machine tools and accessories but tables of the most useful information on engineering matters. It is only some 656 pages long and must have cost a fortune to produce, so I've answered my own question.

Now, back to the matter in hand; the taper turned out to be a B&S No. 9 which, as Phil had said, was just a bit bigger than a 3MT. On checking the tables I reckoned that there was just a chance that provided I could hold - and more importantly, cut - a commercial 3-4 MT it might be modified to suit. Two open ended adapters were ordered, knowing that if the first were successful then the other would come in for other operations and, if not, then I could try some more drastic measures on the second one (**photo 3**).

I'm fortunate in that I have access to a couple of lathes; a Harrison L15 and a Myford S7. Both have taper turning attachments but I've never fitted the one for the Harrison and I just leave the Myford one bolted on to the bed, so the first thought was to try the operation on the Super 7 (**photo 4**). Again it was fortunate that the spare arbor that Phil had brought along had a good, true bore in its 'business end', which I was able to locate on the cone of a running centre with another in the back centre. A quick start up of the lathe proved that things were running true (near enough for farm work at least) and I was then able to set the taper turning slide up to the No. 9 B&S taper. It can be a fiddly job but with the aid of a small brass hammer and a few well chosen words, the dial gauge was giving zero variation end to end (**photo 5**).

Time now for what I think is the clever bit; how to hold the adapter for turning. I have an extended 2-3 MT adapter which allowed me to jam the 3-4MT on its shank after cleaning both male and female 3MT parts. I was tempted to try a spot of bearing fit Loctite type stuff but then reasoned that a fair bit of heat would be produced by the cut and if the Loctite gave with the heat, things could get messy. I therefore left the plug and socket dry but did make sure of a drive fit with a judicious tap with a soft hammer (**photo 6**). I also possess a double tapered 2MT plug, which is one of the handiest things I've ever made (**photo 7**). Plug one end into the lathe mandrel, the other end takes the extended adapter and with a running centre holding everything tight (not too tight, remember the heat and expansion) we were in position to try a few cuts.

Trial cuts

I didn't fancy a high speed tool for this job but I have a modified Hertel tool with some tips which have served well on previous jobs, so off we set. Don't know how I decided on the cut but opted for a 15thou cut for starters with the revs set at second fastest on the low range i.e. 420 rpm (**photo 8**). There is no coolant supply on the Myford, so neat cutting oil was fairly liberally applied with my favourite little squirty can (**photo 9**). I was totally surprised at the finish achieved on that first cut so the pattern was set for subsequent cuts until the job was nearly down to size (**photo 10**). The question of what size to make it did trouble me somewhat, in that the plug size given for the No. 9 taper was 0.900 inch, whilst the

Myford with additions.

Setting the taper.

2 to 3MT arbor.

Double 2MT.

Early cuts.

3MT plug is nominally 0.778 inch. As you will guess, I did chicken out from going all the way down to 0.9 for the plug end but left it at 0.910 inch - as near as I could measure. The adapter held to the 3MT shank throughout the cutting operation with no sign of any slippage but the cut was all towards the headstock which was good in that the forces were tending to push the taper into firmer contact with each cut (… at least that's my theory).

The next worry was to release the two tapers. The wall thickness at the large end looked reasonable so I took the chance with a brass punch and was surprised and, may I say, delighted when a very light tap separated the two (**photo 11**).

At the Doncaster show, I purchased another 3-4MT adapter from a different supplier. This one was somewhat shorter, marginally cheaper and, on a closer inspection at home, I discovered that the blank had been machined on different centres. This showed itself by an unmachined patch on one side of the internal taper. As there was still plenty of machined bore I decided to turn this adapter down as well. It machined as the first had done, although I got the impression that the actual cut was a bit easier but it could just have been that I was more confident by this stage. Anyway, Phil now had two sleeves to play with.

Squirty oil can.

Cutting in progress.

Finished adapter and original arbour.

High quality swarf!

Phil and I did meet up at Doncaster and I was with him when he bought a 3MT arbour and ER32 collet set to fit his mill. He must be a brave man, as at the time the adapters had not been machined. I was really delighted when, a few days later, Phil phoned and told me that the whole operation had been a success and he now had a miller which would extend his machining capabilities.

The only question remaining was what use could be made of the high quality swarf which resulted from the operation (**photo 12**)? ME

Reminiscences of the Enfield & District Model Engineering Society

Norman Barber recalls the kindness of club members who nurtured his hobby and ambitions.

Lying in bed one night recently and wearying of watching the endless stream of woolly cloven-hoofed quadrupeds streaming past my mind's eye, I began to reminisce about the early years of my model engineering career and in particular about the people and organisation that had nurtured it's development. I eventually drifted into the arms of Morpheus but, the following day, recalling the reminisces of the night before, it occurred to me that an account of these might be of interest as a contribution to our Editor's suggested occasional article on mentors. At the same time, I thought (hoped) that my memories might lead to some light being thrown on the history of what is now, I believe, a defunct model engineering club. If nothing else these reminiscences would demonstrate the invaluable roll that a club can have in nurturing the interests and careers of young people.

> One of the members had built a 3½ inch gauge PV Baker to the LBSC design and he taught me to drive the engine. He drove a motorcycle combination and I would ride pillion with the locomotive in the side car.

From my earliest recollections, I have always wanted to be an engineer. The opportunity to engage in practical engineering activity presented in 1944 when my paternal grandparents passed away and my father purchased their house from the estate. We moved into our new home in the spring of that year. For me one of the most important features of our new home was my grandfather's old workshop, sited at the bottom of the small garden. My grandfather had been a self-employed locksmith and had established the workshop to service this business. By present standards it was, in many respects, a primitive affair but, to my twelve-year-old eyes it was heaven-sent and I moved into the workshop as my parents moved into the house!

The workshop was housed in a substantial wooden building, the interior of which

was dominated by a large coke fired forge with a hand driven blower and a chimney through the roof. A bench ran along one side and across one end of the building with a blacksmith's leg vice secured to the end bench. At the other end of the building was a crude, treadle driven lathe. There was no means of lighting the building although windows were fitted along the whole of one side and in the wall behind the vice. There was no power because the house had not had an electricity supply before my parents purchased it.

This workshop proved to be the basis on which all of my subsequent model engineering activities were built.

Initially I began to develop my interest in small scale model railways and built various items of track and rolling stock in both O-gauge and OO-gauge. By 1946 the war in Europe was over. I began to take *Model Engineer* magazine, courtesy of my father's newspaper account, and soon developed a desire to engage in larger scale live steam models.

The equipment inherited in my grandfather's workshop was rather inadequate for this purpose. It was clear that the forge, which occupied a considerable amount of space, was unlikely to be relevant to the model engineering activities in which I intended to engaging and it was removed and the chimney hole sealed up. The lathe's mandrel was solid with a very small self centering scroll chuck secured to the plain mandrel nose with a grub screw. There was a compound slide rest which could be clamped to the bed in the required operating position, there being no lead screw. The tailstock barrel had a plain hole rather than a taper and tooling was secured, like the chuck, with a grub screw. There was no measuring equipment in the workshop other than steel rules and 'stiff joint' callipers. The remainder of the tooling comprised basic files, screwdrivers, punches, etc. These limitations did not deter me from starting the construction of a 3½ inch gauge steam locomotive, however, and all of my pocket money was devoted to improvements in the facilities available. I well remember purchasing my first micrometer second hand from a tool shop in Enfield Town. I now have three 0-1 inch micrometers but that first purchase is still the preferred instrument in daily use.

By this time, I was attending the Enfield Technical School and had joined the local Enfield and District Model Engineering Society. At that time, the Club met in a room behind The Plough public house in Turkey Street, Enfield Wash. The publican had agreed to the construction of a 3½ inch gauge track on ground behind the pub. The primary interests of the Club at that time were live steam locomotives and racing model hydroplanes round a pole in the boating lake of a local park. As far as I can remember I was by far the youngest member of the Club and the membership as a whole were enormously encouraging to me. The Secretary was a Mr. Colebrook who, in hindsight, was a very good Secretary although he was not a model engineer! His hobby, remarkably enough, was knitting. One of the members, who's name I regret I can no longer remember, had built a 3½ inch gauge PV Baker to the LBSC design and he taught me to drive the engine; we would take it to the various events which the Club supported with its portable track. He drove a motorcycle combination and I would ride pillion with the locomotive in the side car. I recall that during this time I was given a set of castings for a small double acting oscillating steam engine. I completed the engine and it was exhibited, running on compressed air together with other engines, on the Club stand at The Enfield Show, an annual event at which local businesses and organisations were able to promote their wares and activities. (I believe that this show still takes place under the title of The Enfield and Country Show.) The little engine was stolen from the exhibition, the thief leaving the air line lying on the table. It was only a small model but it was the first working steam engine I had made and the loss was devastating for a youngster such as me.

My time at the technical school came to an end and I secured an apprenticeship with the Ministry of Supply at the local Small Arms Factory. I remember taking the rolling chassis of the locomotive I was building, a 3½ inch gauge Rainhill to the LBSC design, to the interview for the apprenticeship. I became the Editor of the Club magazine, which was printed on a hand operated Gestetner machine. Older readers may remember these machines, which required the subject matter to be printed to be typed onto a 'skin', which was a thin membrane through which the typewriter would cut the text to form a stencil. The magazine was printed on foolscap size paper in a landscape configuration and the pages folded to form a booklet. By this time, I was courting a young lady (now my wife of sixty-three years) who worked in a City Bank and had access to a long carriage typewriter (required for the landscape format) on which she cut the 'skins' for me during her lunch break. My father was a commercial artist who produced the covers for the magazine by silk screen printing. For its time, it must have been quite an unusual club magazine!

Eventually the end of the apprenticeship arrived and pressures of university and the need to move away from the Enfield Wash district led to loss of contact with the Club and many fallow years for the hobby as marriage, career development and family absorbed all available time.

Through all of this time I maintained a workshop, however, steadily improving the equipment and facilities but it was not until the 1990's that I was able to return to some serious model engineering.

I have tried to determine, without much success, what happened to the Enfield and District Model Engineering Society. Are there any other octogenarians out there who can throw any light on the matter? I have tried searching on Google and there are mentions of the Club as a base for slot car racing during the 1960s with a mention that there was also an interest in model steam locomotives, but I can find nothing further. Can anyone help?

That Club and its members made an invaluable contribution to the development of my model engineering career. I know that there are many clubs around today who encourage youngsters – I was particularly impressed by the efforts of the Hereford Club when I visited them a couple of years ago. What does your club do to help and nurture young people to develop practical skills – an aspect of education which seems to be missing from school curriculum these days?

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IMLEC 2017
Southport Model Engineering Club

PART 2

Diane Carney reports on this year's competition.

Continued from p.315
M.E. 4567, 18 August 2017

Richard Prideaux with an elderly Royal Scot on the 8.30am run in glorious early morning sun. (Photo, John Rothwell.)

Saturday dawned a warm summer's day - perfect for the occasion.

8) Richard Prideaux: LMS Royal Scot (5 inch gauge)
First to leave the starting line at 8.30am was Richard Prideaux from Leyland SME with a 5 inch gauge unrebuilt Royal Scot (**photo 8**). This locomotive is believed to have been built by Mr. Hall from the Wigan area approximately 60 years ago but little more of its history is known to Richard. In recent years, it met with an accident and took a tumble in the workshop, resulting in extensive damage including fractures to the centre engine valve liners. Repairs were undertaken by John Barr from Leyland and it works hard passenger hauling almost every Sunday at the Leyland track. Richard set off with an ambitious 16 passengers but after a difficult first lap settled into a steady run during which the engine wanted to 'get going'! He dropped off three passengers, three laps before the end and completed nine laps. With a recorded efficiency of 0.97% he was eventually placed 15th in the table.

King Stephen *patiently awaits attention from its driver, Tim Jenkins.*

9) Tim Jenkins: GWR King (5 inch gauge)
Another from the host club now, as Tim Jenkins set off with a 5 inch GWR King, *King Stephen.* The locomotive was built by Stephen Hissey of Middlesex and completed in 1998; it won a Gold Medal

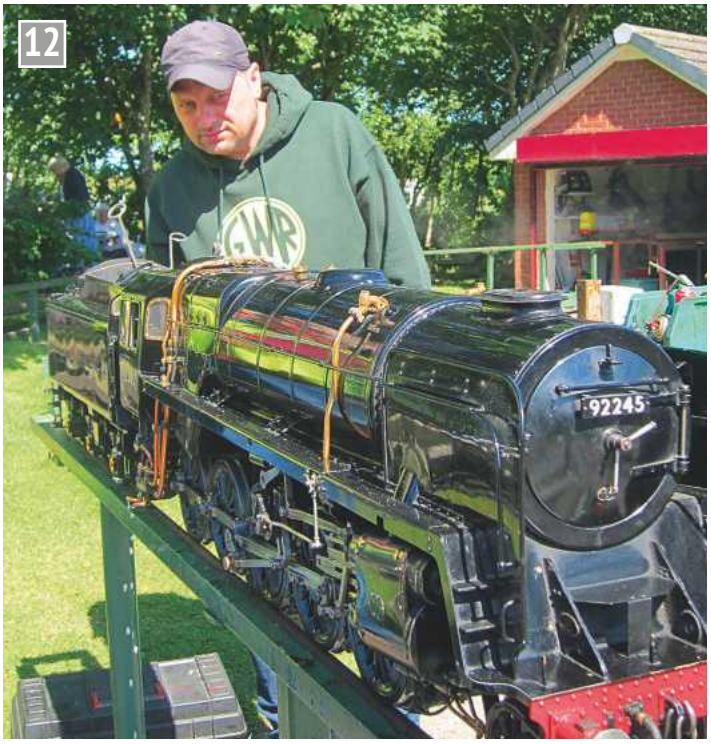
Billy Stock raises steam.

at an Olympia MEX. Tim came across some difficult conditions on the tightest bends where the worst of the gradients peaks and had to drop off two of his 18 passengers. He subsequently dropped off another two, then another three leaving 11 passengers to enjoy the full trip. These were prudent decisions, however, as he completed the half hour putting him in second place on the day. He finally finished in seventh place with an overall recorded efficiency of 1.349% (**photo 9**).

10) Billy Stock: LMS Black 5 (5 inch gauge)
Billy Stock from Urmston DMES was next to go with a very fine 5 inch gauge Black 5 owned by Barrie Purslow of Warrington **(photo 10).** This locomotive was started in 1948 and almost completed 25 years later, by Mr. H. W. Holmes of London. After almost 40 years on static display it was purchased by Barrie in 2012 and has undergone considerable refurbishment, gaining some additional detailing and stainless steel radiant superheaters, although the engine had been scratch built to a very high standard initially. It is a slide valve engine but it had been the builder's intention to also make and fit a set of piston valves in order to make scientific comparisons by means of his own indicator apparatus. Billy made an unsteady start, having to stop due to injector trouble during the third lap. Quickly cured, he set back to the club house and restarted his run. He later dropped off three of his 11 passengers and chose to end the run after just over 25 minutes. He used only 1.5 lbs of coal and achieved a good efficiency of 1.299% which gave him eighth place overall.

11) Jason Pattinson: BR Britannia (5 inch gauge)
From Sale Area MES came Jason Pattinson with the first of three Britannias in the competition, this one being 70049 *Solway Firth* complete with handsome,

Jason Pattinson from Sale ensures he has a good fire before starting.



Urmston's Neil Skellon prepares the engine.

high sided tender **(photo 11).** The locomotive was started in 1979 by David Morris of Urmston - the only Urmston member ever to have won IMLEC - who *almost* completed it before taking up motorcycle restoration and riding, a hobby that almost stole his life! He then concentrated on classic racing cars before returning to model engineering and finally completing this fine engine.

On finishing his run Jason said that he regretted not taking more than the 16 passengers he opted for - the run having been trouble free and very steady. His coal consumption was just under 2 lbs and his final place was third in the table. Who knows - one more passenger and he just might have been a place or two higher!

12) Neil Skellon: BR Std Class 9F (5 inch gauge)
Urmston's second competitor was next to go as Neil Skellon set off with the first of three 9Fs to compete **(photo 12).** Neil finished third in the 2011 competition at Bromsgrove where he elected to take an optimistic six passengers - which speaks volumes about the track and conditions

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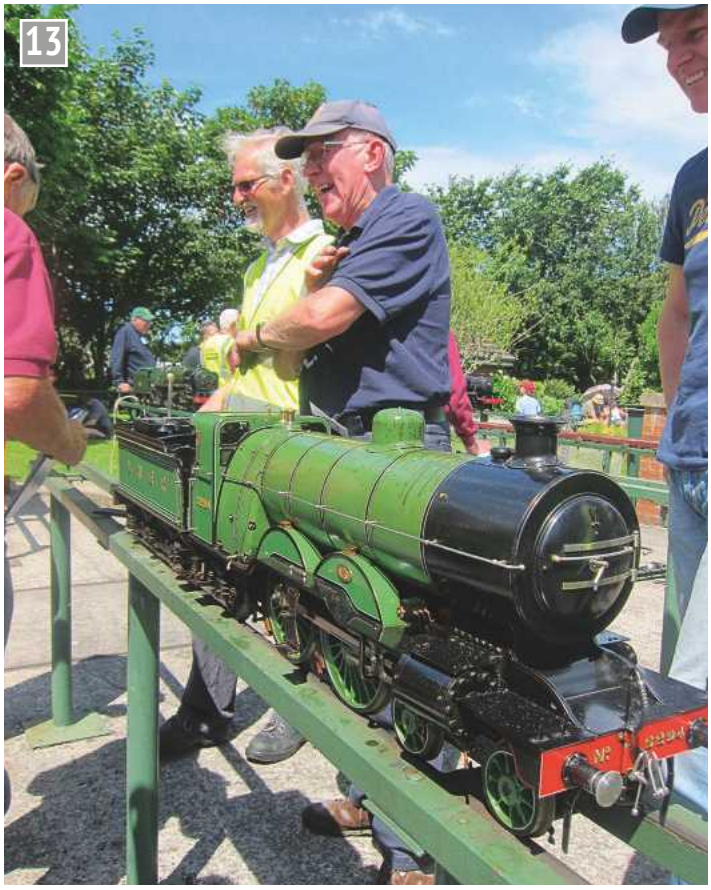


Adrian Hinchcliffe is relieved after completing a very successful run - and has no doubts about the lubricator!

David Kerry (who is probably smiling) heads into the Southport sunshine.

A basking Swan.

experienced that year! Here at sunny Southport, however, he set off with a load of 17 and achieved a good work done figure - the second highest of the competition - that would have been even higher with one or two more. The driver's decision about passenger numbers is a significant element of the competition and one that possibly gives the later runners an advantage - or, there again, may tempt them towards a fall! Well, 17 was comfortable for the 9F in these conditions and Neil was sitting mid-table by the end of the day.

13) Adrian Hinchcliffe: GNR Atlantic (3½ inch gauge)
Sandwiched between two big engines, the first of only two 3½ inch gauge locomotives entered came next. Adrian Hinchcliffe from Leyland built this lovely little GN Atlantic 32 years ago. It won a Silver Medal at the 1985 Model Engineer Exhibition and competed in IMLEC at Nottingham in 2015 where it finished 25th after Adrian threw off all his passengers due to shortage of steam. There was no such disembarkation to be seen this time however (well, maybe just one on the second lap). Adrian had a cracking run; burning under a pound of coal - the least of all - he kept up a good speed throughout and returned an efficiency of a fraction under 1.5% which put him in third place on the day and fifth place overall (**photo 13).** A great result for a little (if somewhat modified) Maisie. I spoke with Adrian after his run and he puts his success down to this engine's balanced valves and 'Rum valve gear' (he said). Hmm … that's a new one on me - but must be of Lancastrian origin. The engine was running with a Rosebud grate this year which may have contributed to the economical use of coal, as would some recent work on the drafting.

I spoke with Adrian after his run and he puts his success down to this engine's balanced valves and 'Rum valve gear' (he said). Hmm … that's a new one on me - but must be of Lancastrian origin.

14) David Kerry: BR Std 9F (5 inch gauge)
Next came the second 9F; David Kerry making his fourth attempt at the IMLEC title. David, from Chesterfield, had spent 15 years on this locomotive, completing it in 2013. He came fifth at Nottingham in 2015 but 'slipped' to 14th on Urmston's heavily graded track last year. He was hoping for a better result this time. Possibly deciding to go one better than Neil Skellon, David decided to take 18 passengers and they gave him no trouble at all (**photo 14).** After a bit of a battle with one injector, however, he covered rather less distance, possibly due to poorer steaming (David feels the tubes are a little too big and there are too few of them) and the recorded drawbar horsepower was a little down on Neil's but the two finished only two places apart, David being 14th at the end of play.

Long time IMLEC supporter, **Keith Tilbury w**as supposed to be next but, sadly, was unable to attend. There then followed a slight alteration to the published running order as Karen Howard, having been brought forward by half an hour, was caught at the start line with a black fire that she was unable to revive so she returned to the steaming bay and Roger Holland stepped into the gap. This gives me a golden opportunity, however, to slip in an extra photo and who could resisit this beauty, basking in the sunshine **(photo 15)?**

16) Karen Howard: Hielan Lassie

To maintain consistency with the results table, though, I will describe Karen's run first.

Karen, from Tonbridge MES, has entered her 3½ inch gauge Hielan Lassie, *Ghillie Dhu* several times (**photo 16).** Karen had left the steaming bays the first time with only a charcoal fire which died on her as she tied onto the train, leaving her with no option but to return to the bay. On leaving the second time she made sure that the same thing would not happen again and had a roaring coal fire at the start. This possibly resulted in a higher than realistic figure for her coal consumption which, together with some dubiety over the last lap and whether she had time to complete it (a driver may choose to go for a final lap if passing the start/finish line *before* 30 minutes running time and Karen was dead on the 30-minute line) contributed to a finishing place in the bottom quarter. Karen is ever cheerful, though, and thoroughly enjoys her time at IMLEC. She was introduced to this wonderful hobby by her father who was a lifelong Southern Railwayman - and always wears his jacket whilst competing.

17) Roger Holland: LNER/ER A4 Pacific

Following next was another from the Chesterfield camp. Roger Holland has also competed four times with his splendid LNER/ER A4, *Wild Swan* built over a period of four years, largely, to Michael Breeze's drawings. The six coupled wheels were the only castings used; a lot of swarf was created during the build as components were hacked out of the solid and many parts were fabricated - and the result is a lovely thing! Roger admits that this engine is rather 'hungry' but he took 18 passengers so it was never going to be light on coal consumption. I did notice, however, that he tends to drive it 'well down the link' but he keeps going and at a good speed too (**photo 17).** With an efficiency figure of 1.268 his finishing position was ninth in the table.

Karen Howard with observer, Rod Ainsworth.

18) Karl Midgley: BR Britannia (5 inch gauge)

The last run on Saturday was by Karl Midgley, another IMLEC stalwart entering for the 13th time! Karl had travelled with his uncle and mentor, Ben Healey, all the way from Gravesend and it was a particularly poignant occasion for Karl as this was the first time he would be driving his own locomotive (**photo 18).** Karl had been given this part built Britannia by the family of a member of the Manx Model Engineering Society who had sadly passed away at a young age and Karl has spent the last 14 years aiming to maintain the same standard of workmanship as had been started. The choice of colour is Karl's own and I have to say, unconventional thought it is, this Britannia rather suits blue. Karl took 15 passengers to start but dropped off three part way round. He burned a fraction under three pounds of coal and had a reasonable run but the efficiency of this locomotive didn't compare favourably with the other two 'Brits'. Karl finished in 16th place and I have no doubt whatsoever that he will be back again next year!

●To be continued.

Roger Holland and Wild Swan *taking everything in their stride.*

Karl Midgley makes a confident start with a good load.

Neil Wyatt concludes the construction of his authentic looking, 3½ inch gauge battery electric locomotive with style.

Southam PART 12

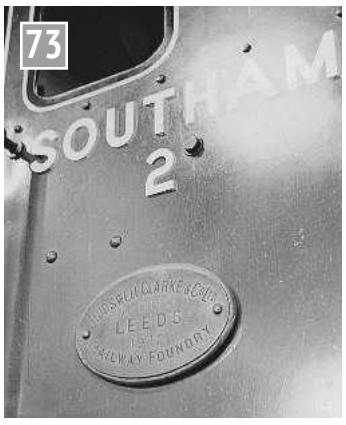
Continued from p.798
M.E. 4561, 26 May 2017

Many model engineers dream of travelling along a model railway behind a locomotive of their own making. Sadly, the cost, time and complexity of even a 3½ inch gauge steam locomotive can be enough to deter many beginners. Well don't give up. In the autumn of 2012 I found myself travelling round the Burton MES's elevated track pulled by my own locomotive, a diesel outline shunter.

Nameplates

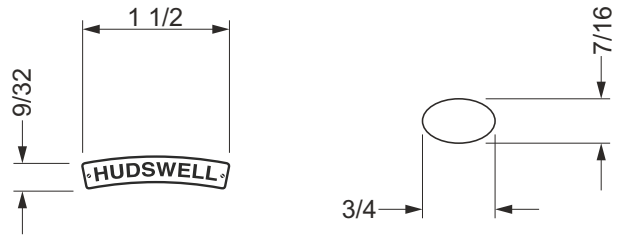
As far as I can discover, all Hudswell Clarke locomotives bore a distinctive oval maker's plate. This was fitted on the left-hand side of the cab in the case of diesels (**photo 72**). On the 1983 picture of D604, the plate, or at least the mark it left, is just visible. The pictures of D625 show this clearly, confirming the size, shape and location (**photo 73**). I found a close up of the plate for Locomotive No. 1704, made in 1938. With some judicious copying of numbers and letters and the rotation of a 9 into a 6, I was able to produce what is, I hope, an accurate facsimile of the original plate (**fig 80**). **Photograph 74** is a 'negative' you can use to etch your own plate. I used a photo-etch process (as used for printed circuit boards) to make my nameplate (**photos 75** and **76**) as electronics is one of my hobbies. As this requires some specialist equipment,

A Hudswell Clarke maker's plate.



The maker's plate fitted to Southam 2.

Fig 80



Maker's Plates
Mat'l: 1/16in brass, photo etched

I suggest you either buy in etched plates, or check out other simpler ways of home etching such as 'press-n-peel'.

Similarly, I used the tidied up artwork in **photo 77** to produce the larger 'Hudswell' plate that adorns the front of the locomotive. Screw heads are etched into both plates so they can be fitted into place with epoxy adhesive.

A 'negative' of Southam's maker's plate.

The two plates ready for etching.

The etched nameplate.

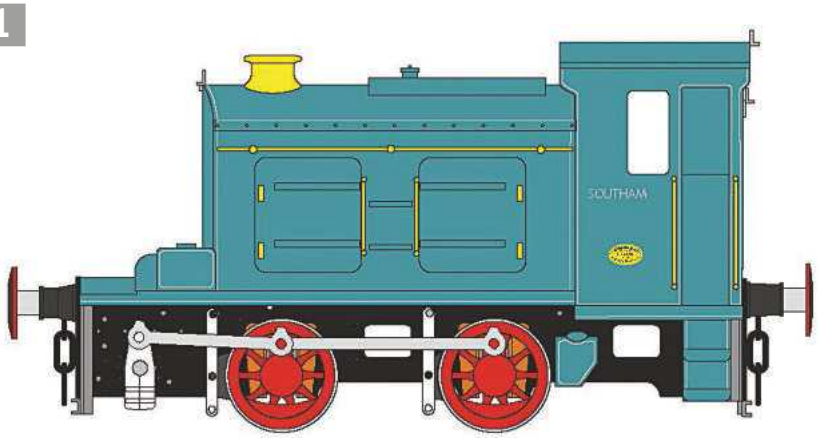
Artwork for the locomotive's Hudswell plate.

Painting

The maroon colour of Southam in the pub car park was far from its original colour. Pictures of it in a Coventry scrapyard show it as a faded blue-green 'petrol' colour, which is shared by D629 at Armley Mills. It is hard to know the true shade that Southam was originally painted in, as it is clearly heavily sunlight faded. My judgement is that the original colour was more likely to have been a true blue of some sort but it may have been a stronger blue green (**fig 81**). The frames appear to have always been black, though the wheels are likely to have been red. The photo of *Southam* in a scrapyard, if processed hard, has the hints of 'wasp stripes' on the rear buffer beam and a photo of *Southam 2* confirms it has wasp-striped buffer beams, so my colour scheme is correct, except that the blue should probably be rather paler and perhaps greener.

I read Chris Vines' excellent book, *How (Not) to Paint a Locomotive* which my wife gave me as a birthday present. Unfortunately, my meagre patience made it clear that I would rather get the locomotive up and running than go for the gold-medal winning long haul! I went for painting the locomotive using aerosol spray paint. I used a standard primer for steel parts and adhesion primer for the brass, finished with automotive colours. My slightly shaky hand-lining was done with a 'paint pen' and everything was sealed with a clear lacquer which had the effect of making the whole model look like a toy (**photo 78**). I rescued the situation with matt lacquer, which darkened the blue paint but made the model look considerably more 'real' (**photo 79**).

Fig 81



Hudswell Clarke No. D604, *Southam*
Suggested Painting Scheme

Variations on a theme

I have already mentioned that as well as D604, *Southam*, there are several similar prototypes, any of which could be easily represented with essentially cosmetic changes to the model. Please note that the sketches (**fig 82**) and notes below have been compiled from a limited number of photographs; I suggest you do your own research if you wish to model one of the other prototypes.

Looking toy-like in shiny paint.

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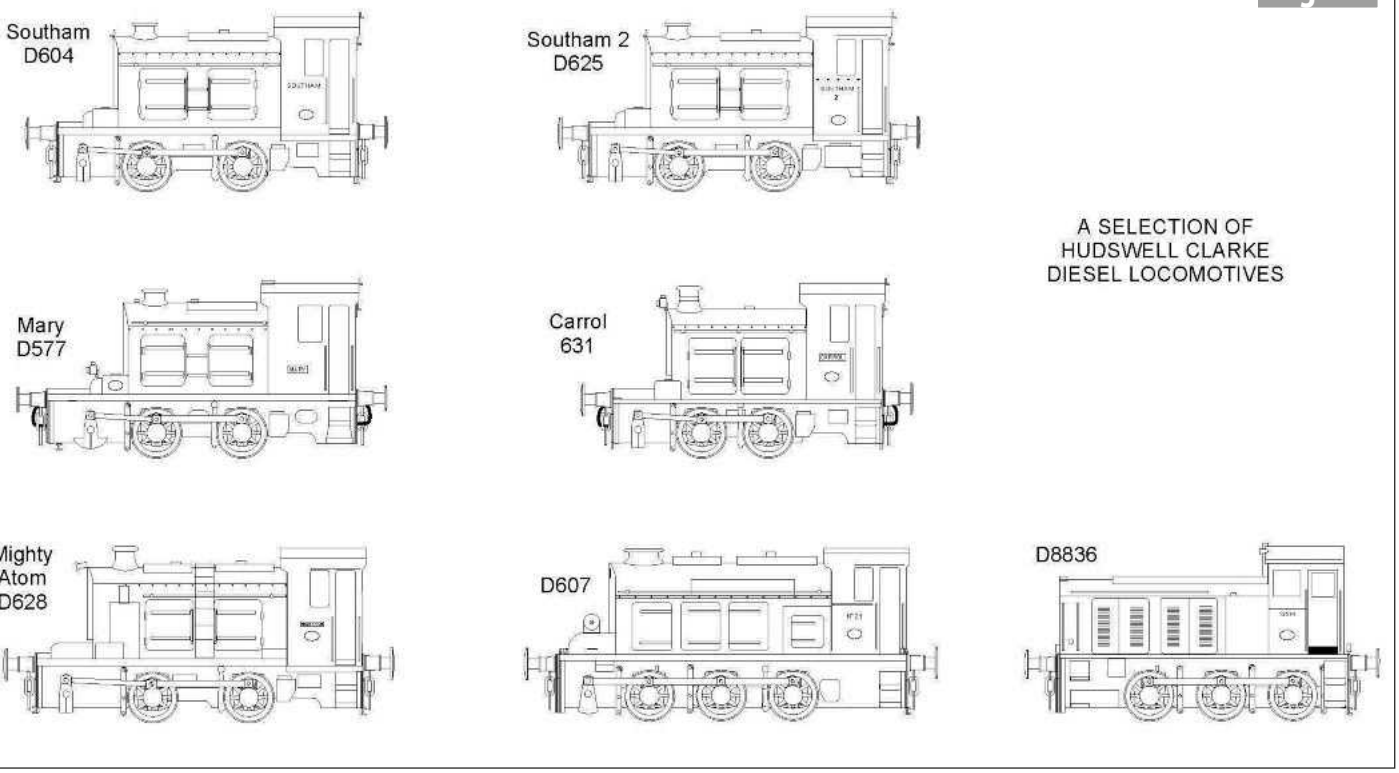
Fig 82



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A more realistic appearance thanks to matt varnish.

You will notice that the bonnet length and wheel base of the engines is rather variable. This is because of Hudswell Clarke's use of a 'modular' diesel engine design where a longer bonnet means more cylinders!

Southam 2

Hudswell Clarke D625, *Southam 2* is D604's sister engine from the Long Itchington cement works. It is now quietly fading at Armley Mills, hopefully awaiting restoration. It is very similar to D604, despite being built rather later in 1942 but there appear to be detail differences:

The side valances appear to be of a shallow 'I' or 'U' section – you could mill a 1/16 inch groove in a suitable strip to simulate this. There is a cylindrical tank (of unknown purpose and not seen on other engines) beneath the left-hand side of the cab to the rear of the sanding box and tucking behind the steps. It could be a fuel tank – the location of the fuel tanks on the other engines isn't obvious. Probably a 7/8 inch tube could be the basis of this tank.

There are five very prominent rivets across the cab side below the side window. On an old photo of D604 a few smaller rivets appear to be present but they are not visible from the time it was laid up. There appear to be vertical handrails on the side panels at the front. Instead of the pronounced rain channels above the bend in the roof, there is a much smaller rain channel immediately above the door and window on each side of the cab, not extending forward of the window.

There may be other detail differences but the photos I have show only part of the left hand side of the locomotive. It is easier to appreciate the lining out (in white) of these two locomotives from the pictures of *Southam 2*.

Mary

Hudswell Clarke D577 is preserved at the Warrington Railway and there are some excellent pictures of this well restored shunter on the Internet.

The front buffer beam is bolted in place (use 10BA screws), not riveted. My best picture of the front of *Southam* shows round headed rivets but other Hudswell Clarke engines I can find good pictures of have hex-headed bolts.

The crank centreline is about ½ inch further ahead of the leading axle and the frames as a whole need to be about 1 inch longer. The cranks have a 'hammerhead' shape to balance the longer connecting rod. The platform in front of the hydraulic gear cover is longer and the front of the cover is in line with the cranks.

There is no step in the running board and the door is correspondingly less tall. The forward sandboxes are circular, not a rectangular shape. The front lamp iron is on the hydraulic gear cover, not on the bonnet. The radiator has square 'gauze' intake (which may not be original) with a 'HUDSWELL' plate above it.

The bottom step is wider than the top step and the steps and door are a little further ahead of the rear stretcher. The buffer pads are still exceptionally large but are 'cut off' top and bottom to give a near oval shape. *Mary* is fitted with vacuum brakes.

Finally, *Mary* does not presently have a guard beam below the rear buffer beam but has an I-shaped guard beam set a short way back from the front buffer beam.

Carrol

Carrol, D631 of 1946, is *Mary's* sister engine at the Middleton Railway. I have one good picture of this engine and it has its own distinguishing features. The biggest difference is that *Carrol* appears to be much shorter – I understand the Hudswell Clarke diesel engine design was modular and could have different numbers of cylinders and this would be reflected by a shorter bonnet and wheelbase.

Carrol has flat running boards and the cab appears slightly taller than *Southam* to compensate. The rain channels are the full length of the cab and lie just above the window and doors. Unlike all other examples I can find, the bonnet top does not have a raised ventilation plate on it.

The radiator grille appears to have been pierced using the same equipment as used for *Southam* but in a different pattern. There is no raised cover for the hydraulic gearbox, just the small access hatch and what appear to be two low boxes behind the buffers. The chimney is quite tall (like *Mighty Atom*) and appears to be in two sections joined by a very short length of plain pipe. A forward facing horn is on the cab front and a flexible hose on the buffer beam shows that it has vacuum brake gear fitted. The bonnet door handles are plain, bent bars and the stand-offs for the handrails are plain cylinders, not decorative stanchions.

Carrol does not have guard beams but the front buffer beam is extended downwards at roughly rail width to leave a very small gap between itself and the railhead.

Mighty Atom

Mighty Atom is preserved at Harwell, numbered D628 and built in 1943. It is similar in appearance to *Southam* and *Southam 2* but like *Mary* it has flat running boards and no front sand boxes. There is a large, near semi-circular cover on the right front part of the engine housing, presumably some sort of air filter or cooler. The bonnet doors may be moved backwards to allow for this.

The chimney is taller, a ladder replaces the two steps on the right of the engine housing and there are tool boxes ahead of the cab. There are two top covers, instead of one. The front lamp is replaced by a horn – no lamp irons are visible. On the running boards there are rectangular toolboxes, just ahead of the cab. The hydraulic gearbox cover is lower but extends much further forwards so it has a large flat surface on top. It has no guard irons.

D707

D707 is, at first sight, very different from the others; it is an 0-6-0 engine that was flame-proofed to work at an oil refinery and is now at the Rutland Railway. A close inspection reveals it is essentially just a stretched version with an extra axle. One feature of note is a pair of headlamps set between 'HUDS' and 'WELL' of the front nameplate. I won't go through the other detail differences but the sketch gives the idea how the basic Hudswell pattern is applied. This engine would make a sizeable and powerful option for a 7¼ inch engine and may well be my next project!

Other engines

Even well into the 1950s the basic Hudswell Clarke construction adopted in the 1930s was still being used. The buffer stocks, the construction of the frames and buffer beams and the coupling hooks appear to be identical. The wheels still have ten spokes but have a smaller counterweight. The distinctive chimneys disappeared, together with the jackshaft and the bonnet and cab became less elegant and more modern in appearance. The rough sketch of D8836 gives the general idea. Even so, the general principles behind D604 can still be applied. ME

If you would like to make your own working locomotive but have been put off by cost and complexity, Neil hopes you will be inspired to consider one of these Hudswell Clarke diesel shunters as a prototype. The satisfaction of seeing your own locomotive on the rails is tremendous (photo 14). If you have any questions or comments, please post them on the Model Engineer web forum – Neil regularly visits the forums and it is a useful way to ensure any corrections, clarifications or good ideas are widely shared.

Rescaling Moving Coil Meters

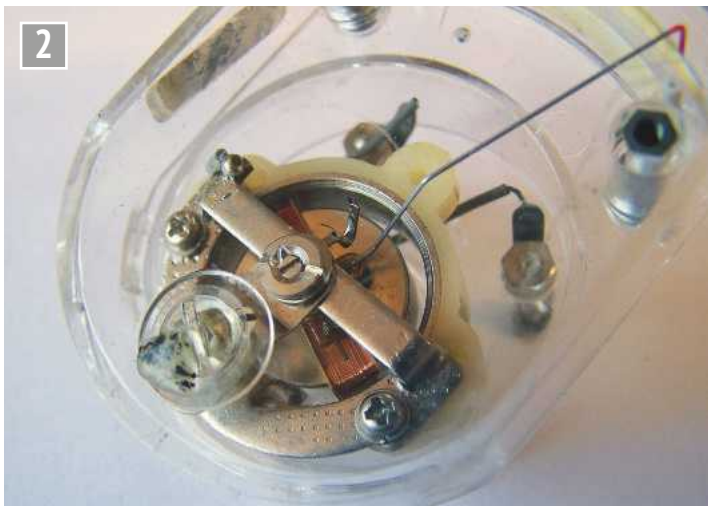
Graham Astbury describes a way of changing the scales and sensitivity of these instruments.

Introduction

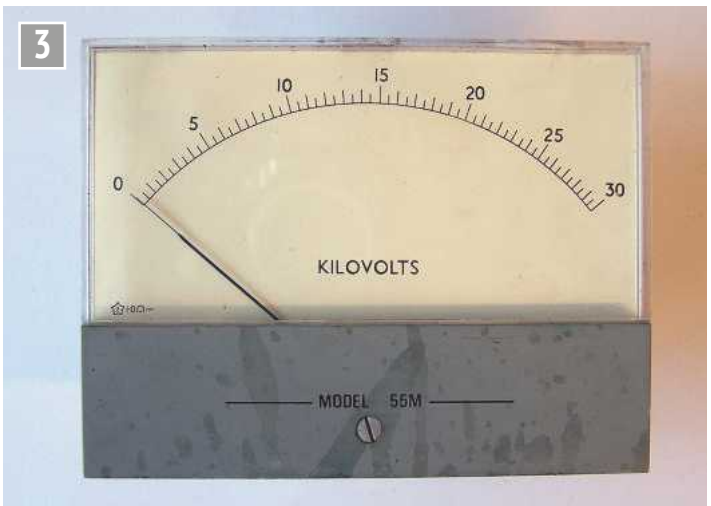
Years ago, a friend of mine gave me a couple of small moving coil meters because, in his words, they were 'all back to front' – well he didn't say that exactly but our Editor would not print what he actually did say. As can be seen in **photo 1** the pointer rests at the right hand end of the scale but the graduations go from the left hand end. Also, there was not any marking on the face or the case as to what the full-scale current was. He thought that I could make use of them so I put them into my 'stores' thinking that they would come in useful one day. Last month, some thirty-odd years on, I did finally have a use for one of them.

These moving coil meters are sometimes known as d'Arsonval meters (no, not Arsenal – that's a London football club) and are quite often available from old equipment as more modern equipment has digital displays. The essential feature of this type of meter is that it has a *linear* scale and usually has quite a sensitive movement which may be rated commonly anywhere between 50µA and 100mA. I have another salvaged meter in which the moving coil can be seen as the copper wire of the coil in **photo 2**. As the connections to the coil are via the hair-springs this type of meter cannot be used for high currents (unfortunately the hair springs are not really visible in this photograph). Sometimes meters do not have the sensitivity that they would seem to have. For example, a meter may show a DC current of perhaps 3 or 5 amps but this will almost certainly have an internal shunt to pass most of the current, with just a little passing through the sensitive hair springs and coil of the meter. You can find this out by opening the case of the meter, where there will be a heavy

The 'back to front' meter.



A moving coil meter showing the coil.



100 microamp meter, which has external resistors to read 30kV.

wire between the terminals forming a shunt for the current. Similarly, voltmeters may have internal or external resistors to make them read the calibrated scale. As an example, the meter in **photo 3** is not a 30kV meter movement; it is 100µA, as it says so on the back, and has external series resistors totalling 300MΩ (megohms or millions of ohms) mounted on the back to give it the calibration required.

The new meters

As I am just starting to build a 7¼ inch gauge battery electric locomotive I realised that both a voltmeter and an ammeter would be useful instruments to fit to the control panel. The small, 40mm diameter meter in photo 1 would make a good voltmeter and in the 'stores' I had a 240 degree 10mA panel meter (**photo 4**) which I thought could be recalibrated to read up to 100 amps. Note that these meters are almost always 240 degree movements, despite their being described commonly as 270 degree movements. The motor that I was using, a Sinclair C5 motor, had a full-load running current of 29 amps and a stall current of around 120 amps or so. The 240 degree meter was scaled 0 to 10 and 0 to 30 but it would be relatively simple to rescale it to read just 10 rather than have the dual markings. The meter would normally show about 29 amps or 2.9 on the graduations as this is the full-load motor current but short-term overloads would be acceptable as they would only occur when pulling away from the station.

One essential thing to remember is that moving coil meters cannot be made more sensitive than their original calibration – only less sensitive. As an example, a 1mA meter can be made to have a full-scale deflection greater than 1mA but not less. In this article I am only considering direct current meters, not alternating current ones, which would take another article to explain.

The 240 degree movement meter.

A typical 52mm diameter automotive instrument.

The instrument the 'right way round'.

'Standard' resistance decade box and my own-built ones.

For those who think that a digital panel meter may be better, there can be problems when using a pulse-width modulated controller in that an analogue meter will always read the mean current, whereas a digital meter may not read at all accurately so is best avoided. The reason for this is complex and depends on the way that each particular digital meter works.

The Voltmeter

Although this meter was 'back to front' rotating it through 180 degrees would make it have the scale at the bottom with the pointer pivot at the top. This would make the meter look a little more like a typical automotive instrument (**photo 5**) in that the pointer would be at the left hand end and move to the right (**photo 6**). It would then need a new face with appropriate calibration marks on it. As I had no idea of the sensitivity of this meter, the first test was to establish its full-scale deflection.

With such meters it is best to test and measure their characteristics using a carefully thought out and logical method. I have a 'Laboratory Standard' resistance decade box which can be set to any value between 0.1 ohms and one million ohms using rotary switches. The decade box is shown in **photo 7** along with a pair of self-built ones. I built the two decade boxes using rotary switches and 1% metal oxide resistors. These decade boxes are well worth making as they are quite useful – not only for meter measurements but also for use in a Wheatstone Bridge for measuring resistances of anything from a million ohms (1MΩ) down to 1/10 ohm with an accuracy the same as the accuracy of the resistors themselves i.e. ±1%. I obtained the Laboratory Standard one from a skip as it was being thrown out because one resistor in the box had burned out creating a gap in the 100 ohms decade.

Using the decade box, with the resistance set at 1 megohm, I connected the meter in series with an AVO meter set to the DC current range, the decade box and a 12 volt battery supply. I have an ageing 12 volt car battery wired through a circuit breaker connected to 12 volt outlets and terminals adjacent to the bench in the workshop so testing low voltage DC equipment is straightforward. I then reduced the resistance down 100kΩ at a time until the meter started to read. By adjusting the other decades until the meter read just full scale, the series resistance could be determined and the current through the meter established by using Ohms Law. The AVO meter provides a check that the calculated current is the same as the actual current. If doing this for the first time make sure that you never set the resistance down to the zero setting as that would connect the meter directly to the DC source and overload it. The series resistance to obtain full scale worked out at 2400 ohms, with the decade box set to 2 x 1kΩ plus 4 x 100Ω. Ohms Law states that the current is the voltage divided by the resistance, so the current is therefore:

$$i = \frac{V}{R} = \frac{12}{2400} = 0.005A \text{ or 5 milliamps}$$

where *i* is the current, *V* is the voltage and *R* is the resistance.

●To be continued.

Ferrabee Pillar Engine, 1862

PART 5

Anthony Mount continues his new construction series; an unusual stationary steam engine.

Continued from p.222
M.E. 4566, 4 August 2017

I was looking through some old technical books and came across an engine exhibited at the International Exhibition of 1862 (not to be confused with the Great Exhibition of 1851); I rather liked the look of it, thinking it would make an attractive model.

Slide valve

The slide valve (**part 10** and **fig 12**), though quite small, requires a lot of machining - all of it on the milling machine. Start by machining a block of brass to the overall dimensions, then mill out the bottom cavity. Set the slide stops on the table and machine the cavity undersize. Measure the amount left all round and carefully bring the border to finished size.

Turn over and grip the block in the machine vice by the sides whilst it rests on parallels, and put in the central longitudinal slot. Turn through 90 degrees and put in the other slot. Re-clamp in the machine vice with the bottom face and top between the jaws and then one side at a time put in the side rebates. A piece of sacrificial waste material can be interposed between the valve top and the vice jaw so that the cutter does not run into the hardened vice jaw.

Valve rod

For the valve rod (**part 11** and fig 12) a length of 2.5mm diameter stainless steel can be used threaded 7BA each end.

Slide valve nut

The slide valve nut (**part 12** and fig 12) is just a scrap of brass a sliding fit in the valve, and drilled and tapped for the valve rod. The tapped hole needs to be square to the face so as not to tilt the valve.

Piston

For the piston (**part 13** and fig 12) gunmetal or cast iron can be used, depending on your cylinder material, and is turned a close fit in the cylinder. Drill, tap and counterbore for the piston rod. Machine in a groove for the piston packing and part off; reverse in the chuck and face off the other side. The packing can be the traditional graphited yarn, PTFE impregnated yarn or an O-ring.

Piston rod

A length of 5mm stainless steel rod is used for the piston rod (**part 14** and fig 12) and is threaded each end M5.

Crosshead clevis

A clevis or fork (**part 15**) is required on the end of the piston rod to take the end of the connecting rod. Start with a piece of 12mm square mild steel bar and face off the end square in the lathe. Change to the milling machine and mill the 11.5 x 10mm section on one end. Cross drill and ream the 4mm diameter hole and then, with a slitting saw, machine in the slot. As it is 8mm wide I expect you will need to do it in a series of stages depending in the thickness of your slitting saw. At this stage the end of the fork can be rounded either free hand with the file or by using a filing button.

Return the bar to the four jaw chuck in the lathe and drill down and thread M5 for the piston rod. The next operation is to machine the front parallel section and to form the bead, then part off.

Little end pin

The little end pin (**part 16**) is quite long as it passes through the clevis and crosshead; it is threaded on the end to retain it in place with a nut.

Crankpin

For the size of the engine the crankpin (**part 17**) is quite small. A plain turning job, it can be Loctited into the crank.

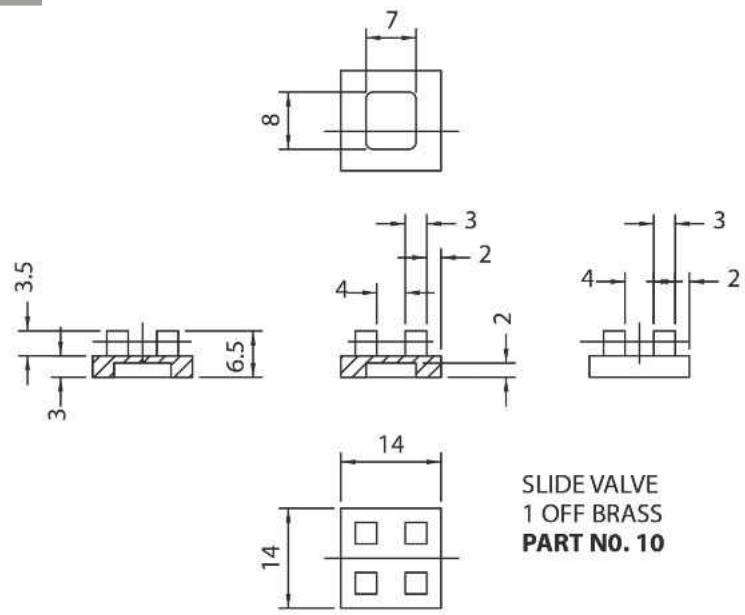
Crosshead

I would suggest cast iron for the crosshead as it is running on mild steel. Machine up a length of bar to 25mm square and set up in the four jaw chuck. Turn down the boss and drill and ream the central hole.

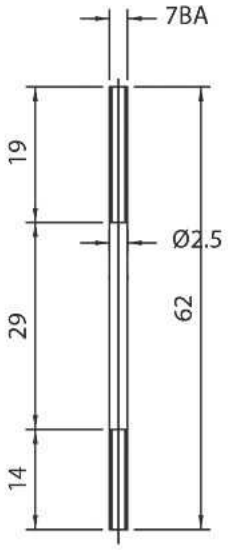
Rather than try and part off a square section, I suggest it is sawn off and then milled to thickness in the machine vice. Turn over and machine in the two rebates with an end mill. Remove all sharp edges with a few strokes of a fine file.

●To be continued.

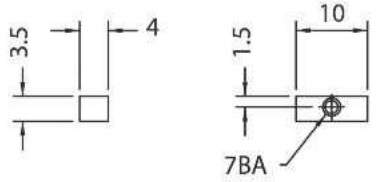
Fig 12



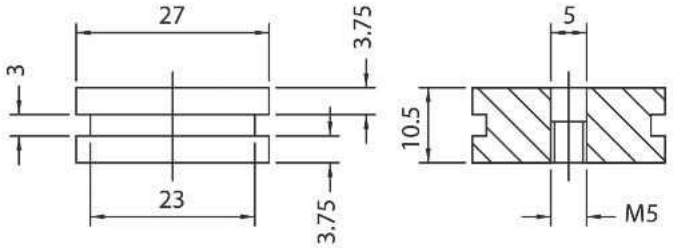
SLIDE VALVE
1 OFF BRASS
PART N0. 10

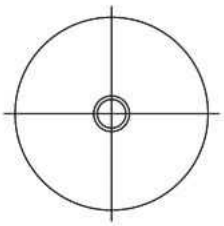


VALVE ROD
1 OFF STAINLESS STEEL
PART N0. 11

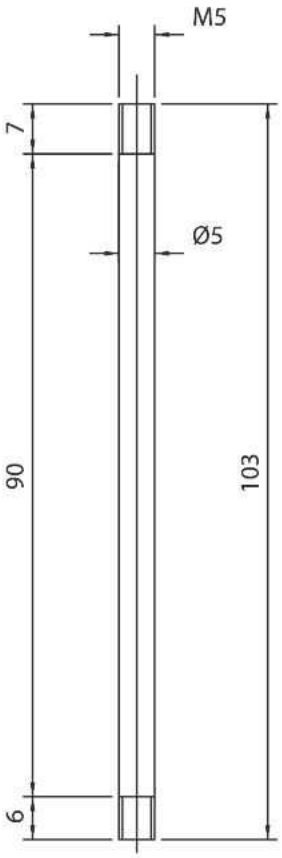


SLIDE VALVE NUT
1 OFF BRASS
PART No. 12





PISTON
1 OFF BRASS
PART No. 13



PISTON ROD
1 OFF STAINLESS STEEL
PART No. 14

FERRABEE'S COLUMN ENGINE 1862	FIRST ANGLE PROJECTION	Historic Engines South West
SLIDE VALVE	DRG NO 12 / REV'	
	SCALE 1:1 / DATE 22-06-13	
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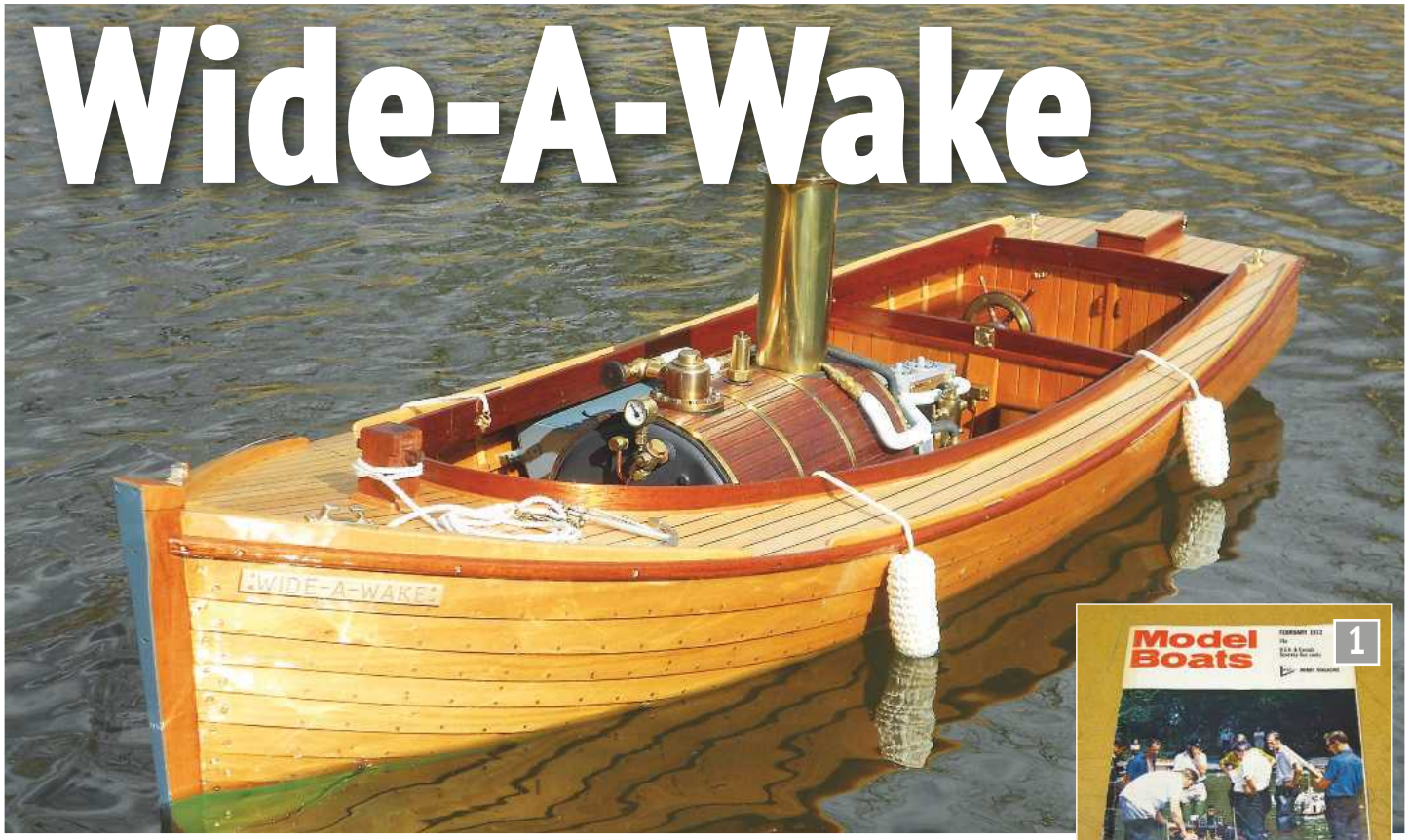
Wide-A-Wake



The completed steam launch, Wide-A-Wake.

The original Feb 1972 issue of Model Boat *magazine.*

Ramon Wilson introduces his new series with a look back to his early days of model engineering and his inspiration.

Wide-A-Wake **is a 2 inch scale model of a clinker built steam launch that plied the waters of Lough Erne in Ireland at the turn of the 19th Century. The model, designed by H. Croker and built in similar fashion to the full size, is powered by a Stuart Turner Double Ten engine and was first featured in the February 1972 issue of** ***Model Boats*** **magazine.**

Within a few days of his twenty-seventh birthday, when that latest issue dropped through the letterbox in the January of 1972, little did your writer realise that what was contained within would prove to have a profound effect not only on his modelling interests for many years to come but also on his working life - a catalyst for change indeed. Many years have passed since that first passionate interest but, unlike many other well considered projects over that time, often sadly to be neglected, the *Wide-A-Wake* had always held a special place, held steadfastly in reserve, some day to be resurrected.

Currently it's mid October 2016 and nearly forty-five years after that moment of turning the page to find the building of this enchanting model described and the immediate desire to do likewise. The attraction was immediate and something that, despite an obvious lack of skill at the time, provoked a powerful desire to try and emulate (**photos 1** and **2**).

Despite that intense initial desire, it's taken a long time to take that first real meaningful step but after some three years of a very enjoyable project, finally it has reached fruition. This is an account of that journey; I hope you will enjoy the tale.

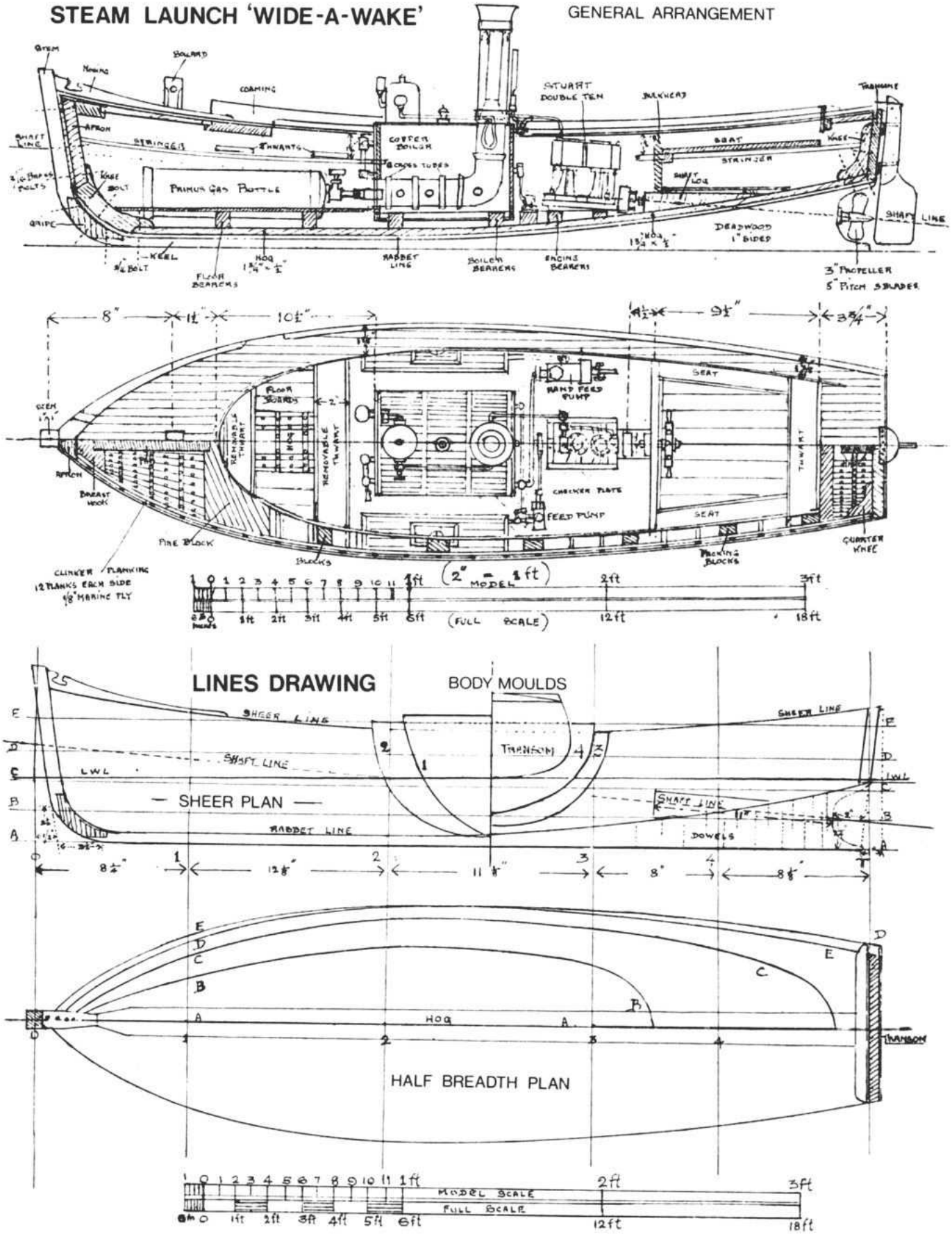
At that time in 1972 a short foray into model boating from the usual dedicated approach to aeromodelling was happening. With no understanding or any real awareness of 'Model Engineering' then this project was to require a degree of input way beyond the skill and resources available at that time but that attraction to try to do likewise far outweighed any reservations.

Unlike most model boat designs of the time, no full size drawings were available - just the general arrangement as shown in **fig 1** and the 'Table of Offsets' in **fig 2**. From the latter however - in fact as per the full size practice - a set of forms or 'moulds' could be developed over which the hull would be

The article's illustration that began it all.

Fig 1

FEBRUARY 1972



57

formed. The lines were drawn out full scale on a large sheet of paper in order to ascertain the shape of the keel and stem parts but were subsequently little referred to during the actual build.

With no means nor knowledge of how to make an engine, one was sought by the usual means at that time – from the local phone box armed with a handful of two bob bits (10p's) and by ringing all the advertisers in *Model Boats* magazine in turn, finally to locate one on the other side of the country at 'Roland Scotts of Bolton'. A deal was done and it duly arrived. It appeared well made and to the untrained eye seemed (and later proved) mechanically sound but it was, however, painted in the most lurid luminous green. It was stripped and repainted and has remained as such until the recent rebuild (**photo 3**).

A boiler was of course required and the confidence to undertake this was helped by early instruction as an apprentice in silver soldering. With no actual knowledge of pressure vessel requirements at that time, however, the drawings in the article were followed in most part but despite careful soldering it produced a boiler that later exhibited a very small leak on one of the water tubes. With no means to get to the offending inside joint with sufficient heat and repair the leak, no test was able to be applied and this consequently resulted in it acting as nothing more than a volume tank when running the engine on air at the odd show over the following years (**photo 4**).

Undeterred by this early set back, however, the desire to participate in the hobby grew at an ever increasing rate. Whilst the intention to build the boat remained for many a year, the setting up of a small workshop took precedence and as confidence grew, so did ideas, leaving the project somewhat neglected but not forgotten.

'Aided' by copies of *Model Engineer* now coming at twice a month, the first lathe - a Myford ML10 - was bought from Reeves followed by a Fobco bench drill and that was the beginning of many pleasurable years of steadily acquiring equipment and the skills to use such. The ML10 was later replaced with an ML7 and later still, in 1979, that would become a Super 7 which has served me well to this day. Early milling was carried out by using a Rodney milling attachment on the ML7 but its limitations were soon realised and this was traded in for an old but very serviceable Linley mill. Actually, classed as a Jig Borer, this small but solid and accurate machine has had several improvements made to it over the years and has proved, like the Super 7, to be a much used and faithful servant.

Sometime in 2012 a chance walk through a Norwich public park brought my wife and I into contact with the world of sailing RC model yachts. This lead to the purchase of one, then two and since then we have sailed on a weekly basis. Two of the members have steam launches as well and this then proved to be the catalyst for finally tackling a project that had first fired the imagination some forty years earlier.

Assessing the project, it seemed logical to tackle it in four distinct stages. The first, obviously, would be to build the hull. If that was achieved then the boiler would have to have considerable work done to bring it to current standards. If that proved successful the hull could then be fitted out to suit and finally the engine would require a reversing gear making. As it turned out the engine had quite an overhaul. Materials available, obtained so long before, were two 100 x 65mm baulks of Parana pine, a further supply of Parana gleaned from old window sills, a jar full of nails and roves for the plank fixing and a few brass screws. At some stage, the keel had been cut from a hard mahogany like timber, possibly Meranti, and the stem, cut from alder, attached. The 'moulds' or shadows as some refer to them, had also been cut out from 12mm birch ply. With no more ado it was time to make a start.

Fig 2 STEAM LAUNCH 'WIDE-A-WAKE' TABLE OF OFFSETS

ALL HEIGHTS FROM KEEL BASE 'A'

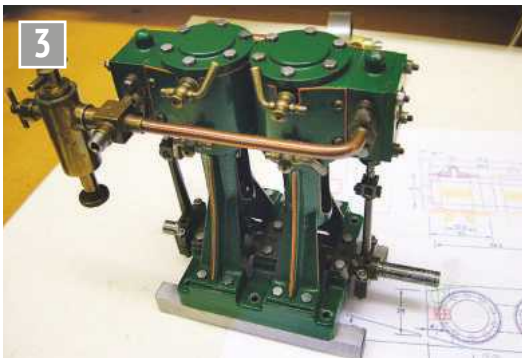
Scale of Model 2 in. = 1 ft.

Use the dimensions below when setting out any drawings.

No. of Stations	0 in.	1 in.	2 in.	3 in.	4 in.	T in.
HEIGHTS						
SHEERLINE	9	7 1/2	7	7 1/8	7 3/8	8 1/8
SHAFT LINE	5 1/2	4 1/2	4	3 1/8	2 1/8	2 1/8
LWL	4	—	—	—	—	4 1/8
RABBET LINE	—	1/8	1/8	1 1/8	2 1/8	4 1/8
STEM HEAD	10 1/4	—	—	—	—	—
HALF-BREADTHS						
WATERLINE B	—	1 3/8	4 3/16	3 7/8	—	—
" C	—	4	6 1/8	5 7/8	4 7/8	—
" D	—	4 1/8	7	6 1/2	5 1/2	4 1/8
" E	—	—	—	—	—	4 3/16
SHEERLINE	—	5 1/4	7 1/8	6 3/8	5 7/8	4 1/8

All breadths to edge of moulds or transom

To build the full-size boat, multiply above figures by 6.



The Stuart Double Ten as acquired and repainted.

The boiler as made in 1972 to the article specs.

Laminating the Hog to the curvature of the keel.

The mild steel jig for drilling the hole for the stern tube

Making a start - the keel

The first tasks were to establish the keel and transom as one and set the moulds out on a straight and even building board. The hull would be built upside down and though not foreseen at the time, in cutting them out sufficient material

had been left on the moulds to allow access from underneath as planking progressed; fortuitous, as it would transpire.

The first thing that became apparent was the need to acquire a new vocabulary; the inner keel, the 'Hog', was laminated from two thicknesses due to the curvature required. Glued together these were clamped to the keel and bench top first to acquire the shape and so prevent any undue stresses (**photo 5**).

Once set, this was glued and screwed to the Keel proper and the shaft log glued and dowelled in place before setting up to drill the long hole for the prop shaft tube. This would require a guide to help maintain the desired angle as well as to keep the drilling in line and a drill jig was made from mild steel and clamped at the correct angle to the keel (**photo 6**).

A long series drill had the end reduced to fit into a carpenter's brace. This allowed a slow but steady approach and after some 225mm or so, emerged with no more than half a millimeter run off (**photos 7** and **8**).

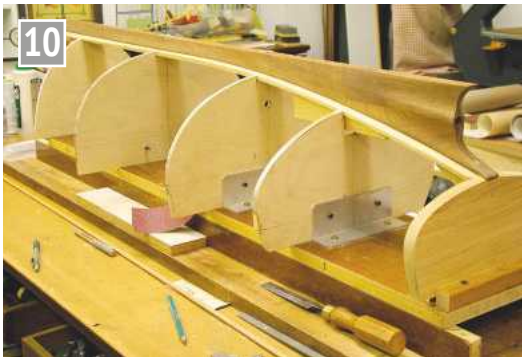
The keel was given a final shaping, the water channels were cut in either side of the prop shaft and it was ready to fit the transom. It was at this stage that the first unknown was reached – how would a transom be made up? Fortunately, close to where I live, there is the Oulton Broad International Boat Building College, an institution well renowned for passing on the skills and traditions of the wooden boat builder. Armed with the magazine and the keel in hand, and with a fair degree of trepidation, I went in search of the answer.

The response to this request could not have been more positive. Not only was the information given freely but an invitation to tour of the workshops to see several examples first hand was offered. The interest shown in my intention was considerable - way beyond expectation - and the visit ended with me being armed with far more information than expected. The only 'cost' of this was to agree to promise to return as the boat progressed.

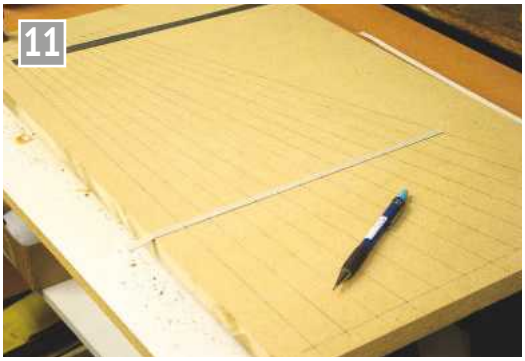
Drilling the hole using a long series drill in a carpenter's brace.

The slow approach paid off in minimal run out.

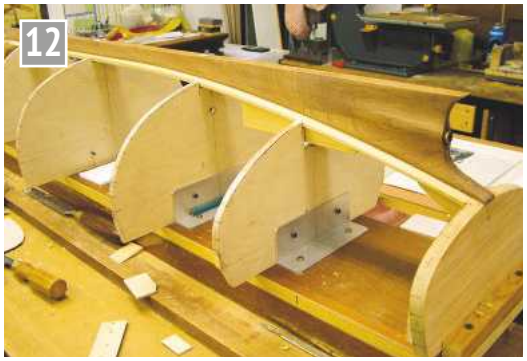
The transom was built from three pieces grooved and keyed together.



The shadows or moulds were faired using a long spline.



The marking board used to ascertain even spaces around each shadow.



Each shadow marking was marked on both sides.

Transom

The transom was made from three pieces of Parana pine grooved and keyed (**photo 9**). Though over scale in thickness, this would give a much better gluing surface and would be totally hidden once finished. Parana pine, a lovely, smooth grained timber to work, was chosen right from the outset to hopefully give that lovely yellowish glow of some full size launches seen. It transpired that it is not a good timber to use externally as it rots easily but given that this boat will never be subjugated to long exposure to water, this factor was overlooked.

Once *in situ* and the transom 'knee' (support) glued and screwed in place, the keel could be set upon the moulds. These had been cut from 12mm ply and were held to the building board by aluminium angles bolted to the board. The keel in turn was bolted through to two of these shadows using 2BA studding screwed into two of the moulds; the holes in the keel would later be plugged (**photo 10**).

The moulds then required to be marked individually for equal plank widths - twelve planks a side. A marking board was drawn with twelve angular lines (**photo 11**) then the length of each mould side was marked on a strip of card before marking this off in twelve equal divisions and these divisions were then transferred to their respective mould (**photo 12**). The planking could now begin.

●To be continued.

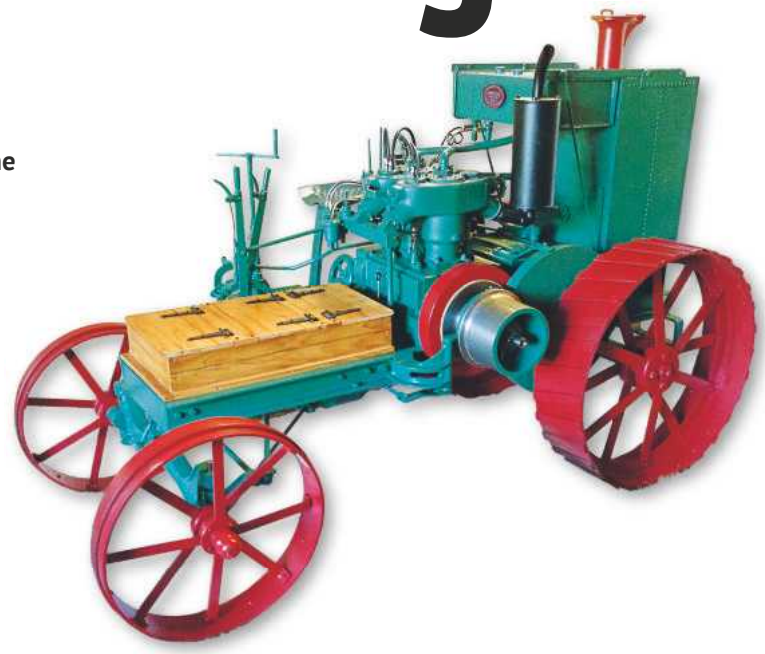
Next time I will describe planking the hull and fitting the ribs.

George Punter makes the engine for his 1913 agricultural tractor.

Saunderson & Mills Tractor Engine

PART 14

Continued from p.116
M.E. 4564, 7 July 2017



In *Model Engineer*, issue 4511 (26 June 2015) I began my description of the building of the chassis of this unusual tractor. Now I shall describe the engine. The engine is the heart of this tractor and is the most complicated part to design and make. This article and the accompanying drawings describe how I did it.

Oil tank

As there is no access point on the engine to fill it with oil, an oil tank is made to fit into the wooden box (**photo 57**). A sight glass is fitted to check oil usage and levels. A control valve in the filler cap takes the form of a long needle that locates into the outlet pipe. When an oil top is required, open the cap and this allows the oil to enter the sump of the engine. The level in the engine is checked with the dip stick.

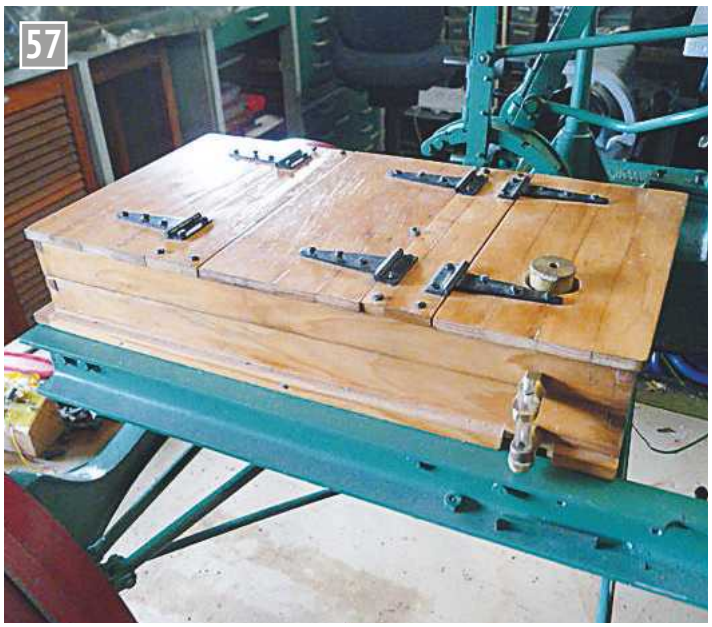
Valves

The valves are made from stainless steel and use an e-clip as a means of retaining the valve spring and collet. I have made a jig that will hold a Dremel onto the tool post of the lathe and I use a small cut off wheel to make the groove for the e-clip. This gives me control of the depth and distance without undue pressure on the valve stem - this process being carried out before the valve is parted off from the base material. The aluminium collets have a recess in the underside to take the e-clips in the closed position.

Detailing

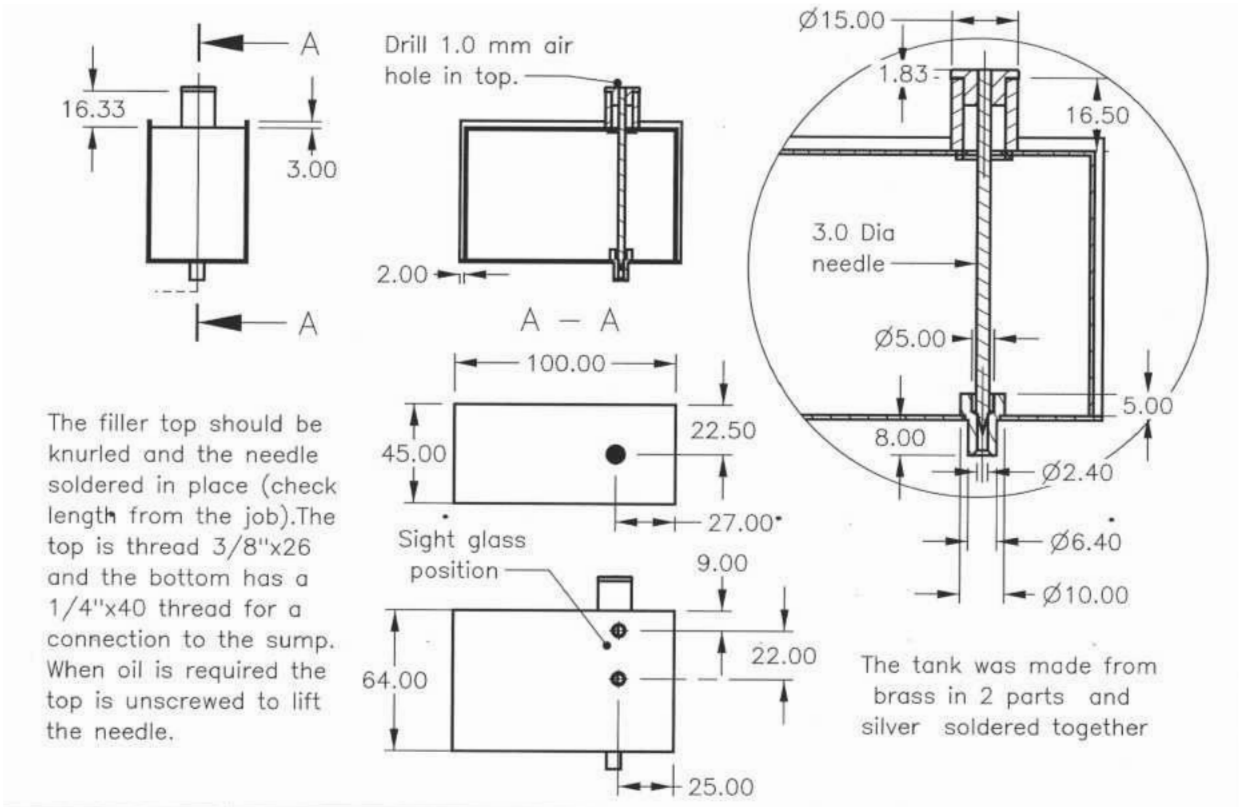
The tank badge (**photos 58** and **59**) was made from cast resin with the mould being made from a 2-pack moulding rubber. Care was taken with the pattern as some of the details are very small.

When the resin was poured into the mould, any air bubbles were removed with the aid of a pin. I made a couple of spare badges and these were later made into lapel badges. The details in drawing 27C are parts that are used to hold

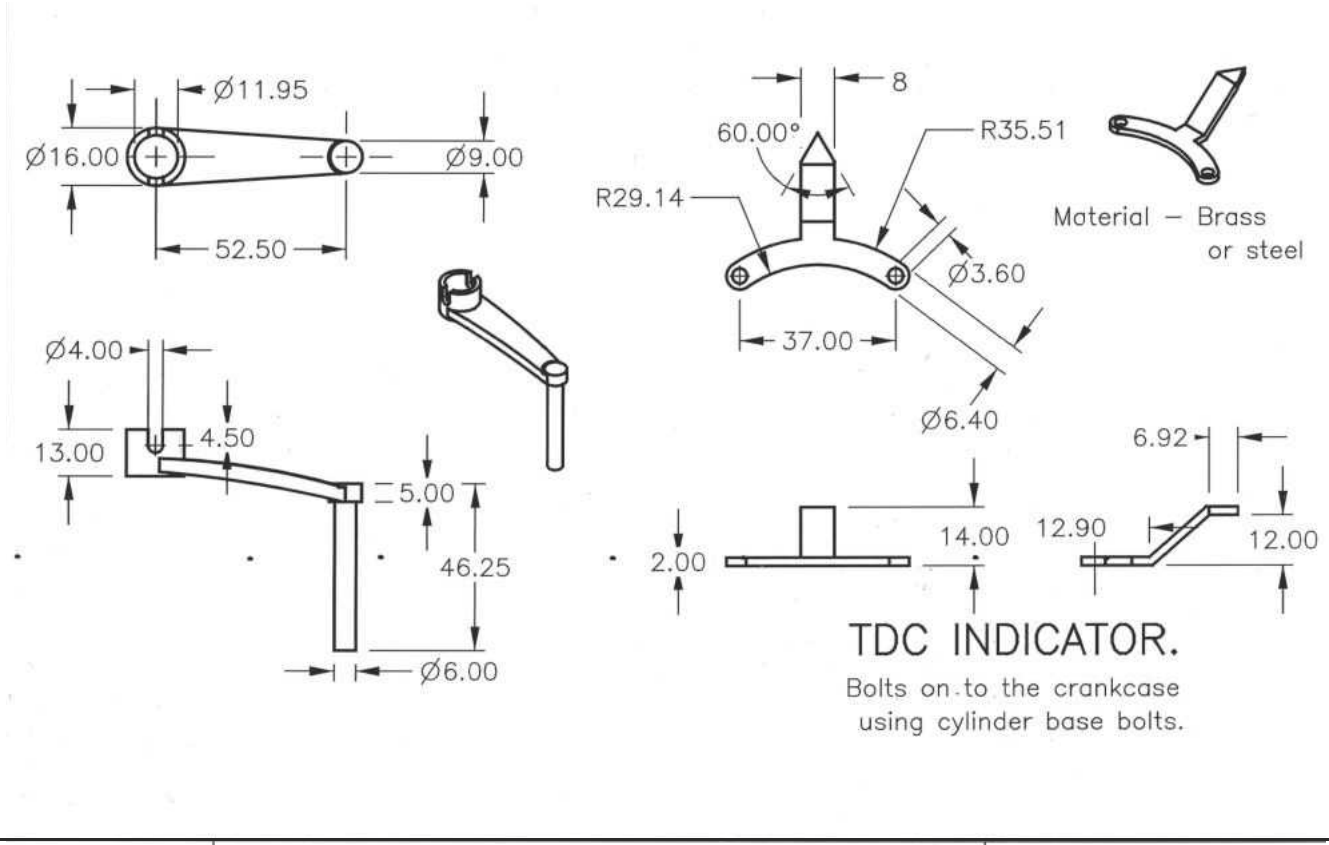


Oil box with level gauge glass.

The tank badge.



G.Punter	OIL TANK	Dra.No.24A



G.Punter	STARTING HANDLE.	Drg.No. 27A

The maker's badge in position on the tank.

the ignition cables away from the engine and avoid heat damaging the leads.

Painting

Normally I would not have painted the model until after the engine had been set up and run but I had been asked to attend two displays so the 'tune up' would have to be done at a later date. Most of the parts had been etch/primed as they were made as it stops the rust building up in our humid climate. Taking the model apart is a rather disheartening process as one has become use to seeing it sitting as a complete assembly on the work bench. Taking notes will be to your advantage when it comes to trying to remember the order of dismantling and assembly.

Blocks of wood with small holes were prepared to take all the bolts so that the heads could be painted. Pieces of plastic tube were slipped over studs and masking tape used on parts that did not require paint to be applied. The painting process was the most expensive part of building but it is the part that can really 'lift' the model. A visit to a local car parts shop soon had me looking through all the sample sheets of spray colours. I had taken a photograph that I hoped would show both the red of the wheels and the green of the rest of the parts to advantage and managed to colour match them quite well. It took several cans of the mixed spray paint and about $200 in cost to complete the exercise. The paint was of the quick drying type which is just as well as our local insect population are attracted to the green bits. Having painted one part I did look out to see a Willie Wagtail bird sitting on it! With the type of paint used, a clear gloss is normally applied as a finishing coat but I decided that I would leave it as a satin finish as I felt this looked more to scale – after all, it was an agriculture machine.

Testing

For test purposes the engine was set up on a separate test bench as it would be easier to access all parts of the engine. On a normal engine, top dead centre is easy to find as all you have to do is watch the piston rise to the top of the cylinder and use a DTI to set the TDC point. On this engine, the piston is not visible as the heads are not removable. My first approach was to remove the lower crankcase to expose the crankshaft and work from there but later I made a dummy cylinder with an open top. The setting of the cams, although they are accessible through the side covers, was carried out from the underside. Once this has been done and top dead centre has been marked on the flywheel the ignition can be set. The governor and throttle settings can only be guessed at this stage and will probably need further adjustment (**photo 60**).

Conclusion

It is now 2015 and I had almost finished a full set of drawings for this project and, thanks to my wife for giving me an A3 printer for Christmas, I am now able to produce drawings with sufficient space for the dimensions to be seen reasonably easily! My normal method of working is to design the parts and then, in the workshop, translate these into reality but, for example, if I don't have a 3.0mm shaft I may substitute a ⅛ inch shaft or I may change some of the dimensions if it is found necessary. The problem comes when other model engineers want to make the model and are working from the drawings. As a result, I took the chassis / engine apart and remeasured all the pieces to make sure they match the drawings. Some parts of the engine, such as the crankcases, did require many views to be able to show all of the details.

Proof reading is always difficult as the more you look at something, the more you tend to not see a mistake. I did change some parts to make them easier to make or to work more efficiently – it's a case of hindsight and *'if only I had thought of that before'!* There are approximately 200 drawings and it has taken many hours but I feel that it is all part of the project and, as they say, its 'provenance' for the model. This version of the tractor shares many aspects with later editions and could be used as the basis of a model of that era.

The Usk Rural Museum in south Wales has a later version tucked away in the back room and would be a valuable asset for those willing to undertake this as a project.

I had been using Pro/Desktop 2000 and had not encountered a problem until the computer with Windows XP gave up the ghost. *Oh bother!* It was many years old and due to be replaced. Up until the point of almost finishing the drawings all was going well and then disaster occurred and the hard drive died. Although I had backed up, I did lose some drawings due to corrupt files. One of the problems seemed to be that the old program could not be updated to the changes of the various Windows programs. The next computer had Windows 7 but

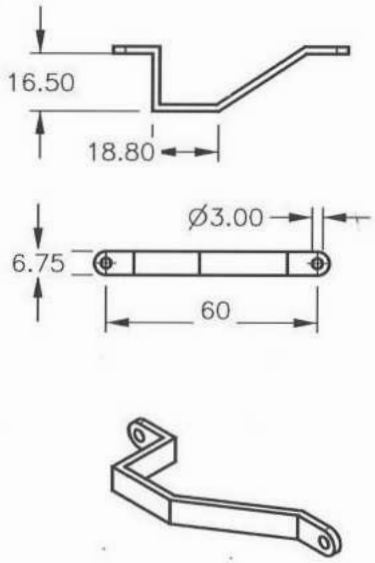
Setting and testing top dead centre.

Name badge to correct scale.

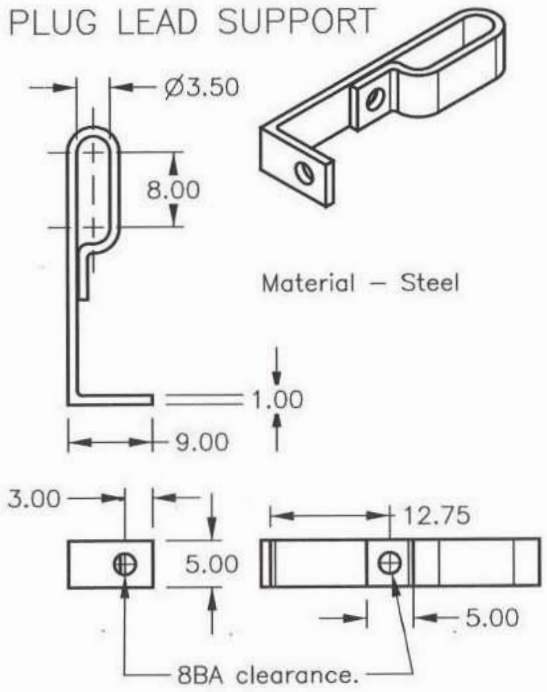
The model badge was made using a wooden pattern with plastic letters glued on to the surface. A silicon mould was then made and the resin poured into the mould making sure there were no air bubbles. The finished badge was then painted and glued onto the front of the fuel tank.

G.Punter	TRACTOR TANK BADGE	Drg.No.27B

FRONT ENGINE GUARD



PLUG LEAD SUPPORT



G.Punter	SMALL PARTS.	Drg.No.27C

the drawing program did not like this system and parts of it refused to work. Fortunately, I had printed hard copies of most of the drawings and had converted them to PDF files. I now have a new computer and new program but now have to spend time learning how to use it. The learning curve never stops!

Just when you think you have finished and you cross check the model with the photographs of the original, full size tractor you see that you have riveted the spokes onto the wrong side of the inner rims of the rear wheels. I must have had brain fade that day. 'Would any one notice?' 'Yes, of course they would' and, anyway, I wouldn't be happy with the situation. No excuses - just remake and fit the new spokes to both rear wheels but this time in the correct position!

I was lucky enough to be given a copy of *Cherry's Model Engines* for Christmas and after reading it I decided that while the model was being measured I should detail it and try to make it the best model that I could, even if only for my own satisfaction! I realise that on the never-ending ladder of quality I still have many rungs to climb!

The model is now structurally finished but the engine has yet to run (see Ed's note below) and I hope to have that all sorted out in the next few weeks - and that will be, as they say, the icing on the cake. From an idea generated by a visit to a museum in 2001 but not worked on until 2010, it has taken many hours of research, design and construction.

The peripheral research into the history of the individual tractor and the company who made it all add interest to the overall project. In the working on a project such as this you cover many disciplines/ trades. The starting point was making the sketches and working drawings using CAD, then came the pattern making and foundry work, followed by machining, fitting and assembly and, finally, the finishing touches.

I spend about seven hours per day in the workshop for at least five days of the week. Multiply that by 45 weeks per year and you have an awful lot of hours. I did take three months off to visit the UK in 2013 (we went to the Harrogate Exhibition).

At least my wife knows where I am and it keeps the brain cells on the move. We do have a great hobby and although, at times, it has been challenging, that is what a good hobby should be.

Thanks to all those who provided information that made this model possible. The next model, a 67cc V-8 OHC, is already being designed and I am looking forward to all the challenges that it will bring. The vision is already there - it just needs to be translated into metal!

●To be continued.

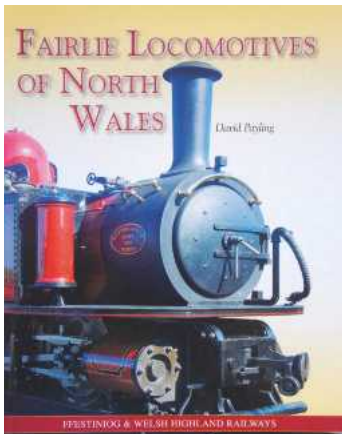
This instalment completes the series of drawings for the tractor engine. In a future issue, George writes a postscript that will bring us up to date with the story of getting the tractor running.

Book Review

Reviewed by **Roger Backhouse.**

Fairlie Locomotives of North Wales

By David Payling



Robert Fairlie's remarkable articulated locomotives - particularly the double ended version - are closely associated with the Ffestiniog Railway which adopted the design most successfully, demonstrating power to Russian, French and Mexican visitors. They were unique, with bogies and flexible steam pipes and were good hauliers, coping with long trains of slate wagons returning to the quarries.

This highly detailed book covers the history of the eight North Wales Fairlies, including those that were scrapped and even one that was only projected. Since preservation the FR has rebuilt or recreated several double and single Fairlies. At one time in their history they were converted to oil firing and then back to coal fuel.

A chapter gives an engineer's view of the engines and another a driver's account of a round trip - and there is much more to driving a double Fairlie than might be supposed! The author also explains the context of Fairlie operation with slate traffic figures quoted. Arcane to some, but declining traffic explains why the Ffestiniog could not develop these engines more fully, yet they anticipated today's diesel and electric locomotives with their power bogies.

Many photos and fold out drawings tell of designs and changes, giving engineering details that will be helpful to railway modellers and model engineers. It is a great improvement on some recent locomotive books by other publishers.

There's a chapter on the similar Péchot - Bourdon locomotives used on French military railways, two of which survive in continental museums. One regret is the lack of information about other Fairlie engines; for example the Royal Scottish Museum has an excellent sectioned model of one built for Mexico. The book is listed as a first edition; perhaps future editions will remedy that deficiency.

Despite this minor criticism, David Payling has written an excellent book; it is a credit to author and publisher. It's also worth noting, perhaps, that the book has been designed and was printed in North Wales.

Publisher - Ffestiniog and Welsh Highland Railways, 2017
316 pages. Full colour, casebound.
ISBN 978 090184814 7
£39.95 plus £4.95 p&p
Aviable from Ffestiniog Harbour Bookshop, Harbour Station, Porthmadog LL49 9NF
www.festrail.co.uk/shop.htm

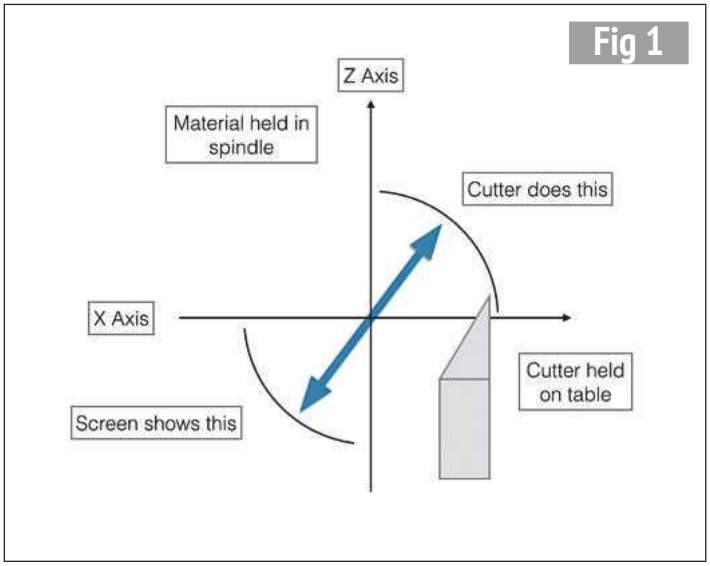
CNC Headlight Reflector

John A. Stewart relaxes whilst the mill does the work.

My 3½ inch gauge Shay locomotive needs a headlight and, of course, a headlight requires a reflector. One can attempt to find and purchase a commercial reflector, or one can have the fun of making one. As I enjoy making things (especially if I have the opportunity to learn something new) I chose to make one.

In Kozo Hiraoka's 1970s Shay plans, he specifies a commercial metal flashlight reflector with a small incandescent bulb. In his later designs, he advocates making a reflector from stock aluminium. I roughed out my design with pencil on the back of an old envelope; the radius was 'guesstimated'

Aluminium stock mounted in the CNC mill spindle; the tool on the table; the headlight reflector surface is almost finished.



Machining with the lathe tool fixed to the table and the material in the spindle.

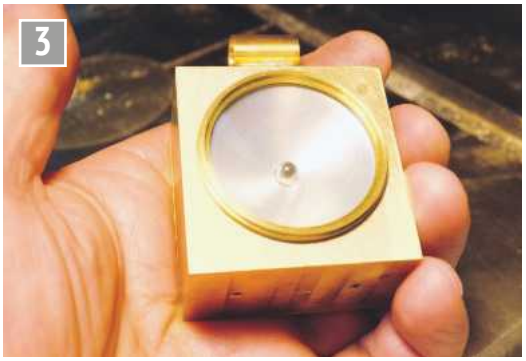
as 19mm, which would give a full diameter of 38mm. However, as the headlight casing expects the reflector to be 35mm diameter, I realised that if I make to that outside diameter, and with a 1mm wall thickness where the reflector meets the headlight glass, the largest diameter of the reflector surface will be 33mm, resulting in a reflector that is not quite a full half-circle. Choosing a radius of 19mm was just a guess; fortunately, the end result looks appropriate.

How does one turn a radius in the end of a bit of aluminium rod? There are many ways, from radius turning apparatus, to writing a computer program to give coordinates to manually follow, to just eyeballing it. All will produce acceptable results. I do have a little CNC lathe converted from a manual lathe (the 1950s Unimat design) and was within the realm of possibility that it had enough spindle power to slowly machine this reflector but I found to my chagrin that my CAM program's lathe module is not fully functional and would not accept my finalised drawing. *Harrumph!*

Back to the drawing board. I decided once again to use my KX1 vertical CNC Milling machine as a CNC Lathe; the material held in the spindle and a lathe tool bit anchored to the table.

CNC lathes and CNC milling machines do have a lot in common but using a mill as a lathe is not as simple as it may at first appear. There is a trick to figuring this out. Holding the material in the spindle with tooling attached

Reflector as machined but requires polishing. Outside diameter finish turned and chucking spigot removed.



Reflector in the headlight casing. LED in the 5mm hole, round glass installed; the headlight is close to completion.

to the table reverses the normal mill configuration so I put the tooling on the right side of the spindle, with the cutting surface facing away from me. On the CNC mill, the Y axis (the 'in and out' axis) sets the tool centre height, with the X and Z axes acting like a lathe.

Referring to **fig 1**, I programmed my computer to cut the arc seen in the bottom left quadrant. The machining process was as usual for a mill, i.e. go deeper (and in this case, follow the arc from centre to left) from the stock surface until the final line is reached. However, what was actually cut was on the top right-hand quadrant of the diagram: a 'mirror image'. In **photo 1**, taken from the front of my milling machine, you can see the tool bit held vertically with the almost-finished reflector facing down in the spindle.

A further explanation that might help clarify the cutter/material interaction is as follows: When the blue line in fig 1 is vertical, the spindle (holding the material) is closest to the table, putting the cutter deep into the material, where the light bulb will be. When the blue line follows the arc, and rotates clockwise towards the horizontal, the table moves to the left and the spindle rises; the cutter arcs to the right, finally leaving the material, cutting the reflector as it goes.

I should mention for completeness that the code that I ran was written directly in G-code; it was not converted from a drawing. I used a program called Arc Buddy that is available from the LinuxCNC website (**ref 1**) for the arc-specific G-code to help me get that correct. There are many ways to code arcs; this was just the way I chose. My quick and dirty G-code is shown in the listing (right), as it may help someone else. Doubtless you can improve on it.

The finish, as machined, was very good (**photo 2**). A short period of polishing, then removal of the chucking spigot, gives us a trial fit (**photo 3**). The 5mm hole for the LED was drilled in the lathe before machining on the CNC mill as, of course, was the 12.5mm chucking piece. Machining time? Long - but as my CNC machines have proven themselves reliable and, in case of mishap, my workshop is well within hearing distance of the kitchen, it quietly machined away whilst I prepared, served and enjoyed dinner with my wife. I even had time to do the washing up afterwards!

Back to the workshop... ME

REFERENCE

1. *Simple LinuxCNC G-Code Generators* - Wiki page: http://wiki.linuxcnc.org/cgi-bin/wiki.pl?Simple_LinuxCNC_G-Code_Generators

```
G-code: ( Lathe-Mill Arc Test )
(do Arc Buddy, change Y to Z, J to K)
G21 G90 G64 G40
G0 Z5.0
T4 M6
G18
F20
M3 S1400

O100 SUB
G0 X0 Z0
(go close to the start, then...)
G1 Z-[#1]
G3 X-[#1] Z0 I0 K[#1]
(go to safe area, away from the workpiece)
G0 X0 Z5.0
O100 ENDSUB

(start diameter)
#1=5.0
(finish diameter is in while statement)
O101 while [#1 LT 38.0]
        (send in the radius)
        O100 CALL [#1/2]
        (and increment a tiny bit)
        #1=[#1+0.05]
O101 endwhile

G1 Z5.0
M5
M30
%
```

G-code program to machine headlight reflector.

CLUB NEWS

Geoff Theasby reports on the latest news from the Clubs.

Brass tapping recently, I needed to tap a blind M4 hole in a brass bar. Drilling the hole tapping size was no problem, taken gently and 'pecking' at it - then the tapping. Using the correct tapping fluid, I gently tapped the hole, backing off frequently in the approved manner, when suddenly, all resistance ceased and the tap wasn't going any deeper. Trying to reverse it out, the tap pulled straight upwards! No thread! Good stuff this tapping fluid, I never felt a thing. The tap must have reached the bottom, then scraped away the thread already formed, assisted by the fluid.

The weekend of 8/9 July was **Sheffield Society of Model & Experimental Engineers**' Open Weekend, during which some photographs were taken North of the River Trent which is, traditionally, where The North begins. In this case, the Limb Brook flowing down the side of the club site is the traditional boundary 'twixt Anglo-Saxon Mercia and Northumbria. (History, yet!) The Open Weekend took place in glorious weather. Lots of activity and great refreshments. My 3-D printed YEC locomotive had an airing but failed at the start line, like Formula 1's Michael Andretti. I am rethinking the drive train. The catering was great, I had two helpings of chocolate fudge cake, which was cause for comment. A 'gotaway' was a 7¼ inch gauge

Dr Hays Adams Tank from Cambridge MES. (Photo courtesy of Tim Coles.)

Deutz Benzollok WWI trench warfare locomotive which was forever where I was not. At first I thought it was a mines locomotive. Maybe even this one: www.sevenandaquarter.org/media/images/forum/7479DSC08444.JPG

Deutz is also the company which invented the turntable ladder for fire engines.

Yesterday I bought a charity shop CD of Flight Simulator 2000, which I find is incompatible with my computer; an online Flight Simulator download wanted me to turn off my antivirus (in your dreams, Sunshine!) and a useful music synthesiser wouldn't work with my MIDI keyboard, so perhaps I'd better hold off with the experiments *pro tem*... I've just heard of an exploding garden shed (search online for exploding garden shed, West Yorkshire). That's why outhouses should be made of bricks. Having recently bought a video on the Me163 Komet and learned how to arm a WE177B, I'd better be careful how I treat those military surplus, suspiciously heavy, grey-blue lumps of warm metal I got. 'Doorstops', the man said they were.

In this issue: Heavy metal, Swedish Chef? A (Holy?) Quail, getting up to no good, G&S, rubble, feeble whistles, safety, Latin and apathy.

Further to my comment about NR & Light Rail wheel profiles differing, (*M.E.* 4567) I overheard a conversation about Sheffield's new TOPS Class 399 tram-trains having narrower aisles than the existing trams, although the seats are the same width. This appears to be due to the sidewalls of the cars being much stronger and thicker in order to improve their resistance to collisions with much heavier vehicles than just another tram.

Tim Coles writes regarding my item on hurdy gurdys (*M.E.* 4564). He says: 'Dr. Helen Hale is a member of the Cambridge Model Engineering Society and here you see a photo with her Adams Radial Tank (**photo 1**). She also plays, amongst various other instruments, the hurdy-gurdy. Here is one shot of Helen trying out her newest gurdy in the workshop of the craftsman who built it (**photo 2**). Then there is another shot of Helen in amongst a group of enthusiasts on a gurdy and bagpipe weekend. (The sound is comparable, in that gurdys have drone strings just as bagpipes have drone pipes - Geoff.) As you see, there is quite a following for the hurdy-gurdy, even today.' Noticing the face on the headstock, extreme bottom right, I enquired this of Tim and he tells me it is a traditional decoration but its form is up to the maker. As the saying goes, nothing for years and then two come along at once! I wonder if there will be a thirdy...?

TSMEE News, June, from **Tyneside Society of Model & Experimental Engineers** tells of their first model boat regatta, in conjunction with Heaton & District Model Power Boat Club, which was most enjoyable and may be repeated. Member, Mike Mee had an idea for marking the

Hurdy Gurdy. (Photo courtesy of Tim Coles.)

red line on a pressure gauge. Rather than hand painting it, he used a sliver of electricians red tape.
W. www.tsmee.co.uk

The **Gauge 3 Society** *Newsletter,* Summer, begins with Don Crouch building a LSWR carriage using laser cut brass parts. Tim Gleed-Owen investigates brushless motors for 'DMU's so that the low-profile motor is scarcely visible through the windows, whist John Branch thinks about motorised bogies. Geoff Nicholls meanwhile makes an unusual model, a sheep truck (two decks) GE variety.
W. www.gauge3.org.uk

The Blower, June, from **Grimsby & Cleethorpes Model Engineering Society** shows Alex Loadman receiving his award at the Doncaster show for his BR Class 08 locomotive, from Mike Chrisp. Also, there was this fine Hunslet DH60C by A. West, adjustable for 5 inch or 7¼ inch gauge (*M.E.* 4563). The Society gazebo went walkabout in Clee, supporting the Classics model shop. This was judged a success, many leaflets disbursed and they featured in the Grimsby Evening Telegraph. The line to G&C came in for a quizzical frown from Jeremy Paxman, according to the Cleethorpes Chronicle, as his connecting train from Kings Cross was cancelled at Doncaster, costing him £90 for a taxi. Also in line for a roasting (!) were the coal merchants who considerately left a delivery at 5 minutes to knocking off time after a hard day's work by the Thursday gang. A new dual-gauge crossover is to be installed (does this mean you are driving on the right now? - Geoff). After the May meeting, Barry Green was offered a lift home but got in the wrong car, although that was going the same way so he stuck with it but was the subject of immoderate laughter for the rest of the evening. Afterwards, he received a solicitous text message asking if he had been taken to the right house! I once visited an event in Cleethorpes, when I was inspired to write a G&S parody. *'Three little maids from Goole are we, filled to the brim with girlish glee, out for the day by the cold North Sea... One little maid is a bride, Yum Yum, one little maid in attendance come, one little maid from the cold is numb...'* (That's enough of that! - Ed)
W. www.gcmes.org.uk

Newslink, Spring/Summer, from **Sutton Model Engineering Club** was sent by Chairman, Paul Harding who fears that this issue was rather dry. Not so, Jo! President, Derek Tidbury notes that he has been a member of SMEC for 60 years. This, he feels, entitles him to say anything to anybody, criticise at will and as usual, be ignored! The welcome is as friendly as ever, he feels. The workmanship, although now measured in millimetres, designed on computers and 3-D printing, with vastly more capable workshop tools to hand, may not be higher quality but is perhaps within reach of many more people. The 82nd Annual Exhibition featured a display of the late Mike Dean's models, although without his GWR Tank 'Experimental No. 1', which now resides in the GWR museum at Didcot. (MEX Gold Award 2007. A recent practical talk on bomb disposal by Chris Ranstead was accompanied by several inert fuses (it says here) and some other British and German associated parts. S&T Department point out that some trains are delayed at signal SG1, after whistling to the signalman. It is thought that it may be due to the signal being badly sited or that some whistles are pretty pathetic! Accordingly, a plunger switch has been fitted at the signal, sounding an alert in the 'box. If drivers feel ignored in that situation, take the plunge!
W. www.suttonmec.org.uk

Reading Society of Model Engineers' *Prospectus*, June, congratulates Marcus Bailey on finding a job with the aid of a reference from RSME Young Engineers Scheme. '61249' comments on Gerard Fiennes' book, *I Tried to Run a Railway*. '6' says he worked in similar capacity but in different circumstances. After spending 30 years managing decline in a nationalised railway, the current public enthusiasm for renationalisation is inexplicable to him. Also, running a TOC is now hardly profitable in the UK, in fact one major operator makes more money running American school buses than from running UK trains. 'Wolverton Pug' visited, *begleitet vom redakteur,* the British Military Train 2012 rerun in Berlin and also explored the area. A large scrub-covered hill at Grunewald was revealed as the rubble from war-torn Berlin which was dumped there after 1945. At the top was Teufelsberg Allied radio monitoring station from the Cold War era, now derelict (see Wikipedia). Editor, John Billard, during this period was working for the MoD and would not have been allowed to visit the DDR.
W. www.prospectpark railway.co.uk

PEEMS Newsletter, May/June, from **Pickering Experimental Engineering & Model Society** spends much time on the Doncaster Exhibition and their excellent stand thereat. It then deals with Mike and Pat Sayers' charity garden party, well attended by many, with lots of models, the portable track and many classic cars to admire. £2,700 was raised for Ryedale Special Families and Next Steps. A day supporting the NYMR at Levisham Station, was not well attended, perhaps because of the location. Whilst Pickering, Grosmont & Whitby are understandably busy, Levisham is not and what is more, the station is a mile from the village and down a steep hill, leading to the classic line, 'Why is the station so far from the village? 'Appen they wanted it near t'railway...'. Following a talk on workshop electrical safety by Ted Fletcher, a number of simple precautions and gadgets are described, with technical appendices. Two 3½ inch gauge rolling chassis have been donated, with two tenders. A 2-6-0 which may be a Stanier Mogul and a 4-4-0 which may be a Midland, Deeley locomotive. These are to be completed within the year, mayhap.
W. https://bisarchtest.wordpress.com/

Also at Sheffield SMEE was this immaculate Ford Model A from 1930. Successor to the

Ford Model A at Sheffield SMEE.

Model T, it featured the Flying Quail radiator mascot (**photo 3**). A speedometer wasn't obvious but a look at the manual online says it is there but nowhere near as prominent as with which we are now familiar. The car was left hand drive, so possibly not made in the UK at Trafford Park. This fine Britannia, 70007, *Coeur de Lion* was attracting attention (**photo 4**) as were two B1s being lit up. Crouching low to get a good perspective in a photograph, I couldn't get up! Helping to restrain a nearby small car, I regained my dignity and composure hoping no-one had noticed. I'm 71 you know! This 'delicious' Ella is good enough to eat! (**photo 5**) whilst IP Engineering's 'Daisy' *George* is a great beginner's model, on the garden Railway (**photo 6**).

Britannia Coeur de Lion at SSMEE.

York City & District Society of Model Engineers' May edition of *York Model Engineer* says that Richard Gibbon and his team raised nearly £3,500 from Loco Le Mans, a 24 hour non-stop run, in aid of Martin House Children's Hospice. Even *Flying Scotsman* joined in, passing on the main line 30 minutes after the start.
W. www.yorksme.org.uk

Bromsgrove Society of Model Engineers, *Offcuts*, June, reports that the station shelter is nearing completion. A May get-together produced a Gauge 1 Class 41 Warship locomotive. Only five of the originals were built but all were scrapped within 10 years. W. www.bromsgrovesme.org.uk

Waushakum Live Steamers' *Waushakum Journal,* Spring, features the reintroduction of club name tags, each bearing an image of a Native American in a feathered headdress. The name appears to be of Algonquin origin. This puts me in mind of the Latin name for railway enthusiasts - Ferroequinologists. Jed Weare further elaborates on the signalling system. Prominent in many photographs is Jim Davidson's GE C44-9 in its dramatic black and white livery. A delivery of coal turned out to be unsuitable for locomotives, being mainly dust, but a local blacksmith has agreed to buy it since it is ideal for his purposes. Walter Webber compares planning for the Annual Meet to 'oiling round' a locomotive before the day's work begins. If you begin early and do it right, it is more likely to go according to plan.
W. www.waushakumlive steamers.org

And finally, from Richard Dedman, Welling MES: 'Last year I joined a support group for procrastinators. We haven't met yet!' (I was once in a group that set up an Apathy section. When it eventually produced a newsletter, the Editor was sacked for incompetence! - Geoff.)

Contact:
geofftheasby@gmail.com

Mick Savage's Ella *at SSMEE.*

Last but by no means least, IP Engineering 'Daisy' George *on the Garden Railway at SSMEE.*

AUGUST

28 **Frimley & Ascot LC.** Bank Holiday public running. Contact John Evans: 01276 34970.

28-31 **Vale of Rheidol Railway.** Driver for a Fiver: Footplate experience days. Contact: 01970 625819.

31 **Sutton MEC.** Afternoon running from noon. Contact Jo Milan: 01737 352686.

SEPTEMBER

1 **North London SME.** Club meeting (topic t.b.c.) Contact: Ian Johnston on 0208 449 0693.

1 **Rochdale SMEE.** Glen Atkinson: TBC. Castleton Community Centre, Rochdale. 7pm. Contact Len Uff: 0161 928 5012.

1 **Stockport DSME.** Bits & pieces. Contact Dave Waggett: 0161 430 8963.

2/3 **Chesterfield & District MES.** Visiting locomotives day/ Open Day. Contact Ian Blackbourn: 01909 562458.

2 **Tiverton & District MES.** Running Day at Rackenford track. Contact Bob Evenett: 01884 252691.

3 **Basingstoke DMES.** Public running at the Viables Craft Centre. 11am - 4pm. Contact: Austin Lewis: 01256 764765.

3 **Bedford MES.** Public running. Contact 07498 869902.

3 **Ellenroad Engine House,** Engines in Steam, 11am - 4pm. Elizabethan Way, Milnrow, Rochdale. Enquiries: 01706 881952.

3 **Frimley & Ascot LC.** Public running, 11am - 5pm. Contact John Evans: 01276 34970.

3 **Grimsby & Cleethorpes MES.** Public running and car boot sale, noon - 4pm. Waltham Windmill site. Contact Dave Smith: 01507 605901.

3 **Plymouth MSLS.** Public running at Goodwin Park. Contact Malcolm Preen: 01752 778083.

3 **NW Leicestershire SME.** **Members and visitors steam up and Curly Lawrence Memorial Day. Contact Den Swain: 01530 412048.**

3 **Wolverhampton DMES.** Public running at Baggeridge Min. Rly. 1 - 5pm. Contact Ian Priest: 01384 287571.

4 **Lancaster & Morecambe MES.** Meeting with speaker (t.b.c.) Contact Mike Glegg: 01995 606767.

4 **Peterborough SME.** Bits & Pieces. Contact Terry Midgley: 01733 348385.

5 **South Cheshire MES.** Les Riley: Progress building a 6in. Burrell. Contact Stuart Daw: 01782 767587.

6 **Bradford MES.** John Holroyd: Stationary Steam Engines. 7.30pm, Saltire Methodist Church. Contact: Russ Coppin, 07815 048999.

6 **Bristol SMEE.** On the Table evening. Contact Dave Gray: 01275 857746.

6 **Leeds SMEE.** Malcolm Frost: P2, 'Cock o' the North'. Contact Geoff Shackleton: 01977 798138.

7 **Sutton MEC.** Bits & Pieces night. Contact Jo Milan: 01737 352686.

9 **Nottingham SMEE.** Polly Owners' Group Rally. Contact Pete Towle: 0115 987 9865.

9/10 **Saffron Walden DSME.** NG2 event for visiting narrow gauge locomotives. Contact Jack Setterfield: 01843 852165.

9 **South Cheshire MES.** Society Open Day. Contact Stuart Daw: 01782 767587.

10 **Grimsby & Cleethorpes MES.** Public running, noon - 4pm. Waltham Windmill site. Contact Dave Smith: 01507 605901.

10 **Leeds SMEE.** Public Running at Eggborough Track from 10am. Contact Geoff Shackleton: 01977 798138.

10 **Sutton MEC.** Afternoon running from noon. Contact Jo Milan: 01737 352686.

10 **Welling DMES.** Public Running 2 - 5pm. (Behind Falconwood Elec Sub stn.) Contact Martin Thompson: 01689 851413.

10 **Wolverhampton DMES.** Public running at Baggeridge Min. Rly. 1 - 5pm. Contact Ian Priest: 01384 287571.

15 **Rochdale SMEE.** General Meeting Castleton Community Centre, Rochdale. 7pm. Contact Len Uff: 0161 928 5012.

15 **Stockport DSME.** David Davies & Colin Hudson: Free Electricity? Contact Dave Waggett: 0161 430 8963.

16/17 **NW Leicestershire SME.** Autumn Gala 12 noon to 4pm. Contact Den Swain: 01530 412048.

16/17 **Vale of Rheidol Railway.** Roaring Twenties and Thirties: 95 Years of the GWR. Contact: 01970 625819.

16 **Westland & Yeovil DMES.** Track running day, 11am - 4.30pm. Contact Bob Perkins: 07984 931 993.

17 **Bedford MES.** Public running. Contact 07498 869902.

17 **Cardiff MES.** Public running at Heath Park. 1 - 5pm. Contact Rob Matthews: 02920 255000.

17 **Grimsby & Cleethorpes MES.** Public running, noon - 4pm. Waltham Windmill site. Contact Dave Smith: 01507 605901.

17 **Rugby MES.** Public running at Rainsbrook Valley Rly., 2pm - 5pm. Contact Ken Eyre: 01788 842709.

17 **Tiverton & District MES.** Running Day at Rackenford track. Contact Bob Evenett: 01884 252691.

18 **Lancaster & Morecambe MES.** Geoff Martell: Drill and tool sharpening. Contact Mike Glegg: 01995 606767.

18 **Peterborough SME.** Cromwell Tools/ Adhesives. Contact Terry Midgley: 01733 348385.

19 **Chesterfield & District MES.** A talk by David Charlesworth. Contact Ian Blackbourn: 01909 562458.

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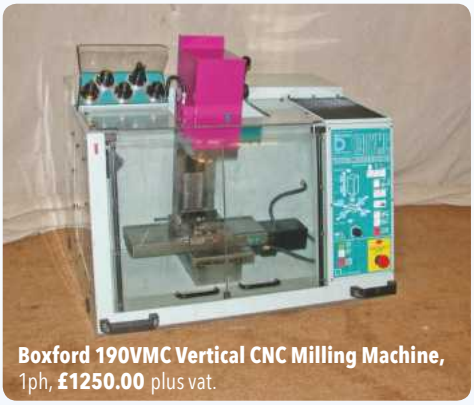

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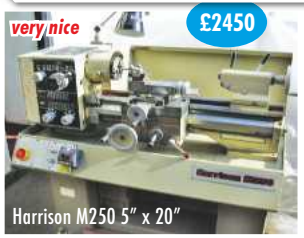

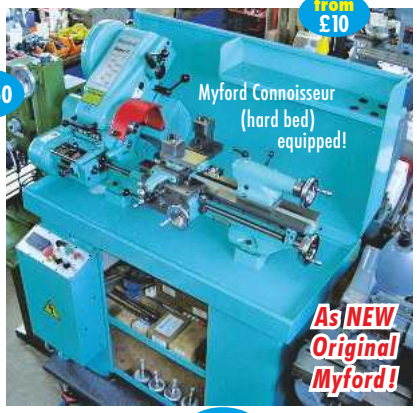

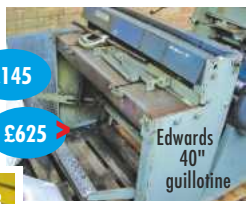

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